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NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन

Facility Based Integrated Management of Neonatal and Childhood Illness (F-IMNCI)




Child Health Division
Ministry of Health & Family Welfare
Government of India

2023

Facilitator Guide

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Facility Based Integrated Management of Neonatal and Childhood Illness (F-IMNCI)

FACILITATOR GUIDE

2023

डॉ. विनोद कुमार पॉल
सदस्य
Dr. Vinod K. Paul
MEMBER

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

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13th November, 2023

MESSAGE

I am pleased to note that the Ministry of Health and Family Welfare has developed the revised version of Integrated Management of Neonatal and Childhood Illness (IMNCI) and developed Facility Based Care of Sick Children as an update of "Facility Based Integrated Management of Neonatal and Childhood Illness (F-IMNCI)" training package which are being released.

National Health Policy (NHP) 2017 provides a framework to strengthen healthcare system for attaining Universal Health Coverage (UHC) and work on Government's philosophy of 'Sabka Sath Sabka Vikas'. Our flagship programme 'Ayushman Bharat' is working towards attainment of UHC as one of the key targets under Sustainable Development Goals. Under this UHC, we are committed to provide appropriate healthcare to newborns and children across the country. Our progress has been steady, despite the COVID-19 pandemic and we are making all efforts to improve children's survival.

There's a continuous need for upskilling and revising training packages, based on recent challenges and new evidence. The training packages developed by the Ministry of Health and Family Welfare are a right step in this direction towards addressing comprehensive management of newborns and sick children in outpatient as well as in-patient settings. These will be helpful in setting up better standards of care in public health facilities for our newborns and children and will help us ensure that each child gets a better start to life and is provided an equal opportunity to survive and thrive.

I extend my best wishes to everyone.

(Vinod Paul)

स्वच्छ भारत
एक कदम स्वच्छता की ओर

सुधांश पंत
सचिव
Sudhansh Pant
Secretary

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आज़ादी का अमृत महोत्सव

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स्वास्थ्य एवं परिवार कल्याण विभाग
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
Government of India
Department of Health and Family Welfare
Ministry of Health and Family Welfare

MESSAGE

Health systems strengthening over the last decade brought a considerable improvement in the infrastructure, availability of human resources, drugs and equipment along with supportive services all across India. Effective sick newborn and child care is a crucial challenge that is faced by every health care system in low resource settings. While efforts are being made to improve the availability of specialists dealing with sick newborns and children, training of doctors, nurses and peripheral health workers remains key to equip the staff with appropriate knowledge and skills to provide evidence based healthcare to children.

With advances in critical care and based on evidence, the Integrated Management of Neonatal and Childhood Illness (IMNCI) training package has now been revised by the Child Health Division, with updated algorithm and improved training methodology. The revised training package also includes recommendations of the technical expert group on paediatric management of common illness. The package has been bifurcated and rebranded into OPD based Integrated Management of Neonatal and Childhood Illness Modules and Facility Based Care for Sick Children Package for inpatient management.

This revised package provides latest, evidence-based knowledge in improving newborn and child at facilities to provide required care for a newborn and child to identify and manage common conditions, complications, and emergency management of children, including pre-referral management, thereby saving many precious lives.

I hope that these training modules will be rolled out expeditiously across the States and UTs to ensure essential care to the children as a first step towards healthy childhood and adult life.

Date: 15.11.2023
Place: New Delhi

Sudhansh Pant
(Sudhansh Pant)

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FOREWORD

The Ministry of Health and Family Welfare, Government of India has implemented a number of policies and programmes aimed at ensuring universal access to health coverage and reducing child and neonatal mortality. Our country has made sizeable gains in last one decade in Child Mortality and reach to 32 per 1000 Live births in the year 2020. Under National Health Policy (NHP) 2017, the country has set-up ambitious targets of Under 5 Mortality i.e. 23 per 1000 Live births by 2025 and our team is closely working with States/ UTs to achieve these targets in given time frame.

To fulfill the role of providing quality healthcare services for newborns and children, Ministry of Health and Family Welfare, Government of India has developed training package for comprehensive management of illness in newborns and under-five children with distinct outpatient and inpatient components. These target the capacity building needs of pediatricians, medical officers, nurses and peripheral health workers and provide knowledge and skills of high order required for management of common conditions that lead to maximum morbidity and mortality among children in our country.

I would like to express my heartfelt appreciation to all those who contributed to the preparation of these documents. I am sure that these packages will help in equipping our healthcare providers with knowledge and skill to deliver newborn and child health services with quality, all across the country.

With best wishes!

(Ms. L S Changsan)

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PREFACE

The Government of India is committed to achieve goals under National Population Policy (2017) and bring down Neonatal Mortality Rate to 16 and Under Five Mortality Rate to 23 by 2025, which are well beyond the Sustainable Development Goals (SDGs) set for 2030. Newborn and Child health are the central pillars in the Reproductive, Maternal, Newborn, Child, Adolescent Health and Nutrition (RMNCAH+N) strategy. Inter-linkages between various RMNCAH+N life cycle stages have a significant impact on the mortality and morbidity of children.

The Child Health Division of the Ministry, with support from technical experts and development partners has revised Facility Based Integrated Neonatal and Childhood Illness (F-IMNCI) developed in the year 2009, with updated algorithms and improved training methodology and presented it in a pictorial format which also serves as a job-aid. The F-IMNCI training package has been divided into two packages of "Integrated Management of Newborn and Child Illnesses (IMNCI)" – for outpatient management of both young infants (0-2 months) and children up to five years of age and new package titled, "Facility Based Care of Sick Children" – focusing on appropriate inpatient management of major causes of childhood mortality beyond neonatal age from one month to 59 months old children with common illnesses, like pneumonia, diarrhoea, malaria, meningitis, and severe malnutrition. The training duration has been reduced to make it more practical.

The package emphasizes on the skill imparting techniques by the facilitators and ensures uniform messaging across all the levels. With this revised training package, we hope that the training will be more hands-on and the entire training experience will be enhanced, leading to better learning outcomes. I urge the States and UTs to take this package up to scale and universalize it by the end of 2024-25.

I am hopeful that by adopting this revised training package, the trainers along with service providers will feel more confident in carrying on with their roles and responsibilities. I would also like to place on record my appreciation for the hard work and untiring efforts put in by the Child Health Division in revising and developing the training package. I assure the States and UTs full support, of my team, in taking this important initiative forward.

(Dr. P. Ashok Babu)

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ACKNOWLEDGEMENT

India has witnessed a huge transformation in the scenario of children's health evident by faster reduction in child mortality over the last decade as compared to global rates. This has been made possible by India's continued investments in health systems which are being strengthened further in the wake of threats posed by COVID-19 pandemic through improvement of physical infrastructure and training of health care providers to equip them with suitable skill sets at different levels of care, to deliver quality newborn and child health services.

The Facility Based Integrated Neonatal and Childhood Illness (FIMNCI) package was first launched in India in the year 2009 guiding appropriate inpatient management of major causes of childhood mortality, which has now been bifurcated into two packages based on outpatient and inpatient management:

1. Integrated Management of Newborn and Child Illnesses (IMNCI)- for outpatient management of both young infants (0-2 months) and children up to five years of age with two separate chart booklets for healthcare workers (ANM) and Physicians to be covered over five days.

Cont'd on next page

2. New package titled, "Facility Based Care of Sick Children" - focuses on providing appropriate inpatient management of major causes of childhood mortality beyond neonatal age i.e. one month to 59 months old children with common illnesses, like- pneumonia, diarrhoea, malaria, meningitis, and severe malnutrition also taught over five days.

Other major differences are:

I. Facility based approach dissociated from IMNCI; management is now linked to Emergency signs
II. New chapters added on management of children with shock, management of children presenting with lethargy, unconsciousness or convulsions, supportive care
III. National Guidelines for pediatric management of COVID-19, Malaria, Dengue and Tuberculosis included
IV. Training videos developed by KSCH, Lady Hardinge Medical College

These training packages are a culmination of the work initiated by my previous colleagues Dr Ajay Khera, Ex-Commissioner (MCH); Dr P K Prabhakar, Ex Joint Commissioner (CH) and Dr. Sumita Ghosh, Ex- Additional Commissioner (Child Health), I convey my sincere gratitude for their vision. I would also like to thank Prof. (Dr) Praveen Kumar, Kalawati Saran Children's Hospital (KSCH), New Delhi and his team who worked very hard to develop and revise this package. I also want to acknowledge the contribution of Dr. Ashfaq Bhat (NIPI), Dr. Deepti Agarwal (WHO-India), Vishal Kataria (MoHFW) and Vaibhav Rastogi (MoHFW) who had worked together with KSCH to refine this package further with the support of Academicians, Experts, State Child Health Officers, Development Partners (NIPI, WHO, UNICEF, USAID, IPE Global, PATH) and also supported the pilot testing.

The Child Health Division will provide all the necessary support to the States and UTs to roll out these training packages at the earliest and contribute towards further improving children's health and survival. I wish you the very best for your efforts and look forward to your continued support as we move together on the mission to improve the quality of life of children and attain the national health goals.

(Dr. Shobhna Gupta)

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ABBREVIATIONS

20WBCT	20-minute Whole Blood Clotting Test
ABCS	Acidosis, Bleeding, Blood Sugar, Calcium, Serum Sodium and Potassium
ACT	Artemisinin Based Combination Therapy
ACT-AL	Artemisinin Based Combination Therapy - Artemether-Lumefantrine
ACT-SP	Artesunate-Sulphadoxine-Pyrimethamine
ADR	Adverse Drug Reaction
AED	Automated External Defibrillator
AED	Anti-Epileptic Drugs
AES	Acute Encephalitis Syndrome
AL	Artemether-Lumefantrine
ARDS	Acute Respiratory Distress Syndrome
ASOM	Acute Suppurative Otitis Media
ASV	Anti-Snake Venom
ATT	Anti-Tuberculosis Treatment
AVPU	Alert, Verbal, Pain, Unresponsive
BAL	Bronchoalveolar Lavage
BMI	Body Mass Index
CBNAAT	Cartridge Based Nucleic Acid Amplification Technique
CECT	Contrast-Enhanced Computed Tomography
CHF	Congestive Heart Failure
CP	Continuation Phase
CPR	Cardio-Pulmonary Resuscitation
CQ	Chloroquine
CRP	C-Reactive Protein
CRT	Capillary Refill Time
CSF	Cerebrospinal Fluid
DF	Dengue Fever
DHF	Dengue Haemorrhagic Fever
DMSA	Dimercaptosuccinic Acid
DOT	Directly Observed Treatment
DSTB	Drug Sensitive TB
ECG	Electrocardiogram
EDS	Expanded Dengue Syndrome
EPTB	Extra Pulmonary Tuberculosis
ERS	Emergency Response System
ETAT	Emergency Triage Assessment and Treatment
FDCS	Fixed Dose Combinations
FFP	Fresh Frozen Plasma
HCT	Haematocrit
HCWS	Health Care Workers
HR	Heart Rate
HRE	Isoniazid (H), Rifampicin (R), Ethambutol (E)

HRZE	Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), Ethambutol (E)
HSV	Herpes Simplex Virus
ICP	Intracranial Pressure
ICT	Intracranial Tension
IDA	Iron Deficiency Anaemia
IGRA	Interferon Gamma Release Assay
IVC	Inferior Vena Cava
JE	Japanese Encephalitis
LTB	Laryngo Tracheo Bronchitis
MDI	Metered Dose Inhaler
MDR	Multi-Drug Resistant
MDRTB	Multidrug-Resistant Tuberculosis
MR	Mono-Resistant
MTB	Mycobacterium Tuberculosis
MUAC	Mid Upper Arm Circumference
NG	Nasogastric
NPIC	National Poisons Information Centre
NS	Normal Saline
NSAID	Nonsteroidal Anti-Inflammatory Drugs
NTEP	National Tuberculosis Elimination Program
ORT	Oral Rehydration Therapy
PCR	Polymerase Chain Reaction
PDR	Poly-Drug Resistant
PEA	Pulseless Electric Activity
PPD	Purified Protein Derivative
PPE	Personal Protection Equipment
PQ	Primaquine
PS	Peripheral Smear
PTB	Pulmonary Tuberculosis
RDT	Rapid Diagnostic Test
RL	Ringer's Lactate
RR	Respiratory Rate
RR-TB	Rifampicin Resistant TB
RT-PCR	Reverse Transcriptase - Polymerase Chain Reaction
SAM	Severe Acute Malnutrition
SE	Status Epilepticus
URI	Upper Respiratory Infection
UTI	Urinary Tract Infection
VCUG	Voiding Cystourethrography
VF	Ventricular Fibrillation
VT	Ventricular Tachycardia
VTM	Viral Transport Media
WALRI	Wheeze Associated Lower Respiratory Infection
XDR	Extensively Drugs Resistant
ZN	Ziehl-Neelsen

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SECTION A: GUIDELINES FOR FIMNCI TRAINING

INTRODUCTION

This facility-based-care of sick children training focuses on providing appropriate inpatient management of major causes of childhood mortality beyond neonatal age i.e. 1 month to 59 months old children with common illnesses like pneumonia, diarrhoea, malaria, meningitis, and severe malnutrition. Babies less than one month will be treated using facility based newborn care guidelines.These are the common illnesses for which children are usually referred by peripheral health workers to district hospital/ health facility. Both IMNCI trained or untrained medical officers or pediatricians involved in the care of sick children can undergo this training.

The interventions in the training manual are based on the latest available scientific evidence.The manual also complement standard comprehensive paediatric textbooks, which should be consulted for management of children above 59 months, complications or conditions which are less commonly seen in this age group and not discussed here. Attempt has been made to make necessary changes in view of COVID-19. However, the participants are also advised to follow latest national/regional management guidelines for diseases like COVID-19, Novel influenza, Japanese encephalitis etc. whenever epidemiologically important.

The training module has ten chapters dealing with different conditions which are given below:

Section 1: General principles of management of sick children (1 month - 5 years).
Section 2: Emergency triage assessment and treatment (ETAT).
Section 3: Approach to a child with cough or difficulty in breathing.
Section 4: Management of children with shock.
Section 5: Management of child presenting with lethargy, unconsciousness, or convulsions.
Section 6: Approach to a child presenting with diarrhoea.
Section 7: Case management of children presenting with fever.
Section 8: Management of children with anaemia.
Section 9: Assessing the nutritional status and management of children with malnutrition.
Section 10: Supportive care.

Facilitator has to follow daily activities as described in this Facilitator Guide.

How does this course differ from other training courses?

The material in the course is not presented by lecture. Instead, each participant is given a module that has the basic information to be learned. Information is also provided through demonstrations and videotapes. The training is designed to help each participant develop specific skills necessary for emergency case management of sick children and providing appropriate treatment after stabilization.

The training methodology used is based on the adult learning principles through use of:

- Self-reading of module
- Summary of key points by power point presentation
- Group discussion
- Demonstrations through video, mannequin, etc.
- Individual case exercises
- Clinical sessions
- Hands-on training

Almost 40% time is spent on building skills through clinical and equipment demonstration sessions.

Who is a FACILITATOR?

A facilitator is a person who helps the participants in learning the skills presented in the course. The facilitator spends much of his time in discussions with participants, either individually or in small groups. For facilitators to give enough attention to each participant, a ratio of one facilitator to 6 participants is desired. In your assignment to teach this course, YOU are a facilitator.

As a facilitator, you need to be very familiar with the material being taught. It is your job to give explanations, do demonstrations, answer questions, talk with participants about their answers to exercises, conduct role plays, lead group discussions, organize and supervise clinical practice, and generally give participants any help they need to successfully complete the course. You are *not* expected to teach the content of the course through formal lectures *(Nor is this a good idea, even if this is the teaching method to which you may be accustomed)*.

What, then, DOES a FACILITATOR do?

