Induction Training Module for Staff Nurses

2023

NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन

उत्तर प्रदेश सरकार

UP-TSU

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UP-TSU

Shri Partha Sarthi Sen Sharma
IAS
Principal Secretary

Department of Medical Health and Family Welfare
Government of Uttar Pradesh

MESSAGE

The Government of Uttar Pradesh is committed to provide quality of care and improve the health status of its people. Several health indicators have shown constant improvement e.g. the maternal mortality ratio and infant mortality rate has recorded highest annual reduction in recent past.

Over the years nursing cadre has been the backbone of health care services that is dedicated to the care of people. Nurses provide care for all ages, newborn, adult and the elderly population across the State. The goal of nursing is to promote health and wellness, prevent illness and provide care to those who are sick or injured.

The Government of Uttar Pradesh has launched the Mission Niramaya recently which focuses on improving the service aspect of nursing profession and aims to enhance the knowledge, skills and practices required for providing quality of care. The soft skills and behaviour of the nursing professionals remains critical which significantly affects the patient's satisfaction status.

The current module for training of newly on-boarded staff nurses covers not only the critical domains of clinical care but also incorporates broader socio-behavioural dimensions e.g. effective communication, concept of gender in public healthcare, quality assurance as well as public health aspects of health care such as Ayushman Bharat Digital Mission, National Health Programs, etc.

It is evident that this would empower the staff nurses with knowledge, skills and competencies which are in tune with recent requirement in the public health arena. It would also prove highly useful for the nursing staff, other medical and paramedical professionals and the community at large.

I firmly believe that this module for orientation of the staff nurses would act as a ready reckoner for developing a deeper understanding of the clinical protocols and acceptable public dealing skills necessary required for delivering improved quality of care and will go a long way in building the overall capacity of the staff nurses and improve the health status of the people of Uttar Pradesh.

,

(Partha Sarthi Sen Sharma)

Dr Pinky Jowel (IAS)
Mission Director

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MESSAGE

It is undeniable that staff nurses are essential healthcare professionals who perform a wide range of tasks and effectively deliver patient care in various health care facilities. "Mission Niramaya" is a visionary program that came into being on International Nurses Day on 20th May, 2022, with the primary goal of revolutionizing medical education and uplifting the quality of nursing and paramedical staff in the state.

A comprehensive and continuous training program is essential for the staff nurses. Staff nurses require a combination of formal education and in-service training to provide safe, effective and up-to-date patient care. Also, their competence and compassion are the bedrock upon which we build a healthier and more vibrant society.

Specialist nursing training programs are essential for acquiring additional nursing skills for greater responsibilities in complex healthcare settings. In conducive environment advanced practice nursing roles can provide effective health services that are instrumental in achieving Universal Health Coverage.

I am delighted to introduce this comprehensive staff nurse training program, a vital initiative within the National Health Mission (NHM). It is evident that a well-trained, motivated nursing workforce is the cornerstone of a robust healthcare system. This training program embodies NHM's commitment to excellence in healthcare delivery. It is designed to equip our staff nurses with the knowledge, skills and mindset required to provide compassionate, safe and effective care. In an ever-evolving healthcare landscape, our nurses must stay abreast of the latest medical advancements and continue to provide patient-centred care.

I extend my heartfelt gratitude to the team of officials from the Directorate, NHM, UPTSU and partners for their relentless efforts in making this training program a reality. Your unwavering commitment to our mission is truly commendable. I look forward to witnessing the positive impact of this training on our healthcare system and the lives of the people we serve.

,

(Dr. Pinky Jowel)

Dr. Deepa Tyagi
Director General

Directorate of Medical & Health Services
Kaisar Bagh, Lucknow
Uttar Pradesh

MESSAGE

I extend a warm welcome to all the staff nurses in the Department of Medical Health and Family Welfare, Uttar Pradesh.

The goal of the induction programme is to provide standardized information on the policies, procedures, protocols and documentation to be followed in the hospitals and to familiarize the new recruited staff nurses on the vision, goals and organizational structure of public health facilities. As part of a changing health service system, staff nurses need to keep up with the evolving health needs, policies, technologies and knowledge.

Nurses after entering into professional healthcare delivery, have little time to academically hone themselves further. This module also imparts essential safety and risk management information, provides core mandatory training and gives nurses, the practical information they will need to begin their new jobs. This helps in enabling nurses to acquire education, skills and competence that will capacitate them to support and help their patients in all kinds of situations.

This training is intended to orient the newly recruited staff nurses on their roles and responsibilities and develop their communication, critical thinking and decision-making skills to enable them to perform their jobs especially in improving the quality of health care to the public.

The ultimate outcomes of induction training programs are to improve the professional practice of nursing. Evaluating the impact on outcomes, through improvement in healthcare quality indicators, validates the importance of induction training for the freshly recruited nursing profession, the value of nurses' contributions to interprofessional teams, and ultimately the delivery of safe, high-quality patient care.

I want to extend my heartfelt gratitude to UPTSU for the invaluable support provided during the development of this training module. Their expertise and assistance were instrumental in the making of this module. Their commitment and willingness to design and shape this module is greatly appreciated. I am sure this will have a significant impact on the quality and effectiveness of this training program.

I believe that this initiative of induction training of staff nurses will go long way contributing towards strengthening the skill, embracing technology by providing training on various portals to provide the quality health services.

(Dr. Deepa Tyagi)

Dr. Shailesh Kr. Srivastava
Director General, Training

Directorate of Medical Health and Family Welfare
Kaisar Bagh, Lucknow
Uttar Pradesh

MESSAGE

I extend my warmest welcome and heartfelt congratulations to all those embarking on the journey of being nurses in the public hospitals of Uttar Pradesh.

It is with great pleasure that I introduce to you the induction training and its training module, which is a first of its kind initiative in the state of Uttar Pradesh. It has been made with a vision that nurses from diverse backrounds have joined the services and should be aligned with the vision and mission of the health services in the state of UP and should work following the common standard protocols in clinical case management. This module will guide the nurses through the core principles of patient care, evidenced based practice, team work and most importantly the ethical, moral, behavioural and other soft skills, which will help them render services with utmost professionalism and compassion..

For the first time, we have also tried to inculcate in our nurses the values which will make our facilities gender responsive.

I appreciate the tireless efforts of IHAT-UPTSU in spearheading this initiative and providing technical inputs in collating and designing this module which will not only build the knowledge but also the competence of our staff nurses. I hope it will be very useful to all our staff nurses in executing and discharging their duties in the hospitals.

I once again congratulate you on joining as a staff nurse to serve the state of Uttar Pradesh.

(Dr. Shailesh Kr. Srivastava)

John Anthony
Senior Project Director & Lead

India Health Action Trust - UPTSU
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MESSAGE

Nurses are at the frontline of healthcare, where they touch the lives of patients and their families every day. They provide comfort in times of distress and administer critical treatments that can make all the difference. As such, the responsibility placed upon their shoulders is immense.

In the ever-evolving landscape of healthcare, the demand for nurses and their roles continue to grow, requiring a commitment to ongoing education and skill development. It is with this in mind that we have supported the GoUP in developing this comprehensive training module for the in-service staff nurses recruited through public service commission. This module is a culminating of hard work put in by the various contributors. It is designed to not only enhance the clinical competencies but also to foster qualities of leadership, effective communication , behavioral skills with special emphasis on gender responsive care and teamwork within the nurses.

I deeply appreciate GoUP commitment in promoting and supporting health care, and its dedication to advancing healthcare access and quality aligns perfectly with our mission and vision of building competence of in-service nurses.

I would like to express my regards to Mr. Partha Sarthi Sen Sharma (IAS) Principal Secretary, Medical Health and Family Welfare (UP) for his leadership and vision in taking this initiative to propose an induction training of newly recruited staff nurses and Dr Pinky Jowel (IAS) Mission Director NHM (UP) for taking this forward with a 12 days training package.

My heartfelt gratitude to Dr Deepa Tyagi DG Medical Health and Dr Shailesh Kr Srivastava DG Training for providing the guidance to the contributors for developing this training module. My thanks to Dr Usha Gangwar JD CHC, Dr Alka Singh JD training, Dr Archna Verma GM training and Mr. Devesh Tripathi ex- DGM training for providing their invaluable support during the development of this training module.

I would like to acknowledge the tireless efforts of Dr Vandana Singh Deputy Director (Nurse mentoring) from UPTSU and her team Dr Rahul Katiyar and Mr. Ajay Singh Shekhawat in compiling and editing the module and bringing it to its final shape.

John Anthony

(John Anthony)

Special Acknowledgement

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Table of Content

Chapter 1
Introduction

Nursing is a unique profession in the health care delivery system that started as an art of care, evolved as a vocation and now complements medicine as a science that is important for complete patient care, well-being and positive clinical outcomes while retaining the age old of touch of art that nurses bring with their individual experiences.

Natural calamities such as the recent COVID-19 pandemic has reinforced the fact that human survival both within hospitals and in home settings is heavily dependent on good quality nursing care and a large number of COVID 19 survivors can vouch for their good health to the tireless, self-less care that nurses provided to them during their hospital stay.

As UP moves ahead in the field of health, the GoUP has recognised the contribution that nurses make to strengthen the health of the community and thus launched the Mission Niramaya.

GoUP is committed to and focussing on the science of nursing by equipping our newly joined nurses with the knowledge, skills, practices and behaviours that are needed for optimum patient care so that an efficient team of doctors and nurses can place UP on the top of the health map of India.

This module is designed to focus on building upon the existing knowledge acquired in nursing schools and colleges complemented by a set of skills that nursing professionals in government health facilities must possess to deliver the desired results as expected by GoUP.

This module will focus upon the following

1. **Knowledge**- Among the vast sea of theoretical knowledge that medicine has to offer and what has already been taught in nursing schools, this module acts as a ready reckoner with standard protocols for nurses to refer to in their day-to-day clinical work to minimize errors and clear doubts.
2. **Skills**- these are the set of psychomotor activities to be performed in order to deliver the services according to the protocols. Learning and practising skills in safe, efficient and effective manner is extremely important for optimal patient care.
3. **Professional Behaviours:** Professional behaviours are actions which reflect the values, rules and practices of nursing and are expected of all nurses.

Professional Behaviours

Core Values in Delivering Patient Care:

- Protecting the rights of patients with honesty and respect
- Developing good partnership between patient and the care givers.
- Alleviating pain and suffering.
- Providing clean and safe environment.
- Protecting comfort and wellbeing.
- Involving the staff in planning and decision making
- Efficient and effective team work

Code of conduct for nursing professionals

A code of conduct is a document designed to influence the behaviour of employees. They set out the procedures to be used in specific ethical situations, such as conflicts of interest or the acceptance of gifts, and delineate the procedures to determine whether a violation of the code of ethics occurred and, if so, what remedies should be imposed. Violations of a code of conduct may subject the violator to the organization's remedies which can under particular circumstances result in the termination of employment.

Code of Professional Conduct for Nurses in India (Indian Nursing Council - INC)

1. **Professional Responsibility and accountability**
   - Appreciates sense of self-worth and nurtures it.
   - Maintains standards of personal conduct reflecting credit upon the profession.
   - Carries out responsibilities within the framework of the professional boundaries.
   - Is accountable for maintaining practice standards set by Indian Nursing Council
   - Is accountable for own decisions and actions
   - Is compassionate
   - Is responsible for continuous improvement of current practices
   - Provides adequate information to individuals that allows them informed choices
2. **Nursing Practice**
   - Provides care in accordance with set standards of practice
   - Treats all individuals and families with human dignity in providing physical, psychological, emotional, social and spiritual aspects of care
   - Respects individual and families in the context of traditional and cultural practices and discouraging harmful practices
   - Presents realistic picture truthfully in all situations for facilitating autonomous decision-making by individuals and families
   - Promotes participation of individuals and significant others in the care
   - Ensures safe practice
   - Consults, coordinates, collaborates and follows up appropriately when individuals' care needs exceed the nurse's competence.
3. **Communication and Interpersonal Relationships**
   - Establishes and maintains effective interpersonal relationship with individuals, families and communities
   - Upholds the dignity of team members and maintains effective interpersonal relationship with them
   - Appreciates and nurtures professional role of team members
4. **Valuing Human Being**
   - Takes appropriate action to protect individuals from harmful unethical practice
   - Considers relevant facts while taking conscious decisions in the best interest of individuals
   - Encourage and support individuals in their right to speak for themselves on issues affecting their health and welfare
   - Respects and supports choices made by individuals
5. **Management**
   - Ensures appropriate allocation and utilization of available resources
   - Participates in supervision and education of students and other formal care providers
   - Uses judgment in relation to individual competence while accepting and delegating responsibility
   - Facilitates conducive work culture in order to achieve institutional objectives
   - Communicates effectively following appropriate channels of communication
   - Participates in performance appraisal
   - Participates in evaluation of nursing services
   - Participates in policy decisions, following the principle of equity and accessibility of services

6. Professional Advancement

- Ensures the protection of the human rights while pursuing the advancement of knowledge
- Participates in determining and implementing quality care
- Takes responsibility for updating own knowledge and competencies
- Contributes to the core of professional knowledge by conducting and participating in research.

Code of Practice (Professional ethics)

A code of practice is adopted by a profession or by a governmental or non-governmental organization to regulate that profession. A code of practice may be styled as a code of professional responsibility, which will discuss difficult issues, difficult decisions that will often need to be made, and provide a clear account of what behaviour is considered "ethical" or "correct" or "right" in the circumstances. In a membership context, failure to comply with a code of practice can result in expulsion from the professional organization.

ICN Code of Ethics

The International Council of Nursing (ICN) Code for Nurses (1973) speaks to the responsibilities of the nurse to other people, to practice, to society, to co-workers, and to the profession as a whole. The fundamental responsibility of the nurse is fourfold: to promote health, to prevent illness, to restore health, and to alleviate suffering. The need for nursing is universal. Inherent in nursing is respect for life, dignity and rights of man.

Nurses and People

- The nurses' primary responsibility is to those people who require nursing care.
- The nurse, in providing care, promotes an environment in which the values, customs and spiritual beliefs of the individual are respected.
- The earlier term of patient has been replaced by that of people, which makes these responsibilities much broader. The Code guides the nurse in two general areas of ethical behaviour.
  - First a person's values, customs and religious beliefs must be respected.
  - Second personal information about this person must be held in confidence or shared only with judgments.

Nurses and Practices

- The nurse carries personal responsibility for nursing practices and for maintaining competence by continual learning.
- The nurse maintains the highest standards of nursing care possible within the reality of a specific situation.
- The nurse uses judgement in relation to individual competence when accepting and delegating responsibilities.
- The nurse when acting in a professional capacity should at all times maintain standards of professional conduct which reflect credit upon the profession.

Nurse and Society

- The nurse shares with other citizens the responsibility for initiating and supporting action to meet the health and social needs of the public.
- The code states the responsibility of the nurse for positive promotion of health for the public by both initiating and supporting action to meet the health and social needs. Social needs are important because they are often closely related to the health needs of the people. Poor housing, unemployment, poor sanitation, malnutrition or illiteracy is thought as social needs only. E.g. Poverty leads to lack of food and malnutrition which may cause serious illnesses especially in children. Illiteracy, which means people cannot read prevents educating the public good health practices. Thus, helping to meet social needs of the general public is also a part of nurses' responsibility.

Nurses and Co-workers

- The nurse sustains a co-operative relationship with co-workers in nursing and other fields. The nurse takes appropriate action to safeguard the individual when their care is endangered by co-worker or any other person.

Nurse and the Profession

- The nurse plays the major role in determining and implementing desirable standards of nursing practice and nursing education. The nurse is active in developing a core of professional knowledge. The nurse, acting through the professional organization, participates in establishing and maintaining equitable social and economic working conditions in nursing.

Dress code and grooming

- Nurse must wear the uniform, display ID card, shoes and socks as per norms of the Institution. Nurses must groom their hair (Hair bun with net for women and short decent haircut and clean shave for men) and cut their nails properly.
- Nurses must have pocket articles required during clinical examinations i.e. small scissors, colour pens/pencils or pocket notebook and tape.
- Nurses are not expected to wear jewellery but they are expected to keep wrist watch with seconds.

Chapter 2
Soft and Communication Skills

COMMUNICATION SKILLS

This chapter focuses on developing inter-personal, communication and soft skills needed for clinical work and for instiling leadership among nurses so that they can effectively undertake management activities .

What is Interpersonal Communication (IPC): Process

Almost every problem, every conflict and every misunderstanding has at its most basic level an interpersonal communication problem. So, what is interpersonal communication?

> *"IPC is a two-way communication between individuals and small groups, using verbal and non-verbal interaction that includes the sharing of information and feelings by establishing trusting relationships for a desired change of behavior in the person or the group."*

Why do we need interpersonal communication?

- We cannot be human alone.
- We live in a world filled with other people.
- We live together, work together and play together.
- We need each other for security, comfort, friendship and love.
- We need each other to mature through dialogue.
- We need each other to achieve our goals and objectives.

None of these needs could be addressed without interpersonal communication.

We communicate to:

- Get acquainted
- Express emotions to others
- Share information
- Persuade others to understand our personal views
- Build relationships

  Ineffective communication causes loneliness, conflicts, family problems, professional dissatisfactions, psychological stress, physical illness and even death when communication breaks down.
- Interpersonal Communication is the lifeblood of every relationship. Good relations are nurtured by open, clear, and sensitive communication.
- Inter-personal communication, being face-to-face, can be more effective in understanding and responding to peoples' thoughts.

Interpersonal Communication Skills

Our link to humanity is communication. Interpersonal Communication refers to the process in which two or more people engage with each other through non–verbal and verbal messages. For example, whenever a service provider interacts with the service receiver/consumer, mostly communication happens verbally and in support of non-verbal exchanges which include to voice, gestures, body language, and facial expressions.

Interpersonal communication plays a critical role in :

Types of communication

1. **Verbal Communication**- Communication is done through spoken words in what is called verbal communication.
2. **Non-Verbal Communication**-Communication that is done without speaking or writing is called non-verbal communication. It involves various types of body gestures and postures.

Effective use of verbal and non-verbal communication

1. **How to use verbal communication effectively?**
    - Avoid using medical jargons to explain symptoms and treatment as it might confuse the patient and caregivers.
    - Listen attentively and carefully to complaints as patients often communicate in their dialects and accents.
    - While consulting, the patients tend to describe health problems in peculiar ways.

People use both spoken and written language to transmit messages in verbal communication. The words used by patients and caregivers in a healthcare setting have a big impact on how well they understand each other.

2. **How to use non-verbal communication effectively?**

Words only convey a portion of a message; the tone of voice, attitude, body language, and movements convey the remainder. Some of the steps that can be adopted for effective non-verbal communication are as follows:

- Avoiding distractions while interacting with someone. Such as not answering the phone and being completely attentive towards the conversation encourging the person involve in the communication with message and information.
- Simple gestures by the individuals involved in the conversation, such as a warm greeting can also help put the conversation at ease and improve the understanding among the individuals.

One-way and two-way Communication

One-way communication	Two-way communication
• One-way communication is when information is shared to others without a response. This would include posting a memo for staff members to read. • One-way communication is linear and limited because it occurs in a straight line from sender to receiver and serves to inform, persuade or command.	• Two-way communication involves information being shared back and forth. Such as a staff meeting where info is given and staff members are permitted to ask questions and give their input. • Two-way communication always includes feedback from the receiver to the sender and lets the sender know the message has been received accurately.

Communication skills in patient interaction

In patient interaction, effective communication are the basis for all treatment protocols as treatment planning starts with a detailed history and patient interview. In patient care settings, the need for communication is even greater, as a lot of emphasis is placed on listening, being sensitive, and being empathetic. Good communication skills will help the patient and the family respond to the illness in better way.

Importance of correct communication

If there is a lack of communication, it may lead to:

- Poor compliance and thus poor symptom control
- Poor adjustment to illness, thus increasing patient distress
- Situations of conflict
- Medico-legal problems arise due to misinterpretations and misunderstandings

Effective communication will reduce stress in both patients and the health care provider, help in building trust and an unsaid bond, prevent any false hopes, and allow the patient and the family members to adapt to the challenges associated with life limiting illnesses.

Basic steps for effective communication

- **Building rapport/relationship:** Take care of the settings and privacy of the patient, make them comfortable.
- **Start a discussion:** Open the discussion by acknowledging the suffering or loss of the patient. Listen actively and take cognizance of non-verbal cues too.
- **Collate information:** Explored at the patient's level. Use open-ended questions.
- **Understand the patient's point of view:** Try to empathize and understand what the patient might be feeling. Also, be prepared for emotions of anger, sadness or despair.
- **Communicate instructions and treatment plans:** Avoid using technical terms, share your instructions or treatment plan with the patient in a simple, understandable language.
- **Repeat or summarize:** Allow questions from the patients' side. Reinforce the instructions and check if anything was left out.
- **Close the conversation very sensitively:** Never be abrupt in closing the discussion. Instruct the patient when they are supposed to report again.

By the end of the discussion, an unsaid bond of trust should have been formed between the health care provider and the patient.

Steps in Communication- GATHER Approach

1.	**G**- Greet the client and build rapport	• Greet & introduce yourself. • Smile. • Show respect and concern. • Ask if they can spare some time to talk to you. • Maintain eye contact.
2.	**A**-Ask the client, Questioning	• Ask open ended questions to gather relevant information.
3.	**T**-Tells- Identify key problems	• Decide which of the problems you will address – don't try to address all the problems. • Share information to create agreement that a specific behavior is problematic.
4.	**H**- Help the client to adopt behavior/ Suggest options and motivate to adopt	• Give correct and complete information for each option suggested. • Emphasize benefits of each option
5.	**E**- Explain the client in detail why to select new behavior, its benefits and persuade them to adopt it.	• Based on which option the client thinks is most suited for them, help them choose an option • Discuss and explain what barriers the client thinks they may face in implementing the new behavior and discuss how best to overcome it

6.	**R**- Return Visit- Summarize, Thank the Client/Set date for the return visit	• Ask the client to tell you what actions they will take based on your recommendations.
		• Remind them of any important points they may have left out.
		• Agree on a convenient time to visit/meet in 5-7 days to see:
		  • if the person was able to make changes
		  • if they felt benefitted by the changes
		  • if they find some things about the changed behavior very challenging
		  • if they think they can maintain the new behavior

Common Barriers to interpersonal communications

- **Age-** Many people find it comfortable to interact with people of their own age. Assess the comfort level of the audience in interacting with people who are older or younger
- **Religion and culture-** Religious beliefs and cultural practices could be barriers to inter personal communication.
- **Gender-** Some people prefer communicating with their own sex on sensitive issues.
- **Language**- Language could be a great barrier. Knowing the local dialect could be a big advantage to any interpersonal communicator.
- **Education-** People would prefer to communicate with someone who has the same level of education or with a superior level.

Barriers to effective communication in health care settings

Barriers at the health care provider's level	Barriers at the patient's level
• Fear of being accused or blamed • Fear of making the patient upset • Fear of being thought of as incompetent • Lack of surety while responding to difficult questions • Uncertainty about handling patient's emotions and reactions • Using too much technical jargon • Talking down to patients	• Language problems • The patient might be afraid of talking freely • They may think health care provider don't have time to listen to their details • They may be afraid of the truth being revealed to them • Not being able to understand the situation and its implications completely

Listening skills

Listening is an integral part of effective communication. The basic steps for effective communication comprise preparing for listening, questioning, listening effectively {active listening), and responding.

Incorporating the following key points during listening can enhance listening skills:

- Start the interview with a **smile** and a **greeting**. The patient should be allowed to be seated comfortably. Sitting next to the patient without any barrier like the table in between is even better.
- **Open-ended questions:** These questions allow the patient to decide how much to talk and make the patient comfortable.
- **Encourage talking:** If the health care provider talks more and the patient doesn't get a chance to clear doubts, a rapport is difficult to form.
- **Listen actively**: The patient should get assurance that they are being listened to. This can be achieved by repetition of what the patient is saying, paraphrasing, and reflection. The assurance should be conveyed by both verbal and non-verbal means. Making eye contact, leaning towards the patient, and avoiding being fidgety are helpful.
- **Allow brief silence:** Health care providers should try to keep patience when the patient sometimes becomes silent during a discussion, especially when narrating about an emotional or sensitive issue. If interrupted, they may forget what they were saying or change the conversation.

Breaking Bad News

As a health care provider, situations arise when a diagnosis of a serious disease or the loss of a loved one has to be conveyed to the patient or family members. Before breaking bad news to the person concerned, the health care provider should first prepare herself or himself. Health care providers should be empathetic and feel the pain of the patient or family member before conveying the news.

Patients have the right to be informed about their disease. Also, it helps them and their family plan their lives ahead, avoids any false hope, and helps build trust between the patient and the provider.

Collusion

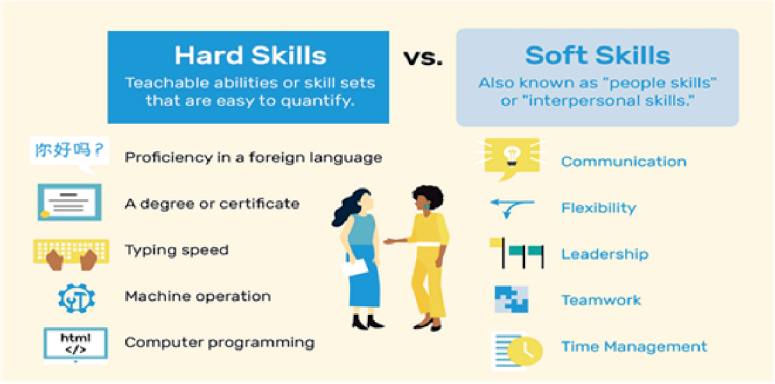
Sometimes, the patient's family does not want the patient to know about the diagnosis. This act of shielding or hiding information from the patient or family is called collusion.

Denial

Denial is a coping mechanism where in the patient tries to avoid thinking about any painful thoughts or feelings. Not wanting to know the diagnosis is a form of denial.

Soft Skills in workplace

Soft skills are personal character traits and interpersonal skills that characterize a person's relationships with other people. In the workplace, soft skills are considered to be a complement to hard skills, which refer to a person's knowledge and occupational skills.



Why Are Soft Skills Important in Nursing?

- Nurses must apply their soft skills to complement the technical aspects of the job. To aid their patients, nurses must recognize cues to better understand their patient's needs. When treating a patient, their physical health is only part of the equation. By recognizing verbal and nonverbal responses, nurses can identify physical ailments and unseen emotional challenges.
- Soft skills also help nurses work with other medical professionals. The ability to function as a team, communicate effectively, and accept/provide constructive criticism gives teams a better chance to deliver quality care.
- Soft skills also include a nurse's ability to adapt. In learning to work in stressful conditions and maintain their resilience, nurses improve their own outcomes for higher job satisfaction and professional success.

Chapter 3
Understanding Gender and Helping Make the Health Services and Facilities Gender Responsive

Bringing a gender-sensitive lens to engaging with the daily tasks of nurses starts with building gender awareness. This implies understanding the negative impact of gender stereotypes, expectations, and roles and developing behaviors and actions to address the situations that arise from these inequalities. The key objectives of this chapter are as below:

- To build an understanding of the difference between 'sex' and 'gender' so as to recognize how social and cultural norms can act as barriers in individual and professional situations;
- To assist participants in identifying their gender biases and how they reflect in the service delivery.
- To help participants build greater confidence in themselves so as to become informed, independent, and self-reliant in handling gender-discriminatory situations.

Important terms to help understand gender

Sex: Refers to the biological and physiological reality of being female or male. That is, when a child is born, the declaration of the newborn being a girl or a boy is based on the genitals of the newborn, disregarding any other attributes.

Gender: Refers to the social and cultural construct, recognizing the differences in the *attributes* of men/women, girls/boys, and the basis on which roles and responsibilities are assigned to men and women, respectively. Gender-based roles and other attributes, therefore, change over time and vary with *different cultural contexts*. The concept of gender also includes the *expectations* about the characteristics, aptitudes, and likely behaviors of both women and men.

Gender Roles: Gender roles are learned from birth and further reinforced by parents, teachers, peers, and society. These gender roles are based on how a society is organized and vary by age, class, and other socio-economic variations.

Gender Norms: The accepted attributes and characteristics of males and females at a particular time for a specific society or community. They are the standards and expectations to which gender identity generally conforms within a range as defined by a particular society, culture, and community at that point in time. Gender norms are ***ideas*** about how men and women should be and act, internalized early in life.

Gender Relations: Gender relations have to do with the ways in which a culture or a society defines the rights, responsibilities, and identities of women, men, girls, and boys in relation to one another. Gender relations refer to the balance of power between women and men or girls or boys.

Gender Equality: Gender equality means that women (girls) and men (boys) enjoy the same status on political, social, economic, and cultural levels. It exists when women (girls) and men (boys) have equal rights, resources, opportunities, and status.

Gender Equity: Gender equity is being fair to both women (girls) and men (boys) in distributing resources and benefits. This involves recognizing inequality and requires measures to work towards the equality of women (girls) and men (boys). Gender equity is the process that leads to gender equality.

Empowerment: Refers to women, men, girls, and boys taking control of their lives: setting their agendas, developing skills (including life skills), building self-confidence, solving problems, and developing self-reliance. The process of empowerment enables women, men, girls, and boys to question the existing inequalities as well as act for change.

Power: Power pervades all domains of one's life and informs who has, can acquire, and can expend assets and decisions over one's body, family, and others whom the person can influence (within and outside the family). It determines if an individual can take advantage of opportunities, exercise rights, build networks, and influence others.

Power also determines how men and women are treated across diverse institutions and policies within different legal frameworks.

Read the following situation

Case study 1

On incurring a knee injury, Sunita was rushed to the nearby CHC for emergency treatment. Upon reaching there, she was taken to the casualty ward where nurse Rashmi was on duty. She asked Sunita to lie down and pull her saree over her knee. As they were in the casualty ward, there were many people around. The presence of the crowd especially men in the ward made Sunita uncomfortable. She hesitated to do as asked. Becoming irritated by the time Sunita was taking, the nurse shouted at her "Stop looking around and pull up your saree quickly. We don't have all day for this".

Feeling terrified of being scolded more in front of everyone, Sunita quickly pulled her saree up. As the nurse applied medicines and bandages on her knee, she laid there silent but uncomfortable.

- What do you think about this situation?
- Have you seen/heard this happening around you?
- Why do you think this happens?
- What would you do if you were in nurse Rashmi's place?

Discussion points

This case study illustrates how lack of privacy and sensitivity can lead to a negative and uncomfortable experience for the patient. A lack of respect and privacy can often result in a humiliating experience for them.

Compromised privacy that violates a woman's sense of safety can result in feelings of shame, hurt, and humiliation. Often, like Sunita, many women might not speak up due to fear of verbal abuse or the expected gender norm of women being submissive. Hence, the healthcare provider must be vigilant to non-verbal cues and respond to them effectively. Maintaining the privacy of the patients acknowledges their agency, improves the comfort of their experience and builds their faith in the provider and the health system. The burden of patients is acknowledged in a given facility, but picking up such non-verbal cues and acting on them takes the same amount of time and effort as in reacting rudely.

As shown here, the Nurse shouting at Sunita without being attentive to the atmosphere around her or the unease she was being put in, made Sunita uncomfortable and scared. Providers appreciate women who are quiet, submissive and obedient as these are the stereotypical expectations from women in the communities. The relation between the patient and the service provider is laden with power dynamics, in many instances giving the upper-hand to the service providers (in this case the nurses) depending upon the background of the patient. Thus, when women express hesitation, pain or any signs of distress, this aggravates the providers and increases the patient's likelihood of being mistreated. Such actions by some healthcare workers discourage women from pursuing essential health services.

Case study 2

Leela is 15 years old. In the past few months, her periods had become increasingly irregular and were accompanied by painful cramps, migraines and nausea. The debilitating pain often confines her to her home, keeping her away from school and engaging in her routine activities. To diagnose the cause behind this, her mother took Leela to the nearby hospital.

As they waited to see the doctor, the staff nurse was taking down everyone's details. Upon hearing about Leela's health concern, she immediately retorted, "This is very common at your age, there is no reason to see the doctor for this". When Leela's mother insisted on the urgency of the matter, the nurse became agitated and retorted, "Do you see all these people around you? They have come with more serious problems than just growing pains. This is all in your head. Every girl has to go through this". Leela and her mother fell silent at this rebuke.

- What do you think about this situation?
- Why did the nurse not take Leela's health concerns seriously enough to see the doctor?
- How do you think the Nurse's words influenced Leela's and her mother's actions?
- What would you have done differently if you were in the Nurse's place?

Discussion points

In our society, the underlying gender norms often connote period pains as a common and essential part of womanhood. Often women who might suffer from conditions that need medical attention are mentally manipulated into downplaying their symptoms. As the nurse in this case study did, medical establishments and staff relegate women's reproductive health concerns to a possible 'over-reaction' or 'over-sensitivity' to pain. Gender norms tend to push girls and women to undergo the anguish as her gender socialisation expected of her to be tolerant. Yet many girls and women make the attempt to seek health services, overcoming all the social-gender normative barriers. But when the nurses and other health providers are insensitive to their needs given the unconscious underplay of gender norms on their actions, pushes women into the suffering without complaining and being served.

Healthcare providers need to reflect on the underlying gender norms that affect the way a woman's pain and health concerns are perceived. It is important to be sensitive to the unique needs and health complications of each woman and not let personal bias stand in the way of providing healthcare. Being respectful and acknowledging a woman's knowledge of her own body and assessment of pain is necessary to work against such harmful gender stereotypes in healthcare.

Case study 3

In DH X, two nurses are often stationed for night duty in the HDU. Though these nurses are on a 8-hour shift, where they are on their feet most of the time, there is no space to rest. The room that is allocated as the nurse's resting station had become an ad-hoc store room for the facility with many odds and bits taking up space. The nurses often have to rest on the waiting room chairs that are kept in the corridors which are mostly occupied by the patient's relatives.

Apart from not having a place to rest, the toilet in this part of the facility had been damaged for over 2 months. Despite notifying this to the higher officials, no action has been taken. Other than this toilet, the second one is located in behind the building. Accessing this toilet is time consuming and also unsafe at night. The nurses feel the discomfort throughout and especially when menstruating or stationed for night duty.

- Do you think what is happening in this situation is fair? Why/why not?
- How do you think this situation influence's the Nurse's work?
- What are some other situations as such that you all face in your workplace?
- What do you think you can do to improve your working condition if you were in this situation?

Discussion points

Women's low participation in the workforce has led to the eventual creation of workplace infrastructures that do not take into account their unique requirements. Nursing is one of the few professions where a female workforce has traditionally dominated. Despite this, there are several issues that still plague the workplaces. As shown in the case study, the absence of a resting place and a toilet, both of which are basic requirements, become obstacles the nurses have to face every day in their workplace.

Creating a safe and enabling work environment requires the provision of basic requirements such as water and a place to rest. Women are expected to adjust to the available resources and not demand. Demanding for better conditions often contradicts society's expectations from an ideal woman, attracting stigmatization and backlash. It is imperative that we move beyond such norms and ensure that there are policies and infrastructure that provide a safe working environment for women employees. It is important to be sensitive to women's vulnerabilities and be accommodative to the demands raised by them. For women in such situations, it is important that they come together as a group and make their demands heard.

Case study 4

During her shift at the general ward, Nurse Pramila met Sarita. Sarita had come to the hospital to get treatment for a severe backache that she had been experiencing. When the nurse examined her, she noticed bruises on Sarita's neck and arms. The nurse immediately asked her how these bruises occurred. Hesitantly, Sarita replied that she had fallen while carrying water. From the nature of the bruises and her body language, the nurse realized that she was lying. However, as this was a household matter and the nurse had more patients waiting, she moved on.

- What do you think about Pramila's reaction about the bruises on Sarita's body? Why do you think so?
- What would you have done if you were in the Nurse's position?
- How is the environment in your facility to handle such cases? Why do you think it is so?

Discussion points

As you might have already recognized, Sarita is a victim of domestic violence. Even though the nurse noticed the signs of violence, she deliberately overlooked them. In many cases, healthcare providers treat survivors' injuries without enquiring into the deeper causes behind them. Many communities validate domestic violence and discourage third party intervention justifying it to be a couple/family matter. This conditioning plays true for services providers too. Though Sarita did not openly state that she was being abused, from her body language and the reason given, the nurse could identify the cause behind her bruises. However, she quickly relieved herself of responsibility by deeming it as a household matter and thus outside her domain.

On the contrary, as healthcare providers, nurses are often the first point of contact for women facing any kind of domestic abuse or gender-based violence. There are instances when nurses do detect signs of gender-based violence in patients and provide first-line counselling, and referrals to further support the survivor. There are instances like in the case study, the woman might not readily share information about the abuse she is undergoing. In such instances, healthcare providers need to be vigilant to subtle signs and body language and support women to report it.

Conclusion and Actionable Pathways

After combatting barriers related to cost, access, geography and limited decision-making, low quality of care further aggravates women's dissatisfaction with the experience of care, lowering their morale and self-worth. These experiences remain embedded in their memories, thereby adversely influencing the uptake of services in the future. Therefore, there is a need for nurses to introspect and challenge the inequitable and inherent gendered attitudes and practices and be conscious of the gender and power dynamics at play between themselves and the end users.

Identifying the needs of women and addressing them under the principle of “Cause no harm”, helps to build trust in the system, sustaining the health-seeking behavior to improve health outcomes. Given below is a list of actionable points that can be adopted by nurses in their practice to make their respective facilities more gender-responsive.

1. Initial interaction of a provider with the patients greatly shapes their perceptions of the service quality. Hence, a friendly disposition of the health provider lays the pathway to a stronger and a trustworthy relationship between a service provider and the patient.
2. Health service provider's behaviour determines how comfortable a woman is. They lay a lot of importance on providers being kind, spending time, and listening attentively to them. This further helps in developing trust and managing their anxieties.
3. It is important for the providers to share information and explain to the patients the procedures, course of care, recommendations, care being given, and if there are any choices that can be made among these.
4. Patients feel valued when spoken to respectfully. No matter what the situation, service providers should maintain a respectful approach to the woman seeking healthcare to help her pass through the process.
5. When discussing any reproductive health-related concerns, it is important that providers listen to the woman seeking service and provide need-based service to the woman.
6. Service providers should always promote the choice of the woman who has come in for healthcare. This choice should be an informed one that the woman makes with the support of the provider and the availability of resources at the facility.
7. Nurses have to be vigilant and sensitive to identify cases where women might be facing any kind of abuse and extend additional support or referrals for them
8. Healthcare workers should be empathetic, non-judgemental, respectful and sensitive in their interactions with the end-user.
9. The healthcare providers must always stand with the women in the face of social/familial pressure to empower them to make their decisions.
10. The service provider must extend support to women colleagues by being sensitive to their vulnerabilities and being accommodative to the requests raised by them such as having washrooms, resting area, etc.

Chapter 4
Emergency Department

Emergency department in the hospital offers comprehensive emergency care with an attending medical officer along with paramedical staff on-duty 24x7.

Free Ambulance services (102 & 108) are available 24x7 for transfer of patients.

Organization of Emergency Department

1. Emergency department should always be at the **ground floor** with easy access to ambulances and vehicles.
2. **Signage** should be placed clearly to indicate the emergency department of the hospital.
3. **Ramps** should be provided for patients to enter the department.
4. **Stretchers and wheelchairs** are stored in the area immediately adjacent to the ambulance entrance and do not obstruct this entry.
5. **Important numbers** including ambulance, blood bank, police and referral centres should be displayed prominently.
6. **Dedicated telephone line** should be available in the emergency receiving area.
7. A person should be assigned in each shift for **enquiry services**.
8. **Waiting area, clean drinking water and separate male and female toilets** should be available for patients and their attendants.
9. There should be separate room for examination of rape victims with availability of sexual assault forensic evidence kit and protocols /guidelines for collection of forensic evidence. Counselling services is to be provided for rape victim and domestic violence.
10. The patient beds should ideally have prop up facility and wheels.
11. **Smoking is prohibited** in emergency, OPD, OT, ward as well other areas of Hospitals under Prohibition of Smoking in Public Places rules 2008.

    A 60 X 30cm board saying, **"No Smoking Area – Smoking Here is an Offence"** should be prominently displayed at each entrance, floors, staircases, and at conspicuous places inside and nurses with other support staff should ensure that all patients and their attendants adhere to it.

12. The **alert codes** should be prominently displayed and known to all staff.

Alert Code

FIRE		**RED**
CPR		**BLUE**
MASS CASUALITIES/DISASTER MANAGEMENT		**YELLOW**
CHILD ABDUCTION		**PINK**
VIOLENCE		**VOILET**
BOMB THREAT		**BLACK**

Role of nurses in maintenance of the emergency department

The nursing in-charge should note on daily rounds and ensure the following. S/he should inform the facility in-charge if there is any issue.

1. There should not be any loosely hanging wires
2. Floors of the Emergency should be non-slippery and even
3. Windows have grills and wire meshwork.
4. Check for fixtures and furniture like cupboards, cabinets, and heavy equipment, hanging objects are properly fastened and secured

5. Emergency has installed fire Extinguisher that is Class A , Class B, C type or ABC type and not expired. Due date for next re-filling should be clearly mentioned.
6. Drug crash cart should be replenished in every shift or earlier as per need.
7. Availability of functional equipment & instruments for examination & resuscitation in every shift, such as BP apparatus, multiparamonitor, torch, hammer, spot light, bag and mask, defibrillator, layrngo scope, nebulizer, suction apparatus etc.
8. Availability of point of care diagnostic test such as glucometer, HIV kit. Avaiability of bedside ECG
9. Clean linen is used on beds and changed after patient shift or whenever, it is soiled.
10. Staff duty roster duly prepared and approved by facility in-charge should be prominently displayed.
11. All infection prevention protocols are available and should be followed. (refer to Chapter 18)

Procedure for Receiving Patients

Patient is received in emergency, the attending doctor/ paramedical staff quickly attend the patient without loss of time to assess the condition and provide initial life support treatment. Initial treatment includes evaluation of patient's condition and initiation of management of case.

Triaging

The process of Triaging (sorting) is used in the Emergency Department for prioritizing the emergency patient care according to the acuity of the patient's condition.

The staff nurse should arrange the articles and assist the doctor in the initial assessment including ascertaining the level of consciousness, checking the blood pressure, pulse, temperature, SpO2 and other vitals.

The initial assessment ascertains the condition of the patient whether stable or unstable and appropriate measures to be taken.

Triage	Description	Color
IMMEDIATE	Respiration present, very serious injury that can be fixed quick without a lot of resources and have a good prospect of survival.	
DELAYED	Can wait for treatment from hours to days, minor fractures & dislocations.	
MINOR	Walking wounded, cut, minor wounds.	
EXPECTANT/ DECEASED	Un-responsive, Not breathing, pulseless, massive head trauma, would take massive resources away from many others to save one.	

A case ID is assigned to the patient for any further workup after stabilising.

Consent

- Staff nurse on duty should facilitate the process of consent.
- The general consent form should be filled and signed either by the patient, if possible or the patient representative, if the patient is not is a state to give consent.
- Life-sustaining measures are not withheld for lack of formal consent if there is no time to obtain the consent for urgent procedures.
- The nursing staff provides all the medical and logistic support for patient care. As per the advice of the attending doctor, medication/dressing, condition monitoring is carried out.
- As per the need and availability of the service, specialist may also be called for to attend to the patient. The staff nurse on duty sends out the call register and coordinates for the specialist evaluation.

Procedure for Admission & Transfer of patient to ward

- The patients are admitted on the basis of recommendation of doctor based on the patient's condition and need. Patients with minor conditions may be discharged from emergency after initial treatment/first aid with proper discharge summary.
- The patient/attendants provide information regarding name, age, sex, date & time of arrival and informed consent is taken by the in-charge.

- Emergency registration no. is allotted to the patient in emergency department & entry is made in the emergency register. On transfer to the ward, the ER no. is entered in the Indoor Patient (IP) register.
- Patients requiring minor surgical procedure are shifted to the procedure room for carrying out X-Ray and pathological investigation.
- In case the services essential for the treatment of the patient are not available in the hospital, patient is provided with the required first aid and condition explained to the attendant. Patient is referred to the alternate hospital and required support through ambulance for transfer of patient, is provided with a complete referral slip mentioning the initial diagnosis and the treatment given.

Bed side patient hand over should be given by nurses during shift change and on proper hand-over register.

Some clinical case scenarios

1. Medico-legal cases

- The criteria for defining medico-legal cases should be clearly defined.
- There should be a procedure for informing police.
- Treatment of the patient should not be delayed for police proceedings.
- Medico-legal cases should be marked on the case records.
- The case records of the MLC should be kept safely away from the reach of anyone other than the treating team.

2. Snake bite

The R.I.G.H.T approach.	
R	Re-assure. Whenever there is a snake bite, the patients panic and this leads to increase in heart rate which can hasten the spread of venom to the whole body. Reassure the patient that most snakes are non-venomous.
I	Immobilize the affected limb in the same way as a fractured limb. Use bandages or cloth to hold the splints so that it does not to block the blood supply or apply pressure. Do not apply any compression in the form of tight ligatures, they have no role and can be dangerous particularly in case of Russell's viper bite. If the bite is on the trunk, carry the patient in supine position on a stretcher.
GH	**G**o to **H**ospital. There is no role of any traditional medicine for snake bite.
T	**T**ell the doctor of the symptoms

- **Hemotoxicity** - bleeding (epistaxis, gum bleeding, reddish urine, red eyes), acute abdominal pain (may be due to intra-peritoneal bleeding), low back ache (due to renal bleeding), local pain and swelling at the site of the bite, enlarged local lymph nodes, hypotension.
- **Neuro-toxicity-**descending paralysis (ptosis and diplopia, paralysis of jaw and tongue leading to airway obstruction, numbness around lips and mouth and pooling of secretions, difficulty in breathing due to paralysis of respiratory muscles).

  Neuroparalytic snakebite patients present with typical symptoms within 30 min– 2 hours in case of Cobra bite and 3 – 24 hours for Krait bite; however, ptosis in Krait bite have been recorded as late as 36 hours after hospitalization.

Management of snake bite

i) **Admit all patients** and they will remain under observation for at least 24 hours.

ii) **Assess A**irway, **B**reathing, **C**irculation and resuscitate.

iii) Establish large bore intravenous access and start normal saline slow infusion. The first blood drawn from the patient should be typed and cross-matched, as the effects of both venom and Anti-venom Serum can interfere with later cross-matching.

iv) **Dealing with ligatures**

- If the patient has come with ligatures, **do not** remove ligatures in the emergency room. In case of multiple ligatures, all the ligatures can be released in Emergency Room EXCEPT the most proximal one; which should only be released after admission and all preparations.
- Before removal of the tourniquet/ligatures, test for the presence of a pulse distal to the tourniquet. In case of clinically confirmed venomous bite, tourniquet should be removed only after starting of loading dose of AVS and keep Atropine Neostigmine injection ready.

v) Give analgesia as per doctor's advice.

vi) **Do not** wash the wound or interfere with the bite wound (incisions, suction, rubbing, massage, application of herbs or chemicals, cryotherapy, cautery) as this may introduce infection, increase the flow of venom into system by stimulating lymphatic system, increase absorption of the venom and increase local bleeding.

vii) **Do NOT** apply or inject Anti-snake venom locally.

viii) Perform **bedside Whole Blood Clotting Test**

- Take a clean and dry glass test tube.
- Draw 2-3 ml of venous blood. Put this blood in the dry test tube and leave undisturbed at room temperature for 20 minutes (normal clotting time is maximum 8 min)
- Gently tilt the tube.
  - If the blood has not clotted at 20 min, it means that the snake was a Viper and is hemotoxic.
  - If the first blood test is “clotted” the test should be carried out every hourly for four times.

ix) Administration **of Anti-snake Venom**

a. All patients including children must get 10 vials of anti-snake venom in the first hour.

b. Each vial of Anti-snake venom must be dissolved in 10 ml of distilled water and added to an infusion of normal saline (i.e. 10 vials of AVS dissolved in 100 ml of distilled water and added to 400ml of normal saline)

c. The volume of infusion may be reduced in children (200ml), in adults according to the body size and urine output as per the doctor's advice.

d. Pregnant women are treated in exactly the same way as other victims.

e. Give pre-medication Inj Adrenaline 0.25 ml sub-cutaneously before starting the drip and keep 0.5 ml aside.

f. Mention the date and time of starting the infusion on the drip.

g. Set the drip rate to complete the drip in 1 hour at constant speed.

h. Do not give anti-snake venom intra-muscular or locally at the bite wound.

Signs of recovery

a. Spontaneous systemic bleeding such as gum bleeding usually stops within 15 – 30 minutes.

b. Blood coagulability is usually restored in 6 hours. Tested by bedside Whole Blood Clotting Test.

- Neurotoxic signs of Cobra may begin to improve as early as 30 minutes after AVS, but can take several hours. Krait bite usually takes a considerable time to improve.
- In shocked patients, blood pressure may increase after 30 minutes.

Monitoring:

- Pulse rate, respiratory rate, blood pressure every hour.
- Blood urea, creatinine, and WBC count; potassium level if facility available (in Viper bite).
- Urine output, urine for RBCs (in Viper bite).
- Vomiting, diarrhoea, abnormal bleeding.
- Extent of local swelling and necrosis.

Management of anaphylaxis to Anti-snake venom

Premedication: With 0.25 ML Inj. Adrenaline S/C, most of the AVS reactions can be prevented.

Itching (particularly on scalp), rashes, fever, vomiting, abdominal pain, tachycardia, hypotension, difficulty in breathing, uneasiness are signs of reactions.

At the first sign of any of the above mentioned signs,

i. Stop AVS drip temporarily for the time being.

ii. ***Give 0.5 ml (0.5 mg of 1:1000) Adrenaline IM over deltoid or thigh***. The pediatric dose is 0.01 mg / kg body weight of Adrenaline IM.

iii. If after 10 to 15 minutes the patient's condition has not improved or is worsening, a second dose of 0.5 mg of Adrenaline 1:1000 IM is given.

iv. Oxygen

v. Start fresh IV normal saline infusion with a new IV set

vi. 100 mg of hydrocortisone and an H1 antihistamine (Phenimarine maleate 22.5 mg IV or Promethazine HCl 25 mg IM, or 10 mg Chlorphenimarine maleate IV)

3. Myocardial infarction (MI)

In MI, an area of the myocardium (muscle of the heart) is permanently destroyed because of complete occlusion of the supplying artery.

- Chest pain that occurs suddenly and continues despite rest and medication is the primary presenting symptom.
- Patient may present with a combination of symptoms including chest pain, shortness of breath, indigestion, nausea and anxiety. **Most commonly, patients and care-givers confuse the symptoms of indigestion as Gastric upset and do not consider it as a possible sign of MI leading to delay is seeking/providing care.**
- Patient may have cool, pale, and moist skin; heart rate and respiratory rate may be faster than normal.

Management

i) Do a quick physical assessment of vitals, consciousness and pain levels.

ii) Electrocardiography (ECG) should be done immediately on arrival at the emergency department.

iii) Perform blood sugar levels with glucometer.

iv) Echocardiography to evaluate ventricular function and Cardiac enzymes and biomarkers (creatine kinase isoenzymes and troponin) may be done if facilities are available.

v) Administer oxygen along with medication therapy to assist with relief of symptoms (inhalation of oxygen reduces pain associated with low levels of circulating oxygen). Administer drugs as per doctor's advice.

vi) Assist patient to rest with back elevated to decrease chest discomfort and dyspnea.

vii) Encourage patient to breathe deeply and change position often to prevent pooling of fluid in lung bases.

viii) Ensure a quiet environment, prevent interruptions that disturb sleep, use a caring and appropriate touch, teach relaxation techniques.

ix) Develop a trusting and caring relationship with patient; provide information to the patient and family in an honest and supportive manner.

x) Monitor closely for cardinal signs and symptoms that signal onset of complication

4. Acute appendicitis

Obstruction of the appendix followed by infection and inflammation leads to acute appendicitis. It is the most common cause of acute inflammation in the right lower quadrant of the abdominal cavity and the most common cause of emergency abdominal surgery. Although it can occur at any age, it more commonly occurs between the ages of 10 and 30 years.

- Patients come to emergency with lower right quadrant pain usually accompanied by low grade fever, nausea and vomiting; loss of appetite is common.
- On examination, there is local tenderness with pressure at McBurney's point (located halfway between the umbilicus and the anterior spine of the ilium). Rebound tenderness may be present.
- If appendix ruptures, pain becomes more diffuse; abdominal distention develops from paralytic ileus and condition worsens.
- Perforation generally occurs 24 hours after the onset of pain. Symptoms include a fever of 37.7 ◦C (100 ◦F) or greater, a toxic appearance, and continued abdominal pain or tenderness.

Management

i) Perform a quick general assessment and stabilise the patient.

ii) Administer antibiotics and IV fluids as per doctor's advice until surgery is performed.

iii) Preoperatively, prepare patient for surgery, start IV line, administer antibiotic, and insert nasogastric tube (if evidence of paralytic ileus). **Do not administer an enema or laxative (could cause perforation).**

iv) Monitor vitals, pain and other symptoms and inform MO on duty.

5. Acute asthma

Asthma is a chronic inflammatory disease of the airways characterized by hyperresponsiveness, mucosal edema and mucus production. Common triggers for asthma symptoms and exacerbations include airway irritants (eg, pollutants, cold, heat, strong smell, smoke, perfumes), exercise, stress or emotional upset, sinusitis with postnasal drip, medications, viral respiratory tract infections, and gastroesophageal reflux.

Most common symptoms of asthma are cough (with or without mucus production), dyspnea, and wheezing. Expiration requires effort and becomes prolonged. As exacerbation progresses, central cyanosis secondary to severe hypoxia may occur.

Management

The patient and family are often frightened and anxious because of the patient's dyspnea. Therefore, a calm approach is an important aspect of care.

i) Assess the patient's respiratory status by monitoring the severity of symptoms, breath sounds, peak flow, pulse oximetry and vital signs.

ii) Obtain a history of allergic reactions to medications before administering medications.

iii) Identify medications the patient is currently taking.

iv) Administer medications (inhaler/nebuliser/ injections) as prescribed by the doctor and monitor the patient's responses to those medications

6. Intestinal obstruction

Most bowel obstructions occur in the small intestine. Intestinal contents, fluid, and gas accumulate above the intestinal obstruction.

Initial symptom is usually crampy colicky pain**. Patient is not able to pass flatus or stools but may pass blood and mucus.** Vomiting occurs. Abdomen becomes distended.

Dehydration results in intense thirst, drowsiness, generalized malaise and a dry tongue.

Management

i) Measure vitals. Correct dehydration and electrolyte imbalance with IV fluids and stabilise the patient.

ii) Collect blood samples for complete blood count.

iii) Insert Naso-gastric (NG) tube and monitor the NG tube output.

iv) Maintain strict intake/output charting.

v) Administer antibiotics and prepare patient for surgery as per doctor's instructions.

7. Diabetic ketoacidosis (DKA)

DKA is caused by an absence or markedly inadequate amount of insulin. This results in disorders in the metabolism of carbohydrates, protein, and fat.

The three main clinical features of DKA are

(1) **Hyperglycemia**, due to decreased use of glucose by the cells and increased production of glucose by the liver;

(2) **Dehydration and electrolyte loss**, resulting from polyuria, with a loss of up to 6.5 L of water and up to 400 to 500 mEq each of sodium, potassium, and chloride over 24 hours; and

(3) **Acidosis**, due to an excess breakdown of fat to fatty acids and production of ketone bodies, which are also acids.

Three main causes of DKA are decreased or missed dose of insulin, illness or infection.

The patient may present with polyuria and polydipsia (increased thirst), blurred vision, weakness, and headache, hypotension with weak, rapid pulse, nausea/vomiting and Acetone breath (fruity smell).

Mental status varies widely from patient to patient (alert to lethargic or comatose).

Management

i) Measure vitals, perform bedside blood sugar.

ii) Collect samples for electrolytes, Blood urea nitrogen, creatinine and urine ketones.

iii) Perform Arterial Blood Gas (ABG) analysis and ECG.

iv) Patients may need as much as 6 to 10 L of IV fluid. 0.9% normal saline [NS] is administered at a high rate of 0.5 to 1 L/h for 2 to 3 hours to replace fluid loss caused by polyuria, hyperventilation, diarrhoea, and vomiting.

v) Administer Insulin as per doctor's advise.

vi) Maintain intake /output charting and monitor carefully for consciousness.

8. Epilepsy

The epilepsies are a symptom complex of several disorders of brain function characterized by recurring seizures. There may be different types of seizures that may come to the emergency department.

- **Simple Partial Seizures**

  Only a finger or hand may shake; the mouth may jerk uncontrollably; the patient may talk unintelligibly, may be dizzy, or may experience unusual or unpleasant sights, sounds, smells, or taste—all without loss of consciousness.

- **Complex Partial Seizures**

  The patient remains motionless or moves automatically but inappropriately for time and place; may experience excessive emotions of fear, anger, elation, or irritability; and does not remember episode when it is over.

- **Generalized Seizures (Grand Mal Seizures)**

  There is intense rigidity of the entire body, followed by alternations of muscle relaxation and contraction (generalized tonic–clonic contraction).

  There may be tongue bite, there is incontinence of urine and stool.

  Convulsive movements last 1 or 2 minutes. The patient then relaxes and lies in a deep coma, breathing noisily.

Management

i) Turn patient to side-lying position to assist in draining pharyngeal secretions.

ii) Maintain an airway and adequate oxygenation.

iii) Suction the airway to prevent aspiration.

iv) Establish an IV line for administering medications and obtaining blood samples for analysis. Monitor IV line closely for dislodgment during seizures.

v) Protect patient from injury during seizures with padded side rails and keep under constant observation.

vi) Do not restrain patient's movements during seizure activity.

vii) Do not insert anything in patient's mouth.

viii) Catheterise and monitor intake/output.

ix) Administer drugs as prescribed by the doctor.

Chapter 5
Out Patient Department (OPD)

An outpatient department is the department of a hospital established for the treatment of outpatients, people with health problems who visit the hospital for diagnosis or treatment, but do not at this time require a bed or to be admitted. Outpatient departments offer a wide range of treatment services, diagnostic tests and minor surgical procedures. Nurses may be posted in all of these departments under various capacities.

Service provision at OPD may include all of these curative services and depending on local endemic conditions special OPDs such as fever OPD/diarrhea clinic etc. Several new OPDs may be added from time to time depending on the government norms and health priorities.

General Medicine	Orthopaedic	Physiotherapy
General Surgery	Skin and VD	Dressing & Injection
Obstetrics & Gynaecology	Psychiatry	Immunization/family welfare
Paediatric	Cardiology	NCD clinic
Ophthalmology	Dental	PPTCT centre
ENT	AYUSH	ICTC and ART centre

Role of Nurses in OPD:

1. General instructions:

- The nurse in-charge/nurses should ensure that:
  - a) All nurses are in proper dress code as mandated by the facility.
  - b) OPD rooms are clean and ventilated with appropriate light. It should be airy and free of unacceptable smells
  - c) Hand washing area is available with elbow tap and liquid soap
  - d) Examination table is available with screen for privacy along with foot step
  - e) All essential equipment and supplies are available:
    - Weighing machine
    - BP Instrument
    - Trays with specific instruments for specific OPDs.
    - Bio Medical Waste (BMW) bins
    - OPD register
    - Wall clock
- The nurse should label, number and maintain all the OPD registers and keep them safe.
- The nurse should be aware of the disaster plan in case of any disasters for example fire safety and needs to perform the roles assigned to her during such emergencies.

2. OPD consultation:

- To mention patient demographic details in the OPD register (Name, Age, Sex, address, OPD registration number, number of visits, etc)
- To ask and record the present complaints, duration of complaints, family and personal history, as well as any drug allergies or any other allergies or any addictions like alcohol and tobacco, etc..
- To perform general physical examination such as height, weight and vitals.

3. Clinical Assessment:

- To take vitals of the patients: Blood pressure, Temperature, Pulse and respiratory rate.
- Based on case history and vitals, the nurse should be able to triage if any critical patient needs urgent attention. In such a case, the queue should be by-passed for providing services on priority basis.

4. Assisting evaluation and management:

- S/he should be able to make the client feel comfortable and should assist in obtaining proper positions for physical examination as instructed by the doctor. S/he should guide the patient to sit on patient stool/chair by the doctor's side and not full face across the desk.
- No patient should be consulted in standing position.
- The nurse should maintain audio-visual privacy of the client during examination and consultation.
- After completion of the examination, the nurse should accomplish the procedures instructed by doctor like guiding the client to laboratory if some tests are to be done or to the injection room if advised any injections etc.
- The nurse should guide the client to pharmacy and counsel them about the timing of medicines, drug regime, dosage as prescribed by the doctor and explain possible side effects, if any.
- Counsel the client and attendant accompanying her / him about the situation and steps to be taken further

5. Handing over of patients:

- The case sheet for the patients who are advised admission via the OPD is filled by the admitting doctor. The nurse assisting in the OPD should ensure that the patient and case sheet and handed over properly to the ward nurse and all care instructions such as sample collection and treatment plan is clearly understood.
- S/he should maintain handing over register and in-person hand-over for inter departmental transfer or ward admission.

Nurses in specific OPDs such as injection room, immunization room and family planning are expected to provide the specific services to clients efficiently with proper documentation.

6. Infection control:

- The nurse should keep replenishing sterile supply / articles in OPD. She should ensure the processing of used instruments after proper disinfection with bleaching/hypochlorite solution at the end of OPD.
- The staff nurse should follow all IP and BMW guidelines as outlined in Chapter 18.

7. Maintenance of OPD equipment

- Staff in-charge of OPD along with the medical superintendent are responsible for checking the functioning of instruments at OPD clinic and report for the maintenance and breakage if any.
- S/he should ensure that all vital and life-saving equipment is covered under AMC.
- There is an arrangement for backup of all vital equipment.
- S/he should bring to the notice of the facility in-charge any malfunction/non-functioning of the equipment and raise complaint to the concerned agency for repairing of equipment.
- All unused /surplus /irreparable /damaged equipment and instruments furniture and linen items to be condemned and replaced.

8. Special considerations for paediatric OPD

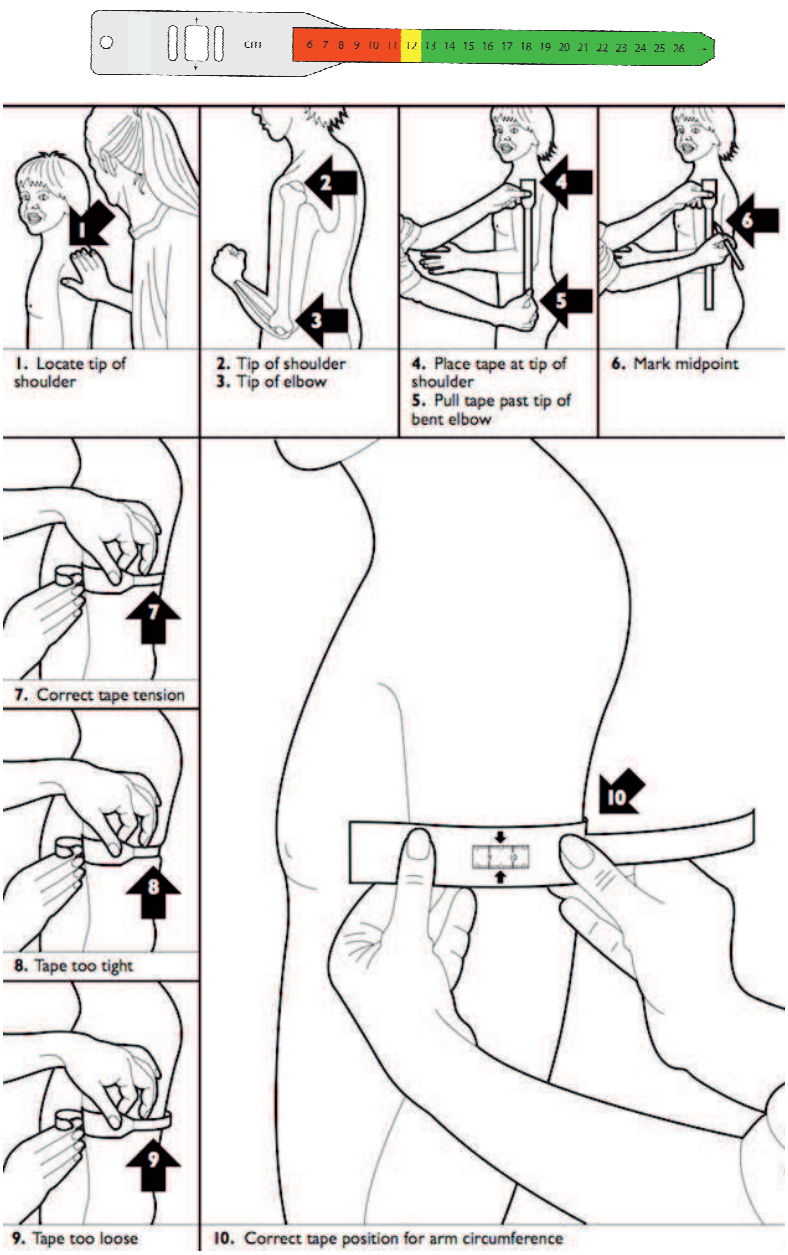
- Children with emergency and priority signs are triaged and if identified in the outpatient queue, s/he must be quickly shifted to emergency and managed there.

EMERGENCY SIGNS	PRIORITY SIGNS	NON URGENT CASES
• Hypothermia (temp < 36°C) • Apnea or gasping respiration • Severe respiratory distress (rate > 70/min, severe retractions, grunting) • Central cyanosis • Shock (cold periphery, Capillary Filling Time > 3 secs, weak & fast pulse) • Coma, convulsions or encephalopathy	• Cold stress (temp 36.4 °C - 36°C) • Respiratory distress (rate > 60/min, no retractions) • Small neonate (< 1800 gms) • Irritable/restless/jittery • Refusal to feed • Abdominal distension • Severe jaundice • Severe pallor • Bleeding from any sites • Major congenital malformations	• Jaundice • Transitional stools • Developmental peculiarities • Minor birth trauma • Regurgitation of milk • Superficial infections • Minor malformations • All cases not categorized as Emergency/Priority

- In the OPD, all children should be weighed & their weight should be recorded correctly
- Immunization status should be checked and any due vaccines should be provided in the vaccination room once the child has recovered from the acute illness.
- Children below five years should be screened for Severe Acute Malnutrition using Mid-Upper Arm Circumference (MUAC) tape.

Mid-upper arm circumference (MUAC) MUAC

- It is a quick and simple way to determine whether or not a child is malnourished using a simple coloured plastic strip.
- MUAC is suitable to use on children from the age of 6 months up to the age of 59 months.
- **How to measure**
  - Arm circumference is measured on the upper left arm.
  - To locate the correct point for measurement, the child's elbow is flexed to 90°.
  - A measuring tape is used to find the midpoint between the end of the shoulder (acromion) and the tip of the elbow (olecranon); this midpoint should be marked (see Figure).
  - The arm is then allowed to hang freely, palm towards the thigh, and the measuring tape is placed snugly around the arm at the midpoint mark. The tape should not be pulled too tight.
  - MUAC less than 11.5 cm is used to identify severe malnutrition and wasting.



- If using a 3-colour tape:
  - A measurement in the green zone means the child is properly nourished;
  - A measurement in the yellow zone means that the child has moderate acute malnutrition;
  - A measurement in the red zone means that the child has severe acute malnutrition. Repeat the measurement two times to ensure an accurate interpretation.

9. **Infant and Young Child Feeding (IYCF) Counselling Corner** should have service provision for communication and counselling on lactation, optimal infant & young child feeding practices, feeding during sickness, WASH (Water, sanitation & Hygiene) etc. as well as for documentation.

(a) Feeding during sickness:

- Feeding during sickness is important for recovery and for prevention of undernutrition.
- Even sick babies mostly continue to breastfeed and the infant can be encouraged to eat small quantities of nutrient rich foods, but more frequently and by offering foods that a child likes to eat.
- After the illness (eg; diarrhoea) the nutrient intake of child can be easily increased by increasing one or two meals in the daily diet for a period of about a month; by offering nutritious snacks between meals; by giving extra amount at each meal; and by continuing breastfeeding.
- Gastro-Oesophageal Reflux Disease (GERD): Mild GERD is a condition when a child regurgitates the feed soon after the feeding. It is often treated conservatively through thickening the complementary foods, frequent small feeds and upright positioning for 30 minutes after feeds.
- For preterm/low birth weight children conduct one to one counselling with the mother/caregiver and advice on follow up visits to the centre. Refer cases requiring intensive counselling, like-lactation failure, failure to thrive to higher centre after consultation with Specialist/MO.

(b) **Infant feeding in maternal illnesses**

1. <u>No need to stop breast-feeding</u> :
   - Chronic infections like tuberculosis, leprosy, or medical conditions like hypothyroidism need treatment of the primary condition and breast feeding should continue.
   - Drugs like antibiotics, anaesthetics, anti-epileptics, antihistamines, digoxin, diuretics, prednisone, propranolol etc. are considered safe for breastfeeding.
2. <u>Temporary cessation of breast-feeding</u>: Painful and/or infective breast conditions like breast abscess and mastitis and psychiatric illnesses which pose a danger to the child's life e.g. postpartum psychosis, schizophrenia may need a temporary cessation of breastfeeding. Family should be counselled for treatment of primary condition and breastfeeding should be started as soon as possible after completion of treatment.
3. <u>Breastfeeding is contraindicated</u> when the mother is receiving certain drugs like anticancer agents, immuno-suppressants, anti-thyroid drugs like thiouracil etc.

Chapter 6
In-patient Department (IPD) / Ward

The general ward is for the patients who require admission for further investigation/evaluation, treatment & monitoring.

Staff Nurses in the general ward have to ensure that all patients are provided with evidence based quality care in an environment of minimal risk, covering every aspect of care from the time patient is received in the ward.

Staff nurses should follow the process and guidelines for

- **management of the patients in the ward -** specific care, medication, nutrition, care during pre and post-operative period, transfer, referrals/ consultation/discharge/ and end of life care., disease surveillance.
- **management of the ward** - includes inventories, cleanliness, laundries, record keeping, ward rounds, duty rosters, and security management,

Procedure for Receiving of the patient

- Patient warding in - Patient is received in ward after admission is done at the OPD/EMERGENCY department. Document required would be – OPD slip, patient registration number, doctors instruction for admission. The patient is usually admitted with the filled case sheet from OPD/Emergency. She should confirm the ID of patient.
- Staff nurse should review the admission note/ instruction and act on any urgent instruction of the admitting doctor.
- After allotment of bed , patient is made comfortable. orientation of patient & companion on layout of the ward is done. In case of non- availability of bed SN makes alternate arrangement .
- Patient's property- valuables of patient should be handed over to the patient's relatives, for eg jewellery, mobiles etc.
- Consent- General consent and if required , high risk consent is signed by every patient/relatives. In case patient or next of kin is illiterate, thumb imprint may also be taken, in presence of a neutral witness.
- Orphaned/lawaris patient- staff nurses should take special care of such patients. Their names are reported to local police and efforts are made to appoint any NGO /Volunteer who can take care of non- clinical needs of the patient.

Rights & dignity of patients

At every step rights and dignity of the patient is maintained that includes –

- Simple & clear language for communication should be used,
- Privacy is to be maintained
- Procedures are explained.
- Consent is taken and
- Confidential information about patient is never discussed /revealed with fellow staff or outside the facility.

Patients with HIV/AIDS

They are not isolated. Their confidentiality is maintained by not marking their beds or files with the diagnosis of HIV & discussed only with those involved in direct care.

Nursing care in ward - Staff nurse

- Confirms history of the patient (present and past illness, medical, surgical, family history, any drug allergy, addictions)
- Performs initial assessment and findings are noted in TPR chart in the case sheet.

If urgent life- saving procedure/treatment is required, it supersedes any documentation work.

Vitals assessment – temperature, pulse, respiratory rate, blood- ressure, oxygen saturation

General examination- Icterus, pallor, cyanosis, oedema, clubbing, lymphadenopathy, dehydration, deformity and system specific.

The staff nurse should also perform general nursing assessment as given in the below sample.

Sample examination form in Case sheet

Allergies / Adverse Reactions (Known or suspected allergies to) :	*marked with red colour pen*		
Nursing Assessment (To Be Done on Admission in Wards)			
IPD No.		Ward/Unit:	
Date /Time of arrival:		Walking/Stretcher/Wheelchair:	
Patient accompanied by: Family/Friend/Police/other			

Visual Examination:	Yes	No	Location
Contusion			
Lacerations			
Raches			
Scars			
Bruises			
Pain			
Others			

Related to	Tick (As Applicable)			Details if known
Medication / Drugs	Yes	No	Not Known	
Blood Transfusion	Yes	No	Not Known	
Food	Yes	No	Not Known	

Functional assessment: Ability to Perform Activities of Daily Life, please tick (As applicable):

Activity	Independently	Assisted	Dependent	Activity	Independently	Assisted	Dependent
Bathing				Bed Activities			
Eating				Sitting			
Dressing				Standing			
Toilet use				Ambulation			
Stair Climbing				Disability			

Investigation

- Samples –blood, urine, stool, sputum etc as advised by the doctor in the case sheet is collected and sent for investigation.
- If required, Bedside ECG, X ray etc is done /requisitioned as per the doctor's advice.

Regular monitoring and assessment of patient –

- regular charting of symptoms, vitals (temperature, pulse, respiration, BP) & signs is done in the case sheet.

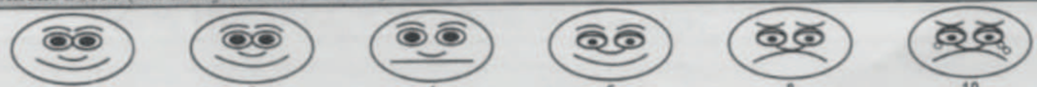
Sample of vitals monitoring in the case sheet

Vital Monitoring Sheet (to be filled by nursing staff)

Date:		Morning	Evening	Night	Date:		Morning	Evening	Night
	Temp	F	F	F		Temp	F	F	F
__/__/__	Pulse	/min	/min	/min	__/__/__	Pulse	/min	/min	/min
	B.P.	m m Hg	m m Hg	m m Hg		B.P.	m m Hg	m m Hg	m m Hg
	R.R.	/min	/min	/min		R.R.	/min	/min	/min
	Input	ml	ml	ml		Input	ml	ml	ml
	Output	ml	ml	ml		Output	ml	ml	ml
	Temp	F	F	F		Temp	F	F	F
__/__/__	Pulse	/min	/min	/min	__/__/__	Pulse	/min	/min	/min
	B.P.	m m Hg	m m Hg	m m Hg		B.P.	m m Hg	m m Hg	m m Hg
	R.R.	/min	/min	/min		R.R.	/min	/min	/min
	Input	ml	ml	ml		Input	ml	ml	ml
	Output	ml	ml	ml		Output	ml	ml	ml
	Temp	F	F	F		Temp	F	F	F
__/__/__	Pulse	/min	/min	/min	__/__/__	Pulse	/min	/min	/min
	B.P.	m m Hg	m m Hg	m m Hg		B.P.	m m Hg	m m Hg	m m Hg
	R.R.	/min	/min	/min		R.R.	/min	/min	/min
	Input	ml	ml	ml		Input	ml	ml	ml
	Output	ml	ml	ml		Output	ml	ml	ml

- Staff nurse should assess and mention pain on pain level scales in each shift as given in the below sample case sheet.

