



Government of Malawi
Ministry of Health

Training Course on
**INPATIENT
MANAGEMENT OF
SEVERE ACUTE
MALNUTRITION**

**Module 6.
Monitoring, Reporting
and Quality Improvement**



SEPTEMBER 2017



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Preface

The *Malawi Inpatient Management of Severe Acute Malnutrition Training Package* includes training modules, training guides, training aids, training planning tools, and job aids. The training package is based on the 2002 WHO Training Course on the Management of Severe Malnutrition (SAM) and has been updated to include the 2013 WHO update on management of SAM in infants and children. The training package guides participants in applying the National Guidelines for the Community-based Management of Acute Malnutrition (CMAM), 2016.

This *Module* is one of a set of training guides and modules for conducting the *Training Course on Inpatient Management of Severe Acute Malnutrition*:

Guides

Facilitator Guide

Clinical Instructor Guide

Course Director Guide

Modules

Module 1—Introduction

Module 2—Principles of Care

Module 3—Initial Management

Module 4—Feeding

Module 5—Daily Care

Module 6—Monitoring, Problem Solving and Reporting

Module 7—Involving Mothers in Care

Acronyms and Abbreviations

ART	Antiretroviral Therapy
AWG	Average Daily Weight Gain
cm	Centimetre(s)
CMAM	Community-Based Management of Acute Malnutrition
CMV	Combined Mineral and Vitamin Mix
dl	Decilitre(s)
g	Gram(s)
Hg	Haemoglobin
HFA	Height-for-Age
HIV	Human Immunodeficiency Virus
HTS	HIV Testing Services
IGF	Insulin Growth Factor
IM	Intramuscular
IMCI	Integrated Management of Childhood Illness
IU	International Unit(s)
IV	Intravenous
IYCF	Infant and Young Child Feeding
kcal	Kilocalorie(s)
kg	Kilogram(s)
L	Litre(s)
LOS	Length of stay
M&R	Monitoring and Reporting
MAM	Moderate Acute Malnutrition
mg	Milligram(s)
ml	Millilitre(s)
mm	Millimetre(s)
MOH	Ministry of Health
MUAC	Mid-Upper Arm Circumference
NG	Nasogastric
OPD	Outpatient Department
ORS	Oral Rehydration Solution
PCR	Polymerase Chain Reaction
PCV	Packed Cell Volume
PDSA	Plan-Do-Study-Act
QI	Quality Improvement
RDT	Rapid Diagnostic Test

ReSoMal	Rehydration Solution for Malnutrition
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
TB	Tuberculosis
WFH	Weight-for-Height
WFL	Weight-for-Length
WFP	World Food Programme
WHO	World Health Organisation
µg	Microgram(s)

Introduction

Monitoring and reporting (M&R) and quality improvement (QI) focuses on inpatient management of children with severe acute malnutrition (SAM). Well-informed monitoring data identify in a timely manner aspects of managing SAM that need improvement. Appropriate action can then be taken to improve individual care, organisation of care and overall quality of care.

Many types of problems may occur in inpatient management of SAM. There may be problems with an individual patient's progress or care, such as failure to respond to treatment. There may also be problems that affect the entire SAM inpatient care ward, such as problems with staff performance, treatment procedures, therapeutic food preparation, use of equipment or other ward procedures. All of these problems require attention to prevent patient deaths.

This module teaches a process for monitoring, identifying, analysing and solving problems that may occur and reporting—all to support QI of inpatient management of SAM. This process can be used in solving problems with case management of individual patients or problems that may affect the entire performance of the NRU.

Learning Objectives

This module describes and allows you to practise the following skills:

- Using a QI process to identify, analyse and solve problems on individual case management
- Monitoring and solving problems with an individual patient
- Monitoring overall weight gain during rehabilitation
- Monitoring patient outcomes (such as recovery, death, default, non-recovery, and referral/transfer)
- Monitoring case management practices and ward procedures
- M&R of performance on the management of SAM in the Nutrition Rehabilitation Unit (NRU)

1.0 Quality Improvement

QI is the combined and unceasing efforts of everyone involved in family health, including health care providers, patients and their families, to make changes that will lead to better patient outcomes, better system performance and better professional development (Batalden and Davidoff 2007). QI enables health care providers to systematically improve the quality of health care delivery by identifying weaknesses in current practices, analysing the reasons for the weaknesses and developing solutions to improve the current practices.

QI can play an important role in improving many processes that affect **safety, effectiveness, patient centeredness, timeliness, efficiency or equity** within a health care delivery system.

There are four main principles of QI:

1. **Patient focus.** Patients are the focus of QI activities. Services should meet the needs and the expectations of patients and their communities.
2. **Focus on systems and processes.** Health care providers should analyse the systems and processes through which they deliver services to improve them. By understanding how systems and processes work, service providers are better able to analyse gaps and understand causes of poor performance.
3. **Test changes and emphasise the use of data.** Health care providers develop and test changes to improve the way services are provided and to determine whether they yield the desired changes.
4. **Teamwork.** QI is achieved through a team approach to problem solving. A QI team should consist of representatives from every step in a process or system of health care delivery.

1.1 Using Quality Improvement to Identify and Solve Problems in Case Management

Identifying problems

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

- A patient's appetite has not returned.
- A patient has failed to improve after being several days in treatment.
- A mother¹ wants to take her child home before the child has reached the criteria for discharge from hospital.
- A child seems to have an unrecognised infection.

By monitoring overall patient outcomes, case fatality rate and performance indicators, you may identify such problems as:

- The case fatality rate in the SAM ward was 15 percent during the months of June through August.
- Some mothers leave with their children before they are discharged.

¹ The term 'mother' is used throughout this module. It is understood that the person who is responsible for the care of the child might not always be that child's mother, but rather some other caregiver. For the sake of readability, however, 'mother' means 'mother/caregiver' throughout this module, 'she' means 'she or he' and 'her' means 'her or his'.

- A few children on the ward have poor weight gain.

By monitoring case management practices, treatment procedures, therapeutic food preparation, hygiene practices and performance of services, you may identify additional problems, which may in fact be causes of adverse outcomes. For example, you may identify such problems as:

- IV fluids are given routinely by certain clinicians.
- Children are not fed every 2 hours through the night.
- Staff do not consistently wash their hands with soap.
- Cups with leftover milk are not collected and amount of milk feeds are not recorded.



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.

This information should help you develop a clearly defined ‘**quality improvement objective**’ statement to guide your problem solving and improvement efforts. The improvement objective should have the following characteristics:

- A specific **boundary** that defines the scope of the improvement objective
- Specific **numerical goals for outcomes** that are ambitious but achievable
- A **time frame** (how much improvement and by when?)
- **Guidance** on how the aim will be achieved

Example of a Quality Improvement Objective

At Balaka DHO NRU, we will increase the proportion of SAM children tested for HIV from 49 percent to 90 percent between January 2016 and June 2016 by involving HIV testing counsellors to provide HIV testing services (HTS) in the inpatient care daily.



SHORT ANSWER EXERCISE

Read each pair of problem descriptions below. Check 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 SAM ward.
___ b. Four deaths have occurred at night in the past month.
2. ___ a. Tran is not gaining weight during rehabilitation.
___ b. After gaining 10 g/kg/day for 4 days, Tran has stayed the same weight for the last 3 days.
3. ___ a. Dr Perez prescribes a diuretic for severe oedema, but no other clinicians do this.
___ b. Diuretics are sometimes prescribed for oedema.
4. ___ a. Weight gain of some children during rehabilitation in the SAM ward is poor.
___ b. Weight gain during rehabilitation is poor for most children who are taking F-100.
5. ___ a. Carla's appetite has returned, is in transition and has not yet been offered ready-to-use therapeutic food (RUTF).
___ b. For the last 3 days, Carla has been drinking F-100 well in transition, but is not yet eating RUTF.

Compare your answers to this exercise to answers given on page 82 at the end of the module.

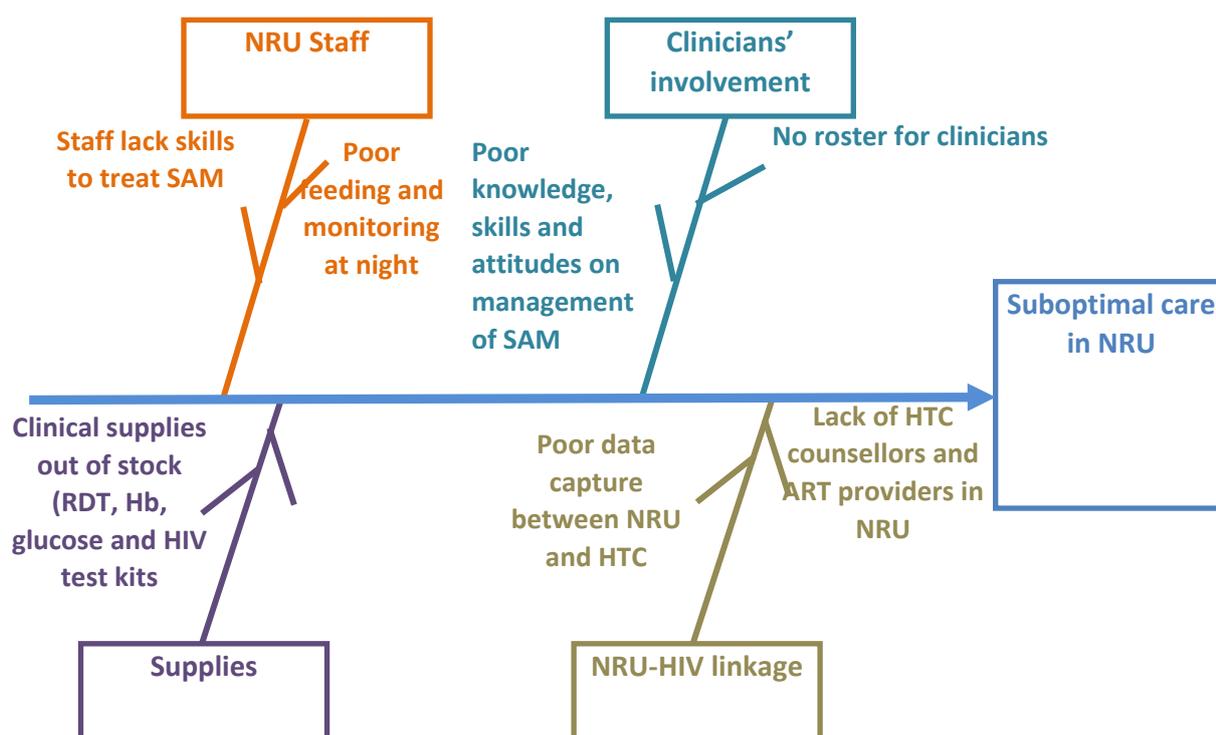
Investigating and analysing causes of problems

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

Investigating causes may mean doing laboratory tests for a patient, observing and asking questions of staff, reviewing Treatment Cards, treatment procedures and/or monitoring food preparation. You could use a checklist of treatment and ward procedures that will assist you in identifying the problem and the cause of the problem. **Annex A and B** give examples of checklists that can be used.



A team of health care providers' works together to discover the root cause of the problem and its effects. This means analysing the systems and processes that are used in providing care to children with SAM. Analysing available inpatient care data can give important information on the problem that needs to be addressed. A cause-and-effect analysis using a fishbone diagram can help in identifying and documenting all the potential causes of problems that need to be addressed (see **figure below**).



Determining solutions or changes to be made

Solutions will depend on the cause(s) of a problem. For example, if staff does not know how to do a new treatment 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)
- Not create another problem

Example of a problem-solving process

Problem: Average length of stay (LOS) in stabilisation is much longer than it was several months ago. Most children stay longer than 1 week on F-75, while before the typical length of stabilisation was 2–7 days. The senior nurse decides to investigate by monitoring treatment procedures and therapeutic food preparation. Below are some possible causes that she might find, along with an appropriate solution for each.

Possible Causes	Possible Solutions
The type of F-75 milk available for making feeds has changed, and the recipes have not been adjusted correctly.	Adjust the feed recipes correctly to use the milk that is available. Post the new recipes and teach them to staff.
Staff added too much water when making the F-100 Diluted recipe.	Explain the recipe to staff. Be sure that 675 ml is measured correctly to be added to the F-100 powder package. Demonstrate how to prepare the milk.
Measuring scoops have been lost, and staff are estimating amounts of ingredients for preparing the F-75 milk feeds.	Obtain new scoops.
There are more children in the SAM 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 finding the cause of a problem, one can avoid wasting money and time on the wrong solutions.





Implementing change ideas (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 in the SAM ward). Good communication with staff is important whenever any change is made.

Promoting good communication when solving problems

Good communication among staff is very important in treating patients effectively. The following will help promote good communication:

- Hold regular staff meetings, during which positive feedback is given and any problems, causes and solutions are discussed.
- Involve staff in QI: identifying and solving problems.
- Provide staff with job descriptions that list their assigned tasks.
- Give clear instructions whenever any change is made, and share the new knowledge that lead to this change.
- Provide 'job aids', such as checklists or posted instructions, for any complex tasks.

Follow up to find out whether a solution is carried out as intended. Then continue to monitor to determine whether the problem is solved. Give feedback to staff that includes praise for work done well, along with any instructions for QI.

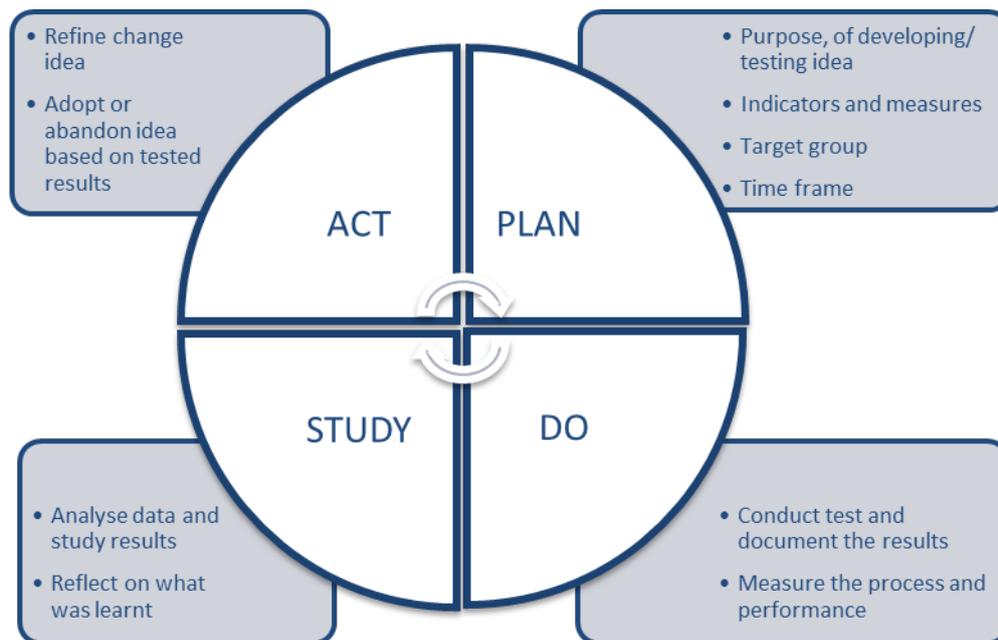
The quality improvement model relies on an ongoing process of developing and conducting small tests of change using the plan-do-study-act (PDSA) cycle shown in the **figure below**. This approach allows teams to introduce a change to see if it helps lead to improvement before carrying out the change at a large scale.

A PDSA cycle can build knowledge for further testing, show the benefits of new ideas, and be used to engage staff. Small tests of change may help uncover the undesirable effects of changes, allowing QI teams to adjust or abandon a change idea that has unintended results.

To find out whether changes made are leading to actual improvement, information and data on the impact of changes need to be collected, analysed and reported on. This includes both **process** and **outcome** measurements. Information/data collected should be on a small sample of sites or beneficiaries, and results should be plotted on time series charts.

We will discuss later in this module the monitoring and reporting indicators and forms used in the inpatient care for the management of SAM.

The PDSA Cycle



Annex B gives an example summarising a QI checklist that can be used to identify problems. The checklist follows the standard steps involved in the care process of a SAM child.

For each activity in each step of the care process, ask yourself important questions such as:

- ‘Do we routinely do this now?’ If yes, put a check under ‘Current Status’. If no, write in what you do now.
- Is action taken after carrying out the step in the care process?
- Is there a flow or process in place on how to do the steps in care process?
- Is there a team of health care providers to oversee the way activities are carried out?
- Are data and information documented on the process and outcomes?
- Are the data used to continuously improve the patient care and ward procedures?
- After identifying the problem, ask yourself, what must we do to start this activity?’ Consider all the actions that are needed to introduce each change and write them in.
- Who will take responsibility for seeing that these actions are carried out? And by when?
- What new resources will we need?
- Who will take responsibility for getting these resources? And by when?

Note that this section only gives a summary of the quality improvement process, a detailed 3–4 days of training in planning and implementation of QI should be organised for inpatient care facilities that have a high mortality rate (above 10 percent). For details, refer to the Inpatient Care Quality Improvement Training Manual.

2.0 Monitoring and Solving Problems of an Individual Patient

2.1 Monitoring Individual Patient Progress and Care

Nursing staff should monitor certain vital 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 **Module 3. Initial Management**, and **Module 5. Daily Care**. Otherwise, simply record information on the Monitoring Record of the Treatment Card, where a clinician can review it during rounds.

