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6. Monitoring and solving problems



WORLD HEALTH ORGANIZATION
DEPARTMENT OF NUTRITION FOR HEALTH AND DEVELOPMENT

**TRAINING COURSE ON THE
MANAGEMENT OF SEVERE MALNUTRITION**

**MONITORING AND
PROBLEM SOLVING**



World Health Organization
Department of Nutrition for Health and Development

Training Course on the Management of Severe Malnutrition

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TRAINING COURSE ON THE MANAGEMENT OF SEVERE MALNUTRITION: MONITORING AND PROBLEM SOLVING

Introduction

Many types of problems may occur in a severe malnutrition ward. There may be problems with an individual patient's progress or care, such as failure to gain weight or treat an infection. There may also be problems that affect the entire ward, such as problems with staff performance, food preparation, or ward procedures or equipment. All of these problems require attention to prevent patient deaths.

This module teaches a process for identifying and solving problems that may occur on the ward. The process includes:

- Identifying problems through monitoring
- Investigating causes of problems
- Determining solutions
- Implementing solutions

This process can be used in solving problems with individual patients or problems that may affect the entire ward.

Learning Objectives

This module will describe and allow you to practise the following skills:

- Identifying problems by monitoring:
 - Individual patient progress, weight gain and care
 - Overall weight gain on the ward
 - Patient outcomes (such as recovery, referral, death)
 - Case-fatality rate for the ward
 - Case management practices
 - Food preparation, ward procedures, and hygiene
- Investigating causes of problems
- Determining solutions appropriate for causes
- Conducting a problem-solving session with a group.

1.0 Use a process to identify and solve problems

1.1 Identify problems

Identify problems by monitoring. By monitoring individual patient progress, weight gain and care, you may identify problems such as the following:

- A patient's appetite has not returned
- A patient has failed to gain weight for several days while taking F-100
- A mother wants to take her child home before the child has reached the discharge weight
- A child seems to have an unrecognized infection

By monitoring overall weight gain on the ward, patient outcomes, and the case-fatality rate, you may identify problems such as the following:

- 20% of children on the ward have poor weight gain
- 75% of mothers leave with their children before they reach the desired discharge weight
- The case-fatality rate in the ward was 15% during the months of June through August.

By monitoring case management practices, food preparation, ward procedures, and hygiene, you may identify additional problems, which may in fact be causes of poor weight gain or adverse outcomes. For example, you may identify problems such as the following:

- IV fluids are given routinely by certain physicians
- Children are not fed every 2 hours through the night
- Staff do not consistently wash their hands with soap
- Mineral mix is not added to feeds.

When a problem is identified, describe it in as much detail as possible.



To describe the problem, state when, where, and with whom the problem is occurring. Also try to determine when the problem began. Knowing the details will help you find the cause, or causes, of the problem.



SHORT ANSWER EXERCISE

Read each pair of problem descriptions below. Tick the problem description that is more detailed and therefore more useful.

1. ___ a. There has been an increase in the number of deaths on the ward.
 ___ b. Four deaths have occurred at night in the past month.

2. ___ a. Tran is not gaining weight.
 ___ b. After gaining 10 g/kg/day for four days, Tran has stayed the same weight for the last three days.

3. ___ a. Dr Perez prescribes a diuretic for severe oedema, but no other doctors do this.
 ___ b. Diuretics are sometimes prescribed for oedema.

4. ___ a. Weight gain of some children on the ward is poor.
 ___ b. Weight gain is poor for most children who are taking adapted home foods instead of F-100.

Check your own answers to this exercise by comparing them to the answers given on page 52 at the end of the module.

1.2 Investigate causes of problems

It is critical to find the cause(s) of a problem before trying to solve it. Different causes require different solutions.

Investigation of causes may involve doing laboratory tests for a patient, observing and asking questions of staff, reviewing patient records, and/or monitoring food preparation and ward procedures.



1.3 Determine solutions

Solutions will depend on the causes of the problems. For example, if staff do not know how to do a new procedure, a solution may be training. On the other hand, if the cause is a lack of equipment or supplies, a different solution is needed. Solutions should:

- remove the cause of the problem (or reduce its effects)
- be feasible (affordable, practical, realistic); and
- not create another problem.



Example of problem solving process

Problem: Weight gain on a severe malnutrition ward is not as good as it was several months ago. Instead of good weight gain for most children on F-100 (that is, 10 g/kg/day or more), the typical weight gain is now less than 10 g/kg/day.

The senior nurse decides to investigate by monitoring ward procedures and food preparation. Following are some possible causes that she might find, along with an appropriate solution for each.

Possible Cause:	Possible Solution:
The type of milk available for making feeds has changed, and the recipes have not been adjusted appropriately.	Adjust the feed recipes appropriately to use the milk that is available. Post the new recipes and teach them to staff.
Staff add too much water when making F-100. They add 1000 ml instead of just enough water to make 1000 ml of formula.	Explain the recipe to staff. Be sure that 1000 ml is clearly marked on mixing containers. Demonstrate how to add water up to the mark.
Measuring scoops have been lost, and staff are estimating amounts of ingredients for feeds.	Obtain new scoops.
There are more children on the ward, and staff numbers have not increased. Nurses cannot spend as much time feeding each child.	Invest time in teaching mothers to feed and care for the children.

It is clear that buying new scoops will not solve the problem if the cause is really lack of an appropriate recipe. By investigating the cause of a problem, one can avoid wasting money and time on the wrong solutions.



1.4 Implement solutions

Implementing a solution may be relatively simple (such as speaking with an individual staff member, or changing a child's feeding plan) or quite complex (such as changing staff assignments throughout the ward). Good communication with staff is important whenever any change is made.

To promote good communication when solving problems:

- Hold regular staff meetings, during which positive feedback is given and any problems, causes, and solutions are discussed.
- Provide staff with job descriptions which list their assigned tasks.
- Provide clear instructions whenever any change is made.
- Provide "job-aids" such as checklists or posted instructions for any complex tasks.

Follow up to determine if a solution is implemented as intended. Then continue monitoring to determine whether the problem is solved. Give feedback to staff that includes praise for work done well, along with any instructions for improvement.



2.0 Monitor and solve problems with an individual patient

2.1 Monitor individual patient progress and care

Nursing staff should monitor certain signs (such as pulse rate, respiratory rate, and temperature) repeatedly during the day, especially during initial treatment. If there are danger signs (such as increasing pulse and respiratory rate, or a sudden drop in temperature), the staff should immediately respond as described in *Initial Management* and *Daily Care*. Otherwise, information is simply recorded on the Monitoring Record of the CCP, where it is reviewed by a clinician during rounds.

Clinicians should do a ward round at least once every day. During rounds, a clinician should:

- Observe the child and question the mother and nurse
 - Is child more alert? smiling? sitting up? able to play?
 - Has the child lost oedema?
 - Is there less diarrhoea?
 - Has dermatosis improved?
 - How is the child's appetite?
- Review the child's weight chart
 - Is the child gaining weight according to the weight chart?
 - If there is a loss, is it due to decreasing oedema?
- Review the CCP and food intake chart
 - Is the child getting the recommended feeds?
 - Is prescribed care (such as antibiotics, folic acid, iron) being given?
 - Are there any danger signs recorded on the CCP:
increased pulse rate, respiratory rate, or temperature?

Daily, after a child is taking F-100, a clinician should calculate the child's weight gain in grams per kilogram body weight (g/kg/day) and judge whether weight gain is sufficient:

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

To calculate daily weight gain

- a. Subtract the child’s weight yesterday (W1) from the child’s weight today (W2). *Note: Do this even if the child has lost weight. If the child has lost weight, the result will be negative.* Express the difference as grams (kg × 1000). This is the total amount of weight gained during the day.

$$W2 - W1 = \text{___ kg} \quad \text{___ kg} \times 1000 = \text{___ grams gained}$$

- b. Divide the grams gained (from step “a”) by the child’s weight yesterday. The result is the weight gain in g/kg/day.

$$\text{Weight gain in grams} \div W1 = \text{___ g/kg/day}$$

If the child has lost weight during the past day, the “weight gain” for that day will be negative.

Note: This calculation is not useful until the child is on F-100, as the child is not expected to gain weight on F-75. In fact, weight may be lost on F-75 due to decreasing oedema.

Remember that this calculation will be most useful if the child is weighed at about the same time each day.

Example

Kofi began taking F-100 on Day 4 in the severe malnutrition ward. By Day 6 he began to gain weight. On Day 6 Kofi weighed 7.32 kg. On Day 7 he weighed 7.4 kg. His weight gain in g/kg/day can be calculated as follows:

- a. $7.4 \text{ kg} - 7.32 \text{ kg} = 0.08 \text{ kg}$ $0.08 \text{ kg} \times 1000 = 80 \text{ grams gained}$
- b. $80 \text{ grams} \div 7.32 = 10.9 \text{ g/kg/day}$

A gain of 10.9 g/kg/day is considered a good weight gain.

SHORT ANSWER EXERCISE

Calculate the daily weight gain for the children described below. Assume that the weights were taken at about the same time each day.

1. Mustaph weighed 7.25 kg on Day 10. He weighed 7.30 kg on Day 11. What was his weight gain in g/kg/day?

2. Kebba weighed 6.22 kg on Day 8. She weighed 6.25 kg on Day 9. What was her weight gain in g/kg/day?

3. Galo weighed 7.6 kg on Day 9. He weighed 7.5 kg on Day 10. What was his weight gain in g/kg/day? *(Note: Since Galo lost weight, the answer will be negative.)*

Check your own answers to this exercise by comparing them to the answers given on page 52 at the end of the module.

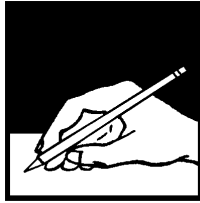
2.2 Identify the child who is failing to respond

A child is failing to respond if he or she:

- does not improve initially; or
- gains weight but then levels off or deteriorates.

Some criteria for failure to respond are listed below as a guide:

Criteria	Approximate time after admission
Failure to regain appetite	Day 4
Failure to start to lose oedema	Day 4
Oedema still present	Day 10
Failure to gain at least 5 g/kg/day for 3 successive days after feeding freely on F-100	After feeding freely on F-100



EXERCISE A

In this exercise you will review information about two cases to determine if they are making progress or if they are failing to respond.

Case 1 – Ceri

Ceri was admitted five days ago with moderate oedema and an SD score of -3 . Parts of her CCP and her 24-Hour Food Intake Chart for Day 5 are provided on the next three pages. Ceri's pulse rate has remained at about 90 over the five days, and her breathing rate has remained at about 35.

Study the information about Ceri and answer the questions below.

- 1a. Is Ceri making progress? If so, describe her progress.

- 1b. Are there problems? If so, describe the problems.

..