Pain Assessment Score (On Daily Basis-In-Wards)



Date:		Mor.	Eve.	N.	Date:		Mor.	Eve.	N.
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			
	Pain score (ref. scale)					Pain score (ref. scale)			

Administration of prescribed drugs

- Staff nurses should administer medications via the prescribed routes as per the doses and schedules prescribed by the doctor.
- They should be able to identify of adverse drug reaction like dizziness, syncope, urticaria, chills and rigor etc and should provide immediate management and inform the doctor.

For details on drugs administration, kindly refer to chapter 12.

Documentation

- Patient's complete medical record should be available at all the times during their stay in hospital.
- Every page of medical record should be labelled with patients' identifiers, details of vitals, fresh orders from treating consultants, procedures, investigation reports etc, duly signed by concerned person with date and time.
- All registers and records should be kept safely away from the reach of anyone other than staff involved in direct patient care.

Diet for patient - Staff nurse should inform diet department for special dietary needs as per doctors' instruction and patients' requirement. Eg. diabetic, heart disease, post-operative etc.

Assisting patients with their activities – daily sponging, wound care, feeding support, bed making, prevention of bed sores, positioning of patient for different conditions etc

Inventory and indenting- staff nurses should be able maintain record of progress, treatment offered, stock of inventory & medicines & consumables as per requirement with adequate buffer stock.

Handover –with every duty shift staff nurses should provide proper bed-side handover in terms of patient's details, progress & treatment, in writing with ward round.

Interdepartmental transfer/referral to higher centres - On doctors' advice, staff nurses should counsel the companions of the patient, inform ambulance and concerned department/higher centre. The patient should be transferred with transfer note/referral note, all medical records and drugs.

Counselling and discharge of patients the patients are counselled on their medication routines, diet, care of self /any surgical wound, follow up dates, danger signs and when and whom to contact in case of emergency.

All reports and medical records of patients are handed over to the patient/family with update in discharge register.

In case of LAMA (left against medical advice), staff nurses should take declaration from patient or the guardian, clearly stating the conditions and their leaving against medical advice with signature/thumb print, relation time and date.

Visiting hours to the wards – To prevent infections and provide optimum care to patient, visiting hours are declared and displayed. If a visitor, media person or police wishes to enter, they may do so, only with permission of medical superintendent.

Records to be maintained in the ward

S.no.	Name of record	Record no	Minimum retention period of hard copy
1	IPD register		3 years
2	Patient registration		3 years
3	MLC register		Till case closes
4	IPD discharge register		3 years
5	Diet register		3 years
6	Laundry register		3 years
7	Death record register		3 years
8	Stock reg		3 years
9	Indent reg		3 years
10	Referral reg		3 years
11	Police information reg		3 years

Some special in-door cases

1. Pre-operative Patients

Using pre-operative checklist, staff nurses should ensure Pre-anesthetic Check (PAC) is done, take consent including high risk if applicable, give pre-operative medications as per doctors' prescription, keep nil oral as advised and prepare parts on the day/night before planned surgery

They should perform vitals charting & shift patient to OT with all medical records on a trolley/wheel chair as applicable.

2. Post-operative patients

- The patient should be received from post-operative recovery room to the ward after s/he is found to be stable and conscious.
- Patient is received by the SN of the post -op ward for monitoring & post-operative treatment and care.

Nursing interventions that are required in postoperative care include

- Prompt pain control
- Monitoring of vitals
- Assessment of the surgical site
- Drainage tubes,
- Monitoring the rate and patency of IV fluids and IV access
- Intake/output charting
- Bowel sounds
- Assessing the patient's level of sensation/post-anaesthesia headache etc.

Prevention of Complications:

- Turn the patient frequently and encourage early mobilization. Walking aids (canes, crutches, walkers) if needed.
- Encourage deep breathing and ensure adequate nutrition
- Prevent skin breakdown and pressure sore
- Keep urine and stool off skin

Sample of pre-operative check-list that can be used in the ward

NURSING PROTOCOL : CHECKLIST FOR PRE-OPERATIVE PATIENT

Nursing staff are requested to complete the following checklist before sending the patient to operation theater for any surgery

S. No.	Check List	Yes	No	Remarks
1.	Consent taken			
2.	PAC done			
3.	Part preperation done			
4.	Prepared part checked by Nursing supervisor/Senior Staff			
5.	All investigations report including X-ray, CT Scan, MRI etc. are attached with file.			
6.	Blood grouping & arrangement of blood done			
7.	Patient instructed on deep breathing, coughing and post-operative exercises.			
8.	Patient fasting			
9.	Jewellery, Bangles etc. removed			
10.	Prosthesis removed like dentures (false teeth) hearing aid, eye-glasses, contact lenses etc.			
11.	Nail Polish make up & hair pins removed.			
12.	Hair combed and tied			
13.	Voided/catheterized			
14.	Enema given with result			
15.	Through bath & patient dressed in hospital clothes			
16.	information about drug allergy recorded on case file			
17.	Pre-medication given on call from O.T.			
18.	Vital sings checked & recorded			
19.	Identification tag tied on patient			
20.	Whether patient is Hbs Ag / HIV+ve			
21.	Naso-gastric tube inserted if ordered			
22.	Patient accompanied and handed over to O.T. nurse with case file.			

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पीपीआईयूसीडी के लिए सहमति (केवल स्त्री प्रसूति विभाग के लिए)

मैं.....बेटा/बेटी/पत् उम्र (साल में).....पता.....

.....स्वयं.....या अन्य.....

उम्र (साल में).....रिशता बेटा बेटी पिता माता पत्नी अन्य प्रक्रिया के लिए अपनी सहमति देता हूँ।

मुझे इस प्रक्रिया में रोगांवित परिणामों के बारे में संपूर्ण सूचना उस भाषा में दी गई है जिसे मैं समझता / समझती हूँ मैं इस सहमति पत्र पर बिना किसी जोर जबरदस्ती और पूरे होश में हस्ताक्षर कर रहा / रही हूँ किसी जटिलता अनहोनी के घटने पर डॉक्टर सेवा प्रदाता की जिम्मेदारी नहीं मानी जायगी।

रोगी का नाम तथा हस्ताक्षर

सहायक का नाम तथा हस्ताक्षर

Sample post-op monitoring tool in case sheet

POST SEDATION RECOVERY SCORE SHEET

Date | Patient Name: | IPD No.

Patient Sign		SS	Score
Consciousness	• Awake, responds easily, A&Ox3 or returned to baseline • Responds readily, but easily falls asleep • Arousable, but not readily • Not responding	3 2 1 0	
Respiratory	• Breathes easily with adequate volume • Slightly decreased rate and/or volume • Labored or limited respiration • Aphea or indequate ventilation	3 2 1 0	
Circulatory	• BP and pulse within baseline limits • BP and pulse approaching limits • Abnormally high or low BP and/or abnormally fast or flow pulse	2 1 0	
Voluntary movement	• Able to move extremities voluntary or on command or returned to baseline • Voluntary movement - no purposeful • Unable to lift hand or move extremities	2 1 0	
Oxygen Saturation	• Able to maintain Oxygen saturation>92% on room air • Needs supplementary Oxygen to maintain Oxygen to maintain Oxygen saturation>90% • Oxygen saturation<90% even with supplementary Oxygen	2 1 0	
	Total Score		

A Score of O in any category excludes eligibility for discharge unless approved by a physician.

Discharge of patient

Counselling of patients and caretaker/relative is done on medications, diet, rest, wound care, danger signs are explained and emergency numbers are also shared. Nurses should take patient satisfaction survey as per the sample prescribed format.

भर्ती रोगी फीडबैक

प्रिय रोगी,

आपने अपना बहुमूल्य समय इस चिकित्सालय में अपने रिश्तेदारों/परिवारजनों के इलाज हेतु दिया। हमारा आपसे विनम्र अनुरोध है कि आपने कीमती सुझाव इस चिकित्सालय में दी जाने वाली सुविधाओं के परिप्रेक्ष्य में हमें बतायें जिससे यहां पर आपकों उपलब्ध करायी जाने वाली चिकित्सीय सुविधाओं को और अधिक बेहतर बनाने में हमें सहायता मिल सके।

कृप्या उचित/सन्तुष्टिजनक खाने में सही ☑ का चिन्ह लगायें।

क0 सं0	विशेषतायें	खराब	उचित	अच्छा	बहुत अच्छा	सबसे अच्छा	टिप्पणी
1	पंजीकरण एवं भर्ती पटल पर सूचनायें उपलब्ध कराने के सम्बन्ध में।						
2	पंजीकरण एवं भर्ती पटल पर प्रतीक्षा करने के सम्बन्ध में।	30 मिनट से अधिक	10–30 मिनट	5–10 मिनट	5 मिनट के अन्दर	तत्काल	
3	पंजीकरण एवं भर्ती पटल पर कार्मिकों का आचरण एवं व्यवहार।						
4	निरावेशित करने की प्रक्रिया के समय पर आपकी सन्तुष्टि।						
5	भर्ती कक्ष की साफ–सफाई के सम्बन्ध में।						
6	स्नानागार एवं शौचालय की साफ–सफाई के सम्बन्ध में।						
7	बिस्तर की चादरों एवं तकियों के कवर की साफ–सफाई के सम्बन्ध में।						
8	चिकित्सालय परिसर एवं नालियों की साफ–सफाई के सम्बन्ध में।						
9	चिकित्सकों द्वारा नियमित ध्यान दिये जाने के सम्बन्ध में।						
10	चिकित्सकों का आचरण एवं बोलचाल तथा व्यवहार के सम्बन्ध में।						
11	चिकित्सकों द्वारा परीक्षण एवं उनसे प्राप्त होने वाली सलाह के सम्बन्ध में।						
12	भर्ती कक्ष में उपचारिका द्वारा तत्काल प्रतिक्रिया किये जाने के सम्बन्ध में						
13	चिकित्सालय भर्ती कक्ष में उपचारिका द्वारा समय–2 पर निरीक्षण किये जाने के सम्बन्ध में।						
14	उपचारिका का आचरण एवं बोलचााल तथा व्यवहार के सम्बन्ध में।						
15	कक्ष सेवक/सेविका की उपलब्धता, आचरण, तत्परता के सम्बन्ध में।						
16	सभी निर्धारित औषधियां चिकित्सालय आपूर्ति द्वारा उपलब्ध कराये जाने के सम्बन्ध में।						
17	चिकित्सक का ज्ञान आपकी जानकारी में है इस सम्बन्ध में।						
18	चिकित्सालय में निदान सेवा मुहैया होने के सम्बन्ध में।						
19	समय से भोजन की आपूर्ति के सम्बन्ध में।						
20	रोगी के रूप में बिताये गये समय के दौरान आपकी सन्तुष्टि के सम्बन्ध में।						

आपका महत्वपूर्ण सुझावः–

दिनांकः–.....आई0पी0डी0रसीद संख्या0ः–..... कक्ष संख्या.....

.नामः–.....

End of life care

- Staff nurse should respect the dignity of both the patient & the caregivers and should be sensitive about the patients and caregivers wishes.
- The medical team regularly updates the patient's representatives about the patient's condition. The patient's representatives are allowed to interact with the patient. Utmost sensitivity is maintained by the medical team in educating and counselling the patient representatives.
- Most appropriate measures that are consistent with their choices are used. It encompasses alleviation of pain & other physical symptoms.
- Assessment & management of psychological, social, spiritual/religious issues are done.
- The continuity of care should be maintained if so desired by the caregivers.
- Access to any therapy which may be expected to realistically improve the quality of life of patient, including alternative or non -traditional treatment should be offered
- Palliative treatment and hospital care is the right of patient.
- Staff nurse should respect the right to refuse treatment by patient. They should also respect the Physicians professional responsibility to discontinue some treatments when appropriate with consideration for both patient and family's preferences.
- Patient's relatives are allowed to perform the religious beliefs without disturbing other patient. The hospital management along with its staff extends all possible help.

Management of death

- Cardio pulmonary Resuscitation (CPR) to be given by Medical Officer on Duty and the attending nurse
- Information about the death is given to the treating consultant by Medical Officer on duty who also informs the Medical Superintendent (Male and Female wing) of the hospital.
- The necessary details regarding condition of the patient and details of CPR is to be written in patient's file to ensure proper medical record for Medical Record Department (MRD).
- Death of a patient is handled carefully with concern without complacency. Counselling of next of kin with sympathy is given at most importance.
- Religious sentiments are given due consideration. Patient's relatives are allowed time with the body. Relatives are allowed to perform the religious beliefs without disturbing other patient. The hospital management along with its staff extends all possible help.
- All help in shifting the body from the hospital is extended to the next of kin including arrangement of hearse car.
- The dead body is released as soon as possible after completion of all formalities. Acknowledgement for receipt of the body and the Death Certificate is obtained from Next of Kin/Legal representative.
- Handing-over of the body is a Solomon occasion and it is ensured that hospital staff takes due care and concern in this respect.
- Due arrangements are made if preserving the body in the mortuary is found necessary.
- A representative of the hospital is present till the departure of the deceased.
- Security personnel on duty ensure orderliness in handing over the body to the next of kin.
- In case of MLC case, the local police station informed. The body is handed over to the police and entry made in the MLC register.

Chapter 7
Operation Theatre (OT)

The operating theatre is a room specifically for use by the anaesthesia and surgical teams and must not be used for other purposes.

For efficient functioning of an Operation Theatre, following principles should be considered.

- Every OT needs to be run with a zero tolerance for non-adherence of technical and infection prevention protocols, so maintaining discipline in OT is of prime importance.
- Entry of patients and staff should be restricted and only those who are on duty or called for by the OT staff are allowed to enter the complex. Entry and exits should always be through the defined routes only.
- Supply and logistics for OT should be replenished only during off hours preferably when surgeries are not in progress. Only such important equipment and logistic should be allowed when OT is functional which are urgently required during surgical procedures and not available in the OT store.

Zoning

It is a process of artificial division, of an area in which certain uses are permitted or prohibited.

The concept of having zoning system in OT complex is to achieve a high degree of asepsis, thereby eliminating chances of hospital acquired infections in post-surgery cases.

The OT complex is divided into four zones

1. Protective
2. Clean
3. Sterile and
4. Disposal,

based on varying degrees of cleanliness/asepsis, and is maintained by a differential decreasing positive pressure ventilation gradient from the inner zone to the outer zone.

Before the protective zone (security guard area) lobby with shoe changing area

It is the outermost area of the OT is lobby/buffer area at main entrance where a dedicated space is given to OT guard for restricting access to protective zone round the clock. The OT guard will ensure adherence to pre-requisites for entering into protective area (shoe change/shoe cap, mask, cap and hand hygiene). They will also ensure the first trolley change.

A. Protective Zone

- It is the outermost area within the OT Complex after the lobby area. Sub areas like OT reception, trolley store area 1, trolley bay, patient transfer area and counselling room are located in this zone.
- Trolley/wheelchair coming to OT will not be allowed to go inside the protective zone without a trolley change.
- The patient is shifted from ward trolley to OT trolley at entrance. Taking the case-sheet, verifying the patient details and facilitating shifting to the pre-operative area are certain key functions to be performed in this area.
- Provide gowns to day care surgery patients and the patient's attendants who are allowed to be with post-op patients.

B. Clean Zone

The clean zone isolates the sterile zone from protective zone and allows staff to move into sterile zone after changing dress. It includes Doctor's changing room, Nurse's (OT In-charge) changing Room, Staff Nurse changing room (separate for male and female), Pantry, staff toilets (Male and Female), Pre and post-operative recovery room, store room, trolley area 2, janitor room and passage to sterile zone with hand wash and slipper change facility.

- Supporting staff spend their time in clean zone for pre-operative preparations for planned surgeries.
- Doctors spend their time in clean zone till OT and patients get ready for the surgery/procedure

1. Pre and Post OT recovery room:

- The beds in this room should preferably be trolley beds and all trolley beds should have a designated area with wall mounted monitors.
- Each bed should have oxygen, suction and air outlets.
- Room should have attached toilets.
- Storing facility for medicines, consumable and linens should not be for more than 7 days.
- The room should have dedicated nursing station for constant monitoring and ensuring medications as per doctor's direction.

2. Store room:

- OT in-charge nurse receives the autoclaved equipment and linen whereas the OT technician will receive other inventories.
- The supply in the store shall be restricted to
    - daily for sterilized equipment and linen.
    - weekly for general supplies like drugs and consumables.

Staff and supplies coming from outside the OT complex will enter adhering to universal precautions and will not be allowed to go beyond the store room.

C. Sterile Zone

The sterile zone includes the operating room, scrub room, entry of theatre supply room for sterilized instruments, auto-clave room, sterilized equipment store room, equipment preparation room and documentation/record room. This zone is maintained at high air pressure just below what is at the operation theatre room so as to exclude entry of air from the other zones.

Movement from Sterile Zone to Operation Theatre:

Surgeon and assisting Nurses will enter sterile zone from a clean zone after washing hands and change to their respective OT slippers, move into the scrub area and wear respective sterile gown, cap and do surgical scrub for hands then wear surgical sterile gloves and enter into the OT. Now doctors and nurses are ready to touch the patient inside the OT for the procedure.

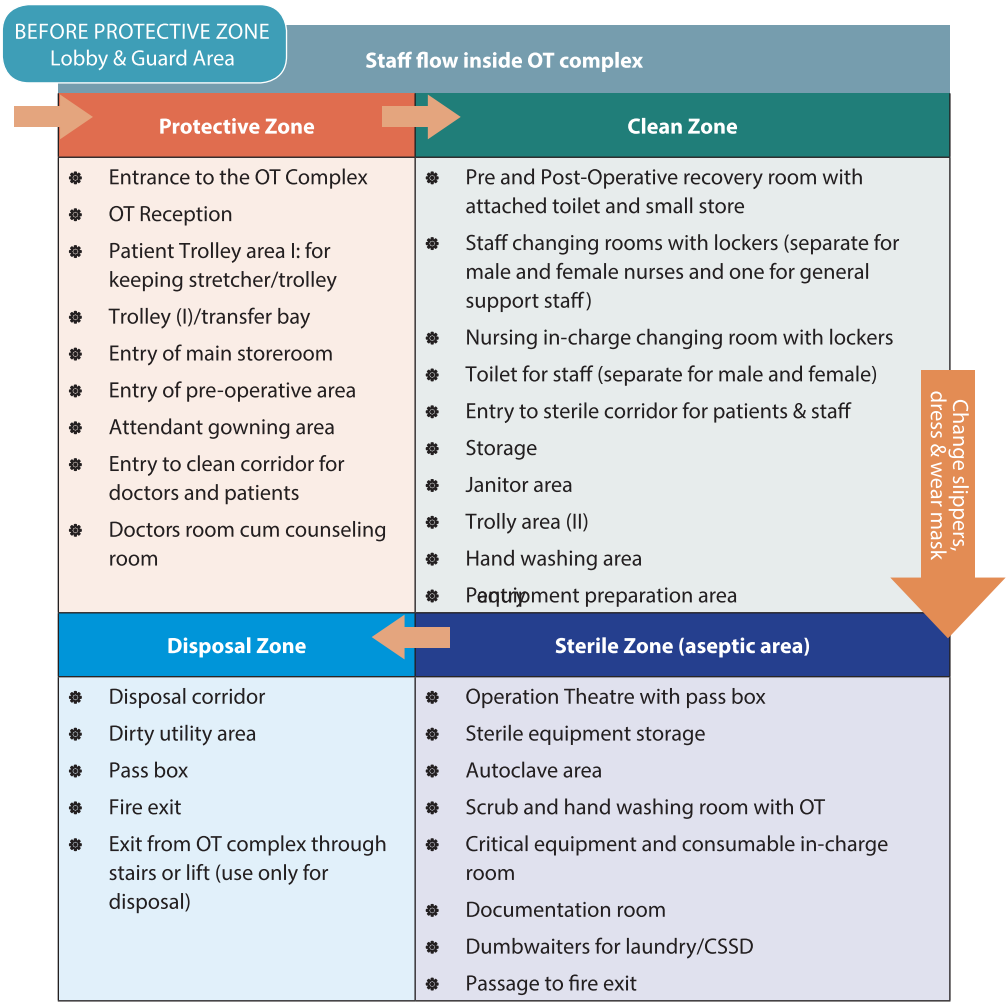
Scrub area:

Situated in the sterile zone. One Scrub area is common for 2 Operating rooms within the sterile area with elbow operated or infrared sensor operated taps. It is essential to have non slippery flooring in this area. Design should also prevent/ minimize water spilling outside scrub basin. Elbow taps have to be placed 10 cm above the wash basins.

D. Disposal Zone

It has an air pressure less than the sterile zone, includes dirty corridor and utility room where used instruments, suction bottles, waste material, used/contaminated equipment and soiled linen are temporarily stored before being collected for disposal or for cleaning and sterilization. It will have an exit which could also be used as fire exit in the time of need.

Flow of movement inside OT complex



Air Handling Unit

Airborne bacteria originate primarily from the skin of persons in the operation theatre. The bacteria carried on the skin reaches the air through skin scales, which are constantly being shed by the persons in the room. After remaining suspended in the air, the skin scales carrying the bacteria settle on various surfaces, equipment and on the floor of the OT.

- **HEPA filters**. Appropriately circulated clean filtered air removes such airborne organisms. Air should be circulated by positive pressure through high efficiency particulate air (HEPA) filters. Bacteria of size 0.5–1 micron get removed by use of such HEPA filters. HEPA filters should be monitored for efficiency on a regular basis and changed when required.
- To prevent contamination of the clean zones, an appropriate pressure gradient is to be maintained between zones. Highest positive pressure is maintained in the sterile areas. The higher pressure allows air to flow to less clean areas around the doors and openings and prevents the entry of air from the less clean area.
- Ducts in AHU are very common sites for microbes to grow and then they become the cause of post-operative infection. Cleaning of these ducts are quite a difficult and professional job, so, its cleaning should be part of Annual Maintenance Contract (AMC). Different models of AHU with duct and without ducts are available in the market. If possible and available ductless AHU is preferred in the operation room.

Maintenance: Even during the non-functional hours, AHU blower should be operational round the clock (may be without temperature control).

Regular maintenance of AHUs should include validation of following points:

- Temperature and Humidity check
- Air particulate count

- Air Change Rate
- Air velocity at outlet of terminal filtration unit/filters
- Pressure Differential levels of the Operation Theatre with respect to adjoining areas
- Validation of HEPA Filters.

Cleaning protocol for OT complex:

OT is a high risk and critical care area: There must be a system of regular rounds comprising of medical superintendant (MS) or designated officer (Infection control officer/Microbiologist etc.), Matron/Nursing Officer and Hospital Manager to the OT complex to ensure adherence to the cleaning protocol.

Activities	Frequency	Agent Used
Cleaning should start from innermost zone to outermost zone.		
Sterile Zone		
Operation Theatre floor	Morning, evening, after every surgery and as and when required	Damp Mop with detergent and water followed by disinfection with 0.5% chlorine
Mopping. (Care to be taken in case of special epoxy flooring)	Morning, evening, after every surgery and as and when required	Damp mop with detergent and water followed by disinfection with 0.5% chlorine
OT table and OT stretcher	Morning, evening, after every surgery and as and when required	Clean with swab dipped in soap water. Let it dry and then disinfect with 0.5% chlorine/70% Isopropyl Alcohol Disinfect the swab separately in chlorine solution.
Instruments	After every surgery	De-contaminate the instruments before cleaning with detergent. Alternatively, use zipper bags (re-usable and autoclavable) for keeping the instruments before sending to CSSD for decontamination and sterilization. Use a leak proof and puncture covered container for transport to CSSD.
Sterile corridor	Morning, evening and every two hours	Damp Mop with detergent and water followed by disinfection with 0.5% chlorine
Equipment like Anaesthesia machines, monitors, ventilators, infant warmers/baby cribs etc. or other equipment/furniture.	After each procedure/ as & when required, whether used or not in last 24 hours	Damp Mopping, dry followed by disinfection with 70% isopropyl alcohol. Monitor screen should not be mopped with any solvent. Cleaning of these screens should be done as per recommendations.
Clean Zone		
Doctors/nurses/ technician room	Morning, evening, and as and when required	Detergent & water
Washroom & wash basins	Morning, evening, every 2 hours and as and when required	Wash with detergent & water, then dry, disinfect with 0.5% chlorine
Store rooms	Morning, evening, and as and when required	Detergent & water

Activities	Frequency	Agent Used
Clean corridor	As per sterile zone cleaning frequency i.e. Morning, evening and every two hours	Damp Mop with detergent and water followed by disinfection with 0.5% chlorine
Pre and Post-operative recovery room	4 Times a day including morning and evening	Damp Mop with detergent and water followed by disinfection with 0.5% chlorine
Pantry	4 Times a day including morning and evening	Detergent & water
Slippers	Once a day and as and when required	Detergent & water
Shoe change area	Once a day	Detergent and water
Protective Zone		
Protective corridor	Morning, evening, and once in two hours	Damp Mop with detergent and water followed by disinfection with 0.5% chlorine
Trolley wash	Clean after each use if not in use, once a day	Damp mop with detergent/alcohol and water
Mops	After every use	Soak in chlorine solution (0.5%) for 30 minutes. Wash again with detergent and water to remove the bleach
Disposal Zone		
Disposal corridor	Morning, Evening and as and when required.	Damp Mop with detergent and water followed by disinfection with 0.5% chlorine
Dirty Utility room	Morning, Evening and as and when required.	Damp Mop with detergent and water followed by disinfection with 0.5% chlorine
Bio Medical Waste Management	Thrice a day and when bags are 3/4th full present in Dirty Utility area	As per BMW rules, 2018
Fumigation	Routine fumigation is not recommended but may be done under special circumstances such as after construction/ renovation and/ or major civil and maintenance work, while commissioning new OT or reporting of any infection in the OT.	A gent recommended: Hydrogen peroxide or combinations of silver nitrates (depending on the availability in the market). ***use of aldehyde containing compounds e.g. Formaldehyde is contraindicated in hospitals.***

FUMIGATION/FOGGING: ***Routine fogging is not recommended for an OT with a HEPA filtered positive pressure air supply system.***

At least one of the following conditions have to be met for fogging to be done:

1. OT which do not have a HEPA filter system.
2. Commissioning a new OT /renovation or other civil works/outbreak of disease.
3. If the validation checks of the ventilation system are found un-satisfactory.

The GoI guideline recommends the use of hydrogen peroxide for fogging. The age -old tradition of formalin fumigation is not recommended as it is difficult to perform, dangerous to use, unreliable and formalin itself is carcinogenic.

Steps for fogging

Once the decision is taken to conduct fogging, following steps need to be undertaken:

1. Wear a gown, cap, mask and utility gloves
2. Clean blood spills, remove waste, clean and disinfect items used in surgery
3. Inspect all surfaces in the OT in detail for visible soiling/dust. Clean any soiling with a disinfectant.
4. Wipe and clean all equipment completely i.e. wipe the entire OT table, OT lights, trolleys, anaesthesia machine.
5. Lastly, clean and mop the floor twice with 0.5% chlorine solution beginning at the end farthest from the door and moving towards it.
6. Cover all electronic equipment with plastic covers. The fogging liquid should not enter them.
7. Turn off the ventilation system
8. Place the fogger in one corner of the OT (preferably near a door so it can be taken out easily) on a trolley. Place a double folded towel under the machine (to prevent it from slipping off as it vibrates when running).
9. Direct the nozzle to the opposite corner of the room elevated at 45 degrees.
10. Start the fogger and close the OT.
11. Allow the fogger to run until a fog can be seen in the OT atmosphere. Check through the door window.
12. Once a suspended fog is seen, wear a cap and mask, open the OT door, turn off the fogger and remove it to the outside.
13. Keep the OT closed for at least one hour. It may be used any time after this.
14. Note:- Inspect the floor for wet patches after opening the OT . All surfaces should be dry. If water deposits are present keep the OT closed to allow them to dry naturally (Turn AC on if available). Do not wipe the water with sterile mop.
15. Check floor and working surfaces for excess stickiness (the foot slips or there are white streaks of deposit). This can be removed using detergent and water. If excessive stickiness or deposits are observed, check the dilution of the cleaning and fogging solution and correct it if excess chemical was added during preparation. If the problem still persists, reduce the fogging time by 1-2 minutes and monitor.

The roles of OT Nurse-in charge

1. **For OT**
   - Ensure preparing of surgical & anesthetic trolleys.
   - Periodic cleaning, BMW practices, microbiological sampling. (Swab culture or air sampling/settle plate method and sensitivity test of OT (OT Table/Shadowless lamp/floor/OT trolley/Shelf or platform over which sterilized drums are kept) has to be done. Register of the same as well as documents, in case of any positive growth of organism is found, should be maintained)

   If microbiological lab is not available in the hospital, then send the sample to the microbiology department of the nearest medical college.
   - Keeping records of microbiological sample taken and reports received.
2. **OT store**
   - Keeping 7 days store of Consumables and other supplies like gloves, catheters, Ryle's tubes, infant feeding tubes, suction cannula, mucus extractors etc. in buffer as per the load. OT store register should be maintained properly.
   - Ensure up-keeping of furniture of OT complex.

3. **Management of OT**

- Cleaning of floors and other area should be done as specified in the housekeeping SOP.
- Ensure functionality of electrical connections, plumbing & water supply and pantry appliances in prescribed check-list, daily and as per the need.
- Ensure workforce management and attendance of Para medical staff working in OT complex.
- Ensure record keeping of OT complex area such as Pre-post area, reception room, changing rooms, counselling room, Operation Theatre, autoclave room, BMW process and cleaning records.
- In consultation with nurse in-charge will prepare the duty roster.
- To prepare a final list of the planned surgeries in consultation with the OT in-charge for the next day.
- To ensure that infected cases are taken at the end of the list of elected surgeries for the OT.
- Ensure that the jewellery and other valuables of the patient have been returned to the patient's attendant and signature for receiving by the patient's attendant must be taken.

The role of other Staff Nurses in OT:

1. To receive & hand over the patient along with case file, diagnostic reports duly filled and signed by concerned doctor.
2. To facilitate the patients in filling the consent form with full signature, date and time.
3. To prepare the patient for operation (ensuring site preparation, antiseptic application and draping of the site).
4. To set up the OT table for specific surgery with required instruments / linen / equipment.
5. To assist the surgeon during the entire process of the surgery.
6. To ensure the availability of cross-matched whole blood units before the commencement of operation and same is recorded.
7. To keep a record of the mops/swabs and instruments used before and after surgery.

Scheduling Surgery

1. OT list is finalized the day before surgery at 3:00 PM by the OT Nurse in consultation with the surgeon/anaesthetist and the same is approved by OT in-charge & displayed on the notice board of the theatre.
2. Emergency cases are accorded priority by the OT in-charge of Operation Theatre. This may require rescheduling of planned surgeries which is intimated to the concerned authorities.

Preparation for surgery

1. Sterilized instruments and linen are collected and arranged in respective OTs from TSSU, on the previous night.
2. All OTs checked for readiness for surgery.
3. Anaesthesia trolley /Anaesthesia machines/ Boyle's apparatus/ ventilators/ central gas supply and cylinders are checked.
4. All sutures and drugs needed for surgery listed and taken from OT Pharmacy with proper documentation.
5. Unused sutures and drugs are returned to OT Pharmacy at the end of day.

Pre-operative checks

6. The ward nurse is informed to arrange shifting of patient to the OT for surgery at least 15 min before the scheduled time.
7. After receiving of the patient at the OT, the anaesthetist and the nurse verifies the identity of the patient against details provided in the case sheet with the patient. Checks for the PAC clearance and consent including high-risk consent, if any.
8. The nurse does a quick evaluation of the patient using WHO Surgical Safety Check-list, checks vitals including Fetal heart sound (if applicable) and records the same in the case sheet.

9. Patient shifted to OT on sterile zone trolley.
10. Patient transferred on to table and connected to monitors.

In Process Checks during Surgery

11. All instruments and assisting nurses ready for surgery. WHO Surgical Safety checklist is used.
12. The Scrub Nurse controls the number of sponges on the table. At the commencement and the closure of the surgical incision, the scrubbed nurse counts the sponges and satisfies herself that these are correct & informs the surgeon accordingly.

It is essential to keep track of the materials being used in the O.T. in order to avoid inadvertent disposal, or the potentially disastrous loss of sponges and instruments in the wound.

It is standard practice to count supplies (instruments, needles and sponges):

- Before beginning a case
- Before final closure
- On completing the procedure

The aim is to ensure that materials are not left behind or lost. Pay special attention to small items and sponges.

Create and make copies of a standard list of equipment for use as a checklist to check equipment as it is set up for the case and then as counts are completed during the case.

Include space for suture material and other consumables added during the case.

Post-Operative Care of the Patient

If the patient is restless, something is wrong.

Look for the following in the Recovery Room:

- Airway obstruction
- Hypoxia
- Hemorrhage: internal or external
- Hypotension and/or hypertension
- Postoperative pain
- Hypothermia, shivering
- Vomiting, aspiration
- Falling on the floor

The recovering patient is fit for the ward when s/he is:

- Awake, opens eyes
- Extubated
- Breathing spontaneously, quietly and comfortably
- Can lift head on command
- Not hypoxic
- Blood pressure and pulse rate are satisfactory
- Appropriate analgesia has been prescribed and is safely established

Ward nurse informed about patient shifting after doctor's advice and patient shifted to ward with due care and charting of all drugs/fluids/output etc . Patient handed over to Ward nurse with the case sheet and all records duly filled.

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

World Health Organization

Before induction of anaesthesia ▸▸▸▸▸▸▸▸▸ Before skin incision ▸▸▸▸▸▸▸▸▸▸▸▸▸ Before patient leaves operating room

SIGN IN

☐ **PATIENT HAS CONFIRMED**
IDENTITY
SITE
PROCEDURE
CONSENT

☐ **SITE MARKED/NOT APPLICABLE**

☐ **ANAESTHESIA SAFETY CHECK COMPLETED**

☐ **PULSE OXIMETER ON PATIENT AND FUNCTIONING**

DOES PATIENT HAVE A:

KNOWN ALLERGY?
☐ NO
☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
☐ NO
☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?
☐ NO
☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

☐ **CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE**

☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM**
PATIENT
SITE
PROCEDURE

ANTICIPATED CRITICAL EVENTS

☐ **SURGEON REVIEWS:** WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?

☐ **ANAESTHESIA TEAM REVIEWS**: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?

☐ **NURSING TEAM REVIEWS:** HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
☐ YES
☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
☐ YES
☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

☐ **THE NAME OF THE PROCEDURE RECORDED**

☐ **THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT** (OR NOT APPLICABLE)

☐ **HOW THE SPECIMEN IS LABELLED** (INCLUDING PATIENT NAME)

☐ **WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED**

☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT**

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Chapter 8
High Dependency Unit (HDU)

Types of specialized care units

Intensive Care Unit (ICU)	Obstetric ICU	High Dependency Unit (HDU)
ICU is a specialized area of the hospital which is specifically designed, staffed, located, furnished and equipped, dedicated to management of critically sick patient, injuries or complications.	It is an ICU which is dedicated to obstetric patients who have developed multi-organ failure necessitating specialized care by super-specialists like intensivist/ nephrologist/ cardiologist, pulmonologist/ endocrinologist etc.	HDU is an area in a hospital where patients can be cared more extensively than in a normal ward, but not to the point of intensive care. So it is also known as the intermediate care unit
It is a department with dedicated medical, nursing and allied staff trained in critical care		Patients in HDU may require ICU admission later (step up) or at the same time, patients in ICU who had an improvement in their condition, may be shifted to HDU (step down), before shifting them to the general ward.

Role of nurses in High Dependency Unit

Nursing In Charge

- Supervisory, Logistics management, Regular reporting.
- Preparing duty roster of nursing staff.
- Work under the intensivist / HDU In-charge and help Intensivist with improving the clinical, administrative services for HDU care.

Nurse

Patient care during shift duty including handling equipment present in the unit and other things-

i) General Nursing Care
ii) Basic Life Support / Basic Cardiac Life support
iii) Should be assisting in all resuscitative & Advanced Life Support clinical work in HDU
iv) Administration of medicines/drugs through all routes
v) Airway Suction & Nebulization
vi) Simple point of care testing
vii) ECG
viii) Monitoring Clinical parameters- manually and via multipara monitors
ix) Maintenance of different charts
x) Maintenance of records, statistics & reporting
xi) Sampling blood and body fluids
xii) Managing requisitions for tests
xiii) Maintenance and keeping ready stock of drugs, equipment, consumables etc.

Setting up HDU

Location

- Within the facility, preferably on First floor, as at the ground floor dust contamination & chances of infection are more. It should ideally be located near the operation theatre.
- In case of obstetric HDU, it should be located near the labour room and operation theatre.
- Proximity to other areas of essential support services such as radiology, laboratory, blood bank, etc. is desirable.
- There should be a single entry/exit point to the HDU.

Privacy

- There should be single-piece curtains and not split into parts between the rooms for ensuring privacy of the patients.
- The curtain fabric should be fire and waterproof, washable, clean, light colored, inherently stain resistant and non- allergic.
- Preferably 3 colors i.e., blue, yellow and red/pink should not be used in HDU/ICU as they interfere with identifying cyanosis, icterus and pallor respectively.
- The curtain height is determined by the floor to ceiling height, and curtains usually should finish approximately 8-10" above the finished floor
- The curtains should have mesh at the top which will allow both light and ventilation in the patient room.
- The curtains should be hanging from the overhanging rails.

Flooring

The floor should be made of large vitrified, antiskid, stain proof and easy to clean tiles with seamless joints. The tiles should be of light color (preferably white or off-white)

Walls

The walls should be of durable glazed tiles which are easy to clean, stain and flame resistant. It will be preferable to have a finishing of wall height of up to 6-7 ft. with the tiles similar to floor tiles

Ceiling

The ceiling should be leak proof. It is suggested that no lines or wires be kept or run over the ceiling or underground.

Nursing Station

- Adequate space for central monitoring
- Scrub Area and wall clock behind the nursing station
- Facility for keeping records and emergency medicines

Store room for Equipment

A separate room should be made to keep the equipment such as the sonography machine, portable X-ray machine, transport ventilator, nebulizer, radiant warmer, blood warmer, crash cart(s), BIPAP/ CPAP machine, etc

General Store Room

A general store room should be made to keep bed linen, disposables and consumables, personal protective attire like caps and masks, slippers, etc.

Toilets

Toilets required as per beds available

Buffer Zone

A protective clean zone should be made available located before the entry in HDU

Autoclaving and Sterilized supply

This should happen from the Central Sterilized Supply Department (CSSD).

Waiting Area

Waiting area for the patients' attendants should be provided, with facility for seating capacity of at least 2 relatives per patient, facility of drinking water etc

Process of Shifting of a Patient from Ward/ Triage Room to HDU

1. Inform the family of the patient of the decision, and take consent.
2. Case sheets containing history, examination, investigations and management should be maintained.
3. HDU staff should be appropriately informed by the emergency/IPD staff.
4. Ensure patent airway and continuation of patent IV line.
5. The patients should be escorted by doctor/staff with all existing treatment
6. Oxygen and supine hypotension prevention (by performing lateral tilt to 15-20 degree),if required.
7. Baby should be shifted along with the mother, if delivered already.

Patient management and Monitoring at HDU

a) **History taking-** Record the date, time and reason for admission, name of clinician contacted, a summary of the current problems, review of the patient's observations and findings on clinical examination, and a plan for the ongoing care. Future review should be completely documented.

b) Immediate initial assessment and resuscitation should be done.

c) **Examination and monitoring:**

- Temperature
- Blood pressure
- Heart rate
- Respiratory rate
- Transcutaneous oxygen saturation
- Fetal heart rate in case of pregnant woman
- Hourly urine output

d) **Following management to be done as per case requirement:**

- Fluid and electrolyte balance.
- Monitor organ function- Cardiovascular, Renal, Pulmonary, Hepatic, and Cerebral.
- Initiate baseline and specific investigations as indicated.
- Treat primary condition (severe pre-eclampsia, hemorrhage, sepsis, Pulmonary Thrombo-Embolism, etc.)
- Hypovolemic shock is managed with fluid therapy- Crystalloid/ Blood/ Blood Components.
- Non-invasive monitoring like SpO2, BP, ABG, lungs functions and others is done.
- Anti-convulsant therapy is given wherever is required.
- Check fetal condition with CTG.
- Oxygen via face mask, as prescribed
- Sepsis- Broad spectrum antibiotics are given (covering both gram negatives & anaerobes).
- Proper care for nutrition should be taken- Enteral and parenteral nutrition is given
- Pain management is done.

- WATCH FOR → Pulmonary edema/ Acute Respiratory Distress Syndorme/ Disseminated Intravascular coagulation, Multi-organ failure, Poor cardiac output despite fluid resuscitation, Septic shock, etc.

e) Discharge of patients from HDU:

- When a patient's physiologic status has stabilized.
- Patient is hemodynamically stable
- The need for intensive patient monitoring is no longer necessary
- No further continuous intravenous medication or frequent blood tests required
- No active bleeding
- No supplementary oxygen required
- Patient is ambulatory and can be cared for in a general ward unit.
- Average time of stay in HDU is usually 24-72 hours.
- Discharge with full written document

Why are dedicated Obstetric HDUs required?

- In India, most of the public health facilities do not have a separate special care unit for high risk pregnancies and postpartum mothers with complications.
- Such women are being managed in the labor room, without dedicated team(s) of competent providers and appropriately equipped facilities.
- To further bring down the maternal mortality ratio (MMR), facility of skill based services in dedicated critical care set up, with state-of-the-art equipment and technology and a team of appropriately trained professionals are the need of the hour.
- Any pregnancy can develop life threatening complications at any time with or without any warning.

The Scope of Obstetric HDU: Following conditions may require admission in obstetric HDU

Obstetric Complications	Pregnancy with Medical Complications
Pregnancy/Labor Pain with Severe Anemia (< 7 gm %) and its complications	Pregnancy with Gestational Diabetes
Ante-partum Hemorrhage- Placental Abruption Placenta Previa	Pregnancy with Cardiac Diseases
Post-Partum Hemorrhage/ Adherent Placenta	Pregnancy with Jaundice
Sepsis	Severe Pre-eclampsia/Eclampsia / HELLP Syndrome
Obstetric Hysterectomy	Post-operative Acute Renal Failure (ARF)
Pregnancy with Trauma	Pregnancy with Asthma and other respiratory problems.
Pregnancy with Disseminated Intra-vascular coagulation (DIC)	Pregnancy with Poisoning
Perforation during abortion	Burns during Pregnancy
Postoperative patients requiring hemodynamic monitoring or intensive nursing care	Pulmonary edema due to perioperative fluid overload, CCF, complication of severe pre-eclampsia or tocolytic therapy
Multiple Gestation with complications	Pregnancy with Cancer

Cleaning Protocols

Activities	Frequency	Agent Used
Cleaning of high touch surfaces	At the beginning of each shift	Cleaning with soap & detergent plus disinfection with alcohol compound or hydrogen peroxide
Cleaning of procedure Instruments	After every procedure	Disinfection with detergent & water followed by sterilization
Cleaning of clean areas and corridors	Twice a day (as & when required)	Damp Mop with detergent and water/0.5% chlorine
Floor Mopping	Thrice a day and after each procedure	Damp mop with detergent and water /0.5% chlorine
Cleaning of dressing trolleys, medication trolleys	Clean after each use	Damp mop with detergent/alcohol and water
Cleaning of equipment like anaesthesia machines, monitors, ventilators, infant warmers/ baby cribs etc. (wiping of entire machine)	Twice a day/ as & when required	Damp Mopping, dry, Disinfect with 70% isopropyl alcohol / 2% glutaraldehyde(Refer to swachhta guidelines for more details)
Doctor's / nurses / technician room/ feeding room/equipment room/stores	Twice a day	Detergent & water
Washroom & wash basins cleaning / Bed pan cleaning area/dirty utility area	Thrice a day and as & when required	Wash with Soap & water, then dry, wipe 0.5% chlorine
Washing of slippers	Once a day and when required	Detergent & water
Shoe change area	Once every shift	Detergent and water
Cleaning of Mops	After every use	Soak in clean water with bleaching powder 0.5% for 30 minutes. Wash again with detergent and water to remove the bleach
Cleaning of patient trolleys, stretchers	Daily morning	Damp mop with detergent/alcohol and water
Cleaning of general furniture	Twice a day	Damp mop with detergent/alcohol and water
Removal of soiled linen and sluicing	As and when required	Soak in clean water with bleaching powder 0.5% for 30 min. Wash again with detergent and water to remove the bleach OR ; launder in hot water (70-80 degree C) if possible.
Cleaning of patient beds, Crash Cart trolleys	Once a day and between change of patients in case of discharge/death etc.	Damp mop with detergent/alcohol and water
Cleaning of bedpans and urine pots	After every use	Wash with detergent and water/0.5% chlorine
Bio Medical Waste Management	Thrice a day and more when bags are 3/4th full present in Dirty Utility area	As per BMW rules, 2018

Chapter 9
Basic Life Support (BLS)

BLS is performed to restore the circulation of oxygenated blood after a sudden cardio-pulmonary-arrest.

BLS does not include the use of drugs or invasive skills.

Global Burden of Sudden Cardiac Arrest

- Approximately 700,000 cardiac arrests per year.
- By doing standard CPR before arrival of emergency services, survival rate from sudden cardiac arrest can be doubled.
- Early resuscitation can result in>60% survival.

Who will provide - Basic Life Support

It can be provided by trained medical personnel and by anyone who knows how to do it, anywhere, immediately and without any other equipment.

Purposes of Cardio Pulmonary Resuscitation (CPR)

Purpose of CPR is maintaining circulation and oxygenation in order to maintain a cardiac output to keep vital organs alive.

Indications of CPR

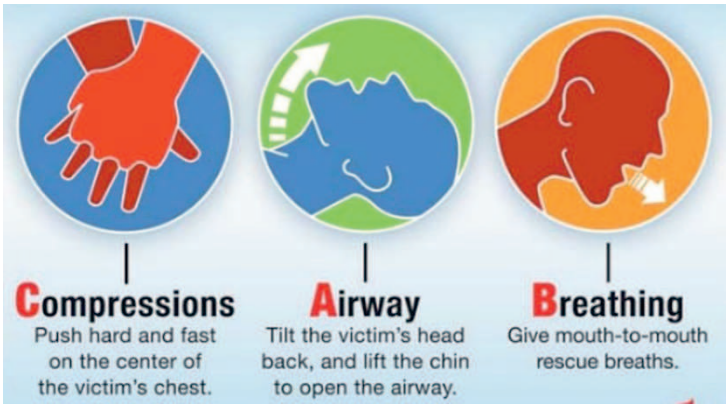
1. Cardiac arrest
2. Respiratory arrest
3. Combination of both

What is CAB approach?

There is a common acronym in BLS used to guide providers in the appropriate steps to assess and treat patients in respiratory and cardiac distress.

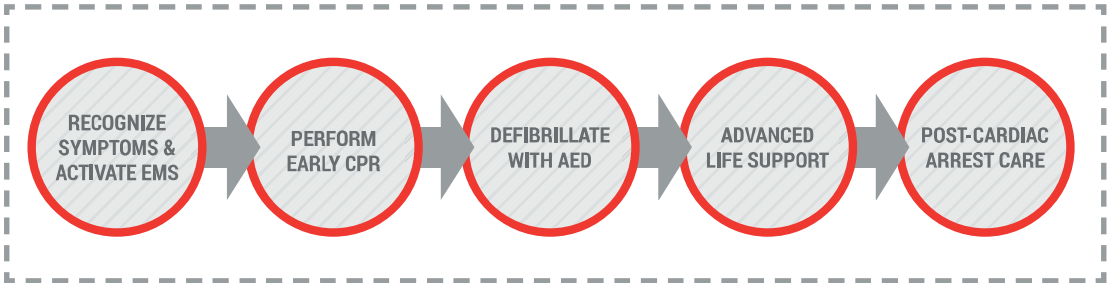
CAB-D (Compression, Airway, Breathing, Defibrillation)

CPR is as easy as **C-A-B**

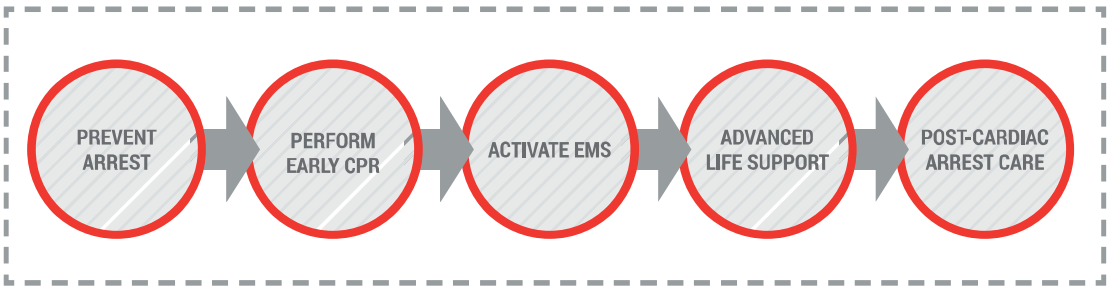


Initiating the Chain of Survival

1. To increase the odds of surviving a cardiac event, the rescuer should follow the steps in the **Adult** Chain of Survival.



2. Infants and children do not usually have primary cardiac events. Pediatric patients will most often suffer from respiratory events or dehydration that lead to cardiac arrest. The most important part of the **Pediatric** Chain of Survival is the first link- **Prevention.**



Actions for Performing Adult CPR

1. Assess scene safety
2. Determine responsiveness
3. Check carotid pulse
4. Perform chest compressions
5. Open Airway
6. Check Breathing and deliver breath

1. Assess Scene Safety

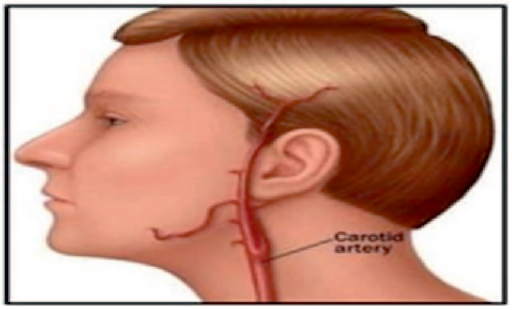
Assess to make sure that the scene is safe for you to respond to the down patient.

2. Assess Responsiveness

Shake the shoulder and speak to the adult asking ARE YOU ALL RIGHT?. Look at the chest and torso for movement and normal breathing simultaneously.

3. Check Circulation (Check carotid pulse)

Check the patient for a palpable carotid pulse for 5-10 seconds.(Do not check for more than 10 seconds)



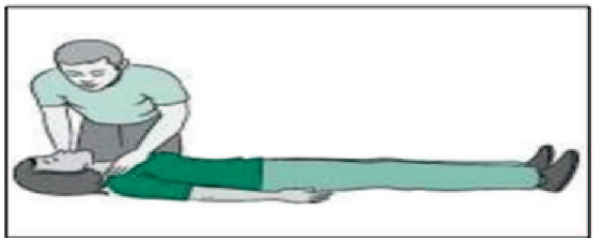
Shout for Help

If there is no pulse and no breathing------- Start CPR

Cardio-Pulmonary Resuscitation (initial steps)

To start CPR, place patient in supine position on a firm and flat surface.

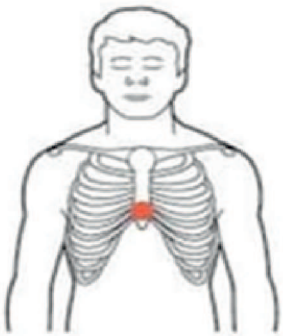
Kneel down to the patient and locate the position for chest compression on person's chest.

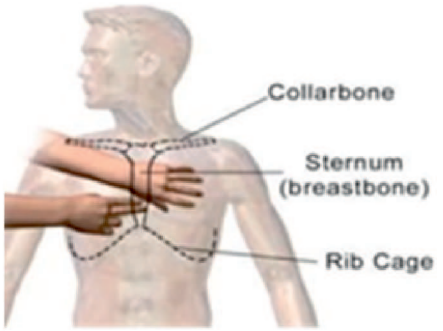


4. Perform chest compressions

Location of Chest Compressions

Locate the lower l /3 of the patient's sternum between the nipples in the midline of body.





Hand position during Compressions

1. Lock your arms
2. Place the heel of one hand over the center of the person's chest, between the nipples. Place your other hand on top of the first hand
3. Keep your elbows straight and position your shoulders directly above your hands

Use your upper body weight (not just your arms) as you push straight down on the chest at-least 2 inches (approximately 5 centimeters) but not greater than 2.4 inches (approximately 6-centimeters).

Good Quality Chest Compressions

- Press hard and fast. Deliver 30 chest compressions initially.
- Allow for full chest recoil with each compression
- Push hard at a rate of 100-120 compressions per minute.
- Allow for only minimal interruptions to chest compressions

5. Open Airway

After, giving 30 chest compressions open airway..There are two maneuvers to open the airway

1. Head-tilt Chin-lift Maneuver
   (avoided in spinal cord injury if suspected).

2. Jaw Thrust Maneuver

Methods of Rescue Breaths-

- Mouth-to-Mouth rescue breathing
- Ventilation With Bag and Mask
- Ventilation With an Advanced Airway

Bag and Mask ventilation: C-E technique

Place the mask on the patient's face before attaching the bag. Using non-dominant hand, create C-shape with thumb and index finger over the top of the mask, and apply gentle downward pressure.

Hook the remaining fingers around the mandible, and lift it upward toward the mask, creating the E

Rescue Breathing

Each rescue breath should last approximately 1 second.

- Watch for chest rise
- Allow sufficient time for the air to expel from the patient

Duration of CPR cycle:

- 1 cycle of adult CPR is 30 chest compressions to 2 rescue breaths
- Perform 5 cycles of CPR (lasts approximately 2 minutes)

If two providers are present: switch rolls between compressor and rescue breather every 5 cycles.

High quality CPR is the key and is defined as-

- Compression rate of AT LEAST 100 per minute for all victims
- Compression depth of AT LEAST 2 inches for adults/children and about 1.5 inches for infants
- Allow complete chest recoil after each compression
- Minimize interruptions in CPR except to use an AED or change rescuer positions
- Do NOT over-ventilate
- Provide CPR as a team when possible

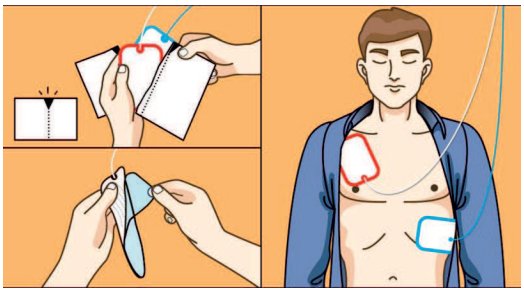
Continue Resuscitation Until

- The patient starts breathing normally
- Rescuer becomes exhausted

Automated External Defibrillator (AED)

An AED, or Automated External Defibrillator, is a device that has the ability to detect irregular heart rhythm and automatically deliver a defibrillation shock, to stop irregular heart beat and resume a normal rhythm. AEDs are designed to be used by anyone and can be used on patients with pacemaker, hairy chest or medication patches.

Steps to use AED



1. Turn on the AED and expose the patient's chest. Dry the chest, if wet.
2. Open the AED pads, peel off the backing and apply the pads
   - Upper right chest above breast
   - Lower left chest below armpit
3. Ensure wires are attached to the AED box and stop CPR.
4. Move away from the patient and tell others not to touch the patient.
5. AED analyses the rhythm.
   - If message is SHOCK, administer 1 shock and resume CPR immediately for 2 minutes.
   - Otherwise, resume CPR immediately for 2 minutes and assess rhythm every 2 minutes.

In case of non-availability of AED or when Manual defibrillator is available, let physician analyze the ECG rhythm and decide, whether rhythm is shockable or not.

Do not give shock in :

1. Normal Sinus rhythm
2. Asystole (ECG flat line) * (please ensure all ECG electrodes are attached)
3. Pulseless electrical activity (some ECG activity in absence of pulse)

In case of

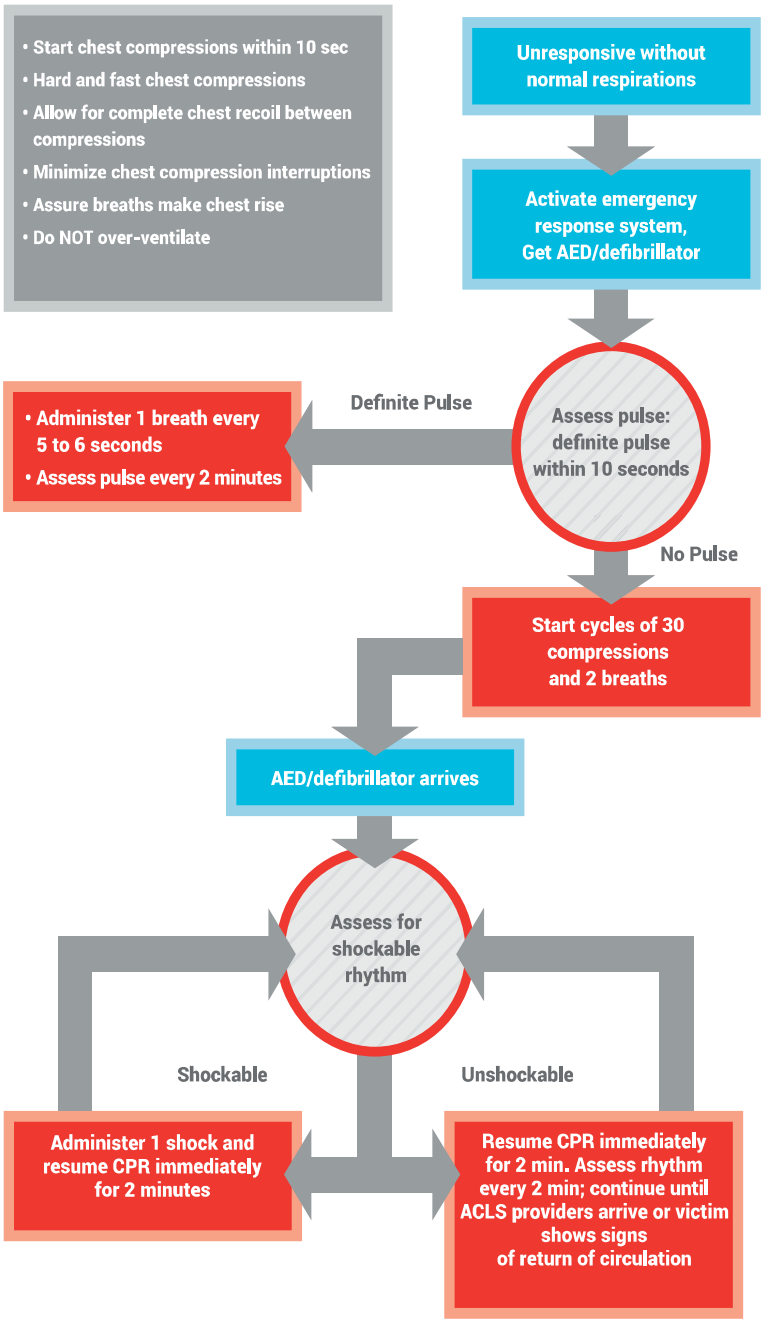
- atrial fibrillation/ flutter - start with 50-100 joules and incremental energies are given in subsequent shocks.
- Ventricular starts from 150-200 joules, then go up to 360 joules
- Children 2 joules/kg

Complications of CPR

Although CPR is a life saving technique but complications may arise if not done properly. Following complications may occur:

- Rib Fracture and internal injuries to organs
- Laceration related to the tip of the sternum
- Vomiting, aspiration and gastric distension

Adult BLS algorithm



Chapter 10
General Nursing Care

General nursing care covers a wide range of activities and responsibilities intended at providing holistic and compassionate care to patients. Nurses play a crucial role in promoting patients' physical, emotional, and psychological well-being. Here are some key aspects of general nursing care:

1. Bed Making

It is an essential procedure in nursing to provide safe and comfortable beds to the clients. The purpose of bed making is to promote proper hygiene and cleanliness and it also prevents bed sores.

Process:

- The nurse should wash hands before and after the bed making procedure to prevent cross infection.
- The nurse should assemble all articles needed for making the bed.
- If the client can easily move, ask her / him to get down from the bed for bed making and make her /him sit comfortably on a chair.
- Remove the pillow and place it on a chair after removing the cover.
- Loosen and remove the sheets starting from the head end to the foot end and send them for washing. Blood stained sheets should be treated with the bleaching power before being washed.
- Do not forcefully shake the sheets in the environment, to avoid the spread of microorganism in the environment.
- Wipe the mattress with the help of dry duster, from farther end to the nearer one. Turn the mattress (if cotton) to air them. Wet duster should be used to remove stains, only if the mattress is lined with mackintosh. Roll the mattress to the top of the bed.
- After dusting of mattress, a clean sheet should be spread on the bed and should be tucked under the mattress from one side.
- Place the mackintosh on the lower half of the bed and the draw sheet over it and tuck them both together.
- Go to the other side and tuck the bottom sheet, mackintosh and draw sheet after pulling and tightening the sheet from all the sides. All four corners should be neatly made and there should be no creases on the bed.
- Top sheet with the blanket should be spread over the bed and tucked at the lower end after making a small pleat. The upper end of top sheet and blanket should be folder back, so as to keep the edges away from the client's face.
- Change the pillowcase and replace the pillow back on the head end.
- Dust the furniture in patient unit, like side table, chair etc. using a damp duster dipped in antiseptic solution.
- Make the patient comfortable on the bed.
- Dismantle all the other articles and wash hands.

Note: If the patient is bed ridden (ICU, immediate post-operative etc) provide for smooth sheet(s) beneath the patient and provide for linen (draw sheet) between the bottom sheet and the patient. Also cover the patient with a clean sheet.

2. Personal Hygiene

Leaving your client unclean can lead to other nosocomial and hygiene related infections. Explain the patient the importance of good personal hygiene. This helps to maintain the dignity of the patient and also boost up the patient's morale.

The following are included in personal hygiene:

a. Oral Care

Poor oral hygiene and loss of teeth may affect a client's social interaction and body image as well as nutritional intake. Daily oral care is essential to maintain the integrity of the mucous membranes, teeth, gums, and lips.

Oral care for conscious client

- Inform the client about the procedure and convince her / him to receive mouth care.
- Ask for the toothbrush and paste, if nothing is available, help the client to rinse his/ her mouth with saline or salt water.
- Collect all required articles in a tray and wash hands.
- Make the client sit up in bed or prop up bed to 45degree level with pillows behind him/ her for comfort.
- Remove dentures or other prosthesis from mouth, if any.
- Cover client's neck and chest with towel to avoid spillage of water.
- Hand over her / him the brush and assist in brushing teeth. Assist in rinsing the mouth with water and receive the dirty water in kidney tray; instruct the client to be careful while spitting to avoid spillage.
- Remove kidney tray, wipe mouth with towel and apply petroleum jelly or glycerin on client's lips to avoid chipping of lips.
- Dismantle articles and wash kidney tray with soap and water before replacing.
- Record the procedure in nurse's note.

Oral care for unconscious client

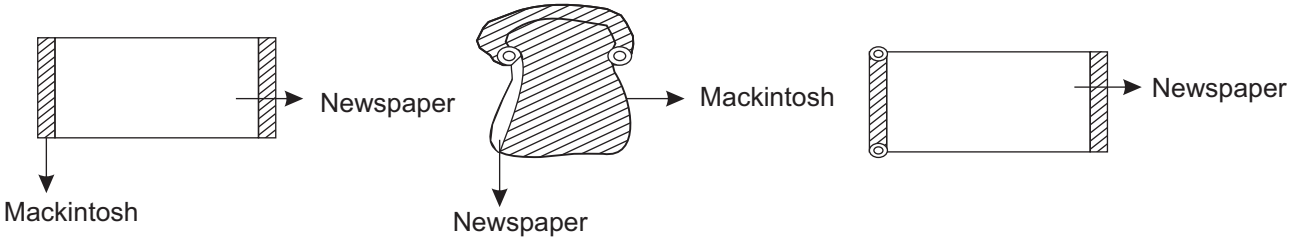
Mouth care is especially important for an unconscious patient. Special precautions need to be taken.

- Collect articles required and wash hands.
- If possible, position client on his or her side, near the edge of the bed. Tilt patient's head to one side. Put a kidney tray under patient's chin with a towel under it to catch any water that drips.
- Open his/her mouth very gently with a tongue blade. Avoid putting finger in patient's mouth.
- Clean teeth and gum with help of toothbrush. Rrinse the mouth by injecting a little amount of water into mouth with a syringe or use a moistened gauze wrapped in an artery clamp to clean the mouth.
- If water is injected into patient's mouth, make sure that it runs out of the side of the mouth or suction the mouth to get it out. Fluid left in the mouth might choke the patient. It could be breathed into the lungs and cause pneumonia.
- After cleaning patient's mouth, apply glycerin or petroleum jelly to prevent dryness.
- Wash hands and record the procedure in nurse's note.

b. Hair Care

Hair care is not only washing hair, simple combing and neatly tying client's hair is also a part of hair care. When needed, hair wash can be given to clean the scalp. This small activity makes the patient feel fresh and healthy.

- Before starting the procedure, client should be informed about the procedure and consent should be obtained from her/ him for procedure.
- Patient's privacy should be maintained by drawing curtains or closing doors.
- Wash hands and collect all the articles, in a tray before starting the procedure and check temperature of the water to suit the environment and patient's need.
- Remove pins, rubber band, and open patient's hair if platted. Comb them carefully to remove tangles.
- Give the patient supine position, remove pillow and bringing her/ his head to the edge of bed.
- Prepare 'trough' by rolling one end of a long piece of mackintosh lined with newspaper and turning it into 'U' shape as shown in the picture. This rolled U shaped portion will go under patient's head.



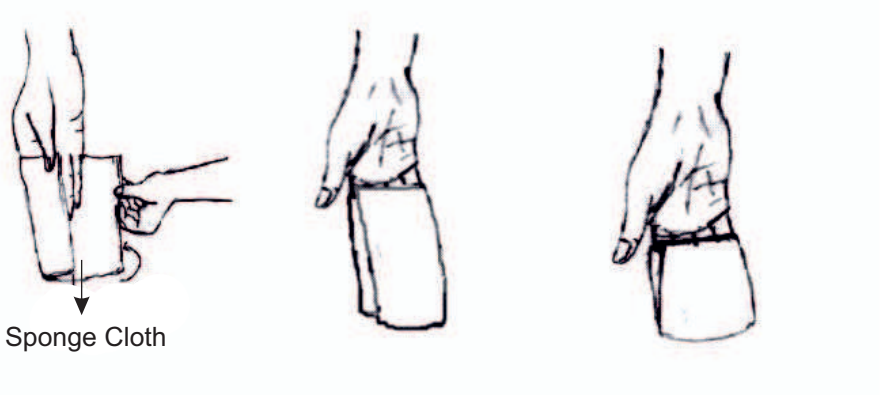
Trough

- Ask the patient to lift her/ his head and support patient's neck with one hand. Spread a towel under his/her head and place the trough over it keeping the mackintosh side up.
- Wear gloves and tuck another towel around patient's neck to prevent his/ her clothes from getting wet. Plug the ears by inserting cotton buds into it.
- Place a bucket at the head end with the lower end of trough falling into it. This arrangement will navigate the flow of dirty water into the bucket.
- Wet client's hair and ensure that her /his clothes are not getting wet. Start applying shampoo on hair and massage the head gently.
- Keep talking to the patient during the procedure, to make her / him comfortable.
- Pour water with the help of mug from patient's forehead to wash of the shampoo in hair but be careful, so the drops of water should not enter into his/her eyes or ears.
- After washing off the shampoo properly, lift his/her head by supporting from neck and pull out the trough carefully without spilling water on the bed sheet or floor. Put the trough in the bucket.
- Wrap and dry hair with the towel lying below patient's head and make her / him sit with support if possible. Remove ear plugs and the other towel.
- Dismantle articles after the procedure by throwing water in bathroom and newspaper into dustbin. Wash mackintosh with soap and dry in shade.
- Remove gloves, wash hands and record procedure in nurse's note. Comb hair after drying and plate them if required.

c. Bathing

Bathing patients is an essential component of nursing care. It removes microorganisms as well as body secretions from skin, gets rid of unpleasant smells, improves blood circulation to skin and makes the patient feel more relaxed and refreshed. Bathing the patient gives the nurse a good opportunity to look at condition of the patient's skin and to see how well the patient can move.

- Choose a right time for giving bath like in the morning. Inform the patient about the procedure and encourage clients to take bath by themselves in bath room.
- If bath has to be given in bed, be prepared with a set of bed sheets to change, as sheets might become wet. Involve the patient or relatives in the process as much as possible and comfortable for them.
- For bed sponging, make the patient lie in bed in supine position. If supine position is not comfortable, give the position, which is comfortable for the client and remove the pillow, blanket etc.
- Cover the bed with the help of screens, to maintain privacy of the client.
- Wash hands and wear gloves.
- Cover the patient till neck, with a top sheet and undress him/ her under the sheet. Check clothes, for blood and other type of stains. If not stained send the clothes for washing; if stained, treat them with bleaching solution first and then send for a wash.
- Put cotton balls in patient's ears to prevent any water from going in.
- Start wrapping sponge cloth around the fingers and fold the hanging part of the sponge cloth over the palm to tuck inside the fold as shown in the picture below.



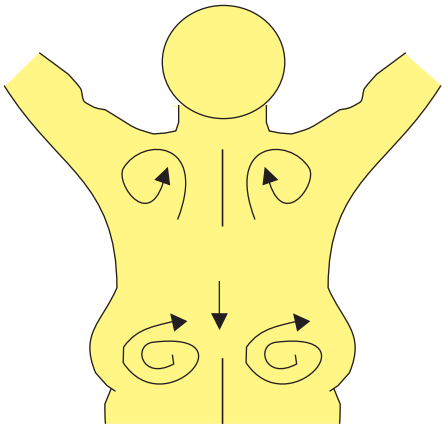
- Dip the cloth in a basin of lukewarm water and start sponging from the face.
- Clean the eyes first, twice and ensure to remove all extra water from eyes.
- Wet the body parts using one cloth and apply soap using another cloth simultaneously on the areas. The sequence followed of cleaning should be face, neck, shoulders, chest, arms, hands, fingers, legs, foot and back. Back should be massaged gently using circular strokes. Keep on dipping and washing the sponge cloth in the basin in between the process. Change water whenever dirty.
- Check nails and cut them if they are too long.
- During the whole process, do not expose body parts, which are not being wiped.
- At the end, clean perineum using betadine gauze and apply principles of asepsis. Penis should be cleaned from tip to shaft using singular firm strokes. Vagina and vulva should be cleaned from inside to out, top to bottom, using singular firm strokes and one gauze piece to be use only once.

d. Back Care

Back rub is one of the most comforting things for patients. It provides relaxation and improves circulation. Hence, the back rub is particularly useful in preventing pressure sores in those patients on bed rest for long times. It also allows the nurse to check the patient's skin and look for red areas that may later develop pressure sores.

- Wash hands and dry them. Wear clean gloves and pour a little lotion in hands.
- Using circular motions, massage the middle of the patient's lower back.
- Next, stroke upward and massage the areas over the right and left shoulder blades, again using circular motions. Then stroke downward and end by massaging the iliac crests, the large muscles of the right and left buttocks.
- Repeat this process for three to five minutes and then take off any lotion left on the skin with a soft towel.
- Dismantle the articles, wash hands and record procedure in nurse's note.

Refer to the figure below for strokes to be used during back rub :



While massaging the back, check the skin for redness. These areas may develop into pressure sores. Immediate measures should be taken to relieve pressure from these areas by giving position and supporting by pillows.

Do not rub over reddened areas of the skin since rubbing skin can cause pealing or damage.

Ways to avoid pressure sores:

- Help the patient change position every one to two hours.
- Keep the patient well nourished: See that he or she gets enough calories, protein and vitamin C.
- Keep the patient clean: If the skin is not clean, bacteria will collect and make pressure sores develop more quickly.
- Keep the patient dry: Moisture from urine and perspiration helps pressure sores to form.
- Keep bedding clean and free of wrinkles: This will reduce friction, which also leads to pressure sores.
- If necessary, use a foam rubber pad or soft mattress: This will reduce the pressure on bony parts of the body such as the back of the pelvis (sacrum). Raising the heels makes them less likely to develop sores.

e. Bowel Care

General nursing bowel care involves a range of interventions aimed at promoting regular and comfortable bowel movements for patients. Here are some general nursing bowel care practices:

- **Assessment:** Begin by assessing the patient's baseline normal bowel habits, any changes in those habits, and any associated symptoms such as constipation, diarrhea, abdominal pain, or bloating.
- **Hydration:** Encourage adequate fluid intake, as dehydration can lead to constipation.
- **Dietary Fiber:** Recommend a balanced diet rich in dietary fiber. Fiber adds bulk to stool and helps promote regular bowel movements. Fruits, vegetables, whole grains, legumes, and nuts are good sources of fiber.
- **Regular Meal Schedule:** Encourage the patient to establish a regular meal schedule.
- **Physical Activity:** Promote regular physical activity within the patient's abilities. Exercise helps stimulate bowel activity and maintain overall gastrointestinal health.
- **Toileting Routine**: Encourage patients to establish a routine for toileting at the same time each day, preferably after meals when the gastrocolic reflex is active.
- **Privacy and Comfort**: Ensure patients have privacy and comfort when using the toilet. Feeling rushed or uncomfortable can inhibit bowel movements.
- **Medication Review**: Review the patient's medications, as some medications can contribute to constipation or diarrhea. If appropriate, work with the healthcare team to adjust medications.
- **Laxatives and Stool Softeners**: If necessary, provide guidance on the use of laxatives or stool softeners under the guidance of a doctor as their misuse can lead to dependency or other issues.
- **Education**: Provide patient and family education about maintaining good bowel habits and recognizing signs of bowel problems. Emphasize the importance of seeking medical advice if there are persistent issues.
- **Medical Conditions**: Be aware of any underlying conditions that could affect bowel function, such as irritable bowel syndrome, inflammatory bowel disease or neurological conditions that impact bowel control.
- **Incontinence Management**: Implement appropriate strategies to manage and prevent skin breakdown, maintain hygiene and ensure patient dignity.