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

- Observe every child and question the mother and nurse:
 - Is the 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's weight during stabilisation stable?
 - If there is weight loss, is it due to decreasing oedema?
- Review the Daily Care and 24-Hour Food Intake Charts:
 - Is the child getting the recommended feeds?
 - Is prescribed care (such as antibiotics) being given?
 - Are there any danger signs recorded: increased pulse rate, respiratory rate or sudden changes in temperature?

During transition and rehabilitation (for those who remain in the NRU until full recovery), the clinician should calculate the child's weight gain in g/kg/day, after the child has taken F-100, and judge whether weight gain is sufficient.

Daily Weight Gain during Transition
Good weight gain: 5 g/kg/day.
Excess weight gain is not a good sign.
Daily Weight Gain during Rehabilitation
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

Note: Daily weight gain is not calculated for children during stabilisation when on the F-75 diet, because weight gain is not indicated during this phase when their condition is stabilising.

To calculate daily weight gain during transition and rehabilitation:

- a. Subtract the child's weight yesterday (W1) from the child's weight today (W2).

Express the difference as grams (g) ($\text{kg} \times 1,000$). This is the total amount of weight gained during the day.

$$W2 - W1 = \text{___ kg} \quad \text{___ kg} \times 1,000 = \text{___ g gained}$$

- b. Divide the grams gained 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.

Daily weight gain is an indicator for *individual quality of care* during transition and rehabilitation. Remember that this calculation will be most useful if the child is weighed at about the same time each day.

Example

Khama began taking F-100 on day 4. By day 6, he began to gain weight. On day 6, Khama weighed 7.32 kg. On day 7, he weighed 7.4 kg. His weight gain in g/kg/day on day 7 can be calculated as follows:

- a. $7.4 \text{ kg} - 7.32 \text{ kg} = 0.08 \text{ kg}$ $0.08 \text{ kg} \times 1,000 = 80 \text{ g gained}$
b. $80 \text{ g} \div 7.32 = 10.9 \text{ g/kg/day}$

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

To calculate average daily weight gain during the entire treatment period:

- a. Subtract the child's starting weight (W0) from the child's weight at the end of treatment (Wn).

$$Wn - W0 = \text{___ kg} \quad \text{___ kg} \times 1,000 = \text{___ g gained}$$

Divide the grams gained by the child's starting weight. The result is the weight gain in g/kg/day.

$$\text{Weight gain in grams} \div W0 = \text{___ g/kg/day}$$

Average weight gain is an indicator for *overall quality of care*. Average weight gain for oedematous children is presented separately from wasted children. For oedema cases the starting weight (W0) is when there is no more oedema, or their lowest weight. You can also calculate the *average weight gain of children in rehabilitation during a 1-week period*, see **section 2.5 below**.

2.2 Identifying the Child Who Is Failing to Respond

A child is failing to respond if he or she:

- Does not improve initially (during stabilisation), *or*
- Gains weight but then levels off or deteriorates (during transition of rehabilitation)

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

Criteria	Approximate time after admission
Failure to regain appetite	4–7 days
Failure to start to lose oedema	4–7 days
Oedema still present	10 days
Static weight or failure to gain weight at least 5 g/kg/day for 3 successive days	During rehabilitation

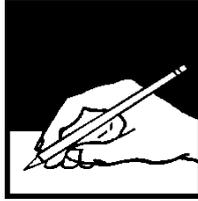


SHORT ANSWER EXERCISE

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

1. Mphatso 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. Chisomo 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. Chalo 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 Chalo lost weight, the answer will be negative.*)

Compare your answers to this exercise to answers given at the end of the module.



Exercise A

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

Case 1 – Neli

Neli was admitted to the NRU 5 days ago with moderate oedema, a mid-upper arm circumference (MUAC) reading of 112 mm and a weight-for-height (WFH) z-score < -3 . Parts of her Treatment Card and her 24-Hour Food Intake Chart for day 5 are provided on the next three pages. Neli's pulse rate has remained at about 90 over the 5 days, and her breathing rate has remained at about 35.

Study the information about Neli and answer the questions below.

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

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

CHILD NAME: Neli M/F AGE: 16 Months HOSPITAL NUMBER: Date: Time: 8:30



INITIAL MANAGEMENT CHART

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

SIGNS OF SAM Severe wasting? Yes No Bilateral Pitting Oedema? 0 + <u>++</u> +++ Dermatitis? 0 <u>+</u> ++ +++ (raw skin, fissures) Weight: <u>6.6</u> kg Height / length: <u>73</u> cm WFH: <u>5-3</u> z-score MUAC: <u>112</u> mm TEMPERATURE: <u>36.0</u> °C axillary / rectal Cover child. If axillary <35° C or rectal <35.5° C, actively warm child. Check temperature every 30 min.		SIGNS OF SHOCK <u>None</u> Lethargic/unconscious Cold hands Slow capillary refill (> 3 seconds) Weak or fast pulse If lethargic or unconscious, cold hands, plus either slow capillary refill or weak or fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids: Amounts IV fluids per hour: 15 ml X _____ kg (child's wt.) = _____ ml																																																																																	
BLOOD GLUCOSE (<3 mmol/l or <54 mg/dl): <u>2</u> (If no test, treat for hypoglycaemia.) If alert, give 10% glucose 50 ml (Infant 25 ml) orally or by NG. If lethargic/unconscious, give sterile 10% glucose 5 ml/kg IV, then 50 ml (25 ml infant) by NG. Amount IV: 5 ml x _____ kg (child's weight) = _____ ml. Amount oral: <u>50</u> ml Time glucose given: <u>9:00</u> H Route: Oral NG IV		<table border="1"> <thead> <tr> <th>Time</th> <th>1st hr</th> <th>Start</th> <th>Monitor every 10 minutes</th> <th>2nd hr</th> <th>Monitor every 10 minutes</th> </tr> </thead> <tbody> <tr> <td>Respiratory rate</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pulse rate</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Time	1 st hr	Start	Monitor every 10 minutes	2 nd hr	Monitor every 10 minutes	Respiratory rate						Pulse rate																																																																			
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HAEMOGLOBIN (Hb): <u>9</u> g/dl (or PCV: _____ %) Blood type: _____ If Hb <4 g/dl (or Hb 4-6 g/dl AND respiratory distress), transfuse 10 ml/kg whole fresh blood slowly over 3 hours (or 7 ml/kg packed cells in case of suspected heart failure). Amount: _____ Time started: _____ H Ended: _____ H		SIGNS OF DEHYDRATION: Watery diarrhoea? Yes No Blood in stool? Yes No Vomiting? Yes No Number of days with diarrhoea: _____ If diarrhoea, circle signs present: Restless/irritable Lethargic Recent sunken eyes Dry mouth/tongue Thirsty No tears																																																																																	
EYE SIGNS: None Left Right MEASLES: Yes No Bitot's spots: <u>Corneal clouding</u> Corneal ulceration Pus or <u>Inflammation</u> If eye signs (Bitot's spots, corneal clouding and corneal ulceration) or measles, give vitamin A treatment dose and atropine immediately. Record vitamin A in box below, and on Daily Care Chart.		If diarrhoea and/or vomiting, give ReSoMal orally (or by NG tube if too ill) every 30 minutes for first 2 hours and monitor ***. Amount: 5 ml x <u>6.6</u> kg (child's weight) = <u>33</u> ml ReSoMal For up to 10 hours, give ReSoMal and F-75 orally (or by NG tube) in alternate hours and monitor every hour ***. Amount: 5-10 ml x <u>6.6</u> kg (child's weight) = <u>33</u> to <u>66</u> ml ReSoMal every 2 hours																																																																																	
VITAMIN A: If eye signs or recent measles, give treatment dose on day 1, 2, and 14. Time first dose: <u>9:00</u> (Do not give vitamin A if the child does not have eye signs.)		<table border="1"> <thead> <tr> <th>Time</th> <th>Start</th> <th>9:00</th> <th>9:30</th> <th>10:00</th> <th>10:30</th> <th>11:00</th> <th>12:00</th> <th>13:00</th> <th>14:00</th> </tr> </thead> <tbody> <tr> <td>Respiratory rate* (breaths/minute)</td> <td></td> <td>38</td> <td>36</td> <td>36</td> <td>35</td> <td>35</td> <td>35</td> <td>35</td> <td>35</td> </tr> <tr> <td>Pulse rate* (beats/minute)</td> <td></td> <td>110</td> <td>100</td> <td>100</td> <td>90</td> <td>90</td> <td>90</td> <td>90</td> <td>90</td> </tr> <tr> <td>Passed urine (YES/NO)</td> <td></td> <td>-</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> </tr> <tr> <td>Number of stools</td> <td></td> <td>-</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>Number of vomits</td> <td></td> <td>-</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Hydration signs (Yes/No)**</td> <td></td> <td>-</td> <td>same</td> <td>moist mouth</td> <td></td> <td></td> <td></td> <td>moist eyes</td> <td>moist eyes + mouth</td> </tr> <tr> <td>Amount ReSoMal taken (ml)</td> <td></td> <td>33</td> <td>33</td> <td>33</td> <td>33</td> <td>45</td> <td>F-75 75</td> <td>F-75 75</td> <td>F-75</td> </tr> </tbody> </table>		Time	Start	9:00	9:30	10:00	10:30	11:00	12:00	13:00	14:00	Respiratory rate* (breaths/minute)		38	36	36	35	35	35	35	35	Pulse rate* (beats/minute)		110	100	100	90	90	90	90	90	Passed urine (YES/NO)		-	N	N	N	N	N	N	N	Number of stools		-	1	1	0	0	0	1	0	Number of vomits		-	0	0	0	0	0	0	0	Hydration signs (Yes/No)**		-	same	moist mouth				moist eyes	moist eyes + mouth	Amount ReSoMal taken (ml)		33	33	33	33	45	F-75 75	F-75 75	F-75
Time	Start	9:00	9:30	10:00	10:30	11:00	12:00	13:00	14:00																																																																										
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Passed urine (YES/NO)		-	N	N	N	N	N	N	N																																																																										
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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: <u>75</u> ml of F-75* Time first fed: <u>09:00</u> Record all feeds on 24-Hour Food Intake Chart. * If hypoglycaemic, feed ¼ of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/L or 54 mg/dl		ANTIBIOTICS: Prescription/Route Dose/Frequency/Duration Time of 1 st Dose <u>Gentamicin IV 50 mg 1x/day 7/7 9:00</u> <u>Benzyll penicillin IV 330,000 4x/day 2/7 9:00</u>																																																																																	
MALARIA TEST (Type/Date/Outcome): HTS Date: / / Outcome: NR R Exposed DNA PCR: Positive Negative Not done N/A Date started cotrimoxazole: / / Date started ART: / /																																																																																			

CHILD NAME: Neli M/F AGE: 16 Months HOSPITAL NUMBER: Date: Time: 8:30

DAILY CARE CHART

DAYS IN HOSPITAL	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
Date	22/8	23/8	24/8	25/8	26/8																
Daily weight (kg)	6.6	6.4	6.4	6.4	6.5																
Weight gain (g/kg) <i>Calculate when on RUTF/F-100 and breastfed infant</i>	-	-	-	-	-																
Bilateral pitting oedema 0 + + + +	++	++	++	++	++																
Diarrhoea (Write number of loose stools)	0	0	0	0	0																
Vomiting (write the frequency)	-	-	-	-	-																
RESOMAL.....mls	33-66	50	50	-	-																
FEED PLAN: Type of feed	F75	F75	F75	F75	F75																
# daily feeds	10	12	12	8	8																
Amount to give per feed (ml)(packet)	75	75	75	110	110																
Total amount taken (ml)(packet)	700	700	800	700	610																
NG tube Yes/No	No	No	No	No	No																
Breastfeeding Yes/No	Yes	Yes	Yes	Yes	Yes																
ANTIBIOTICS AND OTHER DRUGS	<i>List prescribed antibiotics and other drugs in left column. Allow one row for each daily dose. Draw a box around days/times that each drug should be given. Sign when given.</i>																				
1. Benzyl penicillin 300,000 IU IV 4x/day 2/7	9:00	MC	MC																		
	15:00	MC	MC																		
	21:00	PK	PK																		
	03:00	PK	PK																		
2. Gentamicin 50mg IV bx 7/7	9:00	MC	MC	MC	MC	MC															
3. Amoxyl 125 mg PO 3x 5/7	9:00			MC	MC	MC															
	13:00			AD	PB	PB															
	01:00			AD	PB	PB															
ANTIMALARIAL:																					
VITAMIN A treatment dose on days 1, 2, and 14	13:00	MC	MC																		
Albendazole/Mebendazole. Give after 1 week.																					
IRON Give 3 mg/kg/day, 2 x daily, after 2 days starting to gain weight during transition. Do not give when on RUTF.																					
Crush 200 mg ferrous sulphate in 2-2.4 L F-100 or F-100 Diluted. Do not give iron if child is on RUTF.																					
EYE INFECTIONS	9:00	MC	MC	MC	MC	MC															
Tetracycline ointment 3x daily or Chloramphenicol 1 drop 4x daily	15:00	MC	MC	MC	MC	PB															
	21:00	PK	PK	AD	PB	PB															
	08:00	PK	PK	AD	PB	PB															
Corneal ulceration: As above, plus Atropine 1 drop 3 x daily																					
		None																			
Ear, mouth, or throat problems		None																			
Dermatosis 0 + + + +		+	+	+	+	+															
Bathing, 1% potassium permanganate or zinc oxide																					

Case 2 – Limbani

The boy Limbani was admitted to the NRU 10 days ago with mild oedema (both feet), dysentery, signs of dehydration, a fever, a weight of 7.8 kg, a MUAC reading of 112 mm and a WFH z-score < -3. Limbani was given intravenous (IV) benzylpenicillin for 2 days followed by oral amoxicillin for 5 days, and gentamicin for 7 days. After 5 days, his dysentery was gone, but he was still sickly and had a fever. He also had a deep, persistent cough and some difficulty breathing. The clinician suspected possible pneumonia and decided to give ceftriaxone, which has been given for the next 5 days.

Study parts of Limbani's Treatment Card 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 Limbani's weight gain in g/kg/day from day 10 to day 11?

(Enter this on his Treatment Card.)

2b. Is Limbani 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.

CHILD NAME: Limhani M/F AGE: 24 Months HOSPITAL NUMBER: _____ Date: _____ Time: 8:30