CRITICAL CARE PATHWAY (CCP) – SEVERE MALNUTRITION WARD

NAME Ceri M F DATE OF BIRTH OR AGE 16 months DATE OF ADMISSION 1/2/01 TIME 8:30 HOSP. ID NUMBER 302

Comments on pre-referral and/or emergency treatment already given: _____

INITIAL MANAGEMENT

SIGNS OF SEVERE MALNUTRITION Severe wasting? Yes No
 Oedema? 0 + ++ +++
 Dermatitis? 0 + ++ +++ (raw skin, fissures)
 Weight(kg): 6.6 kg Height/length (cm): 73 cm
 SD score: -3 or % of median: 70%

TEMPERATURE 36.5 °C rectal axillary
 If rectal < 35.5°C (95.9°F), or axillary < 35°C (95°F), actively warm child.
 Check temperature every 30 minutes.

BLOOD GLUCOSE (mmol/l): 4 mmol/l
 If < 3mmol/l and alert, give 50 ml bolus of 10% glucose or sucrose (oral or NG).
 If < 3 mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x ___ kg (child's wt) = ___ ml Then give 50 ml bolus NG.

Time glucose given: Oral NG IV
HAEMOGLOBIN (Hb) (g/l): 90 or Packed cell vol (PCV): Blood type: _____
 If Hb < 40 g/l or PCV < 12%, transfuse 10 ml/kg whole fresh blood (or 5-7 ml/kg packed cells) slowly over 3 hours. Amount: Time started: Ended: _____

EYE SIGNS None Left Right MEASLES Yes No
 Bitot's spots Pus/Inflammation Corneal clouding Corneal ulceration
 If ulceration, give vitamin A & atropine immediately. Record on Daily Care page.
 Oral doses vitamin A: < 6 months 50 000 IU
 6 - 12 months 100 000 IU
 > 12 months 200 000 IU

FEEDING Begin feeding with F-75 as soon as possible. (If child is rehydrated, reweigh before determining amount to feed. New weight: 6.6 kg)
 Amount for 2-hourly feedings: 75 ml F-75 • Time first fed: 12:00
 * If hypoglycaemic, feed 1/2 of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/l.
Record all feeds on 24-hour Food Intake Chart.

SIGNS OF SHOCK None Lethargic/unconscious Cold hand Slow capillary refill (> 3 seconds) Weak/fast pulse

If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids:

Amount IV fluids per hour: 15 ml x ___ kg (child's wt) = ___ ml

Start:	Monitor every 10 minutes	*2 nd hr:	Monitor every 10 minutes
Time			
Resp. rate			
Pulse rate			

* If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)

DIARRHOEA Watery diarrhoea? Yes No Skin pinch goes back slowly
 Blood in stool? Yes No Restless/irritable Lethargic Thirsty
 Vomiting? Yes No Sunken eyes Dry mouth/tongue No tears

*If diarrhoea and/or vomiting, give ReSoMal. Every 30 minutes for first 2 hours, monitor and give:**
 5 ml x 6.6 kg (child's wt) = 33 ml ReSoMal

*For up to 10 hours, give ReSoMal and F-75 in alternate hours. Monitor every hour. Amount of ReSoMal to offer:**
 5 to 10 ml x 6.6 kg (child's wt) = 33 to 66 ml ReSoMal

Time	Start	9:00	10:00	10:30	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Resp. rate	38	36	36	35	35	35	35	35	35	35	35	35	35	35
Pulse rate	110	100	100	90	90	90	90	90	90	90	90	90	90	90
Passed urine? Y/N			N	N	N	N	N	N	N	N	N	N	N	N
Number stools		1	1	0	0	1	0	0	1	0	0	0	0	0
Number vomits		0	0	0	0	0	0	0	0	0	0	0	0	0
Hydration signs			moist mouth				moist eyes							
Amount taken (ml)	33	33	33	33	45	F-75	45	F-75	40	F-75	35	F-75	35	F-75

* Stop ReSoMal if: Increase in pulse & resp. rates Jugular veins engorged Increasing oedema, e.g., puffy eyelids

ANTIBIOTICS (All receive)	Drug Route	Dose Frequency Duration	Time of 1 st dose
		4 ml syrup every 12 hours for 5 days	9:00

DAILY CARE

Ceri

			Week 1							Week 2							Week 3									
DAYS IN HOSPITAL			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21			
Date	1/2	2/2	3/2	4/2	5/2																					
Daily weight (kg)	6.6	6.5	6.5	6.5	6.5																					
Weight gain (g/kg)	Calculate daily after on F-100.																									
Oedema	0	+	+	+	+																					
Diarrhoea/vomit	0	D	0	0	0																					
FEED PLAN: Type feed	F-75	F-75	F-75	F-75	F-75																					
# feeds daily	10	12	12	8	8																					
Total volume taken (ml)	700	780	800	700	610																					
List prescribed antibiotics in left column. Allow one row for each daily dose. Draw a box around daytimes that each drug should be given. Initial when given.																										
ANTIBIOTICS																										
Cotrimox	9:00	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS		
4ml	21:00	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC		
FOLIC ACID	9:00	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS		
VITAMIN A 200 000 IU		PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS		
Multivitamin (if not in feed)		PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS		
Drug for worms (Note type of worm)	NONE	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////	////		
IRON		Begin iron after 2 days on F-100.																								
2 X daily																										
FOR EYE PROBLEMS: 1:00	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS		
Tetracycline	15:00	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS		
Gentamicin	21:00	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC		
1 drop 4 X daily	3:00	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC		
Atropine	9:00	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS		
1 drop	15:00	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS		
3 X daily	21:00	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC		
Dermatosis 0 + + + + +		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Bathing 1% permanganate		gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp	gp		
OTHER																										

child admitted with eye sign or recent measles.

*Give Day 1 routinely unless evidence of dose in past month & no eye sign. Give Day 2 & Day 15 if

After 7-10 days, when eye drops are no longer needed, shade boxes for eye drops.

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Ceri Hospital ID number: 302 Admission weight (kg): 6.6 kg Today's weight (kg): 6.5 kg

DATE: <u>5/2</u>		TYPE OF FEED: <u>F-75</u>		GIVE: <u>8</u> feeds of <u>110</u> ml		
Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a - b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)
<u>8:00</u>	<u>110</u>	<u>20</u>	<u>90</u>			
<u>11:00</u>	<u>110</u>	<u>25</u>	<u>85</u>			
<u>14:00</u>	<u>110</u>	<u>20</u>	<u>90</u>			
<u>17:00</u>	<u>110</u>	<u>30</u>	<u>80</u>			
<u>20:00</u>	<u>110</u>	<u>25</u>	<u>85</u>			
<u>23:00</u>	<u>110</u>	<u>20</u>	<u>90</u>			
<u>5:00</u>	<u>110</u>	<u>20</u>	<u>90</u>			
		Column totals		<u>c. 610</u>	<u>d. 0</u>	<u>e. 0</u>
Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) - total amount vomited (e) = <u>610</u> ml						

Exercise A, continued

Case 2 – Lennox

Lennox was admitted ten days ago with mild oedema (both feet), dysentery, a fever, and an SD score of less than -2 . Lennox was given cotrimoxazole for his dysentery. After 5 days his dysentery was gone, but he was still sickly and had fever. He also had a deep, persistent cough and some difficulty breathing. The physician suspected possible pneumonia and prescribed benzylpenicillin, which has been given for 5 days.

Study parts of Lennox's CCP and his most recent 24-Hour Food Intake Chart, which are given on the next six pages. Then answer the questions below.

- 2a. What is Lennox's weight gain in g/kg/day from Day 10 to Day 11? (Enter this on his CCP.)

- 2b. Is Lennox making progress? If so, describe his progress.

- 2c. Are there problems? If so, describe the problems.

When you have finished this exercise, please discuss your answers with a facilitator.

CRITICAL CARE PATHWAY (CCP) – SEVERE MALNUTRITION WARD

NAME Lennox M F DATE OF BIRTH OR AGE about 2 years DATE OF ADMISSION 2/11/01 TIME 8:30 HOSP. ID NUMBER 561

Comments on pre-referral and/or emergency treatment already given:

INITIAL MANAGEMENT

SIGNS OF SEVERE MALNUTRITION Severe wasting? Yes No
 Oedema? 0 ++ +++
 Dermatitis? 0 ++ +++ (raw skin, fissures)
 Weight(kg): 7.9 Height/length (cm): 77
 SD score: <-2 or % of median: <80%

TEMPERATURE 39 °C rectal axillary
 If rectal < 35.5°C (95.9°F), or axillary < 35°C (95°F), actively warm child.
 Check temperature every 30 minutes.

BLOOD GLUCOSE (mmol/l): 5
 If < 3mmol/l and alert, give 50 ml bolus of 10% glucose or sucrose (oral or NG).
 If < 3 mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x ___ kg (child's wt) = ___ ml Then give 50 ml bolus NG.

Time glucose given: Oral NG IV
HAEMOGLOBIN (Hb) (g/l): 95 or Packed cell vol (PCV): ___ Blood type: ___
 If Hb < 40 g/l or PCV < 12%, transfuse 10 ml/kg whole fresh blood for 5-7 ml/kg packed cells slowly over 3 hours. Amount: ___ Time started: ___ Ended: ___

EYE SIGNS None Left Right **MEASLES** Yes No
 Bitot's spots Pus Inflammation Corneal clouding Corneal ulceration
 If ulceration, give vitamin A & atropine immediately. Record on Daily Care page.
 Oral doses vitamin A: < 6 months 50 000 IU
 6 - 12 months 100 000 IU
 > 12 months 200 000 IU

FEEDING Begin feeding with F-75 as soon as possible. If child is rehydrated, reweigh before determining amount to feed. New weight: 8 kg
 Amount for 2-hourly feedings: 90 ml F-75* Time first fed: 12:00
 * If hypoglycaemic, feed ½ of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/l.
Record all feeds on 24-hour Food Intake Chart.