Administering Enema

- Position patient to facilitate flow.
- Use correct temperature for the type of enema. Lubricate the tip of the tubing and insert tubing 3-4 inches
- Provide for bed pan/assistance to washroom
- Document the results

Using bed pan

- Wear gloves and take clean bed pan to bedside
- Maintain privacy by using screen and make the patient lie down flat on bed
- Fold back the sheet/ blanket, leaving just one sheet over the patient and help the patient to loosen the lower clothing
- Ask her/ him to flex knees, press heels against the bed and try lifting his/her buttocks
- Slip left hand under the patient's pelvis to help her/ him raise hips and slip bed pan with the open pouring side towards the client's head and handle of bed pan towards the foot of the bed, lower the patient gently and cover with sheet. Raise back rest or place pillow under the back if necessary
- Leave the patient alone and inform her/him to call when they finish. Give plenty of time but be around to listen patient's call
- If the client has finished and cannot clean him/ herself, clean the perineum and buttocks with the help of cotton or toilet paper.
- Lift the client up, pull out the bed pan and change the pad in case of female clients. Make the client comfortable and put the sheet of the newspaper over the bedpan to cover it.
- Empty the bed pan in the toilet and pour some antiseptic in it to make it disinfected after cleaning.
- Wash hands and make a record of colour, consistency and amount of stool or urine, if found unusual then inform to the doctor.

f. Bladder Care

General nursing bladder care involves maintaining the health and functioning of the urinary bladder, which is a crucial part of the urinary system. Proper bladder care is especially important for individuals who may have medical conditions or are at risk of urinary problems. Here are some key points to consider for general nursing bladder care:

- **Hydration:** Encourage adequate fluid intake to keep the urine diluted and reduce the risk of urinary tract infections (UTIs). However, avoid excessive caffeine and alcohol consumption, as they can irritate the bladder.
- **Regular Emptying:** Encourage individuals to empty their bladder regularly to prevent over distension. Holding urine for extended periods can lead to bladder problems.
- **Proper Toileting Techniques**: Teach patients the importance of complete emptying of the bladder during each trip to the bathroom. Sitting on the toilet with the feet flat on the floor and leaning slightly forward can help optimize bladder emptying.
- **Avoid Straining**: Advise against excessive straining during urination, as it can weaken pelvic floor muscles and contribute to bladder problems.
- **Maintain Good Hygiene**: Emphasize the importance of maintaining good perineal hygiene to prevent infections. Individuals should wipe from front to back after using the toilet to avoid introducing bacteria into the urethra.
- **Clothing and Undergarments**: Recommend loose-fitting clothing and breathable cotton undergarments to prevent irritation and moisture build up in the genital area.
- **Avoid Irritants**: Educate patients about bladder irritants, such as spicy foods, citrus fruits, carbonated beverages, and artificial sweeteners. These substances can potentially trigger bladder irritation or exacerbate existing bladder conditions.
- **Pelvic Floor Exercises**: Suggest pelvic floor exercises (Kegel exercises) to help strengthen the muscles that support the bladder and control urination. These exercises can be especially helpful for individuals with urinary incontinence.
- **Prevent UTIs**: Provide information on ways to prevent urinary tract infections, including maintaining good hygiene, staying hydrated, and urinating before and after sexual activity.
- **Medication Management**: If the patient is on medications related to bladder function, ensure they understand the correct dosage and timing. Monitor for any side effects and report concerns to the healthcare provider.
- **Regular Check-ups**: Encourage individuals to have regular check-ups with their healthcare provider, especially if they have a history of bladder problems or urinary conditions.

Catheterization:

Steps for catheterization:

- Check the expiry date on the pack (16/18 F Foley's catheter)
- Open the pack and leave it partially drawn out on the sterile tray. Hand wash and put on sterile gloves

For female patients: Clean the vulva with wet cotton swabs soaked in antiseptic solution. Separate the labia majora and insert the tip of Foley's catheter in the urinary meatus.

For male patients: Clean the penis with wet cotton swabs soaked in antiseptic solution. Insert the tip of Foley's catheter in the urinary meatus holding the penis straight to avoid bending.

- Push the catheter and connect the other end of the catheter to the urobag. Check the flow of urine
- Inflate the bulb of catheter with 10 ml normal saline

Steps for removal of catheter:

- Put on sterile pair of gloves
- Take 10 ml syringe and attach the barrel of the syringe to short end of catheter
- Deflate the bulb by withdrawing normal saline with the help of syringe
- Pull out the catheter and dispose catheter and urobag in the red bin.

g. Feeding the patient

A. Enteral feeding:

Patients in the hospital often require nutritional supplementation with enteral feeding. Enteral feeding can be administered via nasogastric (NG) means.

Giving medicines through nasogastric tube :

- Confirmation of the medication:
  - Check the name, dosage, type, time of medication and drug allergy with the patient's record
  - If more than one medication is to be given, make sure they are compatible.
- Perform hand hygiene and assemble all equipment. Explain the procedure and put on the gloves
- Check the placement of the naso-gastric tube:
  - Connect a small syringe to the end of tube
  - Gently aspirate the gastric contents with a syringe.
- After checking for the placement of the gastric tube, clamp the tubing and remove the syringe.
- Flush the tube with 30 ml water.
- Administering medications:
  - Pour the liquid medication into medicine cup. Pills must be crushed and capsules opened.
  - Add 15-20 ml of water and stir thoroughly.
  - Remove the plunger from the syringe and insert the syringe tip in the NG tube.
  - Release the clamp and pour the medication into the syringe.
  - If the medication does not flow freely down the tube, insert the plunger and gently apply a slight pressure.
  - After the medication has been administered, flush the tube with 15 to 30 ml of water. Clamp the tubing and remove the syringe.
  - Replace the tubing plug. If feeding is continued, reconnect the tubing to the feeding tubing.
- Assist the patient in a comfortable position.
- Document time, medication type and amount, and the amount of water on the I/O chart.

Note:

- Never crush a mixture of tablets together and never combine drugs in the syringe.
- Never mix liquid formulations. Flush with an appropriate volume of water (usually 10 ml) before administering another drug.

B. Parenteral Feeding:

Parenteral nutrition (PN) is intravenous administration of nutrition, which may include protein, carbohydrate, fat, minerals and electrolytes, vitamins and other trace elements for patients who cannot eat or absorb enough food through tube feeding formula or by mouth to maintain good nutrition status.

3. Insertion of IV Line

Assemble the necessary equipment: Sterile cotton wool swabs, povidone iodine, IV cannula, spirit swabs, adhesive tape, 2 ml N/S gloves, syringe, tourniquet, blood sample bottles

- Wash hands and put on gloves
- Identify the site of insertion and apply tourniquet proximal to vein
- Clean the site with alcohol swab and wait for 30 seconds
- Apply povidone iodine solution, remove the povidone iodine using alcohol and allow to air-dry for 30 seconds
- Insert cannula into vein (5-degree angle) and when blood is seen, advance cannula whilst withdrawing the stylet. Flush with 2 ml of NS to check for flow of the fluid
- Connect to IV fluids or put in stopper. Secure cannula with adhesive tape
- Dispose stylet in puncture-proof container and plastic waste in red bin.

Chapter 11
Laboratory Investigations and Sample Collection

Laboratory confirmation plays a vital part in management of diseases. Sometime must be devoted for careful planning of required investigations and samples to be collected for performing these.

A well-established Laboratory network with timely reporting plays various roles as listed below-

- Establishing diagnosis through lab based surveillance for regularly reported diseases i.e. Malaria, Dengue, Chikungunya, Leptospirosis, Scrub Typhus, Japanese Encephalitis, Tuberculosis, Viral Hepatitis-A, B, C and E, H1N1, HIV etc.
- Aids in confirmation of diagnosis and follow up of confirmed cases during the course of outbreak
- Environmental Monitoring (Water/Food bacteriology)
- Antimicrobial resistance monitoring (ARM)
- Detection of Emerging infectious agents (COVID, Nipah, Ebola, Marburg, SARS- MERS, Avian Inf, Zika etc)
- Detection of Agents of Biological Warfare / Bioterrorism First to detect abnormal activity
- Confirms the end of the outbreak

Systematic sampling, transporting and testing of samples from suspected cases is required to reduce the time taken for confirmation of aetiology so that treatment of individual patients and, if required, public health action can be initiated early.

1. Referral Linkage for specimen

Predefined referral lab linkage is important tool to save the time and other valuable resources for early confirmation of etiological agents. Specimen of blood, urine, sputum, throat swab, stool etc need to be collected from various patients and transported to nearest linked laboratory. In case of suspected food poisoning and water contamination, food and water specimen should also be collected and transported to the laboratory.

2. Types of Laboratory Investigation

- **Chemical pathology** - It is also called clinical chemistry. It involves the assessment of various components in bodily fluids such as the blood, serum or urine.
- **Immunology or immunopathology**- Refers to the study of immune system functions and disorders such as immune deficiencies, organ-transplant rejection and allergies.
- **Haematology or hematopathology**- Concerns with the study of blood components. It helps in investigation and diagnosis of a disease.
- **Cytopathology** – Involves examination of the cells that have been shed into bodily fluids or have been obtained by scraping or aspirating tissue. Some examples include FNAC, cervical smear, sputum, and gastric washings.
- **Forensic pathology**- Involves the post mortem examination of a corpse.
- **Microbiology** – Is the scientific study of microorganisms, a diverse group of generally minute simple life-forms, including bacteria, algae, and viruses.
- **Molecular Biology**- Is the field of biology that studies the composition, structure and interactions of cellular molecules – such as nucleic acids. It is used to identify various organisms on the basis of their genetic structure.

3. Investigations available at different levels

Level of Testing facility	Human Resource	Available investigations
At community / Sub centre level	ASHA/ANM	• Hb% • Pregnancy test • Antigen based bivalent RDT for malaria • Slide preparation for Malaria • RDT for HBV (HBsAg) and HCV (Anti HCV)- during outbreaks only • HIV
HWC level	CHO	• All of the above and • All available Point of care (PoC) test • H2S strip test kit • Kit based on ortho- toluidine reagent • Blood Glucose • Urine test for ph, specific gravity, glucose, bilirubin, urobilinogen, ketone, haemoglobin, protein, nitrite
Primary Health Centre	Lab Technician	• All of the above and • RDT for Hepatitis B (HBsAg), Hepatitis C (Anti HCV), Dengue, HIV. • rK39 test for Kala-Azar • RBC, WBC and Platelet count • Peripheral blood smear
CHC level	Lab Technician	• All of the above and • Urine for pus cells • Gram staining for clinical specimen • Stool - occult blood, routine examination including ova and parasite • Microscopic examination • Biochemistry - Basic liver & Kidney profile
District Level Hospital including (BSL-2 Labs)	Pathologist/ Microbiologist	• All of the above and • Complete range of Haematology and Biochemistry • ELISA based test for Dengue, Japanese encephalitis, Chikungunya • Definitive microscopy for Filariasis and Malaria • Molecular tests – RTPCR and Viral load testing, Truenat, CBNAAT
Divisional Laboratories	Pathologist/ Microbiologist	• ELISA based test for Scrub typhus Leptospirosis • Aerobic and Anaerobic culture • Therapeutic Drug Monitoring: Antibacterial and antifungal drugs

4. Common Specimen Collected for investigation

Syndrome	Suspected Disease condition	Specimen	Test to be done
Loose motion	Cholera/ Diarrhoea	Voided Stool/Rectal swab in transport medium	Culture, Microscopic Examination
Fever with jaundice	Hepatitis/ Leptospirosis	Blood/Serum (4-8 C)	Serology/ RDT/ELISA
Fever with Chills	Malaria	Blood / Blood smear	Serology/RDT/ELISA/ Microscopy
Fever with headache, neck stiffness, Altered sensorium	Meningitis/AES	CSF / Blood (room temperature)	EILSA, Biochemical analysis, Microscopic examination, Culture
Fever (long duration)> 1 week	Enteric fever Urinary infection	Blood in Enrichment broth Serum Urine	Culture/Widal/Typhidot Urine icroscopy/Biochemistry
Fever with rash	Suspected Dengue, Scrub typhus, Measles & Other Haemorrhagic fever, Exanthematous fever	Blood/Serum	Blood counts Serology
Fever with joint pain	Chikungunya (sometimes Dengue and leptospirosis)	Blood/ Serum	ELISA/ PCR
Fever with running Nose, cough, lacrimation	ILI/ SARI (COVID/ H1N1)	Nasal/Nasopharyngeal swab	PCR

5. Sample Collection Criteria

Samples from at least 10% of affected persons representing all types of population including typical, atypical cases and untreated patients should be dispatched to lab.

Right Specimen Selection

Specimen should be collected from site of probable infection. For example-

- Serum sample collected for serology
- Blood/Urine for Zika / urinary symptoms/PUO (Pyrexia of unknown origin)
- Throat Swab/NP (Naso-Pharyngeal) swab ideal for acute influenza SARS/MERS/Corona/Avian Influenza (not the sputum)
- Sputum in Pulmonary TB/Pneumonia (not the throat swab or saliva)
- BAL (Broncho Alveolar Lavage)/Transtracheal aspirate/Suprapubic urine for anaerobic culture
- BAL/Sputum for SARS/MERS/Corona/Avian Influenza

7 RIGHT steps for sample collection

- Right specimen Selection
- Right Quantity
- Right Time of sample Collection
- Right Method of Collection
- RIght Label
- Right Documentation
- Right Safety precautions while collecting specimens

Right Quantity

Samples should be adequate in Quantity for better yield -

- At least 3-5 ml of Blood / Serum for serology
- At least 3-5 ml of Blood for haematology
- 5-10 ml blood in Enrichment Broth for culture

Collection at the Right Time

- Before Anti-microbial administration for bacterial identification
- At appropriate stage of the disease
- Nocturnal blood smears for Filaria
- Blood sample at least 3- 5 days after onset of illness in Dengue/JE/Chikungunya for IgM antibody estimation and for Widal test (Typhoid)

Right Method of Collection (some Dos and Don'ts)

- Strict aseptic techniques
- Appropriate use of Personal Protection Equipment
- Washing of Hands Before/After Sample collection
- Avoid contamination with normal flora of the patient by proper disinfection of skin/other sites
- Collection in screw capped sterile container/transport medium
- Uncontaminated exterior of the container
- Tightly close Container after sample collection
- Never Recap the needles
- Never transport specimens in Syringe/Needle
- Never keep the specimen on the requisition proforma

Right Label

- Proper labelling is important for avoiding mistakes in testing and documentation.
- A preprinted, bar-coded label or a suitable label neatly marked with indelible ink/permanent marker is ideal for labelling specimens.
- It is always better to fill the details like unique identification number, patient identification particulars (Name, Age, Sex, and Locality) with date and time of collection of specimen.
- Matching information should be available in the requisition form.

Right Documentation

Necessary documents while dispatching the samples to a laboratory -

- Line list of the samples
- Requisition forms with clear mention of tests requested and date and time of collection and dispatch.

It is always advisable to provide brief details of sign and symptoms in the line list format.

Right Safety precautions while collecting specimens

- Take universal precaution for all samples for all patients, personal protection is important.
- Use leak-proof specimen containers.
- Don't contaminate the outside of the specimen container or the laboratory requisition form.
- Never transport syringes with needles to the laboratory; instead, transfer the contents to a sterile tube.
- Syringes and needles should be disposed off in a puncture-resistant container.
- Never recap a used needle.

Carelessness in filling formats or labelling of samples or casual packing resulting in seepage of samples forces the laboratory to reject a sample. Seepage due to careless packaging is hazardous also because it can result in laboratory personnel getting infected. Therefore, sample collection packaging and transportation should be done with utmost care.

Also remember, collection of human samples is a time taking process which involves expertise of trained human resources. Persuading clients for sample collection is an arduous task and at times may need a lot of persuasion. Therefore, entire team must understand the value of each collected sample.

Specimen Rejection Criteria

Improperly collected, packaged or transported samples will not provide the required results and will most likely be rejected by the laboratory. Some common errors resulting in rejection of samples -

- No label
- Improperly closed or leaking container
- Insufficient quantity
- Specimen collected in an inappropriate container
- Suspected Contamination
- Inappropriate transport or storage
- Haemolysed blood sample
- Mismatch between line list and requisition form/sample labels

6. Collection of Blood sample

Collect the samples with proper aseptic precautions preferably from veins in the elbow area. After collecting the required quantity, loosen the tourniquet and ensure hemostasis with a dry sterile cotton ball before pulling out the needle. Remove the needle from syringe and expel blood slowly in the collection vial. Never expel blood with needle on syringe as it causes haemolysis.

Blood Sample Collection: By Vacutainers

When a large amount of blood sample is needed, an evacuated tube system with interchangeable glass tubes can be used to avoid multiple venipunctures. There are less chances of spillage of blood, or hemolysis due to smooth flow of blood. Evacuated tubes are commercially available with or without additives and with sufficient vacuum to draw a predetermined blood volume per tube.

Blood collection: Color code Tubes

Red-top tubes also called plain tube. It contains no additives. These tubes are used for serological tests. The sample should be placed for 1-2 hours so that the serum and blood clots will be separated.

Lavender-top tubes contain EDTA, as an anticoagulant. It is used for haematological studies. Plasma can also be obtained from whole blood in an EDTA vial.

Yellow-top tubes contain Acid Citrate Dextrose as anticoagulant. It is used for blood culture, microbiology, immunology purposes.

Green-top tubes contain heparin as an anticoagulant. It is used for bone marrow studies, cytogenetics, Carboxy haemoglobin, Methemoglobin.

Blue-top tubes contain sodium citrate and citric acid. It is used in coagulation studies and blood banking.

Grey-top tubes contain fluoride for Blood sugar, Ethanol, Lactate estimation.

How to Avoid Haemolysis

Following practices should be avoided during collection of samples to avoid haemolysis -

- Blood collection through a fine bore needle – needle should not be less than 22G.
- Forced suction of blood in the syringe during blood collection.
- Use of unclean tube with residual detergent/water for collection.
- Vigorous shaking of blood in the syringe/test tube.
- Forced expulsion of blood from the syringe especially through the needle on syringe.
- Frequent freezing/thawing of blood.
- High speed centrifugation of blood before completion of clotting.

Collection of Blood sample for culture

Drawing sufficient quantity of Blood with proper aseptic technique is of utmost importance for a proper culture outcome. Drawn blood should be directly inoculated in blood culture bottle or 50-100 ml of broth (Glucose/Bile) without removing needle. 0.5% Sodium polyanethol sulfonate should be added. It serves as an anticoagulant and prevents the killing of bacteria by innate cellular and humoral factors. Venous blood is collected in amount given below-

- infants: 0.5 – 2 ml
- children: 2 – 5 ml
- adults: 5 – 10 ml

Collected sample should be transported to the lab as earliest with proper labeling.

Clot Culture

In field conditions Clot Culture is also a choice to culture the organism as well as to perform serological test. At least 5ml blood is allowed clotting in a sterile container. Afterward, serum is removed. For culture, clot is broken with glass rod or streptokinase solution (100units/ml) and the lysed clot added to the broth.

7. Food Samples

In suspected food poisoning, source food material should be collected at the earliest with sterile tools in sterile containers. In case of delay, transport samples at 4-8°C.

- Solid Food - 100-200 grams of sample should be taken from centre with sterile knife.
- Raw meat or poultry - Refrigerate specimen in a sterile plastic jar.
- Liquid food - Mix and shake well before collection, collect in sterile tube/vials/container.
- Samples of cooking material and water used for cooking should be taken in sufficient amount.
- Sample from contact surfaces (utensils and/or equipment) used for food processing - Moisten swab with sterile 0.1% peptone water or buffered distilled water; put the swab in an enrichment broth.

8. Samples for Cholera/other Enteropathogens

Stool is most suitable specimen for microbiological diagnosis i.e. bacterial culture and detection of parasitic diarrhoeal pathogens. It should be collected at the earliest after onset of diarrhoea but before the initiation of antibiotic therapy. Two or three specimens may be collected on separate days; multiple specimens are particularly useful when suspecting parasitic infections. Voided stool sample is the best specimen for isolation of organisms through culture, but rectal swabs may be an alternative (specially for samples from infants).

Cary Blair media is the medium of choice for all enteropathogens and VR fluid (Venkatraman and Ramakrishnan medium - crude sea salt 20 g; peptone 5 g in 1000 ml distilled water, pH 8.6) for Cholera.

How to collect a Rectal swab

Moisten the tip of swab in sterile saline or Cary-Blair medium. Insert swab through rectal sphincter for 2-3 cm and gently rotate, withdraw swab from rectal sphincter and examine for faecal material. If fecal material is not visible on swab, repeat the procedure. Place swab in transport media tube. Place the tube in a refrigerator or cold box. It is always better to Collect 2 specimens, if possible.

How to collect a Faecal swab

If freshly voided sample cannot be collected, faecal swab is an alternative. Void the stool on a clean surface, collect the sample on a swab and place the swab in a suitable medium for transport.

Transportation

- In case a delay of more than two hours is expected in processing of the specimen, the stool specimen should be transported at 4-8°C.
- If a delay of more than 8 hrs is expected before the specimen will be processed, the stool specimen must be transferred in Cary Blair transport medium at 4 - 8°C using two swabs, the sample must be examined within 48 hours of collection as bacterial yields may fall significantly if specimens are not processed within 48 hours of collection. Shigella are particularly sensitive to elevated temperatures.
- Specimens to be examined for parasites should be mixed with 10% formalin- 3 parts stool to 1part preservative and transported at ambient temperature in screw capped containers sealed in plastic bags

9. Throat swab

Throat swab is the specimen of choice for upper respiratory infections. For better yield, it is ideal that no antiseptics, in the form of gargles, be used for 12 hours before collection. While collecting the sample, sterile Dacron tipped swab should be rubbed over the affected area of the visible lesion. If there is no definite lesion, rub the swab thoroughly over whole of pharynx/tonsils. Place the swabs in transport media and send to labs.

10. Specimen Collection for Viral Infections

For the detection of most viruses, specimens collected soon after the onset of clinical symptoms (preferably within the first 3–4 days), when viral shedding is greatest, are preferred. Throat swab/ Nasopharyngeal swab, throat washing, stool, urine and CSF are preferred specimen for isolation.

	Collection	Representative Viruses
Fluids		
Blood	Collect 5-10 ml in sterile tube	Arbovirus
CSF	Collect 2-5 ml in sterile container	Enterovirus, HSV, Mumps virus, Arbovirus
Pericardial Fluid	Collect at least 2 ml in sterile container	Coxsackie B virus
Saliva	Collect saliva on 1 or 2 swabs from anterior part of floor of mouth, near Stenson's ducts. Place swabs into viral transport media (VTM).	Mumps virus
Urine	Collect 10-20 ml of midstream clean-voided urine in sterile container.	Adenovirus, CMV, HSV, Measles virus, Mumps virus, Rubella virus
Gastrointestinal Samples		
Rectal swab	Insert swab 2-3 cm into rectum and roll swab against mucosa. Place swab into VTM.	Adenovirus, Enterovirus, HSV
Stool	Place 2-4 g stool in a clean, leak proof container.	Adenovirus, Enterovirus, Reovirus, Rotavirus
Genitourinary Samples		
Cervical swab	Remove exocervical mucus with swab, discard swab. Insert a fresh swab at least 1 cm into cervical canal, rotate for 10 seconds. Place in VTM.	HSV

	Collection	Representative Viruses
Lesion (dermal)		
Swab	Wipe vesicle with saline. Disrupt vesicle, and collect fluid with swab. With same swab, collect cells from base of lesion. For non vesicular lesions, collect cells from base of lesion by using swab premoistened with saline. Place swab into VTM.	Coxsackie A virus, Echovirus, HSV, Poxvirus, VZV
Vesicle aspirate	Wipe area with sterile saline. Aspirate fluid from vesicle with 26- or 27- gauge needle attached to a tuberculin syringe, and rinse syringe immediately with 1-2 ml of VTM.	Coxsackie A virus, echovirus, HSV, poxvirus, VZV
Lesion (mucosal)		
Swab	Rub the swab back and forth over the lesion and place in the VTM.	Oral: Coxsackie A virus, HSV Anogenital: HSV
Ocular Samples		
Conjunctival swab	Swab lower conjunctiva with flexible fine-shafted swab premoistened with saline. Place swab in the VTM.	Adenovirus, coxsackie A virus, CMV, enterovirus type 70, HSV
Corneal or conjunctival scraping	Specimen should be obtained by ophthalmologist or other trained individual and placed in the VTM.	Enterovirus, Adenovirus, HSV, VZV
Respiratory Samples		
Bronchoalveolar lavage	Place 8 - 10 ml of lavage fluid in sterile container	From all respiratory specimens: Adenovirus, CMV, Enterovirus, HSV, Influenza virus, Measles virus, Mumps virus, Parainfluenza virus, Rabies virus, RSV, Reovirus, Rhinovirus, Rubella virus, VZV
Nasal swab	Insert flexible fine-shafted swab into nostril, rotate swab, and let it rest for several seconds to absorb secretion. Place into VTM. Use separate swabs for each nostril. Both swabs may be placed into the same transport tube.	
Nasopharyngeal aspirate	Using mucous collection device, insert appropriate sized catheter nasally into posterior nasopharynx. Apply suction, using intermittent suction as catheter is withdrawn. Wash aspirate through tubing with 5-8 ml of VTM, and transfer material from trap to sterile tube.	
Nasopharyngeal swab	Insert flexible fine-shafted swab through nostril into nasopharynx, rotate swab gently a few times. Place into VTM.	
Pleural fluid	Place at least 2 ml of fluid in sterile container.	
Throat swab	Vigorously swab tonsillar area and posterior nasopharynx. Use tongue blade to depress tongue to prevent contamination of swab with saliva. Place swab in the VTM.	
Tissue Samples		
All Tissues	Place small samples (e.g. lung biopsy specimen) into VTM to prevent drying. Place larger specimens(1-2 gm of autopsy tissues) into sterile containers, Add 8-10 ml of VTM to prevent drying	Arbovirus, CMV, Enterovirus, HSV, Influenza virus, RSV, Parainfluenza virus

Serology (Blood/Serum)

- Paired sera samples should be collected, for estimation of antibody response of body - first sample during the first week of illness and the second one 7-10 days later.
- Samples should be collected in sterile screw capped plain vials or yellow vacutainers.
- All samples can be transported or stored at 4-8 °C for a duration of up to 7 days, for long term storage keep samples preserved at -20° C to -70°C.

Collection of Nasopharyngeal Aspirate/Wash

- Have the patient seated with the head tilted slightly backward, instill about 1-2 ml of Viral transport medium (VTM)/sterile normal saline into one of the nostrils.
- Flush a plastic catheter with 2-3 ml of VTM/ N.Saline.
- Insert the tubing into the nostril parallel to the palate and aspirate Nasopharyngeal secretions.
- Repeat the procedure with the other nostril.
- Collect 1-2ml of aspirate in a sterile screw capped vial and store at 2-8° C.

Viral Transport Medium

- It is a Sterile buffered solution containing antibiotics for preservation of viruses, used for the collection of samples for viral isolation.
- Viral transport medium (VTM) is used for collection of samples for viral isolation and testing.
- VTM prevents the specimen from drying out, it also prevents bacteria and fungi from growing. VTM can be made in a lab or purchased commercially.

Storing VTM

2-3 ml of VTM is stored in sterile screw capped vials at 4 – 8°C for short periods of time (up to few weeks). For longer periods, Vials to be stored in a freezer at -20°C

Most common collection tubes

Tube Or Bottle Type	Common tests	Syndromic Disease/Condition
Blood Culture Bottle	Aerobic & anaerobic Culture for isolation of bacteria	Microbial Resistance
Sterile Plain Glass Bottle	Urine & Water testing	Urinary Infection Water Bacteriology
Blue Vacutainer (Sodium Citrate)	Coagulation	Bleeding Disorder
Lavender Vacutainer (EDTA)	Haematology	Fever Case
Red Vacutainer (Plain)	Immunology & Biochemistry	Fever Case

11. Packaging and Transportation (Triple Packaging System)

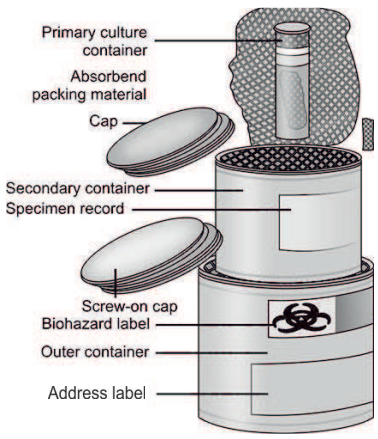
A Triple packaging system is recommended for transportation of samples.

Primary Packaging

Specimen collected in water tight, leak proof, properly labeled container should be wrapped in enough absorbant material. Cap/ mouth of container should be sealed with tape to avoid spillage/leak.

Secondary Packaging

Second, water tight, durable container encloses primary packaging. Enough absorbant material should be wrapped around primary packaging to soak accidental leaks. Container should be wrapped properly with plastic sheaths to prevent leakages. Specimen data form/other information should be wrapped around secondary receptacle after keeping it in water proof packaging.



Tertiary Packaging (outer)package

This layer provides protection to secondary Packaging from outside influences. Ideally maximum capacity of packaging should be 4 lit (or 4Kg). It should be water tight and able to wear outside forces and factors. Shipping address with contact numbers, sender details and type of intended tests should be written clearly with appropriate Biohazard sign.

12. Infectious Substances

For the purposes of transport, infectious substances are defined as substances which are known or are reasonably expected to contain pathogens. Infectious substances are divided into two categories.

Infectious substance, Category A

This is an infectious substance which upon exposure, is capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy humans or animals. Indicative examples of substances that meet these criteria are given in the table in Annexure.

- Infectious substances meeting these criteria which cause disease in humans or both in humans and animals shall be assigned to United Nations number UN 2814. Infectious substances which cause disease only in animals shall be assigned to UN 2900
- Assignment to UN 2814 or UN 2900 category shall be based on the known medical history and symptoms of the human or animal source, endemic local conditions, or professional judgement concerning individual circumstances of the human or animal source.

Infectious substances, including new or emerging pathogens, which do not appear in the table but which meet the same criteria shall be assigned to Category A. In addition, if there is doubt as to whether or not a substance meets the criteria it shall be included in Category

Infectious substances, Category B

An infectious substance which does not meet the criteria for inclusion in Category A. Infectious substances in Category B shall be assigned to UN 3373.

Exceptions

Because of the low hazard they present, the following substances of biological origin are exempted from dangerous goods requirements and regulations:

- Substances that do not contain infectious substances or will not cause disease in humans or animals.
- Substances containing microorganisms that are not pathogenic to humans or animals.
- Substances in a form in which any pathogens present have been neutralized or inactivated such that they no longer pose a health risk.
- Environmental samples (including food and water samples) that are not considered to pose a significant risk of infection.
- Blood and/or blood components collected and shipped for the purposes of transfusion and/or transplantation.
- Dried blood spots and faecal occult blood sample.
- Decontaminated medical or clinical wastes.

Unless patient specimens comply with the following requirements, they must be assigned to UN 2814, UN 2900 or UN 3373, as appropriate.

- Infectious substances, Category A (UN 2814 or UN 2900)
  - IATA Packing Instruction 602, “Infectious substances”
  - Use biohazard label
- Infectious substances, Category B (UN 3373)
  - IATA Packing Instruction 650, “Diagnostic specimens”
  - Do not use biohazard label

Chapter 12
Safe Drug Administration

Safe drug administration is a critical aspect of healthcare that involves the responsible and accurate delivery of medications to patients in a manner that minimizes the potential for harm and maximizes therapeutic benefits. It is a fundamental component of healthcare practice and plays a vital role in patient safety and the overall success of medical treatment.

1. 7 Rights (7R's)

Always keep the following in mind before giving any patient any drug

1. Right Patient
2. Right Drug
3. Right Route
4. Right Time
5. Right Dose
6. Right Reason
7. Right Documentation

Always note the following before administering any drug-

a) If liquids, look for

- Discoloration
- Cloudiness
- Sediment
- Broken seal or bottle
- Cracks in ampoule, bottle or vial
- Dampness or moisture in packaging
- Torn or ripped packaging

b) If tablets (pills), look for

- Discoloration
- Crumbled pills
- Stickiness (especially coated tablets)

Sedimentation

c) If injection, look for

- Liquid not returning to suspension after shaking

d) If capsules, look for

- Discoloration
- Stickiness
- Crushed capsules

2. Look alike/ Sound- alike (LASA medications)

Some drugs appear to be similar to other drugs when written or spoken, these confusing drug names may be a cause of medication error, which may cause harm or even death of patients.

Sound-alike medications

Category	Name of the medication (A)	Name of the medication (B)
Sound-alike injections	Inj. Adrenaline	Inj. Atropine
	Inj. Amikacin	Inj. Oxytocin, Inj. Gentamicin
	Inj. Aminophylline	Inj. Theophylline and Etophylline
	Inj. Ampicillin	Inj. Cloxacillin
	Inj. Dopamine	Inj. Dobutamine
Sound-alike capsules	Cap. Cloxacillin	Cap. Amoxycillin
Sound-alike tablets	Tab. Albendazole	Tab. Carbimazole, Cap.Omeprazole
	Tab. Ascorbic acid	Tab. Folic acid
	Tab. Atenolol	Tab. Metoprolol, Tab. Acecoumarol
	Tab. Carbamazepine	Tab. Carbimazole
	Tab. Cetrizine	Cetrimide cream
	Tab. Chlorpheniramine	Tab. Chlorpromazine
	Tab. Fluoxetine	Tab. Fluconazole
	Tab. Frusemide	Tab. Glibenclamide
	Tab. Glipizide	Tab. Glimipiride
	Tab. Haloperidol	Tab. Misoprostol
	Tab. Metformin	Tab. Metronidazole
	Tab. Phenobarbitone	Tab. Phenytoin sodium
	Tab. Propranol	Tab.Paracetamol, Tab. Salbutamol
	Tab. Resperidone	Tab. Domperidone
Sound-alike liquids	Syrup Cotrimoxazole	Syrup Metronidazole

Look alike drugs

Some drugs may come in similar packaging

Category	**Name of the medication (A)**	**Name of the medication (B)**
Look-alike tablets	Tab. Atorvastatin	Tab. Theophylline
	Tab. Dexamethasone	Tab. Salbutamol
	Tab. Domperidone	Tab. Glibenclamide
	Tab. Erythromycin	Tab. Norfloxacin
	Tab. Isosorbide dinitrate	Tab. Glibenclamide
	Tab.Trimethoprim & Tab. Sulphamethoxazole	Tab. Metformin
Look-alike injections	Inj. Paracetamol	Inj. Diclofenac sodium
	Inj. Ranitidine	Inj. Phenytoin sodium
	Inj. Theophylline & Etophylline	Inj. Promethazine
	Inj. Cefotaxime	Inj. Ceftriaxone

High- alert drugs

High-alert medications are drugs that bear a heightened risk of causing significant patient harm when they are used in error. Drug with narrow therapeutic index, small changes in dosage or blood drug levels can lead to critical events causing significant harm.

Some examples of high alert drugs

S.no	Name of Drugs	Dose per kg body weight	Minimum dose	Maximum dose	Route of administration
1	Atropine	0.01 mg/kg	0.01 mg/kg	1.2 mg	IV
2	Diazepam	0.15 mg/kg	0.15 mg/kg	10.1 mg	IV
3	Magnesium Sulphate		5 gm	15 gm	IV/IM
4	Oxytocin		10 IU	60-80 IU	IM/IV
5	Carboprost		250 mcg	2000mcg	IM
6	Adrenaline* (1 mg/ml)	1 µg/kg body wt (for children)		0.5 mg	IM
7	Dopamine		1-5 mcg/kg/min	20-50 mcg/kg/min	IV
8	Potassium Chloride			200mEq/day	IV
9	Lignocaine	1 to 1.5 mg/kg IV bolus once		3 mg/kg	IV
10	Midazolam	0.07 to 0.08 mg/kg		2.5 mg/dose	IM/IV
11	Furosemide			600 mg/day	Oral

*Refer to page 74

1. Drug interactions in special conditions

(i) Drug-food interactions

Examples of drugs which should be taken on an EMPTY stomach

Ampicillin	Isoniazid
Azithromycin	Isosorbide dinitrate
Levothyroxine	Rifampin
Omeprazole	Tetracycline

Examples of drugs given with food

Amoxycillin/clavulanic acid	Diclofenac
Bromocriptine	Doxycycline
Carbamazepine	Ferrous salts
Cefuroxime	Hydroxychloroquine
Chloroquine	Clofazimine

(ii) Drugs- alcohol interaction

Taking alcohol when on the following medicines can lead to a variety of symptoms like nausea, vomiting, headache, drowsiness, fainting, or loss of coordination etc.

Alprazolam	Ketoconazole	Diazepam	Lorazepam
Amitriptyline	Losartan	Diphenhydramine	Metronidazole
Atorvastatin	Nitrofurantoin	Doxylamine	Paracetamol
Cefoperazone	Phenobarbital	Enalapril	Phenytoin
Clonazepam	Prazosin	Fluoxetine	Ramipril
Griseofulvin	Tinidazole	Ibuprofen	Vitamin D
Isoniazid	Zolpidem	Isosorbide	

4. Adverse Drug Reactions (ADR)

An adverse drug reaction is a response to medicine which is noxious and unintended, and which occurs at doses normally used in humans.

How to recognize ADRs

The following step-wise approach may be helpful in assessing possible drug-related ADRs-

- Ensure that the medicine ordered is the medicine received and actually taken by the patient at the dose advised and verify that the onset of suspected ADR was after the drug was taken, not before and discuss carefully the observation made by the patient
- Determine the time interval between the beginning of drug treatment and the onset of the event
- Report any suspected ADR to treating physician/doctor/in-charge, in the following ADR format

ADVERSE DRUG REACTION/SUSPECTED ADVERSE DRUG REACTION REPORTING FORM

(The form shall be filled in case of any adverse drug reaction or suspected adverse drug reaction and shall be sent to administrator/Hospital Safety Committee. The reporting shall as soon as possible after occurrence of reaction and after the corrective measures.)

Patient Information			
Name		IPD No	
Doctor Incharge		CR No.	
Date of Admission		Sex	
Room No		Height /Weight	

Suspected Medicine						
S. No.	Name & Brand or generic name.	Manufacturer (if Known)	Batch No /Lot No.	Date of Expiry	Route Used	Reason for us Prescribed for

Visual Inspection of Vial : Intact/Turbidity/fungal Growth/Sedimentation (Circle the appropriate)
Remarks:

Suspected Adverse Reaction	
Date of reaction started	
Date of Recovery	
Describe reaction or problem	

Seriousness of Reaction

- ☐ Death
- ☐ Life Threatening
- ☐ Hospitalization-initial or prolonged
- ☐ Disability
- ☐ congenital Anomaly
- ☐ Required intervention to prevent permanent impairment/damage
- ☐ Other (specify)

Outcomes

- ☐ Fatal
- ☐ Continuing
- ☐ Unknown
- ☐ Recovering
- ☐ Recovered
- ☐ Other (specify)

Cause of reaction	
Wrong drug to wrong patient	
Wrong dose	
Wrong route	
Wrong rate of administration	
Other	
Not a medication error	

Reported by (Doctor on Duty)

Name of Doctor: .....
Date of Reporting.....

Signature .....

Did the reaction abate after stopping drug or reducing dose - Yes/No

Management of suspected ADR

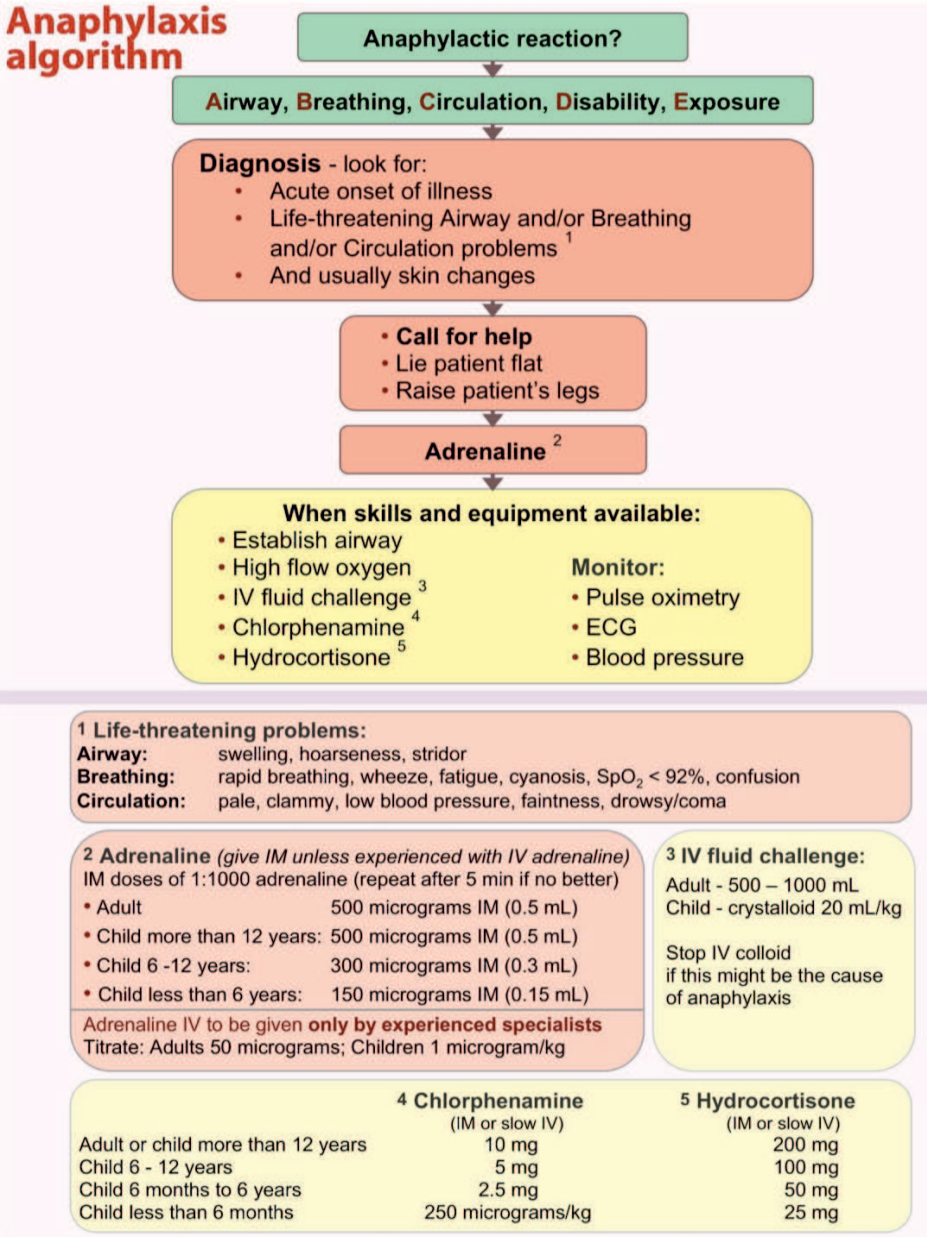
Adverse drug reactions (ADRs) may be a leading cause of morbidity, mortality in hospital admissions. Elderly patients & children are at highest risk of experiencing ADRs, many of which are preventable. The most commonly-implicated medications include antibiotics, anticoagulants, digoxin, diuretics, hypoglycemics, and nonsteroidal anti-inflammatory drugs.

Successful management of adverse drug reactions requires early identification and prompt treatment.

- Acute therapy is directed toward enhancement of oxygenation and maintenance of normotension. Requisite measures include the use of adrenaline, oxygen and adequate fluid replacement.
- Good management also requires anticipation of adverse reactions. Familiarity with the drug groups most commonly responsible for immunologic reactions is helpful, alternative drugs should be used in such cases.

Anaphylaxis

Anaphylaxis is a clinical response to an immediate (type I hypersensitivity) immunologic reaction between a specific antigen and an antibody.



Explain to the patient who has recovered from anaphylaxis, what occurred and instruct about avoiding future exposure to antigens.

Drug toxicity

This may happen when the drugs cross their therapeutic index/maximum admissible dose due to wrong administration. Commonly seen with tablet iron, paracetamol etc., especially accidental poisoning in children.

Antidotes of commonly used drugs

An antidote as a therapeutic agent that counteracts the toxic actions of a drug/toxin. Some examples of drugs with their antidotes are mentioned in below table:

Drug (overdose/Toxicity)	Antidote
Acetaminophen/Paracetamol	Acetylcystiene
Iron	Deferoxamine
Benzodiazepines (Diazepam, Midazolam)	Flumazenil
Insulin	Glucose/Dextrose
Magnesium sulfate	Calcium gluconate
Opioid analgesics (Tramadol, fentanyl)	Naloxone
Heparin	Protamine sulfate
Isoniazid	Pyridoxine

5. Storage of Drugs

Safe keeping of all the drugs and consumables is essential in order to maintain their quality and potency.

Storage Conditions-

The condition specified for storing the product e.g. temperature, humidity, container etc.

Drugs to be stored in special conditions

A. Drugs to be kept at 2-8 ^{0}C, inside refrigerator (Do not keep in freezer compartment)

1. Inj Oxytocin
2. Inj Carboprost
3. Inj ARV (anti rabies vaccine)
4. Insulin preparations
5. Pediatric antibiotic syrups after reconstitution
6. Anti D injections
7. HIV, syphilis testing kits, blood group testing kits

All vaccines to be kept in a special refrigerator called ILR (ice-lined refrigerator)

B. Drugs to be kept in double lock and key (few examples)

Narcotics

1. Fentanyl
2. Tramadol

Psychotropics

1. Diazepam
2. Lorazepam
3. Midazolam

Anesthetics

1. Succinylcholine
2. Ketamine
3. Halothane
4. Propofol

Under direct supervision of Anesthetist

C. FIFO/FEFO:

FIFO stands for First In First Out. It is standard method of inventory management where the stock that comes first will be utilized first and the newest will be used last. While **FEFO** stands for First Expiry First Out, it is to ensure that medicine with the shortest expiry date is taken out into use first.

Management of Unused/Expired drugs

It is essential to safely dispose off unwanted medication to prevent people or animals from taking them by mistake. Discarded drugs can harm them and the environment

Staff Nurse should return any medication after its expiration date has passed. It is also important to dispose off medication that is:

- unwanted
- unused
- damaged or contaminated in any way
- unidentified

It is essential to dispose off unwanted or expired medication immediately. This can help prevent people from taking it accidentally or misusing potentially dangerous drugs. Staff nurse should make record of near expiry drugs and timely hand over the expired drugs back to pharmacy/store for proper disposal.

6. Drug Indenting

Indenting, planning and management of drugs and medical consumables is an essential component of nursing services.

Nurses are expected to maintain adequate supply of medicines and consumables in order to give quality services to patients. They should also ensure and control the right supply, at the right place and in the right quantity.

An **indent** is an official order or requisition for the medicines & supplies from store

Staff Nurses are also expected to maintain **Buffer stock** of essential medicines to ensure their availability in any circumstances.

Reorder at fixed intervals (for eg. Every 15 days or monthly, depending upon demand)

How to calculate stock ?

Let us understand this with an example.

We want to calculate the oxytocin requirement for 1 month.

Step 1. Calculate the monthly consumption of oxytocin for last 3 months.

Let us assume it comes out 100 for previous month, 120 for last to last month and 110 for one month before that.

So the total consumption for last 3 month is : 100+120+110 = 330

Step 2. Adjust the no. of stock out days to calculate the true consumption.

For example the no. of stock out days in last 3 month were 10.

That means the above consumption is not of 90 days but actually it is 80 days consumption.

Step 3. Calculate the average daily consumption for above case: 330/80 = 4.125. round off to 5

Step 4. Calculate the indent requirement for indenting period e.g. 30 days (1 month)

5 x 30= 150

Step 5. Add buffer stock of **25%** to the above

150 + 37 = 187

Chapter 13
Blood Transfusion

Some essential conditions for blood transfusion services include

- A written informed consent for transfusion obtained from the patient or relative, if patient is a minor or not in a condition to give consent
- A trained staff nurse to monitor the patient during transfusion and respond immediately if any adverse effects occur.
- Blood / components to be obtained only from a licensed blood bank. Blood should not be transfused unless it has been obtained from appropriately selected donors and screened for transfusion transmissible infections and tested for compatibility between the donor's red cells and the antibodies in the patient's plasma.

Prescription of Blood and Blood request form:

A request form for whole blood/components accompanied by the samples of the recipient should contain the following information sending to blood bank:

- Two identification details of the recipient - Hospital registration number and full name.
- Name of hospital where patient is admitted, bed and ward No.
- Quantity, date and time of blood/ component needed.
- Whether routine/ emergency
- Diagnosis
- Reason for transfusion –low haemoglobin/ platelet count/bleeding disorder
- History of previous transfusion reaction, if any and if yes details of reaction
- Obstetric history in case of female patient.
- Signature, name of the medical officer ordering blood/component and under whose supervision the blood is to be transfused.
- Name and signature of the staff collecting sample of patient (both on the form and sample)

All requests for planned transfusions should be sent well in advance. Relatives of patient should not be asked to arrange donors or blood. Instead, blood bank should be contacted to avoid any malpractice.

Blood sample collection & labelling:

Blood sample collection and labelling is a critical step for safe transfusion. After patient identification, at least 2 ml blood sample shall be collected for blood grouping and cross matching (EDTA / Plain sample as per blood bank SOP requirement)

Sample should be labelled at bedside of the patient with details such as patient name, Hospital registration no., date of collection and signature of staff who has collected the sample.

For infants less than 6 months of age, sample of mother should also be sent along for compatibility testing.

Preparing for Transfusion and Pre Blood administration checks

In the blood banks, blood is stored in monitored refrigerator and temperature is controlled. Blood should therefore be only brought to ward or operation theatre from blood bank / blood storage at the time it is required to be transfused. All preparations for transfusion should be done before bringing the blood from blood bank and transfusion should begin within 30 minutes of blood being out of blood bank refrigerator as at higher temperatures bacteria in -blood can multiply and cause septic shock.

Packed RBCs /Whole Blood

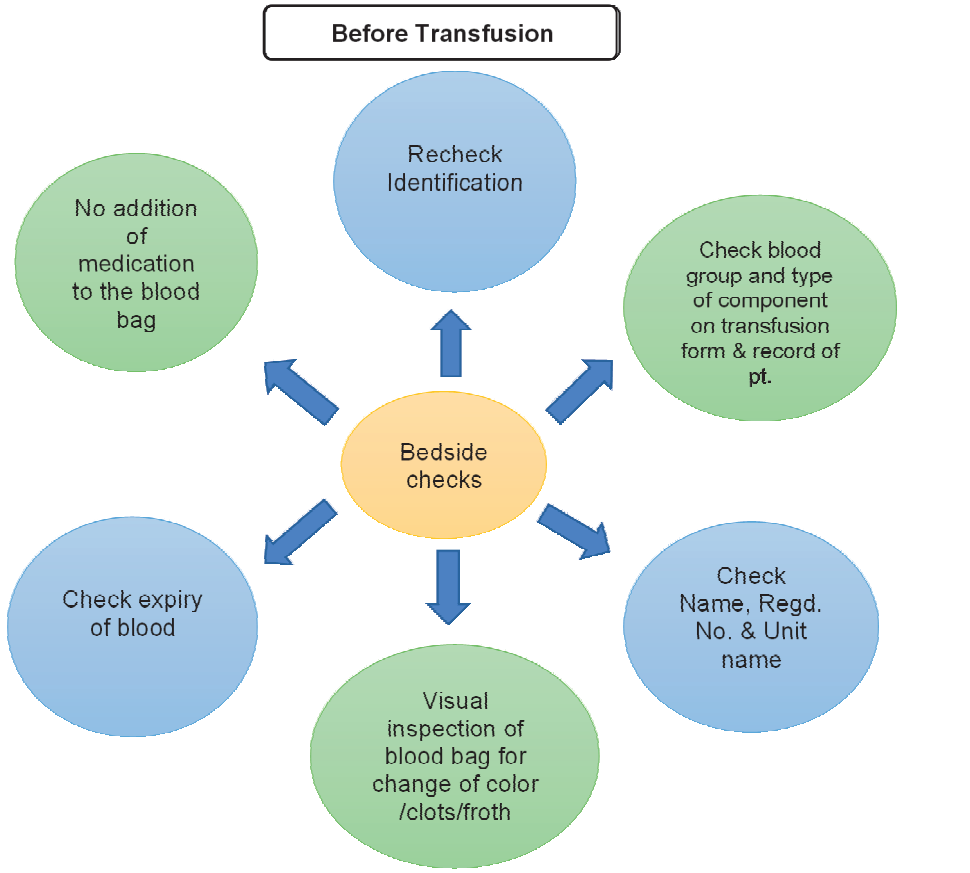
Storage Conditions:

- Packed RBCs/Whole blood should be stored in monitored blood bank refrigerators only.
- It should be issued only when transfusion is planned.

- In case emergency storage in domestic refrigerator is required, it should be stored in the middle shelf below the chiller but not more than 2 hours.
- RBCs/Whole blood should never be stored in freezer / chiller or at the bedside of the patient.

Bedside Checks:

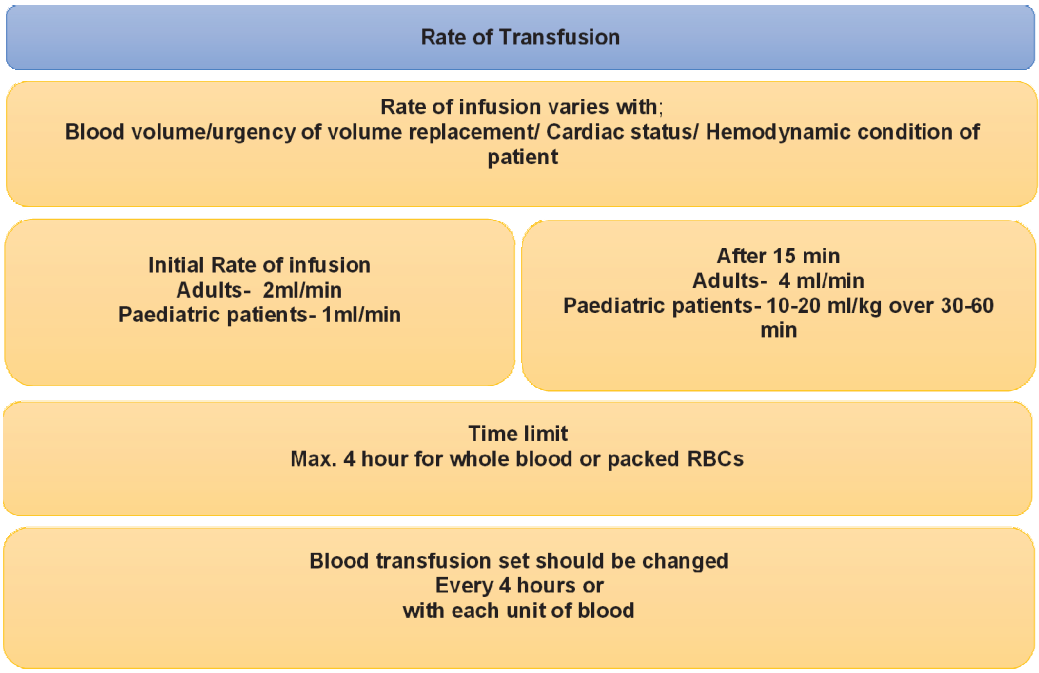
The bedside checks to be carried out before transfusion are as follows.



1. **Blood is kept at room temperature (28° C) before transfusion.**
2. **Packed RBCs can be used for 35 days**
3. **Record:**
   a. **Pre-transfusion vitals of patient**
   b. **time of starting the transfusion**
4. **Do not warm blood in an unmonitored water bath or in direct contact with a hot water bottle.**

Steps for Transfusion

- Wash hands.
- Verify special needs e.g. Use of filters as in case of Thalassemia patients
- Avoid any delay in transfusion and potential wastage of blood components. Intra-venous access should be established. Use 18 or 20 G needle for transfusion.
- If a pre-existing line is to be used, it should be checked for patency; signs of infiltration, inflammation, or infection; and the compatibility of any intravenous solutions
- After initial patient identity and blood unit check and baseline medical check at the bedside, start transfusion.
- Ensure skin antisepsis prior to venepuncture.
- Immediately before transfusion mix the unit of blood thoroughly by gentle inversion.
- Use Set with Filters (170 micron) to remove blood clots and other debris

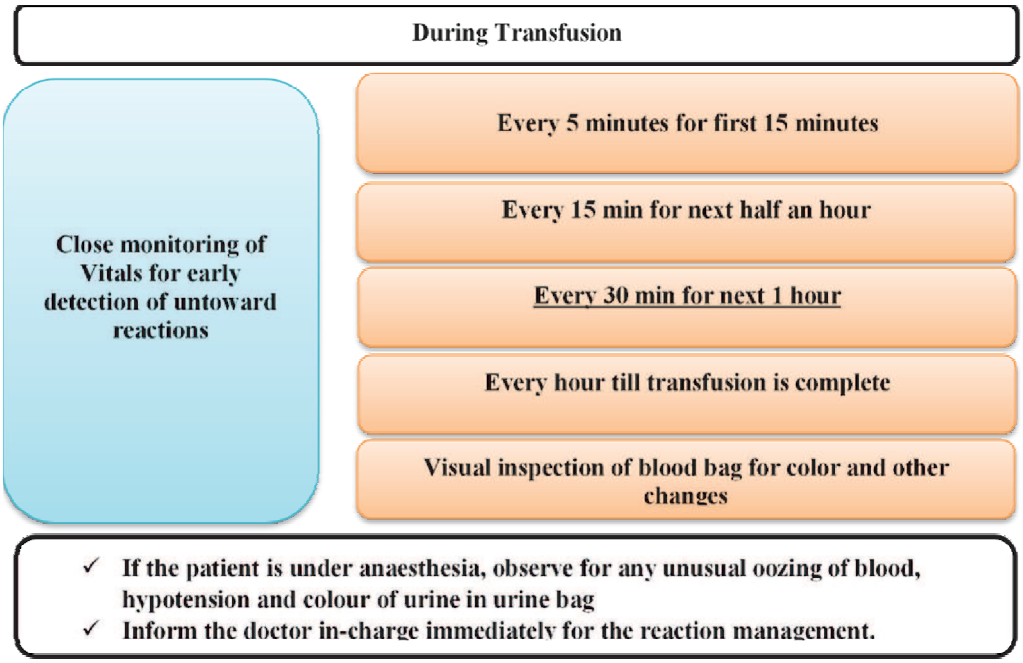


Compatible IV solutions

- Only isotonic normal saline is compatible solution recommended to be used with blood components.
- Do not prime the administration set with 5% Dextrose or Ringer Lactate solutions.
- Dextrose will cause haemolysis of the red cells and calcium in Ringer Lactate will cause clot formation.
- Before administering blood completely flush all the incompatible IV fluids and drugs with normal saline or preferably change the set.

During Transfusion

During transfusion, closely observe the patient and monitor the vitals of the patient for early detection of any untoward reaction at the following frequency:



After transfusion

- Monitoring of patient vitals at 30 min and 6 hours after transfusion.
- Ask to report complaints if any

Blood Components

Platelets: The platelet preparations usually of two types -Platelet Concentrate (PC) and Single donor apheresis platelets (SDAP).

Storage Conditions: The storage conditions are as follows:

- Temperature for storage of PC/SDAP is 22 ± 2ºC with constant agitation
- Platelets should be kept in an platelet agitator and incubator
- Platelets should not be kept in refrigerator

Shelf life of platelets is 5 days.

Bedside checks for platelet transfusion

- Re-check identification of the patient.
- Re-check ABO and Rh from the patient file and component bag (Random donor platelet –RDP need not be ABO and Rh specific).
- Check component for colour change/froth/swelling and if found return the bag to the blood bank immediately.
- Check expiry date of component (5 days)
- Check and record the vitals of the patient prior to the transfusion.

During Transfusion

- Platelets should be transfused as soon as possible after issue from the Department. (Within 30 minutes)
- Platelets are to be administered through a BT set with a 170uL filter.
- check vitals of patient at 15 minutes and every 30 min there-after up to half an hour after transfusion.
- Platelets are to be transfused over 20 minutes to 1 hour.
- Monitor the patient for signs or symptoms of transfusion reactions such as fever, chills, sudden hypotension, chest tightness, allergic skin rashes etc.
- All observations should be duly recorded in the patient file.
- Reaction form should be filled and it should be attached to the patient file and in case of reaction the blood banks should be informed for the same.

Plasma

Preparations:

The whole blood which is a mixture of cells, colloids and crystalloids can be separated into different blood components including fresh frozen plasma (FFP), Single Donor Plasma (SDP) and cryoprecipitate.

Storage:

- Storage of FFP/ Cryo below -3OºC for a period of 1 year.
- Storage of SDP - Below -20ºC for a period of 1 year

Plasma is to be thawed before issue and once thawed, it is not to be refrozen and must be transfused or discarded.

Bedside Check:

- Recheck the identification of the patient.
- Re-check blood group of the patient from the file and on the component bag. (Should be ABO group identical or AB which is universal plasma, RhD matching is not required for plasma components).
- Inspect component bag for any tears or leaks, colour and clots; If defective return to blood bank immediately.
- Check and record the vitals of the patient prior to transfusion.

During Transfusion:

- Check vitals at 15 minutes and every 2 hr there-after up to half an hour after transfusion.

- Plasma is to be transfused through a BT set
- Monitor the patient for signs or symptoms of transfusion reactions such as fever, chills, sudden hypotension, chest tightness, allergic skin rashes etc.
- All observations should be duly recorded in the patient file.
- Reaction form should be filled and sent to the blood bank if more components are required, otherwise it should be attached to the patient file.

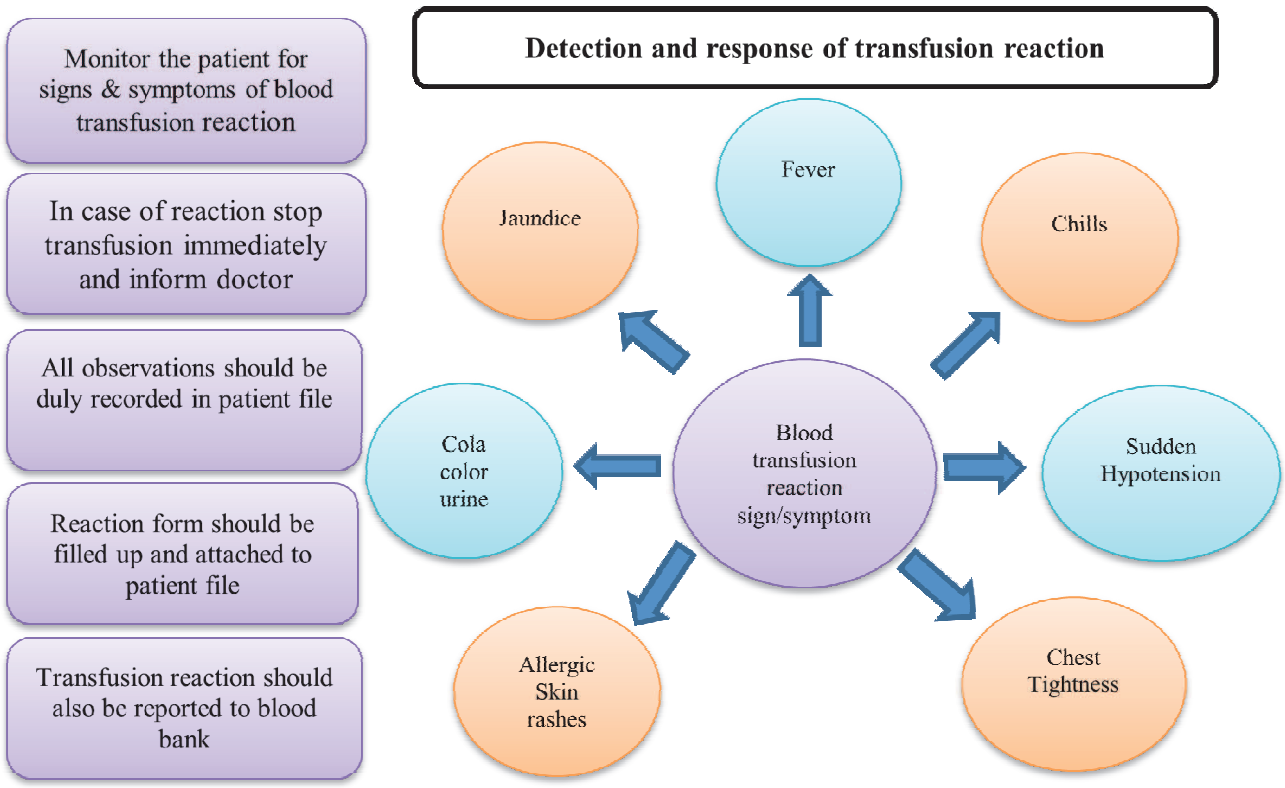
Note: Blood/ Blood component should be issued just prior to transfusion as components which are stored at suboptimal temperature are at risk of bacterial contamination

Problems in flow of blood during Transfusion:

Blood may flow more slowly than desired as a result of obstruction of the filter or when there is excessive viscosity of the component. Steps to investigate and correct the problem include the following:

- Elevate the blood container to increase hydrostatic pressure.
- Check the patency of the needle & IV line.
- Examine the filter of the administration set for excessive debris.

Monitoring for adverse events or reactions during transfusions



Strategy for suspected adverse reactions:

- Most transfusions proceed without complication, but when adverse reactions do occur, medical and nursing staff must be prepared to deal with them immediately.
- Because severity can vary significantly and symptoms are not specific, all transfusions must be carefully monitored.
- As soon as a reaction is suspected stop the transfusion and inform the concerned doctor.
- Maintain IV infusion with NS using a new IV drip set.

- Provide oxygen as prescribed by the doctor.
- Maintain intake-output record.
- In case of allergic reactions, give anti-histamines or corticosteroids as prescribed by the doctor.
- In case of anaphylaxis, give inj Adrenaline and start resuscitation under doctor's supervision.
- If and when a reaction occurs, bags, tubing, and attached solutions should be returned to the blood bank for investigations.

Bio-medical waste disposal

As per the BMW guidelines, the used blood bag and all BT sets are disposed in the yellow bin.

1. Sample format for Blood Transfusion Register

S. No	Patient Details with UHID	Quantity Requested with Component	Indication for transfusion	Blood requesting Date & Time	Blood / Component Receiving Date & time	Blood / Component starting Date & Time	Blood / Component stopping Date & Time	Any reaction with Sign & Symptoms	Order By (Doctor Name)	Name & Signature of Nursing staff/Medical officer

2. Sample Format for Blood Transfusion Reaction Report

(To be used for investigation of suspected reactions to blood products)

Patient Name:

Hospital

Ward:.....Patient ID:.....

Please complete form and forward with appropriate blood specimens and used pack to the ..... Hospital Blood Bank.

Date:.....	Clinical Diagnosis:
Product Transfused:.....	Time Commenced:.....
Donation (pack) number:.....	Volume Transfused:.....ml

Clerical Check (please circle)

Patient ID correct Blood pack correct Blood Transfusion Record correct

Yes / No Yes / No Yes / No

Temperature in the 24 hours prior to transfusion: (Please tick) FEBRILE □AFEBRILE □

Vital Signs	Time	Temperature	Respiratory Rate	B.P.	Pulse Rate
Pre Reaction					
Post Reaction					

Signs and Symptoms – Please Tick

Fever	□	Lower Back pain	□	Skin Pallor	□		
Chills	□	Chest pain	□	Dark Urine	□		
Nausea / Vomiting	□	Anxiety	□	Dyspnoea	□		
Hives / Itching	□	Headache	□	Bleeding from wound or IV site	□	Others	□

Please document any blood products given in previous 12 hours:

Donor Unit Number	Product Type	Date	Time Units		Volume	Reaction

Reviewing Doctors:

Signature:

Name:..... Date:.....

Chapter 14
Equipment

An article, instrument, apparatus or machine that is used in the prevention, diagnosis or treatment of illness or disease for detecting, measuring or correcting the function of the body for some health purpose.

Some commonly used equipment in health care settings are:

A. Digital HB Meter:

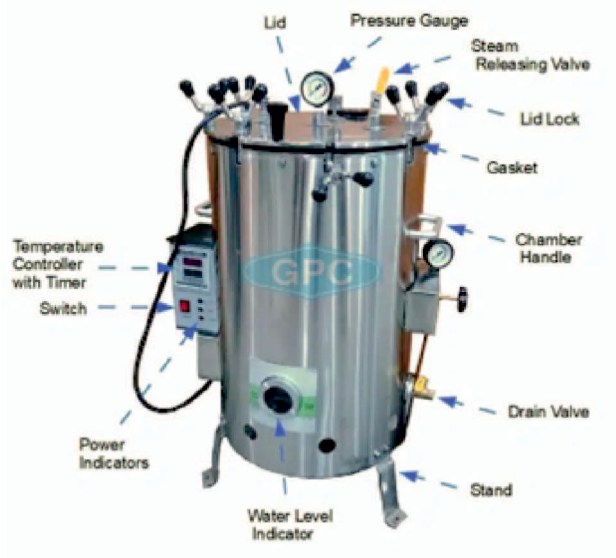
It is a digital device for Point of Care Testing of haemoglobin which gives accurate Hemoglobin measurement within minutes and in exact decimals.

Steps:

- Keep necessary items ready, hemometer, strips, lancing device loaded with fresh lancet, cotton and spirit.
- Wash hand and turn on the meter Check for date, time and strip batch code after a second.
- Match batch code strip & true Hb meter. If not matched, then match by adjusting left and right side mark followed by power button.
- Wait for green light in Hb meter lens. Then insert a fresh test strip into meter with arrow facing towards display without touching sample drop point of strip.
- Observe blood drop symbol on display. Massage the tip of left hand third/ fourth finger.
- Clean same tip of finger and puncture it by fresh lancing device.
- Discard the first drop of blood. Ensure sufficient blood/ hanging blood drop and put it gently by covering completely over white coloured test area of strip. (Don't press the punctured finger).
- Wait for one minute then record the reading.
- Remove the used test strip. Discard the used strip and used lancet by disposing it in proper bin.
- Clean the meter and remove residual blood by moist cotton cloth every day.

B. Autoclave

Autoclave is a device which uses steam under pressure to kill bacteria, viruses, fungi and spores and hence, used to sterilize linen and instruments in health care settings.



Place the autoclave on a clean, dry, flat surface.

- Twist the lid of the autoclave anti-clockwise and lift the lid.
- Fill the bottom of the autoclave with clean water up to the ridge to submerge the immersion heating coil but the top of the tripod stand should stay just above the water surface.
- Place the items loosely in the autoclave drum to allow steam to circulate. Place the indicator strip inside the drum and close the lid.
- Place the drum in the autoclave with its side windows open, inside the autoclave on the tripod stand.
- Put on the lid of the autoclave, press it down and turn it clockwise until it does not turn anymore. The autoclave in the closed position will have both handles parallel and one above the other on either side.
- Lift the lid screws upright and tighten them so that the opposite screws are tightened together.
- Check that the lid is tightly sealed by the rubber gasket.
- Tighten the steam release and vacuum release valve. Check that the pressure gauze reading is at 0.
- Switch on the power.
- After few minutes steam will start generating. When the pressure is at 2 Psi, open the steam release valve slowly so that the air in the autoclave is expelled and the entire autoclave is filled with steam. Once, the pressure goes back to 0, close the valve again and let steam build.
- Note the time when steam emits from the pressure whistle.
    - Keep the wrapped items for 30 mins and
    - Unwrapped items for 20 mins at 15 lbs/sq. inch at 121°C.
- After the designated time, turn off the power.
- Open the pressure valve to release the steam and allow the autoclave to cool for 15-30 mins before opening.
- Make sure that there is no steam left in the autoclave and pressure gauge is also at Zero lb psi.
- Now open the autoclave lid by opening the lid screws, twisting it anticlockwise and lift the lid off.
- Remove the drums from the autoclave, close the windows, remove the indicator strip, check for the colour change and stick the strip in the autoclave strip register with date and time.
- Remove all the water from the base chamber and close the autoclave by putting the lid on it clockwise.
- Keep the drums in a clean, dry place. If the container is not opened, the instruments
- can be used within 7 days. If the lid is opened, re-sterilize the remaining instruments within 24 hours.

How to stop leakage:

Replace the Gasket when

- It begins to show sign of leakage.
- When found visibly damaged.
- When shrinkage has occurred.

If a new gasket leaks or a persistent leaks develops

- Remove the gasket from the lid and clean the surface with some scrubbing pad rinsed in warm soapy water.
- Also clean the surface of the base unit where gasket rests.
- Do not lubricate Gasket.

Care and maintenance of autoclave:

- Disconnect the autoclave from the main power supply before cleaning.
- Ensure that no material falls into the base chamber i.e. autoclave tape, glass etc as they may affect the operation of the exhaust valves.

- Ensure that the pressure gauge is operating correctly.
- Clean & dry the unit after the day use.
- Use the autoclave only for intended purpose.
- Weekly clean both interior and exterior with warm, soapy water ensuring the electrical parts are kept dry. (In case of electric autoclave).

WARNING

- Do not operate the autoclave without water. Avoid using hard water in the unit.
- Make sure the rubber seal is in a good shape & condition.
- Close the autoclave lid properly never try to open it by force without first releasing the steam.
- Do not use any alkaline solution in the unit.

C. Oxygen Cylinder

Oxygen Cylinder set is medical equipment used for storing pressurized Oxygen to be used on patients who are in need of it.

1. Parts

Has two main parts:

- Head (Manometer)
- Body (Steel Cylinder)

2. Accessories

- Oxygen cylinder carrier
- Cylinder stand
- Humidifier bottle
- Tubing
- Face masks in different sizes
- Nasal catheters
- Spanner
- Oxygen Key

3. Preparation

- Identify the right cylinder
- Make sure the oxygen cylinder set is clean, complete and in good working condition.
- Check that the humidifier bottle has distilled water to the required level.
- Fit the manometer to the cylinder by tightening the connecting nut clockwise with use of a spanner.
- Open the cylinder valve to ensure there is oxygen; at the same time this cleans the air outlet.
- Ensure that the flow meter is upright.
- Connect Humidifier bottle to the flow meter.

4. Operation

- Explain to the patient/relative
- Connect the nasal catheter/facial mask from the Humidifier bottle to the patient.
- Regulate the oxygen supply on the flow meter according to the prescription.
- The duration depends on patients" condition.
- Monitor the patient until the condition stabilizes (using pulse oximeter).

