NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन

Ministry of Health & Family Welfare
Government of India

COMPREHENSIVE EMERGENCY OBSTETRIC AND NEWBORN CARE CURRICULUM 2024

Part - II

Comprehensive Emergency Obstetric and Newborn Care (CEmONC)

Revised Curriculum 2024

आराधना पटनायक, भा.प्र.से.
अपर सचिव एवं मिशन निदेशक (रा.स्वा.मि.)
Aradhana Patnaik, IAS
Additional Secretary & Mission Director (NHM)

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

भारत सरकार
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
निर्माण भवन, नई दिल्ली-110011
Government of India
Ministry of Health and Family Welfare
Nirman Bhawan, New Delhi-110011

Message

The National Health Mission (NHM) is dedicated to reducing maternal and infant mortality and morbidity, aligning with national and international targets. The decline in Maternal Mortality Ratio (MMR) is a result of the quality of services and the availability of Basic and Comprehensive Emergency Obstetric Care (EmOC) at healthcare facilities, particularly at First Referral Units (FRUs) and secondary-level care facilities. To achieve these crucial goals, NHM has fortified all Community Health Centers (CHCs) and FRUs to handle emergency obstetric care services, including referrals.

Enhancing service delivery necessitates the re-orientation of medical officers to manage emergency obstetric and newborn services efficiently. The Comprehensive Emergency Obstetric & Newborn Care (CEmONC) and Life-Saving Anesthetic Skills (LSAS) programs play a pivotal role in equipping medical officers with the necessary skills to handle obstetric emergencies and bolstering FRUs' capacity. Many states have leveraged this provision to establish FRUs and significantly improve maternal health outcomes through comprehensive obstetric care. Initiatives like Surakshit Matritava Aashwasan (SUMAN), Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), Laqshya, and the Midwifery Initiative also contribute to providing quality maternal and newborn services, necessitating a skilled workforce and adequate infrastructure.

The CEmONC curriculum, a powerful tool in our mission, has been revised based on extensive consultations with field experts. The updated curriculum, rooted in the latest evidence-based protocols, is expected to enhance training quality, ensuring more trained doctors are available to operationalise FRUs and expand SUMAN CEmONC facilities across states. As mission directors, state and district program officers, and training institutes, I would urge you to effectively use the updated curriculum to improve obstetric and newborn services.

I have complete confidence in the ability of Mission Directors, state and district program officers, and training institutes to utilise the updated curriculum effectively, which will not only operationalise FRUs but also significantly enhance the quality of obstetric and newborn services, thereby contributing to the overall improvement of maternal and newborn healthcare services.

(**Aradhana Patnaik**)

Tel : 011-23063618, 23061097 E-mail : asmd-mohfw@nic.in

Meera Srivastava, IRS
Joint Secretary

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

भारत सरकार
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
निर्माण भवन, नई दिल्ली-110011
Government of India
Ministry of Health and Family Welfare
Nirman Bhawan, New Delhi-110011

Message

Over the past decade, significant advancements have been made in expanding access to essential maternal and newborn healthcare services nationwide. Initiatives such as the Janani Suraksha Yojana (JSY), Janani Shishu Suraksha Karyakram, Pradhan Mantri Surakshit Matritva Abhiyan, LaQshya Program, and the Midwifery Initiative have played a pivotal role in increasing institutional deliveries and improving outcomes for mothers and newborns.

However, disparities persist, particularly in rural and remote areas, where healthcare infrastructure and trained workforce remain inadequate. To address this, short-term training for MBBS doctors began in 2009 to create a pool of health professionals equipped to provide quality maternal and newborn health services. The Emergency Obstetric Care Services Training (EmOC) have focused on operationalising FRUs, providing timely emergency obstetric management, and performing C-sections to ensure timely medical intervention.

Evaluations highlighted the crucial need to revise the curriculum, incorporating the latest evidence-based practices and aligning it with current medical practices for managing obstetric services. The training's name was changed to CEmONC, underscoring the importance of the newborn component. The curriculum's duration was extended from 16 to 24 weeks to ensure comprehensive learnings. The revised curriculum, focusing on skill and practice through video mannequins and case studies, aims to enhance doctors' practical experience at FRUs. These innovative methods, embedded in the CEmONC curriculum, are a significant step towards reducing specialist shortages in rural areas.