As a facilitator, you do 3 basic things:

1. **You INSTRUCT:**
    - Make sure that each participant understands how to work through the materials and what he is expected to do in each section and each exercise.
    - Answer the participant's questions as they occur.
    - Explain any information that the participant finds confusing, and help him to understand the main purpose of each exercise.
    - Lead group activities, such as group discussions, video exercises, and role plays, to ensure that learning objectives are met.
    - Promptly assess each participant's work and give correct answers.
    - Discuss with the participant how he obtained his answers in order to identify any weaknesses in the participant's skills or understanding.
    - Provide additional explanations or practice to improve skills and understanding.
    - Help the participant to understand how to use skills taught in the course in his own facility/hospital.
    - Explain what to do in each clinical practice session.
    - Model good clinical skills, including communication skills, during clinical practice sessions.
    - Give guidance and feedback as needed during clinical practice sessions.

2. **You MOTIVATE:**
   - Compliment the participant on his correct answers, improvements or progress.
   - Make sure that there are no major obstacles to learning (such as too much noise or not enough light).

3. **You MANAGE:**
   - Plan ahead and obtain all supplies needed each day, so that they are in the classroom or taken to the clinic when needed.
   - Make sure that movements from classroom to clinic and back are efficient.
   - Monitor the progress of each participant.

FACILITATION TECHNIQUES

A. Techniques to motivate participants

Encourage Interaction

1. During the first day, you will talk individually with each participant several times (for example, during individual feedback). If you are friendly and helpful during these first interactions, it is likely that the participants (a) will overcome their shyness; (b) will realize that you want to talk with them; and (c) will interact with you more openly and productively throughout the course.
2. Look carefully at each participant's work (including answers to exercises). Check to see if participants are having any problems, even if they do not ask for help.
3. Be available to the participants at all times.

Keep participants involved in discussions

4. Frequently ask questions to check their understanding and to keep them actively thinking and participating.
5. Acknowledge all participants' responses with a comment, a 'thank you' or a 'definite nod'. This will make the participants feel valued and encourage participation.
6. Answer participant's questions willingly, and encourage participants to ask questions when they have them rather than to hold the questions until a later time.
7. Do not feel compelled to answer every question yourself. Depending on the situation, you may turn the question back to the participant or invite other participants to respond. You may need to discuss the question with the another facilitator before answering. Be prepared to say "I don't know but I'll try to find out."
8. Use names when you call on participants to speak, and when you give them credit or thanks. Use the speaker's name when you refer back to a previous comment.
9. Always maintain eye contact with the participants so everyone feels included. Be careful not to always look at the same participants. Looking at a participant for a few seconds will often prompt a reply, even from a shy participant.

Keep the session focused and lively

10. Keep your presentations lively:
    - Present information conversationally rather than read it.
    - Speak clearly. Vary the pitch and speed of your voice.
    - Use examples from your own experience, and ask participants for examples from their experience.
11. Write key ideas on a flipchart as they are offered. (This is a good way to acknowledge responses. The participant will know his suggestion has been heard and will appreciate having it recorded for the entire group to see).
12. At the beginning of a discussion, write the main question on the flipchart. This will help participants stay on the subject. When needed, walk to the flipchart and point to the question.
13. Paraphrase and summarize frequently to keep participants focused. Ask participants for clarification of statements as needed. Also, encourage other participants to ask a speaker to repeat or clarify his statement.
14. Restate the original question to the group to get them focused on the main issue again. If you feel someone will resist getting back on track, first pause to get the group's attention, tell them they have gone out of topic, and then restate the original question.
15. Do not let several participants talk at once. When this occurs, stop the talkers and assign an order for speaking. People usually will not interrupt if they know they will have a turn to talk.

    Thank participants whose comments are brief and to the point.

16. Try to encourage quieter participants to talk. Ask to hear from a participant in the group who has not spoken before, or walk toward someone to focus attention on him and make him feel he is being asked to talk.

Manage any Problems

17. Some participants may talk too much. Here are some suggestions on how to handle an overly talkative participant:
    - Do not call on this person first after asking a question.
    - After a participant has gone on for some time say, "You have had an opportunity to express your views. Let's hear what some of the other participants have to say on this point."
    - When the participant pauses, break in quickly and ask to hear from another member of the group or ask a question of the group, such as, "What do the rest of you think about this point?"
    - Record the participant's main idea on the flipchart. As he continues to talk about the idea, point to it on the flipchart and say, "Thank you, we have already covered your suggestion." Then ask the group for another idea.
    - Do not ask the talkative participant any more questions. If he answers all the questions directed to the group, ask for an answer from another individual specifically or from a specific subgroup. (For example, ask, "Does anyone on this side of the table have an idea?").

18. Try to identify participants who have difficulty understanding or speaking the course language. Speak slowly and distinctly so you can be more easily understood and encourage the participant in his efforts to communicate.

    - Discuss any language problems which seriously impair the ability of a participant to understand the written material or the discussions. It may be possible to arrange help for the participant.
    - Discuss disruptive participants with your co-facilitator.

Reinforce participants' efforts

19. As a facilitator, you will have your own style of interacting with participants. However, a few techniques for reinforcing participants' efforts include:

    - Avoiding use of facial expressions or comments that could cause participants to feel embarrassed, sitting or bending down to be on the same level as the participant when talking to him.
    - Answering questions thoughtfully, rather than hurriedly, encouraging participants to speak to you by allowing them time, appearing interested, saying "That's a good question/suggestion."

20. Reinforce participants who: try hard, ask for an explanation of a confusing point, do a good job on an exercise, participate in group discussions, help other participants (without distracting them by talking at length about irrelevant matters).

B. Techniques for relating modules to participants' jobs

1. Discuss the use of these case management procedures in participants' own facility/hospital.
2. Reinforce participants who discuss or ask questions about using these case management procedures by acknowledging and responding to their concerns.

C. Techniques for assisting co-facilitators

1. Spend some time with the co-facilitator when assignments are first made. Exchange information about prior teaching experiences and individual strengths, weaknesses and preferences. Agree on roles and responsibilities and how you can work together as a team.
2. Assist one another in providing individual feedback and conducting group discussions. For example, one facilitator may lead a group discussion, and the other may record the important ideas on the flipchart. The second facilitator could also check the *Facilitator Guide* and add any points that have been omitted.
3. Each day, review the teaching activities that will occur the next day (such as role plays, demonstrations, and drills), and agree who will prepare the demonstration, lead the drill, collect the supplies, etc.
4. Work *together* on module rather than taking turns having sole responsibility for a module.

D. Summarization and recap

GUIDELINES FOR MODULE READING

A. When participants are working

1. Look available, interested and ready to help.
2. Watch the participants as they work, and offer individual help if you see a participant looking troubled, staring into space, not writing answers, or not turning pages. These are clues that the participant may need help.
3. Encourage participants to ask you questions whenever they would like some help.
4. If important issues or questions arise when you are talking with an individual, make note of them to discuss later with the entire group.
5. If a question is asked which you feel you cannot answer adequately, obtain assistance as soon as possible from another facilitator.
6. Review the points in this Facilitator Guide so you will be prepared to discuss the next exercise with the participants.

B. When providing individual feedback

1. Before giving individual feedback, refer to the appropriate notes in this guide to remind yourself of the major points to make.
2. Compare the participant's answers to the answer sheet provided. Answers do not need to match exactly, but should be reasonable.
3. If the participant's answer to any exercise is incorrect or is unreasonable, ask the participant questions to determine why the error was made.
4. Once you have identified the reason(s) for the incorrect answer to the exercise, help the participant correct the problem.
5. Summarize, or ask the participant to summarize, what was done in the exercise and why. Emphasize that it is most important to learn and remember the process demonstrated by the exercise.
6. Always praise the participant for good work.

C. When leading a group discussion

1. Plan to conduct the group discussion at a time when you are sure that all participants will have completed the preceding work. Wait to announce time until most participants are ready, so that others will not hurry.
2. Before beginning the discussion, refer to the appropriate notes in this guide to remind yourself of the purpose of the discussion and the major points to make.
3. Always begin the group discussion by telling the participants the purpose of the discussion.

- Often there is no single correct answer that needs to be agreed on in a discussion. Just be sure the conclusions of the group are reasonable and that all participants understand how the conclusions were reached.

- Try to get most of the group members involved in the discussion. Record key ideas on a flipchart as they are offered. Keep your participation to a minimum, but ask questions to keep the discussion active and on track.
- Always summarize, or ask a participant to summarize, what was discussed in the exercise.
- Reinforce the participants for their good work by (for example):
  - Praising them for the list they compiled.
  - Commenting on their understanding of the exercise.
  - Commenting on their creative or useful suggestions for using the skills on the job.
  - Praising them for their ability to work together as a group.

DURING CLINICAL PRACTICE SESSION

A. Clinical practice objectives

Clinical practice is an essential part of this training course. Participants learn about the skills by reading information in the modules or seeing demonstrations on videotape. They then use the information by doing written exercises or case studies. Finally, and most importantly, in clinical practice, participants practice using their skills with real sick children and young infants.

General objectives

During clinical practice sessions, participants will:

- See examples of signs of illness in real children.
- See demonstrations of how to manage sick children according to the case management charts.
- Practice assessing, classifying and treating sick children.
- Receive feedback about how well they have performed each skill and guidance about how to strengthen particular skills.
- Gain experience and confidence in using the skills as described on the case management charts.

To make sure that participants receive as much guidance as possible in mastering the clinical skills, the facilitator gives particular attention and feedback to the skill being practiced that day. If any participant has difficulty with a particular skill, the facilitator continues working with the participant on that skill in subsequent sessions until the participant can perform the skill with confidence.

B. Practical sessions

The practical sessions for this course will take place in small groups. The practice area should have all the necessary supplies and equipment for all practical sessions collected together in one box. The facilitator needs to ensure each day that the box is complete and then teach the specific skills and observe participants practicing the skills. There must be simulation of the situation to some extent.

The purpose of the practical sessions is to give information and practice by showing and doing. The more participants are involved with the equipment and "hands on" participation in this simulated situation, the better prepared they will be when they confront real patients. If a participant is not able to successfully perform the skill the facilitator gives him guidance about what to do differently and he then tries again. The participant should repeat as needed until he can successfully perform the skill. If a participant is having repeated difficulty, the facilitator will ask him to watch while another participant performs the skill. This should help the participant see what he is doing wrong.

C. Role of Facilitator During Clinical Sessions

The role of the facilitator during clinical/ practical sessions is to:

1. **Do all necessary preparations** for carrying out the sessions.
2. **Explain** the session objectives and make sure the participants know what to do during each session.
3. **Demonstrate** the case management skills described on the charts. Demonstrate the skills exactly as participants should do them when they return.
4. **Observe** the participants' progress throughout the sessions and provide feedback and guidance as needed.
5. **Be available** to answer questions during the sessions.
6. **Lead discussions** to summarize and monitor the participants' performance. (**There should be 1 facilitator for every group of 6 to 8 participants)**.

VENUE ARRANGEMENT

2 Rooms with sitting arrangements for 15-18 people in a U- table setup. 2 sets of laptop, projector and speakers for presentations and videos demonstration.

SKILL STATION EQUIPMENT LIST

- Resuscitation mannequin- 2 sets of one infant and one child each
- Materials for stabilizing the neck: towel
- Oro-pharyngeal airways – several sizes (Guedel size 000 to 5)
- Self-inflating bags of different sizes (500 ml and 750 ml).
- Face mask of different sizes (Infant and Adult)
- Pulse oximeter (1 set)
- Suction apparatus (1 set)
- Feeding tube (4 to 6)
- I/V cannula (No. 26, 24)
- I/V bottles, I/V set – child and paediatric
- Nebulizer (2 sets)
- MDI & Spacer (2 sets)
- Drugs: (2 sets)
  - Dextrose (10% & 25%)
  - Adrenaline injection
  - Diazepam injection, midazolam
  - Salbutamol respiratory solution
  - Phenytoin
  - Dopamine
  - ORS
  - Hydrocortisone
  - Artesunate Injection
  - Water for Injection

CHECKLIST OF INSTRUCTIONAL MATERIALS NEEDED IN EACH SMALL GROUP

Item needed	Number needed
Facilitator Guide, PPT set	1 for each facilitator
Training Module, Chart Booklet	1 copy for each facilitator and 1copy for each participant
Set of Case Management, Wall Charts/PPT (1.1, 2.1, 2.2, 2.3, 2.4, 3.7, 7.5, 7.6 and 7.7) (Large version – to display on the wall)	1 set for each small group
Post test	1 for each participant
Recording forms	2 for each participant

Agenda for the training on facility based care of sick children

S. No.	Time	Topics and Modality
		DAY-1: EMERGENCY TRIAGE AND TREATMENTS
1.	09:00 am-09:30 am	Registration for the workshop
2.	09:30 am-10:00 am	Participant's introduction and ice breaking
		Rules of the road, expectations and objective of the workshop
3.	10:00 am-11:00 am	Introduction to general principle of management of sick children
	11:00 am-11:15 am	**Tea Break**
4.	11:15 am-13:30 pm	Emergency Triage and Treatment - Airway and Breathing
	13:30 pm-14:15 pm	**Lunch Break**
5.	14:15 pm-16:15 pm	Management of Breathing Problems
		Chest Compression and Circulation
	16:15 pm-16:30 pm	**Tea Break**
6.	16:30 pm-17:15 pm	Coma and Convulsion
7.	17:15 pm- 18:00 pm	Exercises
		DAY-2: EMERGENCY TRIAGE AND TREATMENTS (CONTINUED) AND COUGH
1.	09:00 am-09:15 am	Recap
2.	09:15 am-10:00 am	Section 3: Cough: Different conditions which may present with cough/ difficult breathing
3.	10:00 am-10:45 am	Video (2A-2E)– BLS, Airway, CRT
	10:45 am-11:00 am	**Tea Break**
4.	11:00 am-13:00 pm	Clinical sessions Session 1: Emergency Triage (ETAT) Session 2: Basic Life Support Skills (BLS)
5.	13:00 pm-13:45 pm	Section 3: Cough: Different conditions which may present with cough/ difficult breathing
	13:45 pm-14:30 pm	**Lunch Break**
6.	14:30 pm-16:00 pm	Cough: Severe pneumonia
	16:00 pm-16:15 pm	**Tea Break**
7.	16:15 pm-17:30 pm	Cough: Bronchiolitis, Stridor, Bronchial asthma, Tuberculosis
		DAY-3: SHOCK, COMA AND CONVULSION
1.	09:00 am-09:15 am	Recap
2.	09:15 am-09:45 am	Exercise Cough /Difficult breathing
3.	09:45 am-10:45 am	Shock
4.	10:45 am-11:15 am	Videos(3A-3D) – Counting RR, Fast breathing, Chest in drawing and Stridor
	11:15 am-11:30 am	**Tea Break**
5.	11:30 am-13:30 pm	Skill stations: (50 min each) Station-1: Video (3E-3I) and Equipment- pulse oximetry, oxygen delivery system – prongs, catheter, hood and mask Station 2: Video (3J-3K) and equipment- Nebulization, MDI and drugs – Salbutamol, Ipratromium bromide, Hydrocortisone, and Magnesium sulphate