5. Care

Immediate Care

- After use close flow meter regulator and cylinder valve.
- Remove facial mask/nasal catheter from the patient.
- Disconnect, discard/decontaminate the nasal catheter.
- Open the flow meter regulator to release out any excess oxygen held in the system when the hissing sound stops close the flow meter regulator.

Routine care

- Check whether the Oxygen cylinder set is in good working condition.
- Check humidifier bottle if it has distilled water (2 /3) between maximum and minimum or required level.
- Distilled water to be changed weekly or between patients.
- Check tubing for cracks and deterioration.
- Ensure the right key and spanner is available.
- If empty, label and take to the store for refill.

6. Precaution

- No smoking/flames should be allowed around the cylinder during operation because oxygen supports combustion.
- Do not grease or oil as it may promote explosion.
- Do not allow pressurized oxygen to come into contact with the skin as it causes burns.
- Use proper clear simple signs of danger. showing danger

E.g:

Note

- Consumables like face masks, nasal catheter should be discarded / changed regularly.
- Ensure that there is no leakage of oxygen.
- Make sure that there is right manometer for the right cylinder.
- Make sure that the filter in the humidifier bottle is cleaned regularly.
- Ensure that oxygen key and spanner are easily accessible.

D. Oxygen Concentrator

It is a medical device that helps concentrate oxygen from the ambient air by removing nitrogen.

Steps to use a concentrator

- Plug in the power cable and a green light indicating 'power on' comes on
- Switch on the concentrator and a red/yellow light will come on
- The red/yellow light will be on until the desired concentration of oxygen is achieved

- Check the distilled water level in the humidifying jar and ensure that it is filled up to the mark
- Adjust the oxygen flow as needed
- Place the nasal prongs inside the patient's nostrils and fix them with tape, ensuring that they fit snugly.

Maintenance:

- Coarse filter – ensure it is free of dust and is washed daily
- Zeolite granules –change every year/as per manufacturer's recommendation
- Bacterial filter – change as per the manufacturer's recommendation.

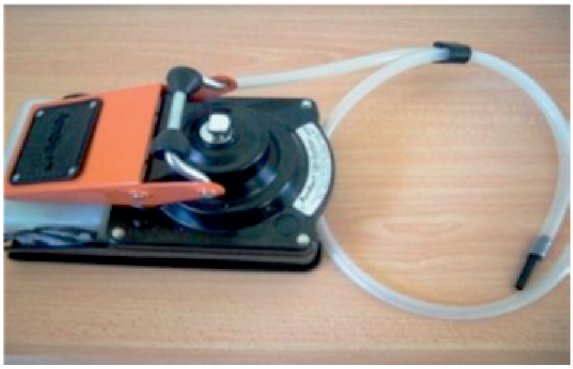
E. Suction Machine

Suction Machine is medical equipment that provides an efficient means of removing body fluids (e.g. blood, mucus, vomitus) from wounds, respiratory tract or body cavities.

Types

1. Electrical

2. Foot/hand operated



Parts

Parts (Foot/hand operated)

- Frame
- Bellows/Foot pedals
- Collecting bottles
- Stopper
- Ball valve
- Spare tube connector

- Cap
- Suction tube nipple (inside the bottle)
- Tubing between ball valve/angle piece
- Silicone rubber tubing
- Angle piece
- Silicone rubber suction tubing
- Suction tip with vent hole

Parts (Electrical)

- Collecting bottles
- Body and the Handle
- Foot pedal
- On and off switch
- Pilot lamp
- Vacuum adjustment control
- Pressure gauge/Vacoumeter
- Two-way cock/plunger
- Wheels/casters with a lock
- Bacterial filter
- Patient connector
- Suction tubings
- Electric cable and plug
- Sensor bottle

Preparation

- Make sure the machine is clean, complete and in good working condition
- Place the suction machine away from the wall and lock the casters.
- Put some disinfectant in the collecting bottles.
- Connect the tubings appropriately.

Operation (electrical)

- Plug into the socket and switch on the mains, stabilizer and machine.
- Ensure the pilot lamp lights.
- Connect the suction tube to the patient connector.
- Fill the collecting bottles not more than 2 /3 as the secretions will over flow to the motor causing damage.
- When one bottle is 2 /3 filled, shift to the other bottle.

Care

Immediate care

- Suck in decontaminant, clean water before disconnecting.
- Switch off the machine, stabilizer and main.
- Unplug the cable from the socket.
- Disconnect tubing, bottles and empty the content

- Decontaminate the bottles and tubes.
- Wash with soapy water, rinse with clean water and leave it to dry.

Routine care

- Make sure that the equipment is clean and dry at all times.
- Pack the tubing in the drum and sterilize.
- Check the tubing for the damages or deterioration

Note: Electrical suction machine is not recommended for infants because of the high pressure. If used, the pressure should not exceed 100 mm Hg.

Manual type

Preparation: Same as electrical

Operation:

- Put little water in the bottles.
- Change the catheter after use and dispose off.

Note:

In case the equipment is to be used for babies-

1. Put little water in the collecting bottle. This is because the disinfectant is harmful to babies in case of back flows.
2. The manual type is recommended for children and babies.

Key points

- For safety of the new-born, maximum suction pressure is limited to 100 mmHg, irrespective of foot pressure.
- If the suction inlet becomes blocked by a thick mucus plug, switch the suction tubing to an alternative suction inlet provided on the rubber stopper.
- The foot suction machine must be cleaned immediately after use. Empty the fluid jar immediately when filled more than half and wash with soap and water
- The fluid collection jar and silicon tubing should be autoclaved
- The rubber lid of the fluid collection jar cannot be autoclaved. Wash thoroughly with soap and water, rinse, reassemble when dry
- If the fluid jar is full and cannot be emptied immediately, open the alternative suction inlet to prevent outflow of fluid into bellow
- Use gentle rather than vigorous suction
- Use only disposable suction catheters
- Check adequacy of suction pressure
- Change bottle solution (0.5% hypochlorite solution) every day in the electric suction machine

F. Radiant Warmer

It is a body-warming medical equipment which is used in delivery rooms including maternity OTs and new born care units, which helps to maintain the body temperature of the baby.

Parts:

- Bassinet (for placing the neonate)
- Radiant heat source (Quartz/ceramic or similar heating rod)
- Skin probe (for sensing baby's skin temperature) and Air probe for surrounding temperature
- Control panel (displays and control knobs)

Control panel (displays and control knobs)

- Mode selector (selects manual or servo mode)
- Heater output control key/knob (to increase or decrease the heater output manually)
- Heater output display (indicates heater output)
- Temperature selection key/knob (select the desired skin temperature)
- Temperature display (displays temperature of baby's skin, the set temperature and air temperature)
- Alarm display for power failure, system failure, skin probe failure, skin temperature high/low and heater failure.

Working

- Connect to mains and switch on. Select the manual mode and keep heater output to maximum for 15-20 minutes for pre-warming the bassinet and linen.
- Select servo mode and set the desired skin temperature to 36.5°C. Heater output adjusts automatically to keep baby at set temperature.

Side effects and dangers - Do not leave the baby unmonitored, when being cared for, under a warmer

- Hyperthermia - (especially in the manual mode if temperature is not monitored or in the servo mode when the probe gets displaced). To prevent hyperthermia, ensure probe is properly attached and the temperature of baby is monitored using a thermometer periodically.
- Hypothermia - usually due to equipment failure or when the probe is malfunctioning. Always maintain the radiant warmer in good condition and attend to alarms immediately.
- Increased insensible water loss occurs due to exposed skin surface to radiant heat, more so in preterm neonates, when nursed under the warmer for prolonged period. Take following actions to prevent this:
  a) Place baby in the bassinet. Cover head with cap, feet with socks and hands with mittens. Baby can be clothed while under a warmer. Connect skin probe to baby's abdomen with a skin friendly tape.
  b) Apply emollients/oil to the skin
  c) Maintain ambient temperature and humidity

Maintenance

- Calibration every 4-6 months, comprehensive warranty for 5 years and then annual maintenance contract

Cleaning and disinection	
Bassinet	Soap/detergent - Use only mild soap and water wipes daily. Do not use spirit or other chemicals to clean the plastic/acrylic parts. Clean using disinfectant, like - 2% Bacillocid or glutaraldehyde, when the bassinet is unoccupied or weekly (move the baby while using disinfectant)
Probe	Clean using isopropyl alcohol swap before and after each use
Do's	Place skin probe on the right upper abdomen in the supine position and in the flanks, if baby is probe. Use skin friendly adhesive tape to secure the probe in place. Do not place probe on bony structures Ensure that the skin is dry or else prepare using alcohol & spirit swab to ensure good adhesion to the skin. Check repeatedly to ensure that the sensor probe is in position. Check temperature manualy, at least once per shift. Always respond to alarms promptly and take corrective measures.
Don'ts	Do not apply probe to bruised skin. Do not reuse disposable probes.

Troubleshooting	
Problem	**Action**
Machine does not switch on	Check power supply, check the plug fuse if all the above okay, call engineer.
Power on but heater not working	Call engineer
No skin temperature display	Faulty skin sensor (replace sensor/call engineer)

G. Phototherapy

It is a medical equipment which uses light for treating jaundice in babies.

- Protect the eyes from light using eye patches once the lights are on.
- Keep baby naked with a small nappy to cover the genitalia.
- Change position supine to prone after each 3-hourly, from feed.
- Place the baby as close to the lights as the manufacturers' instructions allow. Use white curtains or linen as slings so as to reflect back as much light as possible to the baby, making sure not to cover top surface of unit which allows air flow for cooling the bulbs.
- Encourage frequent breast feeding. No need to supplement breastfeeding with any other type of feed or fluids.
- Temporary interruptions for feeding or procedures are allowed. But not for oro-gastric feeding or for IV fluids.
- If baby is on IV fluids or expressed breast milk, increase the volume by 10%.
- Monitor for and ensure urinary frequency 6-8 times/day.
- Monitor temperature 4 hourly and weight every 24 hours.
- Estimate serum bilirubin frequently ~ q 12 hourly. Clinical or visual assessment of jaundice under lights becomes fallacious.
- Change tube lights every 6 months (or usage time >1000 hrs) whichever is earlier; or if tube ends blacken or if tubes flicker
- Monitor irradiance of the phototherapy machine once every week. Use a flux meter to monitor irradiance. Change light source if irradiance falls below 6-8 µw/cm2/nm.
- Do not place anything on the phototherapy unit (this blocks air vents).

Caution:

- Do not use phototherapy unit under a warmer.
- Ensure eye patches do not obstruct nostrils.
- For babies below 2kg, preferably use phototherapy over incubator.
- After switching on the unit, check if all tubes/ bulbs are on.

Troubleshooting

If Unit is not switching on, check the following:

- Mains Socket (change to another socket)
- Fuse
- Loose contact in the plug or a damaged mains cord

If any Tube is flickering, Do the following and check.

- Change starter to the lamp.
- Change lamp.

After doing the above procedure(s), if the unit is still having problem, call qualified technician to repair the unit.

Cleaning/disinfection

- Use moist or dry cloth to clean unplugged unit
- Ensure the reflectors remain dust free.

H. Nebulizer

It is a medical device that changes medicines from a liquid to a mist so they can be inhaled and delivered directly into the lungs in respiratory conditions of children and adults.

Steps:

- Wash hands
- Measure the correct dose of medication to be used in the nebulized chamber
- Add normal saline to make the volume as advised by the doctor.
- Connect the nebulizer tubing to the port on the compressor
- Turn on compressor and check the nebulizer for misting
- Connect the mouthpiece or mask to the T-shaped elbow and ensure the mask is a good fit
- Hold the nebulizer in an upright position
- Ask the patient to take slow deep breath.
- Occasionally tap the side of the nebulizer to help the solution drop to where it can be misted.
- Record the dose and drug in the case sheet.
- Clean the mask and chamber after each use.
- Dry and reassemble

I. Multi-dose inhaler (MDI) with spacer

- Check expiry date
- Shake the container
- Remove the cap from the inhaler
- Insert the inhaler mouthpiece into the slot of the spacer
- Attach mask to the mouthpiece of the space
- Instruct the mother to hold the child in the proper position
- Place the mask over the child's nose and mouth so that there is a good seal with the face
- Press down on the inhaler canister to spray 1 puff of medicine into the spacer
- Allow the child to breathe normally for 5 breaths
- Momentary misting of the spacer and hissing noise

When to administer next dose: Wait for 2–3 minutes, shake the inhaler and repeat steps

J. Pulse Oximeter

It is a hand-held non-invasive device that measures the blood oxygen levels and pulse rate.

Steps to use Pulse Oximeter:

The pulse oximeter consists of a computerized unit and a sensor probe, which when attached to the patient's finger, toe or earlobe measures oxygen saturation of haemoglobin in the blood.

Perform Pulse oximetry:

- During triage, on all patients with clinical signs of hypoxaemia and children and neonates with any "emergency or priority" sign
- On all patients admitted to an inpatient ward with respiratory illness, emergency signs or any sign of hypoxaemia.

Features of a pulse oximeter

- **Sensors:** have to be appropriate to the size of the patient, can be disposable or reused for several patients. Soft rubber sensor probe are ideal for neonates and young children and can be attached to the hand, foot, toe or finger.
- **Display:** The accuracy of the heart rate reading should be checked by comparing the number on the pulse oximeter display with auscultation of the heart.
- Following are the major sources of error in pulse oximetry
  - Poor skin perfusion
  - Movement of the limb – pulse waveform can be not well detected leading to abnormal reading
  - Greater margin of error at lower SpO2

Key points to remember:

- Pulse oximeter is used both for screening and monitoring purpose
- Desired range for preterm babies: SpO2 91% to 95% and desired heart rate 100 to 160 /min.
- Read and record the findings 1-2 hourly in the case sheet only after the number/wave forms are stable.
- Fingertip pulse oximeter is not reliable in newborns and hence should preferably avoid using.

Precautions:

- Avoid oedematous, bruised sites and excessive pressure.
- Avoid excess ambient light to shine on the probe, if so cover with an opaque material
- Do not tie the BP cuff proximal to the limb where the probe is fixed to avoid poor perfusion

Daily cleaning of Pulse oximeter

- Clean probe with spirit swab before every application
- Do not autoclave.
- Do not use petroleum based, acetone or other harsh solutions

K. Multi Para monitor

Patient Monitor is a multi-functional instrument designed for monitoring the vital physiological signs of adult and paediatric patients. With the functions of real-time recording and displaying parameters, such as ECG, heart rate, non-invasive blood pressure, functional oxygen saturation, end-tidal CO2 concentration, respiration rate, body temperature, and so on, it allows comprehensive analysis of patient's physiological conditions.

General Instructions:

- Monitoring a single person at a time.
- Mostly the monitor is defibrillator proof. However, verify that the accessories can function safely and normally and the monitor is grounded properly before conducting defibrillation in ICU/HDU/OT.
- Do not immerse the monitor or its accessories in liquid to clean.
- Each time the monitor is used, check the alarm limits to ensure that they are appropriate for the patient being monitored.
- The monitor is intended only as an adjunct in patient assessment. It must be used in conjunction with clinical signs and symptoms.
- The monitor is prohibited from applying to those who have severe hemorrhagic tendency or who are with sickle cell disease for they may develop partial bleeding when this monitor is used to take the blood pressure measurement.
- DO NOT take blood pressure measurement from a limb receiving ongoing transfusion or intubations or skin lesion area, otherwise, damages may be caused to the limb.
- DO NOT stare at the infrared light of SpO2 sensor when switch it on, for the infrared may do harm to the eye.
- If the monitor falls off accidentally, please do NOT operate it before its safety and technical indexes have been tested minutely and positive testing results obtained.
- Electrical Shock Hazard: Always disconnect the CO2 Sensor before cleaning. Do NOT use if it appears to have been damaged.
- This apparatus should be situated in a place protected against direct sunlight, so as to prevent too high temperature inside it.
- This apparatus should be fixed on a stand, so as to prevent possible shock.
- When using this device with electrosurgical equipment, the user (doctor or nurse) should pay attention to the safety of patient.

Multipara monitor can be used to monitor following:

1. ECG Monitoring

The electrocardiogram (ECG) is primarily a tool for evaluating the electrical events within the heart. The ECG signals can be detected by electrodes at the surface of the skin, this device connects ECG signals and represents them on the monitor as waveforms and numerical value such as heart rate. The electrode type selection and the locations of the electrodes are very important to ensure accurate ECG measurement.

Preparing the Patient and Device

a) **Skin Preparation-** The quality of ECG waveform displayed on the monitor is a direct result of the quality of the electrical signal received at the electrode. Proper skin preparation is necessary for good signal quality at the electrode. A good signal at the electrode provides the monitor with valid information for processing the ECG data. To ensure enough electrolyte material on the skin of patients, you need to moisten the measuring sites with 70% isopropyl Ethanol. This will usually be sufficient for ECG monitoring for a short time (30 to 60 minutes).

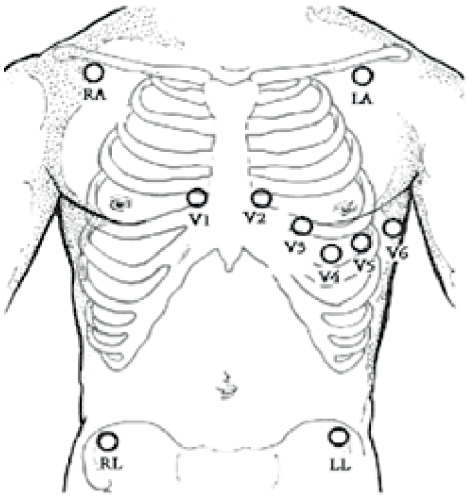
b) Connect the cable to the connector marked with the “ECG” icon on the signal input panel.

Select electrodes to be used. Use only one type of electrode on the same patient to avoid variations in electrical resistance. For ECG monitoring, it is strongly recommended to use silver/silver chloride electrodes.

Note: Alcohol is not recommended as a skin cleanser; **If alcohol is used, ensure 30-second dry time.**

The symbol indicates that the cable and accessories are designed to have special protection against electric shocks, and is defibrillator-proof.

The locations of the electrode are in the following figure:



If skin rash or other unusual symptoms develop, remove electrodes from patient.

After starting the monitor, if the electrodes become loose or disconnected during monitoring, the system will display "*LEAD OFF*" on the screen to alarm the operator.

The ECG leads and their corresponding locations are as follows:

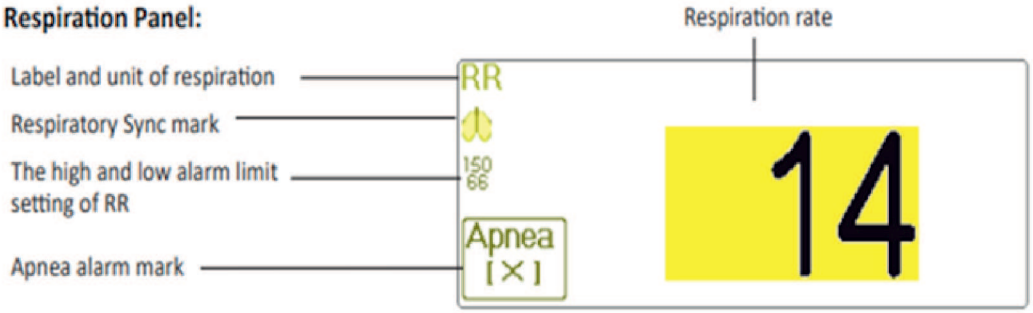
RA	The intersection between the center-line of the right clavicle and Rib 2
LA	The intersection between the centerline of the left clavicle and Rib 2
LL	Left part of the upper abdomen
RL	Right part of the upper abdomen
C1(V1)	The electrodes are placed in different places, the different lead forms
C2(V2)	
C3(V3)	
C4(V4)	
C5(V5)	
C6(V6)	

Factors Affecting ECG signal

- Interference from Electro-surgical Unit
- Doesn't set the filter mode properly
- Poor grounding
- Electrodes are not placed properly
- Use expired electrode or use disposable electrode repeatedly
- The skin placed electrode is unclean or poor contract caused by scurf and hair

2. Monitoring Respiration

Respiration is monitored by measuring the impedance across the thorax via electrodes places on chest. When the patient is breathing or ventilated, the volume of air changes in the lungs, resulting in impedance changes between the electrodes.



"RR": the label of Respiration. **"rpm"** is the unit of the Respiration Rate (respiration per minute). The big font "14" is the value of Respiration rate.

"  ": Breath symbol. The blinking frequency is the same as the Respiration Rate.

- "  ": the high and low alarm limit setting for Respiration Rate.
- 

: the apnea alarm status in RESP alarm setting, refer to the following Section for details.

Note: in RESP settings window, CO_2 and/or AG Settings can be entered if your monitor is configured with CO_2 monitoring and/or AG Monitoring.

3. Monitoring Non-invasive blood pressure (NIBP)

The Oscillometric Blood Pressure Measurement

This device applies the typical non-invasive blood pressure measurement with the oscillometric method. A cuff is used to occlude the artery by inflating it above the patient's systolic pressure, the device measures the amplitude of pressure changes with pulsation in the cuff as the cuff pressure decreases.

Precautions:

- NIBP monitoring is prohibited to those who have severe hemorrhagic tendency or with sickle cell disease, otherwise, partial bleeding will appear.
- DO NOT wrap the cuff on limbs with transfusion tube or intubations or skin lesion area, otherwise, injury may be caused to the limbs.
- Before the measurement is carried out, select an appropriate measuring mode depending on the patient type (adult or pediatric).
- The air-hose which connects the cuff and monitor should be straightway without any tangle.
- When an adult patient is monitored, the device may fail in giving the blood pressure measurement if the pediatric patient type is selected.
- Prior to use of the cuff, empty the cuff until there is no residual air inside it to ensure accurate measurement.
- The NIBP measurement will not be affected when the monitor is connected to the patient on whom the electrosurgical unit and defibrillator is being used.
- The blood pressure measurements determined with this device are equivalent to those obtained by a trained observer using the cuff/stethoscope auscultatory method, within the limits prescribed by the American National Standard, manual, electronic, or automated sphygmomanometers

Measurement Mode

There are three measuring mode for NIBP measurement:

- **Manual:** measurement on demand.
- **Auto:** continually repeated measurements at set intervals.
- **STAT:** continually rapid series of measurements over a five-minute period, then return to the previous mode.

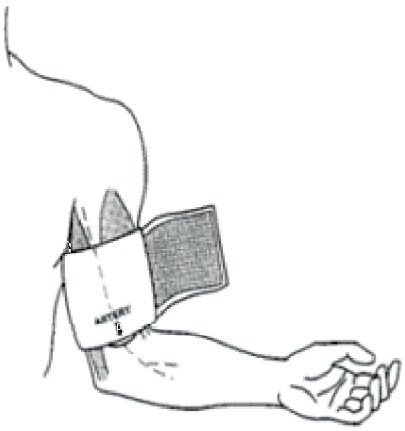
Setting up the NIBP Measurement

a) Power on the monitor.

b) Check the patient information area on the screen. Set a correct patient type, select a correct cuff size.

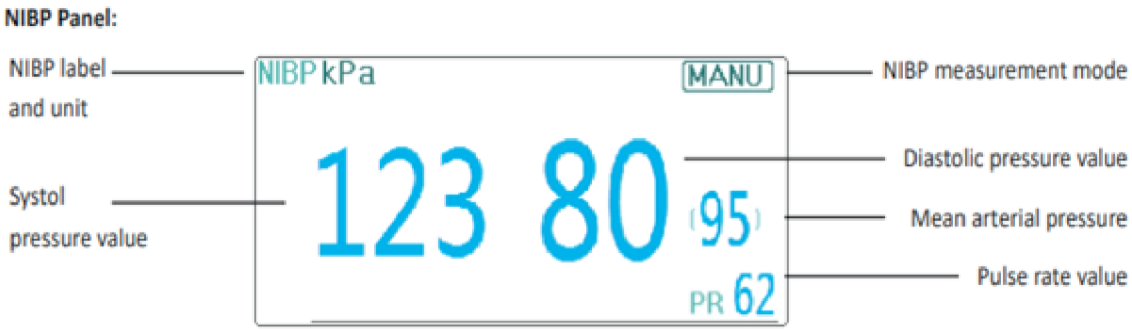
c) Connect the tube with cuff to the connector marked with "NIBP" icon on the signal input panel.

d) Select a cuff with correct size, then unfold the cuff and wrap it around the patient's upper arm as follows:



- Select an appropriate cuff by referring to the limb circumference marked on the cuff. The width of the cuff should be 40% of the limb circumference, or 2/3 of the upper arm's length. The inflatable part of the cuff should be long enough to encircle at least 50% to 80% of the limb. When putting on the cuff, unfold and wrap it around the upper arm evenly to appropriate tightness
- Locate the cuff in such a way that the artery mark "∪" is at a location where the clearest pulsation of brachial artery is observed.
- The cuff should be tightened to a degree where insertion of one finger is allowed.
- The lower end of the cuff should be 2cm above the elbow joint.

Understanding the NIBP Numerics



4. Monitoring Oxygen Saturation (SpO_2)

The functional oxygen saturation (SpO2) - a percentage of the hemoglobin that can transport oxygen, is monitored by this device via a non-invasive optical technique.

Safety Information

- Continuous use of fingertip SpO2 sensor may result in discomfort or pain, especially for those patients with microcirculatory problem. It is recommended that the sensor should NOT be applied to the same site for over two hours

- Check SpO2 probe application site periodically (every 30 minutes) to determine circulation, positioning and skin sensitivity.
- Do NOT place the SpO2 sensor on the finger with edema or fragile tissue.
- Avoid placing the SpO2 sensor on the same extremity with an arterial catheter, blood pressure cuff, or intravascular infusion line
- DO NOT stare at the light of SpO2 sensor (infrared is invisible) when switch it on, for the infrared may do harm to the eye.
- Before each use, surface-clean sensor and cable with a soft gauze pad by saturating it with a solution such as 70% isopropyl Ethanol. If low-level disinfection is required, use a 1:10 bleach solution.
- Please do not use nail polisher or other cosmetic product on the nail.

Understanding the SpO2 and PR Display

Plethysmogram:

✧ **"Pleth":** label for abbreviation of plethysmogram.

SpO_2 Panel:

5. Monitoring Temperature

The body temperature is monitored by direct measuring mode with the temperature sensor of thermistor type.

Safety Information

- Verify that the probe detecting function works correctly before monitoring. Unplug the temperature probe cable from the T1 or T2 connector, and the monitor can display the message [T1 Sensor Off] or [T2 Sensor Off] and give alarm tones correctly.

Making a Temperature measurement

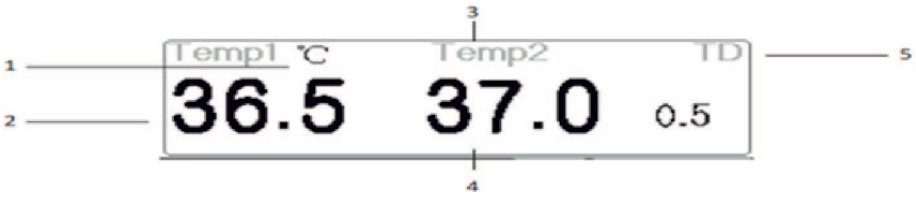
- **Connecting the thermal temperature sensor:**

  The temperature sensor is thermo-resistor type it needs time to respond the temperature change, so the accurate temperature value displays after a while.

- **Operation Procedures for thermal temperature transducer:**
  1. Securely attach the transducer to the patient;
  2. Connect the cable to TEMP probe connector marked “TEMP” in the panel.
  3. Check that the menu setting is matching the used temperature sensor type.
  4. Check that the alarm settings are appropriate for this patient.

Note: When unplugging the probe, be sure to hold the head of the connector and pull it out.

Understanding the TEMP Display



1. TEMP1 °C: Temperature 1 mark and unit. Temperature unit: °C or °F
2. 36.5: displays the temperature measured at temperature channel 1.
3. TEMP 2: Temperature channel 2.
4. 37.0 displays the temperature mesured at temperature channel 2.
5. TD 0.5: Temperature difference, namely the difference between temperature 1 and temperature 2

6. Alarms

Alarms, triggered by a vital sign that appears abnormal or by technical problems of the monitor, are indicated to the user by visual and audible alarm indications.

Alarm Categories:

By nature, the monitor's alarms can be classified into three categories: physiological alarms, technical alarms and prompt messages.

1. **Physiological alarms**: Physiological alarms, also called patient status alarms, are triggered by a monitored parameter value that violates set alarm limits or an abnormal patient condition. Physiological alarm messages are displayed in the physiological alarm area.
2. **Technical alarms**: Technical alarms, also called system status alarms, are triggered by a device malfunction or a patient data distortion due to improper operation or mechanical problems. Technical alarm messages are displayed in the technical alarm area.
3. **Prompt messages**: Prompt messages are not alarm messages. Apart from the physiological and technical alarm messages, the monitor will show some messages telling the system status or patient status. Messages of this kind are included in the prompt message category and usually displayed in the prompt information area.

Alarm Lamp:

Lamp colour	Alarm level	Alarm event
Red flashing	High priority alarm	ECG Brady, ECG Tachy, Low battery, Vital sign alarm
Yellow flashing	Medium priority alarm	Lead off, Probe off, Sensor off
Yellow	Low priority alarm	Arrhythmia event
Green	Normal	

7. Cleaning and Disinfection

a) Cleaning the Device and Accessories

The device should be cleaned on a regular basis. If there is heavy pollution or lots of dust and sand in your place, the device should be cleaned more frequently. Before cleaning the equipment, consult your hospital's regulations for cleaning the device. Recommended cleaning agents are:

- Sodium hypochlorite bleach (diluted)
- Hydrogen peroxide (3%)
- 75% Ethanol
- 70% Isopropanol

To clean your device, follow these rules:

- Switch off the monitor and disconnect the power cable before cleaning.
- Kept the monitor from dust.
- It is recommended to clean the outer shell and screen of the monitor to keep it clean. Only non-corrosive cleanser such as clear water is permitted.
- Wipe the surface of the monitor and transducers with an Ethanol impregnated wipe, and dry it with dry and clean wipe or simply air-dry.
- This monitor can be disinfected, please clean the monitor firstly.
- **Do not let the liquid cleanser flow into the connector jack of the monitor to avoid damage.**
- Clean the exterior of the connector only
- If the monitor is accidentally wet, it should be thoroughly dried before use. The rear cover can be removed by qualified service technician to verify absence of water.

b) Disinfecting the Device and Accessories

Disinfection may cause damage to the device and is therefore not recommended for this monitor unless otherwise indicated in your hospital's servicing schedule. Cleaning device before disinfecting is recommended.

The recommended disinfects include:

- 75% Ethanol
- 70% Isopropanol

Do not use radiation, steam or Ethylene Oxide (EO) to disinfect accessories.

L. Cardio-Tocography (CTG) machine

It is a medical device used to monitor the fetal heart rate and uterine contractions during pregnancy and labor.

Uses of CTG

- The cardiotocograph (CTG) is a continuous electronic record of the fetal heart rate obtained via an ultrasound transducer placed on the mother's abdomen (external or indirect CTG).
- A second transducer is placed on the mother's abdomen over the uterine fundus to record simultaneously the uterine contractions.
- Both fetal heart rate and uterine contractions are traced simultaneously onto a paper strip. Components of the fetal heart rate that can be assessed include: baseline rate, baseline variability, accelerations and decelerations.

- The relationship between fetal heart rate and the timing of uterine contractions is also assessed.
- Cardiotocography is used widely in maternity care, both in the antepartum and intrapartum periods.
- Antenatal CTG is a commonly used form of fetal assessment in pregnancy and uses the fetal heart rate as an indicator of fetal well-being. It usually referred to as the 'non-stress test'. Antenatal CTG is most commonly performed in the third trimester of pregnancy (after 28 weeks).
- CTG is also used for non-invasive monitoring of fetus during labor to identify fetal hypoxia.

General instructions

- The monitor operates within specifications at ambient temperatures between +5°C and +40°C.
- Allow at least 5 cm clearance around the instrument for proper air circulation.
- Check that the equipment, cables and transducers do not have visible evidence of damage that may affect patient safety or monitoring capability before use. If damage is evident replacement is recommended before use.
- The monitor must be serviced only by authorized and qualified personnel
- **EXPLOSION HAZARD** - Do not use the monitor in the presence of flammable Anesthetics.
- **SHOCK HAZARD** - The power plug must be a three-wire pin. Never adapt the three-prong plug from the monitor to fit a two-slot plug point.
- Do not apply this monitor and other ultrasonic equipment simultaneously on a same Patient, there is a potential hazard caused by current leakage current.
- Do not apply this monitor simultaneously with other PATIENT-connected equipment, such as, a cardiac pacemaker or other electrical stimulators, on the same patient.
- The monitor can only be used on one patient at a time.
- Do not apply the monitor during electro-surgery or MRI; otherwise it might result in harming the patient or the operator.

Method

Simultaneous recordings are performed by two separate transducers, one for the measurement of the fetal heart rate and a second one for the uterine contractions. Transducers may be either external or internal.

External measurement means strapping the two transducers to the abdominal wall.

- The pressure-sensitive contraction transducer, called a tocodynamometer (toco), measures the tension of the maternal abdominal wall – an indirect measure of the intrauterine pressure

The fetal heart rate transducer overlays the fetal heart, measures the fetal heart rate

The lead is then plugged into the monitor and a typical CTG reading is printed on paper and/or stored on a computer for later reference. Use of CTG and a computer network allows continual remote surveillance: a single nurse, midwife, or physician can watch the CTG traces of multiple patients simultaneously, via a computer station.

M. Arterial Blood Gas (ABG) machine

An arterial blood gas (ABG) test measures the oxygen and carbon dioxide levels in the blood as well the blood's pH balance. The sample is taken **from an artery, not a vein**,

Use- for the quantitative determination of pH, PCO2, PO2, Haematocrit, Na+, K+, Cl-, Calcium, Glu (Glucose), and Lac (Lactate) in heparinized whole blood.

Sample

Lithium heparin whole blood sample in 5 ml syringe.

Handling requirements

Correct sample handling is critical to ensure that the blood gas values obtained accurately. It is important to ensure that samples are well mixed before introduction into the analyzer. Analyze the sample within 15 minutes for blood gases. Storing samples on ice is not recommended. Using iced samples may elevate the PO2 result.

Acceptable anticoagulants-

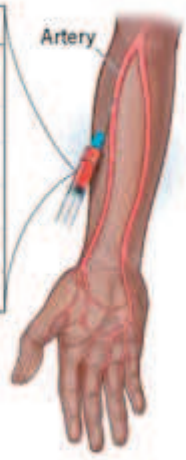
Lithium heparin is the acceptable anticoagulant.

EDTA, citrate, oxalate, sodium heparin, and sodium fluoride ARE NOT acceptable for use.

Liquid or dry heparin when present in excess may cause errors. Ensure blood collection syringe is filled as per manufacturer instructions.

Arterial Blood Gas (ABG)

ABG	Normal range
O_2CT	15-23% per 100 mL of blood
pH	7.35-7.45
$PaCO_2$	35-45 mmHg
PaO_2	80-100 mmHg
HCO_3	22-26 mEq/L
O_2Sat	95-100%



How to collect sample

- Wash hands.
- Clean the site of arterial blood sample (radial or dorsal pedis or femoral artery) with alcohol disinfectant
- Draw 5 ml of blood from the artery in a heparinised syringe
- Put compression cotton pad on the puncture site.
- Put the sample in ABG machine

Interpretation

- Acidosis pH < 7.34
- Alkalosis pH > 7.40

Chapter 15
Family Planning, Maternal and Newborn Health

Introduction

Couples have the right, as well as the responsibility, to plan their families i.e. deciding whether to have children, when to have children, and taking appropriate steps for the same.

Family planning methods help to prevent unwanted pregnancies and preventable deaths occurring due to 'too soon/ too many' births, thus impacting maternal, newborn, and child health outcomes. Staff nurses can play a crucial role in helping clients choose the most suitable contraceptive method, by ensuring that clients receive comprehensive information and make an informed choice especially in the postpartum and post abortion periods.

Too Early/Too Late	Age of mother <18 years or >35 years
Too Frequent	Interval between pregnancies is less than 2 years
Too Many	Woman is pregnant for the 5th time or more

Bad Consequences for Mother:

- Anemia
- Increased chances of:
  - Infections
  - Abortions
  - Hemorrhage
  - Obstructed Labor
  - Pre-eclampsia/Eclampsia

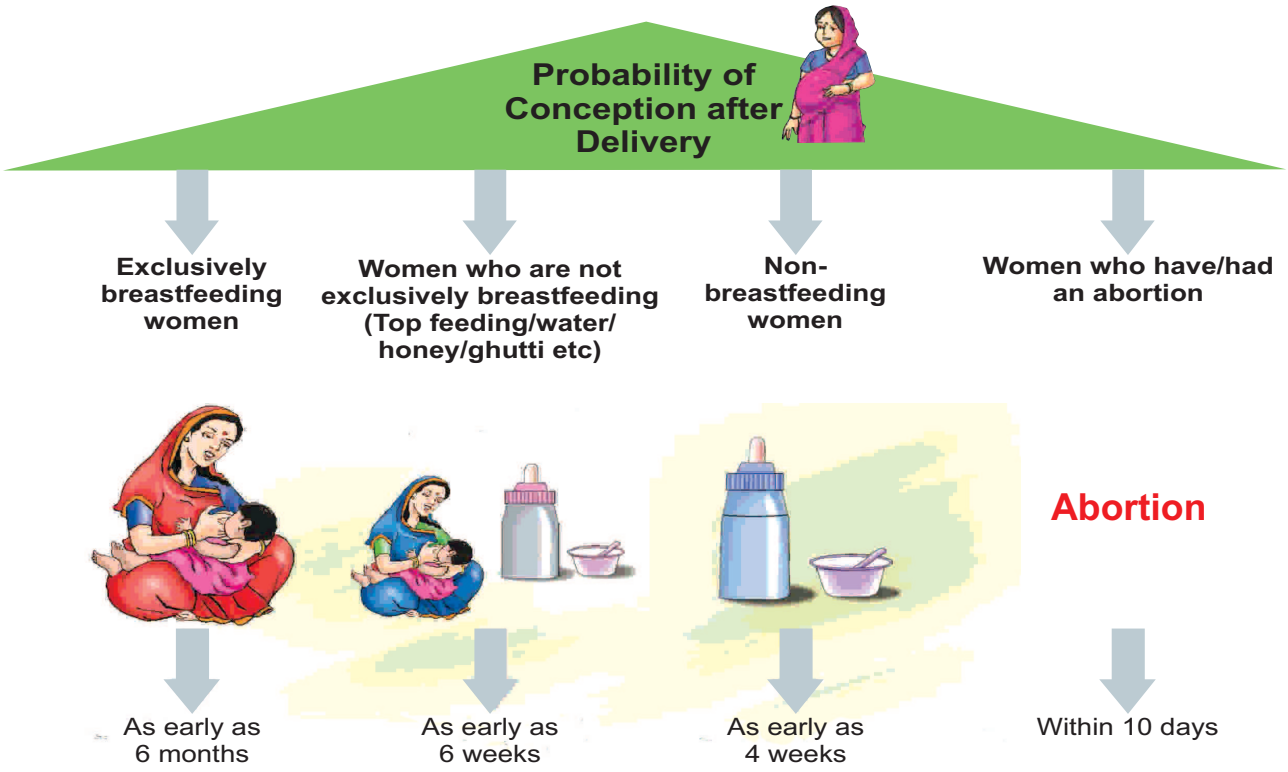
Bad Consequences for Child:

- Low-birth weight
- Pre-mature birth
- Increased chances of infant mortality

Total Fertility Rate (TFR) is the average number of children a woman would have during her reproductive years. **CPR and mCPR,** is the percentage of women of reproductive age who are currently using any or modern contraceptive methods.

Women who are sexually active, and do not use any form of birth control, but express a desire to wait two to three years before conceiving again or not wanting any more children, have **unmet need for spacing or limiting need for contraception.** These are women who are in need of contraception but are currently not using any method, despite their preference to delay or prevent future pregnancies.

The complete basket of contraceptive choices must be offered to all clients to ensure full free and informed choice. While counselling on the basket of choice of contraceptives, complete obstetrical and medical history of client should be taken to assess the client's medical eligibility for the chosen method. The use of contraceptives helps in maintaining healthy timing and spacing of pregnancies because pregnancy can occur as early as:

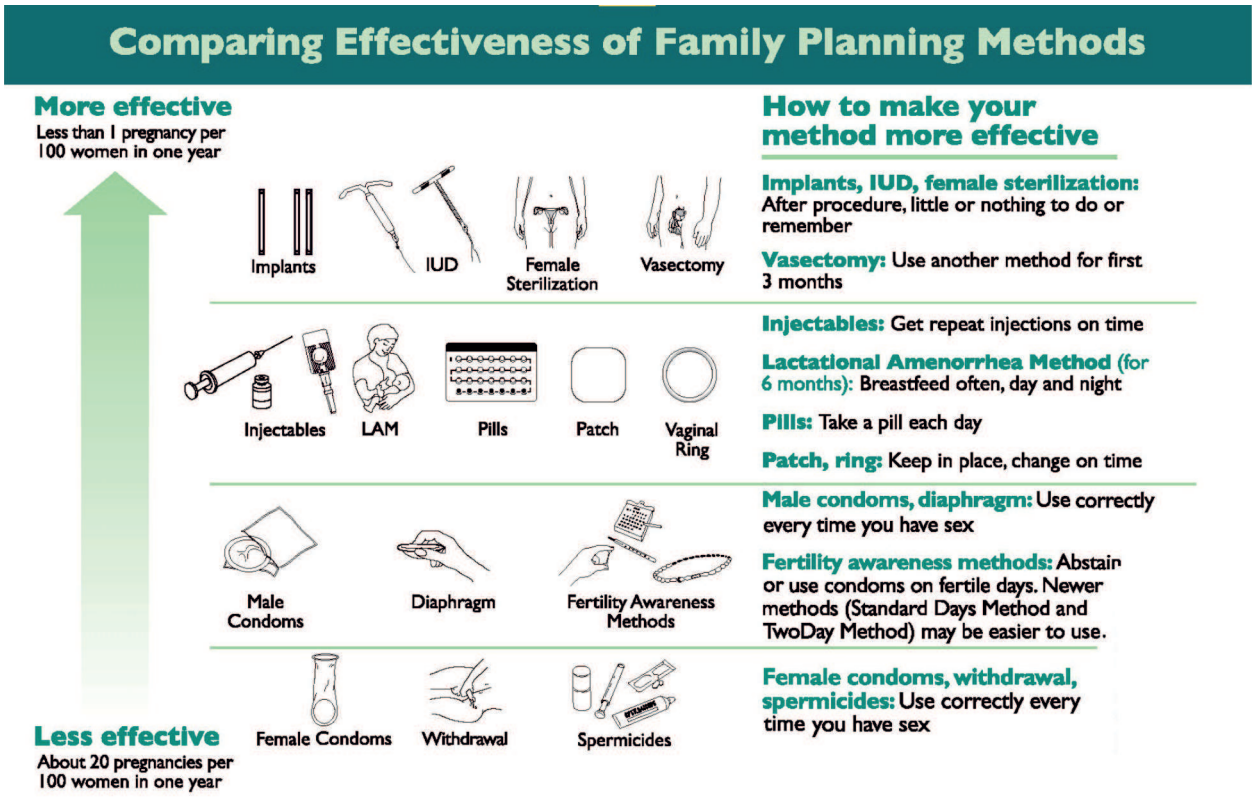


***Pregnancy can occur even before resumption of menses after childbirth/abortion**

Family Planning Methods

These are categorised broadly into: Spacing Methods, Permanent Methods and Emergency contraceptives

Spacing Methods	Permanent Methods	Emergency Contraceptives
These are further of two types non-hormonal and hormonal: **Non-Hormonal** • Intra Uterine Contraceptive Devices –Copper containing IUCD 375 and 380 A • Centchroman (Chhaya) • Condoms (Nirodh) **Hormonal:** • Injectable Contraceptives – Medroxy Progesterone Acetate (MPA) (Antara Programme) • Combined Contraceptive Pills (Mala-N), • Single rod implants • DMPA sub cutaneous	• Male Sterilisation (Conventional and Non-Scalpel Vasectomy) • Female Sterilisation (Minilap and Laproscopic)	• Emergency Contraceptive Pills – Levonorgestrel Pills (EZY pill)



Intra-Uterine Contraceptive Device (IUCD)

A method of contraception, made of plastic and copper, inserted in the uterus. There are two types of IUCD:

- IUCD 380 A- protection for 10 years 
- IUCD 375- protection for 5 years 

IUCD users should have a routine check-up at 6 weeks or after their first menstruation, whichever is earlier

Types of IUCD

Interval IUCD

Any time during menstrual cycle/ after 6 weeks of delivery/ after 12 days of completion of abortion

Post Partum IUCD (PPIUCD)

Within 48 hours of vaginal delivery/ concurrent with C Section

Post Abotion IUCD (PAIUCD)

Within 12 days of completion of abortion (surgical abortion). In case of medical abortion, the completion of abortion is ascertained on 12th day after the intake of second pill or 15th day after intake of first pill

Benefits of IUCD:

- Highly effective long-acting reversible contraceptive method No hassle of remembering to use contraceptives before each sexual contact
- Immediately effective on insertion/ immediate return of fertility on removal
- Free from side effects of hormonal methods
- Can be used as emergency contraception if inserted within 5 days of unprotected sex

Effects of IUCD insertion (non-harmful and reversible):

- Slight bleeding/ spotting after insertion.
- Increase in duration/ amount of menstrual bleeding/ spotting/ light bleeding during first few months after insertion
- Discomfort or cramps during insertion and for the next few days

Clarifying Misconceptions

- Does NOT cause Infertility Does NOT cause Cancer
- Does NOT travel from the uterus to other parts of the body
- Does NOT increase the risk of infection
- Does NOT cause discomfort during sex
- Does NOT lead to frequent abortions

Oral Contraceptives: CHHAYA (Centchroman Pills)

It is a non-steroidal, non-hormonal compound called Ormeloxifene (30 mg) which are a safe spacing option for both breastfeeding and non-breastfeeding mothers. Return of fertility is immediate on discontinuation

How it works

By creating asynchrony between developing zygote and endometrial maturation leading to prevention of implantation

How to use

For initiation of Centchroman, **the** first pill is to be taken on the first day of period and the second pill three days later. For the first 3 months the pill has to be taken twice a week

Schedule for initiating Chhaya Pills		
If 1st day of pill is	**First 3 months**	**After 3 months**
Sunday	Sun, Wed	Sunday
Monday	Mon, Thurs	Monday
Tuesday	Tues, Fri	Tuesday
Wednesday	Wed, Sat	Wednesday
Thursday	Thurs, Sun	Thursday
Friday	Sat, Tues	Friday
Saturday		Saturday

How to manage missed pills:

- Take a pill as soon as possible after it is missed.
- If pill is missed by 1 or 2 days but lesser than 7 days, the normal schedule should be continued, and beneficiary needs to use a back-up method (e.g. condoms) till the next period starts.
- If pill is missed by more than 7 days, beneficiary needs to start taking it all over again like a new user that is twice a week for 3 months and then once a week.

Benefits of Centchroman:

- No hormonal effects
- Can be adopted as immediate post-partum and post-abortion contraception
- No effect on quantity and quality of milk
- Immediate return of fertility on discontinuation
- Prevents/ improves anemia

Effects of Centchroman (Non-harmful and reversible):

- Delayed/Prolonged periods
- Scanty periods over time

Injectable Contraceptive: ANTARA [Medroxy Progesterone Acetate (MPA)

An intramuscular hormonal method for women that provides protection for 3 months with a single dose. The first dose is given only after screening by a trained doctor (MBBS and above) and subsequent doses may be given by a trained health provider (Doctor/ CHO/ SN/ ANM) in the health facility.

It contains 150mg of Medroxy Progesterone Acetate which is safe for breastfeeding mothers as it does not affect the quality and quantity of milk.

Dose and site

The injection is given intramuscularly in the upper arm, buttocks, or thigh, as per the client's preference

Subsequent doses:

- Women must visit the health facility on the scheduled date (3 months from the earlier dose). It is best to come on the scheduled date, though there is a flexibility of 2 weeks earlier or 4 weeks later than the exact date.

If the client does not take the subsequent dose in the stipulated period, she seeks the injection as a new client

Benefits:

- Prevents/ improves anaemia
- No interference with sexual intercourse
- Private and confidential method
- No effect on quantity and quality of milk

Can be adopted as postpartum (Breastfeeding- At 6 weeks of delivery and Non-Breastfeeding at 4 weeks after delivery) or post-abortion contraception (within 7 days of completion of abortion).

Effects of Injectable MPA (non-harmful and reversible):

- Menstrual Irregularities: Light/ Heavy/ No bleeding
- Delay in return of fertility (7-10 months from the last dose of injection)
- Slight weight gain
- Mood swings
- Headache

DMPA Sub-Cutaneous

A lower dose MPA is also available for subcutaneous use; called MPA-SC. Recently it has been registered in India for use after approval by the DCGI. This lower dose MPA (104 mg/0.65 mL) administered by subcutaneous (SC) route is therapeutically equivalent to the intramuscular formulation

Single Rod Implants

A subdermal contraceptive implant, the size of a match stick, inserted beneath the skin in the upper arm of the woman. Contains 68 mg of Etonorgestrel (Progestin-only contraceptive).

Period of use: Approved for a period of three years

Clinical effectiveness: Highly effective. Best among long acting reversible contraceptives.

Return to fertility: Within one month of removal

Insertion and Removal: Requires doctors who are trained in the procedure of insertion and removal. Removal involves a small incision in the upper arm

Condoms

It is a barrier method of contraception that prevents the entry of sperms in the genital tract. It is safe and suitable for couples of all age groups irrespective of the marital status.

Benefits of Condoms:

- Non-hormonal, Free from side effects
- Only contraceptive that provides dual protection (from unwanted pregnancy and STI/ HIV infection)
- No drug interactions
- No effect on quality and quantity of milk
- Can be used as soon as sexual activity resumes after delivery/ abortion
- No change in fertility
- No requirement of follow up

Key points to remember:

- A new Condom should be used each time
- Always check condom wrapper for any tear, holes, or damage. If any, discard the condom.
- A condom should be put on an erect penis only as it may tear or slip off if not used properly
- After use, always knot the condom and discard properly

Combined Oral Contraceptives Pills: MALA-N

Highly effective and reversible with immediate return of fertility on discontinuation. It contains Levonorgestrel (0.15mg) + Ethinyl estradiol (30 micrograms). Each strip of Mala-N contains 21 hormonal tablets and 7 non hormonal (iron)tablets

Benefits

- Decrease in menstrual flow and cramps
- Regulates menstrual cycle
- Prevents ectopic pregnancy
- Immediate return of fertility on discontinuation

Effects of COC (non-harmful and reversible) :

- Bleeding changes (irregular/scanty/ no bleeding/ spotting)
- Nausea/ vomiting/ headache
- Weight changes/Breast tenderness/ Acne.

Who Cannot Use

- Women with the following conditions:
- Deep vein thrombosis

- Heart disease
- Bleeding disorders
- Liver disease
- Recurrent migraine/ headaches with focal neurological symptoms
- Breast Feeding woman <6 months postpartum and non-breastfeeding <3 weeks postpartum
- Women with hypertension (BP 140/90)
- Women who smoke > 15 cigarettes/day and more than equal to 35 year old

How it works

Preventing the release of eggs from the ovaries (ovulation) and preventing implantation. Also thickens cervical mucus prevents passage of sperms.

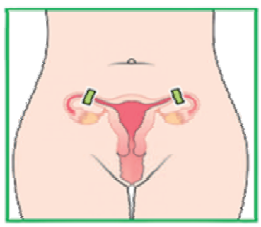
How to use

One pill to be taken every day, irrespective of intercourse. After a pack of 28 pills pills is over, the next pack needs to be started from next day itself, without any break.

How to manage missed pills

Missed 1 or 2 pills	• Take one hormonal pill as soon as possible/two pills at scheduled time
Missed 3 or more pills in 1st an 2nd week	• Take one hormonal pill as soon as possible and continue scheduled pill • Use backup metho for next days
Missed 3 or more pills in 3rd week	• Take one hormonal pill as soon as possible and finish all hormonal pills as scheduled • Start new pack next day • Use backup method for next 7 days
Missed any non hormonal pills	• Discard the missed non-hormonal pill(s) • Continue taking COCs. Start new as usual.

Female sterilization



This procedure involves permanently blocking the fallopian tubes to prevent fertilization. There are two common surgical techniques for female sterilization:

- Mini-laparotomy involves making a small incision in the abdomen. In this, a portion of the fallopian tube is ligated and incised.
- Laparoscopic technique involves inserting a long thin tube with a lens (laparoscope) in it, into the abdomen through a small incision. The laparoscope enables the doctor to view and occlude the fallopian tubes with falope rings.

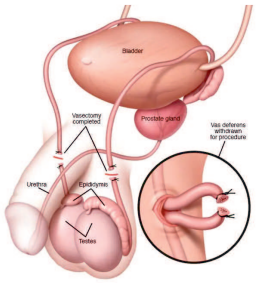
When can it be done

- Any time after ensuring that the client is not pregnant.
- Interval period – within 7 days of the beginning of the menstrual cycle or after 6 weeks of delivery
- Postpartum- within 7 days of vaginal delivery or concurrently with LSCS
- Post abortion- within 7 days of a surgical abortion

Who can undergo sterilization

- Client should be ever- married
- Age should be between 22-49 years (for females) and 22-60 years (males)
- Should have at least one child who is above one year of age (unless medically indicated)
- Client and their spouse/partner should not have undergone successful sterilization in the past
- Medical eligibility (to be ascertained by provider)

Male Sterilization



- It is a permanent method of contraception that can be adopted once the couple's family is complete.
- The procedure involves ligation of the vas deferens to prevent the entry of sperms in the penis.
- The acceptor can walk back home within 30 minutes after the procedure and recover much faster with almost negligible post procedure discomfort or complications

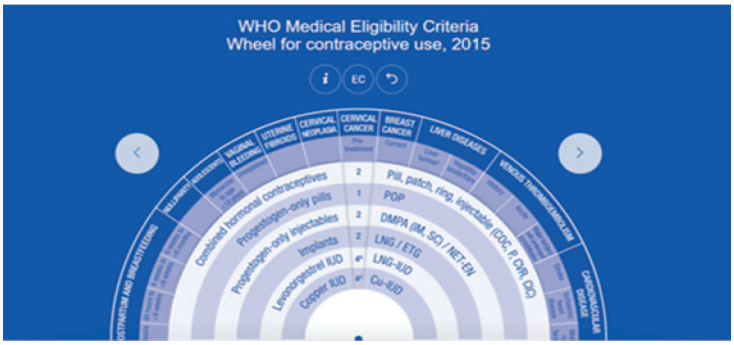
Emergency Contraceptive Pills (ECPs)

EC pills contain progestin–Levonorgestrel (1.5mg per tablet).

- Emergency contraceptive pills are used to prevent pregnancy after unprotected sexual intercourse, if sex was forced or contraceptive accidents like condom rupture or missed pills. ECPs are safe for all women including those who cannot use combined hormonal contraceptive methods
- ECPs help to prevent pregnancy when taken up to 3 days (72 hours) after unprotected sex. The effectiveness is higher if they are taken as early as possible and the rest of the cycle should be protected by using condoms till the next menstruation starts

Medical Eligibility Criteria

The WHO Medical Eligibility Criteria (MEC) forms the scientific foundation for client assessment regarding family planning methods. It gives detailed guidance regarding whether a woman with a certain condition can safely use a given method of family planning.



Medical Eligibility Criteria (MEC) Wheel : It is a very useful job-aid which guides family planning providers in recommending safe and effective contraception methods for women with medical conditions or medically-relevant characteristics.

Government Initiatives

Khushaal Parivaar Diwas

It is celebrated monthly on the 21st, or on the following day if it falls on a holiday. The government of Uttar Pradesh introduced this initiative on December 21, 2020, to promote family planning among couples. The program aims to provide couples with tailored family planning services and counselling. It also offers valuable information to high-risk pregnant women, newly married couples, and those with three or more children, raising awareness about the importance of family planning.

Saas-Bahu-Beta Sammelan

The objective of this event is to create a platform where everyone in a family can discuss family planning. Through this initiative, better communication can be established between husband, wife and mothers-in-law leading to a transformation in their mind-set, behavior, and importance of adopting family planning methods. The event also gives a platform to couples who had their first child at least two years after marriage and have a minimum three-year gap between subsequent children to share their experiences. Couples who have adopted permanent family planning methods after two children, as well as those who have not used any methods, also share their experiences during this event.

Family Planning Kit

It is a 4-column box containing family planning commodities provided free of charge; 2 columns for condoms, 1 column for pregnancy test kit (PTK), and 1 column for emergency contraceptive pill. The staff nurse placed at the health facility, will have to ensure that the commodities in the family planning kit are refilled and should update the same on FPLMIS portal.

Family Planning logistic management system (FPLMIS):

It is a portal to efficiently manage family planning supplies which includes web and mobile applications and covers all service delivery points.

Staff nurses have important responsibilities in updating FPLMIS portal such as: raising requests for supplies, acknowledging the quantity received, and using the system to record the distribution of commodities to clients. This ensures the availability of family planning resources and accurate documentation of their distribution.

1. Web based, Mobile App based, and SMS based application	2. Auto forecasting of contraceptives	3. Auto generated reports for program	4. Instant access to stock information from national level to ASHA level	5. SMS alerts for key indicators

Salient Features of FPLMIS

Care during Antenatal, Intrapartum and Post-partum Period

Introduction

Pregnancy and childbirth are normal events in the life of a woman. Though most pregnancies result in normal birth, it is estimated that about 15% may develop complications, which cannot be predicted.

Maternal death is defined as the death of a woman while pregnant or within 42 days of the termination of pregnancy (delivery or abortion), irrespective of the duration and site of pregnancy, from any cause related to or aggravated by pregnancy or its management, but not due to accidents, trauma or incidental causes.

Maternal Mortality Ratio (MMR) number of maternal deaths per 100,000 live births. According to the latest data given by the Registrar General of India for the period 2018-2020, the MMR of India was estimated to be 97 per 100,000 live births, whereas in UP, it is 167. The SDG goal is to achieve MMR < 70 per 100,000 by 2030.

Neonatal Mortality Rate (NMR) Deaths occurring during the neonatal period, commencing at birth and ending 28 completed days after birth per 1000 births.

In India, NMR is 20 and in UP, it is 28 (SRS Statistical Report 2020). The SDG target to achieve atleast 12 per 1000 live births by 2030.

The five major direct obstetric causes of maternal mortality in India are haemorrhage, puerperal sepsis, hypertensive disorder of pregnancy, obstructed labour and unsafe abortions contributing to about 55% of maternal deaths. Women below the age of 18 years or above 40 years have greater chances of having pregnancy related complications. Primi gravidas and grand multiparas (those who have had four or more pregnancies) are at a higher risk of developing complications during pregnancy and labour

Since any pregnancy can develop complications at any stage, so timely provision of obstetric care services is extremely important for management of such cases and as such, every pregnancy needs to be cared for by a Skilled Birth Attendant (SBA) during pregnancy, childbirth and the post-partum period.

What can be done to combat maternal deaths?

Most of the maternal deaths are linked with three types of delays which can result in an increase in maternal morbidity and mortality. They are-

Delay 1: Delay in Recognising danger signs and deciding to seek appropriate medical help for an obstetric emergency

Delay 2: Delay in reaching an appropriate obstetric facility

Delay 3: Delay in receiving adequate quality of care once a woman reaches the facility

Sensitizing the community and family for right decision at right time and timely referral through pre-identified transport can address the first two delays and would help women access the services available as and when required. Simultaneously, the health workers need to be technically competent and facility adequately equipped to provide services/care to the woman reaching the health facilities. This would help in ensuring the provision of skilled attendance to all women during pregnancy and childbirth.

Care During Pregnancy—Antenatal Care (ANC)

Antenatal care is the systemic supervision of women during pregnancy to monitor the progress of foetal growth and to ascertain the well-being of the mother and the foetus. A proper antenatal check-up provides necessary care to the mother and helps identify any complications of pregnancy such as anaemia, pre-eclampsia and hypertension etc. in the mother and slow/inadequate growth of the foetus. Antenatal care allows for the timely management of complications through referral to an appropriate facility for further treatment. It also provides opportunity to prepare a birth plan and identify the facility for delivery and referral in case of complications.

However, one must realize that even with the most effective screening tools, one cannot predict which woman will develop pregnancy-related complications during and immediately after child birth.

We must therefore:

- Recognize that **'Every pregnancy'** is special and every pregnant woman must receive special care.
- Complications being unpredictable may happen in any pregnancy/child birth and we should be ready to deal with them if and whenever they happen.
- Ensure that ANC is used as an opportunity to detect and treat existing problems, e.g. essential hypertension.
- Prepare the woman and her family for the eventuality of an emergency.
- Make sure that services to manage obstetric emergencies are available on time

For Quality ANC :

- Ensure early registration and see to it that the first check-up is conducted within 12 weeks (first three months of pregnancy).
- Track every pregnancy for conducting at least four antenatal check-ups (including the first visit for registration)
  - ***Suggested schedule for antenatal visits***

    1st visit: Within 12 weeks

    2nd visit: Between 14 and 26 weeks

    3rd visit: Between 28 and 34 weeks

    4th visit: Between 36 weeks and term
- Take the client's history. Enquire from the pregnant women and record the following information :
  - Menstrual history to calculate the Estimated Date of Delivery (EDD)

    (Estimated Date of Delivery = Date of Last Menstrual Period (LMP) + 9 Months + 7 Days)
  - Obstetric history/history of previous pregnancies including Gravida Parity Living Children & Abortions (GPLA).
  - Any history of previous Caeserian Sections/ still birth/neonatal deaths/repeated abortions/infertility treatment, etc.
  - History of any current systemic illness/past history of illness eg. Tuberculosis (TB), asthma, epilepsy, heart disease, jaundice, hypothyroidism.
  - Family history of systemic illness
  - History of drug intake or allergies
  - History of intake of habit-forming or harmful substances eg tobacco, alcohol.

Essential components at every antenatal check-up:

- Verify history and ask for complaints and danger signs
- Conduct a physical examination

General examination

- Measure the height, weight, temperature, blood pressure and respiratory rate. Check for pallor and oedema.
- Examine oral cavity, thyroid and bilateral breasts.

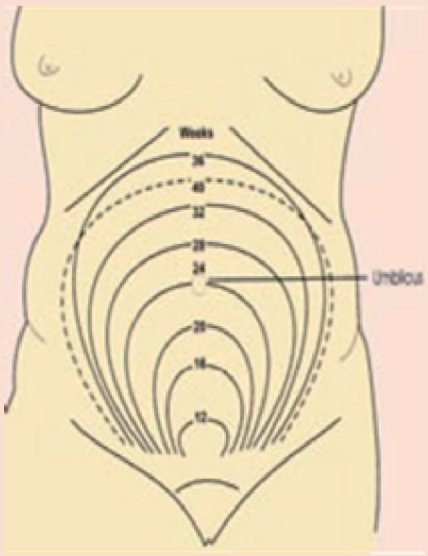
Abdominal examination

- Ask the pregnant woman to pass urine and ensure privacy of the pregnant woman during examination.
- Wash hands and warm them before touching the client.
- Inform the pregnant woman about the examination and take her verbal consent.

- **Stand to the right** of the pregnant woman. Expose the pregnant woman's abdomen from xiphisternum to pubic symphysis.
- Inspection of scars/skin infections/shape/size
- Conduct abdominal palpation for foetal growth, foetal lie and auscultation of Foetal Heart Sound (FHS) according to the stage of pregnancy.

Measurement of Fundal Height

At 12th week	Just palpable above the symphysis pubis
At 16th week	At lower one-third of the distance between the symphysis pubis and umbilicus
At 20th week	At two-thirds of the distance between the symphysis pubis and umbilicus
At 24th week	At the level of the umbilicus
At 28th week	At lower one-third of the distance between the umbilicus and xiphisternum
At 32nd week	At two-thirds of the distance between the umbilicus and xiphisternum
At 36th week	At the level of the xiphisternum
At 40th week	Sinks back to the level of the 32nd week, but the flanks are full, unlike that in the 32nd week



If the height of the uterus is more or less than that indicated by the period of amenorrhea, the possible reasons could be as follows:

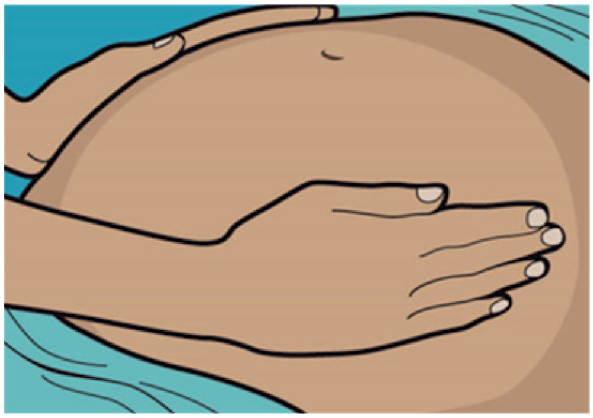
Height of the uterus more than that indicated by the period of amenorrhea	Height of the uterus less than that indicated by the period of amenorrhea
• Wrong date of LMP • Full bladder • Multiple pregnancy/large baby • Polyhydramnios • Hydrocephalus • Hydatidiform mole	• Wrong date of LMP • Intra Uterine Growth Restriction (IUGR) • Missed abortion • Intrauterine Death (IUD) • Transverse lie

Palpation to determine Foetal lie and presentation

A. Fundal palpation/fundal grip

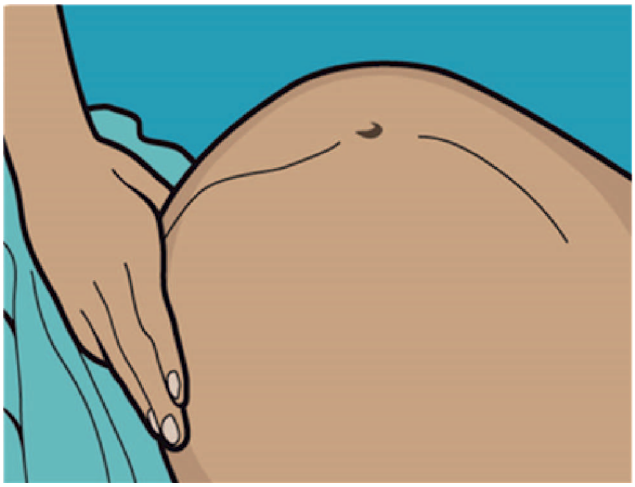
This manoeuver helps determine the lie and presentation of the foetus.

B. Lateral palpation/lateral grip



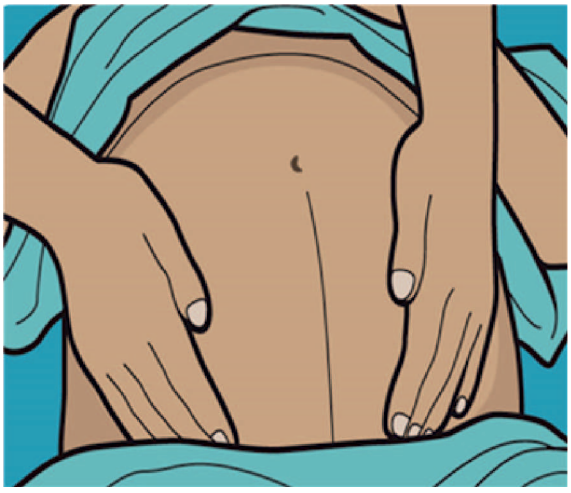
This manoeuver is used to locate the foetal back.

C. First pelvic grip/superficial pelvic grip



The third manoeuver must be performed gently. It helps to determine whether the head or the breech is present at the pelvic brim. If the head cannot be moved, it indicates that the head is engaged. In the case of a transverse lie, the third grip will be empty.

D. Second pelvic grip/deep pelvic grip



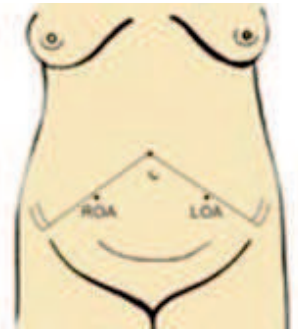
This manoeuver, in experienced hands, will be able to tell us about the degree of flexion of the head.

Foetal heart sound and foetal heart rate

The foetal heart sound in cephalic presentation is best heard at the midpoint of the spino-umbilical line on the side of the foetal back determined by the lateral grip.

The normal fetal heart rate is 120-160 beats per minute.

The foetal heart may be auscultated with a stethoscope or a hand-held foetal doppler.



(Note: ROA right occipitoanterior
LOA left occipitoanterior position)

Investigations

- Carry out investigations, such as haemoglobin estimation, urine tests for sugar and proteins, oral glucose tolerance test, HIV and syphilis, which are all point of care tests.
- Get the woman tested for blood group and Rh factor and Hepatitis B Surface Antigen (HBsAg) which requires laboratory testing.
- Women with high risk factors suggestive of deranged thyroid function should be tested for TSH, T3 and T4 in the lab (High Risk Factors such as obesity, prior history of hypothyroidism, history of infertility, history of recurrent miscarriages, preterm delivery, intrauterine demise, pre-eclampsia/eclampsia, etc.).

Blood group determination

- Essential for all primi-gravida and for women with undocumented blood group
- Required to arrange blood for transfusion in emergency
- Blood group and Rh typing of husband needs to be done for those women who are Rh negative.
- Cord blood of baby should be taken at the time of delivery of babies whose mothers are Rh negative for their blood group.
- Anti D needs to be given to Rh negative mothers with Rh positive husbands at 28 weeks, 36 weeks and within 72 hours of mis-carriage or delivery of Rh positive baby.

Oral glucose tolerance test (GTT)

- To be done for all PW at the time of 1st ANC.
- To be repeated at 24-28 weeks for all PW who tested normal in the 1st Oral GTT.
- For women coming for the 1st time after 28 weeks, oral GTT should be done immediately if not done earlier.

75 g glucose dissolved in 300 ml of water is to be taken by the pregnant woman over 10 minutes irrespective of the timing of the last meal (fasting NOT needed).

Blood sugar is measured with calibrated glucometer at 2 hours and should be **<140 mg%.**

Women with blood sugar >or = 140mg % is a high- risk pregnancy and should be connected to a doctor for further management.

Advise for ultrasound

Every pregnant woman should ideally undergo 3 USGs for fetal well-being

- At 8-10 weeks or at least in 1st trimester. It helps in confirmation of EDD, location of pregnancy (intra-uterine or ectopic), viability, number of fetuses etc.
- At 18-20 weeks, to rule out any gross congenital anomaly.
- At 32-34 weeks for fetal growth, placental position, fetal position and amount of amniotic fluid.

However, if 3 USGs are not possible, efforts should be made to get at least 1 ultrasound done at 18-20 weeks to rule out anomalies while it also tells about number of fetuses, location of placenta and estimates EDD +/- 10 days.

Interventions

- Tab Folic acid 400mcg (available tablet is 5 mg) to be given in 1st trimester till 14-16 weeks to prevent neural tube defects in the fetus.
- Tab Iron and Folic Acid containing 60 mg of elemental iron and 500 mcg of folic acid supplementation from 14-16 weeks onwards to be given for 180 days before delivery and 180 days after delivery.
- Deworming with Tab Albendazole 400 mg once during the pregnancy at 14-16 weeks. However, it may be done any time in 2nd or 3rd trimester, if not given at 14-16 weeks.
- Tab Calcium containing 500 mg elemental calcium with 250 IU Vit D3 twice daily 14-16 weeks onwards (360 tablets before delivery and 360 tablets after delivery).

- Administration of Td injection.
  - 1st dose to be given at the time of registration
  - 2nd dose after a gap of minimum 28 days
  - In case the pregnancy is within 3 years of last pregnancy and the pregnant woman was given 2 doses in the previous pregnancy, she should be a given a single booster dose in this pregnancy.

Counselling

- Help the woman to plan and prepare for birth (birth preparedness/micro birth plan). This should include deciding on the place of delivery and the presence of an attendant at the time of the delivery.
- Advantages of institutional deliveries and risks involved in home deliveries.
- Advise the woman on where to go if an emergency arises, and how to arrange for transportation, money and blood donors in case of an emergency.
- Educate the woman and her family members on signs of labour and danger signs of obstetric complications
- Emphasize the importance of seeking ANC and PNC services.
- Advise on diet (nutrition) including use of iodized salt and rest.
- Inform the woman about breastfeeding, including exclusive breastfeeding.
- Provide information on sex during pregnancy.
- Warn against domestic violence (explain the consequences of violence on a pregnant woman and her foetus).
- Promote family planning.
- Inform the woman about the Janani Suraksha Yojana/Janani Shishu Suraksha Karyakram /Pradhan Mantri Surakshit Matritva Abhiyan/Pradhan Mantri Matritiva Vandana Yojna.

The Mother and Child Protection Card (MCP card)

The MCP Card is a maternal and child care entitlement card, a counselling and family empowerment tool which would ensure tracking of mother and child cohort for health, nutrition and development purposes. As the first contact point between a pregnant woman and the health system, the MCP card has the potential to create awareness, facilitate community dialogue and generate demand for uptake of vital services being provided.

Who are the specific target groups for the card?

1. Pregnant women
2. Lactating women
3. Families with children under 3 years of age, extending up to 16 years for immunization

Who keeps the card?

