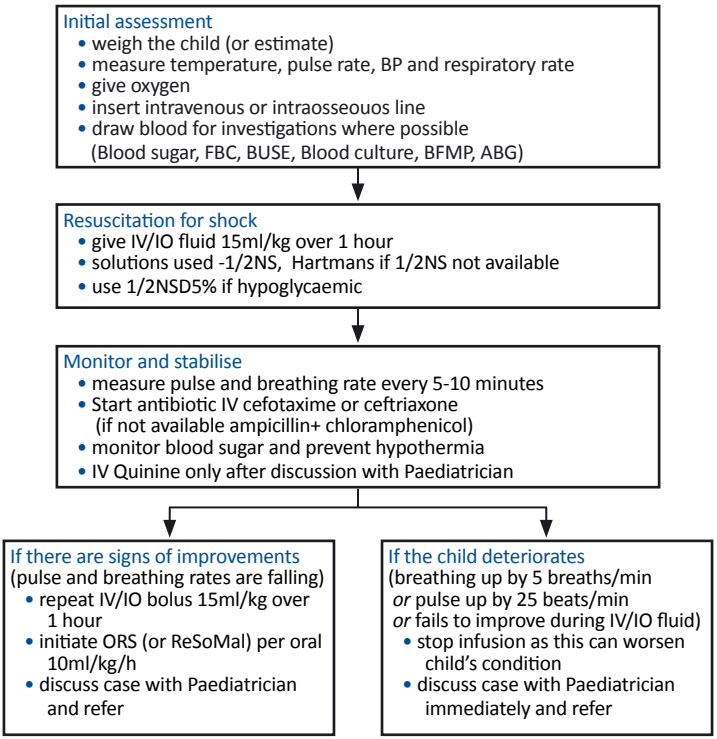
RESUSCITATION PROTOCOL FOR CHILDREN WITH SEVERE MALNUTRITION

This guideline is intended for orang asli and indigenous children who present to District Hospitals and Health Centres with a history of being unwell with fever, diarrhoea, vomiting and poor feeding.

This protocol is not to be used for a child who does not have malnutrition.

This guideline is recommended only for those who fulfill the following criteria:

- orang asli or other indigenous ethnic group
- severe malnutrition
- ill
- lethargic or has lost consciousness
- shock



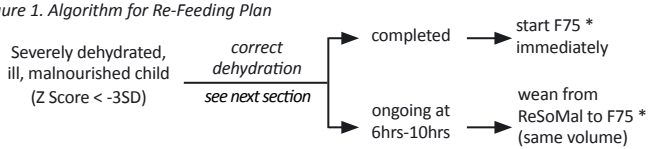
Reference

1. Management of the child with a serious infection or severe malnutrition (IMCI). Unicef WHO 2000

RE-FEEDING SEVERELY MALNOURISHED CHILDREN

This protocol is based on the protocol for Management of the child with a serious infection or severe malnutrition (IMCI), Unicef WHO 2000.

Figure 1. Algorithm for Re-Feeding Plan



Starter feed with F75 based on IMCI protocol

- feeds at 75-100kcal/kg/day (< 100kcal/kg/day in the initial phase)
- protein at 1-1.5 g/kg/day
- total volume 130mls/kg/day (if severe oedema, reduce to 100mls/kg/day)

How to increase feeds?

- increase F75 gradually in volume, e.g. 10 ml/kg/day in first 3-4 days
- gradual decrease in feeding frequency – 2, then 3 and 4 hourly when improves
- calculate calorie and protein content daily
- consider F100 catch up formula when
  - calories 130/kCal-kg/day-140kCal/kg/day
  - child can tolerate orally well and gaining weight, without signs of heart failure

Note:

1. In a severely oedematous child this process might take about a week.

2. If you do not increase calories and proteins the child is not going to gain weight and ward stay will be prolonged.

Monitoring

- *Avoid causing heart failure*
  - suspect if: sustained increase (> 2 hrs) of respiratory rate increases by 5/min, and / or heart rate by 25/min from baseline
  - if present: reduce feed to 100ml/kg/day for 24 hr then slowly increase as follows:
    - 115ml/kg/day for next 24 hrs; then 130ml/kg/day for next 48 hrs
    - then increase each day by 10 mls
- *Ensure adequate weight gain*
  - weigh child every morning before feeds; ideal weight gain is > 10g/kg/day
    - if poor weight gain < 5g/kg/day do a full reassessment
    - if moderate weight gain (5-10g/kg/day) check intake or check for infection
- *Watch for secondary infection*