S.no.	Time	Topics and Modality
	13:30 pm-14:30 pm	**Lunch Break**
6.	14:30 pm-15:30 pm	Management algorithm for Hypovolemic, Septic, Anaphylactic and Cardiogenic shocks
7.	15:30- pm16:15 pm	Coma, Convulsion, AES
	16:15 pm-16:30 pm	**Tea Break**
8.	16:30 pm-17:30 pm	Poisoning, Management of Snake bite
DAY-4: DIARRHOEA AND FEVER		
1.	09:00 am-09:15 am	Recap
2.	09:15 am-10:45 am	Section 6: Diarrhoea
3.	10:45 am-11:15 am	Videos (4A-4B) on Dehydration assessment
	11:15 am-11:30 am	**Tea Break**
4.	11:30 am-13:30 pm	**Clinical session** Station 1: Video (4C-4F) and Clinical cases: cough and diarrhoea Station 2: IV canulation, NG tube and fluids, ORS and Emergency drugs
	13:30 pm-14:30 pm	**Lunch Break**
5.	14:30 pm-16:15 pm	Fever: Managing cases of severe and complicated malaria, fever with or without localizing signs, rash
	16:15 pm-16:30 pm	**Tea Break**
6.	16:30 pm-17:30 pm	Fever: Dengue case classification and volume replacement
DAY-5: ANEMIA, MALNUTRITION AND SUPPORTIVE CARE		
1.	09:00 am-09:15 am	Recap
2.	09:15 am-09:45 am	Anemia
3.	09:45 am- 11:15 am	Section 9: Assessing the nutritional status and management of severe acute malnutrition
	11:15 am-11:30 am	**Tea Break**
4.	11:30 am-12:30 pm	Videos (5A-5I) on Anthropometry, oedema, and feed preparation
5.	12:30 pm-13:45 pm	Maintenance fluid calculation for different weight and choice of intravenous fluid, Blood Transfusion, supporting breastfeeding Common feeding problems and solution
	13:45 pm-14:30 pm	**Lunch Break**
6.	14:30 pm-15:15 pm	Post- test
7.	15:15 pm-15:45 pm	Feedback
8.	15:45 pm-16:30 pm	Closing ceremony

DAY-1

List of Day-1 Activities: Emergency Triage and Treatments

S. No.	Time	Topics and Modality
		DAY-1: EMERGENCY TRIAGE AND TREATMENTS
1.	09:00 am-09:30 am	Registration for the workshop
2.	09:30 am-10:00 am	Participant's introduction and ice breaking
		Rules of the road, expectations and objective of the workshop
3.	10:00 am-11:00 am	Introduction to general principle of management of sick children
	11:00 am-11:15 am	**Tea Break**
4.	11:15 am-13:30 pm	Emergency Triage and Treatment - Airway and Breathing
	13:30 pm-14:15 pm	**Lunch Break**
5.	14:15 pm-16:15 pm	Management of Breathing Problems
		Chest Compression and Circulation
	16:15 pm-16:30 pm	**Tea Break**
6.	16:30 pm-17:15 pm	Coma and Convulsion
7.	17:15 pm- 18:00 pm	Exercises

Introduction to Facility Based Care

A. Icebreaking Session

Interact and let participants introduce themselves with a brief description of their working place and hobbies. Discuss and decide rules to be followed during the training (timing, punctuality, to keep mobile off, to ask questions one by one etc.).

B. Discussion on common causes of child mortality & current management facilities

Lead a discussion on common causes of child mortality. Try to learn how sick young infants and children are received in participants' facilities, assessed for care, and infrastructure available for emergency care of these children.

C. Focus on

1. Whether there is any system of triaging and providing emergency care at their center?
2. Job responsibilities and duty hours.
3. Functional equipment availability.
4. Staff and other support availability.
5. Where babies are referred and why?
6. What skills they think are important for in-patient management of sick young infants & children at their center?

D. Discuss the objective of the workshop

Every year many children die in developing countries before they reach their fifth birthday. The most common causes of infant and child mortality in developing countries, including India, are perinatal conditions, acute respiratory infections, diarrhoea, malaria, measles and malnutrition *(Figure 1.1)*. These are also the commonest causes of morbidity in young children. Many of these deaths may be prevented by early referral of sick children to health facility and standard protocol based treatment. Immediate triage by health workers, providing immediate treatment to sick children with emergency signs, supportive treatment, appropriate treatment after stabilization, monitoring during hospitalization and follow-up helps in reducing these preventable deaths.

This training focuses on providing appropriate inpatient management of the major causes of childhood mortality such as pneumonia, diarrhoea, malaria, meningitis, severe acute malnutrition.

Section 1:- General Principles for the Management of Sick Children (1 month to 5 years)

- **Discuss learning objectives for Section 1 with PPT**
- **Discuss steps of management of sick children**
  - Take participants to wall chart 1.1 or project PPT and discuss steps in the management of children brought to the hospital. Emphasize that in the health facility identifying emergency signs and providing emergency treatment is the first step in the management of the sick children.
  - Once the child is stabilized a detailed assessment for reaching diagnosis should follow. In-patient treatment includes giving specific treatment as well as the supportive care. Emphasize that for children, the scheme of examination may need to be modified so as to reserve the examination which might disturb the child for later part of examination.
  - Briefly discuss the available investigations in their respective health facilities. Emphasize the importance of bedside investigations.
  - Emphasize importance of monitoring of sick children. By monitoring one can know if the treatment being given is bringing desired response or there are some new complications which may require attention. Try to know, how frequently health workers monitor admitted children in their respective health facilities. Tell them that the parameters for monitoring sick children will vary depending upon the underlying illness.
  - Emphasize the need for communication with patients about the condition and prognosis of the child at each step.
  - Discuss with participants about process of discharge & follow-up of patients in their health facility. Follow-up is extremely important for the chronic illnesses such as Tuberculosis, Asthma, SAM etc. Emphasize the need for counselling at the time of discharge to ensure proper continuation of treatment and follow-up.
- **Tell participants to read section 1.1 to 1.10**
- **Summarize the session & answer their queries, if any.**

Section 2: Emergency Triage Assessment And Treatment (ETAT)

- **Ask participants following questions**
  - What is triage?
  - When & where triage should take place?
  - Who should triage?

- Discuss and find out whether triaging process exists in their health facility and whether initiation of treatment happens in emergency or paediatric wards?
- Tell participants that this chapter will teach them the process of triaging patients and offering appropriate emergency treatment. Emphasize the importance of triaging and emergency treatment in reducing mortality. In a hospital setting immediate treatment in very sick children often gets delayed due to lack of triaging. Children with emergency signs are most likely to survive if their emergency signs are picked up quickly and treatment started even before taking a detailed history.

- **Show them learning objective of Section 2.**
  - Tell participants to read section 2.1 to 2.3.
  - Tell participants that triage helps in quickly sorting out patients with emergency signs, priority signs or patients who can wait. Show them ABCD concept and emergency signs by PPT.
  - Take participants through wall chart 2.1, discuss only assessment part and tell them they will learn treatment of emergency signs in subsequent sections. Limit your discussion on assessment part of the chart. Tell them they will learn about management of the emergency signs in subsequent sections. Discuss concept of triage using concept of ABCD (Airway, Breathing, Circulation, Coma & Convulsion, and Dehydration). In addition, emphasize the implications of identifying trauma, hypothermia and severe acute malnutrition (SAM). Identification of SAM during triage may be based on visible severe wasting and bilateral pitting oedema. Tell them, in few guidelines like PALS they use ABCDE where C is used for circulation , D for disabilities and E for exposure like poisons etc. In this module we will be using ABCD for airway, breathing , circulation , coma , convulsion and dehydration(severe) as pneumonia and diarrhea are still commonest causes of death in under five children.
- Participants do exercise 2.1, check answers individually. Help participants who have difficulty in exercise.
- Summarize TRIAGE, ABCD concept, Emergency and Priority signs (show PPT)
- Answer participants query, if they have any.
- Tell participants to read the sections 2.4 - airway and breathing
- Now discuss Chart 2.2: Steps of providing life support. Discuss importance of checking central pulse, indications for chest compression. Tell them providing life support is aerosol generating and highlight changes in context of COVID-19 which they need to follow.

Highlight recent changes of 15 compressions and 2 breaths to be followed whether there is single or two rescuers. Highlight importance of reassessment for pulse every 2 minutes and starting epinephrine 0.1 ml/kg (1:10000 concentration) if no pulse is palpable. They also should call for help in these cases as single person may not be able to provide high quality CPR for long duration.

Also, tell participants that many district hospitals have cardiac monitor and defibrillator available now. Although discussion on skills of defibrillation is beyond scope of this training, it is important to understand that timely use of defibrillator increases chances of survival. Nowadays automated defibrillator is also available and machine itself identifies and instructs whether the patient will need defibrillation.

- Participants read section 2.5-2.6. Discuss values of rescue breathing during initial phase of respiratory arrest. Discuss how to position a sick child to improve the airway. Show them sniffing position and jaw thrust (You can use PPT or demonstrate on mannequin). Also discuss importance of choosing right size of mask during bag and mask ventilation (Use PPT to explain right size i.e. which completely covers the mouth and nose without covering the eyes or overlapping the chin). Explain E-C clamp technique with PPT.
- Discuss management of airway in a chocking child. Demonstrate methods of slapping on back & Heimlich manoeuvre on Mannequin.
- Participants read section 2.7 & 2.8. Ask one of participant to tell indications for starting chest compression and methods. Now a days, thumb technique is preferred when 2 or more health workers are available. Summarize requirements for High Quality CPR (Use PPT). Rate of compression should be between 100-120 as per revised PALS guidelines.
- Participants read 2.9-2.11. When they finish reading, emphasize that in shock the peripheral pulses are first to become weak. While checking the CRT in a limb, it is important to lift limbs slightly above heart level so that arteriolar capillary refill is assessed and not venous stasis. Discuss why blood pressure measurement is not recommended to diagnose shock. However, blood pressure measurement may be helpful for monitoring responses to interventions. WHO defines shock in a child who has cold extremities with prolonged CRT and weak & fast pulse. If child has one or two signs then he has circulatory impairment.
- Take them to chart 2.3 and discuss steps of management of shock. Draw attention on starting oxygen and giving IV 10% dextrose to all children with shock. Tell participants that fluid management of children in shock must be judicious, and clinical condition of the children should be carefully monitored to identify positive or detrimental responses. Fluid therapy mentioned in this module is as per updated WHO ETAT 2016 guidelines. Total volume of fluid is less as compared to previous guidelines or existing guidelines practiced in developed countries. Fluid boluses may still be suitable for facility with invasive physiological monitoring to guide management, but may be harmful in resource poor settings, where health workers are unable to determine whether the shock is due to hypovolemia /severe dehydration or other aetiology. Similarly, health workers may not accurately assess children for severe acute malnutrition, which requires conservative approach to fluid management. Tell them that they will learn detailed management of shock according to types in section-4.
- Try to learn, how they monitor response to fluid in children with shock. Highlight importance of monitoring PR, RR when patient is on IV fluids. If PR, RR increase, they should STOP IV fluids. Tell them fluid of choice for volume expansion is Ringer's Lactate or Normal Saline.
- Participants read section 2.12-2.13. Now show them chart 2.4 and emphasize differences in indications of IV fluid, volume and choice of fluids in a child with SAM. Tell them they will learn more about this in section 9.

- Tell them difference between shock and impairment in circulation. Excessive fluids may kill the child (You can tell them about FEAST trial). (FEAST Trial *Maitland 2011*– "The fluid expansion as supportive therapy" trial was a RCT in which, children who had impaired circulation were included in two strata (A-without and B-with severe hypotension). The intervention arms received either IV 0.9% saline (20ml/kg over 1 hour) or IV albumin (20 ml/kg over 1 hour), and children in comparison arms received no bolus. All three treatment arms received maintenance fluid. FEAST trial demonstrated clear harm "if rapid infusions of IV fluids were given" to children who had febrile illnesses, or had severe anaemia.
- Participants do exercise 2.2 individually. Discuss answers with PPT and summarize circulation.
- Participants read section 2.13. Discuss AVPU scale to assess consciousness. Glasgow coma scale may not suitable for emergency situations. Discuss importance of Oropharyngeal (Guedel) airway in a comatose child. Demonstrate different sizes and method of insertion. Use PPT / Mannequin for explaining the method.
- Participants read section 2.14. Oxygen should be given to all comatose/convulsing children to keep SpO_2 >94%. Discuss drugs used for terminating convulsion and precautions. Discuss importance of checking blood sugar in these patients and rationale of giving calcium to young infants if serum calcium estimation facility is not available. In developing countries calcium deficiency is common cause of seizure in young infants. Emphasize why it is important to give Phenytoin slowly. Discuss recovery position for unconscious child. Participants will learn more about Coma /Convulsion on Day-3.
- Highlight the point that all children with emergency signs should be hospitalized and kept under close supervision like HDU (high dependency unit). Answer participant's queries.
- Participants read section 2.15 and 2.16. Discuss dehydration and tell them that they will learn management of dehydration in detail in section-6. Discuss the priority signs and highlight that children with these signs should be assessed on priority.
- Participants do exercise 2.3 individually. Check answer and give feedback individually.
- Identify one participant to recap key points on day-2

ANSWERS OF EXERCISES

EXERCISE-2.1

1. Meera, 3-year-old is brought to hospital with complaints of loose motion for four days. She is breathing normally; hands are cold and capillary refill is 2 seconds. She is alert and there is no convulsion. The eyes are normal and skin pinch goes back immediately.

   How do you triage Meera: **Emergency/Priority/Non-urgent Case?**
   Answer: Non-urgent Case

2. Mayank, 13 months old child is brought to hospital with the complaints of Cough & Fever. His respiration is very fast and there is severe chest in drawing.

   How you will triage Mayank: **Emergency/Priority/Non-urgent case?**
   Answer: Emergency

3. Sonu, four-year old male child has been brought with high grade fever (39°C) for last 2 days. Sonu is breathing normally, has warm hands and feet. He is conscious, no h/o convulsion and diarrhoea.

   How do you triage Sonu? **Emergency/Priority/Non-urgent case?**
   Answer: Priority.

4. A 10-week old baby was brought in hospital with complaints of not feeding well and excessive crying. Airway, breathing, sensorium and circulation are normal. There is no history of diarrhoea. He feels very hot on touch. He weighs 3.5 kg.

   How do you triage the baby?
   Answer: Priority

5. Suman, 18 months old child is brought to hospital with the complaints of cough & fever. Her respiration is very fast, there is severe chest in drawing and SpO_2 is 88% on room air. Write emergency treatment to be given to Suman.
   Answer: Manage Airway
   Give oxygen
   Give injectible antibiotics

6. A 9-month old baby has been brought to hospital with gasping respiration. His lips are blue and heart rate is 56/minute. Write emergency treatment for this baby.

   Answer: Manage Airway
   Ventilate with bag and mask, reassess pulse and add chest compressions, if pulse remains <60/ minute despite adequate oxygenation.

EXERCISE 2.2

1. A 4-year-old boy was brought to emergency. He is breathing normally; his hands are cold and the capillary refill time is longer than three seconds and pulse is rapid and weak. There is no visible severe wasting and no bilateral pitting oedema. What do you do next?

   Answer: Child is in shock, give oxygen, insert IV line, take emergency blood sample and give 20ml/kg IV fluid R/L or normal saline over 30-60 min. Keep warm. After that assess for coma and convulsion.

2. Sunita 4-month old baby is brought to hospital with fever and refusal of breastfeed. She also had 2 episodes of vomiting and watery diarrhoea. Her respiratory rate 60/min, no chest indrawing and there are no abnormal respiratory noises. Her hands are cold and capillary refill is more than 3 seconds. The femoral pulse is palpable but fast and weak. There is no severe visible wasting. Her weight is 5 kg.
   - ❖ How do you triage the baby?
   - ❖ How do you manage Sunita?

   Answer: The child has emergency signs of shock. To manage give oxygen, insert IV line, take emergency blood sample and give 20ml/kg IV fluid R/L or normal saline over 30-60 min. Keep warm. After that assess for coma and convulsion.

3. Vijay 12-months-old is brought to you with loose stools and vomiting. He weighs 5.0 kg and has visible severe wasting. He is breathing normally. The child is very lethargic and extremities are cold with capillary refill of more than 3 seconds. The pulses are weak and fast. How do you manage this child?

   Answer: The child has emergency signs of shock. Same time he has visible severe wasting, so he will be managed by
   - Airway position
   - Giving oxygen to keep SpO_2 >94%
   - Inserting IV line
   - Collecting emergency blood samples
   - Giving 25 ml 10% dextrose
   - Giving 75 ml of 0.45% saline with 5% dextrose over one hour
   - Monitoring heart and respiratory rate, temperature and CRT rate every 5 to 10 minutes

EXERCISE 2.3

1. Sunil two-year-old boy is brought by his grandmother with convulsions. The child is breathing normally. Extremities are warm. He is unconscious and hot to touch. How would you manage the child if weight is 12 kg?

