CHAPTER 6
Feeding Programs

Nutritional disorders constitute a major health problem in prolonged emergencies. An effective and successful feeding program should have the following essential five elements built into it:

1. Feeding as part of a package of services.
2. Knowledge of nutritional needs.
3. Understanding of the significance of nutritional vulnerability.
4. Knowledge of characteristics of nutrition problems.
5. Knowledge of dietary habits.

6.1. FEEDING AS PART OF A PACKAGE OF SERVICES

Provision of food is only part of a relief package that should include rehabilitation measures implemented during and carried through after the acute effects have been overcome.

6.2. KNOWLEDGE OF NUTRITIONAL NEEDS

Adequate food (energy supplies) for all segments of the affected population is the first priority. The energy requirements are governed by several factors: e.g., age, sex, physical activity, body size, climate, and, in women, pregnancy and lactation. When energy intakes are deficient, a portion of food protein is used to provide energy. Fats (oils) contain twice the energy density of carbohydrates and proteins. If feasible, it is recommended that about 25% of the energy supplied should be given in the form of fats (oils) and about 65% through carbohydrates.

Provision of adequate energy in the form of a staple food, some oil, and another supplementary food will largely meet protein needs. The addition of some locally-available leafy vegetables or other vegetables will upgrade the nutritional quality of the cereals in the rations by providing micronutrients. For those age groups designated nutritionally vulnerable, it may be necessary to provide some additional special supplements. (See below.) The recommended intakes of energy, protein, and vitamins and minerals for the differing age groups are given in Appendix 6.

6.3. NUTRITIONAL VULNERABILITY

Infants and young children, pregnant and nursing mothers are vulnerable to malnutrition even in normal times because of increased needs of

various nutrients per unit body weight. High rates of premature births, still births, and low birth weights are commonly associated with maternal malnutrition. Prolonged breast feeding of infants is a good practice especially in communities where malnutrition and poverty are endemic. Provision of adequate diet to working mothers helps lactation and also protects their health.

No special feeding is necessary for adolescents apart from the established feeding system. Old persons are vulnerable, not because they require more but because of their immobility, restricting them from full participation in the established feeding program. Care should be taken to avoid neglect and abandonment of the elderly.

6.4. KNOWLEDGE OF CHARACTERISTICS OF NUTRITIONAL PROBLEMS

When an acute disaster strikes, initial mortality could be very high, but malnutrition may not be a problem unless the pre-disaster nutritional status is poor or adequate relief measures are not initiated early. Slow onset emergencies, when superimposed on a population chronically undernourished, cause a gradual increase in number of deaths with widespread malnutrition, both of which reach a steady state unless adequate relief measures are launched. The following are brief descriptions of some of the common problems encountered. It would be helpful if good clinical photographs of typical cases of common types of malnutrition described below are included in the manuals to be prepared locally. The photographs should be those of patients from the same country/area and ethnic group.

6.4.1. Protein-Energy Malnutrition (PEM). PEM is a commonly encountered disorder. The population is generally affected in the following sequence:

1. Artificially-fed infants aged 0–12 months.
2. Nursing women, and young children aged 1–3 years in the process of weaning.
3. Pregnant women, and young children aged 3–5 years.
4. School-age children and elderly persons.
5. Adult males, female adults, and adolescents.

The condition becomes manifest in two clinical forms:

6.4.2. Marasmus, or wasting, is more common in the age group 1–3 years, in artificially fed infants, and in infants not receiving adequate breast milk. In the advanced stage, the patient is severely emaciated, eyes are sunken, bones become prominent, skin hangs in folds as though several sizes too large for the body—especially over the upper arm, buttocks, and above the knees. The head and abdomen may appear disproportionately large. The patient is apathetic, listless, and is generally found lying in a corner. Marasmus is the manifestation of severe

food deprivation with consequent deficiency of energy, protein, vitamins, and minerals. Some 80–90% of children with severe malnutrition in times of disaster are marasmic. Older children, elderly persons, and adults also lose weight, and gradually become thin and emaciated. Subcutaneous fat first and then muscle mass gradually disappear. Hunger edema may appear over the lower limbs in later stages.

6.4.3. Kwashiorkor. This is the other clinical form of PEM, where the effects of protein deficiency dominate. The child generally has a swollen appearance, with limbs edematous and the abdomen distended. Pathological changes in hair and skin may or may not be present. The hair may be dry, brittle, sparse, and bleached; the skin may show peeling—with or without pigmentation—especially over moist flexures and folds. The child is very sick, restless, irritable or withdrawn, and apathetic. He frequently will show cough and diarrhea, with or without fever. Many patients may show the features of both, being classified as marasmic-kwashiorkor. PEM in its most florid state can be diagnosed by a trained lay person, but at that stage it may be too late; even under best hospital care, mortality will be high. Table IV will be helpful for field diagnosis.

TABLE IV

Body Weight for Age Expressed as Percent of Standard

(See Appendix 10)

	100 to 80%	**79 to 60%**	**Below 60%**
No edema	Normal	Underweight	Marasmus
Edema	To be investigated further	Kwashiorkor	Marasmic-Kwashiorkor

6.4.4. Vitamin Deficiency. Diseases stemming from B-vitamin deficiency are generally not a priority public health problem. Deficiency signs and symptoms due to Thiamin, Riboflavin, Niacin, and Folate are fairly common in populations severely deprived of food. If not available in the relief food distributed, provision should be made to supply some B-complex vitamins or multivitamin preparations.

Vitamin C deficiency is rare. Scurvy was noted as a prominent feature during the Irish potato famine, where potatoes were the only source of vitamin C for the poor population prior to the famine.

Vitamin A deficiency is a serious problem in poor children in certain parts of the world. This deficiency leads to defective night vision and blindness. It is stated that approximately 20,000 children become blind every year due to vitamin A deficiency causing keratomalacia. Keratomalacia and blindness may become overt features unless adequate vitamin A supplements are included in the food or given separately.

Deficiencies of iron and calcium, although not easily visible clinically, may be expected to be present in the large majority, especially among vulnerable groups. Prevention of these deficiencies is effected either through provision of appropriate supplements or preferably by providing a diet which includes green leafy vegetables.

6.5. KNOWLEDGE OF DIETARY HABITS

Selection and provision of food should be based on full knowledge of local food habits. As far as possible, the food should be familiar to the people, palatable, and in accord with their dietary habits, taboos, and religious beliefs Dietary habits are often hard to change, although they can be modified to some extent during emergency conditions. People who are hungry are prepared to make some adjustments and accept less familiar foods, provided efforts are taken to demonstrate publicly how to prepare these foods. The prepared food should be consumed in public to assure its palatability. This involves giving suitable demonstrations and explanations for the relief staff themselves who may not be familiar with the foods. It is important that the social and religious views of the people be respected and the nature of the food and its components explained in simple language Adjustments and exchanges are possible in regard to the kind of staple given. Appendix 7 gives a list of major foods with appropriate alternatives consumed in many countries.

6.6. DETERMINATION OF FOOD NEEDS

The food needs of the people *should be based on their energy needs* A mixed diet formulated to provide these energy needs and containing three or more selected food items (excluding salts and spices) will usually be satisfactory to cover all nutritional requirements. This is elaborated under section 6.7 (Design of Diets). The provision of energy needs can be considered in three ways:

6.6.1. Emergency Subsistence. The level of food given on this basis helps to keep people alive until an organized relief program is instituted with a continuous flow of supplies. The emphasis is to provide minimum energy needs *for body basal functions and non-occupational activities.* No productive work is possible at this time This period should be kept as short as possible

6.6.2. Temporary Maintenance. With improvement in food supplies, the food energy provided should be increased. The energy furnished should permit slow recovery and maintenance of reasonable health. Some graded occupational activity is now possible. This type of feeding can continue as long as necessary

6.6.3. Normal Rehabilitation. The level of food given at this stage provides a full ration and helps rapid recovery. Full occupational activities are possible at this stage.