SIGNS OF SHOCK None Lethargic/unconscious Cold hand Slow capillary refill (> 3 seconds) Weak/fast pulse

If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids:

Amount IV fluids per hour: 15 ml x ___ kg (child's wt) = ___ ml

Start:	Monitor every 10 minutes	* 2 nd hr:	Monitor every 10 minutes
Time		*	
Resp. rate		*	
Pulse rate		*	

* If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)

DIARRHOEA Watery diarrhoea? Yes No
 Blood in stool? Yes No
 Vomiting? Yes No

If diarrhoea, circle signs present: Skin pinch goes back slowly Lethargic Thirsty
 Restless/irritable Dry mouth/tongue No tears
 Sunken eyes

If diarrhoea and/or vomiting, give ReSoMal. Every 30 minutes for first 2 hours, monitor and give: * 5 ml x 7.9 kg (child's wt) = 39.5 ml ReSoMal

For up to 10 hours, give ReSoMal and F-75 in alternate hours. Monitor every hour. Amount of ReSoMal to offer: * 5 to 10 ml x 7.9 kg (child's wt) = 39.5 to 79 ml ReSoMal

Time	9:00	9:30	10:00	10:30	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Resp. rate	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Pulse rate	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Passed urine? Y/N			N	N	N	N	N	Y	N	N	N	N	Y	N
Number stools			2	1	0	1	0	1	0	0	0	0	0	0
Number vomits			0	0	0	0	0	0	0	0	0	0	0	0
Hydration signs					most moist		tears			skin pink/dk				
Amount taken (ml)	39	39	39	39	76	F75	79	F75	79	F75	79	F75	79	F75

* Stop ReSoMal if: Increase in pulse & resp. rates Jugular veins engorged Increasing oedema, e.g., puffy eyelids

Dose Frequency Duration	Drug Route	Time of 1 st dose
4 ml syrup every 12 hours for 5 days	Cotrimoxazole - oral	9:00

DAILY CARE

Lennox

Week 1

Week 2

Week 3

DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
Date	2/11	3/11	4/11	5/11	6/11	7/11	8/11	9/11	10/11	11/11	12/11											
Daily weight (kg)	8.0	8.1	8.0	8.0	7.9	7.9	8.0	8.0	8.0	8.0	8.0											
Weight gain (g/kg)	Calculate daily after on F-100.																					
Oedema 0 + ++ + + +	+	+	+	+	+	+	+	+	+	+	+											
Diarrhoea/vomit 0 D V	D	D	+	+	+	+	+	+	+	+	+											
FEED PLAN: Type feed	F-75	F-75	F-75	F-75	F-100	F-100	F-100	F-100	F-100	F-100	F-100											
# feeds daily	10	12	8	6	6	6	6	6	6	6	6											
Total volume taken (ml)	870	1040	1040	1050	1040	1040	1100	1210	1400	1400												
ANTIBIOTICS	List prescribed antibiotics in left column. Allow one row for each daily dose. Draw a box around days/times that each drug should be given. Initial when given.																					
cotrimox 9:00	V8	V8	V8	V8	V8	V8	V8	V8	V8	V8	V8											
4ml 21:00	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP											
benzyl- 9:00																						
penicillin 15:00																						
IM 0.9ml 21:00																						
3:00																						
FOLIC ACID 9:00	V8	V8	V8	V8	V8	V8	V8	V8	V8	V8	V8											
VITAMIN A 200 000 IU	V8	V8	V8	V8	V8	V8	V8	V8	V8	V8	V8											
Multivitamin (if not in feed)	V8	V8	V8	V8	V8	V8	V8	V8	V8	V8	V8											
Drug for worms (Note type of worm)	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE											
IRON 11:00																						
2 X daily 17:00																						
FOR EYE PROBLEMS:	Begin iron after 2 days on F-100.																					
Tetracycline or Chloramphenicol																						
1 drop 4 X daily																						
Atropine 1 drop																						
3 X daily																						
Dermatosis 0 + ++ + + +																						
Bathing, 1% potassiumate																						
OTHER																						

child admitted with eye sign or recent measles.

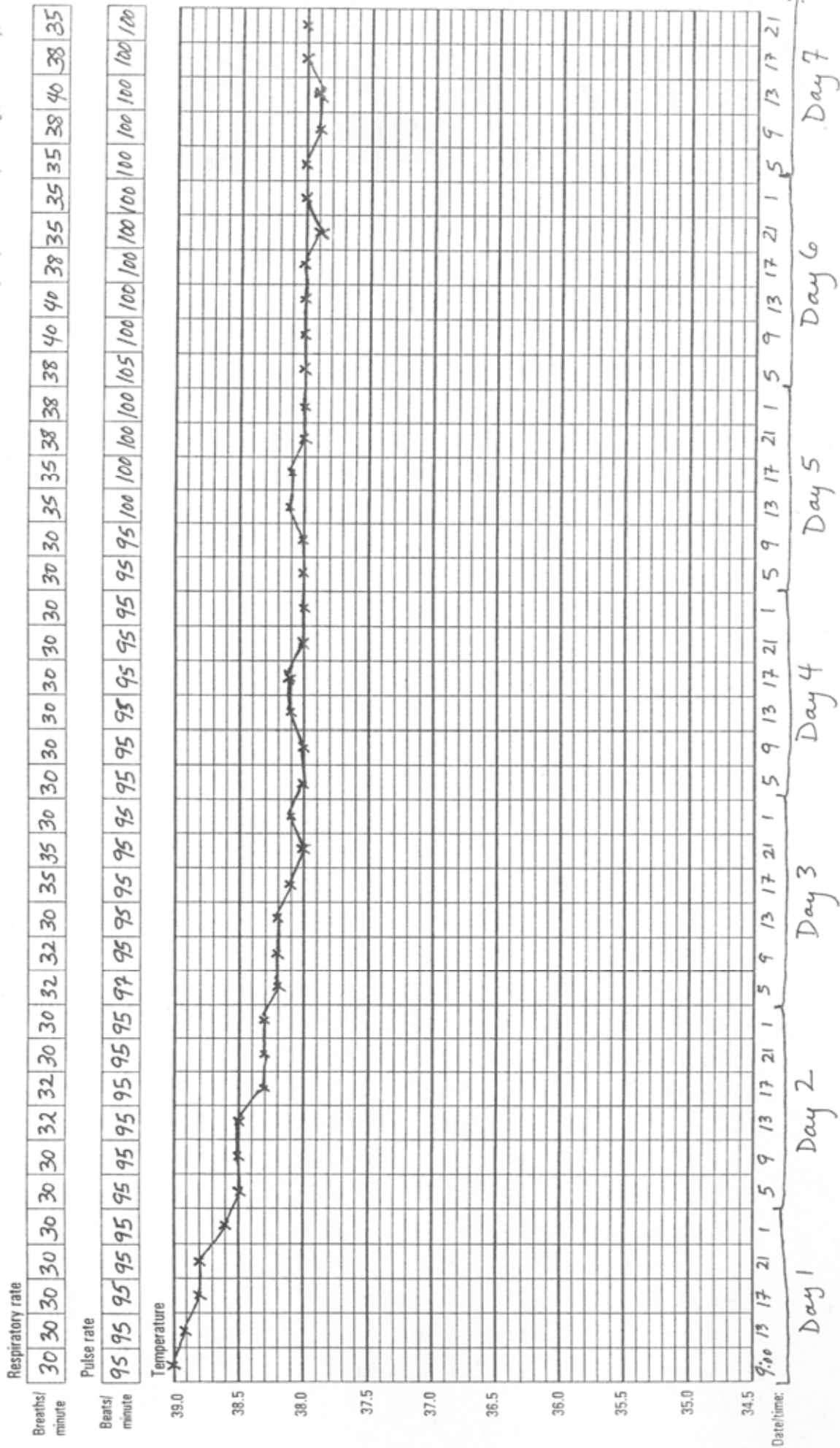
After 7-10 days, when eye drops are no longer needed, shade boxes for eye drops.

Lennox

page 1 of 2

MONITORING RECORD

Monitor respiratory rate, pulse rate, and temperature 4-hourly until after transition to F-100 and patient is stable. Then monitoring may be less frequent (e.g., twice daily).



Danger Signs: Watch for increasing pulse and respirations, fast or difficult breathing, sudden increase or decrease in temperature, rectal temperature below 35.5°C, and other changes in condition. See Danger Signs listed on back of F-100 Reference Card. Normal ranges of pulse and respiratory rates are also listed on back of F-100 Reference Card.

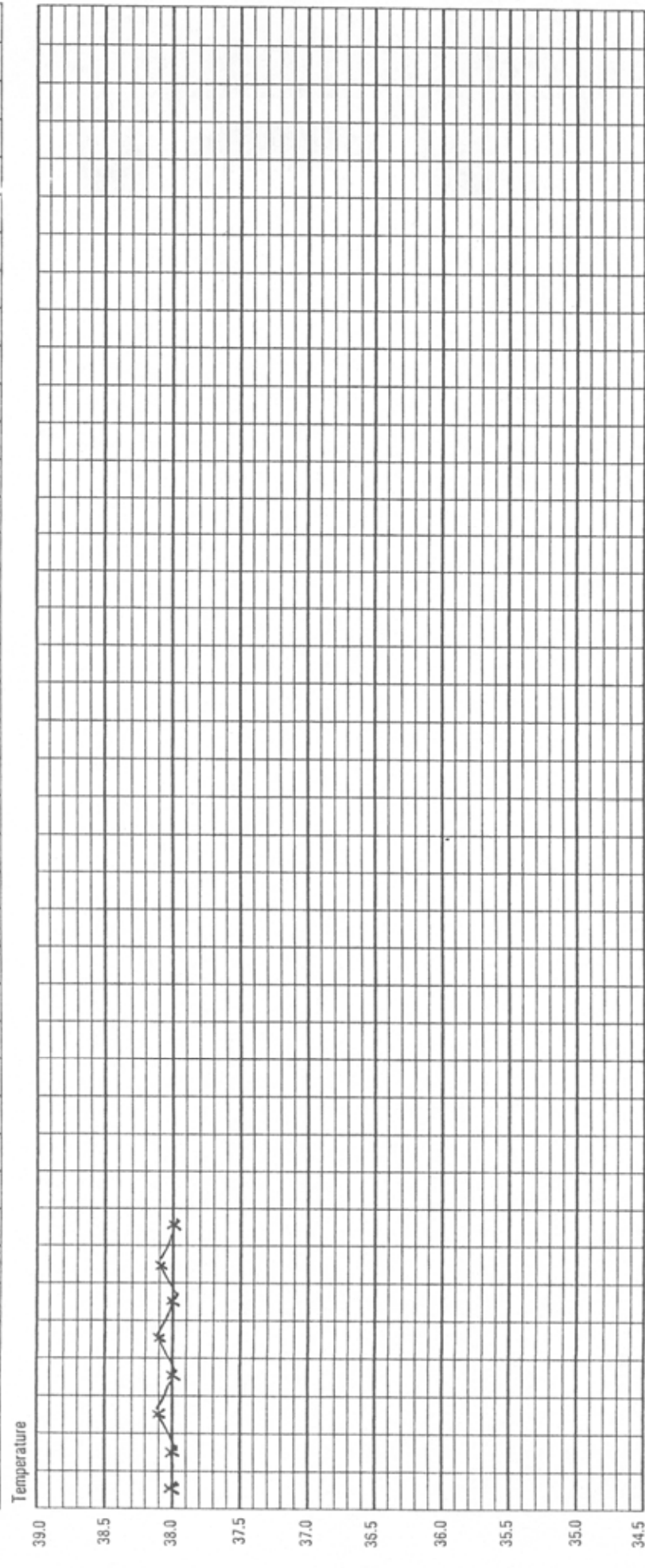
Lennox

MONITORING RECORD

Monitor respiratory rate, pulse rate, and temperature 4-hourly until after transition to F-100 and patient is stable. Then monitoring may be less frequent (e.g., twice daily).