1. Pregnant woman/her family
2. Mothers/parents of children under 3 years of age
3. Immunization Counterfoil to be retained by ANM

MINISTRY OF HEALTH AND FAMILY WELFARE
MINISTRY OF WOMEN AND CHILD DEVELOPMENT

MOTHER AND CHILD PROTECTION CARD (MCP CARD)

Be Wise! Get your child fully immunized

POSHAN Abhiyaan
PM's Overarching Scheme for Holistic Nourishment
सही पोषण - देश रोशन

Keep this card safe and carry along with you during every visit to Village Health Sanitation and Nutrition Day, Anganwadi Centre, Health Centre and Hospital

2018 Version

MINISTRY OF HEALTH AND FAMILY WELFARE
MINISTRY OF WOMEN AND CHILD DEVELOPMENT

MOTHER AND CHILD PROTECTION CARD

paste photo of child here

Is the pregnancy high risk? Yes No

FAMILY IDENTIFICATION

Mother's Name _____ Age _____
Father's Name _____
Address _____
Mobile No. Mother _____ Mobile No. Father _____
MCTS/RCH ID (Mother) _____
Eligible for PMMVY Yes ☐ No ☐
Bank & Branch Name _____
Account No. _____ IFSC _____

PREGNANCY RECORD

No. of Pregnancies / Previous Live Births _____
Last Delivery Conducted at _____
Date of Last Menstrual Period _____
Expected Date of Delivery _____
Name of Identified Delivery Institution _____
Pregnancy Outcome Live Birth ☐ Still Birth ☐

BIRTH RECORD

Child's Name _____
Date of Birth _____ Birth Weight _____
Current Place of Delivery _____
☐ Male ☐ Female Birth Registration No. _____
MCTS/RCH ID (Child) _____

INSTITUTIONAL IDENTIFICATION

AWW _____ LGD Code _____
AWC No. | | | | | | | | | | | |
Village _____ Ward _____ Block _____
Postal Account _____ Postal Code _____
ASHA _____ ANM _____
Hospital Phone No. _____
SHC / Clinic _____ PHC / Town _____
Hospital / FRU _____ District _____
Sub-centre Reg. No. _____ Date _____
Fixed VHSND day _____
Referred to _____ _____ _____ _____ _____

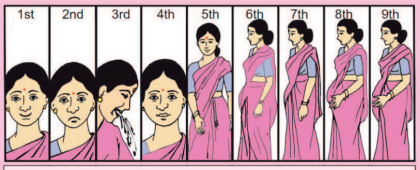
Child's Aadhaar No. _____
Mother's Aadhaar No. _____

ASHA Mobile Number _____
ANM Mobile Number _____
Ambulance Toll Free Phone Number _____

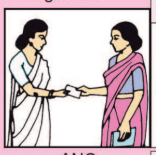
Regular checkup is essential during pregnancy

Urine Pregnancy Test
Yes ☐ No ☐
Date: __/__/____

Months: 1st 2nd 3rd 4th 5th 6th 7th 8th 9th



Registration

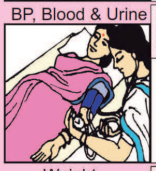


Register with the Health Centre in the 1st trimester.

ANC

Have at least **3** antenatal checkups, after registration.

BP, Blood & Urine

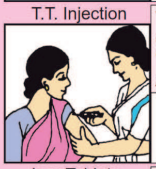


Have blood pressure (BP) checked and blood and urine examined at each visit.

Weight

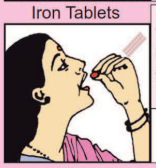
Have weight checkup at each visit. Gain at least **9-11** kg. during pregnancy. Gain at least **1** kg every month during the last **6** months of pregnancy.

T.T. Injection



Take two T.T. Injections. T.T.1 when pregnancy is confirmed and T.T.2 after **1** month. (Fill in the date)
**Give one dose of T.T. if previously vaccinated within 3 years.*

Iron Tablets



Take one tablet of iron folic acid a day for at least **6** months after first trimester. Take at least **180** tablets. (Fill in quantity and date issued)

Take two tablets of calcium per day for at least 6 months after 1st trimester

Take single dose of tablet albendazole (400 mg) after 1st trimester ____/____/_____

Care During Pregnancy

- Consume a variety of food including fortified food items like wheat flour, edible oil etc.
- Consume more foods- around 1/4th times extra than the normal diet.
- Consume Supplementary Nutrition from the AWC regularly.
- Rinse the mouth after every meals brush the teeth atleast twice a day.
- Take at least two hours of rest during the day and in addition to 8 hours of rest at night.
- Use only adequately iodised/ double fortified salt.

आयोडीन नमक

Ensure nutrition counselling at every ANC

ANTENATAL CARE

OBSTETRIC COMPLICATION IN PREVIOUS PREGNANCY
(Please tick (✓) the relevant history)

A. APH	☐	B. Eclampsia	☐	C. PIH	☐
D. Anaemia	☐	E. Obstructed Labor	☐	F. PPH	☐
G. LSCS	☐	H. Congenital Anomaly	☐	I. Abortion	☐
J. Other	☐				

PAST HISTORY
(Please tick (✓) appropriate response/s)

A. Tuberculosis	☐	B. Hypertension	☐	C. Heart Disease	☐
D. Diabetes	☐	E. Asthma	☐	F. Others (Specify)	☐

EXAMINATION

Height (cms)	Heart	Lungs	Breasts (check for inverted nipple)

ANTENATAL VISITS

	1	2	3	4	5 (Under PMSMA)
Date					
POG (Weeks)					
Weight(Kg)					
Pulse Rate					
Blood Pressure					
Pallor					
Oedema					
Jaundice					
Any Complaints					
ABDOMINAL EXAMINATION					
Fundal Height Weeks in cm					
Lie/Presentation					
Fetal Movements	Normal/ Reduced/ Absent	Normal/ Reduced/ Absent	Normal/ Reduced/ Absent	Normal/ Reduced/ Absent	Normal/ Reduced/ Absent
Fetal Heart Rate per Minute					
P/V if Done					
ESSENTIAL INVESTIGATIONS					
Hemoglobin (Gms)					
Urine Albumin					
Urine Sugar					
HIV Screening					
Syphilis					
Ultrasonography (Y/N)					
Gestational Diabetes Mellitus					

Blood Group & Rh Typing ☐ Date ☐

OPTIONAL INVESTIGATIONS

1. Thyroid-Stimulating Hormone	☐	Date	☐
2. Hbs Ag.	☐	Date	☐
3. Blood sugar	☐	Date	☐
4. Others	☐	Date	☐

Participate in monthly fixed Village Health Sanitation and Nutrition Day

POST NATAL CARE

Date of Delivery ☐☐☐☐☐☐☐☐

Place of Delivery

Institution: Normal ☐ Assisted ☐ CS ☐

Home: SBA ☐ Others ☐

Live Birth ☐ Still Birth ☐

Term/Preterm/Abortion _____

If at Institution, Period of Stay Post Delivery _____

Complications, if any (Specify) _____

Sex of baby M F *Weight of baby ☐ kg. ☐☐☐ gms

Cried immediately after birth Y N

Initiated exclusive breast feeding within 1 hour of birth Y N

Injection Vitamin K Y N

Take one tablet of iron folic acid per day for atleast 6 months after delivery

Take two tablets of calcium per day for atleast 6 months after delivery

POST PARTUM CARE

	1st Day	3rd Day	7th Day	6th Week
Any complaints				
Pallor				
Pulse Rate				
Blood Pressure				
Temperature				
Breasts (Soft/Engorged)				
Nipples (Cracked/Normal)				
Uterus Tenderness (Present/Absent)				
Bleeding P/V (Excessive/Normal)				
Lochia (Healthy/Foul Smelling)				
Episiotomy/Tear (Healthy/Infected)				
Family Planning Counselling (Y/N)				
Any other Complications and Referral Requirements (Y/N)				

If baby is less than 2 kg, contact ANM for support, for continued breastfeeding and Kangaroo mother care

CARE OF BABY

	1st Day	3rd Day	7th Day	6th Week
Weight				
Urine passed				
Stool passed				
Diarrhoea				
Vomiting				
Convulsions				
Activity (Good/Lethargic)				
Sucking (Good/Poor)				
Breathing (Fast/Difficult)				
Chest Indrawing (Present/Absent)				
Temperature				
Jaundice				
Condition of Umbilical Stump				

*(Three extra visits if birth weight < 2.5kg)

7

High Risk Pregnancies (HRP)

Classification of HRP (Based on Complications)

1. **History of (H/O) complications in Previous Pregnancy-**
   - Previous H/O of intrauterine death (IUD), Stillbirth, Neonatal Death
   - Previous H/O of Preterm delivery
   - Repeated abortions
   - Blood group, Rh related disorder and Haemolytic disease
   - Previous H/O of Low birth weight (< 2.5 Kgs)
   - Previous H/O of Eclampsia/Pre-eclampsia (Hypertension and Seizures/Convulsions)
   - Previous H/O of Caesarean section
   - H/O of past foetuses/babies with congenital anomalies
   - Previous H/O of PPH
2. **HRP in Present Pregnancy-**
   - Foetus with congenital anomalies
   - Placental malformation or abnormal location
   - Pre-eclampsia (Hypertension / Presence of Albumin in urine/Swelling)
   - Polyhydramnios (Increased amniotic fluid) /Oligohydramnios (Decreased amniotic fluid)
   - Diabetes/Kidney disease
   - Severe Anemia
   - Ectopic pregnancy
   - Vaginal bleeding
   - Excessive Tobacco and Alcohol consumption
3. **Physical Risk Factor-**
   - Age <15 yrs or >35 yrs
   - Short Height (< 145 cms)
   - Cervix/Uterus deformities
   - Low weight of mother (< 35 kgs)
4. **Medical High Risk Factor-**
   - Severe Anemia
   - Hypertension
   - Heart disease/ Kidney disease
   - Epilepsy
   - Tuberculosis
   - Thyroid disfunction
   - TORCH (+ve)

Hypertensive disorders in pregnancy

Hypertension in the first 20 weeks of gestation is called chronic hypertension while that developing after 20 weeks is called gestational hypertension.

These are high risk pregnancies

Gestational /Chronic hypertension

BP >140/90 mm Hg in pregnancy measured on 2 occasions 4 hours apart.

Pre-eclampsia

BP >140/90 mm Hg + proteinuria on urine dipstick >/= +1

Severe pre-eclampsia –

- BP >160/110 mm Hg or
- proteinuria >/= +3 or
- presence of any danger sign such as severe headache, blurring of vision, difficulty in breathing, severe epigastric pain or oliguria with BP between 140/90 mm Hg and 160/110 mm Hg

Eclampsia

Gestational hypertension + convulsions

Management of Eclampsia:

Triage and labour room should have a fully replenished eclampsia kit available at all times.

- Wash hands thoroughly with soap and water and dry them before and after the procedure
- Measure vital signs (Pulse rate/ BP/ Temperature/ Respiratory rate/ Foetal Heart Rate)
- If convulsion is present, put a mouth gag to prevent tongue bite
- Keep the client in a quiet room in a bed with padded rails on sides. Position her on left side
- The oropharyngeal airway is to be kept patent. Perform suction as needed
- Give oxygen by mask at 6-8 lit/ min and start IV fluids – RL/ NS @ 75 ml per hour.
- Insert Foley's catheter and monitor input/ output
- Keep ready 10 ampules of 50% w/v MgSO4
  - (1 ampoule = 2 ml = 1 gm).
  - Prepare 2 syringes (10 ml syringe and 22 gauge needle) with 5g (10 ml) of 50% w/v magnesium sulphate solution in each syringe. Add 1ml of 2% Xylocaine
- Carefully clean the injection site with an alcohol swab. Give 5g (10 ml) deep IM injection in each buttock (upper outer quadrant). Cut the needle with hub cutter and discard used syringes in a proper waste bin.
- In FRU and DWH in addition to 10 gm IM with 1ml of 2% Xylocaine, 4gm 20% w/v MgSO4 will be given slow IV over 5 mins. Hence total loading dose at FRU/DH will be 14 gm
  - (1 ampoule = 2 ml = 1 gm).
  - To prepare 4 gm IV MgSO4 – Fill 1 syringe (20 ml syringe and 22 gauge needle) with 4gm (8 ml) of 50% w/v magnesium sulphate solution and 12 ml NS = 20% w/v MgSO4.
- If recurrent fits after 15-30 minutes of loading dose – repeat 2gm 20% w/v. (4 ml drug with 6 ml NS) slow IV in 5 mins
- Maintenance dose is to be given at FRU – 5gm (50% w/v) deep IM in alternate buttocks every 4 hours for 24 hours after delivery or after the last convulsion. The following shoul be monitored before giving the dose-
  - Deep tendon reflexes (DTR) - should be present
  - Urine output - should be $\geq$ 30 ml per hour
  - Respiratory rate - should be more than 16 per minute
- Record drug administration and finding on the woman's record.
- Refer to nearest functional First Referral Unit (FRU) with appropriate referral slip.

Anemia in pregnancy

A woman who has a haemoglobin (Hb) level below 11 g/dl at any time during the pregnancy is considered to be suffering from anaemia.

Management of maternal anaemia

Gestational Period	Hb < 7 gm/dl	7.1 – 8.9 gm/dl	9-11 gm/dl
14 – 32 weeks onwards Deworming with tab albendazole 400 mg	Blood transfusion/ IV iron sucrose infusion depending on clinical situation	• IFA tablet with 60 mg of elemental Iron and 0.5mg of folic acid 1 tablet twice daily (2 tablets per day) • Monitor hemoglobin after one month to look for adequate rise. • IV iron sucrose if not tolerating oral iron. (Treatment depends on severity, proximity to delivery and symptoms).	• IFA tablet with 60 mg of elemental Iron and 0.5mg of folic acid 1 tablet twice daily (2 tablets per day) • Monitor hemoglobin after one month to look for adequate rise.
32- 36 weeks	Blood transfusion	IV iron sucrose infusion	
More than 36 weeks	Blood transfusion	IV iron sucrose infusion/ Blood transfusion (if clinically indicated) (Treatment depends on severity & symptoms)	

If Hb % is more than 11 gm %: Continue with 1 tab IFA daily (180 tablets before delivery and 180 tablets after delivery)

- Hb estimation is to be done at least 4 times (in 4 ANC) for non-anaemic women and on every ANC for severely anaemic women.
- Deworming is done at 14-16 weeks gestation for all PW by giving 1 tab of 400 mg Albendazole, to be chewed and taken under supervision of the provider.
- Pregnant woman should be counselled that IFA should not be taken with Calcium, food, milk etc. She should also be counselled for common side effects such as nausea, constipation or dark stools, which will disappear on taking IFA regularly and continuously.
- Dietary counselling for high protein diet and green leafy vegetables should be done.

How to administer iron sucrose injection

Total dose in mg required by the pregnant woman is calculated by formula-

(Pre-pregnancy weight in kg x 2.4 x Hb Deficit) + 500

- Injection Iron sucrose is given as IV infusion at a dose of 200mg at a time in 100ml Normal saline IV over 15-20 mins.(Initially first 5 mins very slowly) Given on alternate days in the presence of a medical officer as per the no. of doses calculated.
- Vital signs need to be monitored once before, once during and once after iron sucrose infusion and resuscitation trolley with all emergency drugs and equipment is to be kept ready at bedside at all times.
- IFA should be discontinued during the entire course of Iron sucrose therapy till after 48 hrs of completion of last dose.
- If Hb <5gm%,irrespective of gestational age, blood transfusion is given.

Intrapartum care

Organising The Labour Room

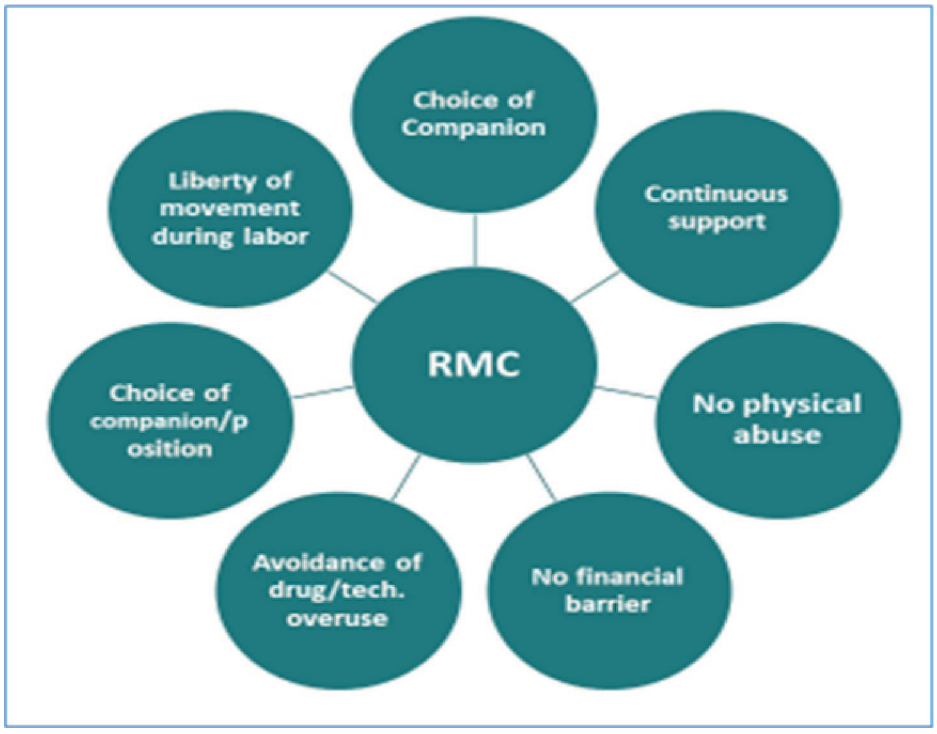
1. The appropriate environment in the Labour Room is to be maintained with adequate lighting, cleanliness, appropriate temperature depending on the surroundings, curtains/screens, windows with intact panes, attached functional toilet with running water. All the important protocols shall remain displayed in an appropriate place in the Labour Room

2. The equipment needed in the Labour Room is available and functional
3. Ensure that all the instrument trays are sterilized and available for each case and the drugs and other trays should always be kept ready
4. All surfaces are cleaned with bleaching powder solution, including the labour tables
5. **Arranging the newborn care corner:**
    - Radiant warmer plugged in, functional and switched on at least 20-30 minutes before the time of delivery
    - Pre-tested, disinfected and functional newborn resuscitation bag and mask is kept ready on the shelf just below the radiant warmer
    - A clock with a second hand should be placed in a prominent place
6. Suction apparatus:
    - For the newborn: Disposable mucous extractor in the tray
    - For the mother: Foot-operated/electric suction is functional along with disposable suction catheter
7. Oxygen cylinder:
    - Check that oxygen is available and flow is checked under water (in a bowl) before inserting the tube and that the knobs are pre-checked
    - A new disposable tube should be used every time oxygen is administered
8. Infection Prevention (IP) practices:
    - The hand-washing area must have soap and running water, and a long-handled tap which can be operated with the elbow
    - Drums to store sterilized items such as gloves, instruments, linen, swabs and gauze pieces
    - Autoclave exclusively for the Labour Room should available and functional, delivery instruments should be wrapped in a sheet and autoclaved in enough numbers (one set per delivery). Autoclaving should be done at least twice a day (at the end of morning and evening shifts), soiled instruments should be first put into 0.5% chlorine solution before processing.
9. Bio Medical Waste disposal – colour-coded bins should be available
10. Records – case sheets with partograph, labour registers, refer-in/refer-out registers should be available and completed for each case

Key points to remember:

- A temperature of between 26ºC and 28ºC must be maintained in the Labour Room and cold areas will need heaters during winter
- Equipment must be checked for its functionality during the change in nursing staff shifts
- Ensure Respectful Maternity Care.
- Use sterilized instruments for every delivery
- The Labour Room should be draught-free
- 20% buffer stock of drugs needed in the Labour Room must be available at all times
- NBCC should not be subject to direct air currents from any source
- Breastfeeding should be initiated within 1 hour
- Injectable oxytocin should be kept in the fridge (not freezer)
- Ensure all members of staff– doctors, nurses, cleaning staff – practice and adhere to infection prevention protocol.
- The colour-coded bins are emptied at least once a day or as and when they are three quarters filled up.

Respectful Maternity Care



Client Rights

Following are the seven 'Universal Rights of Childbearing Women', which need to be considered and practiced during care provision

Category of Disrespect and Abuse	Corresponding Right
Physical abuse	Freedom from harm and ill treatment
Non-consented care	Right to information, informed consent and refusal, and respect for choices and preferences, including companionship during maternity care
Non-confidential care	Confidentiality, privacy
Non-dignified care (including verbal abuse)	Communication with dignity and respect
Discrimination based on specific attributes	Equality, freedom from discrimination, equitable care
Abandonment or denial of care	Right to timely healthcare and to the highest attainable level of health
Detention in facilities	Liberty, autonomy, self-determination, and freedom from coercion

Empowering Birth Companion

A birth companion is someone who will be with the labouring woman during and immediately after delivery. Usually, birth companions are women who have undergone the process of labour and provide continuous one-to-one support to other women experiencing labour and child birth.

Ensure availability of a birth companion with proper counselling on her/his role. Let her/him participate in the care provision with a responsibility.

A birth companion plays a vital role in:

- Providing emotional support to the mother.
- Early identification of danger signs and information to service providers.
- Provide support in basic care practices such as maintaining hydration of mother during labour, keeping the baby covered and early initiation of breast feeding, etc.

Care During Labour and Delivery—Intra-partum Care

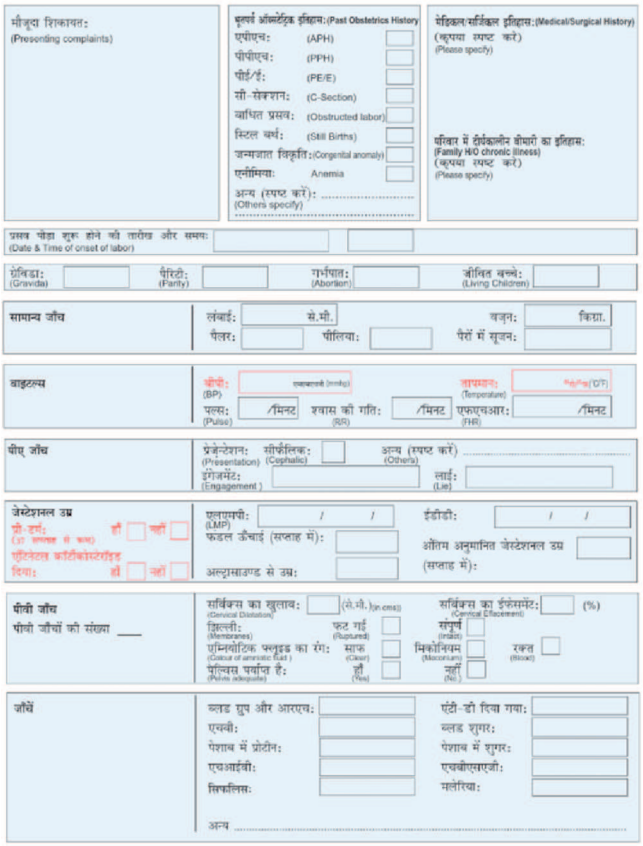
Normal labour is a spontaneous process of expulsion of the foetus and placenta. However it is important to remember that during the intra partum period the woman and the baby go through physical as well as mental trauma.

Initial Assessment and Vaginal Examination during Labour

1. Assessment

   All pregnant and delivered women arriving in the facility should undergo a quick initial assessment including vital signs, perabdomen and pervaginum examination (if required) and should be asked for danger signs in the triage to segregate women requiring urgent intervention from others.

   The WHO Safe Childbirth Checklist 1 in the casesheet should be filled at the time of initial assessment.


मौजूदा शिकायत:
(Presenting complaints)

भूतपूर्व ऑब्सटेट्रिक इतिहास:(Past Obstetrics History)
एपीएच: (APH)
पीपीएच: (PPH)
पीई/ई: (PE/E)
सी-सेक्शन: (C-Section)
बाधित प्रसव: (Obstructed labor)
स्टिल बर्थ: (Still Births)
जन्मजात विकृति:(Congenital anomaly)
एनीमिया: Anemia
अन्य (स्पष्ट करें): (Others specify)

मेडिकल/सर्जिकल इतिहास:(Medical/Surgical History)
(कृपया स्पष्ट करें) (Please specify)

परिवार में दीर्घकालीन बीमारी का इतिहास:
(Family H/O chronic illness)
(कृपया स्पष्ट करें)
(Please specify)

प्रसव पीड़ा शुरू होने की तारीख और समय: (Date & Time of onset of labor)

ग्रेविडा: (Gravida) पैरिटी: (Parity) गर्भपात: (Abortion) जीवित बच्चे: (Living Children)

सामान्य जाँच
लंबाई: से.मी. वज़न: किग्रा.
पैलर: पीलिया: पैरों में सूजन:

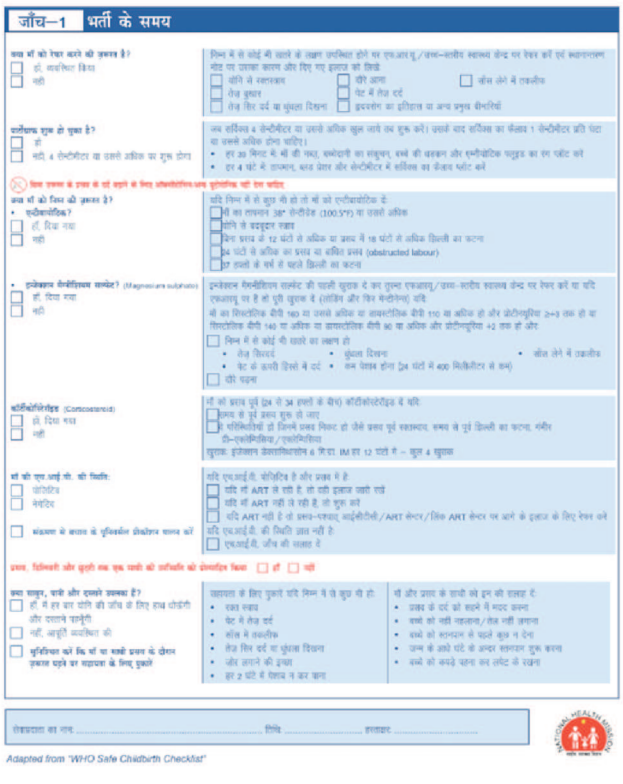
वाइटल्स
बीपी: (BP) तापमान: (Temperature)
पल्स: (Pulse) /मिनट श्वास की गति: (RR) /मिनट एफएचआर: (FHR) /मिनट

पीए जाँच
प्रेजेंटेशन: (Presentation) सीफैलिक: (Cephalic) अन्य (स्पष्ट करें): (Others)
इंगेजमेंट: (Engagement) लाई: (Lie)

जेस्टेशनल उम्र
एलएमपी: (LMP) / /
फंडल ऊँचाई (सप्ताह में):
अल्ट्रासाउण्ड से उम्र:
ईडीडी: / /
औसत अनुमानित जेस्टेशनल उम्र (सप्ताह में):

पीवी जाँच
पीवी जाँचों की संख्या ___
सर्विक्स का खुलाव: (Cervical Dilatation) (से.मी.) (in cms)
सर्विक्स का इफेसमेंट: (Cervical Effacement) (%)
झिल्लियाँ: (Membranes) फट गई (Ruptured)
एम्निऑटिक फ्लूइड का रंग: (Colour of amniotic fluid) साफ (Clear)
मिकोनियम (Meconium)
रक्त (Blood)
पेल्विस पर्याप्त है: (Pelvis adequate) हाँ (Yes) नहीं (No)

जाँचें
ब्लड ग्रुप और आरएच:
एचबी:
पेशाब में प्रोटीन:
एचआईवी:
सिफलिस:
एंटी-डी दिया गया:
ब्लड शुगर:
पेशाब में शुगर:
एचबीएसएजी:
मलेरिया:
अन्य


प्रसवपूर्व | सुरक्षित प्रसव जाँचसूची

जाँच–1 भर्ती के समय

Adapted from 'WHO Safe Childbirth Checklist'

2. Vaginal examination

   - Should be done for women presenting with history suggestive of true labour pain.
   - Should not be done for women presenting with history of bleeding, leaking or suggestive of false labour pain.

True labour pain versus false labour pain: True labour pain has the following features and can be clearly differentiated from false labour pain.

True labour pain	False labour pain
• Begins irregularly but becomes regular and predictable	• Begins irregularly and remains irregular
• Felt first in the lower back and sweeps around to the abdomen in a wave pattern.	• Felt first abdominally and remains confined to the abdomen and groin
• Continues no matter what the woman's level of activity	• Often disappears with ambulation or sleep
• Increases in duration, frequency and intensity with the passage of time	• Does not increase in duration, frequency or intensity with the passage of time
• Accompanied by 'show' (blood-stained mucus discharge)	• Show absent
• Achieves cervical effacement and cervical dilatation	• Does not achieve cervical effacement and cervical dilatation

Steps to perform per vaginum examination:

- Wash hands and wear sterilized gloves on both hands
- Inform the client of the procedure, ask her to empty the bladder or insert a catheter and take a verbal consent.
- Take an antiseptic solution swab in a sponge holder and clean both labia from above downwards in single stroke, repeat the step again using another swab and discard the swabs in yellow bucket. Separate the labia, clean with a swab from above downwards
- Insert index and middle finger to perform the vaginal examination
- Rotate the hand 90 degrees and gently stretch the fingers till the rim of cervix is felt (usually at 3–9 o'clock position)
- Assess cervical dilatation in centimeters
- Assess the cervical effacement by feeling the rim of the cervix with the index and middle finger
- Check for presenting part (vertex, face, brow, breech)
- Check for membranes
    - I – Intact, if ruptured, then C = Clear, M = Meconium and B = Blood
- Check Pelvic Adequacy:
    - The sacral promontory is not reached by examining fingers
    - The sacrum is well curved.
    - The ischial spines are not prominent and both ischial spines cannot be felt by the 2 fingers at the same time
    - Space between two ischial tuberosities admits 4 knuckles
- Remove the glove inside out and discard in red bin
- Record the findings in case sheet and inform the client

Stages of Labour

First stage	This is the period from the onset of labour pain to the full dilatation of the cervix, i.e. to 10 cm. This stage takes about 12 hours in primigravidas and 6–8 hours for multigravidas. It is divided into the latent and active stages. • Latent stage (not in active labour): ▪ Cervix is dilated <4 cm ▪ Contractions weak (less than 2 contractions in 10 minutes) • Active stage: Cervix is dilated ≥4 cm
Second stage	This is the period from full dilatation of the cervix to the delivery of the baby. This stage takes about two hours for primigravidas and about half an hour for multigravidas.
Third stage	This is the period from after delivery of the baby to delivery of the placenta. This stage takes about 15 minutes to half an hour, irrespective of whether the woman is a primagravida or multigravida.
Fourth stage	This is the first two hours after the delivery of the placenta. This is a critical period as PPH, a potentially fatal complication, is likely to occur during this stage.

Monitoring and managing the stages of labour

First stage of labour

Oxytocic drugs for inducing/accelerating labour should not be administered before delivery as their use is associated with a high incidence of rupture of the uterus, foetal distress and birth asphyxia.

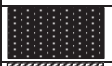
Monitoring	Action/Management
Latent stage, i.e. not in active labour	
Monitor the following every one hour: • Contractions: ▪ Frequency—how many contractions in 10 minutes ▪ Duration—for how many seconds each contraction lasts. • FHR: Normal FHR is between 120 and 160 beats/ minute • Presence of any sign of an emergency (difficulty in breathing, shock, vaginal bleeding, convulsions or unconsciousness)	• Record time of rupture of membranes and colour of amniotic fluid. • Never leave the woman alone. • Allow her to remain mobile. • Let her choose the position in which she is comfortable.
	If after eight hours, the contractions are stronger and more frequent but there is no progress in cervical dilatation, with or without rupture of the membranes, it indicates non- progress of labour. Refer the woman urgently to an FRU.
Monitor the following every four hours: • Cervical dilatation (in cm) • Temperature • Pulse • Blood pressure	If after eight hours, there is no increase in intensity/ frequency/duration of contractions, the membranes are not ruptured and there is no progress in cervical dilatation, ask the woman to relax. Advise her to come/send for you again when the pain/discomfort increases, and/or there is vaginal bleeding, and/or the membranes rupture.

Active stage	
Monitor the following every 30 minutes: • Maternal pulse • Contractions—frequency and duration • FHR • Presence of signs such as meconium blood-stained amniotic fluid, prolapsed cord. ***Monitor the following every four hours:*** • Cervical dilatation (in cm) by P/V • Temperature • Blood pressure	• Never leave the woman alone. • **Start maintaining a partograph when the woman reaches active labour.** • Re-assess the woman and consider criteria for referral. • Call a senior person, if available. Alert emergency transport services. • Encourage the woman to empty her bladder. • Ensure adequate hydration but omit solid foods. • Encourage her to maintain an upright position and walk, if she wishes. • Monitor intensively, using the partograph. Refer immediately if there is no progress.

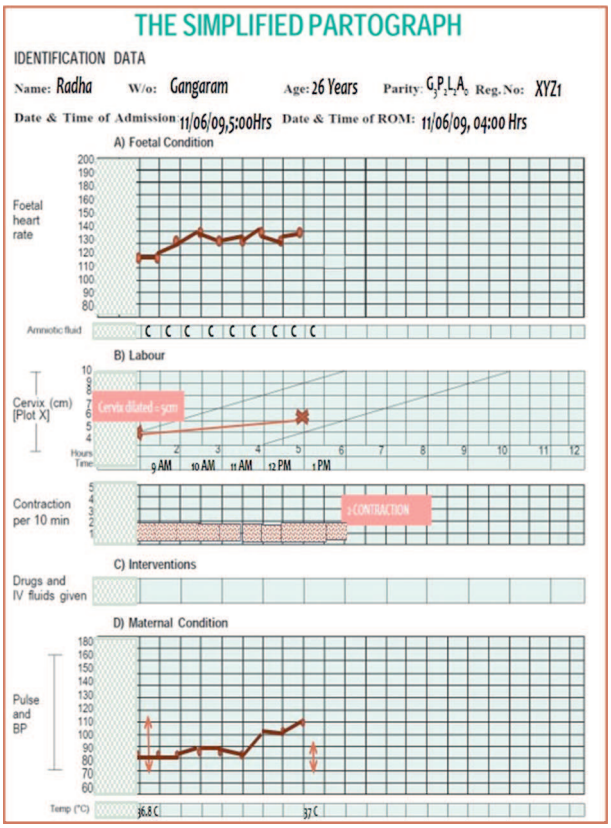
Plotting and interpretation of Partograph

Partograph

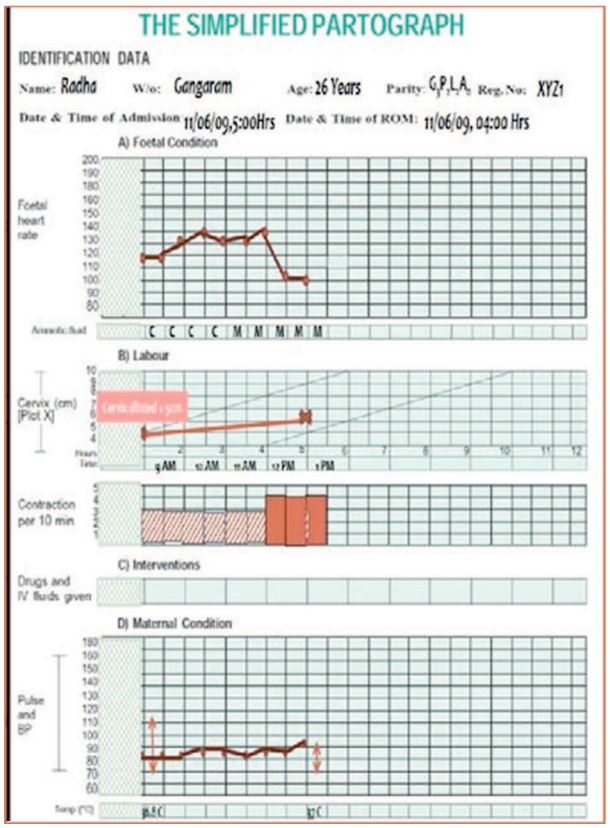
The partograph is a graphic recording of the progress of active phase of labour and the condition of the mother and foetus. It is a tool which helps to recognise prolonged labour and foetal distress and hence the need for referral to a higher facility at the appropriate time.

Parameter	Frequency	Plotting	Interpretation / Action
Maternal Pulse	Every 30 min	Record with dot (.)	<60 bradycardia, >100 tachycardia
Contractions	Every 30 min	Number of contractions in 10 min **Duration (in second)** — **Plotting** Less than 20 —  20 to 40 —  More than 40 — 	Contractions not increasing in duration, intensity and frequency e.g. 2 or less contractions lasting for <20 sec in 10 min are indications for referral to FRU
Foetal Condition	Every 30 min	• Count foetal heart rate every 30 minutes • Count for one full minute, immediately following a uterine contraction • Foetal distress: FHR <120 beats/minute or >160 beats/min	FHR is <120 beats / min or >160 beats / min is an indication for referral to FRU
Amniotic fluid	Every 30 min	Membranes intact (mark 'I'), Blood stained (mark 'B'), Clear liquor (mark 'C'), Meconium stained liquor (mark 'M')*	Meconium and /or blood stained amniotic fluids are indications for referral to FRU
Temperature	Every 4 hours	Note in ˚C or ˚F	>38˚C or 100˚F indicates fever
BP	Every 4 hour	Record using a vertical arrow, with upper end signifying systolic BP and lower end diastolic BP	>140/90mmHg is indicative of hypertension
Cervical dilatation	Every 4 hour	Begin plotting in active labour. **Always plot first finding at Alert line.** Note the time.	If **Alert line** is crossed (the plotting moves to the right of the alert line) it indicates abnormal labour: prolonged/ obstructed labour. Refer to FRU

Partograph findings in case of prolonged and obstructed labour



Partograph in prolonged labour



Partograph in obstructed labour

What is Prolonged labour?

It is characterised by woman experiencing labour pains for 24 hours or more without delivery

Prolonged labour can be due to:

1. **In-coordinate uterine contractions:** These are contractions that are weak or not effective enough to result in cervical dilatation and/ or foetal descent.
2. **Foeto-pelvic disproportion:** This means that it is difficult or impossible for the foetus to pass safely through the pelvis. This condition, if not managed in time, will lead to obstructed labour.

It can be interpreted from Partograph as:

Prolonged Active Phase: Woman is in active phase of labour (> =4 cm dilatation achieved) but cervical dilatation is not occurring at the rate of 1 cm/hour (overall should not last more than 12 hours)

Prolonged Expulsive Phase: Woman is in second stage of labour (> 10 cm dilatation achieved) but baby is not delivered for more than 2 hours even after the woman has an urge to push

What is Obstructed labour?

Obstructed labour means that, in spite of strong uterine contractions, the foetus can not descend because of mechanical factors e.g. CPD, mal-presentation, (transverse lie, brow presentation, mento-posterior presentation) and rarely large tumours. Characterised by Significant caput, moulding, Foetal or maternal distress.

How to diagnose a case of prolonged/obstructed labour?

A partograph is a tool to assess the progress of labour in Active phase.

When, despite good uterine contractions for 8 hours, the woman is still in the latent phase of labour, or when the partograph crosses the "Alert line" it is an indication that the labour is not progressing normally and that the woman needs referral to an FRU/ DH, or any other health facility where facilities for surgical intervention- C-sections are available.

Indications for referral to the FRU on the basis of the partograph

If the FHR is <120 beats/minute or >160 beats/minute

If there is meconium- and/or blood-stained amniotic fluid

When the cervical dilatation plotting crosses the Alert line (moves towards the right side of the Alert line)

If the contractions do not increase in duration, intensity and frequency.

If the maternal vital signs, i.e. the pulse (more than 100/min), BP (>140/90 mmHg) and temperature (>38º C), cross the normal limits.

Second stage of labour

The second stage of labour begins when the cervix is fully dilated and ends with the expulsion of the foetus. When the woman reaches this stage, she should be transferred to the labour room if she is in another room. She should not be allowed to walk during this stage.

The following are the signs of imminent delivery:

- Vulval gaping
- Thinned-out and bulging perineum
- Anal pouting
- Visibility of the baby's head at the vulva.

√	• When the cervix is fully dilated, during a contraction, encourage the woman to take deep breaths and push down.
×	• Bearing down efforts are not required until the head has descended into the perineum. Therefore, the woman should be advised not to push actively until the foetal head is distending the perineum. • Occasionally, the woman may feel the urge to push before the cervix is fully dilated. This must be discouraged as it can result in oedema of the cervix, which may delay the progress of labour. • Do not apply fundal pressure on the abdomen to facilitate expulsion of the baby. • Do not give any oxytocic drugs

Fill the WHO Safe Childbirth Checklist 2 in the casesheet.

प्रसवपूर्व और प्रसव के दौरान | सुरक्षित प्रसव जाँचसूची

जाँच–2 प्रसव से बिल्कुल पहले और प्रसव के दौरान (या सिजेरियन से पहले और शिशु निकलने के बाद)

क्या माँ को निम्न की ज़रूरत है?
एन्टीबायोटिक?
- ☐ हाँ, दिया गया
- ☐ नहीं

यदि निम्न में से कुछ भी हो, तो माँ को एन्टीबायोटिक दें:
- ☐ माँ का तापमान ≥38° सेन्टीग्रेड या ≥100.5°F
- ☐ योनि से बदबूदार स्त्राव
- ☐ प्रसव के दौरान 18 घंटों से अधिक समय से झिल्ली का फटना
- ☐ 24 घंटों से अधिक का प्रसव या अब बाधित (obstructed) प्रसव
- ☐ सिज़ेरियन सेक्शन

इन्जेक्शन मैगनीशियम सल्फेट?
- ☐ हाँ, दिया गया
- ☐ नहीं

इन्जेक्शन मैगनीशियम सल्फेट की पहली खुराक दे कर तुरन्त एफआरयू/उच्च–स्तरीय स्वास्थ्य केन्द्र पर रेफर करें या एफआरयू पर है तो पूरी खुराक दें (लोडिंग और फिर मेन्टीनेन्स) यदि:
माँ का सिस्टोलिक बीपी 160 या उससे अधिक या डायस्टोलिक बीपी 110 या अधिक हो और प्रोटीनयूरिया +≥3 तक हो या सिस्टोलिक बीपी 140 या अधिक या डायस्टोलिक बीपी 90 या अधिक और प्रोटीनयूरिया +2 तक हो और:
- ☐ निम्न में से कोई भी खतरे का लक्षण हो
  - तेज़ सिरदर्द
  - धुंधला दिखना
  - साँस लेने में तकलीफ
  - पेट के ऊपरी हिस्से में दर्द
  - कम पेशाब होना (24 घंटों में 400 मिलीलीटर से कम)
- ☐ दौरे पड़ना

☐ **कुशल सहायक निर्धारित हैं और जन्म के समय मदद के लिए तैयार हैं**

सुनिश्चित करें कि आवश्यक सामग्री बिस्तर के पास/लेबर रूम में मौजूद हो:
माँ के लिए
- ☐ दस्ताने
- ☐ साबुन और साफ पानी
- ☐ सिरिंज में 10 यूनिट ऑक्सीटोसिन
- ☐ माँ के लिए पैड्स (pads)

शिशु जन्म के तुरंत बाद माँ की देखभाल (AMTSL*) की तैयारी करना:
- ☐ सुनिश्चित करना कि केवल एक ही बच्चा है (एक से ज़्यादा नहीं)
- ☐ बच्चे के जन्म के एक मिनट के अंदर ऑक्सीटोसिन देना
- ☐ 'कन्ट्रोल्ड कॉर्ड ट्रेक्शन' से आँवल निकालना
- ☐ आँवल निकलने के बाद बच्चेदानी की मालिश करना

बच्चे के लिए
- ☐ दो साफ सूखे गर्म तौलिये
- ☐ नाल काटने के लिए स्टराइल कैंची/ब्लेड
- ☐ म्यूकस एक्सट्रेक्टर
- ☐ नाल बाँधने का धागा/क्लैम्प
- ☐ बैग और मास्क

प्रसव के तुरंत बाद बच्चे की देखभाल की तैयारी करें:
- ☐ बच्चे को सुखाना, लपेटना और गर्म रखना, विटामिन K देना, स्तनपान शुरू करना
- ☐ यदि साँस नहीं ले रहा हो: साँस के मार्ग को साफ करना और पीठ और पैर सहला कर प्रेरित करना
- ☐ यदि अभी भी साँस नहीं ले रहा हो:
  - नाल काटना
  - बैग और मास्क से कृत्रिम साँस देना
  - सहायता के लिए पुकारना (बच्चे के डाक्टर/SNCU/NBSU/F-IMNCI प्रशिक्षित डॉक्टर यदि उपलब्ध हों)

सेवाप्रदाता का नाम: ..... तिथि: ..... हस्ताक्षर: .....

NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन

Adapted from "WHO Safe Childbirth Checklist"

Delivery of head and shoulders

Fetal head movements during labour (left occiput anterior position)

1. Head floating, before engagement

2. Engagement, flexion, descent

3. Further descent, internal rotation

4. Complete rotation, beginning extension

5. Complete extension

6. External rotation of head and internal rotation of shoulders

7. Delivery of anterior shoulder

8. Delivery of posterior shoulder

Normal Delivery:

- Keep ready all the equipment, supplies and drugs necessary for conducting a delivery: Ensure radiant warmer is switched on 20-30 minutes before delivery and bag and mask is functional. Keep 2 towels under the warmer for warming. Close all doors and windows and switch off the fan.
- Ensure preloaded oxytocin 10 IU is available in the delivery tray at the time of delivery
- Maintain privacy
- Tell the woman and birth companion what is going to be done and encourage them to ask questions

  Listen to what the woman and birth companion have to say an provide emotional support and reassurance
- Put on Personal Protective Equipment (PPE)
- Wash hand with soap and wear gloves
- Put the 2 pre-warmed towels on the mother's abdomen.
- Clean the perineum with betadine solution using gauze pieces
- Deliver the head once crowning occurs:
  - Keep one hand gently on the head under the subpubic angle as it advances with the contractions to maintain flexion
  - Support the perineum with pad in other hand and covering the anus.
  - Tell the mother to take deep breaths and to bear down only during a contraction
- After delivery of the head, feel gently around the baby's neck for the presence of the umbilical cord:
  - If the cord is present and is loose around the neck, gently slip the cord over the baby's head
  - If the cord is tight around the neck, place two artery clamps on the cord and cut between the clamps, and then unwind it from around the neck
- Delivery of the shoulders and the rest of the body:
  - Wait for spontaneous rotation of the head and shoulders and delivery of the shoulders. This usually happens within 1–2 minutes
  - Apply gentle pressure downwards on the shoulder under the sub-pubic arch to deliver the top (anterior) shoulder

- Then lift the baby up, towards the mother's abdomen, to deliver the lower (posterior) shoulder

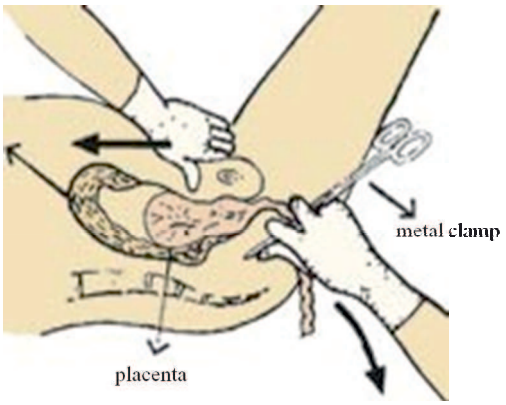
- Delivery of the rest of the baby's body follows smoothly by lateral flexion. Place the baby on mother's abdomen. Immediately call out the time of birth and the sex of the baby.
- Dry the baby with the pre-warm towel and observe whether the baby is breathing/crying.
- If the baby is breathing/crying, discard the 1st towel and cover the baby with 2nd towel. Proceed for essential newborn care.

Third stage of labour

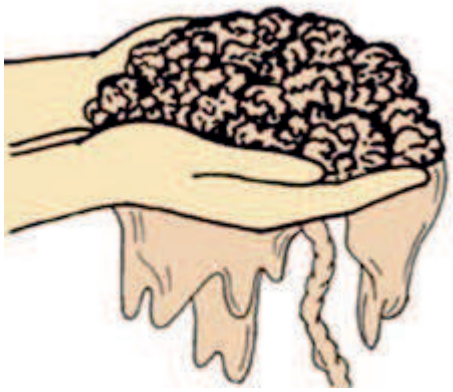
Active Management of Third Stage of Labour (AMTSL):

AMTSL is recommended for all deliveries. It leads to nearly 60% reduction in Post Partum Hemorrhage.

- **Rule out the presence of another baby** by abdominal examination
- **Administer uterotonic drug** injection 10 IU oxytocin IM OR Tablet Misoprostol 3 tablets (600 µgm) orally within one minute of delivery.
- Delayed cord clamping - Clamp and cut the cord with a sterile scissor or surgical blade between 1-3 minutes of birth. Cutting the cord after an interval of 1–3 minutes, helps to avoid neonatal anaemia, as it results in transfusion of an increased amount of blood into the foetal circulation. Apply disposable plastic clamp on the baby's side.
- Perform **Controlled Cord Traction (CCT)** during contractions and deliver the placenta and membranes. CCT is a technique that assists in the expulsion of the placenta, and helps to reduce the chances of a retained placenta and subsequent bleeding, i.e. PPH. Remember, you should never apply cord traction (pull) without a contraction and without applying counter traction (push) above the pubic symphysis with the other hand.
- **Perform uterine massage**
- Examine the lower vagina and perineum
- **Placenta Examination**
  - Maternal surface of placenta
  - Foetal surface
  - Membranes
  - Umbilical cord (look for 3 vessels – 2 arteries and 1 vein)
- Dispose placenta in yellow bin. Provide a sterile pad to the mother
- Place the instruments in 0.5% chlorine solution for 10 mins for decontamination
- Remove gloves and discard in red bin
- Wash hands thoroughly with soap and water and air dry.



Controlled Cord Traction



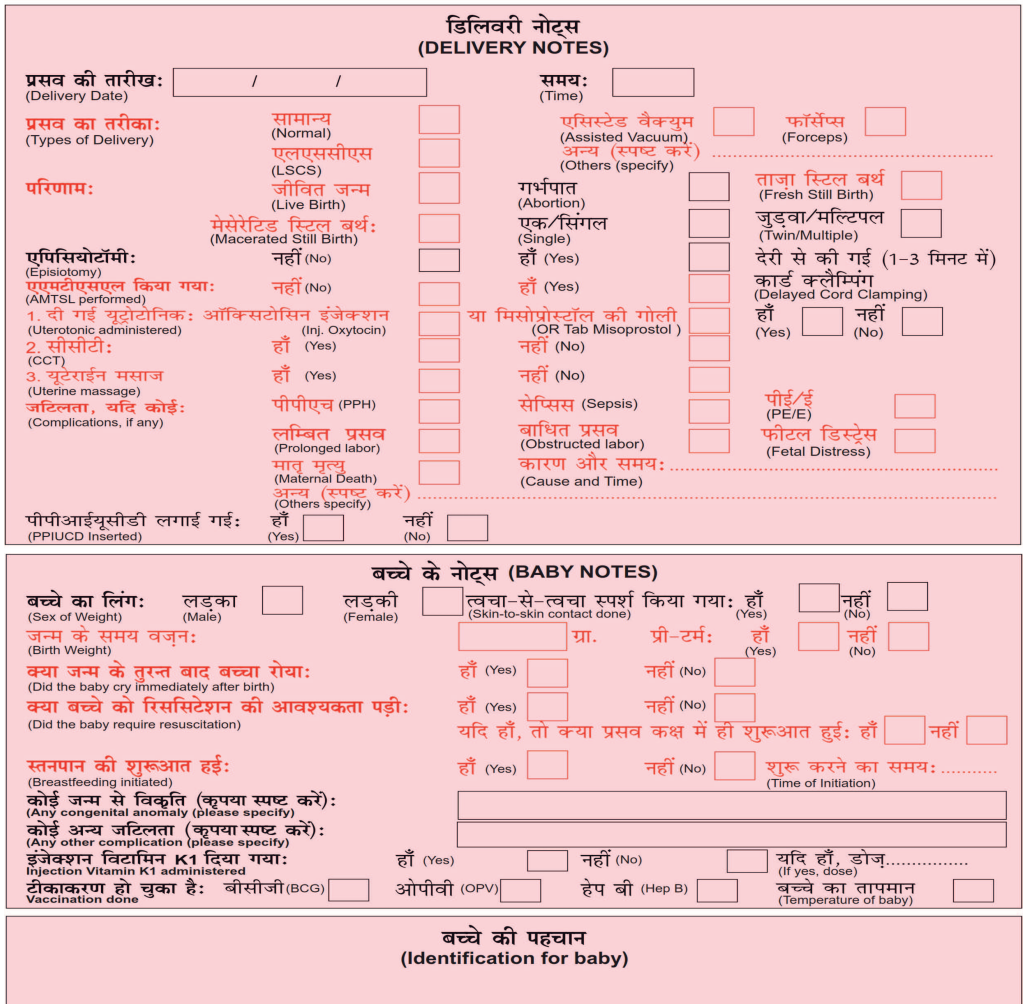
Examination of Placenta

Care of the newborn

- Place the baby between the mother's breast for skin to skin care.
- Examine the baby quickly for malformations or any birth injury as given in the case sheet. If there is major malformation or severe birth injury, refer the baby to the newborn unit in the FRU. Ensure that the baby is warm during the examination and when being transported.
- Put on cap, nappy and socks. Put an identification label with the mother's name on the baby's wrist or ankle.
- Encourage breastfeeding within an hour of birth.
    - Emphasise the importance of colostrum, which helps to protect the baby against infections.
    - Check if the baby's position and his/her attachment to the breast are correct at the first feed.
    - The baby can feed whether the mother is lying down or sitting. What is important is that both mother and baby should be comfortable
    - Do not give artificial teats or pre-lacteal feeds, such as sugar water or local foods, or even water to the newborn.
- Keep the newborn in skin to skin care for 1 hour.
- Weigh all babies after 1 hour and give the baby injection Vitamin K1 1.0 mg, intra muscular to all newborns weighing 1000 gms and above and in a dose of 0.5 mg to newborns weighing less than 1000 gm. The site for the injection is anterolateral aspect of the right mid-thigh.

Vitamin K1 is needed for prevention of hemorrhagic disease of new born.

- Give birth dose vaccination.
- Fill the details in the case sheet.



डिलिवरी नोट्स
(DELIVERY NOTES)

प्रसव की तारीख: (Delivery Date) / / समय: (Time)

प्रसव का तरीका: (Types of Delivery) सामान्य (Normal) ☐ एसिस्टेड वैक्युम (Assisted Vacuum) ☐ फॉर्सेप्स (Forceps) ☐
एलएससीएस (LSCS) ☐ अन्य (स्पष्ट करें) (Others specify) .....

परिणाम: जीवित जन्म (Live Birth) ☐ गर्भपात (Abortion) ☐ ताज़ा स्टिल बर्थ (Fresh Still Birth) ☐
मेसेरेटिड स्टिल बर्थ: (Macerated Still Birth) ☐ एक/सिंगल (Single) ☐ जुड़वा/मल्टिपल (Twin/Multiple) ☐

एपिसियोटॉमी: (Episiotomy) नहीं (No) ☐ हाँ (Yes) ☐ देरी से की गई (1–3 मिनट में)
एएमटीएसएल किया गया: (AMTSL performed) नहीं (No) ☐ हाँ (Yes) ☐ कार्ड क्लैम्पिंग (Delayed Cord Clamping)
1. दी गई यूटोटोनिक: ऑक्सिटोसिन इंजेक्शन (Uterotonic administered) (Inj. Oxytocin) ☐ या मिसोप्रोस्टॉल की गोली (OR Tab Misoprostol) ☐ हाँ (Yes) ☐ नहीं (No) ☐
2. सीसीटी: (CCT) हाँ (Yes) ☐ नहीं (No) ☐
3. यूटेराईन मसाज (Uterine massage) हाँ (Yes) ☐ नहीं (No) ☐
जटिलता, यदि कोई: (Complications, if any) पीपीएच (PPH) ☐ सेप्सिस (Sepsis) ☐ पीई/ई (PE/E) ☐
लम्बित प्रसव (Prolonged labor) ☐ बाधित प्रसव (Obstructed labor) ☐ फीटल डिस्ट्रेस (Fetal Distress) ☐
मातृ मृत्यु (Maternal Death) ☐ कारण और समय: (Cause and Time) .....
अन्य (स्पष्ट करें) (Others specify) .....

पीपीआईयूसीडी लगाई गई: (PPIUCD Inserted) हाँ (Yes) ☐ नहीं (No) ☐

बच्चे के नोट्स (BABY NOTES)

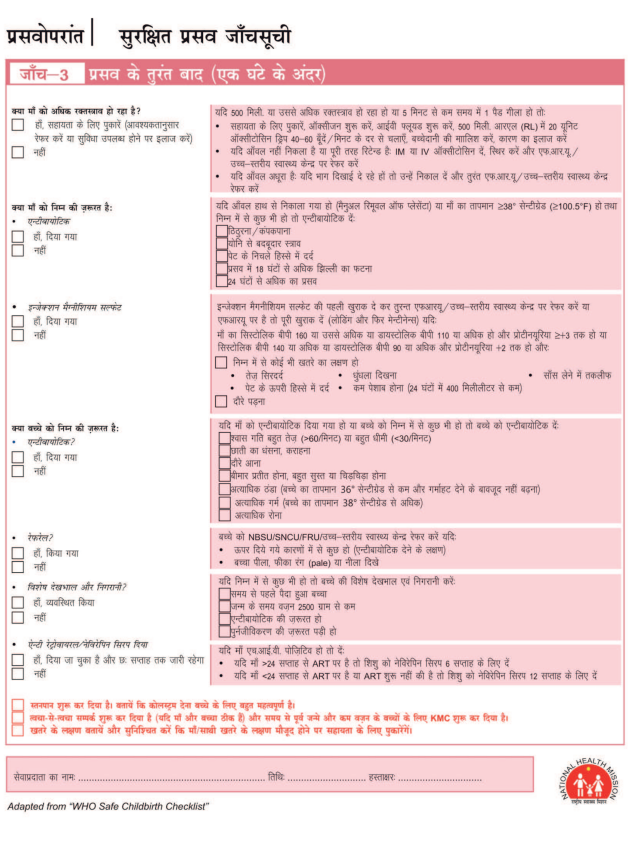
बच्चे का लिंग: (Sex of Weight) लड़का (Male) ☐ लड़की (Female) ☐ त्वचा-से-त्वचा स्पर्श किया गया: (Skin-to-skin contact done) हाँ (Yes) ☐ नहीं (No) ☐
जन्म के समय वज़न: (Birth Weight) ग्रा. प्री-टर्म: हाँ (Yes) ☐ नहीं (No) ☐
क्या जन्म के तुरन्त बाद बच्चा रोया: (Did the baby cry immediately after birth) हाँ (Yes) ☐ नहीं (No) ☐
क्या बच्चे को रिससिटेशन की आवश्यकता पड़ी: (Did the baby require resuscitation) हाँ (Yes) ☐ नहीं (No) ☐
यदि हाँ, तो क्या प्रसव कक्ष में ही शुरूआत हुई: हाँ ☐ नहीं ☐
स्तनपान की शुरूआत हुई: (Breastfeeding initiated) हाँ (Yes) ☐ नहीं (No) ☐ शुरू करने का समय: ..... (Time of Initiation)
कोई जन्म से विकृति (कृपया स्पष्ट करें): (Any congenital anomaly (please specify))
कोई अन्य जटिलता (कृपया स्पष्ट करें): (Any other complication (please specify))
इंजेक्शन विटामिन K1 दिया गया: Injection Vitamin K1 administered हाँ (Yes) ☐ नहीं (No) ☐ यदि हाँ, डोज़..... (If yes, dose)
टीकाकरण हो चुका है: Vaccination done बीसीजी (BCG) ☐ ओपीवी (OPV) ☐ हेप बी (Hep B) ☐ बच्चे का तापमान (Temperature of baby) ☐

बच्चे की पहचान
(Identification for baby)

Fourth stage of labour

The first two hours after the delivery of the placenta are referred to as the fourth stage of labour. This stage comprises both observation and care of the mother and newborn. The mother and her healthy newborn should be examined every 30 minutes and should not be separated.

Fill the WHO Safe Childbirth Checklist 3 and the PNC monitoring format in the casesheet.



प्रसवोपरांत | सुरक्षित प्रसव जाँचसूची

जाँच–3 प्रसव के तुरंत बाद (एक घंटे के अंदर)

क्या माँ को अधिक रक्तस्राव हो रहा है?

☐ हाँ, सहायता के लिए पुकारें (आवश्यकतानुसार रेफर करें या सुविधा उपलब्ध होने पर इलाज करें)
☐ नहीं

यदि 500 मिली. या उससे अधिक रक्तस्राव हो रहा हो या 5 मिनट से कम समय में 1 पैड गीला हो तो:
- सहायता के लिए पुकारें, ऑक्सीजन शुरू करें, आईवी फ्लूएड शुरू करें, 500 मिली. आरएल (RL) में 20 यूनिट ऑक्सीटोसिन ड्रिप 40–60 बूँदें/मिनट के दर से चलाएँ, बच्चेदानी की मालिश करें, कारण का इलाज करें
- यदि ऑवल नहीं निकला है या पूरी तरह रिटेन्ड है: IM या IV ऑक्सीटोसिन दें, शिर करें और एफ.आर.यू./उच्च–स्तरीय स्वास्थ्य केन्द्र पर रेफर करें
- यदि ऑवल अधूरा है: यदि भाग दिखाई दे रहे हों तो उन्हें निकाल दें और तुरंत एफ.आर.यू./उच्च–स्तरीय स्वास्थ्य केन्द्र रेफर करें

क्या माँ को निम्न की ज़रूरत है:

• एन्टीबायोटिक
☐ हाँ, दिया गया
☐ नहीं

यदि ऑवल हाथ से निकाला गया हो (मैनुअल रिमूवल ऑफ प्लेसेंटा) या माँ का तापमान ≥38° सेन्टीग्रेड (≥100.5°F) हो तथा निम्न में से कुछ भी हो तो एन्टीबायोटिक दें:
☐ शिवरना/कंपकपाना
☐ योनि से बदबूदार स्राव
☐ पेट के निचले हिस्से में दर्द
☐ प्रसव में 18 घंटों से अधिक झिल्ली का फटना
☐ 24 घंटों से अधिक का प्रसव

• इन्जेक्शन मैग्नीशियम सल्फेट
☐ हाँ, दिया गया
☐ नहीं

इन्जेक्शन मैग्नीशियम सल्फेट की पहली खुराक दे कर तुरन्त एफआरयू/उच्च–स्तरीय स्वास्थ्य केन्द्र पर रेफर करें या एफआरयू पर है तो पूरी खुराक दें (लोडिंग और फिर मेन्टीनेन्स) यदि:
माँ का सिस्टोलिक बीपी 160 या उससे अधिक या डायस्टोलिक बीपी 110 या अधिक हो और प्रोटीनयूरिया ≥+3 तक हो या सिस्टोलिक बीपी 140 या अधिक या डायस्टोलिक बीपी 90 या अधिक और प्रोटीनयूरिया +2 तक हो और:
☐ निम्न में से कोई भी खतरे का लक्षण हो
• तेज़ सिरदर्द • धुंधला दिखना • साँस लेने में तकलीफ
• पेट के ऊपरी हिस्से में दर्द • कम पेशाब होना (24 घंटों में 400 मिलीलीटर से कम)
☐ दौरे पड़ना

क्या बच्चे को निम्न की ज़रूरत है:

• एन्टीबायोटिक?
☐ हाँ, दिया गया
☐ नहीं

यदि माँ को एन्टीबायोटिक दिया गया हो या बच्चे को निम्न में से कुछ भी हो तो बच्चे को एन्टीबायोटिक दें:
☐ श्वास गति बहुत तेज़ (>60/मिनट) या बहुत धीमी (<30/मिनट)
☐ छाती का धंसना, कराहना
☐ दौरे आना
☐ बीमार प्रतीत होना, बहुत सुस्त या चिड़चिड़ा होना
☐ अत्याधिक ठंडा (बच्चे का तापमान 36° सेन्टीग्रेड से कम और गर्माहट देने के बावजूद नहीं बढ़ना)
☐ अत्याधिक गर्म (बच्चे का तापमान 38° सेन्टीग्रेड से अधिक)
☐ अत्याधिक रोना

• रेफरल?
☐ हाँ, किया गया
☐ नहीं

बच्चे को NBSU/SNCU/FRU/उच्च–स्तरीय स्वास्थ्य केन्द्र रेफर करें यदि:
- ऊपर दिये गये कारणों में से कुछ हो (एन्टीबायोटिक देने के लक्षण)
- बच्चा पीला, फीका रंग (pale) या नीला दिखे

• विशेष देखभाल और निगरानी?
☐ हाँ, व्यवस्थित किया
☐ नहीं

यदि निम्न में से कुछ भी हो तो बच्चे की विशेष देखभाल एवं निगरानी करें:
☐ समय से पहले पैदा हुआ बच्चा
☐ जन्म के समय वज़न 2500 ग्राम से कम
☐ एन्टीबायोटिक की ज़रूरत हो
☐ पुनर्जीवीकरण की ज़रूरत पड़ी हो

• ऐन्टी रेट्रोवायरल/नेविरेपिन सिरप दिया
☐ हाँ, दिया जा चुका है और छः सप्ताह तक जारी रहेगा
☐ नहीं

यदि माँ एच.आई.वी. पोजिटिव हो तो दें:
- यदि माँ >24 सप्ताह से ART पर है तो शिशु को नेविरेपिन सिरप 6 सप्ताह के लिए दें
- यदि माँ <24 सप्ताह से ART पर है या ART शुरू नहीं की है तो शिशु को नेविरेपिन सिरप 12 सप्ताह के लिए दें

☐ स्तनपान शुरू कर दिया है। बतायें कि कोलस्ट्रम देना बच्चे के लिए बहुत महत्वपूर्ण है।
☐ लपक-से-लपका सम्पर्क शुरू कर दिया है (यदि माँ और बच्चा ठीक हैं) और समय से पूर्व जन्मे और कम वज़न के बच्चों के लिए KMC शुरू कर दिया है।
☐ खतरे के लक्षण बतायें और सुनिश्चित करें कि माँ/साथी खतरे के लक्षण पाँचवें होने पर सहायता के लिए पुकारेंगे।

सेवाप्रदाता का नाम: ..... तिथि: ..... हस्ताक्षर: .....

Adapted from "WHO Safe Childbirth Checklist"

माँ के लिए नोट्स:
(Notes for Mother)

बच्चे के लिए नोट्स:
(Notes for Baby)

क्लीनिकल निदान, यदि कोई स्थिति हो तो:
(Clinical diagnosis, if any condition present)
सामान्य (Normal) ☐ संक्रमण (Infection) ☐ पीलिया (Jaundice) ☐ हाइपोथर्मिया (Hypothermia) ☐ दौरे आना (Convulsions) ☐ मृत्यु (Death) ☐
अन्य (स्पष्ट करें) (Others specify) .....

पीएनसी वॉर्ड में भेजने की तारीख और समय: / /
पीएनसी वॉर्ड में भेजते समय स्थिति: .....
यदि रेफर किया गया, तो माँ/बच्चे को रेफर करने का कारण:

प्रसव-पश्चात् स्थिति का आंकलन Assessment of Postpartum Condition

		30 मिनट	30 मिनट	30 मिनट	30 मिनट	6 घंटे	6 घंटे	6 घंटे	दूसरा दिन सुबह	दूसरा दिन शाम
माँ (Mother)	बीपी (एमएमएचजी) BP (mmhg)									
	तापमान (ºसे/ºफ) (ºC/ºF)									
	पल्स (प्रति मिनट) (Pulse (per min)									
	स्तन की स्थिति (मुलायम/एनोर्जड) (Breast condition (soft/engorged)									
	योनि से रक्त स्राव (Bleeding PV) सामान्य-स Normal अधिक-अ Excessive	स ☐ अ ☐	स ☐ अ ☐	स ☐ अ ☐	स ☐ अ ☐	स ☐ अ ☐	स ☐ अ ☐	स ☐ अ ☐	स ☐ अ ☐	स ☐ अ ☐
	यूटेराइन टोन (Uterine Tone) मुलायम/सॉफ्ट-स Soft संकुचित/कॉन्ट्रेक्टिड-क Contracted टेंडर-ट Tendor	स ☐ क ☐ ट ☐	स ☐ क ☐ ट ☐	स ☐ क ☐ ट ☐	स ☐ क ☐ ट ☐	स ☐ क ☐ ट ☐	स ☐ क ☐ ट ☐	स ☐ क ☐ ट ☐	स ☐ क ☐ ट ☐	स ☐ क ☐ ट ☐
	एपिसियोटॉमी/ टियर (स्वस्थ संक्रमण) Episiotomy/Tear (health infected)									
बच्चा (Baby)	श्वास की गति (प्रति मिनट) (Resp rate (per min)									
	तापमान (ºसे/ºफ) (Temp (ºC/ºF)									
	स्तनपान कर रहा है/चूस रहा है (हाँ/नहीं) Breastfeeding/Sucking (Yes/No)									
	गतिविधि (अच्छी/सुस्त) Activity (Good/lethargy)									
	नाल/अम्बिलिकल स्टम्प (सूखी/रक्त स्राव) Umbilical stump (dry/Bleeding)									
	पीलिया(हाँ/नहीं) Jaundice (Yes/No.)									
	पेशाब किया? (हाँ/नहीं) Passed urine? (Yes/No.)									
	मल हुआ? (हाँ/नहीं) Passed stool ? (Yes/No.)									

Shift the mother and baby to the PNC ward after 2 hours and examine them as per the casesheet. Encourage the mother and baby to stay in the hospital for 48 hours after delivery.

Care of the mother and newborn in the post natal ward

- Counsel the mother to breastfeed, including colostrum feeding, within an hour of the birth. Ask her to take warm fluids, eat well, take adequate rest, sleep and maintain hygiene. The latter would include maintaining perineal hygiene, taking a bath every day and washing her hands before handling the baby.
- Delay the baby's bath for 24 hours. Look for any danger signs.
- Encourage the woman to pass urine. If the woman has difficulty in passing urine, or the bladder is full (as evidenced by a swelling over the lower abdomen just above the symphysis pubis) and she is uncomfortable, help her pass urine by gently pouring warm water over her vulva.
- Counsel the mother on the basket of choice available for post-partum family planning.
- Ask the birth companion to stay with the mother and not leave her and the newborn alone. Ask the companion to call for help if any of the following conditions occur:
    - Excessive bleeding per vaginum or ncreased pain in the perineum
    - Dizziness, severe headache, visual disturbance or epigastric pain or convulsions
    - Urinary incontinence or inability to pass urine in the mother.

- Grunting, inability to feed, convulsions, respiratory rate more than 60 per minute, chest in-drawing, excessive crying, feels cold to touch, cord bleeding, etc. in the baby.

Management of PPH:

Triage, LR and PNC ward should have a fully replenished PPH kit available at all times. Loss of 500 ml or more of blood during delivery (woman soaks 1 pad in 5 min) and up to six weeks after delivery or Blood loss sufficient to cause symptoms & signs of hypovolemia (tachycardia/fall in BP).

- Shout for help, mobilize all available health providers
- Check vitals of the woman-pulse, BP, respiration. Assesses bleeding and shock
- Reassure the woman
- Insert 2 IV lines (16-18 gauge) and take blood for HB, Blood grouping and cross-matching
- Start IV fluids (1L RL) in first IV line fast over 15-20 minutes
- Check whether oxytocin has been given in AMTSL. If not, give oxytocin 10 IU IM
- Start oxytocin 10 IU in 500 ml of RL @ 40–60 drops per minute in second IV line
- Catheterize the bladder
- Provide oxygen by mask @ 6-8 litres/ minute
- Wash hands and wear gloves
- Palpate and massage uterus to ensure uterus is well contracted. Identify the exact cause of PPH.
- If atonic, continue uterine massage and give Tab Misoprostol 800 µgm per rectum in single dose (discard the used gloves and wear fresh pair of sterile gloves)
- Check for soft-tissue trauma/tear. It 1st or 2nd degree tear present – repair. If 3rd or 4th degree tear present – refer to FRU/DH for further management
- Check placenta and membranes for completeness.
- If complete placenta is retained, refer to DWH/DCH on oxytocin drip for manual removal of placenta (MRP) under anaesthesia
- **If bleeding has not stopped due to atonicity, perform:**
  - Bimanual compression
  - If bleeding still not controlled after bimanual compression, Aortic compression and uterine balloon tamponade (UBT) may be done under doctor's supervision
- **Reassess the woman once bleeding is under control:**
  - Continue uterine massage every 15 mins for first 2 hours
  - Monitor vitals closely every 10 minutes for 30 minutes, every 15 minutes for next 30 minutes, every 30minutes for next 3-6 hours or until stable
  - Assess urine output every 4 hours until > 30 ml/ hour
  - Look for signs of infection and give antibiotics (Ampicillin 1 gm IV + Gentamicin 80 mg IM + Metronidazole 500 mg IV) in case of tears and retained placenta
- Document all steps of management done in case sheet and fill referral slip with complete information (if applicable). Urgently refer to higher facility with complete referral note and inform the referral facility. Apply Non-pneumatic Anti Shock Garment (NASG) wherever available.

Discharge of mother and newborn

After 48 hours, fill the WHO Safe Childbirth Checklist 4 and ensure that the mother and baby are fit for discharge before sending them home. Give the discharge ticket to the mother and explain the family about the danger signs of mother and baby given behind the discharge ticket. Ask them to return immediately the hospital, if there are any complications.

जाँच–4 छुट्टी से पहले

क्या माँ का रक्तस्राव नियंत्रण में है?

☐ हाँ
☐ नहीं, इलाज करें, अवलोकन करें और ज़रूरत पड़ने पर एफ.आर.यू./उच्च–स्तरीय स्वास्थ्य केन्द्र पर रेफर करें

क्या माँ को एन्टीबायोटिक की ज़रूरत है?

☐ हाँ, दिया गया और छुट्टी देर में करें
☐ नहीं

यदि ≥38° सेन्टीग्रेड या ≥100.5°F तापमान और निम्न में से कुछ भी हो, तो माँ को एन्टीबायोटिक दें:

☐ कंपकपाहट
☐ योनि से बदबूदार स्त्राव
☐ पेट के निचले हिस्से में दर्द

क्या बच्चे को एन्टीबायोटिक की ज़रूरत है?

☐ हाँ, एन्टीबायोटिक दें, छुट्टी रोक दें और एफ.आर.यू./उच्च–स्तरीय स्वास्थ्य केन्द्र पर रेफर करें
☐ नहीं

यदि निम्न में से कुछ भी हो, तो बच्चे को एन्टीबायोटिक दें:

☐ साँस की गति बहुत तेज़ (>60/मिनट) या बहुत धीमी (<30/मिनट)
☐ छाती का धंसना, कराहना
☐ दौरे आना
☐ बीमार प्रतीत होना, बहुत सुस्त या चिड़चिड़ा होना
☐ बहुत ठंडा (बच्चे का तापमान 36° सेन्टीग्रेड से कम और गर्माहट देने के बावजूद नहीं बढ़ना) या बहुत गर्म (बच्चे का तापमान 38° सेन्टीग्रेड से अधिक)
☐ स्तनपान करना बंद कर दिया हो
☐ नाभि की लालिमा त्वचा तक फैल गई हो या मवाद आने लगा हो

क्या बच्चा ठीक से स्तनपान कर रहा है?