INITIAL MANAGEMENT CHART

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

SIGNS OF SAM Severe wasting? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Bilateral Pitting Oedema? 0 <input checked="" type="checkbox"/> ++ <input type="checkbox"/> +++ Dermatitis? 0 <input checked="" type="checkbox"/> ++ <input type="checkbox"/> +++ (raw skin, fissures) Weight: <u>7.8</u> kg Height / length: <u>77</u> cm WFH: <u>-3</u> z-score MUAC: <u>112</u> mm		SIGNS OF SHOCK: None Lethargic/unconscious Cold hands Slow capillary refill (> 3 seconds) Weak or fast pulse If lethargic or unconscious, cold hands, plus either slow capillary refill or weak or fast pulse, give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids: Amounts IV fluids per hour: 15 ml X _____ kg (child's wt.) = _____ ml																																																																																									
TEMPERATURE: <u>39.0</u> °C axillary / rectal Cover child. If axillary <35° C or rectal <35.5° C, actively warm child. Check temperature every 30 min.		<table border="1"> <thead> <tr> <th>1st hr</th> <th>Start</th> <th>Monitor every 10 minutes</th> <th>2nd hr</th> <th>Monitor every 10 minutes</th> </tr> </thead> <tbody> <tr> <td>Time</td> <td></td> <td></td> <td>*</td> <td></td> </tr> <tr> <td>Respiratory rate</td> <td></td> <td></td> <td>*</td> <td></td> </tr> <tr> <td>Pulse rate</td> <td></td> <td></td> <td>*</td> <td></td> </tr> </tbody> </table>		1 st hr	Start	Monitor every 10 minutes	2 nd hr	Monitor every 10 minutes	Time			*		Respiratory rate			*		Pulse rate			*																																																																					
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Time			*																																																																																								
Respiratory rate			*																																																																																								
Pulse rate			*																																																																																								
BLOOD GLUCOSE (<3 mmol/L or <54 mg/dl): _____ (If no test, treat for hypoglycaemia.) If alert, give 10% glucose 50 ml (infant 25 ml) orally or by NG. If lethargic/unconscious, give sterile 10% glucose 5 ml/kg IV, then 50 ml (25 ml infant) by NG. Amount IV: 5 ml x _____ kg (child's weight) = _____ ml. Amount oral: _____ ml Time glucose given: _____ H Route: Oral NG IV		*If improvements after 1 hour (respiratory and pulse rates are slower), repeat same amount IV fluids for second hour; then alternate ReSoMal and F-75 for up to 10 hours. If no improvement after 1 hour, treat for septic shock (transfuse whole fresh blood, see 'Haemoglobin'), give maintenance IV fluids (4 ml/kg/hour) while waiting for blood.																																																																																									
HAEMOGLOBIN (Hb): _____ g/dl (or PCV: _____ %) Blood type: _____ If Hb <4 g/dl (or Hb 4-6 g/dl AND respiratory distress), transfuse 10 ml/kg whole fresh blood slowly over 3 hours (or 7 ml/kg packed cells in case of suspected heart failure). Amount: _____ Time started: _____ H Ended: _____ H		SIGNS OF DEHYDRATION: Watery diarrhoea? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Blood in stool? <input type="checkbox"/> Yes <input type="checkbox"/> No Vomiting? <input type="checkbox"/> Yes <input type="checkbox"/> No Number of days with diarrhoea: _____ If diarrhoea, circle signs present: Restless/irritable <input checked="" type="checkbox"/> Lethargic <input type="checkbox"/> Recent sunken eyes <input checked="" type="checkbox"/> Dry mouth/tongue <input checked="" type="checkbox"/> Thirsty <input type="checkbox"/> No tears <input checked="" type="checkbox"/>																																																																																									
EYE SIGNS: None <input checked="" type="checkbox"/> Left <input type="checkbox"/> Right <input type="checkbox"/> MEASLES: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Bitot's spots, Corneal clouding, Corneal ulceration Pus or Inflammation If eye signs (Bitot's spots, corneal clouding and corneal ulceration) or measles, give vitamin A treatment dose and atropine immediately. Record vitamin A in box below, and on Daily Care Chart.		For up to 10 hours, give ReSoMal and F-75 orally (or by NG tube) in alternate hours and monitor every hour***. Amount: 5-10 ml x <u>7.8</u> kg (child's weight) = <u>39</u> to <u>78</u> ml ReSoMal every 2 hours																																																																																									
VITAMIN A: If eye signs or recent measles, give treatment dose on day 1, 2, and 14. Time first dose: _____ (Do not give vitamin A if the child does not have eye signs.)		<table border="1"> <thead> <tr> <th>Time</th> <th>Start</th> <th>8:30</th> <th>9:00</th> <th>9:30</th> <th>10:00</th> <th>10:30</th> <th>11:00</th> <th>11:30</th> <th>12:00</th> <th>13:00</th> </tr> </thead> <tbody> <tr> <td>Respiratory rate* (breaths/minute)</td> <td></td> <td>30</td> <td>30</td> <td>30</td> <td>30</td> <td>30</td> <td>30</td> <td>30</td> <td>30</td> <td></td> </tr> <tr> <td>Pulse rate* (beats/minute)</td> <td></td> <td>95</td> <td>95</td> <td>95</td> <td>95</td> <td>95</td> <td>95</td> <td>95</td> <td>95</td> <td></td> </tr> <tr> <td>Passed urine (YES/NO)</td> <td></td> <td></td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td>N</td> <td></td> </tr> <tr> <td>Number of stools</td> <td></td> <td></td> <td>2</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td></td> </tr> <tr> <td>Number of vomits</td> <td></td> <td></td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td> </tr> <tr> <td>Hydration signs (Yes/No)**</td> <td></td> <td></td> <td>same</td> <td>same</td> <td>same</td> <td>moist mouth</td> <td>mm</td> <td>tears</td> <td>mm</td> <td></td> </tr> <tr> <td>Amount ReSoMal taken (ml)</td> <td></td> <td></td> <td>39</td> <td>39</td> <td>39</td> <td>39</td> <td>74</td> <td>F-75</td> <td>79</td> <td>F-75</td> </tr> </tbody> </table>		Time	Start	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	13:00	Respiratory rate* (breaths/minute)		30	30	30	30	30	30	30	30		Pulse rate* (beats/minute)		95	95	95	95	95	95	95	95		Passed urine (YES/NO)			N	N	N	N	N	N	N		Number of stools			2	1	0	1	1	0	1		Number of vomits			1	1	0	0	0	0	0		Hydration signs (Yes/No)**			same	same	same	moist mouth	mm	tears	mm		Amount ReSoMal taken (ml)			39	39	39	39	74	F-75	79	F-75
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Pulse rate* (beats/minute)		95	95	95	95	95	95	95	95																																																																																		
Passed urine (YES/NO)			N	N	N	N	N	N	N																																																																																		
Number of stools			2	1	0	1	1	0	1																																																																																		
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Amount ReSoMal taken (ml)			39	39	39	39	74	F-75	79	F-75																																																																																	
FEEDING: Begin feeding with F-75 as soon as possible. If child is rehydrated, reweigh before determining amount to feed. New weight: <u>8.0</u> kg. Amount for 2-hourly feedings: <u>90</u> ml of F-75* Time first fed: <u>11:00</u> Record all feeds on 24-Hour Food Intake Chart. * If hypoglycaemic, feed ¼ of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/L or 54 mg/dl		*Stop ReSoMal if any sign of over-hydration: Fast breathing, increasing pulse and resp. rates, engorging jugular veins, puffing of eyelids. ** Stop ReSoMal if two or more signs of hydration: Passing urine, moist tongue, making saliva, not thirsty.																																																																																									
ANTIBIOTICS: Prescription/Route <u>Benzylpenicillin IV</u> <u>Gentamicin IV</u>		Dose/Frequency/Duration <u>400,000 IU 4x 2/7</u> <u>60 mg 1x 7/7</u>																																																																																									
MALARIA TEST (Type/Date/Outcome): _____		Time of 1 st Dose <u>9:00</u> <u>9:00</u>																																																																																									
HTS Date: ___/___/___ Outcome: NR R Exposed DNA PCR: Positive Negative Not done N/A Date started cotrimoxazole: ___/___/___ Date started ART: ___/___/___																																																																																											

CHILD NAME: Limbari M/F AGE: 24 Months HOSPITAL NUMBER: Date: Time: 8:30

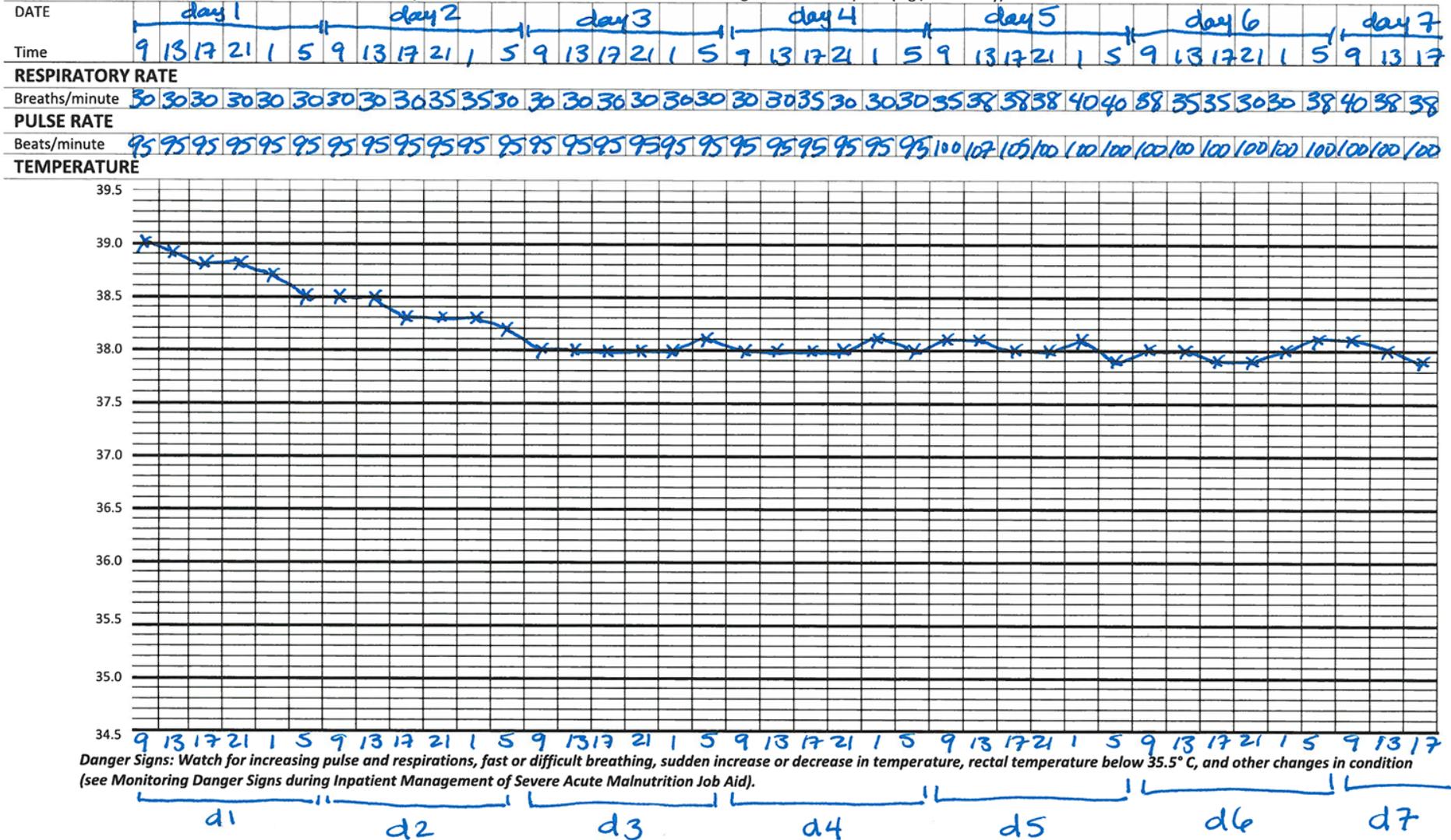
DAILY CARE CHART

DAYS IN HOSPITAL	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
Date	15/8	16/8	17/8	18/8	19/8	20/8	21/8	22/8	23/8	24/8	25/8										
Daily weight (kg)	8.0	8.0	8.0	8.0	7.9	7.9	8.0	8.0	8.0	8.0	8.0										
Weight gain (g/kg) <i>Calculate when on RUTF/F-100 and breastfed infant</i>	-	-	-	-	-	0	0	0	0	0	0										
Bilateral pitting oedema 0 + ++ +++	+	+	+	0	0	0	0	0	0	0	0										
Diarrhoea (Write number of loose stools)	0	0	0	-	-	-	-	-	-	-	-										
Vomiting (write the frequency)	-	-	-	-	-	-	-	-	-	-	-										
RESOMAL.....mls	45	50	50	-	-	-	-	-	-	-	-										
FEED PLAN: Type of feed	F75	F75	F75	F75	F100	F100	F100	F100	F100	F100	F100										
# daily feeds	10	12	8	6	6	6	6	6	6	6	6										
Amount to give per feed (ml)(packet)	90	90	130	175	175	175	200	200	200	200	200										
Total amount taken (ml)(packet)	870	1040	1040	1040	1040	1040	1200	1200	1200	1340											
NG tube Yes/No	N	N	N	N	N	N	N	N	N	N	N										
Breastfeeding Yes/No	N	N	N	N	N	N	N	N	N	N	N										
ANTIBIOTICS AND OTHER DRUGS	<i>List prescribed antibiotics and other drugs in left column. Allow one row for each daily dose. Draw a box around days/times that each drug should be given. Sign when given.</i>																				
1. Benzyl penicillin 400,000 IV 4x day 2/7	9:00	MC	MC	MC	MC																
	15:00	MC	MC																		
	21:00	NK	NK																		
	03:00	NK	NK																		
2. Gentamicin 60mg IV 3/7	9:00	MC	MC	MC	MC																
3. Amoxicillin 125mg PO 3x 5/7	9:00			MC	MC	MC	MC	MC	MC	MC	MC										
	17:00			PU	PU	KP	KP	OT													
	01:00			PU	PU	KP	KP	OT													
ANTIMALARIAL:																					
VITAMIN A treatment dose on days 1, 2, and 14	none																				
Albendazole/Mebendazole. Give after 1 week.									SP	SP	SP										
IRON Give 3 mg/kg/day, 2 x daily, after 2 days starting to gain weight during transition. Do not give when on RUTF.	Crush 200 mg ferrous sulphate in 2-2.4 L F-100 or F-100 Diluted. Do not give iron if child is on RUTF.																				
EYE INFECTIONS Tetracycline ointment 3x daily or Chloramphenicol 1 drop 4x daily																					
Corneal ulceration: As above, plus Atropine 1 drop 3 x daily																					
Ear, mouth, or throat problems																					
Dermatosis 0 + ++ +++																					
Bathing, 1% potassium permanganate or zinc oxide																					

CHILD NAME: Limhani (M/F) AGE: 24 Months HOSPITAL NUMBER: Date: Time: 8:30

MONITORING CHART

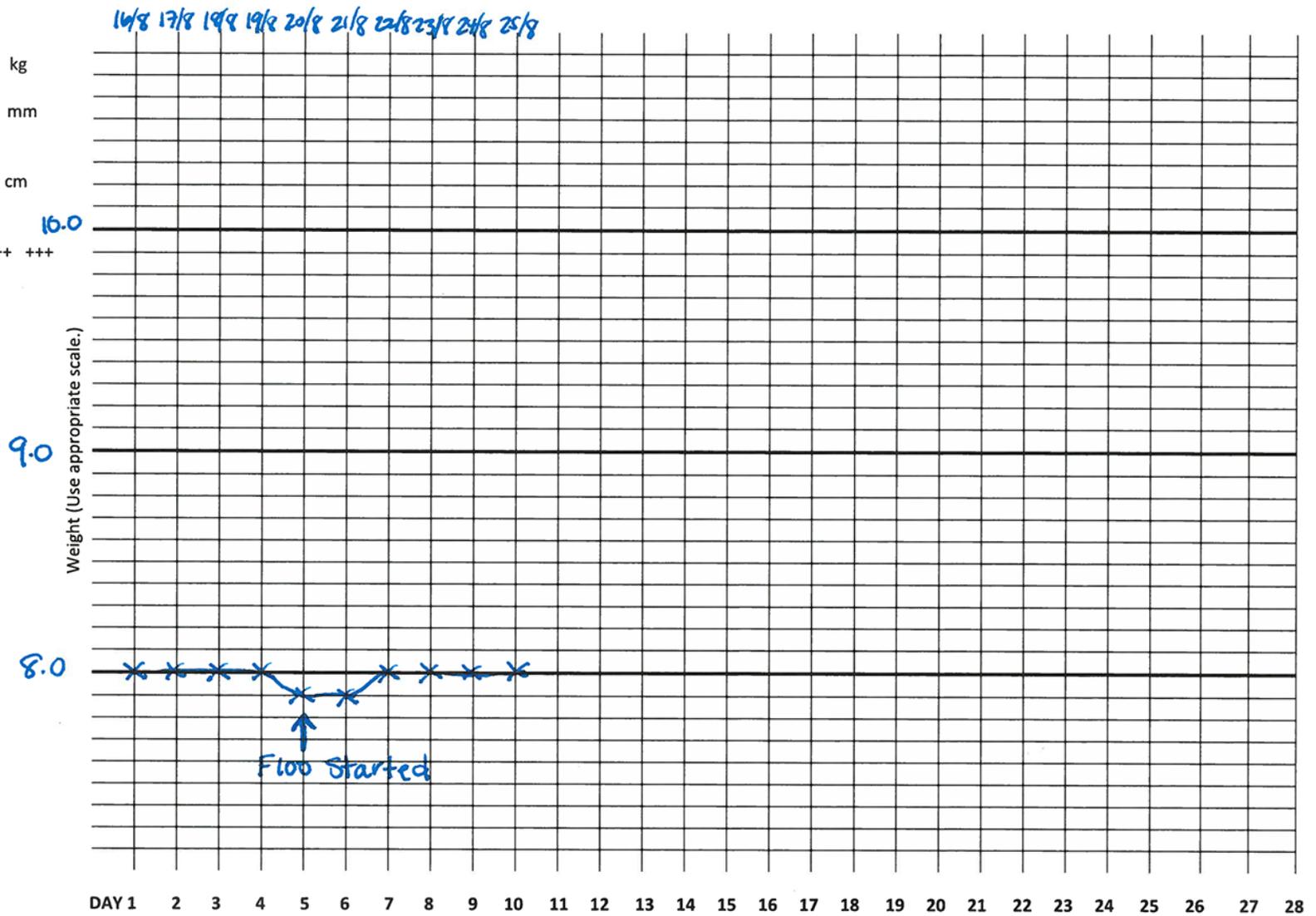
Monitor respiratory rate, pulse rate, and temperature every 4 hours until after stabilisation. Then monitoring can be less frequent (e.g., twice daily).



CHILD NAME: Limbani M/F AGE: 16 Months HOSPITAL NUMBER: Date: Time: 8:30

WEIGHT CHART

Weight on admission: 8.0 kg
 MUAC on admission: 112 mm
 Height/length on admission: 77 cm
 Bilateral pitting oedema on admission: 0 ++ +++



CHILD NAME: Limhani M/F AGE: 16 Months HOSPITAL NUMBER: Date: Time:

24-HOUR FOOD INTAKE CHART

Complete one chart for every 24-hour period during stabilisation and transition.

Starting weight (kg): 8.0 Today's weight (kg): 8.0 Oedema: 0 ++ +++ DATE: 24 August 2016

TYPE OF FEED (circle): F-75 F-100 Infant Formula or F-100-Diluted RUTF									
FEEDS	GIVE <u>6</u> milk feeds of <u>200</u> ml, or _____ ml per day (X)					GIVE _____ RUTF feeds of about _____ packet, or _____ packets per day (Y)			
Time	a. Amount of milk offered (ml)	b. Amount of milk left in cup (ml)	c. Amount milk taken orally (ml) (a – b)	d. Amount of milk taken by NG tube if needed (ml)	e. Estimated amount of milk vomited (ml)	f. Estimated amount of RUTF taken (proportion of packet)	g. Amount of milk offered to complete the RUTF feed (ml) (20 g RUTF or 2 teaspoons = 135 ml F-75 or 100 ml F-100)	i. Passed loose stools (Yes/No)	j. Comments (e.g if vomited feeds were replaced, etc)
8:00	200	0	200						
12:00	210	0	210						
16:00	220	0	220						
20:00	230	0	230						
00:00	240	0	240						
04:00	250	10	240						
TOTALS			C. <u>1340</u>	D.	E.	F.	G.		
24-HOUR INTAKE	Total daily amount of milk taken (H)= (C) + (D) – (E) = _____ ml					Estimated proportion of daily amount of RUTF taken (F/Y): _____ %			
	Estimated proportion of daily amount of milk taken (H/X): _____ %								

2.3 Determining Cause(s) of Failure to Respond

The causes of a child's failure to respond may be related to treatment procedures, skills of staff, equipment or the environment throughout the hospitalisation or they may be related only to the individual child. If many children are failing to respond, look for causes that affect the entire SAM ward, such as incorrect feeding practices or poor hygiene practices; these types of causes are discussed in section 5.0.