I sincerely hope that the states and the training institutes, in collaboration with medical professionals will find the revised curriculum instrumental in ensuring deliverance of quality, comprehensive emergency obstetric and newborn care services.

Meera Srivastava 4/06/24

(Meera Srivastava)

Tel : 011-23061842, 23061195 E-mail : jsrch-mohfw@gov.in

Dr. Pawan Kumar
MBBS, MD, DNB, MBA
Additional Commissioner, Incharge (MH & Immunization)

भारत सरकार
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
निर्माण भवन, नई दिल्ली-110011
GOVERNMENT OF INDIA
MINISTRY OF HEALTH & FAMILY WELFARE
NIRMAN BHAWAN, NEW DELHI - 110011

ACKNOWLEDGEMENT

The Comprehensive Emergency Obstetric and Newborn Care (CEmONC) marks a significant milestone in our ongoing efforts to strengthen maternal and newborn healthcare in India. This framework reflects the Government of India's unwavering commitment to ensuring the well-being of mothers and infants across the nation with especial focus on hard-to-reach areas.

Ensuring accessible emergency obstetric care within the community is vital for reducing maternal and neonatal morbidity and mortality. States/UTs have been supported under National Health Mission (NHM) to create First Referral Units (FRUs) equipped with the necessary infrastructure, equipment, and blood bank/storage units. However, due to the shortage of specialists in peripheral public healthcare facilities, placing skilled doctors at FRUs to conduct C-sections and manage complications has been challenging. It has become imperative to enhance the capacity of MBBS doctors to manage emergency obstetric cases and maintain quality in service delivery.

The Government of India has initiated EmOC training program in 2009 with the aim to operationalize emergency obstetric care services at FRUs. The curriculum has now been revised to include a newborn component, making it the Comprehensive Emergency Obstetric and Newborn Care (CEmONC) curriculum. I extend our sincere gratitude to all those who contributed their expertise, guidance, and unwavering support throughout this transformative process.

I also extend my heartfelt gratitude to Shri Apurva Chandra, Secretary (H&FW), Ms. Aradhana Patnaik, AS&MD (NHM), and Ms. Meera Srivastava, JS (RCH), for their steadfast guidance and administrative support in developing the CEmONC curriculum.

Special thanks to the technical resource group members from esteemed medical colleges across India: Dr. Vinita Das (Ex-HoD Obs & Gynae, KGMU Lucknow), Dr. Amita Pandey, Dr. Anjoo Aggarwal (KGMU), Dr. Poonam Shiv Kumar (MGIMS Wardha), Dr. Vidushi (AIIMS New Delhi), and Dr. Manju Puri (LHMC) for their meticulous work in

Office : Room No. 522-A, Nirman Bhawan, New Delhi-110011
Tel : 011-23061288, E-mail : drpawan.kumar@gov.in, drpawan.mohfw@gmail.com

incorporating the latest technical updates and framing the curriculum with a proper blend of knowledge and skills.

The contributions of NHSRC, particularly Major General (Prof) Dr. Atul Kotwal, Executive Director, Dr. K. Madan Gopal, Advisor Public Health Administration (PHA) Division, Dr. Himanshu Bhushan (former Advisor PHA), and the PHA team, especially Dr. Kalpana, Dr. Palak, Ms. Diksha, Ms. Aashu, and Ms. Neelam, were pivotal in drafting the CEmONC Curriculum. I would also acknowledge the support provided by the various partners like IHAT, IPE Global, Jhpiego, UNFPA, UNICEF, and WHO for their insightful consultations which have significantly enriched the content of the Curriculum.

The unwavering contributions of my esteemed colleagues, Dr. Anupama Prasad (Deputy Commissioner MH), Dr. Santosh Ojha, Dr. Bhumika Talwar, Mr. Vivek Singhal, Dr. Tushar Purohit, Dr. Priyanka Sharma, Dr. Himangini Wadhawan, Dr. Jagdish Chhimpa, and Mr. Brahm Kumar Sharma, have been instrumental in drafting and finalizing the curriculum.

I am confident that the revised CEmONC curriculum will serve as a valuable resource for States/UTs, improving the quality of CEmONC training and facilitating the operationalization of First Referral Units (FRUs). Through these collective efforts, we are poised to enhance the delivery of Obstetric and Newborn Care services across the nation.