Respiratory rate	Breaths/minute	35	35	35	30	35	35	30	30

Pulse rate	Beats/minute	100	100	100	90	100	100	90	90



Date/Time: 1:00 5 17 5 17 5 17 5
 Day 8 Day 9 Day 10 Day 11

Danger Signs: Watch for increasing pulse and respirations, fast or difficult breathing, sudden increase or decrease in temperature, rectal temperature below 35.5°C, and other changes in condition. See Danger Signs listed on back of F-100 Reference Card. Normal ranges of pulse and respiratory rates are also listed on back of F-100 Reference Card.

WEIGHT CHART

Name: Lennox

Weight on admission: 8 kg (after rehydrating)

Height / length: 77 cm

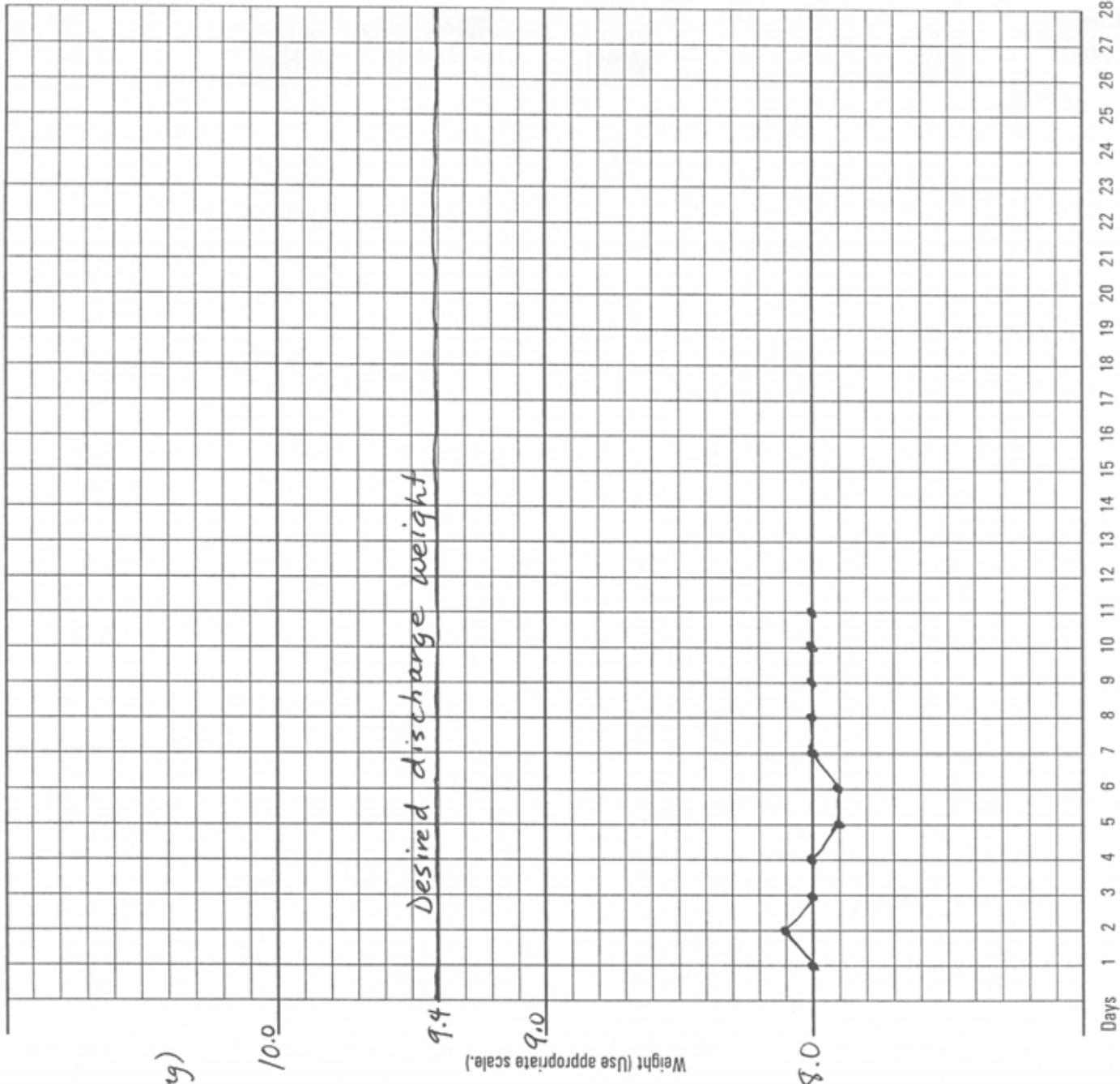
Oedema on admission: 0 + ++ +++ 10.0

Desired weight at discharge (-1SD, 90% weight for height): 9.4 kg

Actual weight at discharge: _____ kg

Enter likely range of weights on the vertical axis in an appropriate scale (e.g., each row representing 0.1 kg). Allow rows below the starting weight in case weight decreases; weight may decrease by as much as 30% if the child has severe oedema.

Draw a bold horizontal line across the graph to show the desired discharge weight.



24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period.

Name: Lennox Hospital ID number: 561 Admission weight (kg): 8.0 Today's weight (kg): 8.0

DATE: <u>11/11</u>		TYPE OF FEED: <u>F-100</u>		GIVE: <u>6</u> feeds of <u>210</u> ml			
Time	a. Amount offered (ml)	b. Amount left in cup (ml)	c. Amount taken orally (a - b)	d. Amount taken by NG, if needed (ml)	e. Estimated amount vomited (ml)	f. Watery diarrhoea (if present, yes)	
8:00	210	0	210				
12:00	220	0	220				
16:00	230	0	230				
20:00	240	0	240				
24:00	250	0	250				
4:00	260	10	250				
		Column totals		c. <u>1400</u>	d.	e.	Total yes:
Total volume taken over 24 hours = amount taken orally (c) + amount taken by NG (d) - total amount vomited (e) = <u>1400</u> ml							

2.3 Determine cause(s) of failure to respond

The causes of a child's failure to respond may be related to procedures, staff, equipment, or the environment throughout the ward, or they may be related only to the individual child. If many children are failing to respond, look for causes that affect the entire ward, such as incorrect feeding practices or poor hygiene; these types of causes will be discussed in section 5.0. If your investigation is focused on one child, consider such possible causes as the following:

- Insufficient food given
 - Has the feeding plan been adjusted as the child gains weight?
 - Is the correct feed being given?
 - Is the correct amount offered at the required times?
 - Is the child being fed adequately at night?
 - Is the child being held and encouraged to eat?
 - Are leftovers recorded so the child's recorded intake is accurate?
- Vitamin or mineral deficiency
 - Is mineral mix added to the child's food each day?
 - Is an appropriate multivitamin given?
- Insufficient attention given to child
 - Do staff pay less attention to this child for some reason (for example, because they believe he is "beyond help")?
 - Is the mother present to assist in feeding and care of the child?
- Rumination – The child regurgitates food from the stomach to the mouth, then vomits part of it and swallows the rest. This usually happens when the child is not observed.
 - Is the child eating well but failing to gain weight?
 - Does the child smell of vomit or have vomit-stained clothes or bedding?
 - Does the child seem unusually alert and suspicious?
 - Does the child make stereotyped chewing movements?
- Unrecognized infection – Infections most commonly overlooked include pneumonia, urinary tract infection, ear infection, and tuberculosis. Others include malaria, dengue, viral hepatitis B, and HIV infection. See pages 30-33 of the manual for more information on identifying possible infections and treating them.
- Serious underlying disease (such as congenital abnormalities, cancer, immunological diseases).

Remember that there may be multiple causes of failure to respond. For example, a child may have an infection plus a vitamin deficiency. Try to find all of the causes.

2.4 Identify and implement solutions for the individual child

In some cases, the cause of a problem may require a specific medical solution. If the child has an infection, a clinician will need to prescribe appropriate treatment as described in the manual, chapter 7.



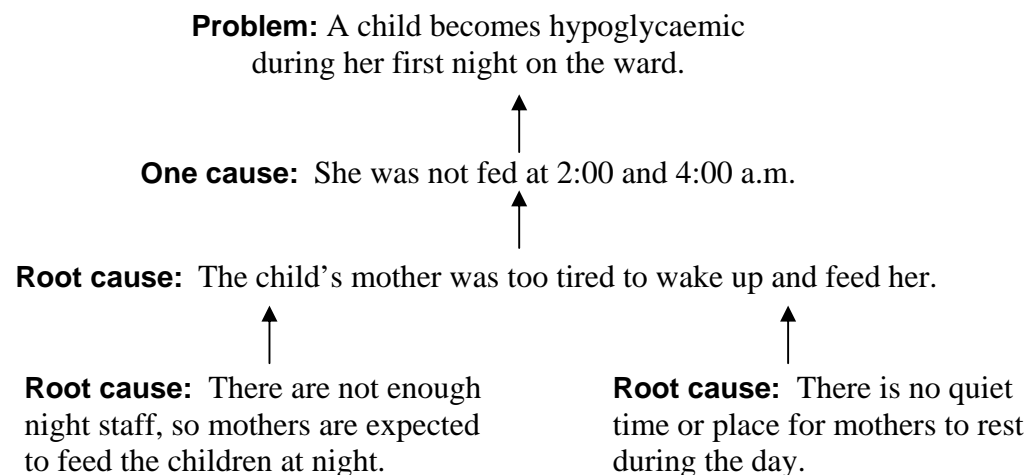
Optional reading for clinicians:

Those who are interested may read the section on infections from the manual, pages 30-33.

If the child is ruminating, it is best to have experienced staff members give special attention to the child. They need to show disapproval whenever the child begins to ruminate, without frightening the child, and encourage less harmful behaviours.

In many cases the solution to a problem may seem apparent through “common sense”. For example, if the child is not being fed according to schedule, he must be fed according to schedule. If the mineral mix has not been added to the child’s food, it must be added. However, there may be underlying causes that are also important. Continue to ask “Why?” until you reach the “root causes” of problems. The solutions to problems must address the root causes.

Example of a problem with root causes



Solutions: To solve this problem, it will be necessary to address all of the causes. Possible solutions include getting more night staff or finding a time and place for mothers to rest during the day. Night staff could also be asked to wake up the mothers and supervise night feeds, or help those mothers whose children require 2-hourly feeds.



EXERCISE B

In this exercise you will discuss causes and solutions to problems affecting Ceri and Lennox, two cases presented previously in Exercise A.

Case 1 – Ceri

You remember that Ceri was failing to respond on Day 5. She had not lost her oedema and was not eating well. She had not progressed to F-100. You may wish to review the information about Ceri on pages 11 – 13.

Write answers to the following questions as preparation for a group discussion:

- 1a. What are some possible causes of Ceri's failure to respond? (List at least 3 possible causes.)

- 1b. How could you find out the real cause(s)? List several possible ways to investigate.

- 1c. While observing feeding in the ward, the senior nurse found that the staff paid very close attention to the children with IV drips and NG tubes. They paid much less attention to the children feeding orally. Ceri did not appear as sick as many of the other children, and the nurses did not spend time with her encouraging her to eat.

Based on the senior nurse's observations, what is a possible cause of Ceri's failure to respond?