If your investigation is focused on one child, consider such possible causes as the following:

- Insufficient therapeutic food given
 - 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?
 - Has the feeding plan been adjusted as the child gains weight?
 - Has the preparation and the quality of the therapeutic milk been checked?
- Vitamin or vitamin deficiency
 - Is mineral mix added to the child's food each time?
 - Is an appropriate multivitamin given (in case feeds are locally prepared using F-75 or F-100 recipes)?
- Insufficient attention given to child
 - Do staff pay less attention to this child for some reason (for example, because they believe he or she is 'beyond help')?
 - Is the mother present to assist in feeding and care practices 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?
- Unrecognised infection. Infections most commonly overlooked include pneumonia, urinary tract infection, ear infection and tuberculosis (TB). Others include malaria, dengue, viral hepatitis B and HIV infection. See Module 3. Initial Management Annex C Management of common medical conditions in SAM, 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 and address all of the causes.

2.4 Identifying and Implementing Solutions for the Individual Child

In some cases, the cause of a problem may require a specific medical solution. If the child is not responding to treatment and/or shows signs of illness, a clinician will need to do a full assessment, make a correct diagnosis, and prescribe the appropriate treatment.

📖 Optional reading for clinicians:
Those who are interested in infections can read the sections on management of common medical conditions, Module 3, Annex C.

In many cases, the solution to a problem may seem apparent through ‘common sense’. For example, if a child is not being fed according to schedule, he or she must be fed according to schedule. 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.

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

Example of a problem with root causes

Problem: A child becomes hypoglycaemic during her first night in inpatient care.



One cause: She was not fed at 2:00 and 4:00.



Root cause: The child’s mother was too tired to wake up and feed her.



Root cause: There are not enough night staff, so mothers are expected to feed the children at night.

Root cause: There is no quiet time or place for mothers to rest during the day.

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 Neli and Limbani, two cases presented previously in Exercise A.

Case 1 – Neli

You remember that Neli was failing to respond on day 5. She had not lost her oedema and was not eating well. She had not progressed to RUTF or F-100. You may wish to review the information about Neli on [pages 14–16](#).

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

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

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

1c. While observing feeding in inpatient care, the senior nurse found that the staff paid very close attention to the children with IV drips and nasogastric (NG) tubes. They paid much less attention to the children feeding orally. Neli 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 Neli's failure to respond?

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

Case 2 – Limbani

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

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

2a. Limbani's Treatment Card on [page 24](#) shows no weight gain. Has Limbani been taking enough F-100?

2b. What is a possible cause of Limbani's failure to respond?

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

2.5 Monitoring Weight Gain during Transition and Rehabilitation

Note: This procedure applies for children less than 5 years of age with SAM who remain in the inpatient care of the hospital for rehabilitation until full recovery. Children with SAM on RUTF should be managed outpatient care at a nearby health facility or if possible in the Outpatient Department (OPD) of the hospital. They preferably should not occupy a bed if RUTF is available and transfer criteria are met. Only very exceptional cases should remain in the inpatient care on RUTF.

Section 2.0 discussed problem solving for individual patients. The remaining sections discuss identifying and solving problems for the Inpatient Care.

Compiling data on weight gain in the inpatient care

Once a month, review Treatment Cards for a given week (for example, the first week of the month) and compile data on a Weight Gain Tally Sheet (see example below).

To complete the tally sheet:

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

Compare the results to tally sheets from similar weeks in other months. Use the tally sheet 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 children 6–59 months in the inpatient care

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)
Children on F-100 or RUTF for entire week	Juleka Issa Nancy Annie	Edna Bwerani Fatima Selina Chalo Monica	Fatsani Alinane
Totals: 12	4	6	2
Proportion of children on F-100 or RUTF in the Inpatient Care Ward	4/12 or 33%	6/12 or 50%	2/12 or 17%

Determining whether there is a problem with weight gain during rehabilitation

If the weight gain on F-100 or RUTF 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.

Stating the problem completely and specifically

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

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

You may think of other questions to ask to find common factors. If there are no clear common factors, then assume that the problem is throughout the inpatient care.

After finding common factors, state the problem specifically. For example, ‘Four out of the five children whose mothers are not staying in the inpatient care have poor weight gain’. If the problem is occurring throughout rehabilitation, say so. For example, ‘25 percent of children during rehabilitation have poor weight gain’.

Stating the problem specifically will help you look for the causes. Investigating causes by monitoring treatment procedures, food preparation and so on will be discussed in **section 4.0**.



Exercise C

In this exercise, you will review information on children who have been on F-100 or RUTF for the past 7 days. They have remained in the inpatient care until full recovery. You will use a tally sheet to determine whether there is a problem with weight gain during rehabilitation. There will then be a group discussion.

Information for the exercise

Twenty children on the ward have been on F-100 or RUTF for the past 7 days. For 17 of these children, the average daily weight gain for the past 7 days has been calculated. These children's names have already been entered on the tally sheet below.

The Treatment Card excerpts for three children are given on the [next page](#). Follow the instructions on the next page to complete the tally sheet. Check your tally sheet with a facilitator if you wish. Then answer the questions on [page 32](#).

Weight gain tally sheet during rehabilitation

Week of: 13/4/00	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 or RUTF for entire week:	Chimwemwe Dziko Suzgo Luntha Nthambi Ayanda	Zeinab Adija Chiza Upile Ekari Limbani Chisomo Chikondi	Mariam Nyenyezi Tapiwa
Totals:			
Proportion of children on F-100 or RUTF in the inpatient care			

Instructions to complete tally sheet

For each child in rehabilitation the Treatment Card excerpt is given below:

1. Calculate the average daily weight gain in the week of April 13–19, 2010:
 - Add the daily weight gains recorded on the child’s Treatment Card for the 7 days of the week being reviewed (dates: 13/4/2010–19/4/2010). Divide the total by 7.
2. Determine whether 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 or RUTF had poor, moderate or good weight gain. To do this:
 - Divide the total in each column by the total children on F-100 or RUTF.
 - Express the result as a percentage.

Treatment Card Excerpt 1 – Alinane (started rehabilitation on April 13)

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	4.5	4.6	4.6	4.6	4.7	4.8	4.8	4.9	5.0	5.0			
Weight gain (g/kg)	–	–	–	–	6.5	4.3	10.7	21.3	10.4	10.3	20.4	0.0			

Treatment Card Excerpt 2 – Khama (started rehabilitation on April 13)

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	6.1	6.1	6.1	6.2	6.2	6.20	
Weight gain (g/kg)	–	–	–	–	–	–	–	0.0	16.0	8.2	–8.1	16.4	8.1	–8.0	

Treatment Card Excerpt 3 – Sonyezo (started rehabilitation on April 12)

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)	-	-	-	-	-	25.6	12.5	6.17	8.6	-2.4	12.2	0.0	6.0		

Questions to Answer and Discuss

- Does the tally sheet show that there is a problem with weight gain during rehabilitation?

- The senior nurse decided to look for common factors among the children who had poor weight gain. She found the following information:
 - Sonyezo – Arrived 21 days ago, age 2 years, orphan (no mother at the hospital), cared for by Nurse Maria
 - Mariam – Arrived 18 days ago, age 19 months, no mother at hospital (aunt comes to visit), cared for by Nurse Ayanda
 - Tapiwa – Arrived 12 days ago, age 22 months, was on IV at admission and then NG tube, but now takes feeds orally, moved yesterday to Nurse Maria’s area, mother is present
 - Khama – Arrived 14 days ago, age 18 months, orphan (parents died and a neighbour left Khama at hospital), cared for by Nurse Rose

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

- State the problem in as much detail 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 find out the causes?

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

3.0 Monitoring Patient Outcomes

3.1 Recording Each Patient's Outcome on the Treatment Card

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

Successful outcomes

Majority of the children under 5 whose condition stabilised and who have regained appetite are **transferred** to outpatient care to continue treatment under the conditions listed below.

For children > 6 months

- Appetite has returned, (passed an RUTF appetite test; the child is eating 75 percent of the daily ration) and has started to gain weight.
- Medical complications are resolved or under control (e.g., started on anti-TB treatment and patient is responding well, e.g., fever resolved or weight gained on RUTF).
- Bilateral pitting oedema is decreasing (if marasmic kwashiorkor on admission, bilateral pitting oedema has resolved).
- Child is clinically well and alert.

For breastfeeding infants less than 6 months

- Medical complication has resolved.
- Bilateral pitting oedema has resolved.
- Infant is clinically well and alert.
- Weight gain on exclusive breastfeeding is satisfactory (e.g., infant is gaining 5 g/kg/day at least for 3 successive days).
- Infant has been checked for immunisations and other routine interventions.
- Mother and infant are linked to continued community-based IYCF and preventative community initiatives.

In special circumstances where it is not possible to transfer children to outpatient care, children who stayed in hospital until full recovery from SAM are considered **cured** if they meet the following end-of-treatment criteria

For children >6 months

- No bilateral pitting oedema for 2 weeks *and*
- MUAC \geq 125 mm *or*
- WFH \geq -2 z-score *and*
- Clinically well and alert.

For infants < 6 months with no prospect of breastfeeding

- No bilateral pitting oedema for 2 consecutive weeks *and*
- WFH ≥ -2 z-score *and*
- Clinically well and alert.
- Health worker is confident that the mother prepares infant formula well and gives it correctly *and*
- Access to adequate infant formula is secured *and*
- Mother and infant are linked with community-based IYCF support.

Adverse outcomes

Some children *die* while in hospital under treatment of SAM; the following information should be noted in case of death:

- Apparent cause of death
- Number of days after admission the child died
- Time of day or night that death occurred
- Other relevant circumstances

Children *defaulted* while in hospital under treatment and are absent for 2 consecutive days (or *early discharge* from hospital against advice).

Note that in case of defaulting, the child's outcome may not be known: the child's condition or outcome should be investigated by a home visit; the child could have died.

Children who were not cured, i.e., did not reach the discharge criteria after 16 weeks while comprehensive medical investigations for non-response to treatment have been done, should be referred to tertiary care for specialist care.

Note that infants less than 6 months with SAM will move to the > 6 months category and follow the respective protocols as soon as they reach 6 months of age.

3.2 Tagging Adverse Outcomes on the Treatment Card

Use a coloured tag or some other means to indicate Treatment Cards with adverse outcomes (that is, death, defaulting, non-recovery) for transfers to outpatient care and for discharged cured. The tag will make these Treatment Cards easy to find in the files when you are doing a review.

Example from Treatment Card

OUTCOME

DISCHARGE DATE: _____ Name of discharging officer _____		
TRANSFER to Outpatient Care, Name of Site: _____		
OUTCOME		
Date: _____		
Transferred (Transfer to outpatient care to continue treatment)		Weight: _____ kg
Cured (Discharge at full recovery)		MUAC: _____ mm
Early Departed or Defaulted (Absence against medical advice for more than 2 days)		Height: _____ cm
Non-cured (Not reaching end of treatment criteria after 4 months of comprehensive investigation and treatment, medical referral to higher care)		
Medical Transfer (Transferred to another higher-level facility for further medical investigations and treatment)		
Died Apparent cause(s) of death: _____		Number of days after admission: < 24hrs 1–3 days 4–7 days > 7 days Time of death: Day Night Did child receive IV fluids? Yes No

Reviewing treatment cards for common factors in adverse outcomes and conducting death audits

Periodically, and whenever there is a death, review tagged Treatment Cards. 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 of admission or later. Deaths that occur within the first 2 days are often due to hypoglycaemia, over-hydration, unrecognised or mismanaged septic shock or other serious infection. Deaths that occur after 2 days are often due to heart failure; check to see whether deaths are occurring during stabilisation or transition.

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/or 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 Treatment Cards for adverse outcomes can provide a basis for staff to discuss and solve problems. A process for group problem solving is described in **section 5.1** of this module.



Exercise D

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

Study the Treatment Card excerpts for Khama, Vitima and Lumbani on the following pages. Answer and be ready to discuss the following questions:

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

Khama –

Vitima –

Lumbani –

2. Are there common factors among 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.

CHILD NAME: Khama M/F AGE: 15 Months HOSPITAL NUMBER: _____ Date: 15/8/16 Time: 10:00



INITIAL MANAGEMENT CHART

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

SIGNS OF SAM Severe wasting? Yes No Bilateral Pitting Oedema? <u>0</u> + ++ +++ Dermatitis? <u>0</u> + ++ +++ (raw skin, fissures) Weight: <u>6.4</u> kg Height / length: _____ cm WFH: _____ z-score MUAC: _____ mm TEMPERATURE: _____ °C axillary / rectal Cover child. If axillary <35° C or rectal <35.5° C, actively warm child. Check temperature every 30 min.		SIGNS OF SHOCK: None Lethargic/unconscious Cold hands Slow capillary refill (> 3 seconds) Weak or fast pulse If lethargic or unconscious, cold hands, plus either slow capillary refill or weak or fast pulse , give oxygen. Give IV glucose as described under Blood Glucose (left). Then give IV fluids: Amounts IV fluids per hour: 15 ml X _____ kg (child's wt.) = _____ ml																																																																																																																																	
BLOOD GLUCOSE (<3 mmol/L or <54 mg/dl): _____ (if no test, treat for hypoglycaemia.) If alert, give 10% glucose 50 ml (infant 25 ml) orally or by NG. If lethargic/unconscious, give sterile 10% glucose 5 ml/kg IV, then 50 ml (25 ml infant) by NG. Amount IV: 5 ml x _____ kg (child's weight) = _____ ml. Amount oral: _____ ml Time glucose given: _____ H Route: Oral NG IV		<table border="1"> <thead> <tr> <th rowspan="2">Time</th> <th colspan="3">1st hr</th> <th colspan="3">2nd hr</th> </tr> <tr> <th>Start</th> <th>Monitor every 10 minutes</th> <th></th> <th>Start</th> <th>Monitor every 10 minutes</th> <th></th> </tr> </thead> <tbody> <tr> <td>Respiratory rate</td> <td></td><td></td><td></td> <td>*</td><td></td><td></td> </tr> <tr> <td>Pulse rate</td> <td></td><td></td><td></td> <td>*</td><td></td><td></td> </tr> </tbody> </table>		Time	1 st hr			2 nd hr			Start	Monitor every 10 minutes		Start	Monitor every 10 minutes		Respiratory rate				*			Pulse rate				*																																																																																																							
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HAEMOGLOBIN (Hb): _____ g/dl (or PCV: _____ %) Blood type: _____ If Hb <4 g/dl (or Hb 4-6 g/dl AND respiratory distress), transfuse 10 ml/kg whole fresh blood slowly over 3 hours (or 7 ml/kg packed cells in case of suspected heart failure). Amount: _____ Time started: _____ H Ended: _____ H		SIGNS OF DEHYDRATION: Watery diarrhoea? Yes No Blood in stool? Yes No Vomiting? Yes No Number of days with diarrhoea: _____ If diarrhoea, circle signs present: Restless/irritable Lethargic Thirsty Recent sunken eyes Dry mouth/tongue No tears																																																																																																																																	
EYE SIGNS: None Left Right MEASLES: Yes No Bitot's spots, Corneal clouding, Corneal ulceration Pus or Inflammation If eye signs (Bitot's spots, corneal clouding and corneal ulceration) or measles, give vitamin A treatment dose and atropine immediately. Record vitamin A in box below, and on Daily Care Chart.		*If improvements after 1 hour (respiratory and pulse rates are slower), repeat same amount IV fluids for second hour; then alternate ReSoMal and F-75 for up to 10 hours. If no improvement after 1 hour, treat for septic shock (transfuse whole fresh blood, see 'Haemoglobin'), give maintenance IV fluids (4 ml/kg/hour) while waiting for blood.																																																																																																																																	
VITAMIN A: If eye signs or recent measles, give treatment dose on day 1, 2, and 14. Time first dose: _____ (Do not give vitamin A if the child does not have eye signs.)		If diarrhoea and/or vomiting, give ReSoMal orally (or by NG tube if too ill) every 30 minutes for first 2 hours and monitor ***. Amount: 5 ml x _____ kg (child's weight) = _____ ml ReSoMal For up to 10 hours, give ReSoMal and F-75 orally (or by NG tube) in alternate hours and monitor every hour ***. Amount: 5-10 ml x _____ kg (child's weight) = _____ to _____ ml ReSoMal every 2 hours																																																																																																																																	
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: _____ ml of F-75* Time first fed: _____ Record all feeds on 24-Hour Food Intake Chart. * If hypoglycaemic, feed ¼ of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/L. or 54 mg/dl		<table border="1"> <thead> <tr> <th>Time</th> <th>Start:</th> <th></th> </tr> </thead> <tbody> <tr> <td>Respiratory rate* (breaths/minute)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Pulse rate* (beats/minute)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Passed urine (YES/NO)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Number of stools</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Number of vomits</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Hydration signs (Yes/No)**</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Amount ReSoMal taken (ml)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>F-75</td><td></td><td>F-75</td><td></td><td></td><td>F-75</td><td></td><td>F-75</td> </tr> </tbody> </table>		Time	Start:															Respiratory rate* (breaths/minute)																Pulse rate* (beats/minute)																Passed urine (YES/NO)																Number of stools																Number of vomits																Hydration signs (Yes/No)**																Amount ReSoMal taken (ml)								F-75		F-75			F-75		F-75
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ANTIBIOTICS: Prescription/Route <u>Benzyl penicillin IV</u> <u>Gentamicin IV</u>		<table border="1"> <thead> <tr> <th>Dose/Frequency/Duration</th> <th>Time of 1st Dose</th> </tr> </thead> <tbody> <tr> <td><u>320,000 IU 4x/day 2/7</u></td> <td><u>10:30</u></td> </tr> <tr> <td><u>50 mg 1x/day 7/7</u></td> <td><u>10:30</u></td> </tr> </tbody> </table>		Dose/Frequency/Duration	Time of 1 st Dose	<u>320,000 IU 4x/day 2/7</u>	<u>10:30</u>	<u>50 mg 1x/day 7/7</u>	<u>10:30</u>																																																																																																																										
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CHILD NAME: Khama (M/F) AGE: 15 Months HOSPITAL NUMBER: Date: Time: 10:00

MONITORING CHART

Monitor respiratory rate, pulse rate, and temperature every 4 hours until after stabilisation. Then monitoring can be less frequent (e.g., twice daily).