   Answer:

   - Manage airway by turning the child on the side to reduce the risk of aspiration, keeping the neck slightly extended and bending one leg to stabilize the body position.
   - Give oxygen to keep SpO_2>94%
   - Check blood sugar and give glucose if needed
   - Give Diazepam (0.6 ml IV or 1.2ml per rectal), or Lorazepam (0.6ml IV), or Midazolam (2.4 mg) to terminate convulsions.

2. Anil is an 18-month-old boy who has fever for two days. His mother has noticed that he has fast breathing. His airway is clear, and he has no chest indrawing. His extremities are warm and there is no history of diarrhoea. However, the boy started to convulse while being examined. He weighs 11 kg. How will you manage him?

   Answer:

   - Manage airway (Positioning)
   - Give oxygen to keep SpO_2 >94%
   - Check blood sugar and treat hypoglycemia, if present
   - Give anti-convulsants; IV Diazepam (0.6 ml IV slow or 1.1 ml per rectal) or IV Lorazepam (0.6 ml IV stat)
   - Put in recovery position and complete assessment

3. Five weeks old infant weighing 4 kg is brought to the emergency with generalized tonic seizures. The child is breathing normally and has warm extremities. Baby's blood sugar is 60 mg/dl. How will you manage this case?

   Answer:

   There is an emergency sign convulsion.

   - Manage airway
   - Clear secretion
   - Give oxygen to keep SpO_2 >94%
   - Draw sample for serum calcium and give calcium gluconate in 1:1 dilution
   - Give diazepam per rectal (0.5 ml) or IV (0.25ml) to terminate seizure, if seizure persist even after giving calcium. You may use lorazepam (0.25ml).
   - Monitor vital signs

DAY-2

List of Day-2 Activities: Emergency Triage and Treatments (Continued) and Cough

S. No.	Time	Topics and Modality
1.	09:00 am-09:15 am	Recap
2.	09:15 am-10:00 am	Section 3: Cough: Different conditions which may present with cough/ difficult breathing
3.	10:00 am-10:45 am	Video (2A-2E) – BLS, Airway, CRT
	10:45 am-11:00 am	**Tea break**
4.	11:00 am-13:00 pm	**Clinical sessions** Session 1: Emergency Triage (ETAT) Session 2: Basic Life Support Skills (BLS)
5.	13:00 pm-13:45 pm	Section 3: Cough: Different conditions which may present with cough/ difficult breathing
	13:45 pm-14:30 pm	**Lunch Break**
6.	14:30 pm-16:00 pm	Cough: Severe pneumonia
	16:00 pm-16:15 pm	**Tea Break**
7.	16:15 pm-17:30 pm	Cough: Bronchiolitis, Stridor, Bronchial asthma, Tuberculosis

- **Start day-2** with recap by selected participant. Add if any important point missed in recap - importance of triage, ABCD concept, immediate initiation of treatment to sick children with emergency signs. Importance of choosing correct size of mask and high-quality chest compression. Answer queries related to ETAT.

Section 3: Approach to a child with cough or breathing difficulty

- Tell learning objectives of Chapter -3 (Use PPT)
- Highlight importance of history and examination in a child with cough or difficult breathing.
- Participants read 3.0-3.1. Summarize key points by discussing chart-3.1 (Use PPT) and Box-3.1. Emphasize importance of counting RR for one minute (young children may have periodic breathing and even older children may have higher respiratory rate due to anxiety), cut offs of RR to identify fast breathing in different age groups.
- Lead a discussion to know, what are common respiratory illnesses which participants see in their practice. Highlight importance of identifying children with wheeze and stridor. Tell them that if a child presents with fast breathing and wheeze, RR should be recounted after giving 3 doses of bronchodilator to see whether fast breathing is due to pneumonia or wheeze.
- Emphasize importance of checking oxygen saturation and need of hospitalization of all children who present with severe pneumonia.
- Hypoxaemia is a common complication in respiratory conditions like severe pneumonia. When hypoxaemia is severe, it leads to poor oxygen delivery to tissues and anaerobic respiration, pulmonary arterial vasoconstriction. Reduced mortality has been reported when oxygen saturation was monitored with pulse oximetry and oxygen was supplied to children with respiratory illnesses & oxygen saturation less than 90%. Stress on value of oxygen saturation monitoring in all cases of respiratory illnesses

- **Video (2A-2C) (BLS, Airway management):** Show participants video on providing life support. Few participants may tell you that it is different than what they have learnt at other places. Tell them in health facility there is a emergency response team which can provide more advanced management. Try to know whether they have vital monitors and defibrillator available in emergency or not. Wherever monitor is available, it should be attached and rhythm should be analyzed. Pause video to discuss different points and repeat to show steps if participants are not clear on any point. Answer participants' queries. In this video , doctor is looking for breathing and pulse separately for demonstration however this will be done together when an unresponsive child is brought .
- **Clinical Session:** Conduct clinical session in two groups and interchange after 60 minutes.

Clinical Session

Session-1: ETAT (60 Minutes)

Objective

At this clinical session, the participants should have:

- Practised the process of triage and assessing a sick child.
- Learnt how to record the observation in the sample format

Equipment/resources required

- Sample case recording format (for ETAT)
- Pen/pencil
- Bench for seating of patients/Beds for examination

Arrangements in clinical setup

- Identify an area in the hospital where sick children first report to. This would either be the emergency (preferably) or the OPD area. To demonstrate the children with emergency sign, you may take them to your HDU/ICU area in small batches.
- A small number of participants (6-8 in one subgroup i.e. 12-16 batch divided into two subgroups) should participate in the clinical session in the same time slot.

Steps in Clinical Practice

- Facilitator demonstrates on a case the process of triage and assessing a sick child. Now facilitator assigns cases to participants.
- Participants should practice the steps relevant to the session's objectives with ***as many children as possible in an assigned time period.***
- Observe participants individually working with their assigned patients. Make sure they are doing the clinical skills correctly.
- Provide specific feedback and guidance as often as necessary. Comment on issues that are done well and offer additional guidance when improvement is needed.
- If there is a sick child with emergency signs, show it to other participants.

If time permits show them videos on (2D-2E) lethargy and unconsciousness and exercises on case study

Session-2: BLS Skill Station 1: Providing Life Support

Objective

At this skill station, the participants should have:

1. Practised basic airway manoeuvre techniques on a mannequin, including use of an oropharyngeal (OP) airway
2. Practised bag-mask ventilation on a mannequin
3. Practised chest compression on a mannequin

Equipment/resources required

- Resuscitation dolls/mannequins/resuscitation head
- Oro-pharyngeal airways in several sizes
- Face masks of varying sizes
- Self inflating bags of different sizes
- Oxygen and oxygen delivering equipment
- Suction catheter

Steps

Demonstrate following steps on a mannequin

- Remove any visible obstruction from the mouth. Clear secretions from the throat.
- Open the airway using head – tilt, chin-lift method

Head tilt-chin-lift manoeuvre

- Extend the neck slightly and tilt the head by placing one hand on to the child's forehead.
- Lift the mandible up and outward by placing the fingertips of other hand under the chin.
- Maintain a neutral position (nose up) in an infant and a sniffing position (chin up) in a child

If child with suspected trauma, open airway with ***jaw thrust without head tilt***.

- Kneel behind the patient's head.
- Rest your elbows on the surface on which the patient is lying.
- Place one hand on each side of the patient's head.
- Place the tips of your index and middle fingers under the angles of the patient's jaw (This is done on both sides).
- Place your thumbs on the patient's jaw just below the level of the teeth. The thumbs will keep the patient's head from turning or tilting during the lift.
- Lift the jaw upward with your fingertips. The mouth should not be closed as this could prevent air from entering the patient's airway. Use your thumb to retract the patient's lower lip, if needed.
- Discuss indications when there is need for a Guedel airway (the patient is unconscious).

- Select appropriate size oropharyngeal (Guedel) airway by measuring distance from the angle of mouth to the angle of the jaw when laid on the face with the raised curved side (convex) up ("the right side up"). The most commonly used size for children is 2.
- Choose an appropriately sized mask; it must completely cover the mouth and nose without covering the eyes or overlapping the chin.
- Chose a bag-mask of appropriate volume for infants-500 ml and children-750 ml
- Check the bag and valve by closing the patient's connection with thumb and attempt to expel air from the bag.
- Attach the bag-mask valve to an oxygen supply. Adjust flow to 10 litres per minute or as high as possible in a concentrator. If oxygen is not available, use room air for resuscitation.

Insert oropharyngeal (guedel) airway

- Position the child to open the airway, taking care not to move the neck if trauma is suspected.
- In **an infant**, using a tongue depressor, insert the oropharyngeal airway (the convex side up).
- In **a child**, using a tongue depressor, insert the airway "upside down" (concave side up) until the tip reaches the soft palate.
- Re-check airway opening.
- Use a different sized airway or reposition if necessary.
- Hold the mask over the face with dominant hand. Maintain the head tilt, chin lift position.
- Perform the bag and mask ventilation with E-C clamp technique. Position the thumb and index finger in a C shape over the mask and exert downward pressure on the mask to ensure proper air seal. Position the last 3 fingers under the angle of mandible to lift the jaw. If resuscitating alone, maintain the E-C clamp with one hand and compress the bag with the other hand.
- Use free hand to compress the bag. Release bag completely between ventilations. Correct rate of ventilation /continue bag and mask ventilation at a rate of 20 breaths/ minute for a few minutes.

Look for noticeable rise in the chest. If chest does not rise and fall when using bag and mask:

- Reapply mask & reposition the head
- Suction the throat and keep mouth slightly open
- Increase the pressure on the bag

Provide chest compressions coordinated with bag & mask ventilation if pulse cannot be detected or if heart rate is less than 60 bpm or there are signs of poor perfusions after adequate ventilation.

Thumb technique:

Thumb technique is preferred over 2 -finger technique.

- Stand at the infant's feet or side
- Place thumbs side by side over lower half of sternum, encircle the infant's chest and support the infants back with the fingers of both hands.
- Use both thumbs to depress the sternum.
- Push at a rate of at least 100 compressions per minute.
- Give two effective breaths after every 15 chest compressions (Ratio of chest compressions: ventilation of 15:2).

KEY POINTS TO REMEMBER

When to ventilate:

Use a bag & mask when child's breathing is very shallow, or slow, or obstructed, or child is not breathing.

When to initiate chest compressions:

If pulse cannot be detected or if heart rate is less than 60 bpm in an infant or child with signs of poor perfusion even after adequate oxygenation and ventilation, then provide chest compressions coordinated with ventilations.

When and how to stop ventilation

Stop after a few minutes; look to see if child revives and starts to breathe spontaneously. If not breathing adequately, continue resuscitation according to decision of clinician.

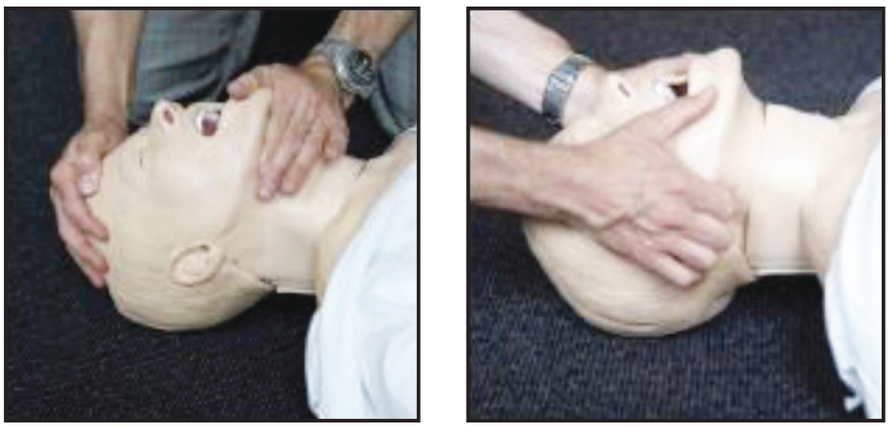

Figure 1: Head tilt/lift and jaw thrust

Figure 2: Correct placement of mask

Single operator technique (nose to chin)

Double operator technique

- Participants read Section 3.2 - severe pneumonia. Discuss Chart 3.2. Emphasize need to supplement oxygen to all children with oxygen saturation less than 90% and appropriate antibiotics. Tell them that all children should be reassessed after 48 hours and indications for upgrading antibiotics wherever indicated. Tell participants, many deaths are occurring due to inappropriate and delayed treatment.
- Discuss Box 3.2 & 3.3 highlighting conditions where anti-staph treatment is required (PPT). Also discuss supportive therapy needed in severe pneumonia. All children with severe pneumonia should be monitored by nurse every 3 hours (RR, SpO_2) and by doctor twice daily to see whether child is improving or not?
- Tell participants, last few years, Seasonal influenza (H1N1), COVID-19 have emerged as important cause of severe pneumonia. Participants should follow management guidelines in presence of clinical and epidemiological clues.
- Participants read 3.3-3.5. Discuss management of non-severe pneumonia with Chart 3.4. Participant may ask about lower chest indrawing being classified as pneumonia. Tell them WHO has updated classification of pneumonia in 2014 and now mild to moderate lower chest indrawing without emergency signs and normal oxygen saturation is classified as pneumonia. If the child has wheezing, a trial of rapidly acting bronchodilator should be given and re-examined before classifying the child as pneumonia.
- Discuss pointers for pleural effusion or empyema in a child with pneumonia and treatment of empyema. Ask them whether they have managed any case of pneumothorax. If yes, how? Reinforce clinical pointers for suspecting air leaks and doing x-ray to confirm.
- Tell participants to do exercise 3.1 and check their answers. Help them if they have any difficulty.

ANSWERS OF EXERCISES

EXERCISE-3.1

3.1. Mayank, 13 months old child was brought to hospital with the complaints of cough & fever for four days. His respiration is very fast and there is severe chest in drawing.

You have started emergency treatment in form of positioning and oxygen as you found his oxygen saturation 88%. When you examined him further, RR is 76/minutes. He looks lethargic, there is no history of convulsion, extremities are warm, and Mother tells you that Mayank is feeding poorly. On chest auscultation, you found equal air entry both side with occasional crepitations. Other systemic examinations are normal.

a. How will you classify Mayank's illness?

Answer: Severe pneumonia

b. What investigations will you order for Mayank?

Answer: Chest X-Ray, haemogram.

c. Write specific treatment which you will start.

Answer: Injection ampicillin 50 mg/kg IV every 6 hours and gentamicin 7.5 mg/kg IV once a day.

d. Write supportive treatment if any required for Mayank.

Answer: Continue oxygen therapy and provide maintenance IV fluid till child accepts oral feeds. Give paracetamol if fever/SOS.

e. How will you monitor him during first 48 hours?

Answer: Monitor at least every 3 hours by counting respiratory rate and checking SpO_2 and looking for appearance of any emergency signs.

f. Enumerate conditions in which you will start anti-staphylococcal treatment.

Answer:

- Rapid progression of the diseases
- Pneumatocele, or pneumothorax, or effusion on chest X-Ray.
- Large skin boils or abscess or infected scabies or post measles severe pneumonia, which is not responding within 48 hours to the initial therapy.

- Participants read 3.6-3.10. Discuss chart 3.5 (causes of wheeze and respiratory distress). Ask them whether they are able to manage bronchiolitis cases in their hospitals and whether they have any difficulty in managing them. Highlight importance of supportive therapy as the mainstay of treatment.
- Discuss importance of classifying asthma into mild, moderate and severe. Emphasize importance of inhalation therapy. Discuss treatment of a child with acute life-threatening asthma highlighting importance of starting oxygen, inhalation therapy and starting systemic steroids.