- 1d. What is a possible solution appropriate for the cause identified in question 1c above?

Case 2 – Lennox

You remember that Lennox was failing to respond on Day 10. He had a deep, persistent cough and some difficulty breathing. The physician had been treating Lennox for pneumonia with benzylpenicillin, which had been given for 5 days.

Since Lennox was not improving on benzylpenicillin, the physician did a complete examination. He obtained a chest x-ray, which showed a shadow on the lungs. The physician also learned that a relative who lives in Lennox's household has tuberculosis.

- 2a. Lennox's CCP on page 16 shows no weight gain. Has Lennox been taking enough F-100?

- 2b. What is a possible cause of Lennox's failure to respond? (Hint: See page 32 of the manual.)

Tell a facilitator when you are ready for the group discussion.

3.0 Monitor overall weight gain on the ward

Section 2.0 discussed problem-solving for individual patients. The remaining sections will discuss identifying and solving problems for the ward.

3.1 Compile data on weight gain in the ward

Once a month, review records for the ward for a given week (for example, the first week of the month) and compile data on a Weight Gain Tally Sheet for the Ward. (See example below. There is a blank tally sheet in Annex A.)

To complete the tally sheet:

- Identify the children who were on F-100 for the entire week. (Only children on F-100 are expected to gain weight.)
- Calculate the average daily weight gain for each of these children:
Add the daily weight gains recorded on the child's CCP for the 7 days of the week being reviewed. Divide the total by 7.
- Determine if the child's average daily weight gain was poor, moderate, or good during that week.
- Record the child's name in the appropriate column of the tally sheet.
- When the process is complete for each child on F-100, total the columns.
- Determine what percentage of the children on F-100 had poor, moderate, or good weight gain. To do this:
Divide total in each column by the total children on F-100.
Express as a percentage.

Compare the results to tally sheets from similar weeks in other months. Use the tally sheets as a basis for discussion and problem solving with staff. If you cannot complete this review process every month, try to do it at least four times a year.

Example weight gain tally sheet for ward

Week of: 9/2/00	Good weight gain ≥ 10 g/kg/day	Moderate weight gain 5 up to 10 g/kg/day	Poor weight gain < 5 g/kg/day
Number of children on F-100 for entire week: 12	<i>Jalika Isatou Nancy Amie</i>	<i>Ebrima Babu Fatemata Sainey Galo Momodou</i>	<i>Fatou Abdouraham</i>
Totals	4	6	2
% of children on F-100 in ward	33%	50%	17%

3.2 Determine if there is a problem with weight gain on the ward

If the weight gain of 10% or more of the children on F-100 is poor, there is a problem that must be investigated. If there is a negative change as compared to previous months, there may also be a problem. For example, if the percentage of children in the “moderate” column increases and the percentage in the “excellent” column decreases, investigate the reasons for this change.

3.3 State the problem specifically

Describe the problem as completely and specifically as possible. Determine if the children who are not gaining weight adequately have certain things in common. For example:

- How long have they been on the ward?
- What are their ages?
- Are they located in a certain area of the ward?
- Are they cared for by certain staff?
- Are they receiving food or drinks that interfere with prescribed feeds?

You may think of other questions to ask to determine common factors. If there are no apparent common factors, then assume that the problem is throughout the ward.

After determining common factors, state the problem specifically, for example, “4 out of 5 children whose mothers are not staying in the ward have poor weight gain”. If the problem is occurring throughout the ward, say so, for example, “25% of children throughout the ward have poor weight gain”.

Stating the problem specifically will help you look for the cause(s). Investigating causes by monitoring ward procedures, food preparation, etc. will be discussed in section 5.0.



EXERCISE C

In this exercise you will review information on children who have been on F-100 for the past seven days. You will use a tally sheet to determine whether there is a problem with weight gain on the ward. There will then be a group discussion.

Information for the exercise

Twenty children on the ward have been on F-100 for the past seven days. For seventeen of these children, the average daily weight gain for the past seven days has been calculated. These children's names have already been entered on the tally sheet on the next page.

CCP excerpts for three children are given on page 29. Follow the instructions on page 29 to complete the tally sheet. Check your tally sheet with a facilitator if you wish. Then answer the questions on page 30.

WEIGHT GAIN TALLY SHEET FOR WARD

Week of: <i>13/4/00</i>	Good weight gain: ≥ 10 g/kg/day	Moderate weight gain: 5 up to 10 g/kg/day	Poor weight gain: < 5 g/kg/day
Number of children on F-100 for entire week: <i>20 children</i>	<i>Prakash Winston Sulayman Fatem Karamo Simeh</i>	<i>Lamin Rohey Jainaba Tako Aramatoulie Ala Isaidu Kaddy</i>	<i>Sanu Marianna Lalita</i>
Totals			
% of children on F-100 in ward			

Instructions to complete tally sheet

For each child whose CCP excerpt is given below:

1. Calculate the average daily weight gain:
Add the daily weight gains recorded on the child's CCP for the 7 days of the week being reviewed (dates: 13/4/00 – 19/4/00). Divide the total by 7.
2. Determine if the child's average daily weight gain was poor, moderate, or good during that week.
3. Add the child's name to the appropriate column of the tally sheet.

When you have added all three children to the tally sheet:

4. Total the columns on the tally sheet.
5. Determine what percentage of the children on F-100 had poor, moderate, or good weight gain. To do this:
 - Divide total in each column by the total children on F-100.
 - Express the result as a percentage.

CCP Excerpt 1 – Aruni

DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date	8/4	9/4	10/4	11/4	12/4	13/4	14/4	15/4	16/4	17/4	18/4	19/4			
Daily weight (kg)	4.6	4.5	4.55	4.6	4.63	4.65	4.7	4.8	4.85	4.9	5.0	5.0			
Weight gain (g/kg)	Calculate daily after on F-100.				6.5	4.3	10.7	21.3	10.4	10.3	20.4	0			

CCP Excerpt 2 – Kodeh

DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date	6/4	7/4	8/4	9/4	10/4	11/4	12/4	13/4	14/4	15/4	16/4	17/4	18/4	19/4	
Daily weight (kg)	5.9	5.8	5.9	5.9	6.0	6.0	6.0	6.0	6.10	6.15	6.10	6.20	6.25	6.20	
Weight gain (g/kg)	Calculate daily after on F-100.				--	--	--	0	16	8.2	-8.1	16.4	8.1	-8	

CCP Excerpt 3 – Sohna

DAYS IN HOSPITAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Date	7/4	8/4	9/4	10/4	11/4	12/4	13/4	14/4	15/4	16/4	17/4	18/4	19/4		
Daily weight (kg)	7.7	7.7	7.7	7.8	7.8	8.0	8.1	8.15	8.22	8.2	8.3	8.3	8.35		
Weight gain (g/kg)	Calculate daily after on F-100.				--	25.6	12.5	6.17	8.6	-2.4	12.2	0	6.0		

-- Exercise continues on next page

Questions to answer and discuss:

1. Does the tally sheet show that there is a problem with weight gain on the ward?
2. The senior nurse decided to look for common factors among the children who had poor weight gain. She found the following information:

Sanu - Arrived 21 days ago, age 2 years, orphan (no caregiver at the hospital), cared for by Nurse Rafia

Marianna - Arrived 18 days ago, age 19 months, no mother at hospital (aunt comes to visit), cared for by Nurse Anjuli

Lalita - Arrived 12 days ago, age 22 months, was on IV at admission and then NG but now takes feeds orally, moved yesterday to Nurse Rafia's area, mother is present

Kodeh - Arrived 14 days ago, age 18 months, cared for by Nurse Amalia, orphan (parents died and a neighbour left Kodeh at hospital)

What common factor(s), if any, are there among these children?

3. State the problem as specifically as possible using the information from the tally sheet and the information gathered by the senior nurse.
4. Do the common factors among the children with poor weight gain suggest a possible cause of the problem? If so, what is a possible cause? What further investigation may need to be done to investigate causes?

Tell a facilitator when you are ready for the group discussion.

4.0 Monitor patient outcomes

4.1 Record each patient's outcome on the CCP

The last page of the CCP has a space for recording patient outcomes. Record the outcome for the patient whether it is successful or not. Also record any relevant comments, such as circumstances and causes of adverse outcomes.

Successful outcome:

- Discharge at $-1SD$ (90% weight for height)

Adverse outcomes:

- Death
 - apparent cause of death
 - number of days after admission
 - time of day or night that death occurred
 - other relevant circumstances
- Early departure or early discharge and circumstances
- Referral and circumstances

Example from CCP

PATIENT OUTCOME		
<i>Circle outcome:</i>	DATE	CIRCUMSTANCES / COMMENTS
Discharge at $-1SD$ (90% weight for height)		
Early departure (against advice)		SD score (or %): _____
Early discharge	4/1/00	SD score (or %): $-2SD$ (80%) <i>After 2 weeks child is doing well. Will visit nutritional rehabilitation centre daily.</i>
Referral		SD score (or %): _____
Death		Number of days after admission (circle): <24 hrs 1-3 days 4-7 days >7 days
		Approximate time of death: _____ Day Night
		Apparent cause(s): _____
		Had child received IV fluids? Yes No

4.2 Tag adverse outcomes on the CCP

Use a coloured tag or some other means to indicate records with adverse outcomes (that is, death, early discharge or departure, referrals). The tag will make these records easy to find in the files when you are doing a review.

4.3 Review patient records for common factors in adverse outcomes

Periodically, and whenever there is a death, review tagged records. Note common factors that would suggest areas where case management practices or ward procedures may need to be carefully examined and improved.

For example, note whether recent deaths have occurred within the first 2 days after admission or later. Deaths that occur within the first 2 days are often due to hypoglycaemia, overhydration, unrecognized or mismanaged septic shock, or other serious infection. Deaths that occur after 2 days are often due to heart failure; check to see if deaths are occurring during transition to F-100.

An increase in deaths occurring during the night or early morning, or on weekends, suggests that care of children at these times should be monitored and improved. For example, if there are many early morning deaths, it is possible that children are not being adequately covered and fed during the night.

If many mothers are choosing to take their children home after only a few days, look for common reasons. Are the mothers unable to leave other children at home? Is the ward uncomfortable for them? Are the staff unfriendly? Early departures also suggest a need to monitor and improve ward conditions and procedures.

Review of patient records for adverse outcomes can provide a basis for staff to discuss and solve problems. A process for group problem solving is described in section 6.0 of this module.



EXERCISE D

In this exercise you will review excerpts from the CCPs of three children who died. You will review the circumstances of the deaths and determine whether there are common factors.

Study the CCP excerpts for Kofi, Vijay, and Luca on the following pages. Answer and be ready to discuss the following questions:

1. What are the circumstances of each child's death?

Kofi –

Vijay –

Luca –
2. Are there common factors among any of the three deaths? If so what are they?
3. What areas of case management practices or ward procedures need to be monitored to find related problems and causes?

Tell a facilitator when you are ready for the group discussion.