(Dr Pawan Kumar)

Maj Gen (Prof) Atul Kotwal, SM, VSM
MBBS, MD (PSM), PDF (Epidemiology),
FRCP Edin, FAMS, FIPHA, FIAPSM
Executive Director

National Health Systems Resource Centre
राष्ट्रीय स्वास्थ्य प्रणाली संसाधन केंद्र
Ministry of Health and Family Welfare
Government of India

MESSAGE

India has not only reached but surpassed the National Health Policy (NHP) goal, achieving a maternal mortality ratio (MMR) of less than 100 per lakh live births. This significant milestone is a testament to our collective efforts towards preventing the preventable maternal deaths, and provides continued motivation for further progress. As we persevere ahead on our journey towards the Sustainable Development Goal (SDG) target of an MMR of less than 70 per lakh live births by 2030, we are optimistic about the future of maternal health in India. However, we acknowledge that maternal mortality and morbidity levels still vary widely between states and within regions, primarily due to differences in access to high-quality Comprehensive Emergency Obstetric and Newborn Care (CEmONC) and a shortage of trained medical professionals at referral facilities.

The 10th Five-Year Plan's expert group, in response to the scarcity of trained doctors, recommended a task-shifting strategy. This innovative approach involved developing training modules in emergency obstetric care (16-week program) and lifesaving anaesthetic skills (18-week program) for MBBS doctors in 2003. The strategy was piloted in two states from 2004-2006, and its implications were undeniable- It operationalised FRUs and saved lives, particularly in remote areas. This paved the way for nationwide implementation in 2009, bringing FRUs to life across many states and further reinforcing our belief in the effectiveness of this strategy.

The curriculum underwent significant revisions following expert consultations to incorporate the latest technical evidence and strategies to enhance CEmONC services. These revisions included extending the training duration to 24 weeks, strengthening FRUs, rationalising CEmONC/ LSAS-trained doctors' postings, improving workforce management, introducing financial and non-financial incentives, and robust indemnity and medico-legal cover. The Ministry's release of operational guidelines in 2020 further enhanced the capabilities of MBBS doctors with the latest practices and protocols, reflecting a commitment to continuous improvement and ensuring that the training remains up-to-date.

Effective coordination, planning, and decision-making involving all stakeholders are crucial to achieving these goals. I am confident that the new curriculum will significantly improve emergency obstetric care services and help reach the SDG target ahead of time.

I thank everyone who contributed to framing the training curriculum for lending their expertise and dedication.

Maj Gen (Prof) Atul Kotwal

Date: 7th June 2024
Place: New Delhi

NIHFW Campus, Baba Gang Nath Marg, Munirka, New Delhi - 110067
(T): 011 - 2610 8983, E-mail: atul.kotwal@nhsrcindia.org

LIST OF CONTRIBUTORS

MINISTRY OF HEALTH & FAMILY WELFARE	
1.	Shri Apurva Chandra, Secretary (Health and Family Welfare)
2.	Ms. Aradhana Patnaik -AS&MD, NHM
3.	Ms. Meera Srivastava, JS (RCH)
4.	Dr. Pawan Kumar, Additional Commissioner, In-charge (MH & Immunization)
5.	Dr. Anupama Prasad, Deputy Commissioner, MH
6.	Dr Sumita Ghosh, Former -Additional Commissioner (Child Health)
7.	Dr. Padmini Kashyap, Former-Deputy Commissioner, MH
8.	Dr Dinesh Baswal, Former-Deputy Commissioner (MH), MoHFW
9.	Dr Aashima Bhatnagar, Deputy Secretary (NUHM)
10.	Dr. Santosh Ojha, Lead Consultant, MH division
11.	Mr Vivek Singhal, Lead Consultant, MH division
12.	Dr Tushar Purohit, Senior Technical Officer MH division
13.	Dr Priyanka Sharma, Consultant Midwifery MH division
14.	Dr Himangini Wadhawan, Consultant Midwifery MH division
15.	Dr Jagdish Chhimpa, Consultant Midwifery MH division
16.	Mr Brahm Sharma, M&E Consultant Midwifery MH division