DATE 15/8 day 1
 Time 10 14 18

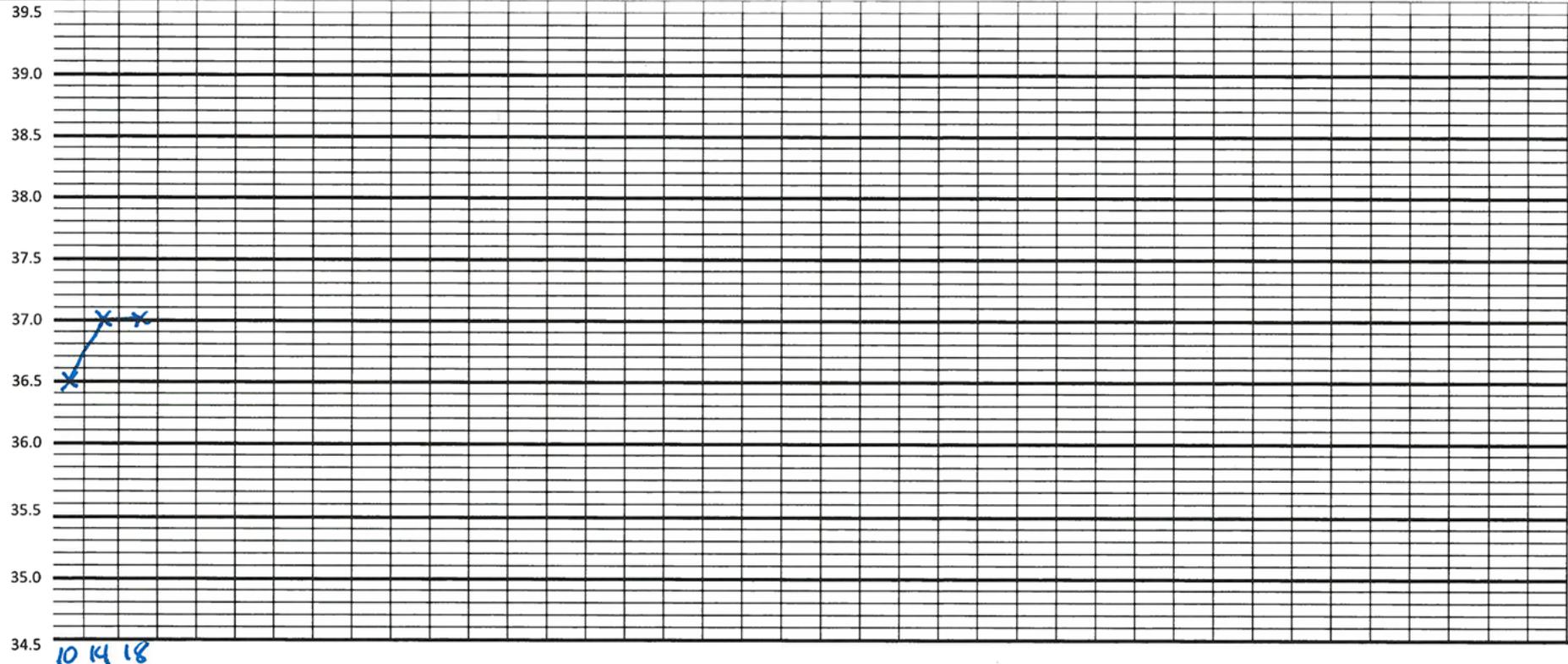
RESPIRATORY RATE

Breaths/minute 30 35 60

PULSE RATE

Beats/minute 90 95 115

TEMPERATURE



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 Monitoring Danger Signs during Inpatient Management of Severe Acute Malnutrition Job Aid).

CHILD NAME: Khama (M/F) AGE: 15 Months HOSPITAL NUMBER: Date: Time:

OUTCOME CHART

COMMENTS

IV began in emergency room and continued until 16:00

COUNSELLING and PSYCHOSOCIAL SUPPORT TO MOTHER OR CARER

IMMUNISATIONS

Vaccination	At birth	First	Second	Third
BCG*	At birth	—	—	—
OPV	At birth	At 6 weeks	At 10 weeks	At 14 weeks
Penta**	—	At 6 weeks	At 10 weeks	At 14 weeks
PCV		At 6 weeks	At 10 weeks	At 14 weeks
Rotavirus	—	At 6 weeks	At 10 weeks	—
IPV				At 14 weeks
Measles	—	At 9 months	At 15 months	—

FOLLOW-UP OR DISCHARGE INSTRUCTIONS

OUTCOME

DISCHARGE DATE: _____ Name of discharging officer _____

TRANSFER to Outpatient Care, Name of Site: _____

OUTCOME		Date:
Transferred (Transfer to outpatient care to continue treatment)		Weight: _____ kg
Cured (Discharge at full recovery)		MUAC: _____ mm
Early Departed or Defaulted (Absence against medical advice for more than 2 days)		Height: _____ cm
Non-cured (Not reaching end of treatment criteria after 4 months of comprehensive investigation and treatment, medical referral to higher care)		
Medical Transfer (Transferred to another higher level facility for further medical investigations and treatment)		
Apparent cause(s) of death: <u>unknown</u>	<u>Died</u> <u>15/8/16</u> <u>19:00</u>	Number of days after admission: < 24hrs 1–3 days 4–7 days > 7 days Time of death: Day <u>Night</u> Did child receive IV fluids? <u>Yes</u> No

CHILD NAME: Vitima M / F AGE: 24 Months HOSPITAL NUMBER: Date: Time: 8:00



INITIAL MANAGEMENT CHART

Comments on pre-referral and/or emergency treatment already given: IV albumin and diuretics given in emergency room.

<p>SIGNS OF SAM Severe wasting? <u>Yes</u> No</p> <p>Bilateral Pitting Oedema? 0 + <u>++</u> +++</p> <p>Dermatosis? 0 <u>+</u> ++ +++ (raw skin, fissures)</p> <p>Weight: <u>8.1</u> kg Height / length: _____ cm</p> <p>WFH: _____ z-score MUAC: <u>111</u> mm</p> <p>TEMPERATURE: <u>36.5</u> °C <u>axillary</u> rectal Cover child. If axillary <35° C or rectal <35.5° C, actively warm child. Check temperature every 30 min.</p> <p>BLOOD GLUCOSE (<3 mmol/L or <54 mg/dl): _____ (If no test, treat for hypoglycaemia.) If alert, give 10% glucose 50 ml (infant 25 ml) orally or by NG. If lethargic/unconscious, give sterile 10% glucose 5 ml/kg IV, then 50 ml (25 ml infant) by NG. Amount IV: 5 ml x _____ kg (child's weight) = _____ ml. Amount oral: _____ ml Time glucose given: _____ H Route: Oral NG IV</p> <p>HAEMOGLOBIN (Hb): _____ g/dl (or PCV: _____ %) Blood type: _____ If Hb <4 g/dl (or Hb 4–6 g/dl AND respiratory distress), transfuse 10 ml/kg whole fresh blood slowly over 3 hours (or 7 ml/kg packed cells in case of suspected heart failure). Amount: _____ Time started: _____ H Ended: _____ H</p> <p>EYE SIGNS: <u>None</u> Left Right MEASLES: Yes No Bitot's spots, Corneal clouding, Corneal ulceration Pus or Inflammation</p> <p>If eye signs (Bitot's spots, corneal clouding and corneal ulceration) or measles, give vitamin A treatment dose and atropine immediately. Record vitamin A in box below, and on Daily Care Chart.</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:20%;">VITAMIN A: If eye signs or recent measles, give treatment dose on day 1, 2, and 14. Time first dose: _____</td> <td style="width:20%;">< 6 months</td> <td style="width:60%; text-align: center;">50,000 IU</td> </tr> <tr> <td></td> <td>6–12 months</td> <td style="text-align: center;">100,000 IU</td> </tr> <tr> <td>(Do not give vitamin A if the child does not have eye signs.)</td> <td>> 12 months</td> <td style="text-align: center;">200,000 IU</td> </tr> </table> <p>FEEDING: <i>Begin feeding with F-75 as soon as possible.</i> <i>If child is rehydrated, reweigh before determining amount to feed. New weight: _____ kg.</i> Amount for 2-hourly feedings: _____ ml of F-75* Time first fed: _____ Record all feeds on 24-Hour Food Intake Chart. <i>* If hypoglycaemic, feed ¼ of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/L or 54 mg/dl</i></p>	VITAMIN A: If eye signs or recent measles, give treatment dose on day 1, 2, and 14. 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CHILD NAME: Vitima M/F AGE: 24 Months HOSPITAL NUMBER: Date: Time:

OUTCOME CHART

COMMENTS

COUNSELLING and PSYCHOSOCIAL SUPPORT TO MOTHER OR CARER

IMMUNISATIONS

Vaccination	At birth	First	Second	Third
BCG*	At birth	—	—	—
OPV	At birth	At 6 weeks	At 10 weeks	At 14 weeks
Penta**	—	At 6 weeks	At 10 weeks	At 14 weeks
PCV		At 6 weeks	At 10 weeks	At 14 weeks
Rotavirus	—	At 6 weeks	At 10 weeks	—
IPV				At 14 weeks
Measles	—	At 9 months	At 15 months	—

FOLLOW-UP OR DISCHARGE INSTRUCTIONS

OUTCOME

DISCHARGE DATE: _____ Name of discharging officer _____	
TRANSFER to Outpatient Care, Name of Site: _____	
OUTCOME	
Date: _____	
Transferred (Transfer to outpatient care to continue treatment)	Weight: _____ kg
Cured (Discharge at full recovery)	MUAC: _____ mm
Early Departed or Defaulted (Absence against medical advice for more than 2 days)	Height: _____ cm
Non-cured (Not reaching end of treatment criteria after 4 months of comprehensive investigation and treatment, medical referral to higher care)	
Medical Transfer (Transferred to another higher level facility for further medical investigations and treatment)	
Apparent cause(s) of death: <u>increased oedema from low albumin</u>	Number of days after admission: < 24hrs 1–3 days 4–7 days > 7 days Time of death: Day Night Did child receive IV fluids? <u>Yes</u> No

CHILD NAME: Limbani @/F AGE: 18 Months HOSPITAL NUMBER: Date: 20/7 Time: 8:00



INITIAL MANAGEMENT CHART

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

<p>SIGNS OF SAM Severe wasting? <input checked="" type="radio"/> Yes <input type="radio"/> No</p> <p>Bilateral Pitting Oedema? 0 <input checked="" type="radio"/> ++ <input type="radio"/> +++</p> <p>Dermatosis? 0 <input checked="" type="radio"/> + <input type="radio"/> ++ <input type="radio"/> +++ (raw skin, fissures)</p> <p>Weight: <u>6.8</u> kg Height / length: <u>74</u> cm</p> <p>WFH: <u>6-3</u> z-score MUAC: <u>113</u> mm</p> <p>TEMPERATURE: _____ °C axillary / rectal Cover child. If axillary <35° C or rectal <35.5° C, actively warm child. Check temperature every 30 min.</p> <p>BLOOD GLUCOSE (<3 mmol/L or <54 mg/dl): <u>4</u> (If no test, treat for hypoglycaemia.) If alert, give 10% glucose 50 ml (infant 25 ml) orally or by NG. If lethargic/unconscious, give sterile 10% glucose 5 ml/kg IV, then 50 ml (25 ml infant) by NG. Amount IV: 5 ml x _____ kg (child's weight) = _____ ml. Amount oral: _____ ml Time glucose given: _____ H Route: Oral NG IV</p> <p>HAEMOGLOBIN (Hb): _____ g/dl (or PCV: _____ %) Blood type: _____ If Hb <4 g/dl (or Hb 4-6 g/dl AND respiratory distress), transfuse 10 ml/kg whole fresh blood slowly over 3 hours (or 7 ml/kg packed cells in case of suspected heart failure). Amount: _____ Time started: _____ H Ended: _____ H</p> <p>EYE SIGNS: None <input checked="" type="radio"/> Left <input type="radio"/> Right MEASLES: Yes <input type="radio"/> No <input checked="" type="radio"/> Bitot's spots, Corneal clouding, Corneal ulceration Pus or Inflammation</p> <p>If eye signs (Bitot's spots, corneal clouding and corneal ulceration) or measles, give vitamin A treatment dose and atropine immediately. 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Amount for 2-hourly feedings: <u>75</u> ml of F-75* Time first fed: <u>12:30</u> Record all feeds on 24-Hour Food Intake Chart. * If hypoglycaemic, feed ¼ of this amount every half hour for first 2 hours; continue until blood glucose reaches 3 mmol/L, or 54 mg/dl</p>	VITAMIN A:	< 6 months	50,000 IU	If eye signs or recent measles, give treatment dose on day 1, 2, and 14. Time first dose: _____	6-12 months	100,000 IU	(Do not give vitamin A if the child does not have eye signs.)	> 12 months	200,000 IU	<p>SIGNS OF SHOCK: None Lethargic/unconscious Cold hands Slow capillary refill (> 3 seconds) Weak or fast pulse</p> <p>If lethargic or unconscious, cold hands, plus either slow capillary refill or weak or fast pulse, give oxygen. 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VITAMIN A:	< 6 months	50,000 IU																																																																																																																																																											
If eye signs or recent measles, give treatment dose on day 1, 2, and 14. Time first dose: _____	6-12 months	100,000 IU																																																																																																																																																											
(Do not give vitamin A if the child does not have eye signs.)	> 12 months	200,000 IU																																																																																																																																																											
Time	1 st hr				2 nd hr																																																																																																																																																								
	Start	Monitor every 10 minutes			Start	Monitor every 10 minutes																																																																																																																																																							
Respiratory rate					*																																																																																																																																																								
Pulse rate					*																																																																																																																																																								
Time	Start	9:00	9:30	10:00	10:30	11:30	12:30	13:30	14:30																																																																																																																																																				
Respiratory rate* (breaths/minute)		35	35	35	35	35	34	35	30																																																																																																																																																				
Pulse rate* (beats/minute)		95	95	95	95	95	94	95	91																																																																																																																																																				
Passed urine (YES/NO)		-	N	N	N	N	N	N	N																																																																																																																																																				
Number of stools		-	0	0	1	0	1	0	0																																																																																																																																																				
Number of vomits		-	1	0	0	1	0	0	0																																																																																																																																																				
Hydration signs (Yes/No)**		-	same	same	same	same	same	moist tongue saliva	mt saliva																																																																																																																																																				
Amount ReSoMal taken (ml)		34	34	34	34	60	F-75	75	95	F-75		F-75																																																																																																																																																	
<p>ANTIBIOTICS: Prescription/Route</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Dose/Frequency/Duration</th> <th>Time of 1st Dose</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>MALARIA TEST (Type/Date/Outcome):</p> <p>HTS Date: ___/___/___ Outcome: NR R Exposed DNA PCR: Positive Negative Not done N/A Date started cotrimoxazole: ___/___/___ Date started ART: ___/___/___</p>		Dose/Frequency/Duration	Time of 1 st Dose																																																																																																																																																										
	Dose/Frequency/Duration	Time of 1 st Dose																																																																																																																																																											

CHILD NAME: Limbani (M) F AGE: 18 Months HOSPITAL NUMBER: Date: Time:

OUTCOME CHART

COMMENTS

COUNSELLING and PSYCHOSOCIAL SUPPORT TO MOTHER OR CARER

IMMUNISATIONS

Vaccination	At birth	First	Second	Third
BCG*	At birth	—	—	—
OPV	At birth	At 6 weeks	At 10 weeks	At 14 weeks
Penta**	—	At 6 weeks	At 10 weeks	At 14 weeks
PCV	—	At 6 weeks	At 10 weeks	At 14 weeks
Rotavirus	—	At 6 weeks	At 10 weeks	—
IPV	—	—	—	At 14 weeks
Measles	—	At 9 months	At 15 months	—

FOLLOW-UP OR DISCHARGE INSTRUCTIONS

OUTCOME

DISCHARGE DATE: _____ Name of discharging officer _____	
TRANSFER to Outpatient Care, Name of Site: _____	
OUTCOME	
Date: _____	
Transferred (Transfer to outpatient care to continue treatment)	Weight: _____ kg
Cured (Discharge at full recovery)	MUAC: _____ mm
Early Departed or Defaulted (Absence against medical advice for more than 2 days)	Height: _____ cm
Non-cured (Not reaching end of treatment criteria after 4 months of comprehensive investigation and treatment, medical referral to higher care)	
Medical Transfer (Transferred to another higher level facility for further medical investigations and treatment)	
Died	Number of days after admission: < 24hrs 1-3 days 4-7 days > 7 days
Apparent cause(s) of death: <u>milk-fluids</u> <u>came out of mouth. Possibly</u> <u>choked on vomit.</u>	Time of death: Day <u>Night</u> Did child receive IV fluids? Yes No
	<u>23/7</u> <u>4:00</u>

3.3 Calculating a Case-Fatality Rate for the Inpatient Care

In inpatient care with a large number of admissions (for example, with 100 admissions per month), calculate the case fatality rate once each month if possible. This will allow improvements or problems to be seen rapidly.