CRITICAL CARE PATHWAY (CCP) – SEVERE MALNUTRITION WARD

NAME Kofi (M) F DATE OF BIRTH OR AGE 15 months DATE OF ADMISSION 4/6/01 TIME 10:00 HOSP. ID NUMBER 678

Comments on pre-referral and/or emergency treatment already given: Child was given normal saline IV in emergency room due to low plasma sodium.

INITIAL MANAGEMENT

SIGNS OF SEVERE MALNUTRITION Severe wasting? Yes No
 Oedema? 0 + ++ +++
 Dermatitis? 0 + ++ +++ (raw skin, fissures)
 Weight(kg): 6.3 Height/length (cm): 71
 SD score: < -3 or % of median: < 70%

TEMPERATURE 36 °C rectal axillary
 If rectal < 35.5°C (95.9°F), or axillary < 35°C (95°F), actively warm child.
 Check temperature every 30 minutes.

BLOOD GLUCOSE (mmol/l): 4
 If < 3mmol/l and alert, give 50 ml bolus of 10% glucose or sucrose (oral or NG).
 If < 3 mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x kg (child's wt) = ml Then give 50 ml bolus NG.
 Time glucose given: Oral NG IV

HAEMOGLOBIN (Hb) (g/l): 90 or Packed cell vol (PCV): Blood type:
 If Hb < 40 g/l or PCV < 12%, transfuse 10 ml/kg whole fresh blood (or 5-7 ml/kg packed cells) slowly over 3 hours. Amount: Time started: Ended:

EYE SIGNS None Left Right **MEASLES** Yes No
 Bitot's spots Pus/Inflammation Corneal clouding Corneal ulceration
 If ulceration, give vitamin A & atropine immediately. Record on Daily Care page.
 Oral doses vitamin A: < 6 months 50 000 IU
 6 - 12 months 100 000 IU
 > 12 months 200 000 IU

FEEDING Begin feeding with F-75 as soon as possible. (If child is rehydrated, reweigh before determining amount to feed. New weight: 6.8 kg)
 Amount for 2-hourly feedings: 75 ml F-75* Time first fed: 16:00
 * If hypoglycaemic, feed ½ of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/l.
Record all feeds on 24-hour Food Intake Chart.

SIGNS OF SHOCK None Lethargic/unconscious Cold hand Slow capillary refill (> 3 seconds) Weak/fast pulse
 If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids:

Amount IV fluids per hour: 15 ml x kg (child's wt) = ml

Start:	Monitor every 10 minutes	*2 nd hr:	Monitor every 10 minutes
Time		*	
Resp. rate		*	
Pulse rate		*	

* If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)

DIARRHOEA Watery diarrhoea? Yes No If diarrhoea, circle signs present:
 Blood in stool? Yes No Restless/irritable Lethargic Thirsty
 Vomiting? Yes No Sunken eyes Dry mouth/tongue No tears

If diarrhoea and/or vomiting, give ReSoMal. Every 30 minutes for first 2 hours, monitor and give:
 5 ml x kg (child's wt) = ml ReSoMal

For up to 10 hours, give ReSoMal and F-75 in alternate hours. Monitor every hour. Amount of ReSoMal to offer: *
 5 to 10 ml x kg (child's wt) = to ml ReSoMal

Time	Start:	5 to 10 ml x <u> </u> kg (child's wt) = <u> </u> to <u> </u> ml ReSoMal	F-75	F-75	F-75
Time					
Resp. rate					
Pulse rate					
Passed urine? Y N					
Number stools					
Number vomits					
Hydration signs					
Amount taken (ml)			F-75	F-75	F-75

* Stop ReSoMal if: Increase in pulse & resp. rates Jugular veins engorged Increasing oedema, e.g., puffy eyelids

Dose / Frequency / Duration	Drug / Route	Time of 1 st dose

COMMENTS | OUTCOME

Kofi

COMMENTS:
 IV begun in emergency room
 was continued for dehydration
 until 16:00 4/6

TRAINING GIVEN TO PARENTS / CAREGIVERS:

SPECIAL DISCHARGE AND FOLLOW-UP INSTRUCTIONS:

PATIENT OUTCOME		DATE	CIRCUMSTANCES / COMMENTS
Discharge at -1SD (90% weight for height)			
Early departure (against advice)			SD score (or %): _____
Early discharge			SD score (or %): _____
Referral			SD score (or %): _____
Death	4/6		Number of days after admission (circle): <u>< 24 hrs</u> 1-3 days 4-7 days > 7 days Approximate time of death: 19:00 Day <u>Night</u> evening Apparent cause(s): <u>unknown, severe malnutrition</u> Had child received IV fluids? <u>Yes</u> No

IMMUNIZATIONS	Immunization card? Yes No			
	First	Second	Third	Booster
BCG	At birth	Optional: > 6 months	—	—
Polio	At birth	2 months	3 months	12 months
DPT	3 months	4 months	5 months	12 months
Measles	6 or 9 months	—	—	—

CRITICAL CARE PATHWAY (CCP) – SEVERE MALNUTRITION WARD

NAME Vijay M F DATE OF BIRTH OR AGE 24 mos DATE OF ADMISSION 5/10/01 TIME 8:00 HOSP. ID NUMBER 756
 Comments on pre-referral and/or emergency treatment already given: IV albumin and diuretic (furosemide) given for low albumin and oedema

INITIAL MANAGEMENT

SIGNS OF SEVERE MALNUTRITION Severe wasting? Yes No

Oedema? 0 + ++ +++

Dermatosis? 0 + ++ +++ (raw skin, fissures)

Weight(kg): 8.1 kg Height/length (cm): 78 cm

SD score: <-2 or % of median:

TEMPERATURE 36.5 °C rectal axillary

If rectal < 35.5°C (95.9°F), or axillary < 35°C (95°F), actively warm child. Check temperature every 30 minutes.

BLOOD GLUCOSE (mmol/l): 4

If < 3mmol/l and alert, give 50 ml bolus of 10% glucose or sucrose (oral or NG). If < 3 mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x ___ kg (child's wt) = ___ ml Then give 50 ml bolus NG.

Time glucose given: Oral NG IV

HAEMOGLOBIN (Hb) (g/l): 90 or Packed cell vol (PCV): Blood type: _____

If Hb < 40 g/l or PCV < 12%, transfuse 10 ml/kg whole fresh blood (or 5-7 ml/kg packed cells) slowly over 3 hours. Amount: Time started: Ended:

EYE SIGNS None Left Right **MEASLES** Yes No

Bitot's spots Pus/Inflammation Corneal clouding Corneal ulceration

If ulceration, give vitamin A & atropine immediately. Record on Daily Care page.

Oral doses vitamin A: < 6 months 50 000 IU
 6 - 12 months 100 000 IU
 > 12 months 200 000 IU

FEEDING Begin feeding with F-75 as soon as possible. (If child is rehydrated, reweigh before determining amount to feed. New weight: ___ kg)

Amount for 2-hourly feedings: 90 ml F-75* Time first fed: 12:00

* If hypoglycaemic, feed % of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/l.

Record all feeds on 24-hour Food Intake Chart.

SIGNS OF SHOCK None Lethargic/unconscious Cold hand Slow capillary refill (> 3 seconds) Weak/fast pulse

If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids:

Amount IV fluids per hour: 15 ml x ___ kg (child's wt) = ___ ml

Time	Start:	Monitor every 10 minutes	*2 nd hr:	Monitor every 10 minutes
Resp. rate				
Pulse rate				

* If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)

DIARRHOEA Watery diarrhoea? Yes No Blood in stool? Yes No Vomiting? Yes No

If diarrhoea, circle signs present: Skin pinch goes back slowly Lethargic Thirsty Restless/irritable Dry mouth/tongue No tears Sunken eyes

If diarrhoea and/or vomiting, give ReSoMal. Every 30 minutes for first 2 hours, monitor and give: * 5 ml x ___ kg (child's wt) = ___ ml ReSoMal

For up to 10 hours, give ReSoMal and F-75 in alternate hours. Monitor every hour. Amount of ReSoMal to offer: * 5 to 10 ml x ___ kg (child's wt) = ___ to ___ ml ReSoMal

Time	Start:	5 to 10 ml x ___ kg (child's wt) = ___ to ___ ml ReSoMal	F-75	F-75	F-75	F-75
Resp. rate						
Pulse rate						
Passed urine? Y N						
Number stools						
Number vomits						
Hydration signs						
Amount taken (ml)			F-75	F-75	F-75	F-75

* Stop ReSoMal if: Increase in pulse & resp. rates Jugular veins engorged Increasing oedema, e.g., puffy eyelids

Dose / Frequency / Duration	Drug / Route	Time of 1 st dose

CRITICAL CARE PATHWAY (CCP) – SEVERE MALNUTRITION WARD

NAME Luca M F DATE OF BIRTH OR AGE 18 mos DATE OF ADMISSION 25/2/01 TIME 9:00 HOSP. ID NUMBER 1064

Comments on pre-referral and/or emergency treatment already given:

INITIAL MANAGEMENT

SIGNS OF SEVERE MALNUTRITION Severe wasting? Yes No
 Oedema? 0 ++ +++
 Dermatitis? 0 ++ +++ (raw skin, fissures)
 Weight(kg): 6.8 kg Height/length (cm): 74
 SD score: -3 or % of median:

TEMPERATURE 36 °C rectal axillary
 If rectal < 35.5°C (95.9°F), or axillary < 35°C (95°F), actively warm child.
 Check temperature every 30 minutes.

BLOOD GLUCOSE (mmol/l): 4
 If < 3mmol/l and alert, give 50 ml bolus of 10% glucose or sucrose (oral or NG).
 If < 3 mmol/l and lethargic, unconscious, or convulsing, give sterile 10% glucose IV: 5 ml x kg (child's wt) = ml Then give 50 ml bolus NG.
 Time glucose given: Oral NG IV

HAEMOGLOBIN (Hb) (g/l): 90 or Packed cell vol (PCV): Blood type:
 If Hb < 40 g/l or PCV < 12%, transfuse 10 ml/kg whole fresh blood for 5-7 ml/kg packed cells slowly over 3 hours. Amount: Time started: Ended:

EYE SIGNS None Left Right **MEASLES** Yes No
 Bitot's spots Pus/Inflammation Corneal clouding Corneal ulceration
 If ulceration, give vitamin A & atropine immediately. Record on Daily Care page.
 Oral doses vitamin A: < 6 months 50 000 IU
 6 - 12 months 100 000 IU
 > 12 months 200 000 IU

FEEDING Begin feeding with F-75 as soon as possible. If child is rehydrated, reweigh before determining amount to feed. New weight: 6.9 kg
 Amount for 2-hourly feedings: 75 ml F-75* Time first fed: 12:30
 * If hypoglycaemic, feed % of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/l.
Record all feeds on 24-hour Food Intake Chart.