The following two tables (V and VI) give an estimate of the energy

expenditure of adults and the energy allowance for different age groups. Once the energy allowance is determined, specific food items and amounts needed should be calculated so as to make the daily diet as balanced as possible.

TABLE V

Estimate of Energy Expenditure of Adults

Distribution of activity	Basal Requirement Kcal	Allowance for Non-occupational Activities Kcal (average)	Occupational Activities			
			Light	Moderately active	Very active	Exceptionally active
Adult Men						
Resting in bed 8 hours	500					
Non-occupational activities 8 hours		1,100				
Occupational activities 8 hours			1,100	1,400	1,900	2,400
Adult Women						
Resting in bed 8 hours	420					
Non-occupational activities 8 hours		780				
Occupational activities 8 hours			800	1,000	1,400	1,800

From *Handbook on Human Nutrition Requirements*, WHO, Geneva: 1974.

TABLE VI

Energy Allowance

Age and Sex	Emergency Subsistence (Kcal)	Temporary Maintenance (Kcal)	Normal* and Rehabilitation Allowances (Kcal)
0 to 2 years	1,000	1,000	1,000–1,200
3 to 5 years	1,250	1,500	1,300–1,800
6 to 9 years	1,500	1,750	1,900–2,300
10 to 17 years	2,000	2,500	2,400–3,000
Pregnant and nursing women	2,000	2,500	2,200–3,000
Adults			
Male	1,900**	2,200	—
Female	1,600**	1,800	—

*Normal allowances for male and female adults should be calculated on the basis of their activities according to Table V.

**There is provision for more than eight hours of nonoccupational activity.

Adapted from: Jean Mayer, "Management of Famine Relief," *Science*, Vol. 188, 1975, p. 576.

In the early days of relief, it may be necessary to recommend only "emergency maintenance" levels. If the relief effort has to be prolonged, every effort must be made to bring the provision to normal rehabilitation levels as soon as possible. Based on the above, an appropriate feeding program should be formulated, taking into account population size, age groupings,[13] and nutritional problems and requirements.

In relief feeding of short duration lasting a day or two, only "something to eat" is often more important than balanced diets, and the nutritional value of the distributed food is of secondary importance.

6.7. DESIGN OF DIETS

The daily diet should be based on locally-available food as a measure to reduce transport expenses. The diet should be built around the local staple food or a suitable alternative. Preferably, it should contain the following basic items:

1. The staple food[14] or choice of two or more staple foods (cereals, tubers).
2. Edible oil (fat).
3. A supplementary food[15] or choice of two or more supplementary foods (legumes, animal products, milk products, oil seed flours, vegetables).
4. Salt/sugar/spices as necessary.

Long-term relief will require external food supplies, domestic or imported. Imported foods other than the familiar staples and supplements are often not the popularly-consumed items. In addition, many of them may not satisfy the bulk needs of the hungry people. Imported food is also frequently packaged in unfamiliar ways. It may be a processed or concentrated food. Methods of preparation before consumption usually differ from local preparation. It will be advantageous therefore to reserve these products for use in special feeding, or only when absolutely essential.

The following three tables (Tables VII, VIII, and IX) can assist in designing relief rations for daily diets for all age groups (except children under two years). Tables VII and VIII give amounts of exchangeable staples providing equivalent Kcals and exchangeable supplement items providing equivalent quantities of proteins, respectively. Table IX suggests proportions of edible fat and Kcal equivalence. The proper combination of the staple, main supplement, and edible oil will satisfy energy needs both for emergency subsistence and temporary maintenance. For adults involved in moderate to exceptionally strenuous activity, the calorie allowance has to be raised proportionately through judicious increase in the quantity of the three basic items. This should be brought about without undue increase in the bulk of the diet. A ration

designed on the above basis may at times provide somewhat less than the recommended allowances of protein (see Appendix 6). The energy and protein content of common articles of food included in the diets are given in Appendix 8.

TABLE VII

Amount of Exchangeable Staples Providing Equivalent Kcal*

(Note: Amount of protein provided is not equivalent)

Item	Amount (g.)	Amount Kcal	Protein (g.)
Rice	500	1,800	35
Wheat flour (whole)	550	1,800	71
Semolina	510	1,800	56
Corn meal (whole)	500	1,800	45
Cassava meal	530	1,800	11
Oat meal or rolled oats	460	1,800	64
Sorghum	510	1,800	56
Millet (Pennisetum)	500	1,800	60

* Calculated from the table in Appendix 8.

TABLE VIII

Amount of Exchangeable Supplement Food Items Providing Equivalent Quantity of Proteins

Item	Amount (g.)	Amount Kcal	Protein (g.)
Legumes/beans	65	230	15
Peanut flour (partially defatted)	31	115	15
Soy flour (partially defatted)	33	86	15
Roasted peanuts	58	342	15
Whole milk powder (vitamins A and D added)	58	285	15
Skim milk powder (vitamin A added)	40	150	15
Dried whole egg powder	33	200	15
Canned meat	90	265	15
Canned fish	83	165	15
Fish flour (solvent extracted and designed for use as an additive in human food)	20	65	15

TABLE IX

Amount of Edible Fat (Oil) for Inclusion in the Daily Ration

(1 g. oil = 9 Kcal)

Age	Amount (g.—range)	Kcal
0–2 yrs	20 to 30 g.	180 to 270
3–5 yrs.	30 to 40 g.	270 to 360
All of the ages and both sexes	40 to 60 g.	360 to 540

6.7.1. Explanatory Notes.

1. To increase protein content of the diet, the amount of supplement should be proportionately increased at the expense of the staple. This is particularly important if the staple consists of the exclusive use of fresh roots and tubers.
2. Mothers of infants (0–12 months) should be encouraged to breast feed. Mothers nursing children over one year of age should be encouraged to continue. Infants receiving adequate breast milk need not get other foods until they reach 4–5 months of age
3. Infants deprived of breast milk should receive other milk preparations or milk-based formulas fortified with vitamins A and D. All children under two years should also receive some milk, milk preparations, or a processed nutritious food in addition to the rations.
4. Vulnerable groups should be given less of the large bulk roots and tubers and an increased proportion of either the supplement or a cereal, if available.
5. The population should be encouraged to eat as many leafy vegetables as possible. These should be locally grown or available. Seasonal fruits will augment vitamin and mineral supplies.
6. Oral multivitamin preparations, B-complex preparations, and vitamin A preparations should be given separately as tablets, capsules, or oral drops, particularly to vulnerable groups.
7. When distribution cuts must be made for short periods due to non-arrival of supplies, reductions should be as far as possible on all items provided.
8. If energy supply has to be increased for any reason, it should be achieved through proportionate increase of all the basic ingredients.
9. Peanuts and legumes should be cooked and pounded/mashed before administration to young children

6.8. DETERMINING FOOD SUPPLY REQUIREMENTS

For entire population. With information on the size of the population, age distribution, and percentage of women who are pregnant or nursing (typically ¼ to ⅓ of the female population), it is possible to calculate roughly the supply requirements for each basic item.

For a segment of the population. In the very early stages, when the number of people suffering from food insufficiency is not known, an arbitrary classification should be made to determine Kcal requirements and, consequently, food supplies:

40% of population—normal rehabilitation allowance on adult scale.
40% of population—temporary maintenance allowance on adult scale.
20% of population—no feeding support.

Since relief population includes children of different age groups, the above estimates for adult scale will be on the safe side.

6.9. USE OF MILK POWDER

Apart from the value of milk powder as a nutritious supplement to daily rations, reconstituted milk powder (or milk-based formulas) with vitamins A and D added is useful in feeding young infants (up to 4–5 months) who are unable to obtain breast milk due to mothers' illness or drying up of the breast. Reconstituted powdered skim milk, although useful, is dangerous if fed alone. It is important that the package label of these products be clear as to the nature of the product, the ingredients added, the vitamin content, and the method of preparation.

The use of reconstituted milk powder and other milk-based formulas as a sole daily ration for older infants and young children is to be discouraged. These products should be used *only as a supplement*. Children especially should get other foods in adequate quantities to supply their energy needs.