Note: The case fatality rate (proportion of children admitted who died during treatment) is calculated differently from the performance indicator death rate (proportion of children discharged who died during treatment) that will be discussed below, and tells a slightly different story.

In a small inpatient care (for example, 10 cases per month), or in inpatient care 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 of the inpatient care

- Determine the number of patients admitted to the inpatient care in the past month(s). Also, include children who die after arrival in the emergency ward or who die within the first 24 hours of admission.
- Determine the number of those children who were admitted who died in the same time period (month[s]). Wait to count deaths until the outcomes for the children are known. For example, wait until the start of November to count deaths among admissions in October.
- Divide the number of deaths by the number of children admitted during that same time period (month) 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

The case fatality rate is calculated on a cohort of children who are admitted for treatment in the inpatient care in a specific time period and who died during the same time period. The case fatality rate is not a very sensitive indicator because it may indicate quality of early care or severity of illness upon admission, which may also reflect poor active case-finding (therefore, late referral) or poor quality of care in outpatient care, problems with referral and/or transportation to hospital or other barriers to access. Carefully review the circumstances of deaths and identify and solve related problems to reduce the case fatality rate.

The objective of an NRU should be to achieve a case fatality rate of < 5 percent.



SHORT ANSWER EXERCISE

Calculate the case fatality rates for the inpatient care described below. State whether the rate is unacceptable, poor, moderate or acceptable.

1. The inpatient care at Ntandire Mission Hospital is small. Over the past 3 months, there have been 32 admissions. Five of these children died.

2. Chinsapo Hospital had 98 admissions with SAM in October. Three of these children died.

- 3a. Senti Hospital had 28 admissions to the NRU in November and July. Two of these children died.

- 3b. In the next 2 months, August and September, Senti Hospital had 36 admissions to the NRU. Four of these children died.

- 3c. How does the rate for August and September compare with the previous 2 months? Is there a problem?

Compare your answers to this exercise to the answers given at the end of the module.

4.0 Monitoring Case Management Procedures

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

- Case management practices
- Food preparation
- Ward procedures
- Hygiene

This section provides suggestions for monitoring the items listed above. Monitoring checklists to use in the NRU are provided in **Annex A and B**:

The Mentorship & Supervision Checklist for Inpatient Management of SAM, and the Quality Improvement Checklist for Inpatient Management of SAM. Any 'No' answer to a question on the checklist indicates a problem that needs to be corrected. Monitoring of performance of inpatient management of SAM is explained in **section 6.0** of this module.

4.1 Monitoring 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 particularly during initial treatment. Ensure that emergency room personnel are also following appropriate practices for children with SAM.

Some examples of common incorrect practices to look for are described below:

Common incorrect practices in initial treatment; these can cause death	Correct practice
Child not fed at night	During initial management, 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 and lethargy or unconscious.	Give IV only if there are signs of shock (cold hand plus slow capillary refill or weak/fast pulse) and lethargy or unconsciousness.
Diuretics given to treat oedema	Do not give these. Oedema will resolve with correct initial treatment using F-75.
High protein diet given immediately	Give F-75 (or infant formula or F-100 Diluted for infants) until the child stabilises and appetite returns.
Antibiotics not given because no clinical signs of infection	Presume infection and give antibiotics to all children with SAM even in the absence of clinical signs of infection or medical complications.
Standard oral rehydration solution (ORS) used instead of rehydration solution for malnutrition (ReSoMal)	Give ReSoMal to children with SAM with diagnosed dehydration.
Child left uncovered at night	Provide blanket and ensure that the child is covered at night. Provide adults cots for the child to sleep with the mother.
Anaemia treated with iron from admission	Wait to start iron until the child has regained appetite and is gaining weight for 2 days. If child is on RUTF, do not give additional iron because RUTF contains iron. Treat severe anaemia with blood transfusion if needed.

4.2 Monitoring Therapeutic Food Preparation

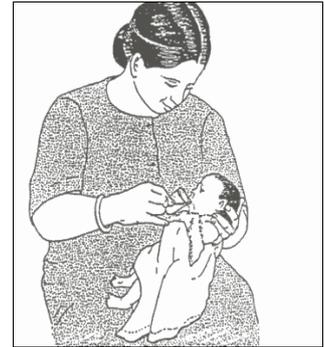
Problems like poor response to treatment may be due to problems with therapeutic food preparation. Periodically, or whenever you suspect that there is a problem, carefully observe preparation of feeds. Monitor the following:

- 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 (and those preparing feeds) wash their hands with soap before preparing food?
- Are measurements made exactly with proper measuring utensils (e.g., correct scoops)?
- Are ingredients thoroughly mixed?
- For commercially prepared milk: Is correct amount of water added to make up the formula?
- Is food served at an appropriate temperature?
- Are correct amounts put in the cup for each child?
- Is leftover prepared food discarded promptly?



4.3 Monitoring Ward Procedures

Problems like long stay, inadequate weight gain during transition and rehabilitation, early departures and 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. Below are the procedures to monitor:



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 and saucer (never a bottle)?
- Is food intake (and any vomiting/diarrhoea) recorded correctly after each feed?
- Are leftovers recorded accurately?
- Are amounts of F-75 (F-100 Diluted for non-breastfed infants) kept the same throughout the initial phase, even if weight is lost?
- Is RUTF appetite test done as soon as appetite returns and medical complications are resolving, and is RUTF offered during transition to children 6–59 months?
- Is RUTF administered correctly?
- Is drinking water provided with RUTF intake?
- Is child consuming 75 percent (or two full meals) of the required daily intake of RUTF before transfer to outpatient care?
- For cases who remain in inpatient care on F-100 (F-100 Diluted for non-breastfed infants) after transition, are amounts of F-100 given freely and increased as the child gains weight?

Warming

- Is the room kept between 25°C and 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 standardised weekly?
- Are children weighed at about the same time each day, 1 hour before or after a feed (to the extent possible)?
- Do staff adjust the scale to 0 before weighing?
- Are children consistently weighed without clothes?
- Do staff correctly read weight to the correct degree of precision?
- Do staff immediately record weights on the child's Treatment Card?
- Are weights correctly plotted on the Weight Chart?



Giving antibiotics and other medications and supplements

- Are antibiotics given as prescribed (correct dose[s] at correct time[s])?
- When antibiotics are given, do staff immediately make a notation on the Treatment Card?
- Is folic acid given daily and recorded on the Treatment Card?
- Is vitamin A treatment given according to schedule?
- For children with appetite who are gaining weight for 2 days, is the correct dose of iron given daily and recorded on the Treatment Card?



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?

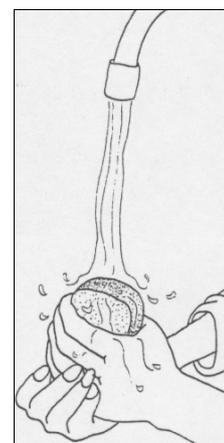


4.4 Monitoring Hygiene

Good hygiene is extremely important because children with SAM are highly susceptible to infection. Whenever you suspect that a problem may be related to hygiene, visually inspect hygiene in the ward. Regular, periodic inspection can be very helpful in ensuring good hygiene. Monitor such items as the following.

Handwashing

- Are there working hand-washing 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 patient visits?

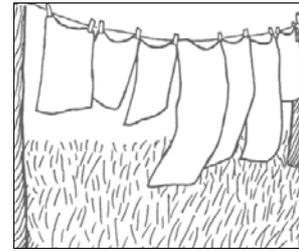


Mothers' cleanliness

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

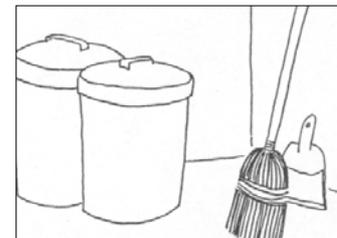
Bedding and laundry

- Is bedding changed every day or when soiled/wet?
- Are nappies, soiled towels and rags, etc., stored in bags, 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?



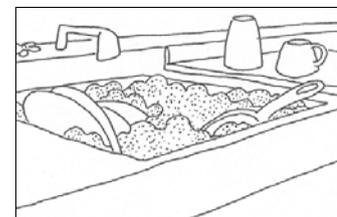
Food storage

- Are ingredients and food kept covered and stored at the proper temperature?
- Are leftovers discarded?
- Is all therapeutic food stored in a hygienic manner?



Dishwashing

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



Toys

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

4.5 Who Should Monitor and How Often?

Monitoring can be done by trained health care providers from the hospital or from the district or regional health bureau.

Three days are usually needed to monitor treatment procedures, feeding practices and ward procedures in inpatient care. This would include the on-site problem-solving sessions (see **section 5.0** in this module). The frequency of visits for monitoring purposes needs to be discussed at other levels of the system.

4.6 Supportive Supervision and Mentoring (or Coaching)

Supervisors should perform regular supportive supervision visits and use a checklist to systematically cover specific job functions to assess and address service performance (see the Example Supervisor's Checklist in **Annex A**). At the same time, the supervisor is a mentor and he/she should use the opportunity to provide support for problem solving and QI based on identified needs. Supervisory visits are conducted to help health care providers improve their performance and job satisfaction. The

visits should be seen as an ongoing part of the capacity development strategy and the motivation of health care providers.

Supervising the quality of carrying out protocols entails monitoring admission and discharge trends and adherence to protocols. Accurately recording and compiling information regarding admissions, re-admissions and referrals and discharges from inpatient care sites is important. Monitoring and reporting (M&R) data are essential for the supervisor to understand overall performance, and can be used to take actions to improve quality care.

Supervisors should review and discuss the quality of services by verifying challenges and opportunities on the following:

- Admission, referral and discharge procedures
- Adherence to medical and dietary treatment protocols
- Completion of the Treatment Cards and other M&R tools
- Progress of individual children
- Quality of health and nutrition counselling and education
- Performance of services
- Psychological support to mothers
- Advice on discharge
- Presence of qualified staff
- Workload of staff
- Organisation of the ward
- Hygiene of ward, children and mothers
- Supply and stock management
- Access to food for the mothers
- Adherence for free care

5.0 Solving 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. Examples of problems that could be reviewed as a group include:

- A diarrhoea outbreak in the ward
- An increasing case fatality rate
- 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 toward a solution if they are involved in decision making that affects them.

5.1 Process for Problem Solving in a Group

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

- 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.
- State the facts of the problem as clearly and completely as possible. Include when, where and with whom the problem is occurring.
- Discuss cause(s) of the problem that you have discovered through monitoring. Ask the staff whether they agree or disagree with your analysis. Ask the staff whether they can think of other possible 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 identified causes on a flipchart or large sheet of paper.

- 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, that is, who will do what after the meeting.
- 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 whether 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 NRU. Your facilitator will assign you a role, such as:

- Clinician
- Senior nurse on duty in the morning (Matron)
- Senior nurse on duty in the afternoon
- Night nurse
- Home-craft worker
- Hospital administrator

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

One participant (the clinician) 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, identify the most likely causes and identify possible solutions.

6.0 Monitoring and Reporting Inpatient Management of SAM

A well-designed monitoring and reporting (M&R) system is an essential component in the management of SAM.

With well-informed monitoring data, aspects of the management of SAM that need improvement can be identified in a timely manner. Appropriate action then can be taken to improve on individual care, organisation of care and overall quality of care.

Notes:

- Reporting is based on calendar months: 1 month usually covers 4 weeks, but occasionally it covers 5 weeks. This has to be considered when interpreting trends.
- Reporting is done by age group: report on children 5–15 years, 6–59 months and infants less than 6 months separately.

6.1 Tools for Monitoring and Reporting

Register

A register is made available to collect information on the admission and exit categories during 1 month to ease reporting at the end of the month.

Monthly report

Children admitted to inpatient care are categorised as a new admission or a transfer from outpatient care because of deteriorating condition (including relapsed cases who started a new episode).

Children discharged from hospital are categorised as cases who are cured, or are transferred to outpatient care (positive outcome) or died, defaulted or non-responded or referred to tertiary care (adverse outcome).

Based on the monthly aggregated information, monthly performance indicators on the management of SAM may be calculated.

6.2 Performance of Management of SAM

There are three basic sets of indicators for measuring the performance of CMAM services for children, as described in the following section.

Output indicators

Output indicators measure whether the SAM service has completed the planned activities needed to achieve the established objectives. They are measured as numbers. Over time they monitor trends of increase and decrease in caseload, and are used for planning purposes for treatment and supply needs.

Below are examples of output indicators for management of SAM at the health facility level, reported per month:

- **Number of health care providers trained** (or mentored) (by sex distribution)
- Report on the **use of therapeutic foods**: F-75, F-100, infant formula or F-100 Diluted, RUTF and ReSoMal (or report on use of ingredients if local recipes are prepared).
- **Total number of new admissions**
- **Total number of children under treatment**

Process indicators

Process indicators directly measure the performance of key processes, which in this case relates to the CMAM treatment process. They are not always part of monthly routine monitoring and can be measured at certain intervals or through non-routine monitoring activities.

Below are examples of process indicators for management of SAM, measured periodically:

- **Cause of death.** Assessing and compiling this information can help identify problems with treatment and use of treatment protocols and determine where strengthened support, training, supervision and QI might be needed.
- **Reasons for absentees, defaulting and non-response to treatment.** Compiling this information can help identify common reasons for default or non-response to treatment. Reasons for non-response might include a high prevalence of TB, hepatitis, HIV and incorrect feeding procedures within the hospital (or at the household level for outpatient care). This information might indicate a need for intensifying monitoring, supervision and quality improvement. It is also important to understand the reasons for defaulting, barriers to accessing services and/or unrecorded death.
- **Readmission after discharge cured (or relapse).** Relapse means that the child's nutrition status deteriorated after end of treatment as cured and that the child returns for treatment of the new episode of SAM within 2 months. High readmission rates may indicate that children are discharged too soon or that the quality of care was not optimal. It may also indicate the need for improving infant and young child feeding (IYCF) practices and/or food security at the household level. Relapse is recorded on the child's Treatment Card and can be tallied periodically from the Treatment Cards.
- **Average length of stay (LOS) of discharged cured.** LOS is the period (in number of days) that a child spends in inpatient care for stabilisation or until full recovery from SAM. LOS in inpatient care for stabilisation is expected to be short (maximum 7–10 days), and long until full recovery (maximum 60 days). *Note:* The average LOS is calculated separately for the two groups.

Average LOS in inpatient care for stabilisation or until full recovery reflects effectiveness of inpatient care. Average LOS is influenced by the proportion of children that presented late for treatment or who do not respond to treatment. A long LOS may indicate that children are not referred to outpatient care in a timely fashion, or have been identified late in the community. A short average LOS may indicate that children are discharged too soon. If there is a high relapse rate, this might be a possible cause.

Average LOS in inpatient care for stabilisation or until full recovery is calculated on a sample of discharged cases (disaggregate cases transferred to outpatient care, and cured at the end of treatment), as the sum of LOS divided by number of Treatment Cards in the sample.

- **Average daily weight gain (AWG) of discharged cured.** The meaning and use of AWG has been discussed in **section 2.5** of this module, [page 28](#).

How to calculate

Average length of stay (number of days)	<p>Length of stay for each <u>cured</u> child (in days):</p> <p>Discharge date for cured child – admission date</p> <p>Average length of stay for <u>all cured</u> children =</p> <p>sum of length of stay (in days) of all cured children / number of cured children compiled</p>
Average weight gain (g/kg/d)	<p>Weight gain for each <u>cured</u> child (in grams) =</p> <p>{discharge weight in g – minimum weight in g} / {minimum weight in kg x number of days between date of minimum weight and discharge day}</p> <p>Mean weight gain for <u>all cured</u> children =</p> <p>sum of weight gains (g/kg/d) of all cured children / number of cured children compiled</p>

Outcome indicators

Outcome indicators measure whether a Community-based Management of Acute Malnutrition (CMAM) service has achieved its programme objectives and planned outcomes. They are measured as percentages, give an indication of performance and are used to monitor trends in performance. If a standardized method of indicators is used, outcome indicators can also be compared to global indicators, e.g., Sphere Minimum Standards².