Take participants to the wall chart (Chart 3.7) & discuss management algorithm and importance of reassessment in a child admitted with acute asthma. Tell participants that they will learn more about inhalation therapy in clinical session. Also, discuss practices not routinely recommended in management of children with asthma.

- Participants read 3.12-3.14. Discuss key points of Table 3.8 with PPT. Highlight clinical signs indicating moderate to severe croup. Discuss importance of giving steroids and why they should not attempt throat examination. Antibiotics will be needed when epiglottis is suspected which presents with high grade of fever .
- Tell one of participants to enumerate causes of chronic cough.
- Highlight importance of establishing diagnosis, diagnostic algorithm for tuberculosis with Chart 3.10. This chart is as per NTEP guidelines where mantoux test is not recommended. Lead a discussion on gastric aspirate examination and NAAT facilities at their hospitals. Highlight importance of doing NAAT in each case where tuberculosis is strongly suspected.
- Answer participants query regarding ATT drugs and doses.
- Participants do exercise 3.2 - 3.4. Discuss answers with them preferably individually.

ANSWERS OF EXERCISES

EXERCISE 3.2

3.2. A four-year-old Sonakshi has been brought to your hospital with cough, fever for a day along with difficulty in breathing. She has RR of 54 /minute. She has similar episodes in past and her father is on Inhalation therapy.

Her oxygen saturation is 94% on admission, has bilateral ronchi. Other systemic examination is normal.

a) What is most likely diagnosis?

Answer: Bronchial Asthma

b) How will you grade her disease?

Answer: Mild to moderate

c) What immediate treatment should be started?

Answer:

- Salbutamol by nebulizer (2.5 mg) or MDI-Spacer (2-6 puffs), repeated every 20 minutes.
- Oxygen to keep saturation above 92%.

d) Will you start antibiotics?

Answer: No

e) After 1 hour, on re-examination, she is better with RR of 30/minute. Write further management plan for her.

Answer: Monitor for 4 hours. If stable, send home on inhaled or oral salbutamol. If symptom recurs, give additional 2-3 puffs per hour and start oral prednisolone. If worsening, admit and treat as severe attack.

Exercise 3.3

3.3. A 2.5-year-old boy is brought with complaints of: mild coryza for one day; difficulty in breathing for 6 hours; barking cough and hoarseness of voice. On examination, the child is agitated, febrile, pale and also has stridor at rest. There are marked chest retraction and absent breath sound on auscultation. She had been hospitalized once with similar complaints at two years of age and has been well since then.

a) What is the diagnosis?

Answer: Viral croup

b) What is the severity?

Answer: Severe croup

c) What would be the appropriate management?

Answer:

Admit

- Give steroid- single dose Inj. Dexamethasone (0.6 mg/kg) max - 8 mg I/M or oral Prednisolone (1-2 mg/kg)
- Epinephrine (adrenaline) – Nebulized Epinephrine (1:1000 solution) 2ml in 2 ml of normal saline
- Oxygen therapy
- Intubation or tracheostomy in children with incipient obstruction
- Antibiotics are not recommended.

Exercise 3.4

3.4. A 4-year-old girl 10 kg has complaints of fever for around 1.5 months; decreased appetite for 1 month and; weight loss over past 1 month. On examination she has bronchial breathing in right inter-scapular region. Sputum on microscopy revealed acid fast bacilli.

Write the daily dose of anti-tubercular treatment for this patient

Answer:

Rifampicin	150 mg/day
Isoniazid	100 mg/day
Pyrazinamide	350 mg/day
Ethambutol	200 mg/day

- Show participants video (3A-3D) of counting RR, Fast breathing, chest indrawing, and stridor. Pause in between and answer queries if they have any (30 mins).

DAY-3

List of Day-3 Activities: Shock, Coma, Convulsion

S. No.	Time	Topics and Modality
1.	09:00 am-09:15 am	Recap
2.	09:15 am-09:45 am	Exercise Cough /Difficult breathing
3.	09:45 am-10:45 am	Shock
4.	10:45 am-11:15 am	Videos (3A-3D) – Counting RR, Fast breathing, Chest in drawing and Stridor
	11:15 am-11:30 am	**Tea break**
5.	11:30 am-13:30 pm	**Skill stations: (50 min each)** Station-1:Video (3E-3I) and Equipment- pulse oximetry, oxygen delivery system – prongs, catheter, hood and mask Station 2:Video (3J-3K) and equipment- Nebulisation, MDI and drugs – Salbutamol, Ipratromium bromide, Hydrocortisone, and Magnesium sulphate
	13:30 pm-14:30 pm	**Lunch Break**
6.	14:30 pm-15:30 pm	Management algorithm for Hypovolemic, Septic, Anaphylactic and Cardiogenic shocks
7.	15:30- pm16:15 pm	Coma, Convulsion, AES
	16:15 pm-16:30 pm	**Tea Break**
8.	16:30 pm-17:30 pm	Poisoning, Management of Snake bite

Start day 3 with recap by selected participants. Add the important points missed in recap.Tell the participants the objectives of the day.

Clinical Session

Skill station-1: (60 minutes and then group will interchange)

Show participants videos (3E-3I) on oxygen sources, oxygen delivery devices and CPAP. Answer queries. If time permits, you can also show them how to set up HHHFNC. After each video pause , demonstrate them items and answer their queries.

A. Oxygen Therapy

Objective

To learn the use of various oxygen delivery devices in an infant/child with problem with the airway or breathing.

Equipment /resources required

- Nasal prongs
- Nasal catheters
- Headbox
- Oxygen supply/source (oxygen cylinder with humidifier, concentrator)
- Humidifier
- Appropriate mannequin /Doll

Procedure

- Demonstrate use of each of the oxygen delivery equipment.
- Discuss the method of disinfection in case the device is reusable.

Steps

- For all children who have any problem with their airway or breathing, always give oxygen first, while continuing to assess for other problems.
- Oxygen therapy should be guided by pulse oximetry.
- A source for oxygen supply and the proper equipment to control oxygen flow rates are pre-requisites for use of various devices described below.

Oxygen delivery

- Give oxygen to a child in a non-threatening manner as anxiety increases oxygen consumption and possibly respiratory distress.
- If a child is upset by one method of oxygen support, you should attempt to deliver the oxygen by an alternative technique.
- If the child is unconscious, manage airway and do suction to maintain the airway.
- In an alert child with respiratory difficulty allow him to remain in a position of comfort because they will assume a position that promotes optimal airway patency and minimizes respiratory effort.
- It is important to have the proper equipment to control oxygen flow rates.

B. Oxygen Delivery Devices

Nasal Prongs

- Nasal prongs are short tubes inserted into the nostrils. Place them just inside the nostrils and secure with a piece of tape on the cheeks near the nose. Care should be taken to keep the nostrils clear of mucus, which could block the flow of oxygen. Prongs come in different sizes for adults and children.
- Nasal prongs are best for delivering oxygen to young infants and children with severe croup or pertussis; do not use a nasal catheter as they provoke paroxysms of coughing.
- **Nasal prongs are the preferred method of delivery in most circumstances, as they are safe, non-invasive, reliable and do not obstruct the nasal airway; there is minimal wastage of oxygen by this method.**
- Nasal or nasopharyngeal catheters may be used as an alternative only when nasal prongs are not available.

A. Infant size prongs
B. Adult size prongs
Note: the distance between the outlet tubes is larger and the tubes are thicker
C. Joined prongs for adults with connector between 2 separate pieces of tubing

Oxygen Therapy: Nasal prongs correctly positioned and secured

Severely ill children with signs of obstructed breathing, central cyanosis, severe respiratory distress or signs of shock or who are unconscious should receive oxygen initially by nasal prongs at a standard flow rate (0.5 – 1 L/min for infants and 2-4 L/min for older children) or through an appropriately sized face mask (flow rate > 4 L/min) to reach a peripheral capillary oxygen saturation ≥ 94%. You demonstrate use of prongs on a mannequin

Oxygen Mask

The soft vinyl paediatric mask is often poorly tolerated by infants & toddlers but may be accepted by older children. A flow rate of 6-10 litres/minute should be kept and titrated with SpO_2 monitoring.

Oxygen hood (Head box)

It is a clear plastic shell that encompasses the patients head. It is very well tolerated by infants; allow easy access to the chest, trunk and limbs and permits control of inspired oxygen. A high flow rate is required (10-15 litres/minute). As a rule, a hood is too small to use with children older than approximately 1 year. The use of head boxes is not recommended because of oxygen wastage.

Nasopharyngeal catheter: This is a 6 or 8 FG catheter which is passed to the pharynx just below the level of uvula a distance equivalent to that from the side of nostril to the front of the ear. **Humidification is required.** The bubble humidifier should be filled with clean warm water. The water should be changed daily.

Nasal catheter is made from tubing of 6 or 8 FG size such as a nasogastric tube or suction catheter. The tubing is inserted into either nostril a distance equivalent to that from the child's nostril to the inner eyebrow. It must then be firmly secured using tape, and connected to the oxygen. The tip of the catheter should NOT be visible below the uvula. Set a **flow rate of 0.5-1 litres for infants and 1-2 litres/min for older children**.

For standard flow oxygen therapy, humidification is not needed. In an emergency setting when a flow >4 L/min through nasal cannulae is required for more than 1-2 hours, effective heated humidification should be added.

When to start oxygen therapy

- Pulse oximetry is recommended to determine the presence of hypoxaemia in all children with ETAT emergency signs.
- When the child has only respiratory distress, oxygen supplementation is recommended at SpO_2 < 90%.
- Children presenting with other ETAT emergency signs with or without respiratory distress should receive oxygen therapy if their SpO_2 is < 94%.
- When pulse oxymeter is not available or pulse oxymeter does not pick saturation in conditions like shock, hypothermia, the necessity for oxygen therapy should be guided by clinical signs although they are less reliable. Oxygen should be given to children with severe pneumonia, bronchiolitis or asthma who have:
  - Central cyanosis
  - Inability to drink (when this is due to respiratory distress)
  - Severe lower chest wall in-drawing
  - Very labored or very fast breathing (Respiratory rate ≥ 70/min)
  - Grunting with every breath (in young infants)
  - Depressed mental status.

C. Monitoring during Oxygen Therapy

Monitor the child at least every 3 hours to identify and correct any problems, including:

- Oxygen saturation, by pulse oximeter
- Position of nasal prongs
- Leaks in the oxygen delivery system
- Oxygen flow rate
- Airway obstructed by mucus (clear the nose with a moist wick or by gentle suction)

D. Duration of oxygen therapy

Oxygen therapy can be stopped when a child no longer has ETAT emergency signs and maintains a peripheral capillary oxygen saturation ≥ 90% in room air.

When the child is stable and improving, take the child off oxygen for 15 min. If the SpO_2 readings with room air remain ≥ 90%, discontinue oxygen but check again 30 min later and every 3 hours thereafter on the first day off oxygen to ensure that the child remains stable.

E. Sources of oxygen

There are two possible sources of oxygen: oxygen concentrators and oxygen-filled cylinders

- **Oxygen concentrators** work by pumping room air through a zeolite canister to remove nitrogen, thus concentrating the oxygen. The device is of moderate cost, requires little maintenance, and, once purchased, produces oxygen continuously at low cost. A continuous electrical supply is required.
- **Oxygen cylinders** are easy to use, requiring only a flow meter and appropriate tubing, and can operate even when there is no electrical supply. The oxygen in cylinders is, however, relatively expensive and maintaining a constant supply is often difficult, especially at peripheral hospitals and health centers. They are useful during transportation.
- **Central supply of oxygen:** Large hospitals usually have central oxygen supply and oxygen ports as source of oxygen.

2. BUBBLE CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

Principles of bubble CPAP

- Increases functional residual capacity (FRC) and improves lung compliance and oxygenation
- Maintains and splints collapsed airways
- Reduces work of breathing and oxygen consumption
- Reverses hypoventilation (increases tidal volume)
- Improves diaphragmatic activity
- Less requirement of sedation

Indications

- Increased work of breathing as indicated by severe chest indrawing
- Barely able to maintain SpO_2 in the range of 92-94% despite the increased work of breathing
- Progressive respiratory failure
- Useful in bronchial asthma, pulmonary edema, atelectasis and neuromuscular diseases
- Weaning from invasive ventilation
- Not to be used in presence of apnoea. or impending cardio-respiratory collapse

Things required for assembly of CPAP circuit

- Pressurized oxygen source
- Oxygen flow meter
- Nasal prongs appropriate for patient's age
- Underwater seal (glass bottle with markings or chest bags)
- T-piece/T-tube

The circuit

- From central source of oxygen, pressurized oxygen is delivered through a flow meter to the patient via appropriate size nasal prongs

- Glass bottle with markings or chest drainage bag is used to make underwater seal which is connected between the oxygen source and patient with a T-piece/T-tube, which has blow-off value
- The amount of CPAP to be delivered is determined by adjusting the height of the water column from tip of the tube under water: 1 cm equal to 1 cm H_2O pressure.
- With oxygen flow at 5-8 L/min, the constant bubbling of gas delivers the CPAP effect.

Targets to be achieved

- SpO_2 92-95%
- PaO_2>60 mm Hg
- $PaCO_2$<50 mmHg

Monitoring

- Vital parameters every 2 hourly
- Arterial blood gases every 12 hours or more frequently depending on clinical need and availability
- Abdominal distention and local redness
- The water level and bubbling every 2 hourly

Complications

- Nasal dryness
- Skin irritation
- Air leaks
- Gastric perforation / Feed intolerance
- Aspiration

3. HIGH FLOW NASAL CANNULA (HFNC)

Principles of HFNC

HFNC flow improves gas exchange by

- Creates an oxygen reservoir in anatomical airways allowing for delivery of ~100% FiO_2
- Reduces anatomical dead space by virtue of its bulk flow rinsing the dead space thus decreasing rebreathing of gas with high CO_2 and depleted O_2
- Provides positive airway pressure effect (CPAP)
- Increases alveolar ventilation
- Prevents drying of airway epithelium and improves mucus clearance
- Greater patient tolerance, leading to reduced anxiety and dyssynchrony
- Better ability to expectorate and clear pulmonary secretions and to participate more actively in physical therapy
- Reduces need for escalation of respiratory support, intubation rates, PICU admission and length of stay
- Simpler application, less nasal trauma
- Well tolerated by patients, empowers parents

Indications

- Bronchiolitis
- Pneumonia
- Congestive cardiac failure
- Apnoea of prematurity
- Weaning from mechanical ventilation

Contradications

- Excessive oral or nasal secretions
- Choanal atresia / Facial anomalies or injuries that preclude appropriate nasal cannula fit
- Trauma/surgery to nasopharynx
- Active vomiting/ Bowel destruction

Things required for assembly of HFNC

- Pressurized oxygen source
- Oxygen flow meter
- Air-oxygen blender
- HFNC circuit/tubing
- Humidifier (MR850, Fisher and Paykel)
- Large-bore binasal prongs appropriate for patients age

The circuit

- HFNC interface consists of short binasal prongs with manufacturer-recommended prong size that fit within the nares according to septum width without abrasion or pressure along the nares. The prong calibre is adapted to the nostril size in order to allow for leakage and avoid excess pressure
- Measuring patient's septum is important for selection of appropriate size of nasal prongs to avoid barotrauma and pressure necrosis of nasal tissue if larger nasal prongs were selected
- Air-oxygen blender allows adjustment of FiO2 from 0.21 to 1.0 and generates flow up to 50-60 L/min.
- The gas is heated and humidified through an active heated humidifier (MR850, Fisher and Paykel)
- The gas temperature is set around 37°C in order to reach optimal humidification
- The heated and humidified gas leaves the humidifier through large bore corrugated tubing that connects to the cannula with a 15-mm outer diameter adapter. A heated wire circuit is used to minimize condensation to prevent water from obstructing the HFNC
- Flow continues through 18-cm length of 10-mm outer diameter tubing and finally to cannula
- Flow administered is around 2 L/kg/min. Recommended flow rates are < 2 L/min for premature or term infants, upto 12 L/min for older infants and toddlers, upto 30 L/min for children, and upto 40 L/min for adults. HFNC is capable of delivering FiO2 of 0.6, 0.8, 0.9 and 0.95 with flow rates of 10, 15, 20 and 30 L/min.
- The fraction of oxygen in the gas flowing in the system should be adjusted to maintain an SpO_2 of > 92%.