SIGNS OF SHOCK None Lethargic/unconscious Cold hand Slow capillary refill (> 3 seconds) Weak/fast pulse
 If lethargic or unconscious, plus cold hand, plus either slow capillary refill or weak/fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids:
 Amount IV fluids per hour: 15 ml x kg (child's wt) = ml

Start:	Monitor every 10 minutes	*2 nd hr:	Monitor every 10 minutes
Time			
Resp. rate			
Pulse rate			

* If respiratory & pulse rates are slower after 1 hour, repeat same amount IV fluids for 2nd hour; then alternate ReSoMal and F-75 for up to 10 hours as in right part of chart below. If no improvement on IV fluids, transfuse whole fresh blood. (See left, Haemoglobin.)

DIARRHOEA Watery diarrhoea? Yes No → If diarrhoea, circle signs present:
 Blood in stool? Yes No Lethargic
 Vomiting? Yes No Dry mouth/tongue
 Sunken eyes Thirsty No tears
 Skin pinch goes back slowly

If diarrhoea and/or vomiting, give ReSoMal. Every 30 minutes for first 2 hours, monitor and give.*
 5 ml x 6.8 kg (child's wt) = 34 ml ReSoMal

Time	Start: <u>9:30</u>	<u>10:00</u>	<u>10:30</u>	<u>11:00</u>	<u>11:30</u>	<u>12:30</u>	<u>13:30</u>	<u>14:30</u>	<u>15:30</u>	<u>16:30</u>	<u>17:30</u>	<u>18:30</u>
Resp. rate	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>30</u>
Pulse rate	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>	<u>90</u>
Passed urine? Y N		<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>
Number stools		<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Number vomits		<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Hydration signs												
Amount taken (ml)	<u>34</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>60</u>	<u>F-75</u>	<u>60</u>	<u>F-75</u>	<u>50</u>	<u>F-75</u>	<u>40</u>

* Stop ReSoMal if: Increase in pulse & resp. rates Jugular veins engorged Increasing oedema, e.g., puffy eyelids

ANTIBIOTICS (All receive) Drug | Route cotrimoxazole oral
 Dose | Frequency | Duration 4 ml syrup every 12 hours for 5 days
 Time of 1st dose 9:30

Luca

DAILY CARE

		Week 1			Week 2							Week 3										
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
DAYS IN HOSPITAL																						
Date		25/2 26/2 27/2																				
Daily weight (kg)		6.9 6.9 6.9																				
Weight gain (g/kg)		Calculate daily after on F-100.																				
Oedema 0 + ++ +++		+ + +																				
Diarrhoea/vomit 0 D V		DV DV DV																				
FEED PLAN: Type feed		F-75 F-75 F-75																				
# feeds daily		10 12 12																				
Total volume taken (ml)		730 750																				
ANTIBIOTICS		List prescribed antibiotics in left column. Allow one row for each daily dose. Draw a box around daytimes that each drug should be given. Initial when given.																				
cotrimoxazole 9:00		[Boxed] [Boxed]																				
4 ml 21:00		[Boxed] [Boxed]																				
FOLIC ACID		[Boxed] [Boxed]																				
VITAMIN A 200 000 IU		[Boxed] [Boxed]																				
Multivitamin (if not in feed)																						
Drug for worms (Note type of worm)		NONE																				
IRON		Begin iron after 2 days on F-100.																				
2 X daily																						
FOR EYE PROBLEMS:																						
Tetracycline or Chloramphenicol																						
1 drop 4 X daily																						
Atropine																						
1 drop																						
3 X daily																						
Dermatitis 0 + ++ +++		+ + +																				
Bathing, 1% permanganate		[Boxed] [Boxed]																				
OTHER																						

child admitted with eye sign or recent measles.

After 7-10 days, when eye drops are no longer needed, shade boxes for eye drops.

4.4 Calculate a case fatality rate for the ward

In a big ward (for example, with 100 admissions per month), calculate the case-fatality rate once each month if possible. Also calculate the case-fatality rate monthly in any ward where the current rate is poor or unacceptable. This will allow improvements to be seen rapidly.

In a small ward (for example, 10 cases per month), or in a ward where the case-fatality rate is moderate or better, the case fatality rate may be calculated less often (e.g., every 3 months).

To calculate the case-fatality rate:

- Determine the number of patients admitted to the severe malnutrition ward in the past month(s).
- Determine the number of those patients who died. (Wait to count deaths until the outcomes for the patients are known. For example, wait until mid-November to count deaths among patients admitted in October.)
- Divide the number of deaths by the number of patients and express the result as a percentage.

For the purposes of this training course, a case-fatality rate of:

>20% is unacceptable
11-20% is poor
5-10% is moderate
<5% is acceptable

Carefully review the circumstances of deaths and identify and solve related problems in order to reduce the case-fatality rate.

The objective of a severe malnutrition ward should be to achieve a case-fatality rate of less than 5%.



SHORT ANSWER EXERCISE

Calculate the case-fatality rates for the severe malnutrition wards described below. State whether the rate is unacceptable, poor, moderate, or acceptable.

1. The severe malnutrition ward at Central Hospital is small. Over the past 3 months, there have been 32 admissions. Five of these children died.

2. City Hospital had 98 admissions with severe malnutrition in October. Three of these children died.

- 3a. Mercy Hospital had 28 admissions to the severe malnutrition ward in June and July. Two of these children died.

- b. In the next two months, August and September, Mercy Hospital had 36 admissions to the severe malnutrition ward. Four of these children died.

- c. How does the rate for August and September compare with the previous two months? Is there a problem?

Check your own answers to this exercise by comparing them to the answers given on page 52 at the end of the module.

5.0 As needed, monitor practices and procedures

Periodically, or to investigate causes of problems, you may need to monitor:

- case management practices
- food preparation
- ward procedures, and/or
- hygiene.

Suggestions for monitoring are provided in this section. Monitoring Checklists for use during ward visits are provided in Annex B. Any “NO” answer to a question on the checklist indicates a problem that needs to be corrected.

5.1 Monitor case management practices

Deaths during initial case management are often the result of well-intentioned but incorrect practice. Monitor to ensure that all clinicians are following the case management practices described in the manual, particularly during initial treatment. Ensure that emergency room personnel are also following appropriate practices for severely malnourished children. No checklist is given for monitoring case management, as it would be too lengthy. However, some examples of common incorrect practices to look for are described below:

Common Incorrect Practices in Initial Treatment – These cause deaths:	Correct Practice
⊗ Child not fed at night	During initial treatment ensure that the child is fed every 2 hours at night. Feeding is never less frequent than every 4 hours.
⊗ IV fluids given even though child is not in shock	Give IV only if signs of shock (cold hand plus slow capillary refill or weak/fast pulse).
⊗ IV albumin/amino acids given	Do not give these.
⊗ Diuretics given to treat oedema	Do not give these. Oedema will resolve with correct initial treatment using F-75 with correct minerals and vitamins.
⊗ High protein diet given immediately	Give F-75 until the child stabilizes; then start F-100.
⊗ Antibiotics not given because no clinical signs of infection	Presume infection and give antibiotics to all severely malnourished children as described in the manual.
⊗ Standard ORS used instead of ReSoMal	Give ReSoMal to severely malnourished children with diarrhoea.
⊗ Child left uncovered at night	Provide blanket and ensure the child is covered at night.
⊗ Anaemia treated with iron from admission	Wait to start iron until the child has been on F-100 for 2 days.

5.2 Monitor food preparation

Problems such as poor weight gain on the ward may be due to problems with food preparation. Periodically, or whenever you suspect that there is a problem, carefully observe preparation of feeds. Monitor the following:

- Are ingredients for the recipes available?
- Is the correct recipe used for the ingredients that are available?
- Are ingredients stored appropriately and discarded at appropriate times?
- Are containers and utensils kept clean?
- Do kitchen staff (or those preparing feeds) wash their hands with soap before preparing food?
- Are the recipes for F-75 and F-100 followed exactly? (If changes are made due to lack of ingredients, are these changes appropriate?)
- Are measurements made exactly with proper measuring utensils (e.g., correct scoops)?
- Are ingredients thoroughly mixed (and cooked, if necessary)?
- Is the appropriate amount of oil mixed in (i.e., not left stuck in the measuring container)?
- Is mineral mix added correctly?
- Is correct amount of water added to make up a litre of formula? (Staff should *not* add a litre of water, but just enough to make a litre of formula.)
- Is food served at an appropriate temperature?
- Is the food consistently mixed when served (i.e., oil is mixed in, not separated)?
- Are correct amounts put in the dish for each child?
- Is leftover prepared food discarded promptly?



5.3 Monitor ward procedures

Problems such as inadequate weight gain on the ward, early departures, or even deaths may be due to inadequate ward procedures. Whenever you suspect that there is a problem related to ward procedures, observe staff as they do those procedures, or review relevant records. Procedures to monitor include:

Feeding

- Are correct feeds served in correct amounts?
- Are feeds given at the prescribed times, even on nights and weekends?
- Are children held and encouraged to eat (never left alone to feed)?
- Are children fed with a cup (never a bottle)?
- Is food intake (and any vomiting/diarrhoea) recorded correctly after each feed?
- Are leftovers recorded accurately?
- Are amounts of F-75 kept the same throughout the initial phase, even if weight is lost?
- After transition, are amounts of F-100 given freely and increased as the child gains weight?



Warming

- Is the room kept between 25° – 30°C (to the extent possible)?
- Are blankets provided and children kept covered at night?
- Are safe measures used for re-warming children?
- Are temperatures taken and recorded correctly?



Weighing

- Are scales functioning correctly? Are they standardized weekly? (Check scales as described in *Daily Care*.)
- Are children weighed at about the same time each day, one hour before a feed (to the extent possible)?
- Do staff adjust the scale to zero before weighing children?
- Are children consistently weighed without clothes?



- Do staff correctly read weight to the nearest division of the scale?
- Do staff immediately record weights on the child's CCP?
- Are weights correctly plotted on the Weight Chart?

Giving antibiotics and other medications and supplements

- Are antibiotics given as prescribed (correct dose at correct time)?
- When antibiotics are given, do staff immediately make a notation on the CCP?
- Is folic acid given daily and recorded on the CCP?
- Is vitamin A given according to schedule?
- Is a multivitamin given daily and recorded on the CCP?
- After children are on F-100 for 2 days, is the correct dose of iron given daily and recorded on the CCP?



Ward environment

- Are surroundings welcoming and cheerful?
- Are mothers offered a place to sit and sleep?
- Are mothers taught and encouraged to be involved in care?
- Are staff consistently courteous?
- As children recover, are they stimulated and encouraged to move and play?



5.4 Monitor hygiene

Good hygiene is extremely important because children with severe malnutrition are highly susceptible to infection. Whenever you suspect that a problem may be related to hygiene, or periodically, visually inspect hygiene in the ward. Monitor such items as the following:

Handwashing

- Are there working handwashing facilities in the ward?
- Do staff consistently wash hands thoroughly with soap?
- Are their nails clean?
- Do they wash hands before handling food?
- Do they wash hands between each patient?