6.10. PROCESSED FOODS

These foods can play a useful role in feeding young children in emergencies, provided they contain acceptable ingredients and conform to the nutrient composition recommended for weaning food (PAG Guideline No. 8). They are particularly valuable when milk is not available for supplementary feeding.

Processed foods should be nutritionally compact, have a high density of calories, and contain adequate amount of proteins. 100g. of the dry food should be sufficient to provide about 350–400 Kcals and 15–20g. of protein. Processed foods should be well packed, dry in form (prepacked and preferably precooked), have a long shelf life (to avoid spoilage during transportation and storage), be simple to prepare and distribute at the feeding site as a liquid or porridge, be palatable, and easily digestible. Table X lists a few of these foods, their constituents, and caloric and protein values. It should be noted that all of these products are similar in that they contain a cereal flour, oilseed flour (usually defatted), legume flour or combination thereof—with or without dry skim milk. Vitamins and minerals are added.

It is important that these products be used selectively when and where necessary. Imports of a variety of these products should be discouraged. It is also essential that those received for use should contain clear labels as to ingredients, nutritional composition, and method of preparation. If such details are not available, the product should be withheld from use.

6.11. LOCAL PRODUCTION OF FOOD

Local food production is an important activity in situations where long-term relief has to be undertaken. Food production should be

TABLE X

Some Examples of Processed Food Mixtures

Name of Product	Ingredients	Nutritional data for 100 g. Kcal	Protein	Fat	Remarks
WSB	Precooked blend of whole wheat flour; defatted soy flour, vitamins, sugar, and minerals	360	20	6	Mixed with suitable quantity of boiled and cooled water and fed as drink
SWF (Special Weaning Food)	Precooked blend of cereal flours; soy or other oil seed flours or both (defatted); vitamins and minerals	360	15	—	Mixed well with 1/6 part oil, boiled and cooled water added with stirring. Given as a drink
SUPERAMINE	Precooked blend of wheat flour, legume flour, dry skim milk, vitamins and minerals	340	20	3.5	Mixed with suitable quantity of boiled, cooled water and fed as porridge or drink
INCAPARINA	Maize flour; cottonseed flour; vitamins, lysine, minerals	360	28	4	——
FAFFA	Cereal flour, legume flour; defatted soy flour, dry skim milk	340	20	2.5	——
CSM	Precooked maize; defatted soy flour; dry skim milk; vitamins and minerals	370	20	6	Mixed with boiled, cooled water. Fed as porridge or soup
BALAHAR	Whole wheat flour; defatted peanut flour; chickpea flour; vitamins and minerals	360	22	4	Roast powder for 2–3 minutes. Add salt to taste. Add water, boil for 5–6 minutes. Fed as porridge.
PKFM	Precooked blend of maize flour; full fat soy flour; dry skim milk; sucrose; vitamins and minerals.	400	20	9	Mixed with boiled, cooled water and fed as drink.

directed both for immediate use and for the rehabilitation and agricultural development of the affected area. Food production activities for immediate use should commence along with food relief. Foods produced for immediate use will help to improve the variety of relief foods available. Crops, particularly leafy and non-leafy vegetables, quick-maturing tubers, papaya, and other fruits with a short growing span, should be raised for immediate consumption. The advice and guidance of agricultural extension workers should be taken in selecting the food crops for cultivation. Stimulation of local production for immediate consumption should note the following factors:

1. There is often a shortage of water for use in agriculture. Waste water may be properly channeled for food production purposes. Extra effort has to be made to improve the water supply through sinking tubewells, tank bunds, and deepening of existing wells. Any suitable open piece of land should be utilized for food production.
2. The physical and psychological make-up of adult working populations are such that work output is likely to be reduced. Adequate publicity, personal discussions, and offer of special incentives will bring forth cooperation of the people. Total family participation in home food production should be encouraged.
3. Seeds, fertilizers, pesticides, and necessary tools should be provided, either free or at subsidized rates. The establishment of vegetable nurseries for continuous supply of seeds and seedlings should be actively explored.
4. Many wild-growing roots, plants, leaves, fruits, and flowers may be used indiscriminately as food in scarcity areas. Their consumption, although possibly helpful, should be watched since some may contain toxic principles.

Relief efforts should not stop short at local production of foods. Steps should be taken to teach mothers how to make use of the foods grown, both for feeding their children as well as other family members. The *PAG Manual on Feeding Infants and Young Children* (Cameron and Hofvander, 1976) provides essential details relevant for children, along with several recipes. Local production of foods is an activity of major significance because these foods involve little or no cash exchange for farmers and rural laborers who cultivate their own crops.

6.12. TYPES OF RELIEF FEEDING

1. **Free distribution:**
   - Cash to buy food from market
   - Distribution of rations (uncooked)
   - Mass feeding (cooked)

2. As wages for work done:
- Payments of cash to buy food
- Payments in kind (uncooked)

3. Supplementary feeding:
- Carry home system (uncooked)
- Spot-feeding system (cooked)

4. Therapeutic:
- Outpatient (cooked)
- In-patient (cooked)

6.12.1. Free Distribution. This approach could be used for limited periods under *special circumstances*—where enough food is available in the market but, due to high cost, is not within the buying capacity of the poorest members of the community. This system works well if large numbers of persons are concentrated in one place such as a camp The distribution is on a weekly basis. Recording and inspecting are essential. Infants and young children may have to be provided with special foods.

Mass feeding is the first step in almost every emergency and may remain the only program for redressing acute emergencies of short duration. The food cooked at a central kitchen is usually distributed twice daily in prescribed amounts to the whole population. People will accept their familiar food cooked in a simple way. Cooked food should be eaten and not stored for a second meal.

Mass feeding can be supported by mobile canteens that bring cooked food to some central place at the village/camp level for distribution at the feeding sites. If the number of persons is limited, food may be distributed in homes, particularly of aged or disabled persons.

Distribution of rations should replace mass feeding as soon as possible. Family registration and a system of identification are essential. Food ration cards should be durable, with plastic covers or cloth binding.

6.12.2. Food as Wages for Work Done. Poor victims may be offered work as part of relief or rehabilitation activity; cash payments are then used to buy food for the family. The points to be noted are.
- Malnourished adult men and women should not participate in manual work.
- The vulnerable groups in the family may fail to share in the benefits.
- Social problems may be created when adults are at work and the children left behind.
- If activities are not pre-planned as part of the development scheme, the work done will be wasteful and unproductive.

The program may be extended by paying wages fully or partially in kind. The staple food item can be given as part of the wages. The staple food should be sold at a reasonable price in fair-price shops or ration shops. Cooperative societies, voluntary organizations, or government agencies should operate the shops. The following points are important:

- The retail price of food should be carefully fixed, using a subsidy if necessary.
- Regular inspection of shops is required to check misuse of food.

If there is a chronic shortage of food, rationing must be introduced for the whole population. Policy decisions have to be made on the items of food meant for general distribution and those reserved for vulnerable groups.[18]

6.12.3. Supplementary Feeding. Twenty-five percent of the total population will provide a rough estimate of the number of people who form the vulnerable group and will need supplementary food. This percentage may not apply to camp populations. Supplementary feeding will help prevent the development of malnutrition and bring those already mildly malnourished up to normal nutritional status.

The choice of supplementary food should be decided on the basis of availability and the special requirements of the vulnerable group. The *PAG Manual of Feeding Infants and Young Children* (Cameron and Hofvander, 1976) has several recipes made from commonly available foods and suitable for use as supplements. If preprocessed packaged food mixtures (Table X, page 78) are used, they should be nourishing, easy to cook, locally acceptable, and fortified with a vitamin and mineral mix. Infants and preschool children should receive the feeds in liquid or porridge forms.

It is recommended that when these foods are given as supplements, young children and pregnant women should get about 300 Kcal and 15 g. protein (about 75 g. of the food mixture/day); and a lactating woman, 400 Kcal and 20 g. protein (about 100g./day). The preparation may be bulky for the young child to eat in one sitting. Sweet preparations are preferred by children. Salted preparations are acceptable to older children and pregnant and lactating women.