Below are examples of outcome indicators for management of SAM measured monthly:

- **Percent cured (cure rate)** = proportion of children who are discharged from the hospital at the end of treatment as cured out of total end of treatment*
- **Percent died (death rate)** = proportion of children who died in the hospital out of total end of treatment*
- **Percent defaulted (default rate)** = proportion of children who are recorded as absent for two consecutive days in inpatient care out of total end of treatment*
- **Percent non-cured** = proportion of children who do not meet the discharge criteria after 16 weeks in the inpatient care out of total discharged.

* Total discharged = cured + died + defaulted

When calculating SAM program outcome, children discharged from inpatient care should be combined with those who continue treatment and are discharged from outpatient care.

The results are compared to international standards (The Sphere Project: Humanitarian Charter and Minimum Standards in Humanitarian Response, 2011); see the table below.

² The Sphere Project. 2011. *Humanitarian Charter and Minimum Standards in Disaster Response*. Oxford, UK: Oxfam. <http://www.sphereproject.org/>.



Exercise F

In this exercise, you will practice completing a monthly report.

On January 1, 2010, inpatient care (NRU) opened in your hospital. You are in charge of M&R for the new site, and you will fill out a monthly report for the first month. New admission and discharge during the month can be recorded on the registry to ease compilation for the monthly report.

Week 1

During week 1, three male children 6–59 months with SAM are admitted; they have low MUAC readings (< 115 mm) and other medical complications. At the end of the week they are all still under treatment and their condition is slowly improving.

Performance indicator	Inpatient
Cured	$>75\%$
Defaulted	$<15\%$
Died	$<10\%$
Non-cured	Not stated
Length of stay if complete treatment as outpatient	
Length of stay (stabilisation and transition as inpatient and transferred to OTP)	2–10 days in stabilisation and 2–3 days in transition
Length of stay (long term stay as inpatient with complete rehabilitation in hospital)	< 4 –6 weeks
Weight gain	> 5 g/kg/day in rehabilitation

Week 2

During week 2, one female infant of 11 months with severe oedema is admitted, and four boys 2 and 3 years with low MUAC readings (< 115 mm) and medical complications are admitted. In the same week, one child is transferred to outpatient care after stabilisation, as his medical condition was improving; he has a good appetite, eats more than two full meals on RUTF, and is clinically well and alert. The child will continue treatment in outpatient care in the health centre close to his home. No other children left the treatment site.

Week 3

During week 3, two girls 6–59 months with $WFH < -3$ z-scores and medical complications are admitted and one boy is referred from an outpatient care site because his condition was deteriorating and he started losing weight in the absence of oedema. He died later during this week. Two children are unexpectedly absent for 3 days.

Week 4

One female child of 8 months with severe oedema is newly admitted, and three children are referred to the outpatient care site.

Every evening during your duty you have tallied the daily activities of the site, and at the end of each week you filled in the rest of the form for that week. Now, at the end of the month, you will complete the monthly report.

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

Annex A: Mentorship & Supervision Checklist for Inpatient Management of SAM

(1a) Hospital Assessment Form: SAM Child Record Review

Assess the last 3 patients' records using the following form. Enter information in blank boxes. For 'status' enter if the child *is currently in care, cured, stabilised, defaulted, or death*. Under "monitoring", tick 'check' boxes [v] if actions were carried out correctly and cross [X] if done incorrectly. Where 'check' boxes are crossed, provide an explanation in 'notes' column. If the action is not applicable (e.g. child was not dehydrated) write N/A. If it is unclear if the action was carried out correctly mark '?' and seek clarification.

District:		Health Facility:			
Where is Management of SAM located (paediatric ward, Nutrition Rehabilitation Unit (NRU) or other:					
BASIC INFORMATION:	Registration no:		Registration no:		Registration no:
	STATUS:		STATUS:		STATUS:
INDICATORS:	<i>Notes</i>		<i>Notes</i>		<i>Notes</i>
STATUS OF CHILD (WHEN ADMITTED ONTO THE CURRENT WARD)					
Age (months)					
Sex					
Admission weight (kg)					
MUAC (cm)					
Weight-for-height/length Z- score					

Oedema grade (0 + ++ +++)			
Dermatosis (skin lesions)			
HIV status (is the child positive, negative, exposed or not tested?)			
Where was the child referred from?			
New admission or readmission in inpatient care			
KEY DATES			
Date admitted to current ward			
Time admitted to current ward			
Date discharge or death			
Time of death (<i>if applicable</i>)			
Date of transition from F-75 onto RUTF or F-100			
Date ReSoMal first prescribed (<i>if applicable</i>)			
Date malaria test done (indicate test result)			

INDICATORS	<i>Chec</i>	<i>Notes</i>	<i>Check</i>	<i>Notes</i>	<i>Check</i>	<i>Notes</i>
Step 1: Treat/prevent hypoglycaemia						
Fed F75 within 30 minutes of arrival on current ward and/or given 10% glucose (IV) or sugar solution (orally)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Step 2: Treat / prevent hypothermia						
Temperature monitored twice daily?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Step 3: Treat / prevent dehydration						
Watery stools documented	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
ReSoMal prescribed and documented as given after each watery stool	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
IV fluids only prescribed if child in shock	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If given IV, duration does not exceed 2 hours	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If given IV, respirations and pulse monitored every 10 minutes	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Child diagnosed as dehydrated only if has watery stools/ vomiting	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If dehydrated, correct volume of ReSoMal prescribed (5ml/kg every 30 mins for 2 hrs and 5-10ml/kg for next 4-10 hrs)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If dehydrated, ReSoMal documented as given according to prescription	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If dehydrated, ReSoMal alternated with F75 after first 2 hours	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If dehydrated, duration of ReSoMal does not exceed 12 hours	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If dehydrated, Child's respirations and pulse monitored at least hourly whilst on ReSoMal	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Step 4: Correct Electrolyte Imbalance						
Were feeds given according to standard protocol?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Diuretic not prescribed for oedema	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Resomal used (e.g. ReSoMal) for dehydration	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	

INDICATORS	<i>Chec</i>	<i>Notes</i>	<i>Check</i>	<i>Notes</i>	<i>Check</i>	<i>Notes</i>
Step 5: Treat / prevent infection						
Antibiotics given on day 1	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Appropriate course of broad-spectrum antibiotics given (5 -7 days)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Cotrimoxazole given if HIV +/exposed	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Antibiotics documented as given according to prescription	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If positive, was the child started on ART after stabilization?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Step 6: Micronutrient deficiencies						
Were the standard feeds, F-75, F-100, RUTF given?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Does the child have eye signs of vitamin A deficiency?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If child has eye signs or measles, was Vitamin A given on day 1, Day 2 & Day 14?	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Vitamin A recorded as given according to prescription	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
if the child is transitioning using F-100, was iron (3mg/kg/day) prescribed only after transition onto F100	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Iron recorded as given according to prescription	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Step 7: Start cautious feeding						
F75 given as starter feed	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Correct volume of F75 prescribed 2 or 3 hourly during stabilization	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Frequency of F75 lowered and volume increased correctly (if no vomiting, <5 watery stools, finishing most feeds)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
F75 recorded as given according to prescription	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
NG tube correctly prescribed (if intake <80% feed over 24 hours or <80% for 3 consecutive feeds)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Step 8: Achieve catch up growth						

INDICATORS	<i>Chec</i>	<i>Notes</i>	<i>Check</i>	<i>Notes</i>	<i>Check</i>	<i>Notes</i>
Transition onto RUTF / F100 prescribed at right time (if appetite and reduced/ minimal oedema)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Correct volume of F75 and RUTF / F100 prescribed and given during transition	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Volume of F75 and RUTF / F100 recorded as given according to prescription	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
If child is getting F100, Volume of F100 increased by 10ml per feed on day 3 of transition	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Volume of RUTF or F100 increased after day 3 of transition	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Total 24 hour daily feed volume calculated correctly	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<i>If transitioned using F100</i> , volume of F100 given in correct amount every 4 hours	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Step 9: Follow up						
If transitioned using RUTF caregiver being informed of the nearest health centre outpatient to her home and being given a transfer slip and a weekly ration of RUTF.	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Monitoring						
Weight accurately plotted on chart	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Z scores recorded daily using WHO charts	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Target weight correctly recorded on admission	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Record weight daily	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Key Points						

(1b) Hospital Assessment Form: Observations on Ward

Observe activities on the ward during feeds (one session) and after feeds (during ward rounds, 2 sessions per day). Complete the blank spaces. Tick check boxes if actions were carried out correctly and cross if done incorrectly. Where check boxes are crossed provide an explanation in notes column. If it is unclear if the action was carried out correctly mark '?' and seek clarification.

District			
Health Facility			
Where is Management of SAM located (paediatric ward, Nutrition Rehabilitation Unit (NRU) or other:			
OBSERVATION PERIOD:	Date	Start time	End time

INDICATORS:	Check	Notes
Step 1: Treat / prevent hypoglycaemia		
Checking question: are children admitted onto the ward within 2 hours of arrival?	<input type="checkbox"/>	
Checking question to mothers: what time did you arrive at the hospital?	<input type="checkbox"/>	
Step 2: Treat / prevent hypothermia		
Children remain covered	<input type="checkbox"/>	
Each child has a blanket	<input type="checkbox"/>	
Ward is not draughty (prevention of cold air getting into the ward, that causes discomfort)	<input type="checkbox"/>	
Hot water bottle discouraged	<input type="checkbox"/>	
Kangaroo method encouraged	<input type="checkbox"/>	
Checking question for HCP: if a child is hypothermic, what would you do? (Active rewarming?)	<input type="checkbox"/>	
Other emergency treatments		
Checking question: If child shows signs of shock are they stabilized at OPD?	<input type="checkbox"/>	
Checking question: If child is in septic shock is 10ml/kg whole blood ordered and administered?	<input type="checkbox"/>	
Checking question: If child has severe anaemia, is 10ml/kg whole blood (or 5-7ml/kg packed cells) ordered and administered?	<input type="checkbox"/>	
Appropriate wall charts for giving IV fluids are present	<input type="checkbox"/>	
Checking question: Are IV fluids not given to treat dehydration unless the child is in shock?	<input type="checkbox"/>	
Checking question: Are pulse and respirations monitored every 10 minutes during IV fluids?	<input type="checkbox"/>	

INDICATORS:	Check	Notes
Step 3: Treat / prevent dehydration		
ReSoMal given instead of ORS to prevent and treat dehydration	<input type="checkbox"/>	
ReSoMal given on time, as prescribed	<input type="checkbox"/>	
Staff accurately measure out ReSoMal volumes according to prescription	<input type="checkbox"/>	
Children on ReSoMal monitored for return of rehydration signs (check pulse rate, respiratory rate every 10 to 30 mn)	<input type="checkbox"/>	
<i>Checking question: Is ReSoMal given routinely after every watery stool?</i>	<input type="checkbox"/>	
Resomal not being given to children who are not severely malnourished (answer yes if given, no if not given)	<input type="checkbox"/>	
Step 4: Correct electrolyte imbalance		
Salt not added to additional foods (ask knowledge of the caregiver and health workers)	<input type="checkbox"/>	
Step 5: Treat/ prevent infections		
Antibiotics given on time (within 30 minutes of prescription time) [Treat]	<input type="checkbox"/>	
Antibiotic type and dose given according to prescription [Treat]	<input type="checkbox"/>	
Staff wash hands between contact with each child [Hand washing]	<input type="checkbox"/>	
Staff wash hands before preparing feeds [Hand washing]	<input type="checkbox"/>	
Mothers wash hands before giving feeds [Hand washing]	<input type="checkbox"/>	
Running water available for staff [Hand washing]	<input type="checkbox"/>	
Soap available for staff [Hand washing]	<input type="checkbox"/>	
Running water available for mothers [Hand washing]	<input type="checkbox"/>	
Soap available for mothers [Hand washing]	<input type="checkbox"/>	
New syringes used for each injection [Ward hygiene]	<input type="checkbox"/>	
New or sterilized syringes used for each feed given through NG tube [Ward hygiene]	<input type="checkbox"/>	
Cups used for feeding children (not bottles) [Ward hygiene]	<input type="checkbox"/>	
Cups washed with soap between each feed [Ward hygiene]	<input type="checkbox"/>	
Feeding equipment washed with soap between each feed preparation [Ward hygiene]	<input type="checkbox"/>	
Separate sink used for washing equipment from washing hands [Ward hygiene]	<input type="checkbox"/>	
Children do not share beds with each other [Ward hygiene]	<input type="checkbox"/>	
Ward appears clean [Ward hygiene]	<input type="checkbox"/>	
No evidence of pests on ward (e.g. rat droppings, cockroaches) [Ward hygiene]	<input type="checkbox"/>	

INDICATORS:	Check	Notes
Clean toilet available for staff [Ward hygiene]	<input type="checkbox"/>	
Clean toilet available for mothers [Ward hygiene]	<input type="checkbox"/>	
Area and detergent available for washing clothes and nappies [Ward hygiene]	<input type="checkbox"/>	
Bed sheets clean and dry [Ward hygiene]	<input type="checkbox"/>	
Steps 7: Start cautious feeding & Step 8: Achieve catch-up growth		
Feeds not shared? [Feed preparation]	<input type="checkbox"/>	
F75 recipe used is correct [Feed preparation]	<input type="checkbox"/>	
RUTF / F100 used as feed once child has stabilized [Feed preparation]	<input type="checkbox"/>	
F100 recipe used is correct [Feed preparation]	<input type="checkbox"/>	
Recipe/s on display close to where feeds are prepared [Feed preparation]	<input type="checkbox"/>	
Jugs measuring in 10ml used to measure volumes [Feed preparation]	<input type="checkbox"/>	
Scoops, if used, provide an accurate measure for each ingredient [Feed preparation]	<input type="checkbox"/>	
Staff use good technique to measure ingredients [Feed preparation]	<input type="checkbox"/>	
Boiled water used to make feeds [Feed preparation]	<input type="checkbox"/>	
Feeds made up to correct volume (whether add x litres or make up to x litres) [Feed preparation]	<input type="checkbox"/>	
Ingredients mixed thoroughly (if starting from scratch, oil not separated out) [Feed preparation]	<input type="checkbox"/>	
Feeds either refrigerated or fresh feeds made every 4 hours [Food storage and administration]	<input type="checkbox"/>	
Utensils and feeds always covered [Food storage and administration]	<input type="checkbox"/>	
WHO F75 feed volume chart easily accessible [Food storage and administration]	<input type="checkbox"/>	
Feeds given on time (within 15 minutes of prescription) [Food storage and administration]	<input type="checkbox"/>	
Staff accurately measure out feed volumes for each child [Food storage and administration]	<input type="checkbox"/>	
Correct feed type given to each child according to prescription (F75 or RUTF / F100) [Food storage and administration]	<input type="checkbox"/>	
Correct volume of feed given to each child according to prescription [Food storage and administration]	<input type="checkbox"/>	
Staff measure any leftovers for each child [Food storage and administration]	<input type="checkbox"/>	
Feeds recorded according to actual volume taken (i.e. leftovers charted) [Food storage and administration]	<input type="checkbox"/>	

INDICATORS:	Check	Notes
Feeds recorded according to actual time given [Food storage and administration]	<input type="checkbox"/>	
If child vomits, feed re-offered [Food storage and administration]	<input type="checkbox"/>	
Reluctant feeders encouraged to eat with patience (no force feeding) [Food storage and administration]	<input type="checkbox"/>	
Children on RUTF / F100 fed until quantity offered finished [Food storage and administration]	<input type="checkbox"/>	
<i>Checking question: Are additional foods withheld from children in stabilisation phase? Ask mother: is the child given anything in addition?</i> [Food storage and administration]	<input type="checkbox"/>	
Oral route tried first before NG route used at each feed [NGT]	<input type="checkbox"/>	
NG tube checked to ensure in place before each feed [NGT]	<input type="checkbox"/>	
Large syringes used for NG feeding (e.g. 20ml) so that fluid can flow freely [NGT]	<input type="checkbox"/>	
NG tube flushed with water (about 20 ml) straight after feeds [NGT]	<input type="checkbox"/>	
Feed allowed to flow through tube by gravity, not forced [NGT]	<input type="checkbox"/>	
Step 9: Sensory stimulation		
Home-craft workers / Nurses touch and hold the children	<input type="checkbox"/>	
Home-craft worker / Nurse contacts with children are gentle, caring and loving	<input type="checkbox"/>	
Mothers interact with their children	<input type="checkbox"/>	
Colourful pictures/ displays up on walls	<input type="checkbox"/>	
Toys are available in/ around beds	<input type="checkbox"/>	
Checking question: Are structured play sessions held for children?	<input type="checkbox"/>	
Step 10: Follow up		
Mothers are treated kindly and supportively by staff	<input type="checkbox"/>	
Checking question: Are educational sessions on children stimulation held for mothers?	<input type="checkbox"/>	
Checking question: Are mothers given a transfer card and referred to the nearest outpatient site to their home?	<input type="checkbox"/>	
Checking question: Are mothers given a weekly ration of RUTF in discharge from NRU	<input type="checkbox"/>	
Checking question: Is the list of health centre providing outpatient Management of SAM available and information given to the mothers?	<input type="checkbox"/>	
Raw skin covered (zinc and castor oil ointment, or petroleum jelly or paraffin gauze) [Nursing]	<input type="checkbox"/>	
1% potassium permanganate solution diluted to pale violet to treat dermatosis [Nursing]	<input type="checkbox"/>	