NATIONAL HEALTH SYSTEMS RESOURCE CENTER	
1.	Maj Gen (Prof) Atul Kotwal, Executive Director
2.	Dr K Madan Gopal, Advisor, Public Health Administration (PHA) Division
3.	Dr Himanshu Bhushan, Former Advisor PHA
4.	Mr. Prasanth KS, Senior Consultant, PHA Division
5.	Dr. Vinay Bothra, Former Senior Consultant, PHA
6.	Dr. Disha Aggarwal, Former Consultant, PHA
7.	Ms. Shivangi Rai, Former Legal Consultant PHA
8.	Dr. Kalpana Pawalia, Consultant, PHA Division
9.	Dr Palak, Former Consultant, PHA Division
10.	Dr. Mansi Mathur, Former Consultant, PHA
11.	Ms. Diksha, Former Consultant, PHA
12.	Ms. Neelam Tirkey, Former Consultant, PHA
13.	Ms. Aashu Ranga , Former Consultant, PHA

	INSTITUTIONAL FORMERPERTS
1.	Dr Vinita Das (Professor and head) Dept of Obs and Gyn. KGMU
2.	Dr. B.S. Garg, Director, MGIMS, Sewagram, Wardha
3.	Dr Amita Jain, Prof. Department of Microbiology, KGMU, Lucknow
4.	Dr Siddharth Ramji, Prof. Dept. of Paediatrics, MAMC
5.	Dr Pratima Mittal, Prof. & Head, Department of Obs & Gyn Safdarjung, New Delhi
6.	Dr Suneeta Mittal, Prof. & Head, Department of Obs & Gyn, Fortis Gurgaon
7.	Dr Sarita Aggarwal, Prof. & Head, Department of Obs & Gyn, AIIMS Raipur
8.	Dr Pushplata, Prof. & Head, Department of Obs & Gyn, AIIMS Bhopal
9.	Dr Poonam Shivkumar, Prof. & Head, Department of Obs & Gyn, MGIMS Wardha
10.	Dr Gopal Krishna, Prof. & Head, Department of Obs & Gyn, Bangalore Medical College
11.	Dr S Rathna Kumar, Advisor, Maternal health, Govt. of Tamil Nadu, Chennai
12.	Dr Papa Dasari,Prof. & Head, Department of Obs & Gyn, JIPMER
13.	Dr Madhu Jain, Prof. & Head, Department of Obs & Gyn, BHU
14.	Dr Vanita Suri, Prof. & Head, Department of Obs & Gyn, PGI Chandigarh
15.	Dr Manju Vhuggani, Principal, College of Nursing, Jamia Hamdard University
16.	Dr Rashmi John, Principal, College of Nursing, KGMU
17.	Dr. Smriti Aggarwal, Associate Professor, Department of OBGY, KGMU, Lucknow
18.	Dr. Namrata Kumar, Assistant Professor, Department of OBGY, KGMU, Lucknow
19.	Dr. Manju Lata, Assistant Professor, Department of OBGY, KGMU, Lucknow
20.	Dr Prashant Gupta, Associate Professor, Department of Microbiology, KGMU
21.	Dr. Anjoo Aggarwal, Professor, Department of OBGY, KGMU, Lucknow
22.	Dr. Amita Pandey, Professor, Department of OBGY, KGMU, Lucknow
23.	Dr. Vidushi Kulshreshtha, Associate Professor, Department of OBGY, AIIMS, Delhi
24.	Dr. Seema Singhal, Assistant Professor, Department of OBGY, AIIMS Delhi
25.	Dr. Pratibha Singh, Professor, Department of OBGY, AIIMS, Jodhpur
26.	Dr Manju Puri, Director and Professor, Department of OBGY, LHMC
27.	Dr. Sushma Nangia, Professor & Head, Department of Neonatology, LHMC, Delhi
28.	Dr. Shrishti Goel, Assistant Professor, Department of Neonatology, LHMC, Delhi
29.	Dr. Suchi Jain, Professor, Department of OBGY, MGIMS Wardha
30.	Dr. Vanita Jain, Professor, Department of OBGY, PGIMER, Chandigarh
31.	Dr. Rashmi Bagga, Professor, Department of OBGY, PGIMER, Chandigarh
32.	Dr. Smiti Nanda, Professor & Head, Department of OBGY, PGI, Rohtak
33.	Dr. Harish Challani, Additional DGHS & Professor, Department of Paediatrics, VMMC &Safdarjung Hospital, Delhi