A table prepared by UNICEF for computing total requirements of supplementary foods before ordering is provided in Appendix 10.

6.12.3.1. The carry-home system. Beneficiaries are given unprepared or prepared food to consume at home. If in unprepared form, a week's requirement of food can be distributed at one time.

Advantages of the Carry-Home System:

- It can cater to a large number of children on a continuous basis.
- A variety of menus can be prepared at home.

- Mothers find the system advantageous because it cuts down the daily waiting time
- Smaller number of mothers will visit daily to collect the food and, given more time, their visits can be used to impart nutrition education.

Disadvantages of the Carry-Home System:

- Food may be shared by older children and other adult members of the family.
- Storage facilities are poor at home, resulting in contamination
- Mothers who leave home for relief work may not have time to feed the children.
- The food may be resold in the market. This is particularly true if milk powder is distributed.

6.12.3.2. Spot feeding. This method implies distribution of cooked food once a day, with allotments consumed at the feeding centers. Infants, children, and pregnant and lactating women should be served in that sequence; mothers should eat after feeding the infants. The UNICEF, South Central Asia Region (11, Jor Bagh, New Delhi, 110003), has issued a *Handbook for Supervisors of Supplementary Feeding Sites of Special Child Relief Programs.* The *Handbook* contains useful, practical information.

Advantages of the Spot Feeding Method:

–Beneficiaries are assured of getting the right kind of supplementary food.

–Preventive health programs can be focused on the beneficiary population; the nucleus is here laid for a future comprehensive health-care service in the community.

Disadvantages of the Spot Feeding Method:

–Irregularity in attendance.

–Difficulty in separating out remainder of the affected population.

–Small children and those who are ill may not be able to eat their food in one sitting. (In such situations, two servings within an interval of two hours may be arranged. During intervals, the center can feed older children and women.)

–High cost of the program per recipient.

6.12.4. Therapeutic Feeding. This involves feeding above and beyond normal nutritional needs and is an attempt to achieve catch-up growth in an already moderately or severely malnourished child. This can be done on an outpatient basis for those who can feed themselves but may require round-the-clock care for children with medical complications requiring tube feeding.

6.12.4.1. Selection of child patients. Paramedical staff should be trained over a short period of time (two-three days) to identify cases of

malnutrition by inspection or by simple examination, and bring them in for therapy. Every tent and house has to be visited and all rooms and corners inspected to locate such children. The same is required for the elderly. Table XI provides rough screening criteria for instituting nutrition therapy for malnourished children.

TABLE XI

Rough Screening Criteria for Nutrition Therapy of Malnourished Children*

Criteria	None Required** (except supl. feeding)	Nutritional Therapy		
		Kwashiorkor	Marasmus	Marasmic/ Kwashiorkor
(1) Body Weight × 100 / 50th percentile standard (from Appendix 10)	Less than 80%	Less than 80%	Less than 60%	Less than 60%
(2) Edema	Nil	+	−	+
(3) Deficit in weight for height***	Minimal	++	++	++
		(75% of standard or below)		

*Adapted from VIII Report of Joint FAO/WHO Expert Committee on Nutrition. FAO Report Series 49 WHO Technical Rep. Series 477. (Also see p. 132, Table IV in this chapter.)

**This group represents underweight children who require careful periodic monitoring for any deterioration.

***Calculated as $\frac{\text{Weight of child}}{\text{Weight of normal child of same height (from Appendix 10).}}$

6.12.4.2. Selection of therapeutic foods. The food used for feeding young children (see pages 72–77) can be used for therapy in cases of malnutrition, with some adjustment of quantity and the addition of oil to increase energy content. The food chosen should be in liquid form for feeding in the early weeks of the therapy; it may be fed as porridge after a few weeks' treatment. Because of likely poor appetite, the therapeutic food should be made tasty.

The food should provide about 150 Kcal and 2-4 g. protein per kg. body weight daily. The protein source should as far as possible be milk and the preparation should be fortified with appropriate vitamins and minerals (or the latter given separately).

6.12.4.3. Initial therapy (for about two weeks). Reinforced skim milk, casilan milk, and K MIX-2 have been successfully used during emergencies. These therapeutic nutritious preparations are costly, however, and should be replaced after about two weeks by appropriate food mixtures.

Reinforced Skim Milk Preparation (to be bulk formulated daily before use):

Dry skim milk (fortified with vitamins A and D)	125 g.
Sugar	30 g.
Oil	50 g.
Water	Quantity sufficient to make total volume of 1 liter.

One liter of the prepared product provides 43 g. protein and 1,020 Kcal. Mix skim milk powder and sugar with vegetable oil and stir. Slowly add to the mixture cooled, boiled water, stirring constantly; make up volume to one liter.

Casilan Skim Milk Preparation (to be bulk formulated daily before use);

Casilan	35 g.
Dry skim milk	35 g.
Sugar	35 g.
Oil	70 g.
Water	Quantity sufficient to make total volume of 1 liter

One liter of the prepared product provides 44 g. protein and 1,028 Kcal. Mix casilan, skim milk powder, and sugar. Add correct amount of any vegetable oil, stir and mix well (red palm oil may not mix easily). Slowly add enough cooled boiled water to make up correct volume, stirring the mixture constantly. Strain the lumps, mix it with a small quantitiy of the liquid portion, stir well, and add to the rest.

K MIX-2 Preparation (Kwashiorkor Mixture No. 2—as supplied without oil):[17]

Calcium caseinate	18 g
Dry skim milk	28 g
Sugar	54 g
Total	100 g

K MIX-2 should not be fed without mixing in any vegetable oil: every 150 g. of K MIX-2 should be mixed with 60 g. oil.

Traditional therapeutic feeding programs have emphasized frequent feedings around the clock (six-eight times daily), in order to ensure that the child consumes *at least* 120 Kcal/kg. and preferably 150 Kcal/kg. body weight per 24 hours. Recent experience has shown that most severely malnourished children can consume the necessary calories in as few as three or four meals, thereby greatly simplifying and economizing the program. Rapid progress is facilitated by a diet containing high energy and low bulk, best achieved through more liberal use of fats (oils).

6.12.4.4. Maintenance nutrition therapy. After two weeks of nutrition therapy using any one of the above products, maintenance therapy with less expensive foods should be begun. Since it is difficult to continue frequent feedings and it is no longer necessary, good results can be achieved by feeding three or four times per day. The feeding may have to continue for four-six weeks. Some of the food mixtures commonly used are listed in Table X, on page 78.

Edible oil is to be added to the food mixture to provide more calories. From 125 to 175 g. of dry mixture, with 40 to 60 g. of oil, will provide adequate calories and protein. Smaller children with lower weights will take less food than others. The desired amount of oil (peanut oil, palm oil, or butter oil) should be well mixed with the estimated amount of dry food mixture for use in a single feed for all of the children Heating of the oil may be necessary to mix it with the dry food mixture. This is particularly so for butter oil. One and one-half to two volumes of boiled water is added to render the feeds in the form of a thick liquid or porridge. If precooked, they require only some warming before being fed. Generally, the children recover in about six weeks' time. They can then be transferred to the supplementary feeding program.

6.12.4.5. Some problems encountered during therapy.

1 Nearly 90% of children with marasmus or kwashiorkor can be fed by mouth. However, much patience, sympathy, and understanding are necessary to feed the children, and mothers and elder sisters of the sick children might be enlisted to perform this work.

2 Nasogastric therapy may be required for a small percent of the cases. It should be performed only by those who have been well trained in the procedure—physicians, qualified nurses, or auxiliaries. These children are very sick and often have associated diarrhea and/or vomiting. A narrow lumen stomach tube is slowly passed through one of the nostrils. The tube should be lubricated with liquid paraffin or any available oil. The lubricated tube should be slowly inserted through the patient's nostril The child will gag or try to vomit when the tube's tip touches the throat. Once in the gullet, a few centimeters of the tube should be pushed in until the second mark on the tube representing "stomach body" reaches the opening of the nostril. If the tube is not marked, the length of the tube corresponding to direct distance between nose to umbilicus should be used as a guide. Aspiration through the tube should bring out a few ml of clear fluid to confirm that the tube is in the stomach. The tube should now be secured and fixed at this point with adhesive tape. The daily total feed of the child

should be divided into 6-10 feeds, administered at two-hour intervals. The feed should be administered slowly into the stomach through the nasogastric tube by gravity flow, using a syringe without plunger. Nasogastric feeding can usually be discontinued after 72 hours. Oral therapeutic feeding can then be started.