Targets to be achieved

- Improvement in respiratory distress, and hemodynamic parameters
- SpO_2 92-95%
- PaO_2 > 60 mm Hg, $PaCO_2$ < 50 mm Hg

Monitoring

HFNC should be initiated in an emergency department or a PICU that has sufficient staff to closely monitor the patient's clinical course and that is well trained to recognize the early signs of respiratory failure. A patient on HFNC should be monitored for improvement or deterioration or for any adverse effects of HFNC.

Monitor for

- Vital parameters every 2 hourly
- Arterial blood gases every 12 h or more frequently depending on clinical need and availability
- Abdominal distension and local redness
- The water level in humidifier chamber and functioning of humidifier every 6 hourly
- Clogging by water in tubing

Complications

- Air leaks
- Nasal dryness
- Skin irritation
- Greater intra- and inter-patient variations in pressures generated

Weaning from HFNC

During weaning support, flow is typically reduced by 10-25% over time. Conversion to low flow nasal cannula may be well tolerated by children receiving ≤ 4 L/min.

Skill Station-2: Using A Nebulizer And Metered Dose Inhaler With Spacer/Volume Holding Chamber

Objective

To learn the correct use of nebulizer and spacer in an infant/child with respiratory difficulty or cough.

At this skill station, the participants should have:

- Practised the use of nebulizer to deliver medications as aerosol
- Practised the use of MDI with spacer as an alternative method for delivery of medications by inhalation

Equipment/resources required

- Nebulizer
- Selection of oxygen masks
- Mouthpiece
- Oxygen supply with tubing
- Commonly used vials of medication for nebulization
- Mannequin or volunteer/patient
- MDI with SPACER and mask

First show them Video (3J-3K) of Nebulization then show them nebulization chamber, tubings and machine. Answer queries.

Steps

Position patient correctly and maintain comfort

- Wash hands thoroughly before using a nebulizer.
- Ensure that the equipment is clean/sterilised appropriately.
- Measure the correct dose of medication (eg; salbutamol nebulizer solution) to be administered and pour into the Nebulizer compartment/chamber. The dose of salbutamol is 0.15 mg/kg (minimum 1.25 mg; i.e. 0.25 ml ml of the 5 mg/ml nebulizer solution).
- Add saline to make volume upto 2-4 ml.
- Connect the Nebulizer tubing to the port on the compressor.
- Turn the compressor on and check the nebulizer for misting.
- Select appropriately sized oxygen mask and connect to nebulizer. Depending on age, a mouthpiece can be used.
- Place facemask over patient's nose and mouth and secure. Hold the nebulizer in an upright position to avoid spillage while using the mask; ensure that it fits well.
- In older children ask the patient to keep the mouthpiece inside the mouth and close the lips around it.

- Starts oxygen at 4–6 l/min. Nebulize the child until the liquid is almost all used up.
- When no further aerosol can be seen and the nebulizer set sounds 'empty', turn off the nebulizer. Assist the child to remove the mask/mouthpiece.
- Document that the medication given and its dose; note if the nebulisation has had any effect on the condition of the child (eg; oxygen saturation, air entry etc.)

Practical points on nebulizer usage:

Nebulization is a method of converting a medicine or solution into an aerosol, which is inhaled directly into the lungs.

The Nebulizer sets come with three components:

- The chamber, where the solution to be nebulized is placed/poured.
- A mouthpiece or mask (either can be used depending on the age of the patient)
- Tubing to attach the gas inlet on the chamber to either an air or oxygen supply.

The driving source for the nebulizer must deliver at least 6–9 litres/minutes of air.

Recommended methods are an air compressor, ultrasonic nebulizer or oxygen cylinder, but in severe or life-threatening asthma oxygen must be used.

Saline should be used as the diluent and not distilled water. This is because hypo-osmolar solutions can lead to reflex bronchospasm.

Delivery may be through a mouthpiece or mask, depending upon the child's age and level of cooperation. If a mask is used, it should be held close to the face (but not so tight that it causes inconvenience). Any gap reduces drug delivery significantly.

Post-procedure cleaning of equipment

- Disconnect the nebulizer set from the tubing and the flow meter. Take the nebulizer chamber apart, so that the three components are separated from each other.
- Ensure any residual solution is discarded since any residual solution left in the chamber will rapidly become colonised with bacteria from environmental sources.
- Wash the three parts of the chamber in warm soapy (neutral detergent/washing up liquid) water. Chlorhexidine-based or other soap products are not suitable. Washing the chamber ensures no residual drug is left in the nebulizer set avoiding subsequent re-administration with the next nebulizer.
- Rinse all three parts well. Remove excess water. Leave the nebulizer parts in a clean area to air dry away from any area where water may splash on it to reduce the risk of contamination.
- Regularly review the integrity of the nebulizer set. Discard the chamber and tubing if either shows any signs of the following:
  - Discolouration
  - Stickiness
  - Cracking of the chamber

Giving salbutamol by Spacer/Volume holding chamber + MDI Steps

1. Assemble the spacer.
2. Remove the cap of the inhaler, shake the inhaler and insert it into rear end of the spacer device.
3. Place the mouthpiece of the spacer in the child's mouth. A good seal should be made with spacer. If required, seal the child's lips around the mouthpiece by gently placing the finger of one hand around the lips.
4. Encourage the child to breathe in and out slowly and gently. This may make a 'clicking' sound as the valve opens and closes (only in spacer with valve). Once the breathing pattern is well established, press the canister with the free hand and leave the device in the same position as the child continues to breathe (tidal breathing) 4 to 5 times. An older child may be taught to breathe in deeply coordinating with the puff release and pause after inspiration to a count of '5-10'. Most children can empty out the spacer in 1-2 breath. As the tidal volume of the patient and the capacity of the spacer can be variable, as a thumb rule, one can ask the child to take 3-5 breaths after the release of each puff without removing it from the mouth between breaths.
5. Remove the device from the child's mouth.
6. If a second puff is required, wait for about one minute before repeating steps 1-5.
7. For children below about three years, a face mask should be attached to the mouthpiece end of the spacer and opposed closely to the face to achieve a tight seal before repeating steps 4-6.

Cleaning the spacer

Wash with a mild soap/detergent solution every month. Allow to drip dry. Do not use a cloth to wipe. This minimizes the static charge and thus, reduces drug deposition on the spacer wall.

Metered dose inhaler

Steps

Ask the child/parent to:

1. Remove the mouthpiece cover and shake the inhaler.
2. Breathe out gently.
3. Place the mouthpiece of the inhaler in the mouth between the teeth and seal lips around it taking care not to bite.
4. Press the canister and simultaneously start breathing in, slow and deep. Continue to inhale deeply.
5. Remove the inhaler from the mouth and hold breath for about 10 seconds.
6. Wait for at least 15-30 seconds before taking another inhalation.
7. Parents must assist and supervise those children who need help in using their MDI correctly.

Key points to remember

- Spacer is a way of effectively delivering bronchodilator drugs and works similar to nebulizer if correctly used. A child below age of 5 years should not be given inhaler without spacer.
- If commercial devices are not available, a spacer device can be made from a plastic cup or a 1-litre plastic bottle by cutting a hole at the base of the cup/bottle in the same size and shape as the mouthpiece of the inhaler. These deliver three to four puffs of salbutamol, and the child should breathe from the device for upto 30 seconds.

Section 4: Management of Children With Shock

- Tell participants, now they will learn about another emergency sign i.e. Shock. They have already learnt emergency treatment initiation. Ask them whether they are able to manage these cases in their hospital. Ask them to name few conditions which can lead to shock in children.
- Participants read 4.1 & 4.2. Ask one of participants to summarize what they learnt in section 4.1- 4.2.
- Now take them through Chart 4.1 on diagnostic approach to a child with shock through PPT.
- Tell them that all types of shock can result in impairment of circulation leading to impaired functions of vital organs. So, management of airways, initial fluid therapy is required in all types of shock. However further fluid boluses should be guided by type of shock and monitoring of vital signs.
- Tell them although blood pressure measurement is not essential to diagnose but they help in monitoring and identifying distributive shock.
- Participants read management of hypovolemic shock. Discuss algorithm (chart 4.2 on management of hypovolemic shock) with PPT.
- Participants read Septic shock. Discuss differentiation of warm septic shock and cold septic shock (Table 4.2) with PPT. Take them through chart 4.3 management algorithm for children with septic shock to discuss management of septic shock.
- Discuss choice of antibiotics and vasoactive drugs. Tell them that more information about preparation of vasoactive infusions are given on page 96 of the participant module. Emphasize the need and indications for giving corticosteroids in case of septic shock.
- Participants read anaphylactic shock and cardiogenic shock. Discuss management algorithms (chart 4.4 ; anaphylactic shock and 4.5 cardiogenic shock) one by one. Tell them, if anaphylactic shock is not treated timely, it can kill child. Highlight importance of giving Adrenaline and preferred route.
- Answer queries if they have any.
- Participants do exercise 4.1 individually. Collect their answer and discuss answers in group with PPT

ANSWERS OF EXERCISES

EXERCISE-4.1

1. A 4-year-old child has sustained a road traffic accident and brought to emergency. He is breathing normally but lips look blue, has cold extremities, CRT > 3 seconds and pulse rate of 148/minutes. Emergency staffs have managed airway, started oxygen by mask. When you examined, child looked lethargic, anxious and in pain. There was swelling over left thigh and pain on left lower limb movements.

   a) Classify the type of shock in this child

   Answer. Hypovolemic haemorrhagic shock

   b) What is lower limit of normal systolic pressure in this child**?**

   Answer. 78 mm Hg

   c) What are steps in initial fluid resuscitation of this child?

   Answer: Fluid resuscitation with boluses of RL/NS 20ml/kg each and as fast as possible. Up to 3 fluid bolus may be given.

   d) After fluid resuscitation, the boy has HR-137/min, RR-40/min, and BP: 68-50 am Hg. What is the most appropriate next step in management?

   Answer. Transfuse packed red blood cells at 10 ml/kg.

2. A 4.5-year-old girl is admitted in ward with an abscess on scalp. Over the last 24 hours, she has developed fever with chills. Her vital signs are: temperature-39.8°C; heart rate-150 beats/min; respiratory rate- 28 /min, and blood pressure- 80/30 mm Hg. Her extremities are warm and flushed, with a capillary refill time of <3 second.

   a) Classify the type of shock in this child

   Answer. Septic shock

   b) Outline the initial fluid and supportive therapy.

   Answer:

   Give Fluid bolus 10-20ml/kg over 30-60 minutes, repeat 10 ml/kg if there is partial response.

   Supportive therapy

   - Give oxygen to keep SpO_2 >94% in supportive therapy
   - Give IV antibiotics (Ceftriaxone with Vancomycin)
   - Maintain temperature

   c) What will be the initial inotrope of choice if child does not respond to fluid therapy?

   Answer:

   Norepinephrine at 0.1 µg/kg/min and titrate up to 2 µg/kg/min. If Norepinephrine not available, other alternatives epinephrine or dopamine may be used.

Section 5: Management of Child Presenting with Lethargy, Unconsciousness or Convulsion

- Participants read learning objectives/ Show Learning objectives (05 mints)
- Tell participants to read section 5.1-5.4.
- Discuss causes of acute febrile encephalopathy and clinical signs which points toward aetiology (Table 5.1 & 5.2). Discuss the CSF findings and their utility in differential diagnosis of various types of meningitis and AES. Also discuss other investigations used to diagnose CNS infections. Tell participants they will learn management of meningitis and severe malaria in Chapter -7.
- Emphasize importance of supportive care (management of raised ICP, maintaining euglycaemia in management of AES
- Participants read section 5.5. Discuss, how frequently they get children with seizure, what anticonvulsant drugs are available in their hospitals.
- Emphasize that the aim of treatment of acute seizure is early cessation of seizures in order to prevent progression to status epilepticus, cardiorespiratory compromise and cerebral damage. Delayed intervention may result in a protracted seizure episode that is more difficult to control, with subsequent neurological morbidity and possibly death.
- Discuss steps of management algorithm for status epilepticus (Chart 5.4). Status epilepticus is a medical emergency that can result in profound systemic and neurological damage and is associated with significant mortality in the short and long term. The ideal anticonvulsant medication is one that can be given safely and easily, acts rapidly, has minimum cardiorespiratory adverse effects, has long lasting effect and less expensive.
- Updated ETAT guidelines recommends that when intravenous access is not available for the control of acute seizures in children, nonparenteral routes of benzodiazepine administration should be used. Options include rectal diazepam, oral or intranasal midazolam and rectal or intranasal lorazepam.
- In children presenting with acute seizures or status epilepticus where IV access is available, either IV diazepam, or lorazepam or midazolam should be used to terminate the seizure early. Early cessation of seizure helps by minimizing the long term neurological morbidity, calms the parents and also avoids undue pressure on treating team.
- Discuss management of febrile seizure. Emphasize long term AED is not required after 1st episode of seizure.
- Participants read section 5.5 c, d, e. Discuss the management of children presenting with first unprovoked seizure and epilepsy. Highlight the role of EEG and neuroimaging. Discuss various antiepileptics. Answer any questions.
- Discuss management of poisoning, snake bite, scorpion bite with PPT.
- Lead a discussion what poisoning cases the participants see in their clinical practice. Highlight the need to have the antidotes of commonly observed poisonings in the emergency. Answer queries if any.
- Tell them this is just broad principles. For more information they will need to consult standard text book.
- Participants do exercise 5.1. Collect answers and then discuss answers in group

ANSWERS OF EXERCISES

EXERCISES 5.1

1. Eighteen months old Kareena has been admitted with the complaints of fever for 2 days, not recognizing parents since night and two episodes of seizures since morning. On admission, her breathing was normal, AVPU (response to pain +), extremities were warm. Emergency staffs have managed her airway and positioned in recovery position, started oxygen, checked blood sugar and found it 60 mg. When you checked RDT, it was negative.

   a) Write empirical treatment.

   Answer:

   - Injection Ceftriaxone (100 mg/kg/day once daily or 50 mg/kg/day ever 12 hours)
   - Injection Acyclovir (10 mg/kg 8 hourly).

   b) Write supportive treatment.

   Answer:

   Maintain euglycemia, maintain hydration.

   Treat raised intracranial pressure by elevation of head end upto 15-30 degree. Give anti convulsants like phenytoin.

2. Fourteen months old Salman was brought to emergency with fever (39.2^{0}C) and convulsing. He is very hot to touch. Nursing officer put IV line and checked blood sugar which was normal. Salman's airway was managed, kept in recovery position, oxygen was started and one dose of diazepam was given. Seizure continued despite a diazepam dose. Systemic examination did not reveal any abnormality. He has regained consciousness after 2 doses of diazepam.

   a) What is most probable diagnosis?

   Answer: Febrile seizure

   b) Write management plan for Salman.

   Answer: Give diazepam or lorazepam to terminate seizure. Put in recovery position after termination of seizure. Reassure parents long term anticonvulsants not needed.

DAY-4

List of Day-4 Diarrhoea and Fever

S. No.	Time	Topics and Modality
1.	09:00 am-09:15 am	Recap
2.	09:15 am-10:45 am	Section 6: Diarrhoea
3.	10:45 am-11:15 am	Videos (4A-4B) on Dehydration assessment
	11:15 am-11:30 am	**Tea break**
4.	11:30 am-13:30 pm	**Clinical session** Station 1:Videos (4C-4F) Clinical cases: cough and diarrhoea Station 2: IV canulation, NG tube and fluids, ORS and Emergency drugs
	13:30 pm-14:30 pm	**Lunch Break**
5.	14:30 pm-16:15 pm	Fever: Managing cases of severe and complicated malaria, fever with or without localizing signs, rash
	16:15 pm-16:30 pm	**Tea Break**
6.	16:30 pm-17:30 pm	Fever: Dengue case classification and volume replacement

Section 6: Approach to a child presenting with diarrhoea

Show learning objectives of Chapter - 6 with PPT.