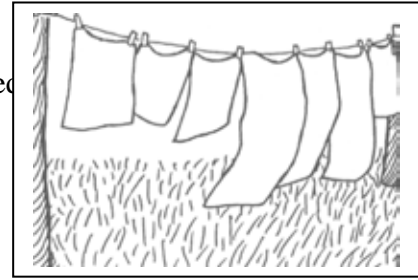


Mothers' cleanliness

- Do mothers have a place to bathe, and do they use it?
- Do mothers wash hands with soap after using the toilet or changing diapers?
- Do mothers wash hands before feeding children?

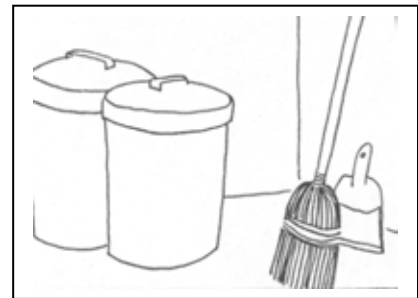
Bedding and laundry

- Is bedding changed every day or when soiled/wet?
- Are diapers, soiled towels and rags, etc. stored in bag, then washed or disposed of properly?
- Is there a place for mothers to do laundry?
- Is laundry done in hot water?



General maintenance

- Are floors swept?
- Is trash disposed of properly?
- Is the ward kept as free as possible of insects and rodents?



Food storage

- Are ingredients and food kept covered and stored at the proper temperature?
- Are leftovers discarded?

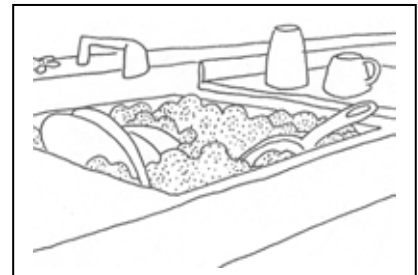


Dishwashing

- Are dishes washed after each meal?
- Are they washed in hot water with soap?

Toys

- Are toys washable?
- Are toys washed regularly, and after each child uses them?



6.0 Solve problems

There are some problems that require individual solutions and should be handled privately. For example, if you find that a particular staff member is doing a procedure incorrectly or dangerously, correct that person privately.

On the other hand, some problems may be solved by working with staff members as a group to discuss the causes and possible solutions. Some examples of problems that could be reviewed as a group might include:

- a diarrhoea outbreak in the ward
- an increasing case fatality rate; or
- procedural problems involving all or many of the staff.

Staff may have useful information to contribute on the causes of problems and creative ideas for solutions. They are also more likely to work together towards a solution if they are involved in decision making that affects them.

Process for problem-solving in a group

When conducting a problem-solving session with a group, use the following process as a guide:

1. Welcome everyone to the meeting and explain the purpose. Be careful not to sound like you are threatening or blaming anyone. Stress that you need their ideas to understand the causes of the problem and how to solve it.
2. State the facts of the problem as clearly and completely as possible. Include when, where, and with whom the problem is occurring.
3. Discuss causes of the problem that you have discovered through monitoring. Ask the staff if they know of other causes. Ask questions to try to find the “root” causes of the problem. Causes may include:
 - obstacles (such as lack of time, insufficient staff, or lack of equipment)
 - lack of motivation (for some reason, staff are not motivated to do a task correctly)
 - lack of skill or information (staff do not know what to do or how to do it)



The group must avoid blaming particular staff or having the discussion degenerate into a complaint session.

It may be helpful to write down causes identified on a flipchart or large paper.

4. Ask the staff to help you think of solutions appropriate for the causes. Different causes require different solutions. For example, if there is a problem due to lack of supplies, a solution is to obtain more supplies. If a task is done poorly because staff members do not enjoy it, a solution may be to rotate that task so that everyone takes a turn, but no one has to do it too often. If staff forget how to do a certain task, the solution may be to make a job aid and post it on the wall.

Ask staff to think of solutions that they believe will work. Discuss the steps needed to implement the solutions, i.e., who will do what after the meeting.

5. Thank the staff for their ideas. Review what was decided in the meeting. After the meeting it is important to implement the solutions as quickly as possible. Be sure to give feedback to staff on how the solutions are working. They will want to know if the problem is decreasing or is solved.



Tell a facilitator when you have reached this point in the module.



EXERCISE E

This exercise will be a role play of a problem-solving session in a severe malnutrition ward. Your facilitator will assign you a role such as one of the following:

Physician in charge
Senior nurse on duty in the morning (Matron)
Senior nurse on duty in the afternoon
Night nurse
Junior auxiliary nurse
Hospital administrator

You will be given a card describing your knowledge and attitude about the situation being discussed.

One participant (the “physician in charge”) will lead the discussion using the process described in the module. Another will assist by recording on the flipchart. Others will participate in the discussion according to their assigned roles.

The objective is to describe the problem clearly, discuss possible causes and identify the most likely causes, and identify possible solutions.

ANSWERS TO SHORT ANSWER EXERCISES

Answers, page 3

1. b
2. b
3. a
4. b

Answers, page 9

1. $7.30 \text{ kg} - 7.25 \text{ kg} = 0.05 \text{ kg}$ $0.05 \text{ kg} \times 1000 = 50 \text{ grams gained}$
 $50 \text{ grams} \div 7.25 = 6.90 \text{ g/kg/day}$
2. $6.25 \text{ kg} - 6.22 \text{ kg} = 0.03 \text{ kg}$ $0.03 \text{ kg} \times 1000 = 30 \text{ grams gained}$
 $30 \text{ grams} \div 6.22 = 4.8 \text{ g/kg/day}$
3. $7.5 \text{ kg} - 7.6 \text{ kg} = -0.1 \text{ kg}$
 $-0.1 \text{ kg} \times 1000 = -100 \text{ grams gained (or 100 grams lost)}$
 $-100 \text{ grams} \div 7.6 = -13.16 \text{ g/kg/day}$

Answers, page 43

1. $5/32 = 0.156 = 15.6\%$ poor
2. $3/98 = 0.031 = 3.1\%$ acceptable
- 3a. $2/28 = 0.071 = 7.1\%$ moderate
- b. $4/36 = 0.111 = 11.1\%$ poor
- c. The case-fatality rate is worse. It has gone from moderate to poor. This is a problem.

ANNEX A

WEIGHT GAIN TALLY SHEET FOR WARD

Week of:	Good weight gain ≥ 10 g/kg/day	Moderate weight gain 5 up to 10 g/kg/day	Poor weight gain < 5 g/kg/day
Number of children on F-100 for entire week:			
Totals			
% of children on F-100 in ward			

ANNEX B:
MONITORING CHECKLISTS

CHECKLIST FOR MONITORING FOOD PREPARATION

OBSERVE:	YES	NO	COMMENTS
Are ingredients for the recipes available?			
Is the correct recipe used for the ingredients that are available?			
Are ingredients stored appropriately and discarded at appropriate times?			
Are containers and utensils kept clean?			
Do kitchen staff (or those preparing feeds) wash hands with soap before preparing food?			
Are the recipes for F-75 and F-100 followed exactly? (If changes are made due to lack of ingredients, are these changes appropriate?)			
Are measurements made exactly with proper measuring utensils (e.g., correct scoops)?			
Are ingredients thoroughly mixed (and cooked, if necessary)?			
Is the appropriate amount of oil mixed in (i.e., not left stuck in the measuring container)?			
Is mineral mix added correctly?			
Is correct amount of water added to make up a litre of formula? (Staff should not add a litre of water, but just enough to make a litre of formula.)			
Is food served at an appropriate temperature?			
Is the food consistently mixed when served (i.e., oil is mixed in, not separated)?			
Are correct amounts put in the dish for each child?			
Is leftover prepared food discarded promptly?			
Other:			

CHECKLIST FOR MONITORING WARD PROCEDURES

OBSERVE:	YES	NO	COMMENTS
<i>Feeding</i>			
Are correct feeds served in correct amounts?			
Are feeds given at the prescribed times, even on nights and weekends?			
Are children held and encouraged to eat (never left alone to feed)?			
Are children fed with a cup (never a bottle)?			
Is food intake (and any vomiting/diarrhoea) recorded correctly after each feed?			
Are leftovers recorded accurately?			
Are amounts of F-75 kept the same throughout the initial phase, even if weight is lost?			
After transition, are amounts of F-100 given freely and increased as the child gains weight?			
<i>Warming</i>			
Is the room kept between 25° – 30° C (to the extent possible)?			
Are blankets provided and children kept covered at night?			
Are safe measures used for re-warming children?			
Are temperatures taken and recorded correctly?			
<i>Weighing</i>			
Are scales functioning correctly?			
Are scales standardized weekly?			
Are children weighed at about the same time each day?			
Are they weighed about one hour before a feed (to the extent possible)?			
Do staff adjust the scale to zero before weighing?			
Are children consistently weighed without clothes?			
Do staff correctly read weight to the nearest division of the scale?			
Do staff immediately record weights on the child's CCP?			
Are weights correctly plotted on the Weight Chart?			

CHECKLIST FOR MONITORING WARD PROCEDURES, continued

<i>Giving antibiotics, medications, supplements</i>			
Are antibiotics given as prescribed (correct dose at correct time)?			
When antibiotics are given, do staff immediately make a notation on the CCP?			
Is folic acid given daily and recorded on the CCP?			
Is vitamin A given according to schedule?			
Is a multivitamin given daily and recorded on the CCP?			
After children are on F-100 for 2 days, is the correct dose of iron given twice daily and recorded on the CCP?			
<i>Ward environment</i>			
Are surroundings welcoming and cheerful?			
Are mothers offered a place to sit and sleep?			
Are mothers taught/ encouraged to be involved in care?			
Are staff consistently courteous?			
As children recover, are they stimulated and encouraged to move and play?			

CHECKLIST FOR MONITORING HYGIENE

OBSERVE:	YES	NO	COMMENTS
<i>Handwashing</i>			
Are there working handwashing facilities in the ward?			
Do staff consistently wash hands thoroughly with soap?			
Are their nails clean?			
Do they wash hands before handling food?			
Do they wash hands between each patient?			
<i>Mothers' cleanliness</i>			
Do mothers have a place to bathe, and do they use it?			
Do mothers wash hands with soap after using the toilet or changing diapers?			
Do mothers wash hands before feeding children?			
<i>Bedding and laundry</i>			
Is bedding changed every day or when soiled/wet?			
Are diapers, soiled towels and rags, etc. stored in bag, then washed or disposed of properly?			
Is there a place for mothers to do laundry?			
Is laundry done in hot water?			
<i>General maintenance</i>			
Are floors swept?			
Is trash disposed of properly?			
Is the ward kept as free as possible of insects and rodents?			
<i>Food storage</i>			
Are ingredients and food kept covered and stored at the proper temperature?			
Are leftovers discarded?			
<i>Dishwashing</i>			
Are dishes washed after each meal?			
Are they washed in hot water with soap?			
<i>Toys</i>			
Are toys washable?			
Are toys washed regularly, and after each child uses them?			

For further information, please contact:

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