3. Some children may develop increased frequency of loose motions during the first two or three days of therapy. If the child has mild diarrhea—i.e. two-four loose movements a day—no change is necessary. If the diarrhea is severe, rehydration fluid (see next chapter) should be added to the normal feeding schedule.

Mothers are expected to accompany children to the unit and breast feeding should be continued. If not breast fed, the elder sisters or brothers can escort the patients. Nutrition therapy day-care centers are preferred to in-patient units.[18]

6.13. MEDICAL-CARE SUPPORT

Nutrition therapy centers should be linked with the existing infrastructure of the health delivery system in the area affected, as well as with medical-care facilities established as part of the relief effort. Severely malnourished children with serious associated complications such as bronchopneumonia, gastroenteritis and dehydration, dysentery with shock, and cerebral malaria cannot be managed in the nutrition therapy centers. Besides being provided the therapeutic foods, the children should be treated appropriately for the complication. The operation of medical-care facilities as part of relief work is described in the next chapter. Full medical coverage should also be provided at the nutrition therapy centers by the medical staff. Malnourished children who are ambulant but suffer from some medical complication should attend the medical care set-up for outpatient or in-patient treatment as required.

6.14. CLEANLINESS AND HYGIENE AT FEEDING CENTERS

- All foods and other commodities should be properly stored at every point to protect from humidity and infestation.
- Meals should be prepared according to instruction provided for different types of food, or as indicated on the label.
- Clean utensils and safe, boiled water should always be used.
- Prepared food should be protected at all times from flies and dust by suitable covers.
- Distributions should be done using clean measures, ladles, or utensils.
- Beneficiaries should be instructed to use clean and washed utensils or containers when receiving the food.
- Beneficiaries should wash their hands before lining up to get meals.

- The feeding area should be cleaned after feeding to reduce the menace of flies
- Garbage bins with lids should be provided at each feeding center and emptied at least once or twice a day.

6.15. NUTRITION EDUCATION

Nutrition education is an essential component of all feeding programs. Talks should be held with beneficiaries while at the centers, in their camp quarters, through poster displays, and whenever possible through mass communication methods. The educational content can be limited to simple messages. Some examples of these messages are:

1. "Breast-feed children as long as possible."
2. "Start feeding semi-solid foods from six months of age."
3. "Feed young children several times a day. A child below age four cannot consume the amount of food he needs in only two meals."
4. "Illness with fever or diarrhea does not require cutting down the food intake or changing the diet in any way."
5. "Make full use of the relief services available. Mothers should learn the signs and symptoms of common diseases so that they can seek advice immediately."
6. "Ensure children are immunized, when such programs are offered by the authorities."
7. "Keep yourself and your surroundings clean; drink only clean water."
8. "There are advantages to a small family."

These simple messages can of course be elaborated to varying degrees depending on local circumstances.

NOTES TO CHAPTER 6

[13]The following figures give an approximate distribution of population in developing countries according to age and sex:

Infants—4%
0-5 years—15-20%
0-15 years—40-50%
Over 15 years—50-60% (males and females nearly equal).
Pregnant and nursing women—6-8%

[14]Staple foods are foods that are regularly consumed in a country or community, and from which a substantial proportion of the total calorie supply is obtained. This is especially true in the case of the poor population sectors and in time of food shortages.

[15]Supplementary food is a supplement to the staple food and provides various nutrients either absent (or present in inadequate amounts) in the staple food. Supplements should vary according to prevalent nutritional deficiencies, needs of the beneficiaries, and the patterns of food consumption.

[16]During World War II, Britain introduced a scientific system of rationing based on nutritional principles. Special physiological needs of vulnerable groups were provided for.

[17]K MIX-2, fortified with vitamin A, is kept in stock for emergency shipments at the UNICEF warehouse in Copenhagen.

[18]A large number of nutrition therapy wards and day-care centers were established for management of the severely malnourished children of refugees from Bangladesh in 1970-71. While attendance at day-care centers was almost 100%, very few children came in for admission to in-patient care. Nearly half of the 10% requiring nasogastric feeding required in-patient care with I.V. hydration and treatment for associated diseases.

CHAPTER 7
Medical Care

7.1. AIMS

Medical care in emergency relief has two primary aims:

1. To prevent death.
2. To prevent or reduce disability and suffering from ill health.

Preventive health measures are of primary importance because they are more effective, cheaper, and more widely available to the population at large than curative services.

A major limitation in the delivery of health services is often the non-availability of doctors. Therefore, it is crucial to make widespread effective use of pre-trained auxiliary personnel. Intelligent volunteers—given guidance, simple and clear instructions, and sharply demarcated jobs—can help to carry out a major portion of important medical services. Thus, doctors and other supervisory personnel should only be used as team captains to oversee the work of smaller groups of auxiliaries (four-eight members) who will supervise and participate in specific activities along with selected volunteers trained to do specific jobs (e.g., vaccinators, weighers, feeders, dispensers of simple medicines). Emergency medical services must be appropriate to the needs, an apparently obvious statement not often heeded in practice.

Prompt response is particularly essential in traumatic disasters (earthquakes, fires) where surgical care, blood, or plasma may save lives in the early stages. In most disasters, however, it is more efficient to delay a few days and design appropriate preventive and curative activities to meet the defined need. Often, in the enthusiasm and compassion of the moment, costly limited service of "high profile" responses preempt more valuable, wider-reaching, and simpler preventive measures. For example, the cost of flying a surgical team and equipment to a village to treat 20 surgical cases exceeds the costs of vaccinating 10,000 children against measles along with providing oral-fluid therapy to treat hundreds of thousands of cases of diarrhea. Cost-effectiveness must be heavily emphasized in the provision of medical/health relief services.

7.2. GENERAL PRINCIPLES

1. Successful medical and health relief action should be effectively collaborative with the regular health services of the country. Emergency health needs should be framed within national needs and resources. Health-service personnel and recipients in neighboring regions not affected by the emergency often become jealous and non-cooperative when unusual, excessive, or inappropriate attention is directed to health in the affected region.
2. Similarly, collaboration should be established and relief provided in close consultation with groups managing nutrition care, as well as coordinated with all other relief activities.
3. *A scarce commodity is trained personnel.* Proper selection and training of additional personnel and reserves are necessary while relief work is in progress. The primary need is to train non-professional local personnel as emergency health volunteers.
4. In order for expatriate medical and health relief workers to be useful, they should have some previous experience in relief work. They should become acquainted, as a high priority, with local customs, health problems, and prevalent methods of treatment. Local workers can learn from their expatriate colleagues successful practices of emergency medical relief and how to adapt them for effective action.
5. Grave emergencies—those with extensive casualties and inadequate medical services—require a system of sorting out patients into those who are hopeless, those who can survive if helped, and those who will survive even without medical attention. This "triage" (three groups) system will assure maximum survivors, although it is extremely difficult to accomplish. The great burden usually comes from the latter group—the minor illnesses; these cases crowd the clinics, consume both doctors' time and available drugs, and often result in leaving the truly sick at home, uncared for. Effective use of auxiliaries and triage, even at a clinic gate, can save valued drugs and doctor-time for those in greatest need.
6. Regular feedback to local/district headquarters by the medical relief team on the work being done, local needs, problems, and solutions, is essential. The system for regular reporting of medical/health information (health surveillance) should consist of two parts: One is provided by relief teams working at specified locations in the field on medical care and nutrition relief; this consists of a report of illness/malnutrition as detected and treated. It is not a reflection of actual prevalence in the community. The second phase of reporting is accomplished by using trained surveillance teams gathering data on key health indicators; these should use uniform methodology from randomly selected sub-groups chosen as representative of the entire population under risk. The diseases to be included in such

surveillance should be critically chosen, according to local disease patterns, seasonal or other expected variations, and efficiency of local control measures.[19] Since filling out forms is so universally disliked—and as blank forms should not be assumed to mean an *absence of disease*—*an optimum number of important* diseases should be included. On page 92 is an example of a reporting form used during the medical relief action in the Ethiopian drought/famine of 1974.

