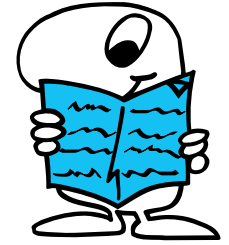


Initiative for Sub-District Support



Kwik-Skwiz
#16

The WHO Ten Steps- The Way Forward for Improved Care of Severe Malnutrition

Severe malnutrition remains a major cause of morbidity and mortality among young children in South Africa. Hospital management of severe malnutrition is an important component of a comprehensive approach to the problem of undernutrition.

File for quick reference

Since 1994 official policy has been to develop an Integrated Nutrition Programme (INP). A national demonstration project for the implementation of the INP was started in 1998 in Mt Frere, Eastern Cape. This comprehensive nutrition project is a collaboration between the Eastern Cape health department, the Health Systems Trust (HST) Initiative for Sub-district Support (ISDS) and the University of the Western Cape's Public Health Programme.

This Kwik Swiz reports on the **process** and **programme** that was undertaken by a district nutrition team, including the paediatric staff in a very under-resourced rural health district to implement one component of the INP, the WHO 10 Steps for improved care of severely malnourished children.

A process of team building has included bringing together doctors, nurses, hospital management, kitchen and pharmacy staff within the hospitals to improve in-patient management of these children.

Despite dramatic improvement in general medical technology, the mortality rate among children admitted to hospital has hardly changed in the past 50 years. Mortality rates of 20-50% are still seen in the 1990s.¹ Yet centres who follow the WHO ten steps have rates below 10%. By following the WHO Ten steps, the INP programme

hopes to demonstrate a dramatic reduction in the death rate due to severe malnutrition (marasmus and kwashiorkor).

This programme emphasises the importance of taking the child's fragile physiological state into account when prescribing treatment. This means feeding frequently day and night, starting with small amounts, and giving ALL children antibiotics, as infections are often hidden and undetectable. Gentle handling is advised to reduce stress, and mothers and other caregivers are encouraged to be actively involved.

We now know that most malnutrition related deaths occur in the first few days of treatment and are mainly due to the following 5 conditions:¹

- HYPOGLYCAEMIA
- HYPOTHERMIA
- MISMANAGEMENT OF DEHYDRATION
- MISSED INFECTIONS
- SEVERE ANAEMIA

The 10 steps have been developed by Ann Ashworth and an international team of specialists and are based on years of research and experience in many centres, including South Africa.

The WHO Ten Steps²

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|---------------------------------------|--|
| Step 1: Treat/prevent hypoglycaemia | Step 6: Correct micronutrient deficiencies |
| Step 2: Treat/prevent hypothermia | Step 7: Start cautious feeding |
| Step 3: Treat/prevent dehydration | Step 8: Rebuild wasted tissues |
| Step 4: Correct electrolyte imbalance | Step 9: Stimulation, play and loving care |
| Step 5: Treat infection | Step 10: Preparation for follow-up after discharge |

Although this pilot programme is in its early stages and many structural issues (such as having reliable scales for weighing children) must still be addressed, this programme has been enthusiastically received by the health workers of Mt Frere. This programme, as part of the overall INP has the potential to improve the nutritional services of Mt Frere Health district as well as play an important role in overall district development.

More detailed information on the WHO Ten Steps is available in the next two pages and from the following locations:

The University of the Western Cape Public Health Programme, University of the Western Cape, P.Bag X17 Bellville 7535, phone (021) 959 2809.

The MCH Information and Resource Centre, Child Health Unit, 46 Sawkins Road, Rondebosch 7700 Cape Town, phone (021) 685 4103 ext 248 or fax (021) 689 5403.

References:

1. Schofield, C. & Ashworth, A. *Severe Malnutrition in Children: High Case-Fatality Rates Can Be Reduced*. Africa Health September 1998, 17,18.
2. Ashworth, A., Jackson, A., Khanum, S., & Schofield, C. *Ten Steps to Recovery*. Child Health Dialogue. 2nd and 3rd quarter issues 3 and 4, 10-12.
3. WHO (1998). *Guidelines for the Inpatient Treatment of Severely Malnourished Children*. www.lshtm.ac.uk/eps/phnu/malnu.pdf

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Comments or criticism?