34.	Dr. Nuzhat Aziz, Professor & Head, Department of OBGY, Fernandez Hospital, Hyderabad
35.	Dr. Ramchandraiah, Prof & HOD, Bangalore Medical College
36.	Dr Jaideep Malhotra, FOGSI
37.	Dr Jaydeep Tank, FOGSI
38.	Dr Yamini Serwal, CMO, Safdarjung Hospital

STATE & DISTRICT FORMERPERTS	
1.	Dr. R. Rajendran, Nodal Officer, LSAS, IOG, Egmor, Tamil Nadu
2.	Dr Archana Mishra, State Program Officer, Maternal Health, MP
3.	Dr Nisha Gupta, CMS, Elgin, Jabalpur , MP
4.	Dr. K Zainam, Former MH Consultant, NHM, Assam
5.	Dr. Venkata Ramana Kumari Sali, DWH, Vishakhapatnam
6.	Dr. Sadhana Desai, Coordinator, EmOC
7.	Dr. Prakash Bhatt, Coordinator, EmOC
8.	Dr. GM Premkumar, Medical Officer, GPHC, Kattampoondi, Tamil Nadu
9.	Dr. M.F. Mohd. Rifan, Medical Officer, PHC, Karungulam, Tamil Nadu
10.	Dr. V Manikandan, Medical Officer, PHC, Tamil Nadu

DEVELOPMENT PARTNERS	
1.	Dr Bhumika Talwar, Maternal Health & Midwifery Specialist, UNFPA
2.	Dr Rashmi Asif, C 3
3.	Dr. Rajani Ved, Country Director BMGF
4.	Dr Seema Tandon, Deputy Director, RRTC, IHAT
5.	Dr Ritu Agrawal, Senior Technical Advisor, Institute for Global Public Health, University of Manitoba
6.	Dr Amrita Kansal, WHO
7.	Dr Asheber, UNICEF
8.	Dr. Manisha Malhotra, Senior Advisor, JHPIEGO
9.	Dr. Sunita Dhamija, Advisor, Clinical Services and Training, JHPIEGO
10.	Dr. Renu Shrivastava Goel, Former-MNCH Advisor, JHPIEGO- NIPI
11.	Dr. Bulbul Sood, Former country Director, JHPIEGO
12.	Dr. Kirti Sharad Iyenger, Former Programme Specialist, UNFPA
13.	Dr. Apurva Chaturvedi, Former Health Officer, UNICEF
14.	Dr Deepak Sinha, UNICEF
15.	Dr Kanupriya Singhal, Health Specialist, UNICEF Uttar Pradesh
16.	Dr. Ram Chahar, Former National Professional Officer (Maternal and Reproductive Health), WHO

TABLE OF CONTENT

CHAPTER 10
OBSTETRIC SURGERY

KEY LEARNING OBJECTIVES

By the end of this session, the participants will be able to learn the following topics:

A. **Operative care principles**
   a. **Preparing the operation theatre**
   b. **Intra operative care principles**
   c. **Post operative care principles**

B. **Cesarean section**
   a. **Indications for cesarean section**
   b. **Problems During Surgery**
   c. **Post-Procedure Care**
   d. **Tubal Ligation at Caesarean**

C. **Laparotomy for ruptured uterus**

A. OPERATIVE CARE PRINCIPLES

a) Preparing the Operating Theatre

Ensure that:

- The operating theatre is clean (it should be cleaned after every procedure).
- Necessary supplies and equipment are available, including drugs and an oxygen cylinder.
- Emergency equipment is available and are in working order.
- There is adequate supply of theatre dresses.
- Clean linens are available;
- Sterile supplies (gloves, gauze, instruments, drapes) are available and are not beyond expiry date.

Preparing the Woman for a Surgical Procedure

- Explain the procedure to be performed and its purpose to the woman. If the woman is unconscious, explain the procedure to her family including the husband.
- Obtain informed consent for the procedure as in consent form no 16.
- Assist the woman and her family to prepare her emotionally and psychologically for the procedure.
- Review the woman's medical history and check for any possible allergies.
- Send a blood sample for hemoglobin & blood group & type. Order blood for cross match if there is possibility of transfusion. Do not delay transfusion if needed.
- Wash the area around the proposed incision site with soap and water.
- Do not shave the woman's pubic hair as this

increases the risk of wound infection. The hair may be trimmed, if necessary.