7.3. SIGNIFICANCE OF REGULAR REPORTING

The success of relief efforts rests heavily on the system of regular reporting. With a twofold system (as discussed above), firm data can be obtained upon which to base the difficult decisions repeatedly required in emergencies: Are the most urgent needs being met? Do areas not covered by existing relief teams need more help than areas receiving emergency help? Are the medical priorities generally agreed upon? Should they be changed? Are scarce resources being best utilized? Is there a documented need to bring in additional resources from outside the country?

A program cannot be *proven* successful, and is less likely to *be* successful, without documentation of its effectiveness. Collection and evaluation of relevant data will nearly always uncover inadequacies in any program, the correction of which will be necessary to assure maximum effectiveness and application.

7.4. CAN MEDICAL PROBLEMS ARISING FROM EMERGENCIES BE PREDICTED?

It has been suggested in the past that medical problems can be predicted with some certainty, based on given types of emergencies and their duration. If this were completely the case, many problems of responding appropriately to emergency medical needs would be greatly simplified. In general, it can be expected that acute catastrophes—such as tornadoes, earthquakes, and tidal waves—will mainly result in traumatic injuries. Survivors in tidal waves with serious injury may be rare. Epidemics of infectious disease—so often anticipated in the wake of some of these disasters—have fortunately in recent years been infrequent, and compulsory emergency immunization programs need not be recommended automatically.

Generally speaking, however, it is hazardous to predict, except in very general terms, what the medical consequences of a particular emergency may be.

Nevertheless, seasonal epidemics are known to occur in many countries (cholera, in Bengal; dengue, in Thailand; measles, in West Africa) and disasters will predictably exacerbate normal seasonal phenomena. Similarly, crowding, lack of water, and shortages of clothing will surely result

should also be given to matters such as vaccine effectiveness, coverage of population, and the "opportunity-cost" of alternative programs (those that may be delayed or put aside in reckoning program expenses). Thus, in planning a drive using vaccine providing 60% protection, and assuming two-thirds coverage of the susceptible population, actual protection will extend to only 40% of the population. As benefits accrue only to this 40%, resulting per-capita costs become proportionately high.

Similarly, benefits consist not only of deaths averted or hospital costs avoided. They may also be calculated in terms of prevention of a potential impact of the epidemic disease on the economy as well as in terms of the immeasurable values of psychological reassurance and sense of well-being imparted to the community.

The preventive immunizations that *may* have to be planned include measles, BCG, tetanus, diphtheria, pertussis, typhoid-paratyphoid, and cholera. Yellow-fever vaccine may be appropriate in areas where the disease is still found and Aedes vector not controlled. Vaccine against rabies should be available, if needed, for use on individuals bitten by suspected rabid animals. Vaccines against rubella, mumps, plague, typhus, and the like need not be planned for in emergency situations. Meningococcal meningitis, especially group A, has been a major threat to concentrated populations (such as in army camps) and could constitute a danger in certain disasters; new vaccines are yet unproven, leaving sulfonamide as the sole prophylactic agent. Malaria continues to be endemic in much of the disaster-prone world. While vector control in camp areas may be the most cost-effective prevention, the administration of weekly chloroquin or pyrimethamine, especially to children, may be necessary in some areas to prevent epidemic resurgence of malaria. Control of breeding places of Aedes mosquito—responsible not only for yellow-fever transmission but also the dengue group of fevers—should be undertaken vigorously by preventing stagnation of clear water near domestic sites.

7.6.2. Washing with Soap and Water. The medical supply item of the highest value of all is soap. It need not be of any particular medicinal or antiseptic nature; almost any type, along with a modicum of water, will be of inestimable benefit in preventing many skin diseases, water-borne, fomite-borne, and other types of diseases that easily become epidemic in conditions of social disruption, crowding, poor sanitation, and malnutrition. (Details on water and other sanitation measures are given in Chapter 8.)

7.6.3. Active Disease Surveillance Systems. Surveillance should include regular and uniform reporting by relief and other medical teams established in the field. These procedures are described on pages 90 and 91.

7.6.4. Prevention of Psychological Disturbance and Disability. Mass psychological abnormalities can be controlled by checking the spread of unverified rumors and biased reports, and by substituting accurate information, especially concerning progress in combatting the disaster. Efforts in this direction will help to prevent disturbances and improve efficiency of the assessment. Public demands may arise for certain health measures which may not be deemed appropriate by health experts. Clear explanations and reassurances should be publicized; authorities are cautioned not to initiate an inappropriate procedure merely for the purpose of placating misguided demands.

Severe psychological disturbances may occur in some individuals in the population, and these conditions—by virtue of subject apathy, grief, bewilderment, and confusion—may prevent their participation in feeding programs, as well as delay their normal recovery.

7.7. THE PRIORITY PROBLEMS

Priority health and medical problems usually include:

- Severe manifestations of malnutrition, requiring medical care in addition to special feeding.
- Infectious diseases commonly associated with malnutrition.
- Certain chronic diseases which may be exacerbated by severe malnutrition.
- Other medical conditions that may warrant emergency attention.
- Severe traumatic injuries.

7.7.1. Drug (Non-Food) Therapy for Severe Manifestations of Malnutrition. The following three conditions must be considered: 1. Certain nutritional anemias—iron and folate deficiency. 2. Hypovitaminosis-A and possibly B-complex, ascorbic acid, or other micronutrient deficiencies. 3. Hypoglycemia in kwashiorkor-type of protein-energy malnutrition (PEM).

7.7.1.1. Nutritional anemias. Unless the anemia is very severe, clinical recognition is difficult, requiring inspection for pallor of nails, palmar creases, mucous membrane of mouth and eyelids. Auxiliary personnel should be trained to recognize pallor and to administer treatment in the form of 300 mg. of ferrous sulphate daily for a minimum of four weeks.

Folate deficiency is a contributing cause of much nutritional anemia, especially in conditions of severe food deprivation. Folic acid preparations of 5 mg. per day should be provided for all cases of severe anemia. Pregnant women should receive iron and folate in the last trimester. Vitamin B_{12} is not indicated in these nutritional anemias.

In extremely severe iron-deficiency anemia, deep injection of intramuscular iron preparations may be indicated.

7.7.1.2. Hypovitaminosis-A and other vitamin deficiencies. In regions of the world where carotene and vitamin A dietary deficiencies are common, severe ocular manifestations of hypovitaminosis-A among children of preschool age may approach epidemic proportions, usually in conjunction with PEM or measles or diarrheal diseases. In such situations, 200,000 IU (65,000 micrograms) of oral vitamin A is indicated for mass distribution for this age group. When early acute keratomalcia is detected, oral or injectable doses of vitamin A concentrates in aqueous form must be administered quickly to preserve eyesight. Injectable doses of an aqueous preparation is preferred if diarrhea or vomiting is present. The absorption of an oil-soluble form of vitamin A from the injected site is unreliable.

B-complex vitamins or multivitamins are frequently prescribed and administered, even though the benefits of administration are generally not significant. Although their routine use is not necessary, they will do no harm given in usual doses as necessary.

7.7.1.3. Hypoglycemia in kwashiorkor. Transient severe hypoglycemia is among the many serious metabolic derangements which complicate kwashiorkor. The severity and frequency of this fatal complication is often recorded in the early morning hours. Clinical research investigators recommend provision of frequent feeding (every three hours)—at least during early days of treatment—as a way to prevent its occurrence. Intravenous glucose solution (50 ml of 10% or 25 ml of 50%) should be tried if the condition develops.