Introducing Catch up Growth formula (F100)

- gradual transition from F75 to F100 (usually over 48-72 hrs)
- increase successive feed by 10mls till some feeds remains uneaten
- modified porridge or complementary food can be used, provided they have comparable energy and protein levels
- gradually wean to normal diet, unlimited frequent feeds, 150-220 kCal/kg/day
- offer protein at 4-6 g/kg/day
- continue breast feeding if child is breastfed

Note: If child refuses F75/F100 and is too vigorous for forced RT feeding, then give normal diet. However must calculate calories and protein (as above).

Discharge criteria

- not oedematous
- gaining weight well
- afebrile
- has completed antibiotics
- aged ≥ 12 mths (caution < 12 mths - specialist opinion required before discharge)

In situation where patient need to be transferred to district facilities make sure:

- provide a clear plan on how to feed and how to monitor progress
- provide a dietary plan with adequate calorie and protein requirements
- a follow up appointment with a Paediatrician

Table 1. Recipes for starter and catch-up formulas

	F-75 (starter)	F-100 (catch-up)	F-135 (catch-up)
Dried skimmed milk (g)*	25	80	90
Sugar (g)	100	50	65
Vegetable oil (g)	30 (or 35 ml)	60 (or 70 ml)	85 (or 95 ml)
Electrolyte/mineral solution (ml)	20	20	20
Water: make up to	1000 ml	1000 ml	1000 ml
Contents per 100 ml			
Energy (kcal)	75	100	135
Protein (g)	0.9	2.9	3.3
Lactose (g)	1.3	4.2	4.8
Potassium (mmol)	4.0	6.3	7.7
Sodium (mmol)	0.6	1.9	2.2
Magnesium (mmol)	0.43	0.73	0.8
Zinc (mg)	2.0	2.3	3.0
Copper (mg)	0.25	0.25	0.34
% energy from protein	5	12	10
% energy from fat	36	53	57
Osmolarity (mOsmol/L)	413	419	508

Preparation

- using an electric blender: place some of the warm boiled water in the blender, add the milk powder, sugar, oil and electrolyte/mineral solution. Make up to 1000 ml, and blend at high speed
- if no blender is available, mix milk, sugar, oil and electrolyte/ mineral solution to a paste, and then slowly add the rest of the warm boiled water and whisk vigorously with a manual whisk
- store made-up formula in refrigerator

**Alternative recipes: (other milk sources)*

F-75 starter formulas (make up to 100 ml)

- full-cream dried milk 35 g, 100 g sugar, 20 g (or ml) oil, 20 ml electrolyte/mineral solution
- full-cream milk (fresh/ long life) 300 ml, 100 g sugar, 20 g (or ml) oil, 20 ml electrolyte/mineral solutn

F-100 catch-up formulas (make up to 100 ml)

- full-cream dried milk 110 g, 50 g sugar, 30 g (or ml) oil, 20 ml electrolyte/mineral solution
- full-cream milk (fresh / long life) 880 ml, 75 g sugar, 20 g (or ml) oil, 20 ml electrolyte/mineral solutn

Table 2. WHO electrolyte/mineral solution recipe

item	quantity (gm)	molar content (in 20 ml)
potassium chloride: KCl	224	20 mmol
tripotassium citrate: C6H5K3O7.H2O	81	2 mmol
magnesium chloride: MgCl2.6H2O	76	3 mmol
zinc acetate: Zn(CH3COO)2.2H20	8.2	300 µmol
copper sulphate: CuSO4.5H2O	1.4	45 µmol
water	to make up 25000 ml	

*Note: if available: add **selenium** (sodium selenate 0.028 g), and **iodine** (potassium iodide 0.012g) per 2500ml*