☐ हाँ, माँ को 6 महीने तक सिर्फ स्तनपान कराने के लिए प्रोत्साहित करें।
☐ नहीं, माँ की सहायता करें, छुट्टी देर में करें; ज़रूरत पड़ने पर एफ.आर.यू./NBSU/SNCU/उच्च–स्तरीय स्वास्थ्य केन्द्र पर रेफर करें।

☐ **माँ के साथ परिवार नियोजन के तरीकों के बारे में चर्चा करें और प्रदान करें।**
☐ **नार्मल प्रसव के पश्चात् 48 घंटे अथवा C-सेक्शन के पश्चात् 7 दिनों के लिए रहना सुनिश्चित करें।**
☐ **खतरे के लक्षण समझायें और सुनिश्चित करें कि छुएँ हो जाने के बाद माँ/साथी खतरे के लक्षण मौजूद होने पर सहायता लेंगे/वापस आयेंगे।**
☐ **घर भेजने के लिए वाहन (परिवहन) व्यवस्थित करें और माँ और बच्चे के लिए फॉलो-अप तय करें।**

आपसे सेवायें लेने के लिए माँ को धन्यवाद दें

खतरे के लक्षण

माँ को निम्न में से कुछ भी हो:

- अधिक रक्त स्त्राव
- पेट में तेज़ दर्द
- तेज़ सिर दर्द या धुंधला दिखना
- साँस लेने में तकलीफ
- बुखार या ठिठुरना/कंपकपाहट
- पेशाब करने में तकलीफ
- योनि से बदबूदार स्त्राव

बच्चे को निम्न में से कुछ भी हो:

- तेज़ साँस चलना या साँस लेने में तकलीफ
- बुखार
- असाधारण रूप से ठंडा
- ठीक से स्तनपान न करना
- सामान्य से कम गतिविधि
- पूरा शरीर पीला पड़ना

सेवाप्रदाता का नाम: ..... तिथि: ..... हस्ताक्षर: .....

Adapted from "WHO Safe Childbirth Checklist"

डिस्चार्ज/ रेफरल/ लामा/ मृत्यु फॉर्म (जो लागू हो उस पर सही (✓) का निशान लगायें)

Discharge/Referral/LAMA/Death Form (Tick (✓) whichever Applicable)

स्वास्थ्य केन्द्र का नाम:			
ब्लॉक:		जिला:	
सेवा प्रदाता का नाम तथा हस्ताक्षर:		फोन न.:	

नाम:	पिता/पति का नाम	उम्र (साल):	एमसीटीएस न.: (MCTS NO.)
भर्ती की तारीख: / /	भर्ती का समय:	डिस्चार्ज/रेफरल की तारीख: / /	डिस्चार्ज/रेफरल का समय:
प्रसव की तारीख: / /	प्रसव का समय:	प्रसव का परिणाम: जीवित जन्म ☐ गर्भपात ☐ एक/सिंगल ☐ ताज़ा स्टिल बर्थ ☐ (Fresh Still Birth) मैसेरेटेड स्टिल बर्थ ☐ (Macerated Still Birth) जुड़वा/मल्टिपल ☐ (Twins/Multiple)	

अंतिम परिणाम: डिस्चार्ज/ बाहर रेफर हुआ/ लामा/ मृत्यु/ गर्भपात
(जो लागू हो उस पर सही (✓) का निशान लगायें)

डिस्चार्ज का संक्षिप्त विवरण:

माँ की स्थिति .....
परिवार नियोजन चुनाव (यदि दिया गया).....
बच्चे की स्थिति .....
बच्चे का लिंग M☐ F☐ जन्म के समय वज़न (ग्रा.) .....

प्री-टर्म: हाँ☐ नहीं☐ इंजेक्शन विटामिन K1: हाँ☐ नहीं☐
टीकाकरण: बीसीजी☐ ओपीवी☐ हेपेटाइटिस बी☐

डिस्चार्ज के समय सलाह:
☐ माँ और बच्चे में खतरे के लक्षण के बारे में काउन्सेलिंग हुई
☐ आराम, पोषण और अधिक मात्रा में तरल पदार्थ
☐ आयरन की गोली ..... ☐ कैल्शियम की गोली.....

इलाज दिया गया .....
.....

रेफरल का संक्षिप्त विवरण:

रेफरल का कारण .....
.....
स्वास्थ्य सुविधा केन्द्र का नाम (जहाँ रेफर हुआ).....
.....
इलाज दिया गया .....
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डिस्चार्ज/ रेफरल/ मृत्यु के नोट्स

New Born Care Corner (NBCC)

It is a designated space within the labor and maternity OT with 24*7 trained staff available to provide essential newborn care at the time of birth and following prerequisites:

- Clear floor area of 30-50 sqft space in the Labour room & Obstetric OT
- One radiant warmer (RW) for every 3000 annual deliveries with adequate free space for movement around it, power source for radiant warmer, oxygen and suction equipment.
- Baby tray with bag and 0 and 1 size masks, disposable suction catheters, cord clamps, sterile towels, shoulder roll and Inj. Vitamin K_1.

More than 90% of the babies will cry at birth and should to be placed on the mother's abdomen **for** mandatory **Essential New born Care (ENC)** regardless of where the baby is born. ENC includes:

- skin to skin contact of the newborn with the mother,
- maintaining the airway, support in establishing respiration and
- early initiation of exclusive breastfeeding

Equipment & Supplies at NBCC		
Baby tray with two clean, warm towels/sheets	Mucous extractor (Dee Lee's)	Surgical gloves
Cord clamp/tie,	Cotton swabs	Needle (26 gauge) and syringe (1ml.)
Inj. Vitamin K-1	Catheters 8F (10 and, 12, 14 F.)	Sterile cord cutting scissors or surgical blade.
Functional self-inflating bag (250 & 500 mL)	Infant masks in two sizes: size '1' for normal weight baby and '0' for small baby.	A folded piece of cloth to be used as shoulder roll during resuscitation (1/2 to 3/4th inches thick)
▪ Discard Mucus extractor and suction catheter after single use & replaced with new ones. ▪ Make all essential equipment available, in working condition and disinfect before use (Bag and mask, neonatal stethoscope, radiant warmer and suction machine). ▪ Define roles and responsibility of each provider during resuscitation. ▪ Designate provider for the documentation & record keeping, communication with the family and calling for additional help.		

Breastfeeding

Early initiation of breastfeeding within the first hour of birth in addition to exclusive breastfeeding can cut down 22% of all newborn deaths. It accelerates the process of involution of uterus, reducing chances of postpartum haemorrhage and lowers the risk of breast and ovarian cancer in the mother

Colostrum -thick and yellowish secretions that mothers produce in the first few days after delivery contains anti-infective proteins and white cells which provide the first immunization and has a mild purgative effect, clearing the baby's gut of meconium and bilirubin thus prevent hyperbilirubinemia.

Recommended Breastfeeding Practices

- Initiate breastfeeding soon after (within half to one hour) birth and exclusive breastfeeding during first 6 months of life (medications if required).
- Breastfeed day and night on-demand at least eight times or more per day. Allow baby to feed at one breast at a time and offer her /him the other breast if the baby demands more or first at the next feeding session.

Do not introduce Prelacteal feeds (ghutti, gripe water, honey or any other milk). This will reduce the breast milk intake by the baby.

Breastfeeding Technique

Correct positioning is important because it will ensure correct attachment and effective suckling and prevent sore nipples and breast engorgement.

Four signs of **good position** are :

1. Baby's body is well supported.
2. The head, neck and the body of the baby are kept in the same plane.
3. Entire body of the baby faces the mother.
4. Baby's abdomen touches mother's abdomen.

Four signs of **good attachment** are

1. Baby's mouth wide open.
2. Lower lip turned outwards.
3. Baby's chin touches mother's breast.
4. Majority of areola inside the baby's mouth.

Effective suckling is when the infant shows slow deep sucks, sometimes pausing. If the infant is not sucking well, then look for ulcers and white patches in the mouth (Thrush).

Breastfeeding in Preterm & Low Birth Weight (LBW) Babies

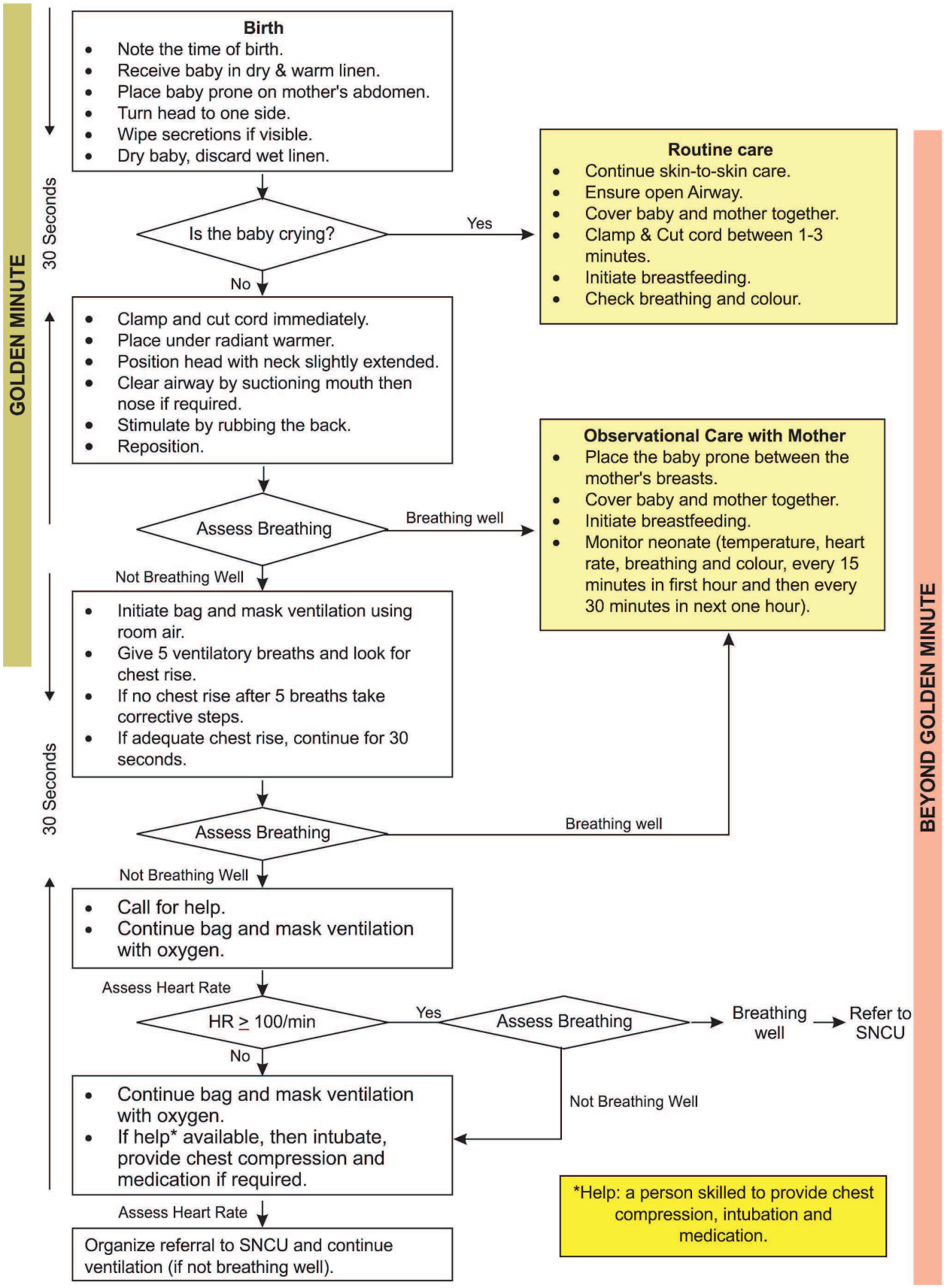
The ability of an infant to breastfeed depends on the suck, swallow, & breathing coordination of the innate reflexes which happens around 34 – 35 weeks.

Mothers with preterm delivery produce milk with higher concentration of proteins, calories, & protective substances which makes it particularly suited for preterm babies. Assisted breast feeding support should be extended to all mothers where baby cannot breast feed directly with activities such as manual expression of breast milk, taking care of the baby in the newborn unit and promote non-nutritive sucking (putting baby to the breast to develop sucking).

Common Neonatal Conditions

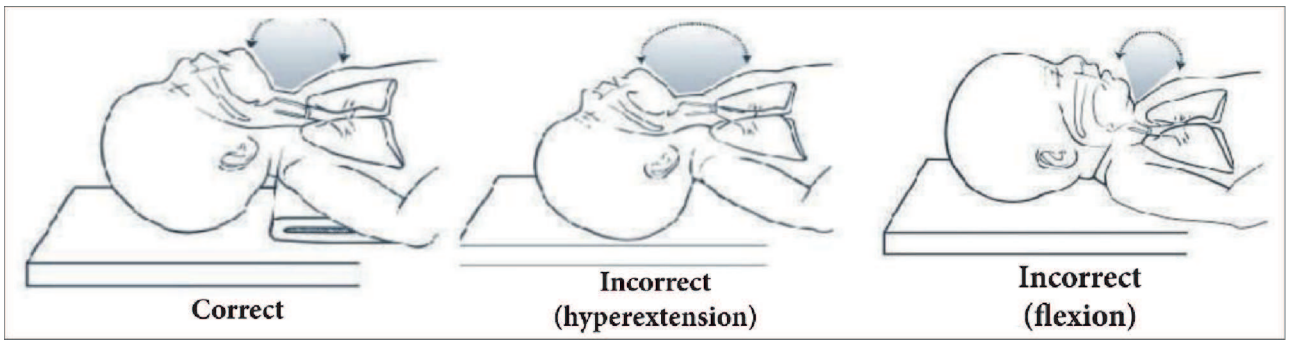
1. **Passage of meconium** in more than 90% of the neonates happen by 24 hours of age. Evaluate the newborn in case meconium is not passed by 24 hrs and/or has associated vomiting and/or abdominal distension. **Transitional Stools** are passed on Day 2/3 of life and are semi-loose, yellow-green stools and recovers in 24-48hrs without needing any treatment
2. **Voiding of urine** in more than 90% of the neonates happen by 24 hours of age and almost all void by 48 hrs
3. **Toxic Erythema of Newborn** is a common, benign and self-limiting conditions begin in the first few days after birth presenting as combinations of erythematous macules (flat red patches), papules and pustules
4. **Vaginal Discharge and Bleeding** observed after 3-5 days of birth as a withdrawal bleeding of maternal hormone. This is usually mild and needs no treatment.
5. **Enlargement of breast in babies of both sexes is seen**
6. **Physiological Jaundice** yellow discoloration of the skin and eyes should be atleast assessed twice in daylight for first few days of life. It typically appears on 3rd day peak on 4th -5th day of life and usually disappears before 14 days of life. Any deviation from this needs evalution.
7. **Caput Succedaneum and Cephalohematoma** are both not severe or life-threatening birth injuries of head. Cephalohematoma is an accumulation of blood under the scalp whereas Caput succedaneum is swelling or edema of the scalp following vaginal delivery

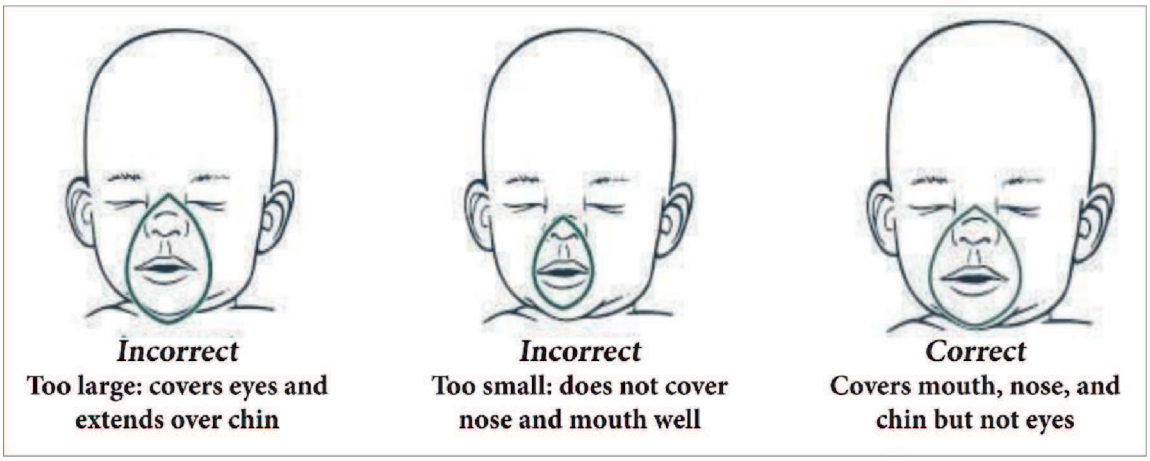
ALGORITHM FOR NEONATAL RESUSCITATION
(Activities in the Golden ONE Minute and beyond)



How to administer Positive Pressure Ventilation (PPV) using Self-Inflating Bag and mask

- Place the newborn under a radiant warmer. Place a shoulder roll under the shoulders and the face mask covering the chin, mouth and nose, but not the eyes.
- Stand at the head end of the newborn and squeeze the bag 40- 60 times per minute using the dominant hand. Look for chest rise.





New Born Stabilization Unit (NBSU)

At Community Health Centres (both FRU & NFRU), well networked and supported by district hospital provides basic care to sick and small new born close to home. Mother, along with the staff as an active caregiver is involved in– routine baby hygiene, feeding the baby, monitoring the babies on phototherapy, and providing KMC for longer duration.

Admission Criteria for NBSU (CHC/CHC FRU)

1. Stabilisation of new born presenting to CHC FRU/ NBSU with emergency signs/ New born weighing above 1800 gm without emergency signs **AND** any of the following signs:
    - Having feeding problem
    - Fast breathing (RR 60 - 70/min.)
    - Hyperthermia (Axillary temp >37.5°C) or hypothermia (35.5°C -36.4°C)
    - Jaundice requiring only phototherapy.
    - New born with suspected sepsis
2. Newborns weighing 1500-1800 grams with no sign of sickness
3. Newborns who for any reason cannot be transferred to SNCU/referral facility
4. Newborns back-referred (from SNCU) to NBSU for completion of treatment

NBSUs should have the following :

1. 4-6 bedded unit in close proximity to the maternity ward
2. 100 sq.ft per radiant warmer for baby care area and ancillary areas.
3. Ancillary area includes space for the following:
    - Gowning area at the entrance
    - Hand washing stations
    - Examination area/triage area
4. Nursing station for receiving/recording/reporting

Special Newborn Care Unit (SNCU)

SNCU at district hospitals and medical colleges provide 24x7 comprehensive secondary level of new born care to small and sick neonates not requiring surgical intervention and mechanical ventilation. Well performing SNCU can provide non-invasive CPAP ventilation and also serve as training hub for medical officers and nurses working at NBSU. Mothers of all babies admitted to the SNCU are to be provided a bed in the MNCU.

Admission Criteria SNCU (at district level)

1. **Management of newborns with emergency signs:**
    - Apnoea (Not breathing at all) or gasping respiration
    - Severe respiratory distress (RR>70/min, Grunting, moderate retractions)
    - Central Cyanosis
    - Shock
    - Convulsions
    - Unconsciousness
    - Hypothermia (Temp.< 35.5 degree C)
2. **Newborns weighing less than 1800gms / more than 4kg/ less than 32 weeks**

#Newborns weighing 1500-1800 g can be managed at either NBSU or SNCU depending on the place of delivery, sickness and can be admitted even for KMC and feeding support.

Each SNCU should have the following:

- Located near Labour room/maternity ward
- Minimum 12 bedded or larger unit with minimum of 120 -170 square feet of clear floor space
- Dedicated, trained doctors, staff nurses and support staff

SNCU complex can have following designated areas:

- **Entrance and reception area** for direct contact with families and staff nurses. Provision of lockers, footwear stands and simple amenities like comfortable seating space, safe drinking water and a wash room for the caregivers by the hospital must be done.
- **Triage area** - designated 160 sq. ft area near the entrance, radiant warmer, essential equipment for triaging & immediate management of a sick newborn.
- **Gowning & handwashing area**:
    - hands-free, elbow operated taps with
    - sufficient supplies for the staff and the parents/ mothers,
    - two-way bevel doors for all the interconnected areas,
    - pictorial hand washing instructions in local languages
    - space for soap and towel dispensers and BMW management

- **Critical/baby care area** should have central oxygen and suction, 4 ft. space between two adjacent radiant warmers (RW) should be and within 20 ft. from hand washing station,
- **Ancillary area** – feeding room, utility room, storage area
- **Rooms** for doctors, staff nurses and support staff

Follow up OPD cum counselling area: Ensure to share that the list of follow up with ASHA and RBSK manager to coordinate for provision of care like – Retinopathy of Prepmaturity (ROP), BERA, surgical intervention etc.

Follow up schedule for SNCU/NBSU admitted baby at facility: 1st visit after 48 hours of discharge/within a week of discharge and then two visits every 14th day. Then link follow ups with scheduled visits for immunization till 18 months of age with a visit at 6 months and 12 months of age specially for babies as under:

- Babies with <1800 g birth weight and/or gestation <34 weeks/ Small and large for date
- Any condition which required prolonged stay/ had difficult SNCU stay
- Perinatal asphyxia – Apgar score 3 or less at 5 min and/or hypoxic ischemic encephalopathy of stage II and above

Mother Newborn Care Unit (MNCU)

This aims for **zero separation** of mother and new born during hospital care. This can be done by ensuring access to bed, diet and treatment to recently delivered mother whose babies are admitted for care in SNCU in the same space/ area. Babies eligible for care at MNCU are:

- Stable SNCU admissions no longer on IV fluid and oxygen supplementation but need KMC, phototherapy, completion of antibiotic course, feeding support, etc.
- At risk newborn- 1800-2000g babies without sickness from postnatal ward for KMC and breast feeding support and requiring phototherapy
- Any newborn who is not sick yet requires breastfeeding support till the requisite weight gain for discharge

Family-participatory care (FPC) is a standard practice of respectful maternal- new born care where family is empowered with essential skills to be actively involved in care and supported in caring for their baby. Mothers /parent attendant are allowed entry into the unit and involved in care of the new born. DO REMEMBER the primary responsibility for the care and wellbeing of the new born is with the nurses and doctors.

District Early Intervention Centre (DEIC)-SNCU linkage

- SNCU team in coordination with the DEIC team will ensure that preterm babies and sick babies are screened for hearing and vision before discharge and during follow up visits as per the recommendations under RBSK. District Early Intervention Centers (DEIC) at District Hospitals under Rashtriya Bal Swasthya Karyakram (RBSK) evaluate, manage and support children by providing comprehensive services under one roof with a holistic approach.
- Staff in the labour room all delivery points, OT, postnatal ward, as well as in the new born care unit. must screen and report visible birth defects like neural tube defect, cleft lip & palate, club foot etc.
- At SNCU level screening for congenital heart disease, metabolic defects, haemo-globinopathies, congenital hypothyroidism should be undertaken.
- Under universal eye screening programme, DEIC ensures that all SNCU discharges below are screened and managed appropriately screening for retinopathy for prematurity (ROP) as per the schedule:
  1. Birth weight less than 2000 gm and or gestational age less than 34 weeks
  2. Gestational age between 34 to 36 weeks an unstable clinical course who are with risk factors such as:
     - Cardio-respiratory support, prolonged oxygen therapy for any cause
     - Fetal hemorrhage, intraventricular hemorrhage
     - Neonatal sepsis, apnoea
     - Blood transfusion, exchange transfusion,
     - Poor postnatal weight gain (weight gain less than 10gm/kg/day after regaining birth weight and on full enteral feeds).

Neonatal Intensive Care Unit (NICU)

It provides tertiary level newborn care especially ventilation and surgery or advanced workup (for example metabolic disorder) to newborns with differing degrees of complexity and risk. NICU should have the following:

- located at medical colleges/district hospitals (attached to medical college)
- 24*7 specialized personnel (like neonatologists, neonatal nurses)
- advanced diagnostics, neuro imaging, surgeries and
- multidisciplinary management for congenital malformations should also be available.

A. Approach to a new born brought to a facility

Assess and stabilize any sick newborn using the TABC priority in that order so no emergency sign is missed.

- **T:** Temperature
- **A:** Airway
- **B:** Breathing
- **C:** Circulation/Convulsions/Coma

Perform following **3 steps (RED) for Clinical Assessment of Emergency Signs** as soon as a baby arrives:

1. Place the newborn under a **Radiant warmer** and under good light and record temperature.
2. Check for the **Emergency signs** and institute appropriate treatment while planning for referral to SNCU/higher facility.
3. If there is an emergency sign perform **bedside Diagnostics** (oxygen saturation & blood glucose).

This is important as many sick babies are hypothermic and their survival chances increase, if hypothermia is taken care of even before initiating any resuscitation measure. Give priority to stabilizing the sick or small baby before assessing and treating the underlying cause of the problem.

Respiratory Distress (Chest in-drawing, nasal flaring & grunting):

The normal respiratory rate is 40-60 breaths per minute. If the first count is 60 or more, repeat the count. If the second time also the breathing rate is 60 breaths or more, the neonate has 'fast breathing'.

- Mild chest in-drawing is normal in a neonate because the chest wall is very soft.
- Severe chest in-drawing (lower chest wall goes in when the infant breathes in) is a sign of pneumonia and is a danger sign.

Nasal flaring is widening of the nostrils when the neonate breathes in.

Grunting is the soft, short sounds a young infant makes when breathing out, when an infant is having trouble breathing.

New born may also require further investigation or referral for the following:

- Excessive crying (detailed evaluation for any causes).
- Drooling of saliva or choking during feeding.
- Persistent vomiting/ any bilious vomiting/ Blood in stool
- Inability to pass urine and stool (within 24 hours).
- Bleeding from any site.

Classification of signs in newborn		
Emergency Signs	**Priority Signs**	**Non-urgent Signs**
Body temperature (35.5C) Apnea/gasping/Signs of respiratory distress (RR >70, severe retractions, grunt) Central cyanosis Shock (cold periphery, CFT >3secs, weak and fast pulse) Coma, convulsions or encephalopathy	small neonate (60 but no or minimal retractions) Irritable/restless/jittery /Refusal to feed Abdominal distension Severe jaundice (in 2 weeks) /Severe pallor Bleeding from any site Major congenital malformations (Tracheo oesophageal fistula, Menigomyelocele, Anorectal malformation) • Large baby >3.8 kg/ as per the percentile charts	Jaundice Transitional stools/ possetting Developmental peculiarities Minor birth trauma Superficial infections Minor malformations All cases not categorized as Emergency/Priority
ACTIONS		
Manage these at high risk Neonates urgently. Once stabilized admit/refer to the SNCU/NBSU	immediate assessment on priority basis and will also need to be referred to SNCU or admitted in NBSU.	Assess to provide further treatment according to neonate's requirement

B. Management of Newborn with Emergency Signs

1. Low Body Temperature (TEMP<35.5°C)

- Check axillary temperature and remove wet clothing
- Place newborn under radiant warmer in servo control mode and continue to assess axillary temperature every half hourly
- Start Kangaroo Mother Care (KMC) if radiant warmer is not available.
- Keep the room warm (at least 26°C) using an external heating device, if needed.
- Watch for apnoea, hypoglycaemia & capillary refill time during rewarming.
- Maintain temperature in the range 36.5–37.5°C

2. Not breathing at all "OR" gasping respiration

- Position and clear airway by suction.
- Initiate bag & mask ventilation, if there is apnoea, gasping/ RR too slow (<20/minute).
- Follow the algorithm for newborn resustication as given above on page 141.

When to stop resuscitation

If there is no sign of life (no breathing and no cardiac activity) even after 20 minutes of resuscitation; inform the family and provide emotional support to the family and with their approval resuscitation efforts can be discontinued.

C. Oxygen Therapy

It is indicated in all newborns who present with emergency signs and if the oxygen saturation is < 91%. Meticulous monitoring of SpO2 using pulse oximeter and general condition of newborn should be ensured to guide oxygen therapy. Oxygen can be discontinued once the infant can maintain saturation > 90% in room air.

Oxygen delivery devices

Nasal prongs /cannula	Most preferred mode of providing oxygen FiO2 between 25 to 45% with flow rates of 0.5-2 L/min. Always selected most An appropriate neonatal size prongs should be selected Ends of prongs should be cleaned twice daily with saline and checked to avoid plugging by mucous or secretions. Allows breast feeding while newborn is on oxygen therapy
Oxygen hood	Need flow rates of 2-3L/Kg/min Have occludable portholes on the sides to provide varying Fio2 - both port open 30-40%, one port hole open close to 40-50% and 80-90%, with both port holes closed Allows movement of neck

D. Management of SHOCK in a new born:

Maintain Termperature Airway Breathing (TAB) and glucose levels:

- Insert IV line in superficial distal veins over dorsum of hands or feet
- Give IV fluid bolus 10 mL/kg normal saline over 20-30 minutes. Repeat bolus, if circulation does not improve.
- use a micro drip set or an infusion pump.
- Always check the fluid bottle for type of fluid, bottle's seal, date of expiry and whether it contains clear fluid or not.
- Check the intravenous site for leakage or displacement of cannula.

Monitoring:

Response to therapy	Signs of Over-Hydration
Heart rate (decrease in HR by at least 10 bpm) Respiratory Rate (normalization of RR). Capillary refill time (Improvement of CRT). Oxygen saturation (Improvement in SpO2).	Puffiness of eyes. Weight gain. Increasing liver size on per abdomen examination

In case of excess fluid administration, further fluid bolus should be stopped and only maintenance fluid therapy should be continued.

E. Treatment of Hypoglycemia

If blood glucose <45mg/dl by glucometer (if possible, get confirmation done by plasma blood sugar levels), start treatment.

Asymptomatic newborn: Provide one oral feed (direct breastfeed or EBM 20ml by spoon). Assess blood sugar after an hour, if blood sugar remains below 45mg/dl, treat with IV dextrose as for symptomatic newborn (given below).

Symptomatic newborn (lethargy, limpness, sweating, respiratory distress, apnoea etc.): Give a bolus of 10% Dextrose @2ml/kg slowly over a minute (If IV access is difficult, give the same amount through OG tube) and follow by Dextrose infusion @6mg/kg/min. Start infusion of dextrose containing fluid at the daily maintenance volume according to the baby's age so as to provide a glucose infusion rate (GIR) of 6 mg/kg/min. Repeat blood glucose after half an hour. Refer to SNCU for further management.

Referral Transport

Components of neonatal transport

Communication begins at the first contact with health facility, till the baby leaves after discharge or treatment. Communication can be verbal (spoken language) and non-verbal which involves use of correct body posture, gestures and eye contact.

- At admission, inform the family following assessment about the condition of the baby, need for admission, prognosis of the baby, treatment options and likely duration of treatment.
- Inform the parent/ parent attendant about free entitlements to baby and mother under Janani Shishu Suraksha Karyakram and Ayushman Bharat PM Jan Arogya Yojana (PM-JAY).
- Counsel the mother regarding care of her newborn including feeding and whether the mother is medically fit allow her to stay along with the admitted baby.
- Communicate with the concerned doctor/authority regarding the referral of the newborn to SNCU/appropriate health facility providing comprehensive neonatal health care.

Pre-referral and in transit stabilization

As per the protocol to maintain **Temperature, Oxygenation, Perfusion and Sugar (TOPS)**

- **Temperature**: Maintain temperature 36.5-37.5°C by adequate covering (Wrap the baby well in layers with head, hands and feet covered) / Skin to skin contact or KMC
- **Airway and oxygenation**: Ensure airway patency by keeping the neck slightly extended using a shoulder roll and clearing secretions and maintain saturation between 91-95% with nasal cannula/prongs attached to an oxygen source with flow of 0.5 to 1 L/min (Do check adequacy of oxygen in gas cylinder)
- **Perfusion**: Maintain heart rate between 120-160/minute and a CRT < 3 secs
- **Feeding**: Enteral feeds/IV fluids are continued even en-route to maintain blood glucose levels during transport
- **Pre-referral antibiotics** All newborns with emergency signs should be given before transport are ampicillin and gentamicin.

Referral note should mention the following:

- Case particulars- Name, age, gender, address.
- Chief complaints and reason for referral.
- temperature, oxygenation, perfusion, sugar both at arrival at health facility and referral
- Management and treatment details provided for stabilization, including antibiotics.
- Contact details of the referring health personnel.
- All available reports.

En-route monitoring can be done by the accompanying wherever feasible health care provider/ EMT if available and the parent/parent attendant for TOPS to accompany, monitor and provide necessary supportive care/resuscitation during transportation. **Confirm successful transport:** Ensure documentation of receiving the baby and inform the referring unit

Routine Immunization

Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by administering a vaccine. Vaccines stimulate the body's immune system to protect the person against later infection or illness. Each vaccine provides immunity against a particular disease; therefore, several vaccines are administered to children and women to protect them from many vaccine-preventable diseases.

India's Universal Immunization Programme (UIP) is one of the most extensive immunization programs in the world. In Uttar Pradesh, the UIP aims to vaccinate nearly 57 lakh infants each year with all primary doses and an additional ~1 crore children of 1- 5 years old with booster doses. In addition, almost 60 lakh pregnant mothers are targeted for Td vaccination yearly. Every year, ~24 lakh immunization sessions are conducted to vaccinate the beneficiaries, most of which are at the village level.

The vaccination services are delivered at both facilities and outreach sites. Facility based vaccination in Uttar Pradesh includes the vaccination provided to pregnant women and children on outpatient (OPD) basis and the vaccination of neonates at birth. Since January 2023, daily vaccination sessions, including Sundays, are being organized at all urban health facilities across Uttar Pradesh to strengthen immunization in urban areas. The goal is to provide assured quality services at all health facilities. At District Hospitals and UCHCs the sessions are organized on all seven days of the week and at UPHCs sessions are organized from Tuesday to Sunday.

All children and pregnant women visiting your facility should receive the benefits of immunization. This includes all the patients who may or may not have come specifically for immunization related services.

Responsibilities of Staff Nurse in Routine Immunization

As Staff Nurses, you play a very important role in providing Immunization services to mothers & children. You are expected to vaccinate all children and pregnant women according to the National Immunization Schedule (NIS) if given the responsibility of immunization at the facility you are posted at. Your responsibilities can be highlighted under the following headings

- Ensuring all pregnant women and children are immunized as per NIS
- Ensuring that every newborn received their birth doses in the labor room
- Ensuring that the Cold chain of vaccines provided to the facility is maintained till the empty vials are returned to cold chain point
- Recording and Reporting of immunization data

Vaccine Preventable Diseases

The following are the targeted vaccine-preventable diseases under Universal Immunization Program:

1. Tuberculosis
2. Hepatitis B
3. Polio
4. Diphtheria
5. Pertussis
6. Tetanus
7. Haemophilus Influenzae Type B related diseases (bacterial meningitis, pneumonia and others)
8. Diarrhoeas due to rotavirus
9. Pneumococcal disease
10. Measles
11. Rubella
12. Japanese Encephalitis

National Immunization Schedule for infants, children and pregnant women

Age	Vaccines
Pregnant women	Td-1, Td-2*, Td-Booster (if received 2 Td doses in a pregnancy within the last 3 years)*
Birth	bOPV-0, HepB0, BCG
6 weeks	bOPV-1, RVV-1, Penta-1, f-IPV-1, PCV-1
10 weeks	bOPV-2, RVV-2, Penta-2
14 weeks	bOPV-3, RVV-3, Penta-3, f-IPV-2, PCV-2
9-12 months	Vit-A, Measles-Rubella-1, PCV-Booster, f-IPV-3, JE-1**
16-24 months	bOPV-Booster, Vit-A, DPT-Booster-1, Measles-Rubella-2, JE-2**
5-6 years	DPT-Booster-2
10 years	Td-10
16 years	Td-16

*Give Td2 or Booster doses before 36 weeks of pregnancy. However, give these even if more than 36 weeks have passed. Give Td to a woman in labour, if she has not previously received Td.

** JE vaccine has been introduced in selected endemic districts. If first dose delayed beyond 12 months ensure minimum 3 months gap between 2 JE doses.

Max age, dose, route and site of immunization

Vaccine	Max age	Dose	Diluent	Route	Site
For Pregnant Women					
Td-1	Give as early as possible in pregnancy	0.5 ml	No	Intramuscular	Upper Arm
Td-2		0.5 ml	No	Intramuscular	Upper Arm
Td- Booster		0.5 ml	No	Intramuscular	Upper Arm
For Infants					
BCG	Till one year of age	0.05 ml until 1 month age, 0.1ml from 1m. to 1yr. of age	Yes	Intra-dermal	Left Upper Arm
HepB	Within 24 hours	0.5 ml	No	Intramuscular	Antero-lateral side of mid-thigh - LEFT
bOPV-0	Within the first 15 days	2 drops	No	Oral	Oral
bOPV 1, 2 & 3	Till 5 years of age	2 drops	No	Oral	Oral
RVV 1, 2 & 3	Till 1 year of age	5 drops	No	Oral	Oral
f-IPV 1 ,2 & 3	Up to 1 yr. of age along with OPV 1 & OPV3	0.1 ml	No	Intradermal	f-IPV 1 & 2 doses right upper arm, and f-IPV 3rd dose left upper arm

Vaccine	Max age	Dose	Diluent	Route	Site
Penta1,2, & 3	Till one year of age	0.5 ml	NO	Intramuscular	Antero-lateral side of mid-thigh (Left)
PCV 1st, 2nd & Booster	Till 1 year of age	0.5 ml	NO	Intramuscular	Antero-lateral side of mid-thigh (right)
JE *1st dose	Till 5 years of age	0.5 ml	NO	Intramuscular	Anterolateral aspect of left mid thigh
MR - 1st Dose	5 years of age	0.5 ml	YES	Subcutaneous	Right upper Arm
Vit A (1st dose)	5 years of age	1 ml (1 lakh IU)	NO	Oral	Oral
For Children					
DPT booster-1	7 years	0.5 ml	NO	Intramuscular	Antero-lateral side of mid-thigh (Left)
MR 2nd dose	5 years of age	0.5 ml	YES	Subcutaneous	Right upper Arm
bOPV Booster	5 Years	2 drops	NO	Oral	Oral
JE 2nd Dose	Till 5 years of age	0.5 ml	NO	Intramuscular	Anterolateral aspect of left mid thigh
For Children					
Vit A (2nd to 9th dose)	up to the age of 5 years	2 ml (2 lakh IU)	NO	Oral	Oral
DPT Booster-2	7 years	0.5 ml	NO	Intramuscular	Upper Arm
Td	16 Years	0.5 ml	NO	Intramuscular	Upper Arm

Immunization Practices

Reconstitution of vaccines

Vaccines that need to be mixed with diluent before use are **BCG and MR**. Use these vaccines as per following instructions:

- Before reconstitution check that the vaccine is within the expiry date and that VVM has not reached/crossed the discard point.
- When reconstituting, do so **only with the diluent provided** by manufacturer for that batch of vaccine.
- Reconstitute the vaccine with diluent immediately before use.
- **Reconstitute the vaccine even when only one eligible child is present.**
- Write the **date and time of reconstitution** on the label of the vial immediately following reconstitution.
- Use the reconstituted vials **only for a single session**; ***do not carry them from one session to another, even if the session is close by***.
- If any AEFI occurs following use of any vial, do not use that vial; mark it and retain safely for AEFI investigation.

Importance of safe injection practices

A safe injection is one that -

- Does not harm the recipient
- Does not expose the health workers to any avoidable risks
- Does not result in waste, which is dangerous for the community

The most common, serious infections transmitted by unsafe injections are Hepatitis B, Hepatitis C, and HIV (the virus that causes AIDS). Poorly administered injections can also cause injuries or drug toxicity when the wrong injection site, vaccine, diluent, or dose is used. It is important to prevent the risks of accidental needle-stick injury, and necessary to dispose of used syringes and needles safely to prevent risks to the community at large.

Good injection technique

- **Wash hands before giving injections**
  - Wash or disinfect hands prior to preparing injection material.
  - Avoid giving injections if the skin at the site of injection of the recipient is infected or compromised by local infection (such as a skin lesion, cut, or weeping dermatitis).
  - Cover any small cuts on your skin.
- **Use sterile injection equipment, every time**
  - Always use AD Syringe for each injection and a new disposable syringe to reconstitute each vial of BCG and MR.
- **Prevent the contamination of vaccine and injection equipment**
  - Prepare each injection in a designated clean area where contamination from blood or body fluid is unlikely.
  - If the injection site is dirty, clean it with clean swab. **Do not use alcohol swab**
  - Always pierce the rubber cap of the vial with a sterile needle.
  - Ensure opened vial septum is covered to prevent contamination.
  - Follow product-specific recommendations for use, storage, and handling of a vaccine.
  - Do not touch the needle or rubber cap of vial with your finger.
  - Discard any needle that has touched any non-sterile surface.
- **Assume all used equipment is contaminated**
  - Cut the used syringe at the hub immediately after use.
- **Practice safe disposal of all medical sharps waste**
  - Used sharps (needles) must be collected in a hub cutter and then carried to the PHC for safe disposal.
- **Prevent needle-stick injuries**
  - Do not recap or bend needles.
  - Collect sharps in a puncture proof container (Hub cutter).
  - Anticipate sudden movement of the child.

Using Auto-Disable (AD) syringes

Good injection technique includes administering all injectable vaccines with an auto- disable (AD) syringe. To use AD syringes correctly, remember that the plunger of an AD syringe can only go back and forth once; so do not draw up air to inject into the vaccine vial when filling the AD syringe.

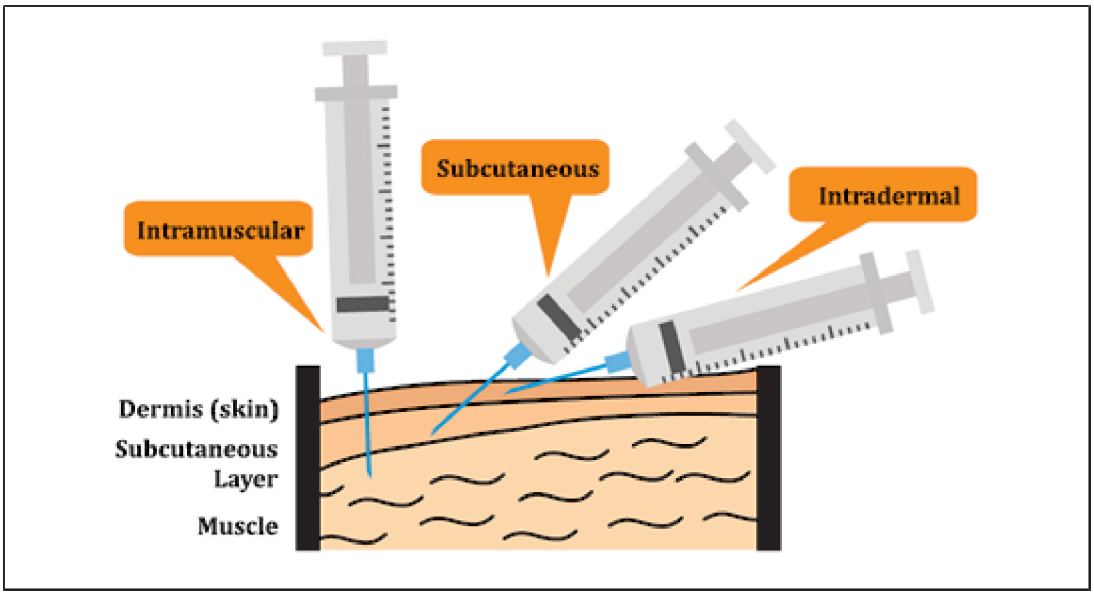
AD syringes have a fixed needle and are pre-sterilized in a sealed pack. They can only be used once.

They are available in two sizes with vaccine drawing capacity of 0.1 ml and 0.5 ml.

Correct use of AD syringes

<table>
<tr><td rowspan="3">  </td><td>1. Select the correct syringe for the vaccine to be administered – 0.1ml for BCG, fIPV and 0.5ml for all others.</td></tr>
<tr><td>2. Check the packaging. Don't use if the package is damaged, opened, or expired.</td></tr>
<tr><td>3. Peel open or tear the package from the plunger side and remove the syringe by holding the barrel. Discard the packaging into a black plastic bag.</td></tr>
<tr><td rowspan="6"> 
  </td><td>4. Remove needle cover/ cap and discard it into the black plastic bag.</td></tr>
<tr><td>5. Do not move the plunger until you are ready to fill the syringe with the vaccine and do not inject air into the vial as this will lock the syringe.</td></tr>
<tr><td>6. Take the appropriate vaccine vial, invert the vial, and insert the needle into the vial through the rubber cap. Insert the needle such that the tip is within the level of the vaccine. If inserted beyond you may draw air bubble which is very difficult to expel.</td></tr>
<tr><td>7. Do not touch the needle or the rubber cap (septum) of the vial.</td></tr>
<tr><td>8. Pull the plunger back slowly to fill the syringe. The plunger will automatically stop when the necessary dose of the vaccine has been drawn (0.1 or 0.5 ml).</td></tr>
<tr><td>9. Do not draw air into the syringe. In case air accidentally enters the syringe, remove the needle from the vial. Holding the syringe upright, tap the barrel to bring the bubbles towards the tip of syringe. Then carefully push the plunger to the dose mark (0.5 or 0.1 ml) thus expelling the air bubble.</td></tr>
<tr><td>10. Clean the injection site (if dirty) with a clean water swab.</td></tr>
<tr><td>  </td><td>11. Administer the vaccine.
• BCG: upper arm LEFT
• DPT and Hep B: Anterolateral aspect (outer side) of midthigh LEFT
• Pentavalent: Anterolateral aspect of mid-thigh LEFT
• fractional IPV: Upper arm RIGHT
• PCV: Anterolateral aspect of mid-thigh RIGHT
• MR: Upper arm RIGHT
• Td: Upper arm RIGHT
• JE: upper arm LEFT.
12. Push the plunger completely to deliver the dose. Do not rub the injection site after vaccine is given.</td></tr>
<tr><td>13. Do not recap the needle. Cut the hub of the syringe immediately after use with a hub-cutter that collects the sharps in its puncture proof container.</td></tr>
<tr><td>14. Then collect the plastic portion of the cut syringes in a red plastic bag.</td></tr>
</table>

Needle positions for ID, SC and IM injections



- **For intradermal (ID) injections**, gently stretch and support the skin with the thumb and forefinger. Lay the syringe and needle almost flat along the infant's skin. Gently insert the needle into the top layer of the skin.
- **For subcutaneous injections (SC),** gently squeeze the skin. Insert the entire needle at a 45-degree angle (towards the shoulder) with a quick, smooth action.
- **For intramuscular injections (IM),** gently stretch and support the skin between thumb and forefinger. Push the entire needle in at a 90-degree angle with a quick, smooth action
- For all injections, depress the plunger slowly and smoothly, taking care not to move the syringe around.
- For all injections, pull the needle out quickly and smoothly at the same angle that it went in.
- For all injections, the caregiver may hold a clean swab gently over the site if it bleeds after injection.
- For all injections, cut the hub of the syringe with hub cutter and put the plastic part of the syringe into the red bag immediately after each vaccination.
- For all injections, soothe and distract the child when all the vaccines have been given.

Key messages to be given to the caregiver during vaccination:

During assessment -

- Explain what vaccine(s) will be given and the disease it prevents;
- Mention possible adverse events (minor AEFIs) and explain how to handle them;
- Explain the need for the child to return for each contact in the immunization schedule to be fully protected. Write the date for the next vaccination on the immunization card and tell the caregiver;
- Remind the caregiver to bring the immunization card when they bring the child back for the next vaccination;
- Explain the importance of waiting for 30 minutes after vaccination;
- Check vaccine name and sure the correct vaccine is being given.

After vaccination: Give the 4 key messages

- Explain the minor adverse events that may happen post vaccination, and how to manage them
- Write the date for the next vaccination on the immunization card and tell the caregiver;
- Remind the caregiver to carry the immunization card when they take the child for the next vaccination
- Remind the caregiver when to return with the infant;

Ask the caregiver if they have any questions or concerns and answer them politely.

Recording and Reporting

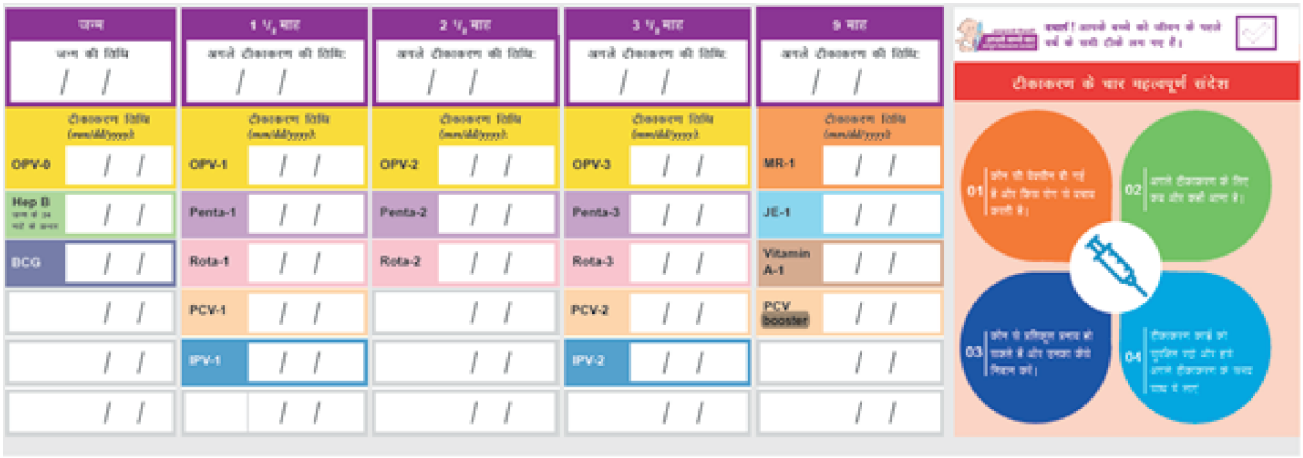
- Record all vaccinations in Mantra application & case sheet in case of birth doses and immunization card and immunization register in case of older infants.
- Mark the date of vaccination and the next due date on the card if another dose is needed, and ensure that the caregiver understands when and where to return for the next dose(s) of vaccine(s);
- Report all AEFIs.

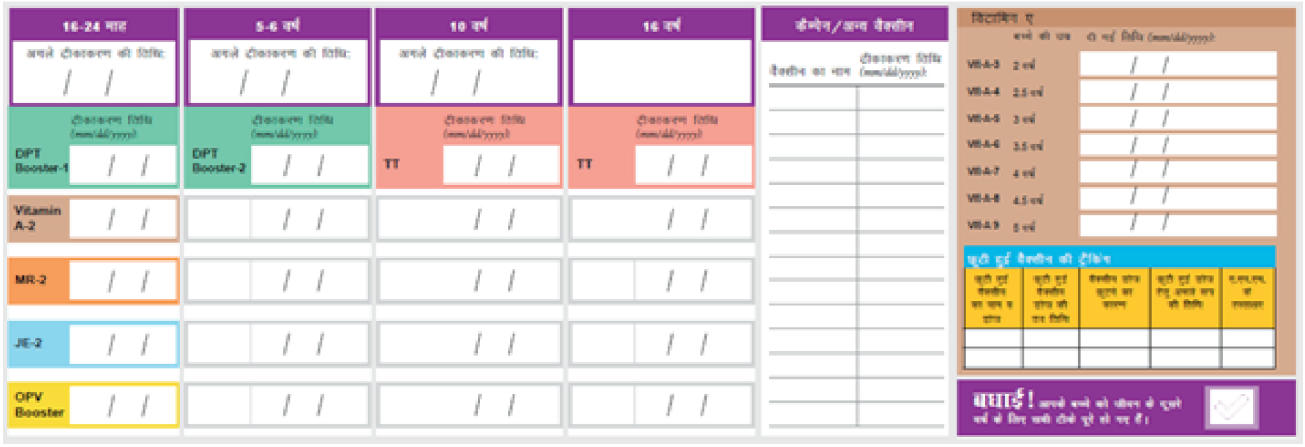
Mother and Child Protection (MCP) card

The MCP Card is a tool for families to learn, understand and follow positive practices for achieving good health of pregnant women, young mothers and children. The card gives information on the immunization schedule and the doses of Vitamin A to be given to the child during the first five years. Boxes in the chart indicate each type of vaccine, date to be given, date when it was given and age.

Details that would be available from MCP Card are:

- Next vaccination date - top box - when the child is expected to come for next immunization.
- Date of vaccination - against vaccine name - when the child was immunized.





The cold chain

Cold Chain is a system of storing and transporting vaccines at recommended temperatures from the point of manufacture to the point of use. The key elements of the cold chain are:

- **Personnel:** to manage vaccine storage and distribution (vaccine and cold chain handler at each cold chain point).

- **Equipment:** to store and transport vaccine and monitor temperature.
- **Procedures:** to ensure correct utilization of equipment and ensure vaccines are stored and transported safely.

Vaccine sensitivities

- Vaccines lose their potency due to exposure to heat (temperature above +8°C), cold (temperature below + 2°C) and light. The loss of potency due to either exposure to heat or cold is permanent and cannot be regained.
- Reconstituted BCG and MR vaccines are the most heat and light sensitive. Since these live vaccines do not contain preservatives, there is risk of contamination with Staphylococcus aureus leading to toxic shock syndrome and, therefore, they should be used **within 4 hours of reconstitution**. These light sensitive vaccines are supplied in amber-coloured vials.

Sensitivity of various vaccines to heat, light and freezing is given below:

Do's and Dont's in cold chain and vaccine sensitivities

Dos	Dont's
• Keep all vaccines in ILR at +2°C to +8°C at PHC • Use diluent provided by the manufacturer with the vaccine • Keep diluents in ILR at +2°C to +8°C at least 24 hours before use • Use reconstituted Rotavirus vaccine, BCG, & MR vaccine within 4 hours • Discard all damaged vials for disinfection and disposal	• Do not keep in the cold chain: ▪ Expired vials, ▪ Frozen vials or ▪ Vials with VVM beyond the end point • Do not use reconstituted BCG and MR vaccines after 4 hours. • Do not dispose damaged or empty vials in the surroundings of the session site.

Open vial policy

Any vial of the applicable vaccines opened/used in a session (fixed or outreach) can be used at more than one immunization session up to 4 weeks (28 days) provided that:

- The expiry date has not passed;
- The vaccines are stored under appropriate cold-chain conditions both during transportation and storage in cold-chain storage point;
- The vaccine vial septum has not been submerged in water or contaminated in any way;
- Aseptic technique has been used to withdraw vaccine doses, i.e. needle/septum has not been contaminated in any way;
- The VVM has not reached/crossed the discard point.
- Date and time is written on vial

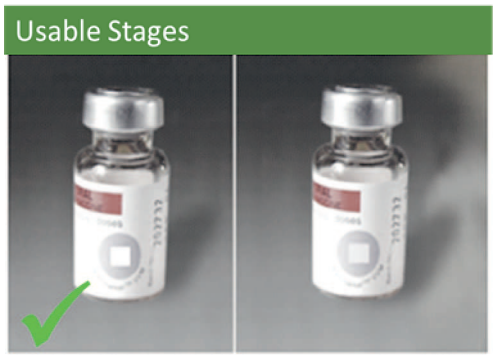
Open Vial Policy	Yes	No
Vaccine	HepB, OPV, DPT, Penta, Td, PCV, fIPV, RVV and JE	BCG and MR

Diluents

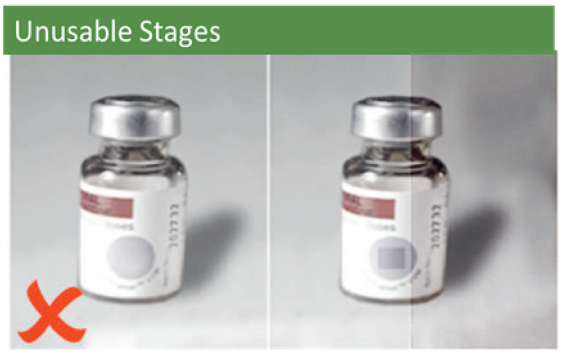
Only those diluents that are provided with the vaccine by the manufacturer should be used. **Keep diluents in an ILR at +2°C to +8°C at least 24 hours before use** to ensure that the vaccine and diluent are at the same temperature when being reconstituted. Keep diluents with the vaccines in plastic zipper bag inside the vaccine carrier during transportation.

Vaccine Vial Monitor

Vaccine Vial Monitor (VVM) is a label containing a heat sensitive material to record cumulative heat exposure over time. The combined effect of time and temperature cause the inner square of the VVM to darken gradually and irreversibly. Before opening a vial, check the status of the VVM. If the VVM shows change in colour to the end point, then discard the vaccines.



Reading the Stages of the VVM
The inner square is lighter than the outer circle.
If the expiry date has not been passed:
USE the Vaccine



Discard Point:
The color of the inner square matches that of the outer circle:
DO NOT use the vaccine if the color of the inner square is same or darker than the outer circle

Mark for discard or disposal any vaccine vial in case any one of the following conditions are met:

- Expiry date has passed;
- VVM has reached/crossed discard point (for freeze-dried vaccine, before reconstitution only) or vaccine vials without VVM or disfigured VVM;
- No label/partially torn label and/or writing on label not legible;
- If date and time is not mentioned on vial
- Any vial thought to be exposed to non-sterile procedure for withdrawal;
- Open vials that have been under water or vials removed from a vaccine carrier that has water;
- Vaccine vial is frozen or contains floccules or any foreign body;
- There is breakage in the continuity of the vials (cracks/leaks);
- There is any AEFI from any of the vials; if so, do not use it, and retain it safely. Inform MO and/or supervisor.

Cold chain equipment

Cold chain equipment, both electrical and non-electrical, is used for storing vaccines and/or transporting them at appropriate temperatures.

ILR point or Cold Chain point: An ILR or cold chain point is any centre (PHC/CHC/DH) with an Ice Lined Refrigerator for storage of vaccines and a Deep Freezer for preparation of frozen ice packs. There is usually a generator as power back up. The function of the ILR point is to receive, store and further distribute vaccines, diluents and other logistics to another ILR point or directly to the session sites.

Domestic Refrigerator:

Domestic refrigerator can also maintain the cabinet temperature between +2° to +8°C. Vaccines can be stored in domestic refrigerators only if no other option is available as it is not the preferred equipment to store vaccines. Refrigerators must be loaded correctly to maintain the temperature of the vaccines and diluents. **Do not** store other supplies such as drugs, ointment, serum, samples, food articles, drinks etc. **Do not** put vaccines on the door shelves. The temperature in door shelves is too warm to store vaccines, and when the door is opened shelves are instantly exposed to room temperature. **Do not** place vaccines in the freezer, chiller or baskets.

Vaccine Carrier

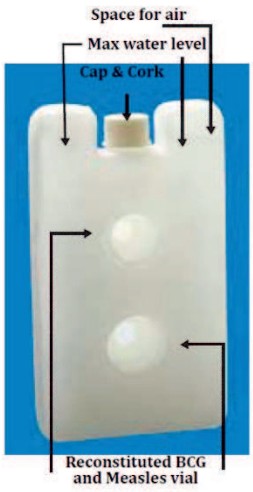
It is an insulated box used for carrying vaccines (16-20 vials) and diluents from PHC/Cold chain point to session sites and to bring back the open vials (under the open vial policy) from the session sites to the cold-chain point on same day after the session for storage and subsequent use. Vaccine carrier (with 4 conditioned icepacks) maintains the inside temperature between +2°C to +8°C for 12 hours, if not opened frequently.

Do's and Dont's in using a vaccine carrier

Dos	Dont's
• Place vaccines & diluents in cartons or polythene bags to ensure labels are protected. • Use well-sealed conditioned icepacks in the vaccine carrier. • Ensure collection of vaccines in the vaccine carrier on the session day itself. • Close the lid tightly and securely. • Keep the interior of the vaccine carrier clean and dry after every use.	• Never use day carriers, which contain 2 icepacks or thermos flasks for routine immunization. • Never use any screwdriver or any other sharp shaft to open the lid of vaccine carrier. • Do not drop, knock or sit on the vaccine carrier. • Do not leave the vaccine carrier in the sunlight. • Do not leave the lid open once packed.

Icepacks are plastic containers filled with water. These are hard frozen in the deep freezer. They are placed inside a vaccine carrier and cold box to improve and maintain the holdover time; also used in ILR as inside lining to improve & maintain holdover time during electricity failure.

Dos and Dont's in using icepacks

Dos	Dont's
• Fill water only up to the level mark on the side to leave 10mm room for expansion as water freezes. • While filling, keep the ice pack vertically up wards under the tap so that it will overflow after reaching the desired level. • Fit the stopper and screw on the cap tight. • Check and ensure that icepack does not leak. • Clean the outer surface of icepacks with dry cloth before putting into the deep freezer. • Keep icepacks horizontally (not flat) in a crisscross manner in DF. • Keep gap / breathing space between icepacks for freezing to be faster & uniform. • Ensure that icepacks are frozen ROCK solid.	• Do not use icepacks that are cracked and are without cap or cork. • Do not use icepacks with leakage; discard them. • Never add salt to the water as it lowers the temperature to sub-zero level, which is not recommended. • Do not refill icepack every time before use, same water can be used repeatedly. 

Conditioning of frozen Icepacks: Icepacks come out of the freezer at a temperature of about -20°C. They need to be kept at room temperature for a period of time to allow the ice at the core of the icepack to rise to 0°C. This takes at least 30-45 minutes in hot weather and longer in cooler conditions. This process is called 'conditioning'.

AEFIs (Adverse events following immunization)

- Adverse event following immunization (AEFI) is defined as any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the usage of the vaccine.
- The adverse event may be any unfavourable or unintended sign, abnormal laboratory finding, symptom or disease.
- Majority of the adverse event are coincidental i.e unrelated to vaccine or vaccination process but have to be reported as the symptoms or signs have occurred after vaccination.

Vaccine reactions

Vaccine reactions may be classified into common, minor reactions; severe reactions; or serious reactions. Most vaccine reactions are minor and settle on their own. More severe and serious reactions are very rare and in general do not result in long-term problems.

Common minor vaccine reactions

- Local reactions (pain, swelling and/or redness at the injection site) and fever can be expected in about 10% of vaccinees, except for those injected with DPT, or tetanus boosters, where up to 50% can be affected.
- BCG causes a specific local reaction that starts as a papule (lump) two or more weeks after immunization, which becomes ulcerated and heals after several months, leaving a scar.
- Measles/MR vaccine causes fever, rash and/or conjunctivitis, and affects 5–15% of vaccinees. It is very mild.

Serious and severe vaccine reactions

- An AEFI will be considered serious if it results in death, requires hospitalization, results in persistent or significant disability/incapacity or a cluster (two or more cases) of AEFIs occur in a geographical area.
- AEFIs that are not minor but do not result in death, hospitalization or disability are categorized as severe. Examples include non-hospitalized cases of seizures, hypotonic hyporesponsive episodes (HHEs), persistent screaming, anaphylaxis, severe local reaction, injection site abscesses, intussusception, etc. Anaphylaxis, while potentially fatal, is treatable without leaving any long-term effects

Recognition of anaphylaxis

Anaphylaxis is a very rare but severe and potentially fatal allergic reaction. You should be able to distinguish anaphylaxis from fainting (vasovagal syncope), anxiety and breath-holding spells, which are common benign reactions.

Distinguish anaphylaxis from fainting (vasovagal reaction)

	Fainting	Anaphylaxis
Onset	Usually at the time or soon after the injection	Usually some delay, between 5 to 30 mins, after injection
Skin	Pale, sweaty, cold and clammy	Red, raised and itchy rash; swollen eyes, face, generalized rash
Respiratory	Normal to deep breaths	Noisy breathing from airways obstruction (wheeze or stridor)
Cardiovascular	Bradycardia, transient hypotension	Tachycardia, hypotension
Gastrointestinal	Nausea, vomiting	Abdominal cramps
Neurological	Transient loss of consciousness, relieved by supine posture	Loss of consciousness, not relieved by supine posture

Initial management of suspected anaphylaxis case

Following vaccination, a case of anaphylaxis can be suspected if there is early onset of symptoms ***(within minutes to 6 hours)*** with rapid progression. In such a case,

- The health worker should reassure the patient, parents and relatives.
- If the child is conscious, he/she should be kept in a supine position with lower limbs raised higher than head level.
- If the child is unconscious, he/she should be kept in left lateral position.
- As per the age of child, staff nurse must administer one dose of injection adrenaline by deep intramuscular route.

Chart listing age-specific dose of adrenaline (1:1000) to be administered intramuscularly using insulin syringes for one-time management of anaphylaxis by health worker

Age group	Dose in ml (insulin syringe)
0-1 year	**2 ml**
1-6 years	**4 ml**
6-12 years	**8 ml**
12-18 years	**12ml**

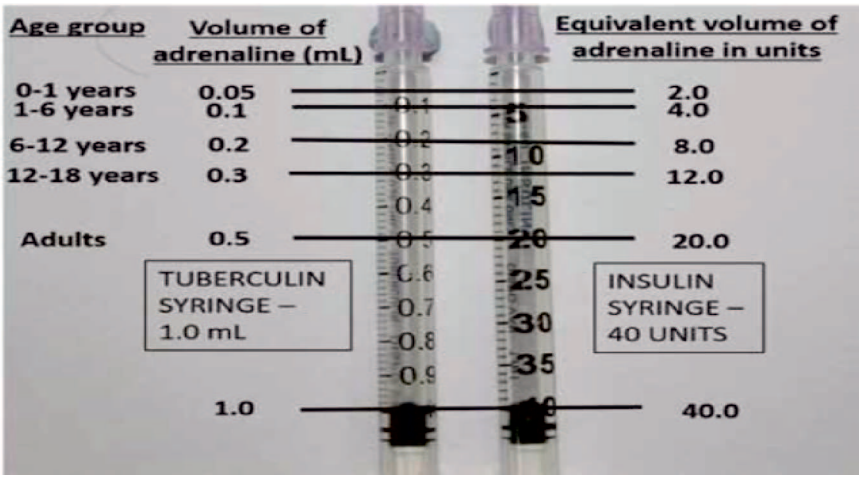
Contents of anaphylaxis kit

- 1 mL ampoule of adrenaline (1:1000) – 3 nos.
- 1 mL tuberculin syringes / 40 unit insulin syringes without fixed needles – 3 nos.
- 24/25 G needles of 1 inch length – 3 nos.
- Swabs – 3 nos.

Store the contents in a plastic air tight container away from light.

Ensure the contents of Anaphylaxis kits are verified every three months. Adrenaline has a short expiry date.

Markings of age appropriate dosage of adrenaline in mL (tuberculin syringes) and equivalent volume in units when using insulin syringes



Chapter 16
Pediatric Care

Facility Based care at all public facilities has the potential to reduce mortality in children by providing emergency care towards fulfilling the vision of universal health care to children. Under NHM, State Child Health Nodal Officer provides overall guidance and coordinates with the District Program Managers for pediatric care services under guidelines for strengthening of paediatric care at district hospital. Ministry of Health & Family Welfare, Government of India rolled out package of integrated management of newborn and childhood illnesses (IMNCI) for OPD management by ANMs, nurses and medical officers and facility based package(FIMNCI) for doctors and staff nurses for management of admitted patients.

Provision for Facility based paediatric care at districts

Similar to facility based newborn care, each district should have a three-tiered facility based paediatric level care system, mirroring the existing public health system. In a district, besides a fully functional district hospital, one SDH (50/100 bed units) for every 10-lakh population has been envisaged for provision of comprehensive secondary care health services.

Overview of Comprehensive Paediatric Care Facilities at all levels

Paediatric Services available	Type of Facility		
	FRU CHC	Non- FRU CHC	SDH/DH
Emergency (part of general emergency services)	Identification, triage, stabilization, admission, referral*	Identification of danger signs, triage, initial stabilization, referral	Identification, triage, stabilization, admission, referral*
OPD (including growth and development + nutrition counselling + immunization + follow-up)	Yes, separate OPD	Yes, with general OPD	Yes, separate OPD
High Dependency Care Area (HDU)	Yes	No	Yes
In patient services	Yes	Day care observation /management, co-located with in-patient beds, with privacy and space for parent/attendant (e.g. management of fever, ARI, diarrhoea & any other follow-up treatment, e.g. RHD chemoprophylaxis etc.)	Comprehensive management
Play area	Yes	Yes	Yes
Diagnostic services#	Yes	Yes	Yes
Common provisions	Waste management, construction/renovations (floor, ceilings, lighting, sound, Fire safety, disaster management, ventilation, power audit), AMC for equipment, temperature, WASH (water supply, washrooms), other infection control and patient safety measures as per extant guidelines for the level of care		
Auxiliary Services	Kitchen; provision for child's attendants' stay, food, washrooms		
Linkages	To: DH, DEIC, Medical college, NRC From: Community, HWC	To: Medical college	

*Management of cases where referral is refused or not possible #Newborn and Paediatric compliant

Emergency Department should remain functional 24x7 at all levels. *Triaging and management of a sick child should always be prioritised over any administrative procedures. Initial assessment should occur in 30 seconds and requires no special equipment.*

The paediatric emergency care area should have a bed/radiant warmer, crash cart/emergency care trolley, equipment (such as suction pump, oxygen delivery system) and a chamber with reasonable privacy to counsel and information that can be shared by the whole emergency team in the emergency area. FIMNCI training package is for the staff designated for paediatric triage & emergency treatment

Emergency Signs	Priority Signs	Non Priority
• AIRWAY & BREATHING- Not breathing/Gasping/Obstructed breathing/ Central cyanosis /Severe respiratory distress • CIRCULATION- Cold hands with: Capillary refill longer than 3 seconds and Weak and fast pulse • COMA/CONVULSIONS • SEVERE DEHYDRATION (ONLY IN CHILD WITH DIARRHOEA)	• Young infant -sick child aged <2 months) • Temperature (very high) • Trauma/ urgent surgical condition • Pallor (severe) • Poisoning (H/o swallowing drug/poisonous substance or stings/bites) • Pain (severe) • Respiratory distress • Restless, continuously irritable/ lethargic • Referral (urgent) • Malnutrition: visible severe wasting • Oedema of both feet • Burns (major)	• Not breastfeeding/ drinking poorly • Becomes sicker • Develops fever or feels cold to touch • Fast breathing • Difficult breathing • Diarrhoea with blood in stool
Manage in emergency care area for treatment and transfer to a High Dependency Area/ higher referral unit post stabilization, based on the case response and facilities available.	Prioritise in the outpatient queue or managed in the Emergency area itself if OPD is closed.	Detail examination in OPD

Emergency Signs

ABCD (Airway-Breathing-Circulation/Convulsions/Consciousness-Dehydration) **concept**

Assessment of Danger Signs	
Airway	If positive then treat , if negative then go to
Breathing	If positive then treat if negative then go go to
Circulation/conscious or convulsing	If positive then treat if negative then go to
Dehydration	If positive, treat. If negative, proceed to priority signs

*If the child has any emergency sign of the **ABCD**, it means the child has an emergency "E" sign and emergency treatment should start immediately.*

1. Call for help but don't delay starting treatment and may need to work with other health workers to begin several treatments at once.

2. Senior/most experienced health professional should continue assessing the child to identify all underlying problems and prepare a treatment plan.
3. Do not move neck if cervical spine injury possible.
4. Make sure to keep the child warm always specially if young infant
5. Check for Obstructed breathing/Central cyanosis/ Severe respiratory distress**
6. if not breathing or gasping -- Manage airway and -Start life support
7. if foreign body aspiration-- Manage airway in choking child**. Remove any visible obstruction from the mouth. Clear secretions from the throat**
8. if no foreign body aspiration- - Manage airway & Give oxygen. **Open the airway using head – tilt, chin-lift method.**
9. For circulation check for cold hands with Capillary refill (longer than 3 seconds) and weak and fast pulse
10. Prepare to perform venipuncture and insert a cannula
11. Before starting the therapy send blood for investigations and for typing and cross-matching if the child appears to be severely anaemic or is bleeding significantly
12. Insert IV line* and begin giving fluids rapidly if NO SEVERE ACUTE MALNUTRITIONI
13. IF SEVERE ACUTE MALNUTRITION Give IV glucose Insert IV line and give fluids
14. If the child has any bleeding, apply pressure to stop the bleeding. Do not use a tourniquet, Give oxygen and Make sure child is warm

**If not able to insert peripheral IV, insert an external jugular or intraosseous line.*

15. If Coma Or Convulsing: Manage airway, Position the unconscious child (if head or neck trauma is suspected, stabilize the neck first), give oxygen
16. Check and correct hypoglycaemia, Give IV calcium if infant <3 months, If convulsion continue, give anti-convulsant
17. In cases with history of diarrhoea plus any two of these: Lethargy, Sunken eyes, very slow skin pinch then after ensuring that child is warm, If No Severe Acute Malnutrition: Insert IV line and begin giving fluids (RL/NS) rapidly but in cases of Severe Acute Malnutrition (SAM): Do not give IV fluids, give ORS@ *5 ml/kg every 30 min for 2 hours*
18. Call for surgical help or follow surgical guidelines if a child has trauma or other surgical problems
19. Carry out point of care emergency investigations (blood glucose, pulse oximeter & check temperature*, blood smear, haemoglobin if possible urine for sugar/ketones etc

After giving emergency treatment, proceed immediately to assess, diagnose and treat the underlying condition. All these children should be hospitalized and observed till stabilization. During and after providing emergency treatment, the child should be re-assessed using the complete ABCD sequence.

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.

Use of airway, indicated when 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.
- Position the child to open the airway, taking care not to move the neck if trauma is suspected.
- Using a tongue depressor, insert the oropharyngeal airway (the convex side up) in an infant
- In a child, 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

Bag & Mask

- Check the bag and valve by closing the patient's connection with thumb and attempt to expel air from the bag.
- Choose a bag of appropriate volume for infants 500 ml and children 750 ml and an appropriately sized mask; which completely covers the mouth and nose without covering the eyes or overlapping the chin.
- Attach the bag-mask valve to an oxygen supply. Adjust flow to 10 litres per minute or to maximum possible if using a concentrator. If oxygen is not available, use room air for resuscitation.
- 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.
- 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 pressure on the bag

Chest compressions coordinated with bag & mask ventilation to be provided if any of the following:

- Pulse cannot be detected
- Heart rate is less than 60 bpm
- Signs of poor perfusions after adequate ventilation.

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) if there are two rescuers.
- Maintain a ratio of 30:2 with a single rescuer.