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Further Information on the WHO Ten Steps to Recovery:

A programme for improved management of severely malnourished children

This article provides a brief overview of practical steps needed for implementing the 10 steps programme. If you plan to implement this programme, we encourage you to contact the authors for further detailed information.

1. Treat/prevent hypoglycaemia
2. Treat/prevent hypothermia
3. Treat/prevent dehydration
4. Correct electrolyte imbalance
5. Treat infection
6. Correct micronutrient deficiencies
7. Start cautious feeding
8. Rebuild wasted tissues
9. Stimulation, play and loving care
10. Preparation for follow-up after discharge

The Mt. Frere Experience in implementing the 10 steps

Steps 1 and 2 go hand in hand because **frequent feeding** is an important aspect of preventing both hypoglycaemia and hypothermia and both tend to occur together in severe infection. Rooms should be kept warm and unnecessary bathing is discouraged.

Some of the things we have done in Mt. Frere include identifying larger rooms in the hospital which can be used as pediatric wards to allow mothers to stay overnight with their children. Having mothers admitted with the child has two major benefits; the mothers can be actively involved in feeding the child 2-3 hourly (including at night) and by sleeping with the child can help to ensure warmth. This is a critical intervention where staff shortages, especially at night, are an issue.

Step 3, is similar to standard WHO case management of diarrhoea, but is done more slowly because of the risk of fluid overload and death. Although the *WHO Ten Steps* recommend the use of a modified oral rehydration solution (ORS), which adjusts the sodium and potassium concentrations, the oral rehydration solution currently available in South Africa was deemed to be acceptable by paediatricians involved in the Mt. Frere programme.

Another important aspect of care is the cautious use of intravenous fluids. Many hospitals, as was the case in Mt. Frere, commonly use IV fluids as a way of rehydrating severely malnourished children. However, this is a potentially dangerous practice as it can easily lead to fluid overload and congestive heart failure. Therefore rehydration should always be done orally, unless the child is in shock. Furthermore,

dehydration in malnourished children can be confused with septic shock. Therefore, a malnourished child on IV fluids needs to be watched closely for signs of improvement as well as signs of fluid overload. If there is no improvement, the child is most likely to have septic shock.

In Mt. Frere, we have developed wall charts which outline the 3 signs of shock as cold hands, weak and rapid pulse (or slow capillary refill) and lethargy. Initial training in the use of this chart has been done and an obvious reduction in IV fluid use has already been noted.

Step 4 is important because we now know that severely malnourished children have excess sodium but not enough potassium or magnesium in their bodies. The classic sign of kwashiorkor, oedema, can be partly attributed to these imbalances and therefore should **never** be treated with a diuretic. An electrolyte/mineral solution can be prepared and added directly to a child's food. Plans are underway to have this solution made locally. Meals should be prepared without salt.

Step 5 Severely malnourished children are prone to infections but will often not show the typical signs of infection such as fever. Therefore, the WHO recommends that these children routinely get an appropriate course of broad spectrum antibiotic, whether or not they show clinical signs of infection. WHO also recommends giving measles vaccine to all children 6 months of age and older if not previously immunised.

HIV infection commonly presents as *failure to thrive* in young children. It is important to keep this in mind and to screen for it as necessary. Actively looking for and treating commonly associated conditions such as parasites and tuberculosis, is also an important aspect of care.

Tuberculosis should be **strongly** suspected if there is a history of:

- > *TB contacts*
- > *Poor growth despite good intake*
- > *Chronic cough*
- > *Chest infections not responding to antibiotics.*

In such cases, the WHO recommends that a Mantoux test and chest X-ray be done. It is important to remember that false negative Mantoux readings frequently occur in this population.

Step 6 Give multivitamins, zinc and copper daily. In addition, give a large dose of vitamin A and folic acid on day one. The zinc and copper can be made as part of the electrolyte/mineral

solution and added to feeds. The others need to be given separately in pill or capsule form.

Although severely malnourished children are often anaemic, giving iron can make infections worse, therefore iron should be withheld until the child is eating and starting to gain weight.