- Tell participants that diarrhoea is the second most common cause of mortality in under-five children. Ask few participants, how commonly they see diarrhoea in their practice. What are the difficulties they face in the management? Tell them they will learn about management of diarrhoea in this chapter.
- Participants read 6.1 to 6.4.
- Summarize types of diarrhoea and important history which they should take in dealing with a case of diarrhoea.
- Discuss investigations and tell them no investigation is required in acute diarrhoea unless complications like electrolyte disturbances is suspected.
- Lead a discussion on assessment of dehydration in cases with diarrhoea. Emphasize importance of classifying dehydration status in each case of diarrhoea and use of zinc. Highlight the dangers of using antidiarrhoeals and indiscriminate use of antimicrobials during diarrhoea.
- Discuss indications for hospitalization in acute watery diarrhoea.
- Participants read 6.5-6.7. Summarize Plan C, B, A.
- Participants read 6.8-6.9. Discuss chart 6.1 & 6.2 with PPT. Emphasize importance of assessing dehydration in dysentery and persistent diarrhoea cases also. Tell participants indications of hospitalization in dysentery and persistent diarrhoea cases. Explain importance of investigations and nutritional management in persistent diarrhoea cases.
- Tell participants to do exercise 6.1 to 6.2. Discuss answers.

ANSWERS OF EXERCISES

EXERCISE 6.1

1. Sana 13 months old female baby is brought to emergency with history of loose motion for 2 days. Her admission weight is 9 Kg.

   On examination Sana is lethargic, her eyes are sunken and her skin pinch is very slow. When she is offered fluid, she is not able to drink.

   a) Classify the hydration status of Sana?
   Answer: Severe dehydration

   b) Which plan of treatment you will start?
   Answer: Plan C

   c) Write the type of fluid, amount and duration over which you will rehydrate?
   Answer: Ringer's Lactate 30 ml/kg (270 ml) over 30 mins, then 70 ml/kg (630 ml) over 2.5 hours.

   d) What will you monitor during rehydration?
   Answer: Signs of dehydration, pulse rate and urine output.

   After 3 hours, you re-examined Sana. She now looks alert, eyes are normal, skin pinch goes back immediately and she is drinking normally.

   e) What is hydration status now?
   Answer: No dehydration

   f) Will you discharge her or observe in clinic/Hospital?
   Answer: Observe at least for 6 hours.

   g) What discharge advises you will give her parents?
   Answer:
   - Give more fluids (ORS) than normal (50-100 ml after each loose stool) Continue feeding
   - Give zinc 20 mg daily for 14 days
   - Explain danger signs (when to bring child back to the hospital)

2. Fourteen months old Irfan is brought to hospital with history of loose motions and vomiting for 3 days. On examinations, he is irritable, eyes are normal, skin pinch is slow and he drinks eagerly when offered fluid?

   a) Classify hydration status
   Answer: Some dehydration

   b) Write treatment plan for this child.
   Answer: Plan B

EXERCISE-6.2

1. Akbar, 3 years old child is brought to hospital with loose stool, pain abdomen and fever for two days. Akbar also has visible blood in stool. Akbar does not show any emergency signs and has no dehydration. There is no past history of measles. His weight is 11 Kg.

   a) Write treatment for Akbar.

   Answer:

   - Give oral cefixime 10-15 mg/kg (150 mg) in two divided doses for five days.
   - Zinc supplementation for 14 days extra fluids to prevent dehydration

   b) After what interval you will call Akbar for follow-up?

   Answer: Two days

   c) Now there is no blood in stool, no abdominal pain, and he is passing semi formed stool with occasional mucus. What advise you will give?

   Answer: Continue oral cefixime to complete five days treatment.

2. Sonu is 8 months old and weighs 6.0 kg. He has had diarrhoea for 20 days. He has some dehydration. He has been referred with classification of severe persistent diarrhoea, moderate underweight and anaemia. His diet includes animal milk, cooked cereal, and some mashed vegetables.

   a) Should Sonu be admitted to the health facility?

   Answer: Should be admitted

   b) Name some non-intestinal infections which may be causative?

   Answer: Sepsis, pneumonia, and UTI.

   c) Write treatment plan for Sonu.

   Answer: Treat some dehydration with Plan B. Give antibiotics, zinc, vitamins and minerals.

   d) What diet will you give to Sonu?

   Answer: Diet A

   e) Enumerate criteria for changing the diet?

   Answer: An increase in stool frequency (usually more than 10 watery stool a day), often with signs of dehydration. There is no weight gain or weight loss.

- Show participants video (4A-4B) on diarrhoea**.** Answer participants query if they have anything related to management of diarrhoea.

Clinical Sessions

Skill Station-1

Objective:

At this clinical session, the participants will:

- Practise the assessment of a sick child with diarrhoea or cough & difficult breathing.
- Learn the recording of clinical observation in the sample format.
- Enhance skill through video (4C-4F)

Resources

- Sample case recording format (for Inpatient record)
- Pen/pencil
- Beds for examination
- Pulse oxymeter (preferable)
- Thermometer

Arrangements in Clinical Setup

- Identify an area in the hospital close to where sick children are admitted (pediatric ward). This area should preferably have 6-8 beds so that identified cases (children diagnosed with diarrhoea or could & difficult breathing) can be examined there.
- Allocate a case to single or pair of participants; not more than 14-16 participants should be assigned to this activity in one-time slot.
- At least two facilitators and one/two nurses should be at hand to facilitate the participants and to provide feedback after the case has been assessed by the participants.

Steps in Clinical Practice

Facilitator assigns cases to participants. Participants should practise the steps relevant to the session's objectives with the case assigned (relevant history, examination and management plan)**.** Observe participants individually working with their assigned patients. Assist them in doing the clinical skills correctly.

Provide specific feedback and guidance as often as necessary. Comment on issues that are done well and offer additional guidance when improvement is needed.

Skill Station 2: IV canulation, NG tube and fluids, ORS and Emergency drugs

Objective:

At this skill station, the participants should have:

- Practised the insertion of IV line and intraosseous line.
- Learnt the use of rectal diazepam as an alternative method for delivery of medication

Equipment/resources required

- Antiseptic solution
- IV Cannula of paediatric sizes
- Splint
- Adhesive tape
- Diazepam injection

Steps: Insertion of an Indwelling Intravenous Cannula in a Peripheral Vein

Identify an accessible peripheral vein. In young children aged > 2 months, this is usually the cephalic vein in the antecubital fossa or the fourth inter digital vein on the dorsum of the hand.

- An assistant should keep the position of the limb steady and should act as a tourniquet by obstructing the venous return with his or her fingers lightly closed around the limb or use a torniquet.
- Clean the surrounding skin with an antiseptic solution (such as spirit, iodine, isopropyl alcohol or 70% alcohol solution), then introduce the cannula into the vein and insert most of its length.
- Fix the catheter securely with tape. Figure below
- Apply a splint with the limb in an appropriate position (e.g. elbow extended, wrist slightly flexed)

Other Points to Remember

Care of the cannula

Secure the cannula when introduced. This may require splinting neighbouring joints to limit the movement of the catheter. Keep the overlying skin clean and dry. Flush and fill the cannula with normal saline immediately after the initial insertion and after each injection.

Common complications

Superficial infection of the skin at the cannula site is the commonest complication. The infection may lead to thrombophlebitis, which will occlude the vein and result in fever. The surrounding skin is red and tender. Remove the cannula to reduce the risk of further spread of the infection. Apply a warm, moist compress to the site for 30 min every 6 hour.

Intravenous drug administration through an indwelling cannula

Attach the syringe containing the IV drug to the injection port of the cannula and inject the drug. Once all the drug has been given, flush with normal saline until all the blood has been expelled and the catheter is filled with the solution.

Steps: Intraosseous Line

Facilitator can demonstrate and participants can practise on chicken thigh bone or any other animal bone.

- Gather necessary supplies.
- Wash hands and put on clean examination gloves.
- You can use a sterile intraosseous needle, bone marrow needle, or a 22-gauge needle. Identify the insertion site (proximal end of tibia or distal end of femur).
- The site at the proximal end of the tibia is 1 cm below and 1 cm medial to the tibial tuberosity.
- The site at the distal end of the femur is 2 cm above the lateral condyle.
- Prepare the skin over the insertion site using a swab or cotton-wool ball soaked in antiseptic solution, and allow it to dry.
- Position the baby's leg with the knee bent about 30 degrees and resting on the table.
- Support the upper tibia with one hand, placed so that the hand is not directly behind the site of insertion.
- Hold the needle (with the attached syringe if using a hypodermic needle) in the other hand at a 90° angle to the selected insertion site, angled slightly towards the foot.
- Advance the needle using a firm, twisting motion and moderate, controlled force. Stop immediately when there is a sudden decrease in resistance to the needle, which indicates that the needle has entered the marrow cavity.
- Once the needle is properly positioned, remove the stylet (if a bone marrow or intraosseous needle was used) and attach the syringe.
- Aspirate using the syringe to confirm that the needle is correctly positioned. The aspirate should look like blood.
- Slowly inject 3 ml of I/V fluid to check for proper placement of needle.
- Look for swelling (indicating leaking of fluid under the skin) at the front of the leg or in the calf muscle at the back of the leg. If swelling is seen, remove the needle and try again.
- Secure the needle in place using tape, and splint the leg as for a fractured femur ensuring that the elastic bandage does not interfere with the needle or infusion set.
- Inspect the infusion site every hour.

  Remove the intraosseous needle as soon as alternative I/V access is available, and within 8 hours, if possible.

Steps: rectal diazepam

- Wash hands and put on clean examination gloves.
- Have an assistant remove the baby's napkin and hold the baby on one side, similar to the lying position for lumbar puncture.
- Draw up exact dose of Diazepam into the tuberculin syringe. Remove the needle from the syringe.
- Lubricate the syringe with a water-based lubricant.
- Gently insert the syringe into the baby's rectum and advance it approximately 4-5 cm.
- Administer the drug slowly over 3 min and then slowly withdraw the syringe. Allow the baby to relax from the curled-up position.
- If the dose is passed from the rectum within the first five minutes, repeat the dose.
- The majority of absorption will occur between 5 and 15 min after administration, so if stool is passed after this, the dose does not need to be repeated.

Interval before giving another dose (if convulsions do not stop) is 10 min.

Section 7: Case management of children presenting with fever

- Present learning objectives: tell them fever is one of the most common morbidity with which children are brought to hospitals. Most of the cases are managed on outdoor basis but they may have serious underlying infections and diseases. It is important to examine carefully so that viral infections and more serious infections are differentiated.
- Participants read section 7.1-7.2.
- Lead a discussion on causes of fever (Chart 7.1 & 7.2), managing cases of severe and complicated malaria. Emphasize criteria for classifying fever cases as severe malaria. Tell them importance of PS examination and RDT. Emphasize importance of timely starting artesunate in severe malaria cases and supportive therapy. WHO has updated Malaria guidelines and has recommended use of primaquine in children above 6 months . See guidelines for more information.
- Emphasize importance of treating hypoglycemia and seizures in severe malaria cases (Box 7.1).
- Discuss Table 7.1 with PPT
- Discuss indications of blood transfusion in severe malaria cases through Box 7.1.
- Participants read section 7.3-7.4. Discuss Box 7.2 with PPT to highlight important history and examination findings in a suspected case of malaria. Emphasize importance of starting antibiotics early in suspected meningitis. Discuss measures to decrease raised intracranial pressure.
- Discuss when should they suspect tuberculous meningitis.
- Participants read section 7.4b. Discuss treatment of typhoid fever and importance of giving adequate dose and duration of antibiotics. Discuss urine sample collection method in suspected UTI (Section 7.5).
- Participants read section 7.6 till management. Discuss Table 7.3 with PPT (Dengue fever: Phases & common complication). Discuss warning signs and symptoms and importance of timely identification of these symptoms. Discuss atypical manifestations like encephalopathy, hepatitis etc.
- Participants read management of dengue fever. Emphasize that there is no advantage of giving prophylactic platelet transfusions unless platelet count is less than 10,000 or there is hemorrhage. Discuss Chart 7.4 to 7.8 one by one highlighting appropriate classification and careful fluid administration. Also discuss table 7.3 and highlight atypical manifestation of dengue fever. Emphasize (Box 7.4) on indication of platelet transfusion.
- Participants read scrub typhus from section 7.7. Tell participants that scrub typhus has emerged as an important cause of fever in many parts of country. Discuss important clinical features which suggest possibility of scrub typhus.
- Tell participants to do exercise 7.1 to 7.3. Collect answer sheet. Discuss answers with PPT.

ANSWERS OF EXERCISES

EXERCISE-7.1

1. 3 years old John has been brought with fever for 3 days and impaired consciousness for 6 hours and one episode of seizure on the way while coming to the hospital. He is breathing normally, is unconscious but responding to painful stimuli, extremities are warm. On arrival, you have started emergency treatment – positioning, oxygen and anticonvulsant.

   History & examination – Weight -14 kg, Temp- 39°C, Pallor ++, RR-28/min, no signs of meningeal irritation, spleen 3 cm. His peripheral smear is positive for P. falciparum, Blood Sugar-60mg/dl, Hb - 4 gm/dl, Blood urea/Serum Creatinine- Normal.

   a) What is likely diagnosis?

   Answer: Cerebral malaria

   b) What other complications does John have?

   Answer: Severe Anaemia

   c) Write Specific treatment which you will start?

   Answer: Give artesunate 42 mg I/V stat, at 12 hrs and at 24 hrs. Then 42 mg I/V once a day. Once the patient regains consciousness, start oral therapy with ACT-SP for 3 days and primaquine (10 mg) single dose on day 2.

   d) What supportive treatment will John need?

   Answer:

   - IV fluids
   - Blood transfusion
   - Antipyretic

EXERCISE-7.2

1. 13 months old Sharad has been brought with history of fever for 2 days and impaired consciousness and one episode of seizure on the way to the hospital. He is breathing normally, unconscious but responding to painful stimuli, extremities are warm. On arrival, you have started emergency treatment –positioning, Oxygen.

   History & examination – Weight -8 Kg, Temp- 39°C, No Pallor, RR-38/min, Signs of meningeal irritation +, no splenomegaly. His peripheral smear is negative for malarial parasite, Blood Sugar- 40 mg/dl, Hb -11.5gm/dl, Blood urea/Serum Creatinine- N, CSF- 250 cells, 90% polymorphs, Protein 68mg/dl, Sugar 30mg/dl, Fundus -Normal.

a) What is the likely diagnosis?

Answer: Acute Bacterial Meningitis

b) What complications does Sharad have?

Answer: Hypoglycemia, seizures

c) Write specific treatment which you will start?

Answer: Injection ceftrixone 50 mg/kg/dose every 12 hours.

d) What supportive treatment will Sharad need?

Answer:

- Inj 10% Dextrose 40 ml, anticonvulsant (Inj phenytoin 20 mg/kg, I/V loading (followed by 5 mg/kg day)
- Antipyretic
- I/V maintenance fluid

2. Deepak, a 4-year-old child, weighing 11 kg, was brought to the hospital emergency with history of fever and cough for 1 month, headache and vomiting for 7 days and one episode of generalised seizures followed by loss of consciousness for 2 hours. On examination, his vitals were: temperature 38°C, heart rate 80/min with good volume peripheral pulses, respiratory rate 40/min, BP 110/88 mmHg, and SpO_2 98% on room air. There was intermittent stiffening and extension of all four limbs and no localisation of pain. His chest X ray showed consolidation of left lower zone. He has received intravenous antibiotics (ceftriaxone) in appropriate doses for 5 days prior to hospitalization without any clinical improvement.