2-finger technique:

- Lay the infant in supine position on a hard-flat surface
- Use tips of the middle finger and either the index finger or ring finger of one hand to compress the lower half of the sternum (but not over the xiphoid). After each compression, allow the chest to recoil fully.
- Push with sufficient force to depress the chest approximately one third to one half the antero-posterior diameter of the chest.
- Release completely to allow complete recoil of the chest by completely releasing the pressure but maintaining contact with the compression site.

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 the child starts to breathe spontaneously. If not breathing adequately, continue for 45 minutes or according to decision of clinician.

In Patient Services

The Paediatric ward provides care for children from 1 month of age up to 12 years, who meet the criteria for admission. The ward should have provision for one parent -attendant to stay (per patient) on the ward overnight. In addition to the beds available in the indoor facility there should be a designated area for **High Dependency care area (HDU).**

High Dependency care area (HDU) is an area of designated beds contiguous to the nursing station of the general ward, well- equipped with ready access to oxygen source, IV fluid stands, suction ports including adequate electrical points to provide paediatric patients with expert medical and nursing care and monitoring facilities. Once the patient has made sufficient recovery, s/he can be shifted to beds allocated in general ward. The medicines included in the essential drug list for emergency management of children should also be available for use in the HDU.

Admission criteria for high dependency care

- Pre-referral stabilization of all cases presenting with danger signs /where referral is refused or not possible
- Any case requiring frequent monitoring and feeding support and fluid boluses
- Non-intubated children requiring increasing amounts of oxygen, nebulization and/or CPAP, HFNC
- Child being treated for electrolyte imbalance , hypoglycemia or other metabolic causes

Admission criteria for paediatric care ward

- All cases presenting with danger signs, stabilized and do not require referral
- Step down from high dependency care
- Any case requiring completion of antibiotics or blood transfusion, fluid or feeding support, being weaned off oxygen support and/or nebulization, further investigations not available at facility to establish a diagnosis
- Any referral from community, HWC, RBSK team

The duty roaster should ensure that atleast one nurse for every 6 functional beds should be available in the ward during routine hours. The staff nurses must accompany the Medical officer for clinical round during his/her shift and more frequent assessment of cases in the HDU. Other supporting services should be available in each shift, as per norms. After routine hours, the paediatrician should be available on call 24*7. Evening round is mandatory for the 'paediatrician on call' so that new admissions and seriously ill children (in HDU) are assessed on the same day.

Play and recreation area for both in and outpatients as well as patients should be created for an environment where children enjoy themselves and learn while waiting to be treated; healthcare providers are under less pressure because children are not crying to go home; and it's easier for parents to keep their children waiting. Play may also be used for therapeutic purposes, as part of the child's care plan, and prepare to cope with procedures and interventions. An effort should be done to make the facility child friendly by equipping a play area with toys, games, puzzles etc., colourful wall paintings and patient friendly waiting area for OPD with ambience to help the differently abled children.

Under IPHS norms 2022 , Day Care Facility for management of conditions like moderate diarrhoea, completion of antibiotic therapy, follow-up chemoprophylaxis for rheumatic heart disease, blood transfusion, nebulisation for acute asthma attack and similar conditions where admission is not required, but the child needs to stay at the facility for a few hours only to receive the treatment/therapy can be created by designating beds in IPD. These beds will not only help in reducing out of pocket expenditure for parents by precluding visits to referral facilities, but will also help in reducing load on the existing emergency facilities and higher level facilities.

Oxygen Management ,as a provider use oxygen judiciously as a drug, minimize wastage and ensure following considerations:

- Ensure oxygen supply, even during transit if referral is required to be made.
- Forecast oxygen requirement considering the peak demand, reserves and additional time for supply chain and adequate buffers maintained.

Hospital Kitchen (Dietary Service): Mostly the dietary requirement of children of various ages is not considered and children are supplied the same food as for adults, which is not always palatable for various reasons. Arrangements should be made to ensure that age- appropriate diet is made available in consultation with the dietician/ nutrition counsellor and the doctor. Semi solid and liquid diet appropriate to the different cultural needs of children and their families distributed in covered container, good quality fresh fruit and drinks, including water should be made available. Children need to be tempted to eat and thus always require the presence of the caregiver, the provision of food for the parent- attendant should be made from the hospital kitchen. This would essentially mean two meals per pediatric bed per shift (breakfast, lunch & dinner).

Take every opportunity to encourage and facilitate breast feeding.

Recording & Reporting: use standardized stationery, recording and reporting formats and the common information management system to ensure seamless integration of all service delivery components.

Nutrition Rehabilitation Centre (NRC)

Recommended criteria for identifying Severe Acute Malnutrition (SAM)

Infants> 6 months of age	Infants <6 months of age/any infant (> 49 cm** in length
• Weight-for-height less than -3 SD and/or • Visible severe wasting and/or • Mid arm circumference (MUAC) < 11.5 cm and/or • Oedema of both feet*	• Weight-for-height less than -3 SD and/or • Visible severe wasting and/or • Oedema of both feet*
* Other causes of oedema e.g. nephrotic syndrome should be excluded. ** For children with length less than 49 cm in length, visible severe wasting can be used as criteria to identify SAM	

Admission criteria in a Nutrition Rehabilitation centre or a health facility
• Presence of any of emergency signs • Oedema • Persistent vomiting • Very weak, apathetic • Fever (Axillary temperature > 38.5 degree Celsius) • Children with fast breathing / chest in drawing/ cyanosis **Fast breathing is said to be present if number of breaths per minute is:** • 60 or more in children up-to 2 months , • 50 or more in children 2 months up-to 1 year and • 40 or more in children 1 year up-to 5 years)
• Extensive skin lesions, eye lesions, post-measles states • Diarrhoea with dehydration based on history and clinical signs • Severe anaemia • Hypothermia (Axillary temperature <35 degree centigrade) • Any other general sign which the clinician thinks warrants transfer to in-patient facility for assessment or care In addition to above criteria if the caregiver is unable to take care of the child at home, the child should be admitted.

The process of triage of sick children with SAM when they arrive at a facility is similar; except for the management of shock and severe dehydration. **Avoid rapid fluid boluses** and prefer NG/OG feeding over IV fluid administration. BEFORE starting any rehydration treatment:

- WEIGH the child (The weight should be taken on admission).
- MARK the edge of the liver and the costal margin on the skin.
- RECORD the Pulse rate, respiration rate and capillary refill time.

Manage preferably by Clinical signs of improvement and over-hydration. Use either WHO low osmolarity ORS with potassium supplements (15 ml. of potassium chloride syrup added to one litre ORS)/Rehydration Solution for Malnourished Children prepared from WHO-low Osmolarity ORS. Always teach the mother to give the ORS slowly. WHO RECOMMENDED ORS for SAM Children is currently not available in India.

A good history and physical examination should be recorded once the child is stabilized.

Take a history concerning	On examination, look for
Recent intake of food and fluids Usual diet (before the current illness) Breastfeeding Duration & frequency of diarrhoea and vomiting Type of diarrhoea (watery/bloody) Chronic cough Loss of appetite Family circumstances (to understand the child's social background) Contact with tuberculosis Recent contact with measles Known or suspected HIV infection. Immunizations	Anthropometry- weight, height/ length, mid arm circumference Oedema Pulse, heart rate, respiratory rate Signs of dehydration Shock (cold hands, slow capillary refill, weak and rapid pulse) Palmar pallor Eye signs of vitamin A deficiency: ‹ Dry conjunctiva or cornea, Bitot's spots Corneal ulceration Keratomalacia Localizing signs of infection, including ear and throat infections, skin infection or pneumonia Fever (temperature ≥ 37.5° C or ≥ 99.5° F) or hypothermia (axillary temperature

Management Steps

	STABILISATION		REHABILITATION
	Day 1-2	Day 3-7	Week 2-6
1Treat/prevent hypoglycaemia			
2.Treat/prevent hypothermia			
3.Treat/prevent dehydration			
4.Correct imbalance of electrolytes			
5. Treat infections			
6.Correct deficiencies of micronutrients		Non iron	With iron
7. Start cautious feeding			
8. Rebuild wasted tissues (catch-up growth)			
9. Provide loving care and play			
10. Prepare for follow-up			

Duration of stay: usually 10-14 days after admission for the first part of the rehabilitation phase

Feeding is most critical part of managing severe malnutrition; started cautiously, in frequent, small amounts and as soon as possible with Starter diet.

- **"starter"** formula is used until the child is stabilized and contains 75 kcal and 0.9 g protein per 100 ml. and the amount given per day is based on the admission weight and does not change (if the child is rehydrated on the first day, use the rehydrated weight) for further calculation.
- **Catch-up diet** When the child is stabilized (usually after 2 -7 days), containing more calories and protein 100 kcal and 2.9 g protein per 100 ml is used to rebuild wasted tissues.
- As the child stabilizes, the child can take more at each feed, and feeds can be less frequent. Continue to offer each feed orally first; then use an NG tube to complete the feed if the child does not take at least 80% orally.

Criteria for increasing volume/decreasing frequency of feeds:

- If vomiting, lots of diarrhoea, or poor appetite, continue 2-hourly feeds.
- If little or no vomiting, modest diarrhoea (for eg, < 5 watery stools per day), and finishing most feeds, change to 3-hourly feeds.
- After a day on 3-hourly feeds: If no vomiting, less diarrhoea, and finishing most feeds, changes to 4-hourly feeds.

Increase each feed by 10 ml as long as the child is finishing feeds. If the child does not finish a feed, offer the same amount at the next feed; then if feed finished, increase by 10 ml. Continue increasing the amount until some food is left after most feeds (usually when amount reaches about 30 ml/kg per feed). If the child is breastfeeding, encourage the mother to breastfeed between feeds of Catch-up diet. **Do not schedule feeding during a shift change**

Supplementary Suckling Technique (SST) is a technique which can be used as a strategy to initiate relactation in mothers who have developed lactation failure. The infant suckles and stimulates the breast at the same time drawing the supplement (expressed mother's milk or therapeutic formula) through the tube, and is thereby nourished and satisfied. SST stimulates prolactin reflex to secrete more milk

Criteria for discharge

Child	• Achieved weight gain of ≥ 15% (See Annex 20 for target weight at 15% weight gain) and has satisfactory weight gain for 3 consecutive days (>5 gm/kg/day) • Oedema has resolved • Child eating an adequate amount of nutritious food that the mother can prepare at home • All infections and other medical complications have been treated • Child is provided with micronutrients Immunization is updated
Mother/caregiver Knows how to	• prepare appropriate foods and to feed the child • make appropriate toys and play with the child • give home treatment for diarrhoea, fever and acute respiratory infections • recognise the signs that/he must seek medical assistance
provider	Follow-up plan is completed

Daily Attentive and consistent Nursing care with patience and caring for both the children and their parents all day **will make the difference in a** SAM child's recovery This includes following:

Weighing and bathing Preparing and maintaining a daily weight chart at about the same time each day, preferably one hour before or after a feed. Children on 3-hourly and 4-hourly schedules may be bathed when they are weighed since the children are undressed for weighing. Avoid bathing in sick children.

Sensory stimulation: Severe acute malnutrition affects mental and behavioural development, which can be reversed by appropriate treatment including sensory stimulation and emotional support.

- Tender loving care (smiling, laughing, patting, touching, talking softly to the child while giving treatments, gentle handling in removing the child's clothes, in bathing, holding the child close while feeding, comforting a child after a painful procedure etc.) and a cheerful stimulating environment.
- Structured play therapy for 15-30 minutes a day. The play sessions should make use of toys made of locally available discarded materials
- Physical activity as soon as child is well
- Caring for the skin and eyes
- Giving prescribed antibiotics and other medications and supplements.

Encourage mother/parent attendant and involve as much as possible (e.g., comforting, feeding, play) so that the special care is continued at home

Monitoring pulse, respirations, and temperature and watching for danger signs especially at night. It is extremely important that trained staff is assigned for night shifts also as many deaths in SAM children occur at night because a feed is omitted/child becomes uncovered and cold

Chapter 17
Vector and Water Borne Diseases

1. Malaria:

- Major public health problem in India & Uttar Pradesh.
- Causative agent: Plasmodium (Protozoa)
- Vector: Female Anopheles mosquito
- Common species in India: P. falciparum and P. vivax.
- Incubation period:
    - P. Vivax: 8-17 days
    - P. falciparum: 9 - 14 days
    - P. Ovale: 16-18 days
    - P. Malarie: 18-40 days

a) Clinical Features

i) Simple malaria

- Commonly presents with typical chills and rigor followed by high grade fever and sweating (This occurs daily in Plasmodium falciparum infection and once in two days for Plasmodium vivax)
- Headache and body ache are also present. Sometimes they may present with continuous fever, malaise, and headache.
- Symptoms may vary considerably in paediatric age group.

ii) Severe Malaria

- It is mainly due to the Plasmodium falciparum species.
- Severe Malaria occurs more frequently in persons like unexposed subjects, persons who have migrated from non-endemic areas, children below 5 years of age, pregnant women, debilitated patients, or in subjects in an area of seasonal transmission.

The severe forms may present in the following ways:

- Hyperpyrexia > 1040 F.
- Hemolysis - Mild jaundice, sudden worsening of pallor, bleeding diathesis.
- Encephalopathy- Convulsions (more than 2 times/24 hours, in children – to exclude febrile convulsions) delirium focal neurological deficits Clouding of consciousness, Coma (lasting more than 1/2 hour in children who just had convulsions)
- Renal involvement - Decreased urine output (oliguria).
- Pulmonary involvement - Severe breathlessness, acute pulmonary oedema.

ii) Chronic malaria

It presents as Low-grade fever, Weight loss, Splenomegaly, Severe anemia with pancytopenia; all of which may persist over two weeks or even longer.

b) Diagnosis

- Syndromic: Fever with chills in a patient residing in an endemic area.
- Presumptive: A case of Fever with chills clinically diagnosed as having malaria (with possible splenomegaly).
- Confirmed: A presumptive Malaria case supported by positive blood smear examination for malarial parasites or a positive RDT test for Malaria.

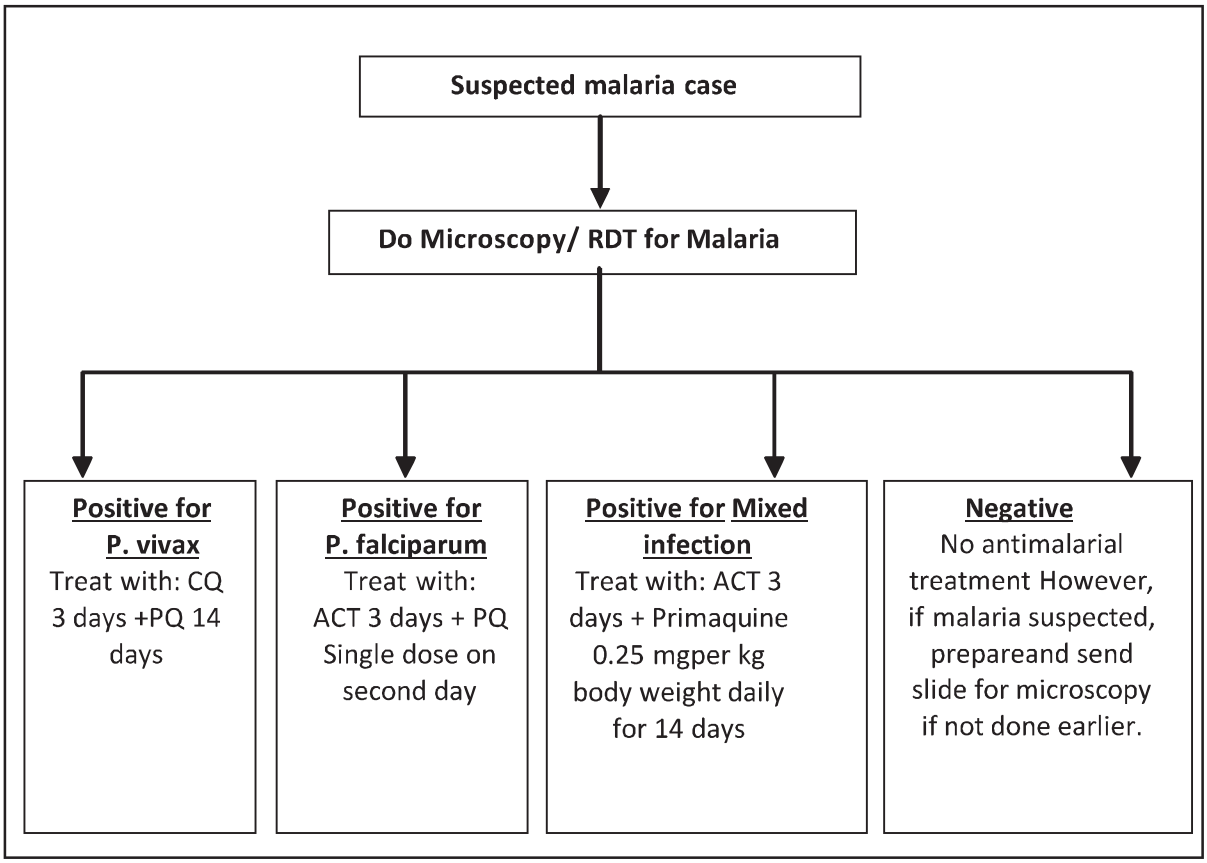
c) Laboratory confirmation:

Thick and thin smear examination should be done in all cases of suspected Malaria; peripheral blood smear test remains the gold standard. RDT kits are also quite reliable these days and should be used for early diagnosis in the field specially during any outbreak. Persons who have tested positive using RDT kits, should be considered as lab confirmed cases without the need for any further confirmatory tests.

d) Treatment

Early diagnosis and complete treatment of malaria aims at:

- Complete cure
- Prevention of progression of uncomplicated malaria to severe diseases
- Prevention of deaths
- Interruption of transmission
- Minimizing risk of selection and spread of drug resistant parasites



Uncomplicated malaria:

- Symptomatic management: Fever management - Paracetamol, cold sponging (for high grade fever), Hydration and
- Radical treatment: Combination of Chloroquine and Primaquine

Plasmodium Vivax malaria:

Chloroquine:

Dose: Chloroquine Tablets (150 mg base):

- 25 Mg/kg body weight divided over three days
- 10 mg/kg on day 1

- 10 mg/kg on day 2
- 5 mg/kg on day 3

The dosage written on the box is sometimes expressed as chloroquine salt and sometimes as chloroquine base. This leads to frequent confusion. Equivalence between salt and base:

- 100 mg base = 130 mg sulphate = 150 mg phosphate or diphosphate;
- 150 mg base = 200 mg sulphate = 250 mg phosphate or diphosphate.

Age Group	First Day		Second Day		Third Day	
	Dose Required	Tablets to be given	Dose required	Tablets to be given	Dose required	Tablets to be given
Below 1 year	75 mg	1/2 tab of 150 mg	75 mg	1/2 tab of 150 mg.	37.5 mg	1/4 tab of 150 mg.
1 – 4 years	150 mg	1 tab of 150 mg.	150 mg	1 tab of 150 mg.	75 mg	1/2 tab of 150 mg.
5 – 8 years	300 mg	2 tabs of 150 mg.	300 mg	2 tab of 150 mg.	150 mg	1/2 tab of 150 mg.
9 – 14 years	450 mg	3 tab of 150 mg.	450 mg	3 tab of 150 mg.	225 mg	1+1/2 tab of 150 mg
> 14 years	600 mg	4 tab of 150 mg.	600 mg	4 tab of 150 mg.	300 mg	2 tab of 150 mg.

- In children, if the temperature is lowered using antipyretics and/or cold tepid sponging before taking the anti-malarial drug, it would decrease the frequency of vomiting.
- If fever does not respond by third day and blood smear still shows parasites, then suspect irregular intake of medicines or drug resistance.
- Side Effects for Chloroquine- Nausea, vomiting, headache and blurring of vision
- Remember- Chloroquine should not be given on empty stomach.
- Contra-indications of Chloroquine - Pregnant women

Primaquine:

- Primaquine is given for prevention of relapse.
- Dose is 0.25 mg/kg body weight daily for 14 days.

Age Group	Primaquine base - 2.5 mg	
	Daily Dose for 14 days	
	Dose required	Tablets to be given
Pregnancy & 0 to 1 years.	Contraindicated	
1 to 4 years.	2.5 mg	1 tab of 2.5 mg
5 to 8 years.	5.0 mg	2 tab of 2.5 mg
9 to 14 years.	10.0 mg	4 tab of 2.5 mg
14 years & above	15.0 mg	6 tab of 2.5 mg

Patient should be advised to stop Primaquine immediately if he/she develops any of the following symptoms and should report to the doctor immediately:

(i) Dark coloured urine
(ii) Yellow conjunctiva
(iii) Bluish discolouration of lips
(iv) Abdominal pain
(v) Nausea
(vi) Vomiting
(vii) Breathlessness

Contraindications of Primaquine – Pregnant women, Children < 1 year and individuals with G6PD deficiency.

Falciparum Malaria:

Following table summarizes the treatment protocol for uncomplicated Falciparum malaria.

Dosage Chart for Treatment of *falciparum* Malaria with ACT-SP

Age Group (Years)	1st day		2nd day		3rd day
	AS	SP	AS	PQ	AS
0-1* Pink Blister	1 (25 mg)	1 (250 +12.5 mg)	1 (25 mg)	Nil	1 (25 mg)
1-4 Yellow Blister	1 (50 mg)	1 (500+25 mg each)	1 (50 mg)	1 (7.5 mg base)	1 (50 mg)
5-8 Green Blister	1 (100 mg)	1 (750+37.5 mg each)	1 (100 mg)	2 (7.5 mg base each)	1 (100 mg)
9-14 Red Blister	1 (150 mg)	2 (500+25 mg each)	1 (150mg)	4 (7.5 mg base each)	1 (150 mg)
15 & Above White Blister	1 (200 mg)	2 (750+37.5 mg each)	1 (200 mg)	6 (7.5 mg base each)	1 (200 mg)

* SP is not to be prescribed for children <5 months of age and should be treated with alternate ACT

Note: These drugs act synergistically therefore, all tablets have to be consumed simultaneously, every day.

MONOTHERAPY OF ORAL ARTEMISININ DERIVATIVES IS BANNED IN INDIA Artemisinin derivatives are the only rapidly acting antimalarials as of date and if used alone, can lead to the development of artemisinin resistance. Hence, they should not be administered as monotherapy for uncomplicated malaria except for specific studies on artemisinin resistance after consultation with NVBDCP and NIMR or as injectables for severe malaria. Injectable artemisinin derivatives should be used only in severe malaria.

Treatment of malaria in pregnancy:

The ACT should be given for treatment of P. falciparum malaria in second and third trimesters of pregnancy, while quinine is recommended in the first trimester. Plasmodium vivax malaria can be treated with chloroquine.

1st Trimester	2nd and 3rd Trimester
Quinin, 20mg/Kg on admission in 5% dextrose/DNS over a period of 4 hour, followed by maintenance dose of 10mg/Kg 8 hourly for 7 days.	Artesunate (2.4mg/Kg i.m./i.v. given on admission then on 12hour and 24 hour then once a day for 3 days) Plus SP on day 1 (1500 mg + 75 mg)

Treatment of Complicated Malaria

- All patients need admission and may need to be referred to CHC/ Higher centers. If the patient is found unconscious, refer the patient in a safety position (Maintain the patient's airway, circulation and nerve damage)

Initial parenteral treatment for at least 48 hour : CHOOSE ONE of following four options :	Follow-up treatment, when patient can take oral medication following parenteral treatment :
1. Quinine: 20 mg quinine salt/kg body weight on admission (IV infusion or divided IM injetion) followed by maintenance dose of 10 mg/kg 8 hourly; infusion rate should not exceed 5 mg/kg per hour. Loading dose of 20 mg/kg should not be given, if the patient has already received qunine.	Quinine 10 mg/kg three times a day with doxycycline 100 mg (3 mg/kg bw) once a day or Tetracycline 4 mg/kg bw 4 times a day or clindamycin (10 mg/kg bw twice a day) n pregnant women and children under 8 years of age, to complete 7 days of treatment.
2. Artesunat: 2.4 mg/kg i.v. or i.m. given on adission (time = 0), then at 12 h and 24 h then once day. or 3. Artemether: 3.2 mg/kg bw i.m. given on admission then 1.6 mg/kg per day. or 4. Arteether: 150 mg daily i.m. for 3 days in adults only (not recommended for children)	Full oral course of area-specific ACT: In North Eastern states: Age specific ACT-AL for 3 days + PQ Single dose on second day In other states including U.P. : Treat with: ACT-SP for 3 days + PQ Singe dose on second day.

Complementary treatment

Convulsions: Blood sugar estimation is needed and treatment is indicated, if patient is hypoglycemic Intravenous glucose 50% should be given. If blood sugar estimation could not be done, one can presume hypoglycemia in all cases of severe and complicated malaria especially cerebral malaria and treat with intravenous glucose 50%. Oral glucose or sugar solution can be given once the patient recovers consciousness after fits.

Convulsions can be treated with diazepam - intra rectal or intravenous.

2. Dengue

- **Caused by**: Dengue virus is a member of arbovirus family, genus flavivirus.
- Four known serotypes are DENV-1, DENV-2, DENV-3 and DENV-4.
- Aedes aegypti and Aedes Albopictus are the two most important vectors of dengue disease.
- Aedes aegypti is a highly domesticated, strongly anthropophilic nervous feeder (i.e., it bites more than one host to complete one blood meal); clusters of cases have been reported in particular households or neighbourhoods due to this feeding behaviour of the vector.

- Dengue has shown an increase in recent years due to rapid urbanization, lifestyle changes and deficient water management including improper water storage practices in urban, peri-urban and rural areas, leading to proliferation of mosquito breeding sites.
- The disease has a seasonal pattern - the cases peak after monsoon.
- The Aedes mosquito becomes infective by feeding on a patient (from the day before onset of symptoms to the 5th day - viraemia stage- of illness).
- After an extrinsic incubation period of 8 to 10 days, the mosquito becomes infective, and is able to transmit the infection.
- Transovarial transmission of dengue virus occurs – Immature forms of the mosquito also act as reservoir of the Dengue virus and transmission is maintained in adult mosquito developing from larva of an infected mosquito. This is a major reason for the persistent cycle of infection in Dengue.
- The population of Aedes aegypti, survives best between 16°C- 30°C and a relative humidity of 60- 80 per cent.
- **Clinical presentation: Three major categories -**
  i. Classical dengue fever
  ii. Dengue haemorrhagic fever without shock
  iii. Dengue haemorrhagic fever with shock
- The major pathophysiologic changes that determine the severity of disease in Dengue haemorrhagic fever and differentiate it from other fevers are plasma leakage and abnormal haemostasis, as manifested by a rising haematocrit value and moderate to marked thrombocytopenia.
- The haematocrit stabilizes or may be lower due to the dilutional effect of reabsorbed fluid.
- Respiratory distress from massive pleural effusion and ascites will occur at any time if excessive intravenous fluids have been administered.
- During the critical and/or recovery phases, excessive fluid therapy may be associated with pulmonary oedema or congestive heart failure.
- Criteria for Clinical Diagnosis-

Acute febrile illness with two or more of the following;

- Headache,
- Retro-orbital pain,
- Myalgia,
- Arthralgia/bone pain,
- Rash,
- Haemorrhagic manifestations,
- Leukopenia (WBC 5000 cells/mm3),
- Thrombocytopenia (platelet count **< 100,000** cells/mm3), *** - Guidelines for clinical management of DHF and DSS - NVBDCP**
- Rising haematocrit (5-10%);

The following laboratory tests are available to diagnose dengue fever and DHF:

1. Virus isolation: Isolation of dengue virus from clinical specimens
2. Viral nucleic acid detection: PCR
3. Immunological response and serological tests e.g., ELISA.
4. Viral antigen detection: ELISA and dot blot assays directed against the envelop/membrane (EM) antigens and non-structural protein 1 (NS1) can be detected in both patients with primary and secondary dengue

infection **up to 6 days** after the onset of the illness.

5. Rapid diagnostic test (RDT): A number of commercial rapid format serological test-kits for anti'-dengue IgM and lgG antibodies have become available in the past few years, some of these producing results within 15 minutes. Though these tests are not confirmatory and the number of persons testing positive through RDT alone, will not be taken into consideration as Confirmed Dengue cases in L form reporting, these results must be taken into consideration while investigating an outbreak as probable diagnosis to initiate outbreak response.
6. Analysis of haematological parameters: Standard haematological parameters such as platelet count and haematocrit are important and are part of the diagnosis of dengue infection. They should be closely monitored.

Clinical Management

- Symptomatic treatment with antipyretics/cold sponging and maintenance of hydration are the mainstay of management of an uncomplicated case.
- A full blood count of the patient should be done at the first visit to establish the patient's own baseline haematocrit.
- A rapidly decreasing platelet count in parallel with a rising haematocrit compared to the baseline is suggestive of progress to the plasma leakage/critical phase of the disease.
- Management of complicated cases requires treatment after admission to a facility.

Complications: Complications and sequelae of dengue virus infections are rare but may include following

- Cardiomyopathy.
- Seizures, encephalopathy, and viral encephalitis.
- Hepatic injury.
- Depression.
- Pneumonia.
- Iritis.
- Orchitis.
- Oophoritis.

Platelet therapy in DHF: Platelet transfusion should be guided by clinical considerations and not merely by platelet counts, though as per NVBDCP guidelines,

Indications of platelet transfusion

- In general, there is no need to give prophylactic platelets even at < 20,000/cumm
- Prophylactic platelet transfusion may be given at level of <10,000/ cumm in absence of bleeding manifestations
- Prolonged shock; with coagulopathy and abnormal coagulogram
- In case of Systemic massive bleeding, platelet transfusion may be
- needed in addition to red cell transfusion.

3. Chikungunya

- Dengue like illness
- Caused by: Chikungunya virus (Group A virus)
- Transmitted by: Aedes Mosquitos
- C/F: High fever and severe articular pains in the limbs and spinal column,
- Incubation period: 4-7 days

Clinical Management of Chikungunya cases

- Management is mostly symptomatic for this self-limiting illness
- Paracetamol and NSAIDs are commonly used for symptomatic relief but avoid Aspirin
- During epidemic, every patient clinically suspected need not undergo serological testing.
- Promptly refer the case to higher centres as and when indicated
- Protect against mosquito bite during febrile phase for prevention of transmission (mosquito net, mosquito repellent etc.).
- Relapse or reinfection is not seen.
- Co-infection with Dengue and malaria can occur concurrently.
- No specific antiviral drug is available

Complication: Systemic manifestation is rare

4. Japanese encephalitis (JE)

- Mosquito- borne encephalitis caused by a group B arbovirus (Flavivirus)
- Transmitted by culicine mosquitoes.
- Viral invasion of the central nervous system occurs probably via blood.
- J E transmission intensifies during the rainy season, when vector population increases.
- The disease is transmitted to man by the bite of infected mosquitoes.
- Man is an incidental "dead-end" host.
- Man to man transmission has not so far been recorded.
- The pigs are thus considered as "amplifiers" of the virus.
- Culicine mosquitoes, generally breed in irrigated rice fields, shallow ditches and pools.
- The rice fields are important breeding places.
- The incubation period in humans following mosquito bite is not exactly known. probably, it varies from 5-15 days

Clinical Syndromes: -

- Febrile Group: undifferentiated fevers benign with or without rashes and joint pains.
- Haemorrhagic Fevers: haemorrhagic fevers, generally associated with moderate or high mortality.
- Encephalitis: Encephalitis or meningoencephalitis which is associated with a considerable and sometimes high mortality or physical and mental disability.

Diagnosis of JE

- Mainly based on serology using IgM-capture ELISA
- Conventional antibody assays on paired sera for JE-specific antibody.

Management of JE

- There is no specific treatment of JE.
- However, supportive treatment and good
- Nursing care can significantly reduce case fatality rate.
- Encephalitis cases should be referred to a hospital as early as possible so that treatment is started without waiting for serological laboratory results.

Treatment of JE:

- Maintenance of circulation and blood glucose level (fluid restriction to 70% of total requirement of fluid per day. Fluids - Dextrose saline, 5% Dextrose or Ringers Lactate)

- Reduction of increased Intra Cranial Pressure (Osmotic diuretics – Mannitol 20% (2-5 ml/kg/dose) given 4- 6 hourly; Lasix 1 mg/kg)
- Contraindication of mannitol – pulmonary oedema, fluid overload
- Treatment of convulsions - Diazepam (0.25 – 0.5 mg/kg) intravenously to control the acute episode followed by anti-convulsant - (a) Dilantin 5 – 8 mg/kg/day, (b) Phenobarbitone 5 – 8 mg/kg/day)
- Management of respiratory failure for maintenance of airway and breathing (If Needed: Oxygen inhalation, Ventilatory support)
- Disability limitation and rehabilitation
- The patient may require: Physiotherapy, speech therapy and special support.

Prevention and control

- **Vaccination-** Two doses (at 9 months and between 16-24 months), along with Measles vaccination (in endemic districts)

5. Enteric fever

- The term "enteric fever" includes both typhoid and paratyphoid fevers.
- S. typhi is the major cause of enteric fever.
- Common in areas where water supplies and sanitation are sub-standard
- Human is the only known reservoir of infection, viz cases and carriers.
- The carriers may be temporary (incubatory, convalescent) or chronic.
- Convalescent carriers excrete the bacilli for 6 to 8 weeks.
- Persons who excrete the bacilli for more than a year after a clinical attack are called chronic carriers.
- Typhoid fever may occur at any age but highest incidence of this disease occurs in the 5-19 years of age group.
- Enteric fevers cases are observed all through the year. The peak incidence is reported during July-September. This period coincides with the rainy season and an increase in fly population.

Modes of transmission:

- Directly through soiled hands contaminated with faeces or urine of cases or carriers, faecal-oral route or urine-oral routes.
- Indirectly through soiled hands contaminated with faeces or urine of cases or carriers.

Incubation period: Usually 10-14 days

Clinical feature: characterized by

- Typical continuous fever with relative bradycardia with enlargement of Lymph nodes.
- The fever ascends in a step-ladder fashion never touches the base line.
- After about 7-10 days, the fever reaches a plateau and the patient has toxic look appearing exhausted and often prostrated.
- If illness is longer than 2 weeks and person have not received proper treatment, then Serious complications may occur in up to 10 per cent of typhoid fever patients.
- Intestinal perforation is most likely to occur during the third week.
- Intestinal haemorrhage is manifested by a sudden drop in temperature and signs of shock, followed by dark or fresh blood in the stool.

Laboratory diagnosis of typhoid

Microbiological

- Definitive diagnosis of typhoid fever depends on the isolation of S. typhi from blood, bone marrow and stools.
- Blood culture is the mainstay of diagnosis of this disease.

Serological procedure:

- Felix-Widal test - measures agglutinating antibody levels against O and H antigens.
- Usually, 0 antibodies appear on day 6-8 and H antibodies on day 10-12 after the onset of disease.
- It can be negative in up to 30 per cent of culture - proven cases of typhoid fever. This may be because of prior antibiotic therapy that has blunted the antibody response.

Control of Typhoid Fever

1. Control of reservoir (Early identification, isolation, treatment and disinfection)
2. Control of sanitation, and
3. Immunization.

- The weakest link in the chain of transmission is sanitation which is amenable to control.
- As a rule, cases should be isolated till three bacteriologically negative stools and urine reports.
- Follow-up examination of stools and urine should be done for S. typhi 3 to 4 months after discharge of the patient, and again after 12 months to prevent the development of the carrier state

Complications: Duodenal ulcer and enteric perforation

Treatment: Fluroquinolones and cephalosporines are widely regarded as the drugs of choice for the treatment of typhoid fever.

Disinfection

- All soiled clothes and linen should be soaked in a solution of 2 per cent chlorine and steam-sterilized.
- Nurses and doctors should not forget to disinfect their hands.

6. Cholera

- Cholera is an acute diarrhoeal disease caused by V. Cholerae 01 (classical or El Tor) and 0139.
- Cases range from symptomless to severe infections.
- The majority of infections are mild or asymptomatic.
- Characterized by the sudden onset of profuse, effortless, watery diarrhoea (rice-water stool) followed by vomiting, rapid dehydration, muscular cramps and suppression of urine.
- Case fatality may be as high as 30 to 40 per cent if delay initial treatment.
- Cholera is both an epidemic and endemic disease.
- V. cholerae 01 causes the majority of outbreaks.
- At-risk areas include peri-urban slums, where basic infrastructure is not available and in areas, where as a consequence of a disaster, disruption of water and sanitation system takes place, or the displacement of population to inadequate and overcrowded camps.
- Elimination of contaminated water does not immediately bring an outbreak to an end, but a so-called "tail" of the epidemic is produced. This is due to the continuation of transmission through contacts so follow up of outbreak are much important.
- People with low immunity, e.g., malnourished children and people living with HIV are at a greater risk of death if infected. Carriers: The carriers are usually temporary, rarely

Period of Communicability:

- A case of cholera is infectious for a period of 7-10 days.
- The chronic carrier state may last from a month up to 10 years or more.

Incubation period: 1-5 days.

- The patient who Contacts carriers probably play an important role in the spread of cholera.

Mode of transmission: Contaminated Water, Contaminated Food and Drinks & Direct Contact.

Clinical features: The severity of cholera is dependent on the rapidity and duration of fluid loss.

Diagnosis of cholera can never be made with certainty on clinical grounds.

Laboratory methods of diagnosis are required to confirm the diagnosis: A fresh specimen of stool should be collected for laboratory examination. Sample should be collected before the person is treated with antibiotics.

Control of Cholera

i. Verification of the diagnosis

ii. Notification

iii. Early case-finding

iv. Establishment of treatment centres

v. Rehydration therapy

vi. Adjuncts to therapy - The commonly used antibiotics for the treatment of cholera are fluoroquinolones, tetracycline, Azithromycin, ampicillins and Trimethoprim TMP Sulfamethoxazole (SMX).

vii. Epidemiological investigations

viii. Sanitation measures

- WATER CONTROL: As water is the most important vehicle of transmission of cholera, all steps must be taken to provide properly treated or otherwise safe water to the community for all purposes (drinking, washing and cooking).
- EXCRETA DISPOSAL: Provision of simple, cheap and effective excreta disposal system (sanitary latrines)
- FOOD SANITATION: Since food may be an important vehicle of infection, steps should be taken to improve food sanitation, particularly sale of foods under hygienic conditions. Health education must stress the
- DISINFECTION:
  - V. cholerae are killed within 30 minutes by heating at 56 deg.C or within a few seconds by boiling.
  - Bleaching powder is another good disinfectant which kills vibrio's instantly at 6 mg/litre. Disinfection should be both concurrent and terminal.

ix. Chemoprophylaxis

- Mass chemoprophylaxis is not advised for the total community
- Tetracycline is the drug of choice for chemoprophylaxis,
- It has to be given over a 3-day period in a twice-daily dose of 500 mg for adults, 125 mg for children aged 4-13 years, and 5O mg for children aged 0- 3 years.
- A single oral dose of doxycycline (100 mg for adults and 6 mg/kg for children under 15 years) has proved to be effective.

x. Vaccination: Oral cholera vaccines (OCVs), Two doses

xi. Health education - The most effective prophylactic measure is perhaps health education.

7. Acute Diarrhoeal Diseases

- Defined as the passage of loose, liquid or watery stools usually passed more than three times a day.
- ADD causes 1.3 thousand million episodes and 4 million deaths each year in developing countries in under-fives.
- Diarrhoea is an important cause of malnutrition and death in children below 2 yrs.

Acute watery diarrhoea- Diarrhoea that begins acutely, lasts less than 14 days (most episodes last less than seven days), and involves the passage of frequent loose or watery stools without visible blood. Vomiting and fever may be present.

Dysentery- Diarrhoea with visible blood in the faces. Important effects of dysentery include anorexia, weight loss, and damage to intestinal mucosa by the invasive bacteria.

Predisposing Host Factors

1. Under nutrition
2. Recent measles (In previous four weeks).
3. Immunodeficiency

Seasonal: Rotavirus throughout the year. Bacterial in summer & rainy season.

Common pathogen which causing diarrhoea

Causing organism	Affected	Incubation period
Cholera	Small Bowel	3 to 6 days
Shigella	Large Bowel	7 to 14 days
Rota Virus	Small Bowel	5 to 7 days
ETEC	Small Bowel	5 to 10 days
EIEC	Large Bowel	
Salmonella	Small & Large	3 - 7 days
Giardia	Small Bowel	Chronicity
Amoebiasis	Large Bowel	Chronicity

Fluid Balance in The Gut -

- Absorption & secretion of water & electrolytes occur throughout intestine. They are simultaneously absorbed by the villi & secreted by the crypts of the mucosa.
- Normally fluid absorption is more than fluid secretion in the intestine but In Diarrhoea fluid secretion is more than fluid absorption.

Treatment:

- Remove offending agent from diet.
- Treat underlying cause.
- Correct fluid & electrolyte deficits.

8. Food poisoning

- Food poisoning is an acute gastroenteritis caused by ingestion of food or drink contaminated with either living bacteria or their toxins or inorganic chemical substances and poisons derived from plants and animals.
- The condition is characterized by:
  - (a) History of ingestion of a common food
  - (b) Attack of many persons at the same time, and
  - (c) Similarity of signs and symptoms in the majority of cases.
- Types of food poisoning - Mainly two types: non-bacterial and bacterial.
  - a) Non-bacterial: Caused by chemicals such as arsenic, certain plant and sea foods.
  - b) Bacterial: Caused by the ingestion of foods contaminated by living bacteria or their toxins.

Bacterial food poisoning may be of the following types:

Salmonella food poisoning

- An extremely common form of food poisoning.
- The species most often incriminated in human Outbreaks are S. typhimurium, S. cholera-suis and S. enteritidis, besides many others.

- Salmonellosis is primarily a disease of animals.
- Human gets the infection from farm animals and poultry - through contaminated meat, milk and milk products, sausages, custards, egg and egg products.
- INCUBATION PERIOD: 12 to 24 hours
- MECHANISM OF FOOD POISONING: The causative organisms, on ingestion, multiply in the intestine and give rise to acute enteritis and colitis.
- The onset is generally sudden with chills, fever, nausea, vomiting, and a profuse watery diarrhoea which usually lasts 2-3 days.
- Mortality is about 1 per cent.

Staphylococcal food poisoning

- It is about as common as salmonella food poisoning.
- AGENT: Enterotoxins of certain strains of coagulase positive Staphylococcus aureus.
- Toxins can be formed at optimum temperatures of 35 deg. to 37 deg. C.
- INCUBATION PERIOD: 1- 8 hours. The incubation period is short because of "preformed" toxin.

Botulism

- Most serious but rare. It kills two-thirds of its victims.
- AGENT: Exotoxin of Clostridium botulinum
- SOURCE: The organism is widely distributed in soil, dust and the intestinal tract of animals and enters food as spores.
- The foods most frequently responsible for botulism are home preserved foods such as home- canned vegetables, smoked or pickled fish, homemade cheese.
- INCUBATION PERIOD 18 to 36 hours.
- The prominent symptoms are dysphagia, diplopia, ptosis, dysarthria, blurring of vision, muscle weakness and even quadriplegia.
- Fever is generally absent, and consciousness is retained.
- Frequently fatal, death occurring 4-8 days later due to respiratory or cardiac failure.

Perfringens food poisoning

- AGENT: Clostridium (Cl.) perfringens (welchii).
- SOURCE: faeces of humans and animals, soil, water and air.
- The majority of outbreaks have been associated with the ingestion of meat, meat dishes and poultry.
- INCUBATION PERIOD: 6 to 24 hours, with a peak from 10 to 14 hours
- The most common symptoms are diarrhoea, abdominal cramps and little or no fever.
- Nausea and vomiting are rare.
- Illness is usually of short duration, usually 1 day or less.
- Recovery is rapid and no deaths have been reported.

Investigation of Food Poisoning

- Secure complete list of people involved and their history
- Laboratory investigations: causative agent from stool, vomit or remnants of food, cooking media, surface of vessels and utensils, and water, by inoculating into appropriate media. Stool samples of the kitchen employees and food handlers should also be investigated.

Prevention and Control

- Food handling techniques
- Personal hygiene
- Sanitary improvements
- Sanitization of all work surfaces

9. Viral hepatitis

- Viral hepatitis is increasingly being recognized as a public health problem in India.
- National Viral Hepatitis Control Program with provision of free diagnosis and treatment for viral hepatitis through the National Health Mission.
- Viral hepatitis caused by five different viruses with transmission either through contaminated food or water (hepatitis A and E) or through exposure to blood or body fluids (hepatitis B. C and D).

Hepatitis A

- Causative agent: Hepatitis A virus
- Reservoir of Infection: human cases are the only reservoir of infection.
- **Period of Infectivity:** The risk of transmitting HAV is greatest from 2 weeks before to 1 week after the onset of jaundice.
- Infection with HAV is more frequent among children than in adults. Severity increases with age.
- In India the disease tends to be associated with periods of heavy rainfall. Poor sanitation and overcrowding favour the spread of infection, giving rise to water-borne and food-borne epidemics.
- **Routes of transmission:**
  - **Faeco-oral Route** is the major route of transmission and occurs mainly indirectly by way of contaminated water and food under conditions of poor sanitation and overcrowding.
  - **Parenteral Route**: Rarely, during the stage of viraemia.
  - **Sexual Transmission:** As a sexually transmitted infection, Hepatitis A may occur mainly among homosexuals.
- **Incubation period:** 10 to 50 days (usually 14- 28 days).
- **Clinical spectrum:** The disease is heralded by nonspecific symptoms such as fever, chills, headache, fatigue, generalized weakness, aches and pains, followed by anorexia, nausea, vomiting, dark urine and jaundice.
- Hepatitis A resolves completely in majority of cases but relapse of symptoms is noted in 3-20 percent cases.
- **Diagnosis:**
  i. Abnormal liver function, such as elevated serum bilirubin and alanine aminotransferase (ALT).
  ii. Demonstration of HAV particles or specific viral antigens in the faeces, bile and blood.
  iii. HAV is detected in the stool from about 2 weeks prior to the onset of jaundice, up to 2 weeks after.
  iv. Anti-HAV appears in the IgM fraction during the acute phase, peaking about 2 weeks after elevation of liver enzymes.
  v. ELISA is the method of choice for measuring HAV antibodies.
- **Prevention and containment**
  i. Reducing the spread of infection: Promoting simple measures of personal and community hygiene (e.g., hand-washing before eating and after toilet; sanitary disposal of excreta which will prevent contamination of water, food and milk; purification of community water supplies by filtration and adequate chlorination).

ii. During outbreaks and epidemics, drinking water should be consumed after boiling or chlorination with chlorine tablets.

Control of susceptible population (Include travellers to areas of intermediate or high endemicity, those requiring life-long treatment with blood products, men having sex with men, workers in contact with non-human primates, injection drug users and addition, patients with chronic liver disease): *Use of hepatitis A vaccine rather than passive prophylaxis with immune globulins should be considered for pre-exposure prophylaxis (e.g. for travellers) and post-exposure prophylaxis (e.g. for close contacts of acute cases of hepatitis A).*

Hepatitis E

- Caused by the hepatitis E virus (HEV)
- Water-borne disease.
- Hepatitis E prevalence is common in resource constrained settings with limited access to essential water, sanitation, hygiene and health services.
- **Mode of Transmission**
  i. Through the faecal-oral route, due to faecal contamination of drinking water.
  ii. Other transmission routes include: Food-borne transmission from ingestion of products derived from infected animals; transfusion of infected blood products; and vertical transmission from a pregnant woman to her foetus.
- **Incubation period:** from three to eight weeks
- **Symptoms:**
  i. The typical symptoms are jaundice, loss of appetite, abdominal pain and tenderness, nausea and vomiting, fever and enlarged and tender liver.
  ii. In pregnant women Hepatitis E can result in fulminant hepatitis (acute liver failure) and death. Mortality up to 20% may be encountered among infected pregnant women in their third trimester.
- **Diagnosis**
  i. Based on the detection of specific IgM and IgG antibodies to the virus in the blood.
  ii RT-PCR to detect the hepatitis E virus RNA in blood and/or stool.
- **Treatment**
  i. Hepatitis E is usually self-limiting.
  ii. No specific treatment or prophylaxis is available.
- **Prevention**
  i. Maintaining hygienic practices such as hand washing with safe water, particularly before handling food;
  ii. Using safe drinking water
  iii. Following safe food practices.

10. Rickettsial Diseases

Scrub Typhus

- The rickettsiae are gram negative, obligate intracellular bacteria. They are grouped into genera; Rickettsiae, Ehrlichia, Orientia, and Coxiella. Every species is associated with an arthropod vector (lice, ticks, fleas, or mites) at some stage in its life cycle Humans are accidental hosts in the life cycles of the microorganisms. The zoonotic diseases considered important in India are Epidemic typhus,Murine typhus, Scrub typhus, Indian tick typhus and Q fever
- Causative agent for scrub typhus is *Orientia Tsutsugamushi*

Incubation Period : 7 to 21 days but can range up to 32 days.

Transmission-

Through bite of infected larval mites. Chiggar (larval stage) of mite is the only stage that is parasitic on humans or animals. Pathogen found in the salivary glands of Chiggar, which injects in the body of host during feed. No direct person to person Transmission. Human is accidental host

Clinical Feature

- Fever (104- 105 F) with chills, malaise, conjunctival irritation. Headache, Cough, Myalgia, GI symptoms, Lymphadenopathy & Lymphocytosis.
- Typical Eschar formation is Hallmark, on 5th day of illness.

Complications

- Pneumonitis, Hepatitis, Myocarditis, Meningoencephalitis, DIC, Multi Organ Failure.

Diagnosis

- Immuno Fluorescent Assay
- Indirect immunoperoxidase & enzyme immunoassays.
- PCR amplification of Orientia genes from eschar and blood is also effective

Weil- Felix Test

- The Weil - Felix test is helpful in establishing presumptive diagnosis in diseases caused by members of typhus and spotted fever groups of Rickettsia. This test depends upon the development of antibodies that agglutinate certain strains of nonmotile Proteus organisms, i.e. P vulgaris 0X19and 0X2 and P.mirabilis .

Treatment

- Doxycycline (100 mg bid orally for 7–15 days),
- Azithromycin (500 mg orally for 3 days), or
- Chloramphenicol (500 mg qid orally for 7–15 days).

Protozoal Diseases

11. Leishminasis (Kala-azar)

In India-endemic in Bihar, Jharkhand, West Bengal and UP

Causative agent - Complex disease caused by the protozoan Leishmania

Two morphologically distinct stages

- Amastigote (aflagellate) or Leishmania stage: in human, Icalled Leishman-Donovan (LD) body
- Promastigote (flagellate) or Leptomonad stage: occurs in gut of (a) sandfly and (b) artificial culture

Transmission- Transmitted by the bite of female phlebotomine sandfly

Clinical Feature
Three forms-

Cutaneous	Mucocutaneous	Visceral
• Most common Cause skin ulcers on exposed part of body leaving lifelong scars & disability	Partial or total destruction of mucous membrane of nose mouth and throat	• Irregular bouts for fever, weight loss, enlargement of spleen & liver, anaemia

Common salient feature includes Fever, splenomegaly & hepatomegaly, anaemia, weight loss, darkening of skin of the face, hands, feet, abdomen and lymphadenopathy.

Post kala-azar dermal leishmaniasis lesions multiple nodular infiltrations of the skin, usually without ulceration. VL and PKDL in India caused by L. donovani.

Diagnosis

Visceral leishmaniasis - PCR assay is found to be almost 100% sensitive using peripheral blood

Bone marrow & spleen aspirations

- Staining method most appropriate for leishmania detection is one employing panoptic May Grunwald–Giemsa stain.
- Classical blood agar NNN medium (consists of 0.6% NaCl added to a simple bloodagar slope) is the most currently used media
- Other serological tests- IFAT, Immuno- enzymatic techniques, counter current immune-electrophoresis, IHA and immune blotEasy tests-Direct Agglutination Test, rK39 immuno chromatography dipstick, latex particle agglutination, dot – ELISA and fast – ELISA.

Treatment

- Sodium stibogluconate (100mg/ml). Daily dose 20mg/kg iv or im for 28-30 days. Amphotericin B deoxycholate – 15 iv infusions (dose 0.75- 1mg/kg body wt) daily or on alternate days.
- Orally administrable alkyl phospholipid, miltefosine is used. Dose 50mg BD for adults weighing>25kg and once daily for those < 25 kg, after meals for 28 days

12. Leptospirosis

- Primarily a contagious disease of animals, occasionally communicable to humans, caused by a pathogenic *spirochete* of the genus *Leptospira* It is an Emerging global public health problem & most widespread zoonotic diseases in the world
- Major reservoir hosts include: rodents, foxes, wild cats and rabbits. Rat being the predominant natural carrier of leptospires, in India *Rattus norvegicus & Rattus rattus* is reservoir for several serovars

Transmission

- The leptospira-host relationship is complex. Rodents remain infected for life and carriers of a particular serovar prevailing in the area. Rodents excrete large number of leptospirae in the urine, which is the main source of contamination incriminating human and animal leptospirosis.
- Human, dead-end host, get infection on contact with the urine of rodents/ infected animals directly or indirectly due to domestic, occupational or recreational activities. The bacteria enter the body through skin, oral or ocular routes.

Clinical Feature:

The clinical spectrum of leptospirosis is very wide, with mild anicteric presentation at one end to severe leptospirosis with severe jaundice and multiple organ involvement on the other.

- **In Anicteric leptospirosis** Fever & Myalgia is Characteristic finding. Calf, abdominal & lumbosacral muscles are very painful & severely tender.
- **Icteric leptospirosis** is more severe form of leptospirosis. Jaundice prominent symptoms. Others features are Fever, Nausea, vomiting, diarrohea, abdominal pain Severe myalgia forcing the patient to stop walking. Acute renal failure manifests as oliguria/anuria and/or proteinuria Hypotension and circulatory collapse
- Severe **leptospirosis** known as Weil's disease with severe liver kidney CVS CNS involvement and SHOCK

Diagnosis

- Demonstration of leptospires in urine or tissues by immunofluorescence is confirmatory A Positive IgM ELISA Microscopic Agglutination Test (MAT) titre of 100/200/400 or above in single sample
- **Supplementary Laboratory findings are** slightly elevated WBC count with neutrophilia, raised ESR, BUN, serum creatinine, bilirubin, creatinine phosphokinase (CK) SGOT SGPT and Decreased platelet counts

Treatment-

Mild to moderate cases	Adults:	Doxycycline 100 mg BD X 7 days
	Pregnant & lactating	Ampicillin 500 mg every 6 hourly
	Children< 8 years	Amoxycillin/ Ampicillin 30-50 mg/kg/day in divided doses for 7 days
Severe cases	Adults	Inj. Crystalline penicillin 20 lacs IU IV 6 hrly If sensitive to Penicillin than Ceftriaxone 1 gm IV x 6 hourly for 7 days OR Cefotaxime 1 gm IV x 6 hourly for 7 days OR Erythromycin 500 mg IV x 6 hourly for 7 days
	Pregnant & lactating	ampicillin 500 mg every 6 hourly
	Children< 8 years	Inj. Crystalline penicillin should be given 2–4 lacs IU/kg/ day for 7 days If sensitive to Penicillin than • Ceftriaxone 50-75 IV mg/kg/day for 7 days OR • Cefotaxime50-100 IV mg/kg/day for 7 days OR • Erythromycin 30-50mg/kg/day in divided dose for 7 days

13. Tuberculosis

Tuberculosis (TB) is an infectious disease that most often affects the lungs and is caused by a type of bacteria named *Mycobacterium tuberculosis*. It spreads through the air when infected people cough, sneeze or spit. Tuberculosis is preventable and curable. TB disease is usually treated with antibiotics and can be fatal without treatment. About 5–10% of people infected with TB will eventually get symptoms and develop TB disease.

People living in overcrowded places, poorly ventilated conditions at compromised nutritional (undernourished) & hygienic state are likely to catch the infection. Other than these chronic smokers and co-morbidities i.e. HIV and Diabetes are prone to get infected by TB.

Signs and Symptoms –

1. Pulmonary TB
    a. Prolonged Cough (2 weeks or more)
    b. Chest Pain
    c. Fever
    d. Loss of appetite
    e. Loss of Body weight
    f. Night sweats
    g. Generalised Fatigue with or without breathlessness.
    h. Haemostasis.
2. Extra Pulmonary TB
    a. Lymph swelling
    b. Abdomen pain and swelling (ascites)
    c. Breathlessness
    d. Fever
    e. Localised Symptoms.

Classification of Disease

1. **Based on site of Disease -**

   a. **Pulmonary TB** – Affecting the Lungs. The Pulmonary TB (PTB) is characterized by pulmonary infiltration, the formation of granulomas with caseation, fibrosis, and cavitation. Common symptoms of PTB includes persistent cough (2Weeks or more), fever, night sweats, weight loss, Loss of hunger, haemoptysis, generalised fatigue.

   b. **Extra- Pulmonary TB** – Affecting organs/parts of human body other than Lungs. involving Pleura, Lymph nodes, Abdomen, Bone & Spine, CNS etc. The symptoms are mostly organ specific and may or may not appear with the cardinal signs of TB

2. **Based on the sensitivity of the causative organism**

   a. **Drug Sensitive TB (DSTB)** – where the TB organism is sensitive to all the 1st line Anti TB drugs i.e. Isoniazid (H), Rifampicin (R), Ethambutol (E) & Pyrazinamide (Z).

   b. **Drug Resistant TB (DRTB)** – Where the TB Organism is resistant to one or more 1st line anti TB drugs.

3. **Based on the stage of pathogenesis –**

   a. **Active TB:** This is the stage where the TB bacteria are actively multiplying and causing symptoms in the person's body. Active TB can affect the lungs (pulmonary TB) or other parts of the body (extrapulmonary TB). Common symptoms of active TB include persistent cough, fever, night sweats, weight loss, and fatigue. Active TB is contagious and can be spread to others through the air when an infected person coughs or sneezes.

   b. **Latent TB:** In this stage, a person is infected with the TB bacteria, but the bacteria are lying dormant and hence not multiplying. There will be no signs and symptoms elicited. Latent TB is not contagious. It is estimated that close to 35-40% of whole population is infected and in the Latent stage.

How TB can be diagnosed :

Following are the pathway followed to confirm the MTB infection in human.

1. **Microbiological confirmation on sputum:**

All patients (adults, adolescents, and children who are capable of producing sputum) with presumptive pulmonary TB should undergo quality-assured sputum test for rapid diagnosis of TB (with at least two samples, including one early morning sample for sputum smear for AFB) for microbiological confirmation.

2. **Chest X-ray as screening tool:**

Where available, chest X-ray should be used as a screening tool to increase the sensitivity of the diagnostic algorithm.

3. Molecular Test (CBNAAT/TrueNAT/LPA)

NAAT -- Cartridge-based nucleic-acid amplification test NAAT (CBNAAT/ TrueNat) to all notified new patients and to test for resistance to Rifampicin. This is termed as Universal Drug Sensitivity Test (DST) for Rifampicin.

LPA -- Line Probe Assay to determine 1st and 2nd line (partial) drug sensitivity.

4. **Culture (Gold Standard Test)** – Liquid culture is done for majority of DSTB and DRTB medicines for confirmation.

Administering Medications and Pharmacological Support

The focus of pharmacological management of tuberculosis (TB) is to effectively treat the infection, eradicate the Mycobacterium tuberculosis bacteria, and prevent the development of drug resistance. This involves the use of a combination of antimycobacterial medications, often referred to as a multidrug regimen.

First line antituberculosis drugs to be used for Drug Sensitive TB

All new patients should receive an internationally accepted first-line treatment regimen for new patients. The initial phase should consist of two months of **Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), and Ethambutol (E)**. The continuation phase should consist of three drugs (Isoniazid, Rifampicin and Ethambutol) given for at least four months.

1. **Isoniazid (H)** -- It is a bactericidal drug that is effective against intracellular and extracellular organisms. The most frequent adverse effects associated with isoniazid treatment are peripheral neuropathy and hepatitis.
2. **Rifampicin (R)** --. A common side effect of rifampicin is the temporary discoloration (reddish-orange) of bodily fluids, such as urine, feces, saliva, sweat, and tears.
3. **Ethambutol (E)** -- Ethambutol is commonly used in combination with other drugs to form a multidrug regimen for TB treatment, helping to prevent the development of drug resistant strains and promoting effective management of the infection. Ethambutol can cause visual impairment, particularly affecting the optic nerve.
4. **Pyrazinamide (PZA** It is particularly effective against the dormant or non-replicating forms of the bacteria, which are often present in tuberculosis. Pyrazinamide is used in combination with other drugs as part of a multidrug regimen for TB treatment, helping to shorten the duration of therapy and prevent the development of drug-resistant strains. Regular monitoring of liver function is important, as pyrazinamide can occasionally cause liver toxicity.

Name of Anti TB Drug	Route of Administration	Adult dose in mg/Day	Paediatric Dose in mg /Day	Maximum Limit in mg per day	AdverseDrug Reactions
Isoniazid (H)	Oral (Fixed Dose Combination in Govt. Supply)	5 (4-6) mg	10 (7-15) mg	300 mg	Peripheral neuropathy Skin rash Hepatitis Sleepiness and lethargy
Rifampicin (R)		10 (8-12) mg	15 (10-20) mg	600 mg	Gastrointestinal: abdominal pain, nausea, vomiting Hepatitis Generalised cutaneous reactions Thrombocytopenic purpura
Pyrazinamide (Z)		25 (20-30) mg	35 (30-40) mg	2000 mg	Arthralgia Hepatitis Gastrointestinal
Ethambutol (E)		15 (12-18) mg	20 (15-25) mg	1500 mg	Retrobulbar neuritis

What to do if symptoms of adverse effects occur?

If symptoms of ADRs occur, the following should be done: -

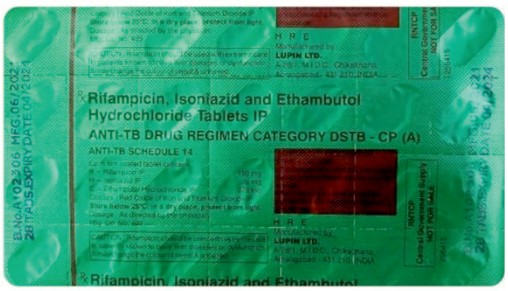
- The dose of drugs should be checked
- All other causes of symptoms should be excluded
- The adverse effects should be registered
- The drugs may need to be stopped and should eventually be reintroduced gradually when symptoms disappear
- Development of drug resistance should be avoided

Daily Dose Schedule for Adults as per weight band for Fixed Dose Combination (FDC)

Weight Category	No of FDC Tablets	
	Intensive Phase (HRZE) 75/150/400/275 mg	Continuation Phase (HRE) 75/150/275 mg
25 – 34 kg	2	2
35 – 49 kg	3	3
50 – 64 kg	4	4
65 – 75 kg	5	5
>75 kg	6	6

4 FDC – HRZE supplied by NTEP*

3 FDC – HRE supplied by NTEP*



(*NTEP – National TB Elimination Program)

Second-line antituberculosis drugs to be used for Drug Resistant TB : Bedaquiline (Bdq), Levofloxacin (Lfx), Moxifloxacin (Mfx), Clofazimine(Cfz), Cycloserine (Cs), Delaminid (Dlm), Inj Amikacin (Am), Pyrazinamide (PZA), Ethionamide (Eto), Para-aminosalicylate (PAS), Ethambutol (E).

These are used when the first-line medications are not effective or not tolerated due to drug resistance or other factors. These medications are reserved for the treatment of drug-resistant tuberculosis (DR-TB) or when a patient experiences adverse reactions to the first-line drugs.

The DRTB treatment is broadly divided

A. Shorter Bedaquiline MDR/RR TB regimen

B. Longer Oral M/XDR Regimen and C. Isoniazid Mono/Poly DRTB regimen.

List of Adverse drug reactions reported due to consumption of 2nd Line TB Drugs

- Hepatitis
- QT prolongation
- Rash, allergic reaction and anaphylaxis
- Gastrointestinal symptoms
- Giddiness /Seizures
- Arthralgia
- Peripheral neuropathy
- Depression/Psychotic symptoms
- Tendonitis and tendon rupture
- Vestibular toxicity (tinnitus and dizziness)
- Optic neuritis
- Metallic Taste
- Superficial fungal infection and thrush

Infection control at the public health Institutions

Administrative control strategies for health-care facilities (Policies and work practices) have the greatest impact on preventing TB transmission. They serve as the first line of defence for preventing the spread of TB in health care settings.

A. Outpatient Settings

1. **Screening:** Screening for respiratory symptoms should occur as early as possible upon patient's arrival at the health care facility. Patients can be effectively screened at the registration counter itself by asking simple questions related to chronic respiratory symptoms, and those suspected to have tuberculosis can be given priority slips.
2. **Education on cough etiquette and respiratory hygiene:** Another physical method that can prove useful for reducing airborne transmission is the provision patient education on cough hygiene and sputum disposal. This education can easily be imparted to patients through posters and other means in the waiting area, as well as by actual discussion by a staff.

   Disposable medical masks can be provided to patients by health care workers.These workers should also explain to patients how and when to use masks. Cough etiquette should be reinforced by all staff members when poor cough etiquette is observed.
3. **Patient segregation:** Segregation of patients with respiratory symptoms can be achieved by having a separate waiting area for chest symptomatic, within the overall outpatient area. This is particularly important in larger institutions with heavy OPD loads.
4. **Fast tracking of patients with respiratory symptoms:** Those identified as patients with respiratory symptoms can be further fast-tracked in both their clinical and laboratory evaluation. One option could be to directly send these patients for sputum smear examination before they see a doctor. The other options are to allow these patients to jump the routine queue and be seen earlier than other patients, or to have totally segregated physician areas for these patients.

B. Operations at In-Patient Department

Suggested priorities for separation of patients are as follows:

1. Separation of patients with confirmed or suspected diseases of public health concern, such as epidemic influenza, from all other patients.
2. Separation of sputum-smear positive TB /known/suspected TB patients from all patients especially immune-compromised patients.
3. Separation of patients with known or suspected drug-resistant TB from Immune-compromised patients.

The best choice for infectious or potentially-infectious patients is to house and manage them in airborne precaution rooms. Where such airborne precaution rooms are not feasible, other options for physical separation include:

- Having a few small 'airborne precautions rooms' for patients with infectious respiratory disease patients.
- Having a separate ward designated for patients with infectious respiratory disease.
- Keep a designated area with better ventilation available for the placement of potentially-infectious patients.
- Where it is not possible to have a designated airborne precaution room, ward, or area of a ward, there can at least be an area designated as a “No Immune-Compromised Patient Area”, where TB inpatients would be preferentially placed. This approach avoids specifically labelling patients as immune-compromised, HIV+, or having infectious TB. If properly implemented, this approach would keep vulnerable immune-compromised patients safely away from areas where infectious TB patients (if any) might be housed.

Educate in-patients on cough hygiene and provide adequate sputum disposal: Wards housing infectious patients should display sign boards in the ward demonstrating cough hygiene. All patients admitted in the ward/area should be issued surgical masks and counselled on their proper use. Adequate measures for safe collection and disposal of sputum.

Establish safe radiology procedures for patients with infectious respiratory disease, including smear-positive TB cases or TB suspects:

When caring for an infectious TB case / suspect, the radiology departments should attempt to:

- Schedule inpatient chest radiographs on infectious and suspect TB patients for non-busy times, such as the end of the afternoon.
- Provide coughing patients with a surgical mask to wear, or tissues or cloth to cover their mouths.
- Provide priority service to potentially infectious TB patients to minimize the length of time spent in the department.
- Use the room with the best ventilation for taking images of potentially infectious TB patients.

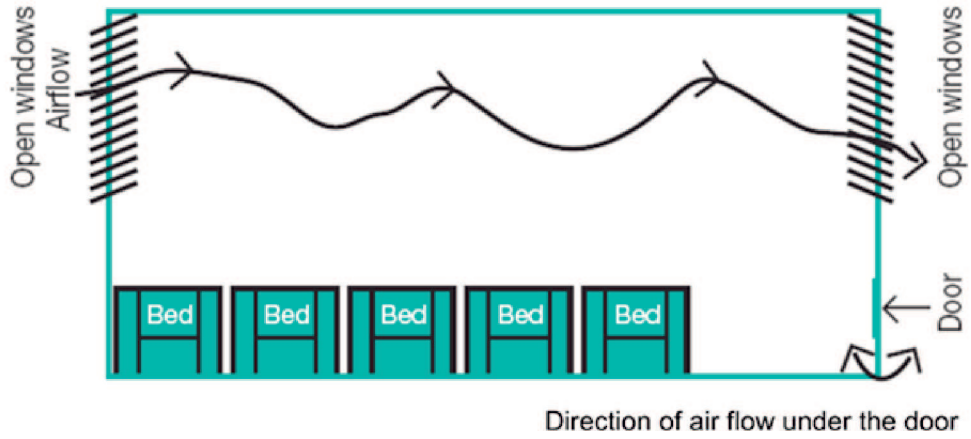
Environmental controls

Environmental control measures are the second line of defence for preventing the spread of TB in health care settings. Environmental controls include ventilation (natural and mechanical), ultraviolet germicidal irradiation, filtration and other methods of air cleaning.

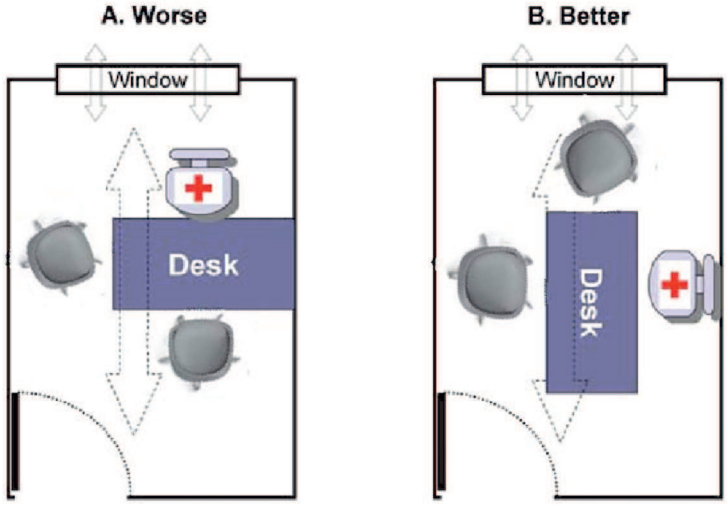
Ventilation

Ventilation can reduce the risk of infection through dilution and removal. When clean or fresh air enters a room, by either natural or mechanical ventilation, it dilutes the concentration of airborne particles, such as droplet nuclei, in room air. Dilution reduces the likelihood that a person in the room will breathe air that may contain infectious droplet nuclei. As room air exchange doubles, the concentration of airborne particles in the room falls by half.

Improved ventilation in health-care facilities is essential in preventing transmission of airborne infections and is strongly recommended. Better ventilation lowers the risk of transmission of TB and other airborne infections.

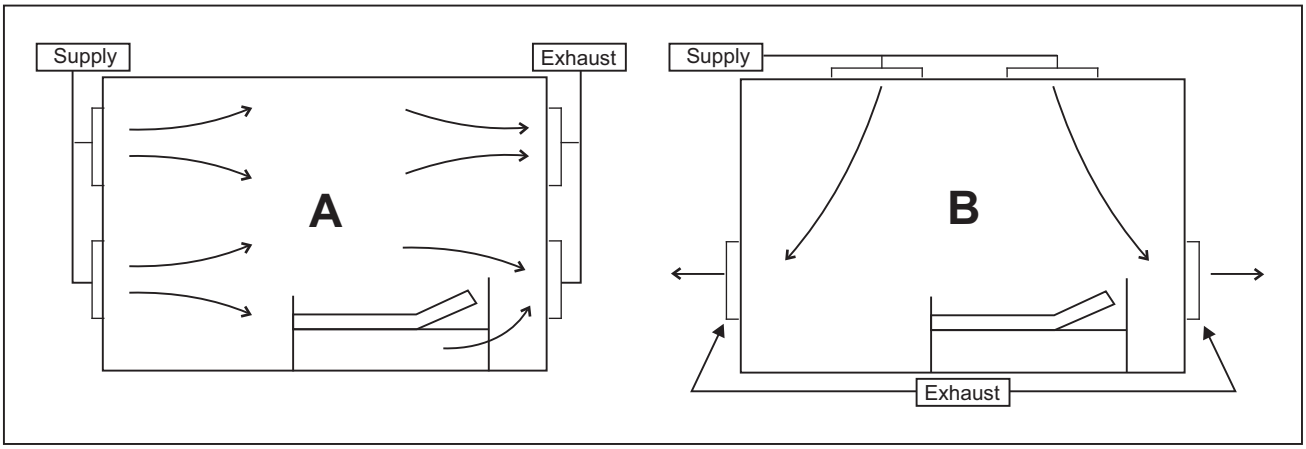


Schematic of the room with natural ventilation. Fixed unrestricted opening on both sides allow for adequate air exchange.



Below schematic showing the arrangement for patient and health care worker (red cross). (A), natural ventilation would allow potentially infected air to cross health care worker. In (B), with this seating arrangement the chance of such exposure is lessened somewhat.

Schematic diagrams of mechanical ventilation, with optimal directional control or air flow in the room.



Chapter 18
Infection Prevention

Infection prevention is a practical, evidence-based approach preventing patients and health workers from being harmed by avoidable infections. Effective Infection prevention practices requires constant action at all levels of the health system, including policymakers, facility managers, health workers and those who access health services. It is unique in the field of patient safety and quality of care, as it is universally relevant to every health worker and patient, at every health care interaction. Defective Infection prevention practices causes harm and can kill.