Steps 7 and 8 are very important and are fundamental to success. The primary foods are specially prepared milks, made of milk, sugar and oil. There is a starter milk to stabilise the children, and then a high energy milk (HEM) to support rapid growth. Severely malnourished children must be fed frequently. Feeding is first done cautiously with small amounts, progressing to unlimited amounts of the catch up formula.

Recipes for milk-based formulas (make up to 1000 ml with warm boiled water)		
	<u>Starter formula</u>	<u>Catch Up formula</u>
Ingredients*	Amount	Amount
Whole dried milk**	35g	110g
Sugar	100g	50g
Vegetable Oil	20g	30g

* If available, the recipe should include the electrolyte mineral solution as well.

** Alternative recipes are also available for using dried skim milk or fresh cow's milk

The use of specially prepared milk is now recognised as the "gold standard" in the management of severe malnutrition. This is because it is tailored to meet the unique physiological needs of severely malnourished children. This is especially true in the first few days of treatment when the risk of death is greatest.

Specially prepared milk is low in protein and iron yet high in energy, all factors that are desirable in the initial phase of treatment.

Despite these real advantages, structural and process issues **must** be addressed before they can be used successfully. Belief in specially prepared milks and their benefits must be recognised by staff. Careful planning must be done to ensure that kitchen staff can accurately make this product. Breaking away from current practices of using infant formula takes careful consideration and effort for successful implementation.

A review of current feeding practice in Mt. Frere showed that children were usually offered too large a volume of food, too infrequently. To improve the practice of giving small frequent feeds, a wall chart has been prepared which provides the correct amount of food to be given every 2 to 3 hours based on the child's weight. A sheet which records the amount of food offered, the actual amount taken and

the amount leftover has also been introduced. Also, we have tried to make better use of mothers and nursing assistants to actively feed these children.

To prepare the special formulas, dry ingredients such as powdered milk, sugar and oil have been ordered. It is prepared in the hospital kitchen and the paediatric nurse orders the daily requirement for the ward. Refrigerators have also been placed in each of the two hospitals' paediatric wards to facilitate frequent feeding of children.

As the child begins *catch up* growth high-energy milk is used in addition to energy and nutrient dense locally available foods such as porridge with peanut butter, or samp with beans and margarine (*Rama*). In Mt. Frere we are working closely with the hospital dietician to adapt the menu so that it is more representative of the local diet, based on a household survey, as well as making the menu more energy dense and "child friendly".

Step 9 Malnourished children are at risk of both developmental and behavioral delay. Therefore, children should be actively engaged and stimulated while in hospital. Structured play or play therapy promotes the development of language and motor skills. Toys for structured play can be made of locally available materials.

Funds from churches have made possible the purchase of colorful posters for the wards as well as educational toys. Future plans include working with the local staff to develop an occupational therapy programme for all hospitalised children.

Step 10 Preparation for follow-up and discharge should begin soon after admission. This step is an important one since we know that relapses are common. Health workers need to gain a clear picture of the home environment and should work with the mother and family to find realistic ways of providing the child with energy and nutrient dense meals prepared from locally available foods. During hospitalisation, mothers should receive training on the nutritional requirements of their child as well as practical ways of providing frequent, nutritious meals. Part of the success depends on how clear, consistent and realistic the messages are which we as health workers give.

Finally, it is important to create referral systems that are able to track "at risk" children as they leave the hospital and move back to the community and clinic setting. Tracking children may be extremely difficult in some settings, therefore it is important that a full discharge history is recorded on a patient retained card. Also, it must be stressed to the mother that the child needs to be taken to the nearest clinic regularly after discharge for follow up.

Once the 10 steps have been implemented, it is important to review local successes and failures. There are a number of reasons children may fail to respond which is noted by a continued high mortality rate and poor weight gain during the catch up phase. Possible causes of poor weight gain include inadequate feeding, specific nutrient deficiencies and untreated infections such as Tuberculosis, urinary tract infections and otitis media (see Step 5). Finally, despite high prevalence rates of HIV/AIDS, successful recovery from malnutrition is possible.³