INDICATORS:	Check	Notes
Pulse rate recorded [Nursing]	<input type="checkbox"/>	
Respiratory rate recorded [Nursing]	<input type="checkbox"/>	
Temperature recorded twice daily [Nursing]	<input type="checkbox"/>	
Set of weighing scales present [Monitoring]	<input type="checkbox"/>	
Good technique used to weigh children [Monitoring]	<input type="checkbox"/>	
Length board present OR MUAC tapes available [Monitoring]	<input type="checkbox"/>	
Good technique used to measure height/length OR to measure MUAC [Monitoring]	<input type="checkbox"/>	
WHO weight for length charts OR MUAC charts easily accessible to staff [Monitoring]	<input type="checkbox"/>	
Critical Care Pathway (CCP), weight gain tally sheet, 24 hour feeding card filled for each child [Monitoring]	<input type="checkbox"/>	
Separate ward or 'corner' available to treat severe malnutrition [Ward]	<input type="checkbox"/>	
Separate kitchen available [Ward]	<input type="checkbox"/>	<i>de</i>
Guidelines for treatment of severe malnutrition easily accessible to staff [Ward]	<input type="checkbox"/>	
Charts for each child kept at end of their bed (e.g. intake, weight, drugs, vital signs) [Ward]	<input type="checkbox"/>	
Admissions register complete (n admitted, readmission, defaulters, death, cured) [Ward]	<input type="checkbox"/>	
Referral slip for outpatient care complete [Ward]	<input type="checkbox"/>	
Ward in good state of repair [Ward]	<input type="checkbox"/>	
Equipment on ward in good working order [Ward]	<input type="checkbox"/>	
Oxygen available [Ward]	<input type="checkbox"/>	
Minimum of one nurse to five children available during day [Staff]	<input type="checkbox"/>	
At least one qualified nurse, plus one other person available at night [Staff]	<input type="checkbox"/>	
Duty shift organised every 12 hours [Staff]	<input type="checkbox"/>	
Ward round carried out every day, including weekends [Staff]	<input type="checkbox"/>	
Doctor/s visit ward at least once per day outside of ward rounds/ emergencies [Staff]	<input type="checkbox"/>	
KEY NOTES		

(1c) NRU Routine data

	Number
Total at the start of the month	
WFH/L < -3 z-score	
MUAC < 11.5cm	
Bilateral Oedema	
Other	
TOTAL NEW ADMISSIONS	
Returned defaulter	
Transfer from Hospital	
Transfer from OTP	
Transfer from other NRU	
TOTAL ADMISSIONS	
Stabilised	
Cured	
Died	
Default	
Medical Transfer	
Transfer to other NRU	
TOTAL EXITS	
Total at the end of the month	
Cure Rate (%)	
Death Rate (%)	
Default Rate (%)	
Medical Transfer	
Children referred for HTS	
Children tested for HIV	
Children HIV status already known	
Child HIV sero-status R: (1)	
Child HIV sero-status NR: (0)	
HIV Exposed children	
On ART	

Annex B: Quality Improvement Checklist of Inpatient Management of SAM

The matrix on the following pages provides an example on assessing and preparing an action plan to improve the quality of inpatient management of SAM.

For each activity in each step of the care process, ask yourself the following questions:

- Do we routinely do this now? If yes, put a check under ‘Current Status’. If no, write in what you do now.
- Is action taken after implementing the step in the care process?
- Is there a flow or process in place on how to do the steps in care process?
- Is there a team of health care providers to oversee the implementation of the activities?
- Are data and information documented on the process and outcomes?
- Are the data used to continuously improve the patient care and ward procedures?
- After identifying the problem, ask yourself, what must we do to start this activity?’ Consider all the actions that are needed to introduce each change and write them in.
- Who will take responsibility for seeing that these actions are carried out? And by when?
- What new resources will we need?
- Who will take responsibility for getting these resources? And by when?

Example of Quality Improvement Checklist for Inpatient Management of SAM

Step (Hospital)	Current Status (What do we know?)	Changes to be introduced (New things we must do)	Who will organise changes?		New resources needed	Who will organise resources?	
			Who?	When?		Who?	When?
EMERGENCY TRIAGE ASSESSMENT AND TREATMENT (ETAT)							
Malnourished children need care that is <u>different</u> from the care provided to other children. Prioritise cases with severe wasting or oedema in the Emergency Room (ER) for ETAT.							
Prioritise cases with severe wasting or oedema in the outpatient department (OPD) queue for ETAT.							
Measure MUAC and check oedema for new admissions.							
Have trained staff in the ER on ETAT in case of SAM.							
Separate children with SAM in SAM ward or corner in the paediatric ward.							
Move child quickly from ER or OPD to the SAM ward.							
FULL ASSESSMENT							
Submit the child for a full assessment at the appropriate time in the management of SAM procedures.							
Examine the child, take history.							
Confirm signs or suspected illness with laboratory tests and other investigations.							
Decide on differential diagnose and full treatment plan.							

TREAT or PREVENT HYPOGLYCAEMIA AND HYPOTHERMIA							
If conscious, - Give bolus 10% glucose or sucrose solution orally. - Feed straightaway.							
If unconscious, - Give bolus 10% sterile glucose IV. Keep the child warm. Give antibiotic.							
Keep (re-warm) the child warm: use kangaroo technique; cover with a blanket, mother sleeps with child in adult bed.							
If conscious, Feed straightaway.							
If conscious, Feed every 2 hours day and night. Feed on time. Keep room warm: use heater, exclude draughts.							
Change wet clothes and bedding; have 24-hour linen supply.							
Do staff know warning signs: lethargy, limpness, drowsy or loss of consciousness; retraction of eyelids, low temperature?							
TREAT SEVERE PNEUMONIA							
Give oxygen. Give antibiotic.							
Monitor pulse and respirations every 5–10 min.							
TREAT SHOCK							
Give oxygen. Give antibiotic.							
Give 10% glucose by IV.							
If lethargic or unconscious: Give IV fluids.							
If no response to IV treatment: Treat for septic shock, and give blood transfusion (with diuretic).							
Monitor pulse and respirations every 5–10 min.							
TREAT BLINDING EYE SIGNS							
Give vitamin A treatment. Give antibiotic.							
Give eye care: wash, apply antibiotic eye ointment, bandage.							

Give atropine.							
TREAT SEVERE ANAEMIA							
Give oxygen. Give antibiotic.							
Give blood transfusion (with diuretic).							
TREAT DEHYDRATION							
<u>If conscious and not in shock:</u> Give ReSoMal 5ml/kg every 30 minutes for 2 hours orally.							
Monitor pulse and respirations every 30 minutes during oral rehydration.							
Stop ReSoMal when there are signs of hydration.							
After rehydration, give ReSoMal orally after each watery stool.							
Do staff know: signs of dehydration, hydration and over-hydration?							
TREAT AND PREVENT INFECTIONS AND OTHER MEDICAL CONDITIONS							
Give first-line antibiotic.							
Give antibiotic on time.							
Give antihelminth after 1 week in treatment to children > 1 year.							
Give measles vaccine to children > 6 months. Give repeat vaccine at discharge from hospital.							
Give vitamin A treatment dose when corneal clouding or corneal ulceration and/or recent measles (past 3 months).							
Do staff know when to give first line, second-line and third-line antibiotic and administer correct dose?							
Examine and treat other infections and medical conditions according to the national guidelines.							
Provide adult beds with insecticide-treated bed nets for mother and child to sleep under.							
TEST AND LINK CHILDREN TO HIV CARE AND TREATMENT							
Conduct HIV testing routinely for every SAM child.							
All HIV-positive SAM children should be linked/referred to HIV care and treatment points.							
Results for HIV testing should be documented in the Inpatient Care Treatment Charts?							
Inpatient Care Treatment Charts should be regularly reviewed to audit HIV testing and the linkage of treatment and care							

TREAT AND PREVENT MICRONUTRIENT DEFICIENCIES							
Do not give vitamin A preventive dose if therapeutic foods comply with WHO specifications, but give if therapeutic foods do not comply with WHO specifications.							
Give folic acid, single dose on day 1.							
Give iron sulphate after 2 days in transition phase and only when on F-100.							
If clinical signs of hypokalemia: give extra potassium.							
If clinical signs of hypomagnesium: give extra magnesium.							
Do staff know that vitamin A, folic acid, zinc and copper are already in the commercial therapeutic foods, or in the locally prepared foods when CMV is being used?							
THERAPEUTIC FEEDING							
Stabilisation							
Give F-75 therapeutic milk 130 ml/kg/day and divide into 2-hourly to 3-hourly feeds.							
If the child has severe oedema (+++), reduce the volume to 100 ml/kg/day.							
Give 2-hourly feeds in the first 24 hours, then change to 3-hourly feeds according to the condition of the child.							
If the child has poor appetite, encourage the mother to support the child finishing the feed.							
Use an NG tube, if the child takes < 80% of the amount offered for two consecutive feeds.							
Keep a 24-Hour Food Intake Chart for each child. Measure feeds carefully.							
If the child is breastfed, always offer breastfeeding before giving F-75.							
Weigh daily and plot weight.							
When appetite returns, move the child to transition phase.							
Transition							

<p><i>Gradually introduce RUTF:</i> Offer RUTF at each feed with plenty of clean water to drink. -If the child takes the RUTF (passes the appetite test), continue all feeds with RUTF, based on 150 kcal/kg/day. -If the child takes not all RUTF, top up/complete the feed with F-75 or F-100. -If the child does not take RUTF, give F-100 but repeat offering RUTF at every feed.</p>							
<p><i>If RUTF is not available:</i> Continue feeding with F-100 and divide in 5-hourly to 6-hourly feeds.</p>							
<p>If the child is breastfed, encourage continued breastfeeding.</p>							
<p>Weigh daily and plot weight. (The child should not gain more than 5 g/kg/day.)</p>							
<p>Observe the child for 24 hours to ensure he/she is able to eat the daily amount of RUTF, and transfer the child to outpatient care to continue treatment.</p>							
Rehabilitation of feeding for catch-up growth							
<p>If RUTF is available, but the child cannot be transferred to outpatient care, give RUTF in correct amounts 150–220 kcal/kg/day. Offer plenty of water to drink.</p>							
<p>If RUTF is not available, continue free feeding on F-100 150kcal/kg/day–220 kcal/kg/day. Offer extra amounts of F-100, if the child finishes the amount prescribed.</p>							
<p>If the child is breastfed, encourage continued breastfeeding.</p>							
<p>Weigh daily and plot weight. (The child should start gaining weight, i.e., more than 10 g/kg/day).</p>							
<p>Gradually introduce home foods before the child reaches end of treatment.</p>							
HYGIENE PROMOTION							
<p>Keep children with SAM in a separate ward.</p>							
<p>Reduce overcrowding.</p>							
<p>Prevent cross infections: - Wash hands before preparing feeds, after use of bathroom, after change of nappies, before and after handling the child. - Ensure good hygiene in the ward. - Discard leftover feeds. - Change bedding regularly.</p>							
EMOTIONAL AND SENSORIAL DEVELOPMENT							
<p>Provide tender loving care to the child.</p>							

Help and encourage mothers to comfort, feed and play with their children.							
Give structured play when the child is well enough; this improves development.							
PSYCHOSOCIAL SUPPORT TO MOTHER OR CARER							
Assess health and nutritional status.							
As needed, provide health and nutritional treatment or support.							
As needed, provide psychosocial support.							
Link with community health worker and community support initiatives.							
PREPARE TRANSFER and DISCHARGE							
Update immunisation schedule.							
Fill in the Outcome of the Treatment Card.							
Inform the mother of the closest outpatient care site to her home and give the mother a weekly ration of RUTF.							
Establish a link with community health workers for follow-up in outpatient care.							
Write a clinical summary on the referral form for the health care providers in outpatient care.							
Link mother or carer with community IYCF and other support initiatives.							
CONDUCT DEATH AUDITS							
Death audit should be conducted for every SAM child who dies in the inpatient care							
Findings from death audits should be used for decision making at the facility level Findings from death audits should be recorded and reported to central level							
Death audit should be conducted for every SAM child who dies in the inpatient care							

Annex C: Nutrition Rehabilitation Unit (NRU) Monthly Reporting Form

	Definition
Admissions	
Total at the start of the month (A)	The number in the NRU at the start of month
Total New Admissions (F)	The number admitted to the NRU classified according to WFH/L z-score, MUAC, bilateral oedema or other = B+ C+D+E
Returned Defaulter (G)	Defaulted within the past 3 months and has returned to continue with treatment
Transfers from	Those transferred from hospital (H), OTP (I), or another NRU (J)
Total Admissions (K)	The total number of children <6 months, 6–59 month, 5–12 years and 12–15 years admitted to the NRU as new and old cases = F+G+H+I+J
Discharges	
Discharges	The number discharged from NRU according to category; stabilized to OTP, cured, died, defaulted, non-cured, transfers and referrals
Stabilised (L) and Cure rate (M)	The proportion of children who are stabilised and discharged to OTP, and those who cured in NRU (i.e. reached the OTP discharge criteria while in NRU). = (L+M)/(L+M+N+O+P)*100
Death rate (N)	The proportion of children discharged having died while registered in the NRU = (N)/(L+M+N+O+P)*100
Default rate (O)	The proportion of children discharged having defaulted from NRU = (O)/(L+M+N+O+P)*100
Non-cured rate (P)	Proportion of children discharged from the programme and have not achieved the NRU discharge criteria for cure = (P)/(L+M+N+O+P)*100
Referrals (Q) and Transfer (R)	Referrals: The number of children whose health condition deteriorated and are referred for further medical care. Transfers: The number of children who have been transferred for treatment in another NRU.
Total Discharged (S)	The total number of children < 6 months, 6–59 months and 5–12 years and 12–15 years discharged from the NRU = L+M+N+O+P+Q+R
Total at the end of month (T)	Total number of children in the NRU at the end of the month. = (A+K)-S
HIV Testing Services (HTS)	
Children referred for HTS	Children referred for HIV testing services during the reporting month
Children tested for HIV	Children who were tested and results received during the reporting month
Children HIV status is already known	Children who were tested elsewhere and verified from a health document
Child HIV Sero-status	Includes all those children who were tested and results received during the month, plus those who were tested elsewhere, classified by R (1), NR (0) and Exposed children
Number of Children on ART	Includes those children who are on ART
Other Information	
Number of relapse	Children who were successfully treated in the NRU within the last 6 months, but again meet the eligibility requirement for admission.
New admissions by gender	New admissions should be recorded by gender and age category; <6 months, 6-59 months and 5-12 years and 12-15 years.
Parental Status	The children parental status classified by; those without mother, father, both parents and those with both parents

Name of Health Facility:	Month:	Year:
District:	TA:	
Prepared by:	Position:	
Checked by:	Position:	

Age	Total at the start of the month (A)	New admissions				Total new admissions (F)=B+C+D+E	Returns and Transfers			Total Admissions (K) = F+G+H+I+J	Discharges					Referral and Transfer to		Total discharged (S)=L+M+N+O+P+Q+R	Total at end of month (T)=(A+K)-S	
		WFH/L z-scores (B)	MUAC (C)	Bilateral Oedema (D)	Other (E)		Returned defaulter (G)	Transfer from			Other NRU (J)	Stabilised to OTP (L)	Cured (M)	Died (N)	Defaulted (O)	Non-cured (P)	Medical transfer (Q)			Other NRU (R)
								Hospital (H)	OTP (I)											
< 6 Months																				
6-59 months																				
5-12 years																				
12-15 years																				
TOTAL																				

Other Information:

Target	>75%	<10%	<15%	N/A	Stabilised & Cure rate = $L+M / (L+M+N+O+P) * 100$ Death rate = $N / (L+M+N+O+P) * 100$ Default rate = $O / (L+M+N+O+P) * 100$ Non-cured rate = $P / (L+M+N+O+P) * 100$
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Children referred for HTS <i>No. referred during the month</i>	Children tested for HIV <i>No. of test results received in the month</i>	Children HIV status already known <i>No. of children tested elsewhere</i>	New admissions by gender (Children from 0 months-15 years)								Parental Status	
			< 6 months		6-59 months		5- 12 years		12-15 years		Without mother	
			Male	Female	Male	Female	Male	Female	Male	Female	Without father	
Child HIV sero-status <i>Of all children tested (include children tested elsewhere)</i> R=Reactive NR=Non-Reactive	R (1)										Without both parents	
	NR(0)										With both parents	
HIV Exposed children												
Number of children on ART												

Comments on performance indicators:

Answers to Exercises

Answers to short answer exercise, page 4

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

Answers to short answer exercise, page 12

1. $7.30 \text{ kg} - 7.25 \text{ kg} = 0.05 \text{ kg}$
 $0.05 \text{ kg} \times 1,000 = 50 \text{ grams gained}$
 $50 \text{ grams} \div 7.25 = 6.90 \text{ g/kg/day}$
2. $6.25 \text{ kg} - 6.22 \text{ kg} = 0.03 \text{ kg}$
 $0.03 \text{ kg} \times 1,000 = 30 \text{ grams gained}$
 $30 \text{ grams} \div 6.22 = 4.8 \text{ g/kg/day}$
3. $7.5 \text{ kg} - 7.6 \text{ kg} = -0.1 \text{ kg}$
 $-0.1 \text{ kg} \times 1,000 = -100 \text{ grams gained (or 100 grams lost)}$
 $-100 \text{ grams} \div 7.6 = -13.16 \text{ g/kg/day}$

Answers to short answer exercises, page 47

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