   A detailed history revealed that the mother had completed a course of antitubercular therapy about 6 months back for pulmonary tuberculosis.

   a) What is the most likely diagnosis?

   Answer: TBM with raised ICT

   b) Write the supportive and definitive treatment plan considering the above diagnosis in mind?

   Answer:

   - Supportive – head end elevation, I/V mannitol, I/V phenytoin, paracetamol (nasogastric/rectal suppository)
   - Monitoring of GCS, vitals
   - Definitive - ATT cat I with steroids

   c) What other investigations would you plan to confirm the diagnosis?

   Answer:

   - Fundus examination for raised ICT
   - Neuroimaging of brain (contrast enhanced CT)
   - CSF examination after initial stabilization (not to be performed till raised ICT persists).
   - GA for AFB & NAAT, NATT of CSF (NAAT, if positive, supports the diagnosis. If negative it doesn't exclude the diagnosis).

EXERCISE-7.3

1. A five-year-old child, weighing 20 kg is brought to the hospital with history of fever, generalized rash, body ache and headache for 5 days and extreme lethargy and abdominal pain for one day. On examination, he is conscious, his temperature is 38°C, PR – 110/min, BP – 98/60 mmHg, CFT/CRT <3seconds, RR – 26/min. He has erythematous, maculo-papular rash all over body. His tourniquet test is positive.

   a) What is the most likely diagnosis?

   Answer: Dengue fever with warning signs (lethargy, abdominal pain & tourniquet test positive)

   b) What are the important investigations to confirm the diagnosis?

   Answer:

   - CBC (look at hematocrit, platelet count)
   - NS1 antigen and dengue serology (IgM, IgG)

   c) Outline the management plan.

   Answer: Give IV fluid 6ml/kg/hour, R/L or NS, over 1-2 hours and then decide based on repeat haematocrit. Shift to oral fluids whenever general condition improves.

2. A five year-old child weighing 25 kg is brought to hospital with history of fever, headache, bodyache and rash for 7 days. The parents reveal that the child has been excessively sleepy for last 12 hours and has coldness of hands and feet. He has not been accepting anything orally and has not passed urine for last 12 hours.

   On examination, he is drowsy and confused. His temperature is 36°C, HR-150/minute, pulse are feeble. His CBC shows HB-15.2, HCT-46, TLC-3200, platelet count-49000.

   a) What is the most likely diagnosis?

   Answer: Dengue fever with profound shock

   b) Outline the initial management plan.

   Answer: Initiate I/V fluid 10-20 ml/kg of NS/ R/L rapid bolus over 15-30 minutes and then decide based on vitals & repeat haematocrit

   After initial management with volume replacement therapy (bolus), there is no improvement in vitals. The repeat haematocrit comes to 38.

   c) What complication will you suspect and what is the next step in management?

   Answer: Blood transfusion as there is no improvement in vitals in spite of fall of haematocrit. Internal bleeding should be suspected.

DAY-5

List of Day-5 Anemia, malnutrition and supportive care

S. No.	Time	Topics and Modality
1.	09:00 am-09:15 am	Recap
2.	09:15 am-09:45 am	Anemia
3.	09:45 am- 11:15 am	Section 9: Assessing the nutritional status and management of severe acute malnutrition
	11:15 am-11:30 am	**Tea break**
4.	11:30 am-12:30 pm	Videos (5A-5I) on Anthropometry, oedema, and feed preparation
5.	12:30 pm-13:45 pm	Maintenance fluid calculation for different weight and choice of intravenous fluid, Blood Transfusion, supporting breastfeeding Common feeding problems and solution
	13:45 pm-14:30 pm	**Lunch Break**
5.	14:30 pm-16:15 pm	Fever: Managing cases of severe and complicated malaria, fever with or without localizing signs, rash
	16:15 pm-16:30 pm	**Tea Break**
6.	14:30 pm-15:15 pm	Post- test
7.	15:15 pm-15:45 pm	Feedback
8.	15:45 pm-16:30 pm	Closing ceremony

Section 8: Management of children with anemia

- Tell participants that anaemia is a very common morbidity in children in India. Nutritional anemia is the most common anemia in children. Tell learning objectives of the chapter.
- Participants read section 8.1- 8.3.
- Discuss Table 8.1, importance of doing peripheral examination in all cases of anemia.
- Discuss red flag signs for non-nutritional anemia and need of referral if investigations are not available.
- Tell participants to do exercise 8.1 individually and then discuss in group.

ANSWERS OF EXERCISES

EXERCISE-8.1

1. Karishma, a 2-year-old female child, weighing 9 kg is brought to hospital with history of increasing pallor and lethargy for two months. The mother tells that the child has become irritable, is not interested in playing and refuses to eat anything. Her feeding history revealed that the child was predominantly on milk feeds and took cereal-based feed only occasionally.

   On examination she has severe pallor, temperature - 37^0C, pulse rate 100/min, BP – 88/54 mmHg and respiratory rate 30/min. Her systemic examination is normal and haemoglobin is 3 gm/dl.

   a) What is the most likely diagnosis?

   Answer: Nutritional anaemia

   b) What investigations will you order? Outline the initial treatment.

   Answer:

   Complete hemogram with peripheral smear and retic count, stool routine examination for ova/cyst, Serum iron studies (ferritin, TIBC, transferring saturation) wherever available.

   Initial treatment – Transfusion of packed red blood cells @10ml/kg over 3-4 hrs. (Alternatively whole blood @20ml/kg over 3-4 hrs)

   c) Discuss further treatment and followup?

   Answer:

   - Oral iron @ 2-3 mg/kg/day for 3 months. Dietary counselling
   - Deworming
   - If coexisting vitamin B12/folate deficiency is suspected, treatment of the same should be added.

Assess response to treatment by repeating CBC with peripheral smear with retic count after 2 weeks. An increase in hemoglobin by 1-2 gm% and reticulocytosis should be observed if there is response to iron.

Section 9: Assessing the Nutritional Status & Management of Children with Malnutrition

- Introduce objectives by PPT.
- Ask participants following questions:
  - Why it is important to determine nutritional status of under five children?
  - How do they to assess the nutritional status of the child attending their hospital?
- Explain that malnourished children are usually not brought to hospital because of their nutrition status. They mostly come because their child have some medical complication e.g. diarrhoea, pneumonia. The usual response is to tackle the illness first, and plan to do something about the malnutrition later, when the illness has been treated. But this is not correct. We have to identify malnourished children and manage their malnutrition as well as medical complications.
- Explain that children who are classified as severe underweight, wasted or stunted. To decide whether the child is wasted or stunted we need to take certain other measurements like length/ height or MUAC. If the child has moderate acute malnutrition they will need dietary counselling while children with severe acute malnutrition need special therapeutic diet and supplements.
- Tell participants to read section 9.1 and 9.2. Discuss classification of nutritional status by PPT. Explain plotting & interpreting weight on growth charts by PPT. In addition, elaborate about various growth curve patterns. Summarize methods for identification of acute malnutrition (show PPT).
- Ask participants to read 9.3 and 9.4. Now summarize these sections using slides. Discuss and summarize the important history, examination points, which will help them to plan treatment. Discuss common investigations, like blood sugar monitoring and investigations to screen for infections.
- Take participants to wall chart and elaborate on principles of care (Chart 9.5) and explain 10 steps of management.
- Tell them to read section 9.5 till step 3 of 10 essential steps of management of children with severe acute malnutrition. Once all participants have completed reading the sections, reiterate that all SAM children are predisposed for hypoglycemia and hypothermia.
- Misdiagnosis and inappropriate treatment of dehydration is common in SAM children and nearly all children with SAM have bacterial infection. Answer participants' query.
- Now ask them to read from step 4 to 10. Highlight importance of micronutrients for proper recovery in children with SAM. Emphasize that all SAM children for their optimal recovery need potassium and magnesium supplementation for at least 2 weeks.
- Discuss recommended antibiotics and duration as per PPT. All SAM children with medical complications need broad spectrum antibiotics which covers both gram-positive and gram-negative infections.
- Discuss special feeds for starter diet and catch-up diet for SAM children. Sections 9.5.8 and 9.5.9 will describe how to start feeding on starter diet, transition to catch-up diet, and continue with free-feeding on catch–up diet.
- Assemble all the participants for video demonstration and show videos (5A-5I) on anthropometry, oedema and feed preparation. Ensure all of them can see the projection. Ask them to watch the video and to note down their queries. Facilitators can address the queries at the end of the video session. If required, the video can be put on 'rewind' for viewing any particular sections linked to the query/ies.
- Conclude the section by making these points that all children with malnutrition should be identified early and should be provided with appropriate counselling and treatment.
- Tell them to do exercises from 9.1 to 9.5 individually (20 minutes) and discuss answer (10 minutes).

ANSWERS OF EXERCISES

EXERCISE 9.1

Determine weight-for-height (or weight- for- length) SD scores for the following cases. (The participants should refer to Chart 9.2 of the Training Module depicting the reference charts)

1. Reena is a 2-year-old girl. Her weight is 6.9 Kg and length is 75 cm. What is her weight for height SD score?
   Answer: <-3SD
2. Rahul is a 4-year-old boy. His weight is 13 Kg and height is 95 cm. What is his weight for height SD score?
   Answer: < Median
3. Vikas is a 3-year-old boy. His weight is 9.8 Kg and length is 88 cm. What is his weight for height SD score?
   Answer: <-2SD
4. Soni is a 1-year-old girl. Her weight is 5.1 Kg and length is 72 cm. What is her weight for length SD score?
   Answer: <-4SD
5. Kishan is a 6-month old boy. His weight is 7.3 Kg and length is 67 cm. What is his weight for height SD score?
   Answer: < Median

EXERCISE 9.2

Determine nutrition status of children using measurements given below.

Name	Age (months)	Sex	Weight (kg)	Length /Height (cm)	SD Scores	MUAC	Oedema	Nutritional Status
Prince	12	M	9.8	73	**> med**	12.8	No	**Normal**
Rani	15	F	7.2	75	**<-2SD**	11.8	No	**MAM**
Ritika	26	F	10.4	89	**<-1SD**	12.3	No	**MAM**
Dinesh	32	M	10.5	95	**<-3SD**	12.1	Yes	**SAM**
Iqbal	20	M	6.4	83	**<-4SD**	11.5	No	**SAM**
Nitin	5	M	4.2	64	**<-4SD**	10.9	No	**SAM**
Sakina	8	F	4.2	72	**<-4SD**	10.6	No	**SAM**

EXERCISE 9.3

1. 14 months Ramesh has been brought to hospital with poor feeding. He weighs 5.6 kg and his length is 72.5cms. Examination history shows that his airway and breathing is normal and he has become unconscious while coming to hospital. His mid-upper arm circumference is 11.6 cm and there is no pedal oedema. His blood sugar is 40 mg/dl and temperature is 36^0C.

   a. Do you think Ramesh has SAM?

      Answer: Yes

   b. Is Ramesh hypoglycemic?

      Answer: Yes

   c. Does he have hypothermia?

      Answer: No

   d. What immediate treatment you will give to Ramesh?

      Answer: He should be given IV 10% glucose 5 ml/kg (30 ml)followed by 50 ml of 10% glucose or sucrose by NG tube.

EXERCISE 9.4

1. Radha, a 7 months old child has been brought to hospital with history of diarrhoea and vomiting for 5 days with no blood in stools. Her weight was 5 kg, MUAC 9.2 cm and she has sunken eyes and very slow skin pinch and did not accept the offered fluids (Project the photo on the screen for participants).

a) Does Radha have signs of dehydration?

Answer: Yes

d) How will you treat Radha?

Answer: Radha should be given ORS for SAM 5ml/kg for two hours every half hourly followed by 5-10 ml/kg ORS in alternate with starter F 75 every hour for upto 10 hours.

b) Tina, 2 years old girl, was admitted as SAM with diarrhoea in the hospital and has given treatment for hypoglycaemia and her repeated blood glucose is normal. Her weight was 6.5 kg, temperature 36.7°C she was alert and drinking eagerly. Her skin pinch is slow and eyes are not sunken.

a) What immediate treatment will you give her?

Answer: Tina will be given 30ml ORS for SAM (5ml/kg) for two hours every half-hourly followed by 30- 65 ml (5-10 ml/kg) ORS in alternate with 70 ml starter F 75 every hour for upto 10 hours.

EXERCISE 9.5

1. When you examine Radha after 30 minutes, she is better and accepting ORS orally. What antibiotics and micro-nutrient supplementation should be given to her?

   Answer: She will be given Inj. Ampicillin 250mg/ dose 6 hourly and Inj. Gentamicin 37.5mg once a day.
   - Potassium 15 meq/ day (20 meq/ 15ml) 50% of Magnesium sulphate 1.5ml
   - Vitamin A 1 lakh IU
   - Multivitamin Supplement 5ml OD Folic Acid 5 mg
   - Zinc 10mg

2. Anu weighs 6 kg and length is 82 cm. She does not have any airway problem, doesn't have convulsion. Capillary refill time is less than 3 seconds. She is lethargic and has blood sugar of 40mg/dl, axillary temperature is 34.8 degree centigrade and has mild dermatosis.

   a. What two antibiotics should Anu be given now? Determine the dose of each antibiotic.

   Answer: She will be given Inj. Ampicillin 300mg/ dose 6 hourly and Inj. Gentamicin 45mg once a day.

   b. Write the electrolyte and micronutrient supplementation you will give to Anu?

   Answer:
   - Potassium 18 meq/ day (20 meq/ 15ml)
   - Folic Acid
   - 50% of Magnesium sulphate 1.8ml
   - Vitamin A 1 lakh IU
   - Multivitamin Supplement 5ml OD
   - Zinc 12mg

Section10: Supportive Care

- Tell participants that supportive therapy is equally important in sick children. Show them learning objectives of the chapter
- Discuss fluid requirements (maintenance IV fluids) and importance of using isotonic maintenance IV fluids. Discuss chart 10.1 and help participants to understand these calculations.
- Discuss importance of optimal feeding practices and how to help mothers with breastfeeding problems and other feeding problems
- Discuss chart 10.2 – 10.4.

At the end discuss Annexures 1-8 of participant modules.
Summarize and answer the queries if any

Now tell the participants that they will be given post test for their final assessment. Explain them the rules of the test.

ANNEXURE: CASE RECORDING FORM

Checklist for Monitoring Clinical Sessions		Date:										
Sick child age 1 months up-to 5 years **Tick correct classifications** **Circle if any assessment or classification problem** **Annotate below**												
Participant's Initials												
SICK CHILD AGE (months)												
TRIAGE	**Emergency signs**											
	Airway & Breathing											
	Circulation											
	Coma											
	Convulsion											
	Severe dehydration											
	Priority signs											
	Non-urgent											
COUGH OR DIFFICULT BREATHING	Very severe pneumonia											
	Severe pneumonia											
	No pneumonia											
	Asthma/WALRI											
	Viral Croup											
DIARRHOEA	Some dehydration											
	No dehydration											
	Severe persistent diarrhoea											
	Persistent Diarrhoea											
	Dysentery											

Checklist for Monitoring Clinical Sessions			Date:									
FEVER	Malaria											
	Meningitis											
	Typhoid											
	Dengue											
	Other causes											
ANAEMIA	Severe anaemia											
	Anaemia											
	No anaemia											
MALNUTRITION	Severe Acute Malnutrition											
	Moderate Acute Malnutrition											
	No Acute Malnutrition											

Tick treatments or counseling actually given. Circle if any problem. Annotate below

TREATMENT GIVEN	Drugs										
	Supportive care										
	Advice										
COUNSEL FEEDING	Asks feeding questions										
	Feeding problems identified										
	Gives advice on feeding problems										

SIGNS DEMONSTRATED IN ADDITIONAL CHILDREN

PROBLEMS:

NATIONAL HEALTH MISSION

राष्ट्रीय स्वास्थ्य मिशन