A. Hand hygiene-

Practicing hand hygiene is a simple yet effective way to prevent the spread of infections. Failure to perform appropriate hand hygiene is considered to be the leading cause of nosocomial infections and the spread of multi-resistant micro-organisms, and has been recognized as a significant contributor to infection outbreaks

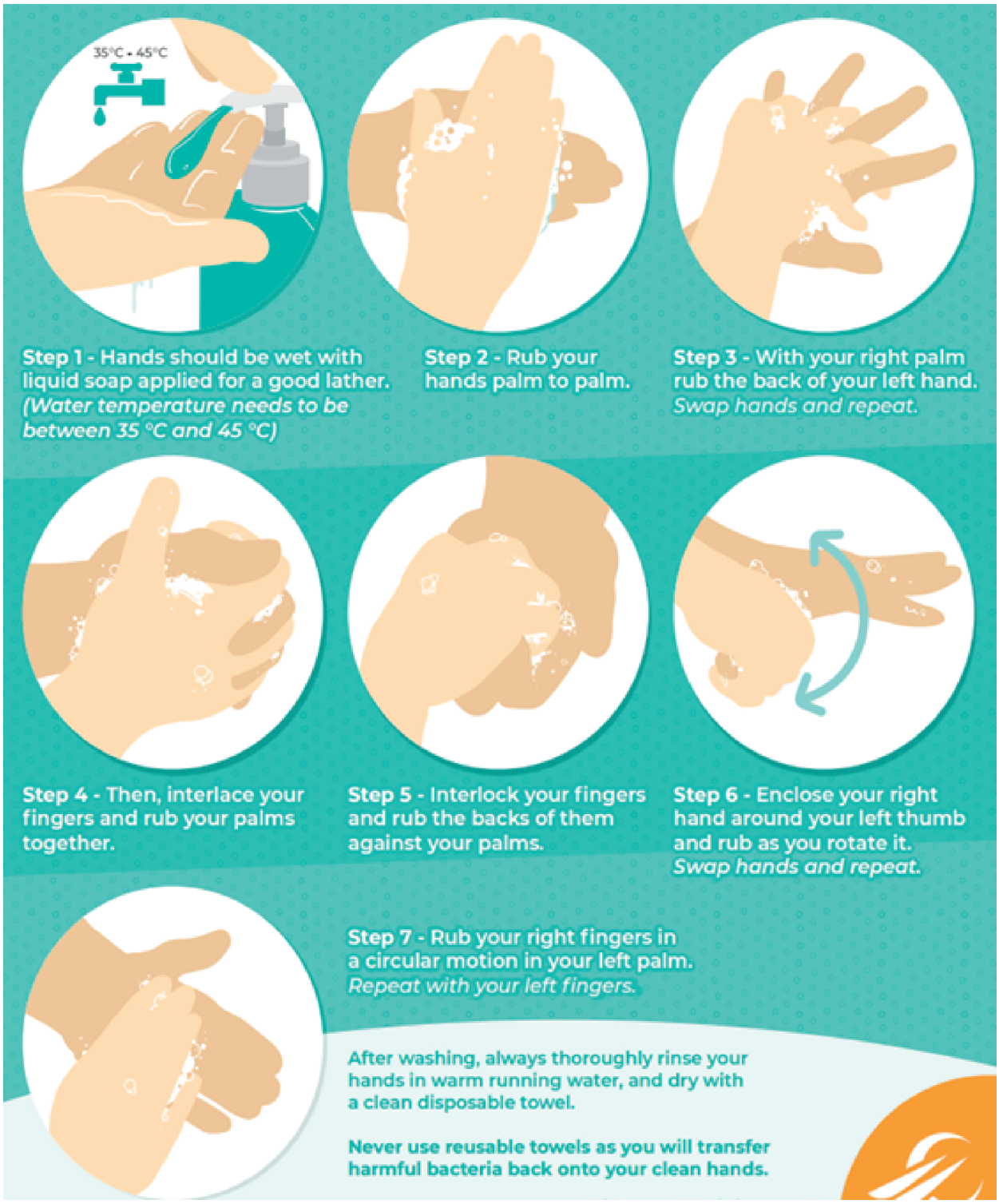
Before Patient Contact	**When:** Clean your hands before touching a patient when approaching him/her **Why:** To protect the patient against harmful germs carried on your hands **Example:** Shaking hands, helping a patient to move around, clinical examination
Before Performing Clean/ Aseptic Procedure	**When:** Clean your hands immediately before performing a clean/aseptic procedure **Why:** To protect the patients from harmful germs, including patients' own, from entering his/her body **Example:** Oral/dental care, secretion aspiration, wound dressing, catheter insertion, preparation of food and medications
After Body Fluid Exposure Risk	**When:** Clean your hands immediately after an exposure risk to body fluids and after glove removal **Why:** To protect yourself and healthcare environment from harmful patient germs **Example:** Oral/dental care, secretion aspiration, drawing and manipulating blood, cleaning up of urine, faeces, handling of waste
After Touching a Patient	**When:** Clean your hands after touching a patient and his/her immediate surroundings, when leaving the patient's side **Why:** To protect yourself and healthcare environment from harmful patient germs **Examples:** Shaking hands, helping a patient to move around, clinical examination
After Touching Patient Surroundings	**When:** Clean your hands after touching any object or furniture in the patient's immediate surroundings when leaving – even if the patient has not been touched **Why:** To protect yourself and healthcare environment from harmful patient germs **Example:** Changing linen, any bedside equipment setting

Preferred medium of hand hygiene

Soap and Water (Hand Wash)

- When visibly dirty
- When visibly soiled with blood or other body fluids
- After using toilet
- Suspected or proven exposure to potential spore forming pathogens including outbreaks of C. *difficile*

7 Steps of Hand Washing (SUMAN - K)



Alcohol-based Hand Rub

- If hands are not visibly soiled
- Before and after touching the patient
- Before handling an invasive device for patient care, regardless of whether or not gloves are used
- After contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings
- If moving from a contaminated body site to another body site during care of the same patient
- After contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient
- After removing sterile or non-sterile gloves
- Before handling medication or preparing food, sanitize hands using an alcohol-based hand rub or wash hands with soap and water.

B. How to put on Personal Protective Equipment (PPE)

Steps in that order :

- Shoe covers
- Waterproof apron
- Eye cover
- Cap
- Mask
- Gown
- Gloves

How to wear sterile gloves

- Ask assistant to open the outer package of the gloves
- Open the inner wrapper exposing the cuffed gloves with the palm facing upwards
- Pick up the first glove by the cuff, touching only the inside portion of the cuff
- Hold the cuff in one hand and slip the other hand into the glove ensuring that the fingers enter the corresponding finger of the glove
- Pick up the second glove by sliding the fingers of the gloved hand under the cuff of the second glove
- Put the second glove on the ungloved hand by maintaining a steady pull through the cuff until the fingers reach the end of the corresponding finger of the glove
- Adjust the cuff until the gloves fit comfortably and cover both the wrists.

How to remove contaminated gloves after the procedure

- Grasp one of the gloves near the cuff and pull downwards towards the fingers
- Grasp the second glove and pull downwards
- Pull off the two gloves at the same time, being careful to touch only the inside surfaces of the gloves with your bare hands
- Dispose in red bin

Precautions to be taken to avoid contaminating sterile gloved hands

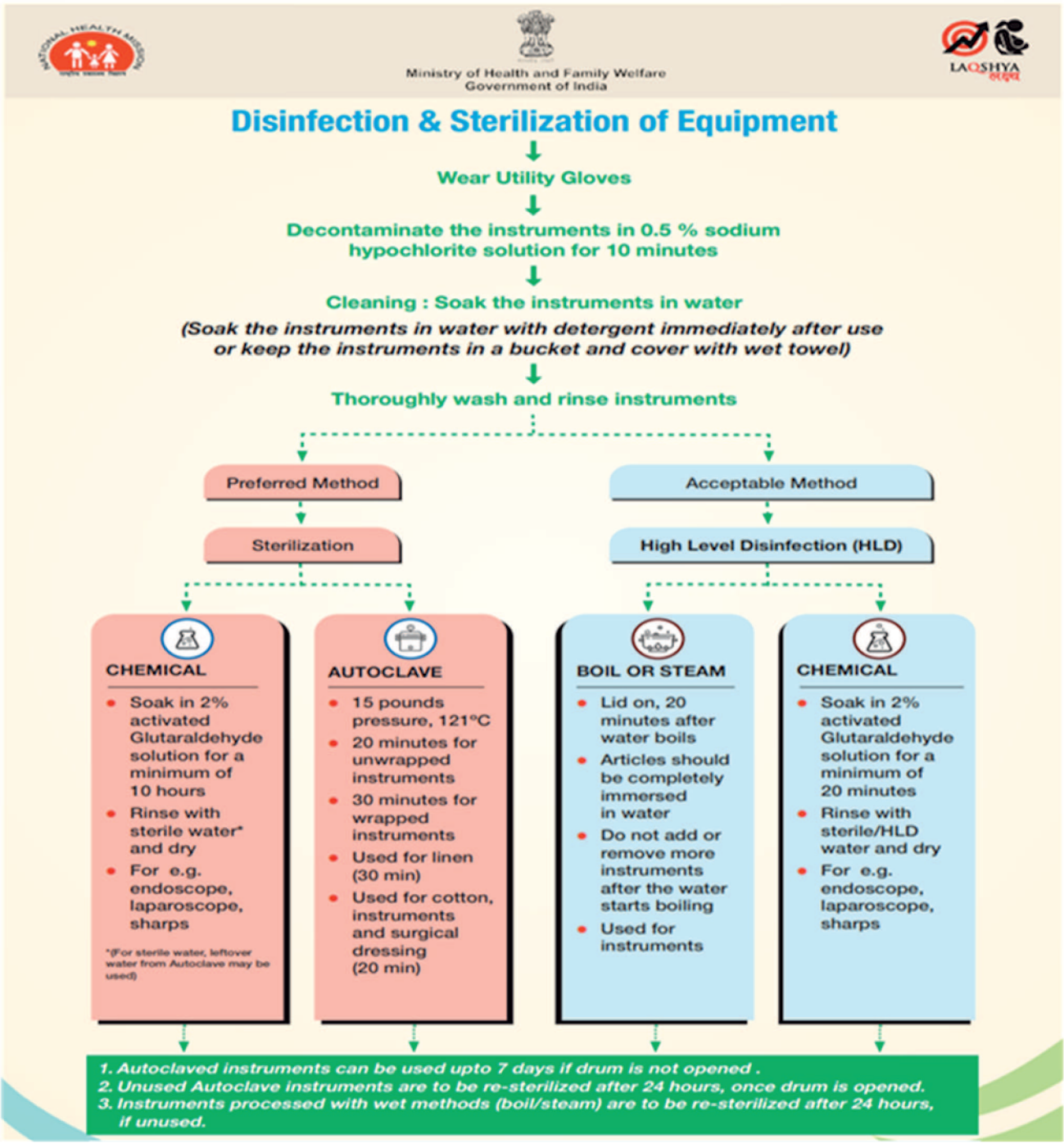
- Don't touch unsterile items with gloved hands
- Keep gloved hands above waist level

C. Processing of instrument/ equipment for re-use

Recommended steps of instrument processing are as follows-

- Disinfection
- Cleaning of instrument
- Packaging
- Sterilization
- Dispatch and Storage

Sterilization of instruments



D. Needle Stick Injury (NSI)

It occurs when the skin is accidentally punctured by a used needle, Blood-borne diseases that could be transmitted by such an injury include human immunodeficiency virus (HIV), hepatitis B (HBV) and hepatitis C (HCV).

Protocol (NSI) -immediately after needle stick injury: encourage the wound to bleed, ideally by holding it under running water. wash the wound using running water and plenty of soap. Do not scrub the wound while you're washing it.

1. **PEP for HIV-** PEP means taking medicine to prevent HIV after a possible exposure. PEP should be used only in emergency situations and must be started within 72 hours after a recent possible exposure to HIV. If you are prescribed PEP, you will need to take the HIV medicines every day for 28 days. Recommended regimen is : Tenofovir (300mg) + Lamivudine (300mg) + Efavirenz (600mg) once daily for 28 days.
2. **PEP for Hepatitis B-** After exposure to hepatitis B virus (HBV), appropriate and timely prophylaxis can prevent HBV infection and subsequent development of chronic infection or liver disease. The mainstay of postexposure prophylaxis (PEP) is hepatitis B vaccine, but, in certain circumstances, hepatitis B immune globulin is recommended in addition to vaccine for added protection

Sample Form for Needle Stick Injury

Name of Hospital: **District:**

Sr. No.	Parameters		Remarks
1.	**Name of Health Care Worker (HCW)**		
2.	**Name of the Unit & Department**		
3.	**Date and Time of Needle Stick/Sharp Injury**		
4.	**Date and Time of Reporting to ICN**		
5.	**Site of Injury**		
6.	**Nature of Injury**	Needle Prick /Sharp Cut/Lacerations/Splash of Fluids / Splattered Glass/Others(Please specify)	
7.	**Source of Injury (If Available)**		
8.	**Action taken on site**		
9.	**Pre-exposure Prophylaxis given**	Yes/No	
10.	**Date Time & Type of Vaccination**		
11.	**Whether vaccination taken after exposure**	Yes/No	
12.	**If taken after exposure Date Time and Type of Vaccination**		
13.	**If not taken after exposure reasons for the same**		
14.	**Test Results after exposure with method used.**		

Filled By:_____ Submitted to:_____

Action Taken_____

Biomedical Waste Management (BMW)

The bio medical waste as defined by the BMW Rules, 2016 is any waste which is generated during the activities of diagnosis, treatment and immunisation of human beings or any research activities pertaining thereto or in the production or testing of biological or in the health camps.

SN	Category	Type of Waste	Colour & Type of Container
1	**Yellow Category**	Human Anatomical Waste • Soiled Waste • Discarded or Expired Medicine • Chemical Liquid Waste • Chemical Laboratory Waste • Chemotherapy Drug Vials	Yellow colour non chlorinated plastic bags or containers 
2	**Red Category**	Contaminated Waste (Recyclable)	Red colour non chlorinated plastic bags and containers 
3	**White Category**	Waste Sharps including metals	White colour puncture proof, leak proof, tamper proof containers 
4	**Blue Category**	• Glassware • Metallic Body Implants	Puncture proof and leak proof boxes or containers with blue coloured marking (2018 Amendment)

For implementation of the BMW Rules, 2016 & 2018 (Amendment) the health facilities need to be aware of the following:

- Bio medical waste generated from the health facilities is segregated as per the new colour coding scheme specified in the BMW Rules, 2016 & 2018 (Amendment)
- All the health facilities which are situated within 75 km radius of Common Bio Medical Waste Treatment Facility (CBMWTF), need to have a formal agreement with the CBMWTF for final treatment and disposal of the bio medical waste

- Health facilities which do not lie within 75 km radius of CBMWTF need to have approval for deep burial pit, used for disposal of waste from the Pollution Control Board office
- Health facilities also need to ensure that the pre-treat the waste at the health facilities as per BMW Rules before handing over the same to CBMWTF or before the final disposal
- Each health facility also needs to ensure that only non-chlorinated bags (excluding blood bags) are used by the hospital for collection of waste in the hospital
- Health facilities also need to ensure that they monitor the activities of BMW management through a committee formed at the facility. This committee should meet at least once in six months and all the records related to the same need to be maintained by the health facility.

The key activities that a hospital performs for the management of BMW include:

- Segregation of the waste at the point of generation
- Waste collection in colour coded bins
- Transportation of the waste from the interim storage areas of the hospital to the BMW shed

Handover from Biomedical shed to Common Biomedical waste treatment facility (CBMWTF)

Segregation

General Requirements

- Waste has to be segregated at the point of generation itself
- Segregation of the waste is the responsibility of the service provider generating the waste
- The waste generated from different areas of the hospital needs to be segregated as per the colour coding provided in the BMW Rules, 2016 & 2018 (Amendment).
- The general waste generated should not to be mixed with the bio medical waste.
- The work instructions are displayed at appropriate areas of the hospital for proper segregation of the waste as per the colour coding.

Collection of Waste

General Requirements

- All the bags used for waste collection need to be sealed once they are full to 3/4th of their capacity and transported to the central waste storage area or interim storage areas
- Collection of the waste needs to be done in closed covered containers which are sturdy preferably wheelbarrows
- Collection time needs to be fixed and size of the bins need to be appropriate to the quantity of waste produced in each area of the healthcare facility
- General waste should not be collected at the same time or in the same trolley as infectious or other hazardous wastes
- Collection of the waste should be done daily, with collection timed to match the pattern of waste generation during the day
- The collection timings should enable the hospital to minimise or nullify the use of interim storage of waste in the departments
- The collection of the waste should be done by the waste handlers only after downing of the appropriate PPE i.e. gum boots, heavy duty gloves, face masks and eye wear
- All the bags needs to be labelled with biohazard or cytotoxic hazard symbol along with date of generation and area of generation for easy traceability.

Transportation of Waste

- BMW generated from the health facilities should be transported in covered wheelbarrow based sturdy trolleys through a route which has low traffic flow of patients and visitors (whenever possible)
- The waste transportation trolleys should be dedicated for the purpose of waste transportation only
- The transportation trolleys need to be separate for general waste and for BMW
- It is preferable that the trolleys used for transportation should be as per the colour coding, as provided in the New BMW Rules.
- All the trolleys used for the transportation of the waste should be labelled with bio hazard logo
- After every transportation cycle, ensure trolley should be washed, disinfected & dried up
- Route of transportation to the BMW holding/disposal area should preferably be planned in such a way that ensures:
    - it does not include transportation through high risk areas
    - supplies and waste are transported through separate routes.
    - waste is not transported through areas having high traffic of patients and visitors
    - central waste collection area can be easily accessed through this route
    - provide safe transportation of waste to avoiding spillage and scattering of waste

Storage of Biomedical Waste

The BMW generated from the hospital needs to be stored in a dedicated central waste storage area (BMW shed), before handing over the same to the CBMWTF. The minimum requirements that are needed to be ensured by hospitals for central waste storage area as listed as follows:

- BMW shed should be away from the public/visitors access
- BMW shed should be manned through lock and key under the responsibility of designated
- person
- BMW shed should be ventilated through the use of exhaust fan or by use of wire meshes for ventilation
- There should also be provision of water supply adjacent to BMW shed for cleaning and washing of this station, trolleys and also for hand washing for the staff
- The entrance of this station should be labelled with “ENTRY FOR AUTHORISED PERSONNELL ONLY” and logo of BMW Hazard.
- It is to be ensured that no general waste is stored in the central waste collection area
- The hospital should ensure that waste generated from the hospital should not be stored beyond a period of 48 hours
- Health facilities need to maintain the record of waste handed over to the CBMWTF and also for recyclable waste generated and handed over to the authorised recyclers

Disposal of Biomedical Waste (BMW)

Hospitals need to ensure that they have adequate arrangements for the disposal of BMW generated from the health facility. The final disposal of the BMW generated from the health facility should be taken up by the Common Bio-medical Waste Treatment Facility (CBMWTF). All the hospitals, which are situated within a distance of 75 km of CBMWTF, need to have a formal agreement/contract with the CBMWTF for transportation and disposal of BMW generated from the hospital. These hospitals have to hand over the waste to the CBMWTF for final disposal and should ensure that waste is not disposed of in the deep burial and sharp pits.

Hospitals which are situated outside 75 km areas of the CBMWTF should ensure that they have the facility of disposal of waste within the premises of the hospital i.e. deep burial and sharp pits. Hospitals need to have approval from Pollution Control Board office for all the deep burial pits and sharp pits created in the hospital and records of the same need to be maintained by the hospital. The deep burial pits created in the hospital should meet the requirements as listed in the BMW Management Rules.

Spill Management

In a hospital, hazardous substances such as body fluids, drugs, cleaning fluids and other chemicals are in very close proximity to hundreds of people each day. Thus in hospital spillage of blood, body fluids or chemicals can occur at any time due to broken or faulty equipment or human error. Any such spill poses risk to the staff, visitors and patients who are extremely susceptible to infection.

Small volumes of spill (few drops):

- Wear workman's gloves and other PPE appropriate to the task
- When sharps are involved use forceps to pick up sharps, and discard these items in a puncture resistant
- container
- Wipe the spill with a newspaper moistened with hypochlorite solution (1% dilution containing
- minimum 500ppm chlorine). Discard the paper as infected waste
- Repeat until all visible soiling is removed
- Wipe the area with a cloth mop moistened with 1% hypochlorite solution and allow drying naturally
- All contaminated items used in the clean-up should be placed in a bio-hazardous bag for disposal.

Large spills (>10ml):

- Confine the contaminated area
- Wear workman's gloves and other PPE appropriate to the task
- Cover the spill with newspaper or appropriate absorbent material to prevent from spreading
- Flood the spill with 10% hypochlorite solution. While flooding the spill with 10% hypochlorite solution it is to be ensured that both the spill and absorbent material is thoroughly wet
- Alternatively, chlorine granules can be sprinkled on the spill first and then the paper put over it
- Wait for five minutes.
- Remove and discard the paper as infected waste
- Wipe the area with paper moistened with 10% hypochlorite again if required until all visible soiling is cleaned
- Wipe the area once with 10% hypochlorite and a cloth mop and allow drying naturally
- All contaminated items used in the clean-up should be placed in a bio-hazardous bag for disposal.

Spill Kit

Blood and body fluid spill kit contents:

- Workman's gloves x 2 pairs
- Apron
- Mask
- Shoe over or plastic bag to cover the shoes
- Absorbent material like newspaper or blotting paper
- Waste collection bag

Chapter 19
Quality Assurance

Quality Assurance is a systematic activity under NHM, its framework was launched in 2013, using similar framework new guidelines & assessment tools were launched in 2015. Quality Assurance Standards for Healthcare facilities are developed to help themselves to create credible quality management system & ensure quality can be defined quantitively. The system also offer a standardize process for monitoring and evaluation of quality of services by various stakeholders.

For improving the quality of care at public health facilities, Quality Assurance Standards for District Hospitals (DH), Community Health Centres (CHC), Primary Health Centre (PHC) and Urban-Primary Health Centres (UPHC) were drafted in 2013, and their implementation has been operationalised through the National Quality Assurance Programme.

Assessments are being done on pre-defined facility (DH, CHC, PHC, HWC etc) and program specific (NQAS, Kayakalp, LaQshya, MusQan) checklist.

Assessment conducted at 3 levels:

1. **Internal assessment** (done by a team of internal assessors)

   If facility scores more than the defined passing marks/criteria, it should apply for State assessment

2. **State assessment** (done by a team of internal and external assessors)

   After clearing this, facility applies for National assessment

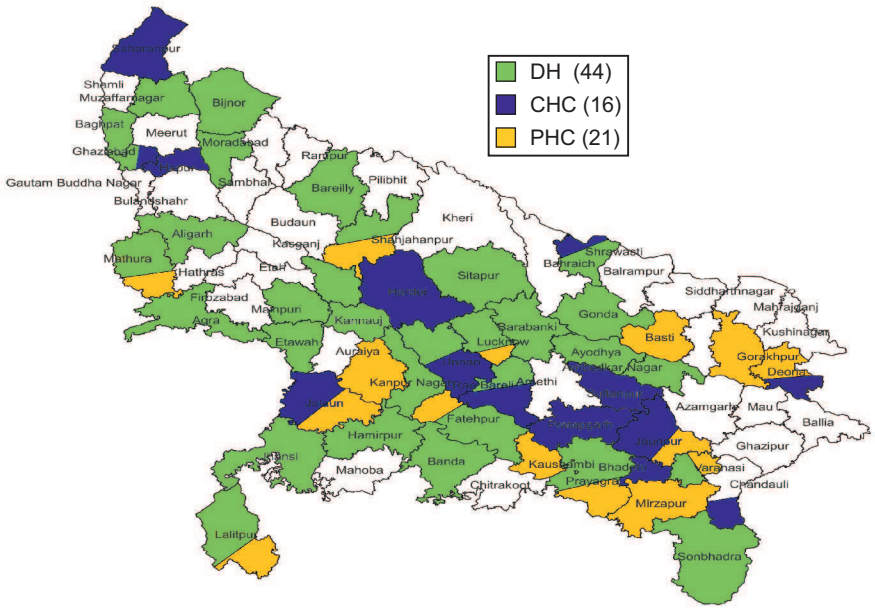
3. **National assessment** (done by a team of NQAS certified external assessors)

   Facility achieves certification after clearing this last step.

Certification is valid for a period of 3 years only (for NQAS, LaQshya & MusQan)

Various programs started to ensure quality of care in a public health facility-

1. **NQAS**- National Quality Assurance Standards (NQAS) Program launched by the Ministry of Health and Family Welfare with the aim of recognizing the good performing facilities. The National Quality Assurance Standards (NQAS) were launched in 2013 with an aim to improve the Quality of Care in Public Health Facilities of India. The NQAS continue to meet the global benchmark.



NQAS certification status in Uttar Pradesh (till Dec 2022)

Following areas are recognized under Quality assurance framework (Same for NQAS, LaQshya and MusQan)

(A) Service Provision

(B) Patients' Rights

(C) Inputs

(D) Support Services

(E) Clinical Services

(F) Infection Control

(G) Quality Management

(H) Outcome

2. **Kayakalp award scheme**- Sanitation and hygiene prevents disease and promotes well-being, making it the perfect expression of WHO's definition of health, as expressed in its constitution, i.e. "A state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity".

   The Kayakalp scheme, which was launched as an extension of Swachh Bharat Abhiyan of Hon. Prime Minister Shri Narendra Modi on 15th May 2015 is the first comprehensive scheme for Public Health System of India, which has successfully highlighted the linkage between hygiene, sanitation in health facilities and better health outcomes. It also highlights the role of health authorities as champions of sanitation and hygiene promotion.

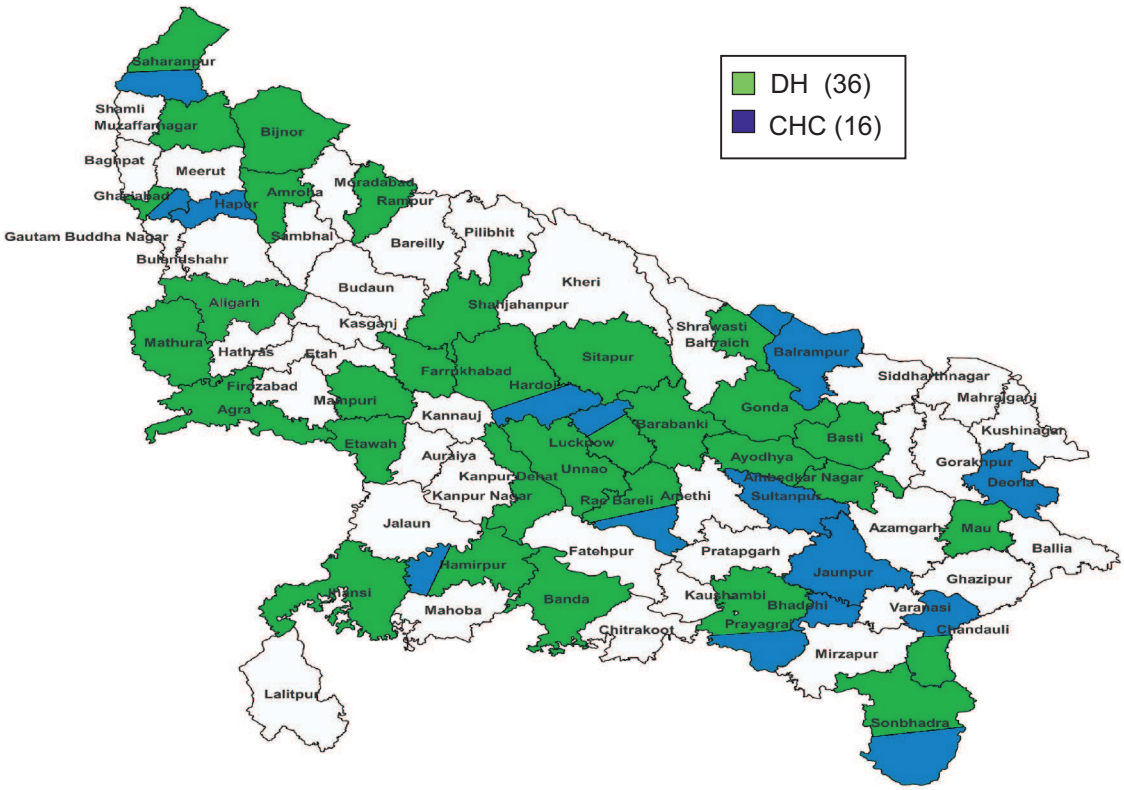
Scope: Under Kayakalp award scheme DH, SDH, CHC, PHC, UPHC, HWC are evaluated on a pre-defined checklist.

Kayakalp scores obtained under following parameters:

a. Hospital/Facility Upkeep
b. Sanitation and hygiene
c. Waste Management
d. Infection control
e. Support Services
f. Hygiene Promotion
g. Cleanliness beyond Hospital/facility Boundary wall
h. Eco-friendly facility

3. **LaQshya**- Considering the issue of concern with a focus on the quality of care around birth; India has stepped forward to ensure safe motherhood to every pregnant woman in the Country. With this vision in mind, Ministry of Health and Family Welfare has launched LaQshya initiative in November 2017 with aim to reduce preventable maternal and new-born mortality, morbidity and stillbirths; improve quality of care during intra-partum and immediate post-partum period in the Labour Room and Maternity Operation Theatre (MOT); enhance satisfaction of beneficiaries, provide positive birthing experience and Respectful Maternity Care (RMC) to all pregnant women receiving care in public health facilities.

LaQshya certification status in Uttar Pradesh (till Dec 2022)



4. **MusQan**- For improving the quality of care at public health facilities for children up to 12 year of age group, Government of India has setup the MusQan initiative. The goal of MusQan initiative to ensure provision of quality child friendly services in public health facilities to reduce preventable newborn and child morbidity and mortality

The Scope of services under MusQan is as:

District Hospitals	Sub District Hospitals(SDH)	All functional FRU CHCs	All other facilities
4 Departments • Paediatric OPD • Paediatric Ward • SNCU • Nutrition Rehabilitation Centre	**3 Departments** • Paediatric OPD • Paediatric Ward • SNCU/ NBSU	**2 Departments** • Paediatric OPD • NBSU/ SNCU (if available)	**4 Departments** • Paediatric OPD • Paediatric Ward • SNCU • Nutrition Rehabilitation Centre

Role of nurses in Quality assurance-

Nurses are directly involved in almost all aspects of hospital quality, including patient care, bedside and medication management, assistance with surgeries and other major operations, data collection/reporting, and more. Furthermore, nurses are directly responsible for monitoring and assessing patients, and performing immediate interventions to reduce risk or prevent medical complications. Nurses also oversee other care providers, i.e. patient care technicians, caregivers, and more. An attending nurse even helps educate patients and family members regarding post hospital care, before discharge.

Below are some of the broad activities identified for staff nurses under QA framework

1. Adherence to Protocols and Guidelines
2. Patient Safety
3. Documentation and Reporting
4. Continuous Monitoring and Assessment
5. Participation in Interdisciplinary Teams
6. Quality Improvement Initiatives
7. Patient and Family Education
8. Feedback and Communication
9. Compliance and Regulation

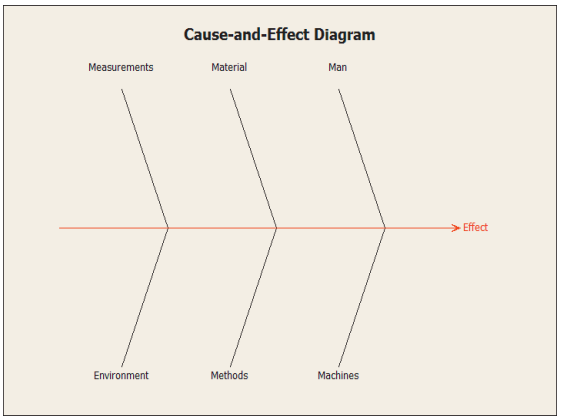
Quality Tools

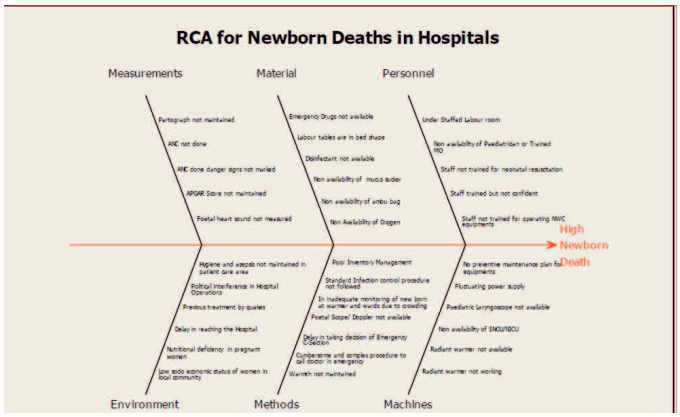
The **seven basic tools of quality** are a fixed set of visual exercises identified as being most helpful in troubleshooting issues related to quality.

They are called *basic* because they are suitable for people with little formal training in statistics and because they can be used to solve the vast majority of quality-related issues.

The seven basic tools are-

1. **Cause & Effect diagram**- A cause and effect diagram, often called a "fishbone" diagram, can help in brainstorming to identify possible causes of a problem and in sorting ideas into useful categories. A fishbone diagram is a visual way to look at cause and effect



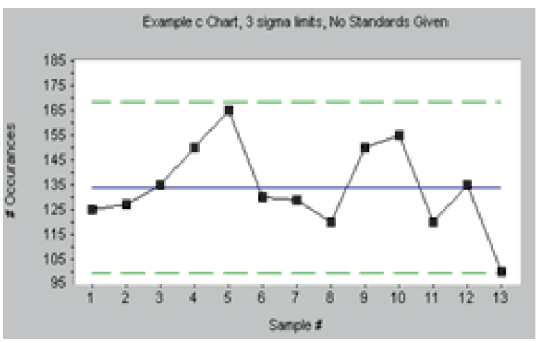


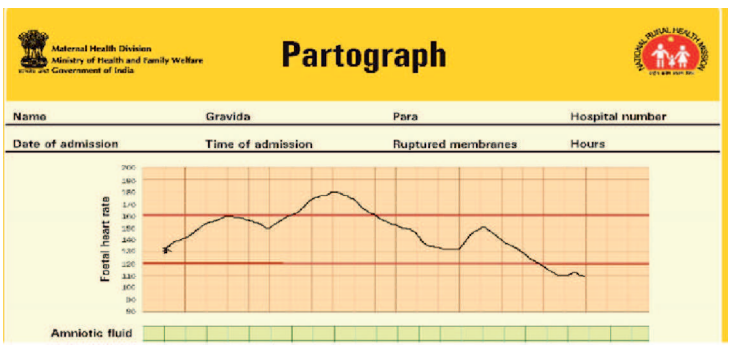
2. **Check sheet**- A check sheet is a structured, prepared form for collecting and analyzing data. This is a generic data collection and analysis tool that can be adapted for a wide variety of purposes and is considered one of the seven basic quality tools (eg. NQAS/LaQshya/MusQan checklist)

Checklist for Accident & Emergency

Reference No.	Measurement Element	Checkpoint	Compli-ance	Assess-ment Method	Means of Verification
	AREA OF CONCERN - A SERVICE PROVISION				
Standard A1	**The facility provides Curative Services**				
ME A1.1.	The facility provides General Medicine services	Availability of Emergency Medical Procedures		SI/OB	Poisoning, Snake Bite, CVA, Acute MI, ARF, Hypovolumic Shock, Dysnea, Unconsious Patients
ME A1.2.	The facility provides General Surgery services	Availability of Emergency Surgical Procedures		SI/OB	Appendicitis, Rupture spleen, Intestinal Obstruction, Assault Injuries, perforation, Burns
ME A1.3.	the facility provides Obstetrics & Gynaecology Services	Availability of Emergency Obstertics & Gynaecology Procedures		SI/OB	APH, PPH, Eclampsia, Obstructed labour, Septic abortion, Emergency Contraceptives
ME A1.4.		Availability of emergency Pediatric procedures		SI/OB	ARI, Diarrheal diseases, Hypothermia, PEM, reucitation

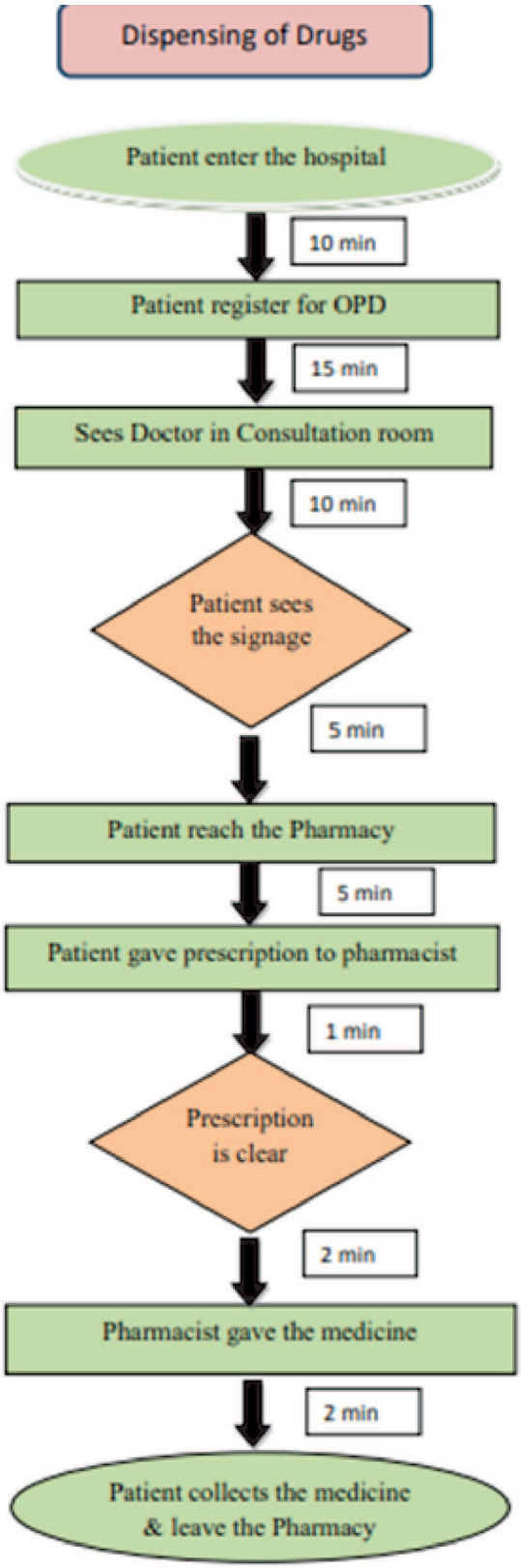
3. **Control chart-** A quality control chart is a graphic that depicts whether sampled products or processes are meeting their intended specifications. If not, the chart will show the degree by which they vary from specifications



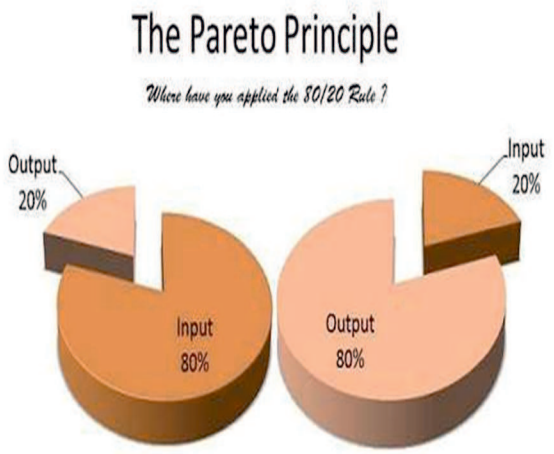


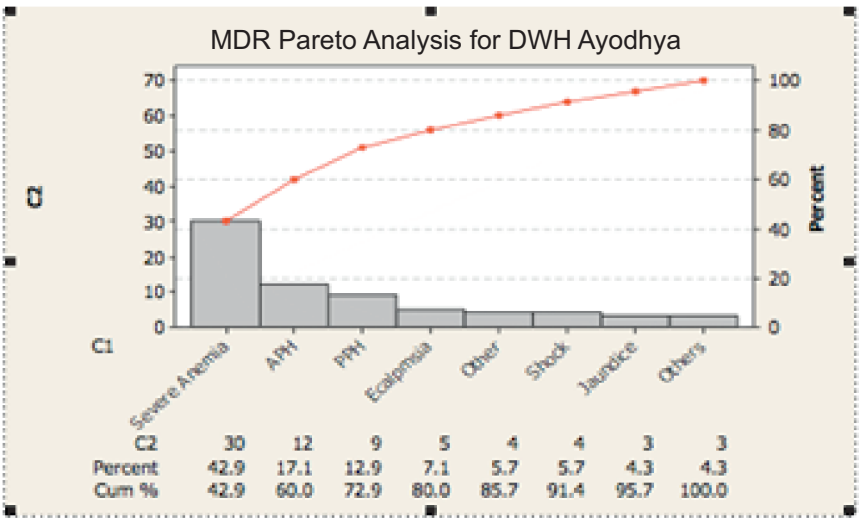
4. **Process Mapping**- Process mapping is a technique used to visually map out workflows and processes. It involves creating a process map, also referred to as a flowchart, process flowchart, or workflow diagram. The purpose of process mapping is to communicate how a process works in a concise and straightforward way.

Below diagram is the illustration of Process map for drug dispensing at a Pharmacy.

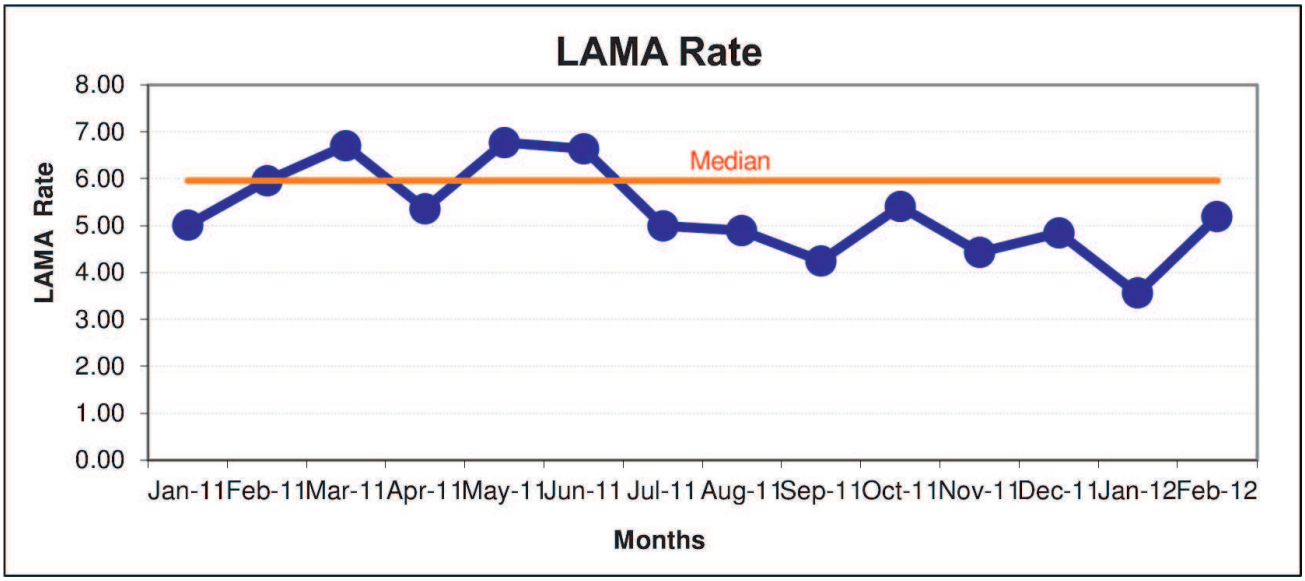


5. **Pareto chart-** A Pareto chart is a powerful tool that helps viewers understand which factors most influence outcomes. It's based on the Pareto principle, which is that 80 percent of outcomes arise from 20 percent of causes. The chart helps to display this principle graphically.





6. **Run chart-** A run chart, also known as a run-sequence plot is a graph that displays observed data in a time sequence.



7. **PDSA-** Process mapping is a technique used to visually map out workflows and processes. It involves creating a process map, also referred to as a flowchart, process flowchart, or workflow diagram. The purpose of process mapping is to communicate how a process works in a concise and straightforward way.

PDSA Cycle		
Plan	Change to be tested	Gestational age to be calculated for all arrivals in Labor room
	Who will test	Quality Circle member (Dr. X & Ms Y)
	Over how much time will the test be done?	2 month
	When will it take place?	During true labour pain in all the arrivals in all shifts
	What will you measure	Percentage of Preterm deliveries amongst all arrivals
	What do you predict will happen?	Increase the coverage of administration of Antenatal corticosteroids amongst 24-34 weeks from baseline to 80%
Do	By training the staff nurses and regular mentoring	
Study	Staff nurses don't know how to elicit LMP and how to calculate EDD	
Act	Conduct refresher training on LMP/EDD. Provide gestational wheel/App for the calculation of gestational age. Monitor documentation of gestational age in case sheet and follow case sheet instructions to give ANCS in 24-34 weeks	

Chapter 20
Documentation and Digitization

Importance of documentation and records keeping

Documentation and records keeping play a crucial role in healthcare for several important reasons:

- **Continuity of Care:** Accurate and comprehensive documentation ensures the continuity of care for patients. It allows healthcare providers to have a complete and up-to-date understanding of the patient's medical history, ongoing treatments, medications, allergies, and other relevant information. This enables healthcare professionals to make informed decisions and provide appropriate care, especially during care transitions or when multiple providers are involved.
- **Communication** : Documentation serves as a means of communication among healthcare professionals. It allows nurses, doctors, therapists, and other team members to share critical information about patient care, progress, and interventions. This ensures that all team members are well-informed and can work together efficiently to deliver coordinated care.
- **Legal and Regulatory Compliance:** Accurate and timely documentation provides evidence of the care given, adherence to standards, and compliance with policies, protocols, and regulations. Documentation serves as a defence in legal situations, demonstrating that care was delivered appropriately and within established guidelines.
- **Quality Improvement and Patient Safety:** Documentation is integral to quality improvement efforts and patient safety initiatives. Through documentation, adverse events, near misses, and critical incidents can be recorded and analysed to identify areas for improvement and implement preventive measures. Documentation also helps in tracking and monitoring patient outcomes and ensuring compliance with patient safety protocols.

Auditing and Continuous Improvement

Conducting periodic audits to assess compliance and effectiveness of documentation practices in healthcare is an important quality improvement measure. Here's how conducting such audits can be beneficial:

- Compliance Assessment: Audits help assess the extent to which documentation practices comply with regulatory requirements, legal standards, and organizational policies. By reviewing a sample of documentation, auditors can identify any deviations or non-compliance issues and take corrective actions to ensure adherence to standards.
- Identify Gaps and Areas for Improvement: Audits provide insights into areas where documentation practices may have gaps or deficiencies. By reviewing the documentation against established guidelines and best practices, auditors can identify areas that require improvement. This includes issues related to completeness, accuracy, timeliness, and consistency of documentation.
- Quality Assurance: Auditing documentation practices helps ensure the quality and integrity of patient records. By reviewing the documentation for accuracy, clarity, and compliance, auditors can verify that the information is reliable and can support appropriate patient care decisions.
- Training and Education Needs: Audit findings can highlight the need for additional training or education for healthcare professionals. If deficiencies are identified in certain areas of documentation, targeted training programs can be developed to address those specific needs.
- Standardization and Consistency: By identifying variations and discrepancies, auditors can recommend standardized approaches, templates, or guidelines to ensure uniformity and consistency in documentation.
- Risk Management and Patient Safety: Auditing documentation practices contributes to risk management and patient safety efforts. By identifying incomplete or inaccurate documentation, auditors can recognize potential risks and take corrective actions to prevent errors or adverse events. Accurate and comprehensive documentation supports patient safety by providing a clear record of patient care, treatments, and outcomes.

Benefits of Digitization

Digitization refers to the process of converting written information into digital format. Here are some key benefits why digitization in healthcare is important:

- **Improved Efficiency:** Digitization reduces manual workloads, leading to improved efficiency. Digital documents can be easily created, stored, retrieved, and shared, eliminating the need for physical paperwork. This saves time and allows healthcare professionals to focus more on patient care.
- **Enhanced Accessibility and Availability**: Digital information can be accessed quickly and from anywhere with proper authorization. This allows healthcare providers to retrieve information promptly, make informed decisions and provide timely care, epecially in emergency situations or working remotely.
- **Better Information Management:** Digitization enables efficient management of vast amounts of healthcare data as digital records can be organized and searched, making it easier to find specific information quickly.
- **Enhanced Collaboration and Communication**: It enable easy sharing and exchange of information, such as test results, imaging reports, and care plans, among different providers involved in a patient's care.
- **Disaster Recovery and Care Continuity:** It provides a means for secure backup in the event of accidents or system failures. Digital records can be stored on cloud-based platforms, reducing the risk of data loss.

Ayushman Bharat Digital Mission

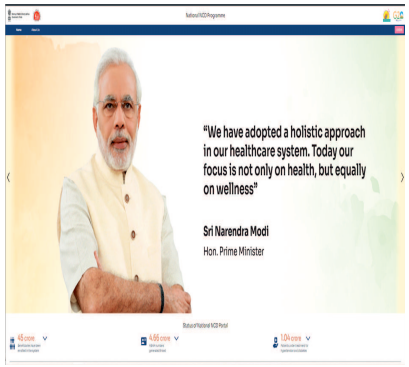
Ayushman Bharat Digital Mission was launched by the Government of India in Year 2021. The mission aims to transform the healthcare sector in India by leveraging digital technologies and promoting interoperability between various stakeholders in the healthcare ecosystem. Here is an overview of the Ayushman Bharat Digital Mission and its objectives:

- **Digital Health Infrastructure:** The mission focuses on establishing robust digital health infrastructure at various levels, including national, state, and district levels from tertiary care to community level. This infrastructure includes building blocks ABHA (Ayushman Bharat Health Account), Health Professional Registry (HPR) and Health Facility Registry (HFR) to support Health Information Exchanges (HIEs), Telemedicine networks etc.
- **Health ID/ABHA ID:** The mission aims to create an unique Health ID which is National Identification Number (NIN) for every citizen. This Health account will link comprehensive digital health records. The Health ID will be linked to individuals' health records, diagnostic reports, prescriptions, and other relevant health information, allowing for easy accessibility and interoperability of health data through consent manager.
- **Interoperability:** It aims to enable seamless exchange of health information between different healthcare providers, facilities, and government agencies, ensuring continuity of care and efficient healthcare delivery.
- **Telemedicine:** The mission promotes the use of telemedicine to extend healthcare services to remote and underserved areas. It seeks to establish a robust telemedicine network that enables virtual consultations, remote diagnosis, and electronic prescriptions. Telemedicine helps overcome geographical barriers and increases access to quality healthcare services.
- **Electronic Health Records (EHR):** Ayushman Bharat Digital Mission aims to digitize health records and promote the adoption of Electronic Health Records (EHRs) across healthcare facilities. EHRs facilitate secure storage, retrieval, and sharing of patient information, leading to improved patient care, coordination, and decision-making.
- **Data Analytics and Insights:** The mission recognizes the value of data analytics and aims to leverage health data for research, policy-making, and monitoring of healthcare programs. Analyzing large-scale health data can help identify disease trends, assess healthcare outcomes, and drive evidence-based interventions.
- **Capacity Building:** Ayushman Bharat Digital Mission emphasizes capacity building initiatives to ensure that healthcare professionals, administrators, and other stakeholders are equipped with the necessary skills and knowledge to effectively utilize digital health technologies. This includes training programs, workshops, and skill development initiatives.

Digital Tools and Platforms

There are software solutions designed to streamline and manage healthcare-related data in hospitals.

Portal Name	Program Name	URL	Description	Snap
MaNTrA-Maa Navjaat Tracking app	Maternal health	https://mantradashboard.upnrhm.gov.in/	Labour room MIS for real-time monitoring of key parameters of quality of care around birth	
RCH	Reproductive Child Health	https://rch.nhm.gov.in/RCH/	Real time information and line-listing of beneficiaries registered in events related to pregnancy, childbirth and immunization.	
Nikshay	National Tuberculosis Elimination Programme	https://nikshay.in/	Web enabled patient management system for TB control under the National Tuberculosis Elimination Programme.	
FBNC MIS	Facility Based New Born Care	http://fbncindiaonline.org	Real time monitoring and tracking of small and sick newborn admitted in SNCU and NBSU	
Manav Sampada	Manav Sampada.	https://ehrms.upsdc.gov.in/	All-in-one portal for Human Resource Management Solutions (HRMS) across Government Departments.	
FPLMIS	Family Planning Logistics Management Information System.	https://fplmis.mohfw.in/IMCS/hissso/Login.fp	Robust logistic system to manage supply chain related to contraceptive	

UPKSK	Uttar Pradesh Ke Swasthya Kendra.	https://upehealthfacility.in/	Details about the public health facilities in Uttar Pradesh	
NCD	Non Communicable Diseases.	https://ncd.nhp.gov.in/#/login	Focus on strengthening infrastructure, human resource development, health promotion, early diagnosis, management and referral	
HIMS	Hospital Information Management System	NIC e-Hospital, CDAC e-Sushrut	Includes patients' registration, OPD, IPD, Discharge Module etc. for patients care	
HMIS	Health Management Information System	https:/s/www.hmis.mohfw.gov.in	Includes information regarding health indicators from various levels of govt. facilities and private hospitals.	HMIS HEALTH MANAGEMENT INFORMATION SYSTEM

MaNTrA- Maa Navjaat training App

- was launched in Dec 2021. It digitized the Labour room delivery register and referral-out registers
- captures the key parameters of Quality of care in labour room such as use of partograph, AMTSL, newborn vaccination. Monitoring of these indicators and outcomes such as stillbirths, newborn deaths and maternal deaths, in Labour room helps improve maternal and newboroutcomes.
- Data entry in Mantra app is done by staff nurses in Labour room across all public delivery points in State (Medical colleges, DH, CHC, PHC and Subcentre)
- dashboard can be accessed to download reports and monitor progress on various indicators
- is integrated with other plarforms such as eKavach, Civil registration system (for birth registration), ABHA, AADHAAR etc.

Benefits of MaNTrA:

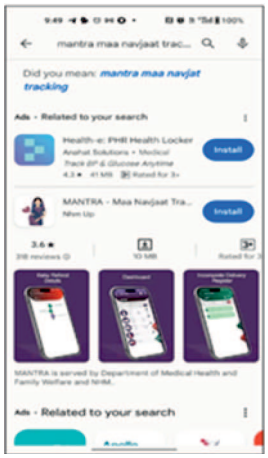
Facility-level Users
- Auto-generation of monthly reports
- Readily available data for clinical audits
- Prompt & mistake-proofing features
- Facilitates compliance to LaQshya

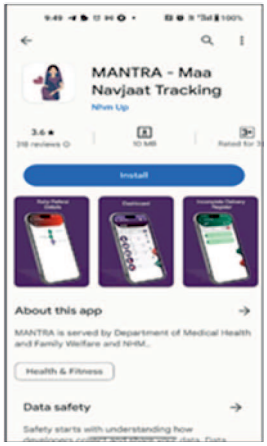
District level administrators
- Review of HR Utilization
- Review of service delivery
- Facility preparedness
- Monitoring of referrals

State level policy makers
- Activation of FRUs including BSUs
- Rational deployment of HR
- Performance monitoring of specialists
- Linking performance based incentive to specialist

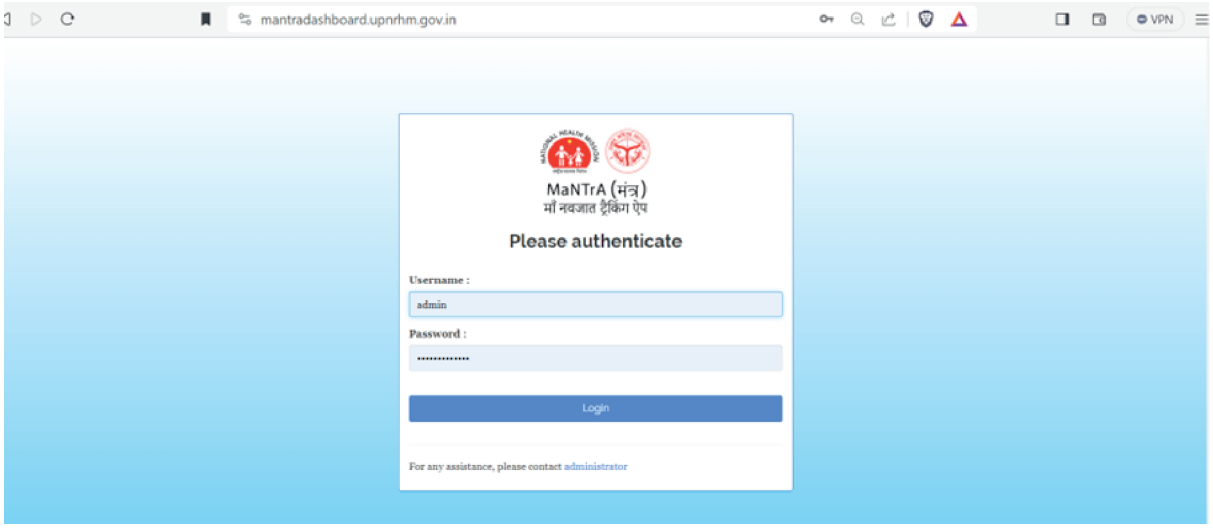
How to download the MaNTrA App?

MaNTrA app (**Link**: https://play.google.com/store/apps/details?id=com.nhmup.frumis)





MaNTrA Dashboard
(Link: https://mantradashboard.upnrhm.gov.in/)



Health Management Information System (HMIS)

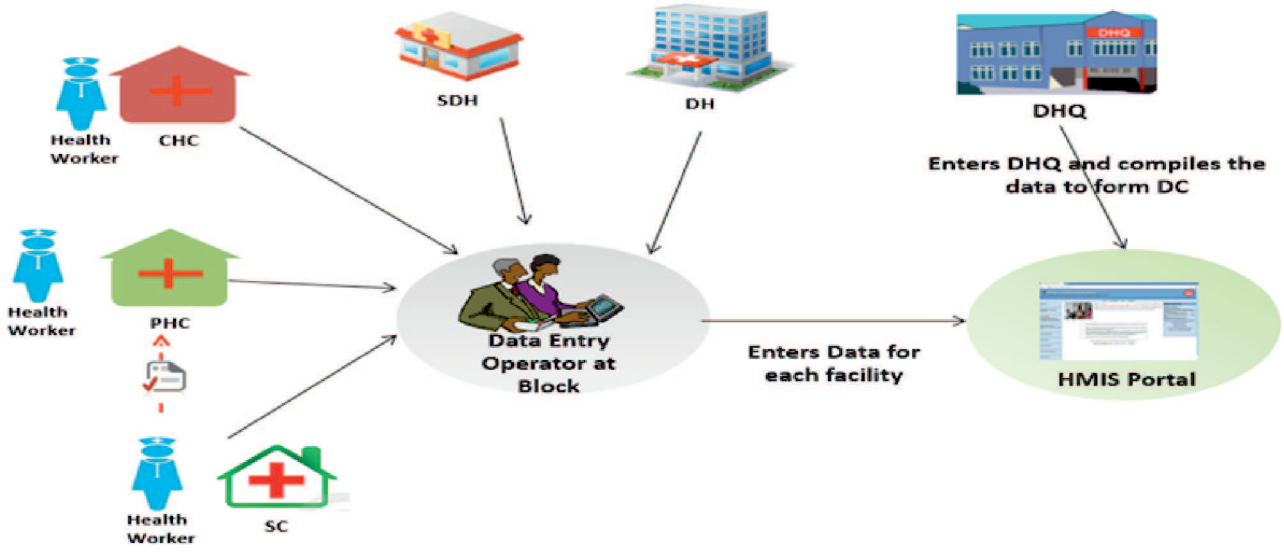
HMIS is a web-based public portal developed by "Government of India" for generating a set of predetermined indicators across different levels of facilities based on a set of registers and other source documents at facilities. The facility wise data from the registers are collated to arrive at indicators. The HMIS provides the monthly information on service delivery indicators but many of the critical data elements were not be able to capture by the HMIS, which are required by the program managers to take the decisions for review and implementation of program.

Objectives of HMIS:

- To monitor the performance & quality of health care services at Health facilities
- A tool for evidence based health planning
- Repository of information on health care indicators and trends
- Used for testing the effectiveness, efficiency and coverage of health programs and schemes
- To improve availability and access of health care to the population
- Developing and monitoring performance based health indicators

There are in total 482 data elements in CHC and 500 data elements in DH HMIS format

Flow of Data in case of Facility Level Reporting



Uses of HMIS Data:

- HMIS data is widely used by States in preparing Program Implementation Plans (PIPs)
- Indicators from HMIS (like Institutional Deliveries, C -Section deliveries, Immunization, IPD, OPD, Surgeries, etc.) are used to evaluate the States' performance during National Programme Coordination Committee (NPCC) meetings
- Facility wise data of PHCs is used for grading the facilities (Grading of PHCs). This grading is also a conditionality for incentivisation/decentivisation of funds under NHM
- Further, CHC Grading & DH Ranking is also being done

Introduction on Aastrika Sphere- E-Kshamata

E-Kshamata is an online learning platform for competency based knowledge and skill development of healthcare professionals.

What does the platform provide?

- Build capacity and enhance knowledge and skills of healthcare personnel
- Make information and knowledge accessible to all
- Certified content from renowned healthcare partners

Objectives Behind Launching E-Kshamata:

- **Learning Framework:** The main objective behind introducing the platform is to help the learners to build theoretical knowledge with the help of PPTs, case studies, live-demonstration and videos.
- **Competency & Assessment Framework:** By the end of every module there are various competency based assessments in order to evaluate the theoretical knowledge of the user.
- **Personalized Training:** The platform provides individualized competency building products to close the competency gaps identified.

How to Login to E-Kshamata:

You can scan the QR code mentioned below and download the app. Once you have downloaded you can login into the app with your registered mobile no and OTP.

How to access the competency Dashboard?

Step 1: Click on **competency icon** given in the picture.

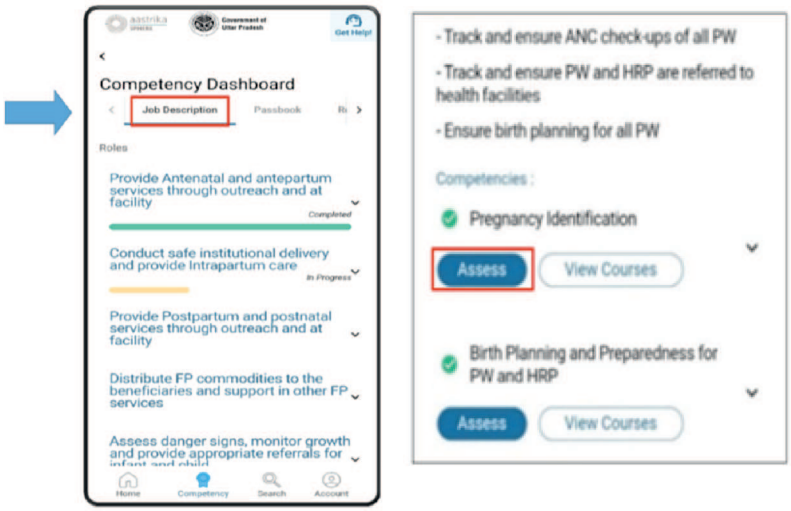
Step 2: Go to the **Job Description Tab.** Job description helps to understand the roles, activities and competencies for a position. As per your position, Roles appears in a list.

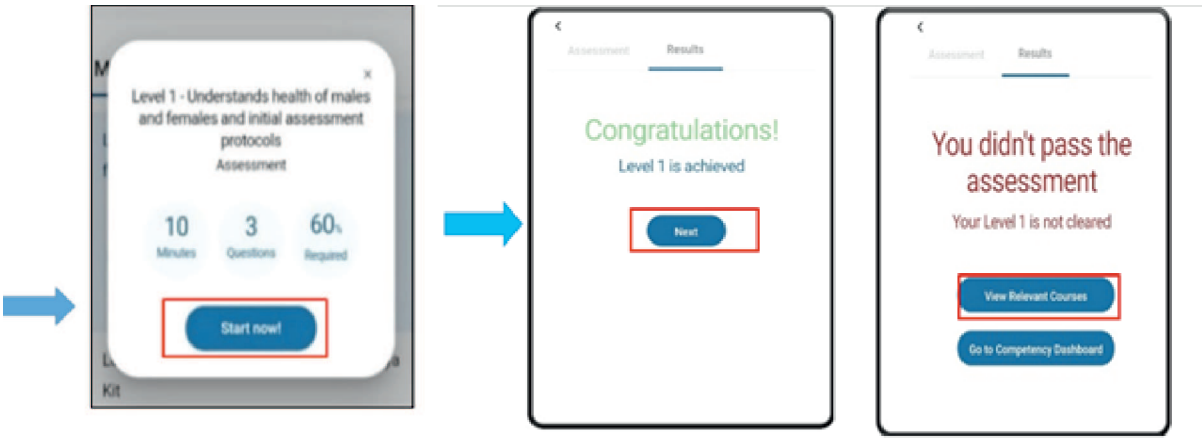
- Yellow line: indicates course in progress.
- Green line: indicates that you have "Completed" the course.
- Courses with no such indication means you haven't gone through the course.

How to take Self-Assessment?

Step 1: Go to **'Job Description'** and click on the dropdown.

Step 2: Click on **Assess** then click on Start Now.



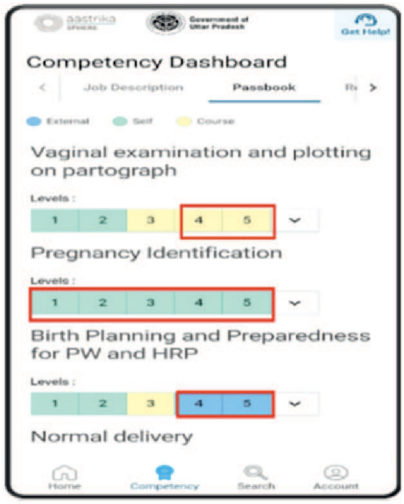


Step 3: Once you click on **start assessment** question will be displayed answer the ques and click on **'Submit'** once you have completed.

Step 4: If you pass the assessment, click on **Next** button and upgrade your levels.

In case you fail in the assessment then click on the **'View Relevant Courses'** and start the courses to achieve the level.

How to access the competency passbook?



You can always check your competency passbook to track your progress. As soon as you successfully finish assessments or courses, levels are immediately updated.

Each competency is divided in 5 different levels. It updates automatically once you achieve a level.

- Green indicates the proficiency level is achieved through self-assessment
- Yellow indicates the relevant courses for the level is completed successfully
- Blue indicates the Admin updates level for you

Chapter 21
National Health Programmes

Since India became independent, several measures have been undertaken by the National Government to improve the health of people. Prominent among these measures are the National Health Programmes, which have been launched by Government of India for the control/elimination of the communicable/non communicable diseases, preventing and reducing maternal and under 5 mortality rates, strengthening of routine immunization, and reducing vaccine preventable diseases, raising standard of nutrition, family planning programmes, adolescent health, school health programmes etc.

A) Janani Suraksha Yojana (JSY)

JSY scheme was launched on 12th April, 2005 with objective of reducing maternal mortality and infant mortality through encouraging delivery at health institutions and focusing at institutional care among women in below poverty line families.

Salient features of JSY scheme are as follows:

- It is a 100 percent centrally sponsored scheme;
- Under National Health Mission (NHM), it integrates the benefit of cash assistance with institutional care during antenatal, delivery and immediate post-partum care
- The Yojana has identified ASHA, the Accredited Social Health Activist as an effective link between the Government and the pregnant women.
- Each beneficiary registered under this Yojana should have a MCP card and should be registered at RCH portal. ASHA under the overall supervision of the ANM should mandatorily prepare a micro-birth plan for the pregnant woman for institutional delivery.
- **Scale of Cash Assistance for Institutional Delivery**

Rural Area		Urban Area	
Mother's Package	**ASHA's package**	**Mother's Package**	**ASHA's package**
1400	600	1000	400

The benefits of JSY package is applicable for all deliveries happening in government medical colleges, district women/combined hospitals, other district level hospitals and all government health facilities under Chief Medical Officers (CMO).

Under Ayushman Bharat Mission recognised private nursing homes/hospitals provide health benefit package to eligible beneficiaries for complicated deliveries and Caeserian facilities.

The payment of JSY is done directly to the beneficiary woman to her AADHAAR linked bank account. The payment should be done to the beneficiary within 48 hours of delivery.

B) Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)

PMSMA was launched to provide fixed-day assured, comprehensive and quality antenatal care universally to all pregnant women (in 2nd and 3rd trimester) on the 9th of every month with the objective of atleast one antenatal care to be done under the supervision of a specialist or MBBS doctor with free antenatal diagnostics and treatment.

This program has now undergone some changes :

1. It is held on 9th of every month across all block level facilities, district women hospitals, urban PHCs and CHCs as well as government medical colleges.

2. On the 1st, 16th and 24th of every month, **PMSMA plus** is being held at CHCs (urban and rural), district hospitals and government medical colleges but not at the PHCs.

Salient features of PMSMA:

- While antenatal care is routinely provided to pregnant women, **special ANC services are provided by OBGY specialists/ Radiologist/ Physicians** at government health facilities under PMSMA.
- Several volunteer private practitioners provide their services in this program.
- ANMs and ASHAs prepare due list of pregnant women in 2nd and 3rd trimesters and send bulawa parchi to the women for mobilization to PMSMA.
- The women in the facilities are provided refreshment, BP, weight and per abdomen examination, all essential blood tests including HIV and syphilis, urine test and ultrasound free of cost. If a particular test is not available at that centre, the pregnant woman can be referred to the higher facility.
- The women is provided necessary medicines and supplements free of cost.
- One of the critical components of the Abhiyan is identification and follow-up of high risk pregnancies and red seal is put on to the Mother and Child Protection cards of women with high risk pregnancies. The line list of high risk pregnancies is maintained at the health facility.
- Counselling is provided to pregnant women on high risk conditions, danger signs, nutrition, breast feeding and family planning.

C) Janani Shishu Suraksha Karyakram (JSSK)

Government of India launched the **Janani Shishu Suraksha Karyakram (JSSK) on** 1st June 2011, a new national initiative, to make available better health facilities for women and child.

This new initiative provides the following facilities to the pregnant women:

- All pregnant women delivering in public health institutions to have absolutely free and no expense delivery, including caesarean section.
- Free drug and consumables
- Free diet upto 3 days during normal delivery and upto 7 days in C-section
- Free diagnostics
- Free provision of blood transfusion
- Free transportation from home to institution, between facilities in case of referral and drop back to home.
- No user charges
- In 2014, the programme was extended to all antenatal & post-natal complications of pregnancy and similar entitlements have been put in place for all sick newborns and infants (up to one year of age) accessing public health institutions for treatment.

D) Navjat Shishu Suraksha Karyakram (NSSK)

To reduce perinatal asphyxia related morbidity and mortality, Government of India launched a training programme - Navjaat Shishu Suraksha Karyakram (NSSK) - essential newborn care and resuscitation in 2009-10. The course was aimed to impart the basic skills required to manage common neonatal problems related to birth asphyxia, infections, hypothermia and breastfeeding

With advances in critical care and based on the evidence, the NSSK training package has now been revised with updated algorithm and improved training methodology. The revised training package is two days classroom and hands-on training.

Eligibility of participants: All service providers working in the labour room, and involved with care of mother and the baby at time of birth are eligible for this training. Even SBA trained providers will be eligible for this training.

E) Facility Based Newborn Care (FBNC)

Facility Based Newborn Care (FBNC) along with Home Based Newborn Care (HBNC) and Home-Based Care for Young Child (HBYC) establishes a continuum of care to ensure that every newborn receives essential services right from the time of birth and first 48 hours at the health facility and then at home up to 15 months.

Facility based newborn care program includes:

- Newborn care corners/areas (NBCC/NBCA)
- Newborn Stabilization Unit (NBSU)
- Special Newborn Care Unit (SNCU)

F) Mothers' Absolute Affection (MAA)

Programme for breastfeeding promotion through health systems

An intensified programme launched in the month of August 2016, in an attempt to bring undiluted focus on promotion of breastfeeding, in addition to ongoing efforts through the health systems.

Goals & Objectives of the Programme

The goal of the 'MAA' Programme is to revitalize efforts towards promotion, protection and support of breastfeeding practices through health systems to achieve higher breastfeeding rates.

The following are the **objectives** of the Programme in order to achieve the above mentioned goal:

- Build an enabling environment for breastfeeding through awareness generation activities, targeting pregnant and lactating mothers, family members and society in order to promote optimal breastfeeding practices
- Reinforce lactation support services at public health facilities through trained healthcare providers and through skilled community health workers.
- To incentivize and recognize those health facilities that show high rates of breastfeeding along with processes in place for lactation management.

G) National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS)

Major risk factors to NCDs

- Most NCDs are strongly associated and causally linked with following four major behaviour risk factors:
- Tobacco use, Physical inactivity, Unhealthy diet including high intake of salt, Sugar & Transfats and low intake of fruits & vegetables, Harmful use of alcohol
- The other risk factors include stress and household air pollution.
- If the above behavioural risk factors are not being managed /modified then they may lead to following biological risk factors:
- Over weight/obesity, High blood pressure, Raised blood sugar, Raised total cholesterol/lipids
- The other non-modifiable risk factors such as age, sex and heredity are also associated with the occurrence of NCDs.
- The NPCDCS aims at integration of NCD interventions in the NHM framework for optimization of scarce resources and provision of seamless services to the end customer / patients as also for ensuring long term sustainability of interventions.

Strategy:

Health promotion, awareness generation and promotion of healthy lifestyle

Screening and early detection

Timely, affordable and accurate diagnosis

Access to affordable treatment,

Rehabilitation

Package of Services

It is envisaged providing preventive, promotive, curative and supportive services (core and integrated services) in Cancer, Diabetes, Cardio-Vascular Diseases (CVD) & Stroke at various government health facilities

The package of services would depend on the level of health facility and may vary from facility to facility. The range of services will include health promotion, psycho-social counselling, management (out-and-in-patient), day care services, home based care and palliative care as well as referral for specialized services as needed. Linkages of District Hospitals to private laboratories and NGOs will help to provide the additional components of continuum of care and support for outreach services. The district may be linked to tertiary cancer care health facilities for providing comprehensive and advanced secondary care.

H) National Mental Health Program (NMHP)

It is estimated that 6-7 % of population suffers from mental disorders. The World Bank report (1993) revealed that the Disability Adjusted Life Year (DALY) loss due to neuropsychiatric disorder is much higher than diarrhea, malaria, worm infestations and tuberculosis if taken individually.

The Government of India has launched the National Mental Health Programme (NMHP) in 1982, with the following objectives:

- To ensure the availability and accessibility of minimum mental healthcare for all in the foreseeable future, particularly to the most vulnerable and underprivileged sections of the population;
- To encourage the application of mental health knowledge in general healthcare and in social development; and
- To promote community participation in the mental health service development and to stimulate efforts towards self-help in the community.

Strategies:

- Integration of mental health with primary health care through the NMHP
- Provision of tertiary care institutions for treatment of mental disorders
- Eradicating stigmatization of mentally ill patients and protecting their rights through regulatory institutions like the Central Mental Health Authority (CMHA) and State Mental Health Authority (SMHA)

Components:

- Service Provision- Management of cases of mental disorders and counseling at different levels of district health care delivery system
- Capacity Building- Manpower training and development for prevention, early identification and management of mental disorders
- Awareness generation through Information Education Communication (IEC) activities

Services provided:

- Clinical services, including the outreach services.
- Targeted interventions are being focused on life skills education and counselling in schools, College counselling services
- Work place stress management and Suicide prevention services

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