7.7.2. Therapy of Common Infectious Diseases Associated with Malnutrition. The most common, serious, and potentially fatal infectious disease processes which may precipitate severe PEM, or be synergistically found with moderate PEM in the earlier stages, are the two broad categories of diarrheal and respiratory infections of childhood. Together, these two general conditions—in conjunction with malnutrition—account for the greatest share of all deaths occurring in many developing countries, even in their "normal" state of endemicity. During an emergency, the death toll resulting from diarrhea and respiratory infections occurring in conjunction with malnutrition becomes greater still.

By simple observational methods, trained auxiliaries can arrive at reasonably accurate diagnoses of most conditions falling in this category. They may initiate rational therapy employing only a modest list of relatively inexpensive drugs. As a result, many lives could be saved in most emergencies, with benefits far outweighing the risks of therapeutic failures and toxic side effects.

The following list of diseases is presented not by priority of frequency or severity, but by body systems. It is intended to be neither comprehensive nor universally applicable, but it does include the major

medical conditions likely to present serious health problems in emergencies in developing countries.

7.7.2.1. Diarrheal diseases.

1. Cholera and other diarrheal diseases

The major danger of diarrheal diseases is dehydration. The treatment of choice is fluids, where possible by mouth, where necessary by vein. Oral fluids are absorbed faster than intraperitoneal, making the latter only rarely useful. Table XII provides a rough guide for diagnosis of dehydration. Estimated fluid loss should be replaced within four hours—50% of the loss in the first 60–90 minutes. Oralyte[21] dissolved in water can be used for rehydration. For I.V use, Ringer Lactate (sterile) should be used. The oral route can be used for rehydration if the patient is conscious and cooperative—otherwise, I.V. drip should be started and switched to oral as soon as the patient can drink. Tetracycline (250 mg. six hourly, for 3–4 days) should be given for those with fever or suggestive cholera for controlling infection. A reyhydrated patient will have:

- Easily felt pulse on dorsum of foot.
- Respiration and pulse normal.
- A reasonable quantity of urine every four hours

If any of these criteria are not met, additional fluids should be administered as before

TABLE XII

Diagnosis of Dehydration and Fluid Requirements

Degree of Dehydration	Pulse/min * (child/adult)	Respirations* /min. (child/adult)	Eyes	Skin Turgor (when pinched): Time to Return to Normal	Fluid Loss (% Body Wt.)	Approximate Rehydration (ml): Volume of Fluid (child/adult)
None	100/80	24/18	— nil —	— nil —	0	0/0
Mild	120/90	30/25	— nil —	— nil —	3 - 5	500/1,200
Moderate	140/110	40/30	Hollow	1-2 seconds	7 - 9	1,000/2,500
Severe	160/130	50/40	Very sunken	5 or more seconds	10 - 15	1,500/4,000

*If fever and/or chest infection is present, these parameters may not be a proper reflection of the degree of dehydration

Once rehydrated, the patient should receive:

–If a child, one full glass (200 cc) of oral fluid for each stool passed, two glasses for adults.

–Allow extra fluid if thirsty—enough to quench thirst

–Vomiting is not a contraindication to frequent administration of small amounts of fluids.

–Feed normal diet as soon as possible, preferably within hours.

2. Probable bacilliary dysentary

Acute, severe, diarrhea with severe cramps. Stools mucous and bloody, but usually not foul smelling *Illness of three days or more duration.* Abdomen tender. May be with dehydration

Suggested therapy:

Give oral fluids, as above if necessary, diet as tolerated.

Tetracycline, 250 mg., six hourly for three days or sulfadiazine or sulfadimidine, 1 g., six hourly for six days For cramps, tincture of opium 5 ml in water, four hourly.

3. Probable amebiosis

Severe abdominal pain and fever May be frequent stools with mucous and blood, with foul odor, *for 10 days or more* Abdomen tender. Liver may be enlarged or tender. May be weight loss.

Suggested therapy:

Oral fluids, as above, if necessary, diet as tolerated

Tetracycline, 1,000 mg. stat. and 250 mg., six hourly for six days. Then Diiodohydroxyquinoline, 500 mg., every 12 hours for three weeks.

If liver tender, Metronidazol, 250 mg , three times daily for six days

4. Probable "simple" diarrhea

Acute or recurrent diarrhea, moderate to mild. May be six or more stools per day, but patient does not appear to be seriously ill. Alert, pulse strong, and skin with good elasticity

Suggested therapy:

Oral rehydration as described. Frequent feeding is emphasized, even in face of continued loose stool Avoid large amounts of milk. Give K MIX-2, if available

5. Probable typhoid

High fever with abdominal pain May be diarrhea, or constipation. Pulse may be slow. Headache May be delirious. Abdomen tender. Liver and spleen enlarged and tender.

Suggested therapy:

Give oral fluids, as above, if necessary, diet as tolerated.

Chloramphenicol, 500 mg , six hourly for 10 days.

7.7.2.2. Respiratory diseases.

1. Probable acute pneumonia

Fever, often with sudden onset, and chills. Productive cough

with yellow, often blood-streaked sputum. Chest pain Difficult breathing, respiration rate rapid, rib retraction, dullness to percussion and rales. May be cyanosis

Suggested therapy:

Encourage oral fluids and continue to feed. Procaine penicillin, 600,000 units IM daily for three days, or benzathine penicillin 1.2 million units, or penicillin G Pills 4 million units, four hourly for seven days.

2. Probable sub-acute pneumonia

Persistence of symptoms and signs, as in (1.), after five days of penicillin therapy

Suggested therapy:

Fluids and feed, as above. Tetracycline, 500 mg. stat. and 250 mg six hourly for five days.

3. Possible pulmonary tuberculosis

Persistence of symptoms and signs, as in (1.) for two weeks or more, or long history of cough, with fever, sweats, hemoptysis, weight loss. Rales, possibly dullness from pleural effusion. Enlarged lymph nodes. TB treatment should not be started if no guarantee to maintain long enough, at least one year. Diagnosis should be based on sputum examination where possible.

Suggested therapy:

Fluids as above with extra feedings. The national TB treatment is to be applied.

- INH, 300 mg./day for a year
- Thiacetazone, 150 mg./day for a year.
- Streptomycin, 1 g. IM daily for one to three months and stop.

Where national TB treatment is available, the patient should be referred for definitive diagnosis, and long-term therapy as soon as possible after instituting emergency treatment Family members, especially young children, should receive.

- INH, 100 mg. daily for one year.

4. Probable acute laryngo-tracheitis or pertussis

Symptoms and signs as in (1.), with obstructed or whistling breath sounds, hoarseness or whooping cough, in children. Severe air hunger and rib retraction. May occur with dehydration.

Suggested therapy:

Fluids and feed, as in (1.). With severe dehydration, give oral fluids, as in diarrheal therapy. Chloramphenicol, 250 mg., six hourly for five days for children over six years and 125 mg., six hourly for five days for younger children.

Antibiotics make no difference in the severity or duration of disease once established, but they do reduce case infectivity. It is probably of greater value to treat all close contacts of the index child as a preventive measure.

5. Probable acute bronchitis

Fever, cough, chest pain. Breathing not difficult. Generalized coarse rales and rhonchi; lungs otherwise clear.

Suggested therapy:

Fluids and feed, as in (1). Sulfadimidine or Sulfadiazine, 2 g. stat. and 1 g. six hourly for three days. [Penicillin can be used as alternative in dosage given in (1.)]

6. Probable acute upper respiratory infection (URI), with tonsillitis

Fever, sore throat, cough. Pharynx and tonsils red, often with patches of pus. Tender lymph nodes in neck. (Presence of thick, grey-white membrane which bleeds readily indicates possible diphtheria.)

Suggested therapy:

Fluids, as in (1.). Soft diet until soreness clears.

Procaine penicillin, 500 units IM daily for five days or benzathine penicillin, 1.2 ml for five days. (For diphtheria, give anti-toxin when available.)

7. Mild URI

Stuffy, runny nose, often with sore throat and cough. May be low-grade fever.

Suggested therapy:

Fluids; reassurance Aspirin, 150 mg., six hourly for one day for children with fever.

7.7.2.3. Eye and ear diseases.

1. Probable acute conjunctivitis

Pain in the eye, made worse by moving eyelid. Redness of membranes of eyeball and eyelid. May be discharge of pus.

Suggested therapy:

Wash eye with saline (mother to be taught). Tetracycline ophth. ointment, application twice a day for seven days. If purulent discharge is severe, give Sulfadimidine 1 g. six hourly for seven days.

2. Probable acute otitis media

Pain in the ear, usually with fever. May be discharge from the ear.

Suggested therapy:

Keep ear protected from cold. Procaine penicillin, 600,000 units IM daily for three days. If no improvement in three

days, benzathine penicillin 1.2 ml for three more days or Tetracycline, 500 mg. stat. and 250 mg., six hourly for seven days. For children under six years, Tetracycline may be given from the beginning. Antibiotic ear drops, three times daily for seven days, if discharge present.

3. Probable acute otitis externa

Pain in the ear, usually without fever. Pain increased by pulling the ear. Redness and swelling of external ear canal.

Suggested therapy:

Antibiotic ear drops, three times a day for seven days.

7.7.2.4. Skin diseases.

1. Probable scabies

Itching and rash. May be generalized, but is usually present between fingers and toes, underarms and in the groin, under breast in nursing women; babies' face and frequently all over body. Rash may be secondarily infected. (See 2.)

Suggested therapy:

Thorough washing with soap and water. Paint thoroughly the involved areas with Benzyl Benzoate, 20%, and allow to dry. Particular attention should be given to creases and folds which should be opened and the drug applied. A second application is made one day later and at more regular intervals, if necessary. A cleansing bath is taken two days after the last application. Clothing and other linen used should be boiled before replacing. Persons living in close groups should receive simultaneous treatment.

2. Probable pyoderma (e.g., impetigo, boils)

Pain and sores on skin, often with swelling and discharge. Redness, tenderness and swelling, often with crusting and pus.

Suggested therapy:

Wash with soap and water, twice a day. Apply warm, moist compresses; apply gentian violet or antibiotic ointment daily. Procaine penicillin, 600,000 units IM daily for three days or 1.2 ml benzathine penicillin; incision and drainage of abscesses, when indicated.

7.7.2.5. Parasitic diseases.

1. Probable malaria

Chills and fever, with headache and muscle aches. May be nausea and vomiting. (There may be also more severe manifestations requiring specialized treatment.)

Suggested therapy:

Chloroquin phosphate, 250 mg. tab (= chloroquin base, 150 mg.):

Adults: 3 tab stat. and 1 tablet per day for two days

Children 5-10: 1 tablet per day for three days
Children 1-5 : ½ tablet per day for three days
Children 0-1 : ¼ tablet per day for three days

Alternatively, one-day treatment with 600 mg. chloroquin base and repeated after three days if necessary. Proportionately less dosage for children.

2. Probable hookworm infestation

Variable symptoms. May be weakness and pallor. Microscopy of stools for eggs will confirm diagnosis.

Suggested therapy:

Biphenium, five g./d for one day only (½ dose for children 1 to 6). (*Do not treat children under one year.*)

3. Probable roundworm infestation

May be abdominal distention and pain. Large worms may be found in stool. Microscopy of stools for eggs will confirm diagnosis.

Suggested therapy:

Piperazine, four g./day for two days (¾ dose for children 1 to 6; ½ dose for children under one).

7.7.2.6. Acute urinary tract infection.

1. Probable acute pyelitis or cystitis

Frequency and urgency with burning on urination. May be fever, chills, and pain in flank and back.

Suggested therapy:

Drink at least 10 cups of water daily, and Sulfadiazine or Sulfadimidine, 2 g. stat, and 1 g. four hourly for three days then: 0.5 g. six hourly for next three days.

7.7.3. Medical Management of Certain Non-Infectious Conditions. Lower priority must necessarily apply to chronic conditions whose diagnosis and therapy are far more difficult. This is particularly true when these conditions are considered in the context of a nation's total, long-term health programs.

There is a tendency, especially by expatriate health personnel, to apply complex and difficult methods of medical management to patients with such conditions as diabetes, heart or kidney disease, and cancer. With health manpower and resources already spread thin by the emergency, the real question should be: Can the ordinary, meager attention that can be given in these conditions be continued or should still greater attention be considered? It is unacceptable to establish expensive and complex therapeutic programs which cannot possibly be maintained after the emergency is over. However, such patients should not be denied essential treatment as may be available under difficult emergency situations.

In severe famine, certain cases of chronic cardiac or renal failure may masquerade as kwashiorkor or hunger edema. A routine urine examination will help in arriving at a diagnosis. If this cannot be done, these disorders may be treated as if they were cases of primary malnutrition. Conditions caused by heart or kidney disease would sort themselves out soon by non-response to nutritional therapy.

7.7.4. Other Conditions. Pregnancies and live births are reported to decrease during famine. Nonetheless, obstetrical care—with pre- and post-partum care—will continue to require that maternal demands of pregnancy and lactation be met. The ordinary problems of parturition may be well met by indigenous midwives, who should be supported by the relief authorities in continuing their work. Close communication with the midwives will facilitate referral of obstetrical complications, when necessary, to a professional nurse or physician. Attempts to immunize all pregnant women against tetanus should be undertaken to protect the newborn. Two injections at intervals of 4 to 6 weeks should be given, the second before the 36th week of gestation. Pregnant women should receive iron and folate, if possible, during the last trimester, a single capsule of vitamin A (200,000 IU) should be administered a few days before delivery to protect against deficiency in the early months of life. Midwives should be given short courses on delivery and post-partum care and be provided with a kit containing sterile blades and ties for cutting the umbilical cord.

7.7.5. Severe Traumatic Injuries. No attempt is made in this Guide to describe the treatment procedures for this group of conditions.

The medical aid unit should be equipped with one or two sets of first-aid surgical equipment for minor surgical procedures. The items usually required are listed below:

Sterilizer with Burner	Bandages
Sutures	Tourniquet
Stethoscope	Forceps, Dressing
Forceps, Hemostatic	Holder, Needles
Knives	Syringe Needles
Scissors	Suture Needles
Syringes	Safety Razors
Local Anaesthetics	Splints

7.8. TABLE OF DRUGS

The following list of drugs should be used only according to the recommendations given. These instructions may be revised for specific reasons by the local medical authority in charge of emergency medical relief. When properly used, these drugs can save lives; otherwise, they can cause serious illness or death. They must be stored carefully so they do not spoil, and controlled rigorously so that they are not subject to

Ringer Lactate and sterile I.V. sets

7.9. LABORATORY FACILITIES

Minimum facilities in the form of a microscope with Wrights and gram stains, acid-fast stain, a haemoglobinometer, a small hand centrifuge, slides, and coverslips will greatly help in making accurate diagnosis and assessing progress of treatment. Routine laboratory examinations should not be performed at any time. Laboratory facilities, if provided, should be shared betwen two or more in-patient care units.

smallpox, measles, pertussis, and meningitis. Eighteen such diseases were covered in the surveillance system developed in camps for East Bengali refugees in India.

[20] Such cost-effective calculations have been worked out for cholera vaccine, which in endemic areas provides about 60% protection over six months. Wide coverage is expensive and often fails to reach those in need. In the midst of an epidemic, the vaccine is slow to retard cholera propagation in the affected region. Therefore, the decision is taken in many areas to forego vaccination and concentrate on early rehydration—a more cost-effective intervention.

[21] UNICEF oral rehydration salt. A packet contains:

Sodium chloride (common salt)	3.5 g.
Potassium chloride	1.5 g.
Sodium bicarbonate (baking soda)	2.5 g.
Glucose	20.0 g.
Flavoring	0.5 g.
Total Weight	28.0 g.

Direction: Dissolve a packet in one liter of drinking water. To be taken orally as directed.

Caution: Do not boil solution.

(Salt with similar composition can be prepared for use.)