- Monitor and record vital signs (blood pressure, pulse, respiratory rate and temperature).
- Administer premedication appropriate for the anesthesia used.
- Give an antacid (Magnesium Trisilicate 300 mg) to reduce stomach acid in case there is aspiration.
- Catheterize bladder if necessary and monitor urine output.
- Ensure that all relevant information is passed on to other members of the team (doctor/midwife, nurse, anaesthetist, assistant and others).

Preparation on the part of surgeon and assistants - Ensure that infection prevention practices are followed as described in chapter on infection prevention.

b) Intra-Operative Care Principles

Position

Place the woman in a position appropriate for the procedure to allow:

- Optimum exposure of the operative site.
- Access to the anesthetist.
- Access to the nurse to take vital signs and monitor i.v. drugs and infusions.
- Safety of the woman by preventing injuries and maintaining circulation.
- Woman's dignity and modesty to be maintained.

Note: If the woman has not delivered, have the operating table tilted to the left or place a pillow or folded linen under her right lower back to decrease supine hypotension syndrome.

Surgical Handrub

Perform a surgical handscrub before gowning:

- Remove all jewellery.
- Hold hands above level of elbows.
- Wash from fingertips to elbows with soap and water for 3-5 minutes.
- Rinse each hand and arm separately with clean running water, holding hands above level of elbows.
- Dry each hand with a separate clean or disposable towel, wiping from fingertips to elbows or air dry.
- Put on sterile gown & wear sterile gloves by aseptic technique.

Preparing the Incision Site

- Prepare the skin with an antiseptic (e.g. iodophors, chlorhexidine):
- In all abdominal surgeries antiseptic cleaning should be done from xiphisternum till mid of the thigh and laterally up to anterior superior iliac spine.
- Apply antiseptic solution (70% isopropanol or ethyl alcohol or 2% w/v chlorhexidine with 70% isopropanol followed by painting with 10% povidone iodine) three times to the incision site using a high-level disinfected ring forceps and cotton or gauze swab. Do not contaminate the glove by touching unprepared skin;

- Begin at the proposed incision site and work outward in a circular motion away from the incision site; at the edge of the sterile field discard the swab. Repeat 2 more times, using a new swab each time.
- Never go back to the middle of the prepared area with the same swab. Keep your arms and elbows high and surgical dress away from the surgical field to avoid contact with the unsterile areas.
- Drape the woman immediately after the area is prepared to avoid contamination: If the drape has a window, place the window directly over the incision site first.

Monitoring during surgical procedure-

Monitor the woman's condition regularly throughout the procedure.

- Monitor vital signs (pulse, blood pressure, respiratory rate etc.), level ofconsciousness and blood loss.
- Record the findings on a monitoring sheet to allow quick recognition if the woman's condition deteriorates.
- Maintain adequate hydration throughout surgery,

Anesthesia

Maintain adequate pain management and anesthesia throughout the procedure. Women who are comfortable during a procedure are less likely to move and cause injury to themselves. Pain management can include:

- Emotional support and encouragement.
- Local anesthesia.
- Regional anesthesia (e.g. spinal).
- General anesthesia.

Antibiotics

- Give prophylactic antibiotics 30 minutes before skin incision. Recommended antibiotic is Inj. Cefazolin 1g IV or Inj. Ampicillin 2g IV Inj.Amoxiclav must not be used if the antibiotic is being given prior to skin incision.

Making the Incision

- Make incision only as large as necessary for the procedure.
- Make incision with great care and proceed withone layer at a time.

Handling Tissue

- Handle tissue gently.
- When using clamps, close the clamp only one ratchet (click), when possible. This will minimize discomfort and reduce the amount of dead tissue that remains behind at the end of the procedure, thus decreasing the risk of infection.

Haemostasis

- Ensure Haemostasis throughout the procedure.
- Women with obstetrical complications often have Anaemia. Therefore, keep blood loss to a minimum.

Instruments & Sharps

- Start and finish the procedure with a count of instruments, sharps and sponges and suture needles.
    - Perform the count every time before a body cavity (e.g. uterus, abdomen) is closed

- Document in the woman's record that the surgical counts were correct.

- Use instruments, especially sharps carefully to reduce the risk of injury.
- Use "safe zones" when handling and passing instruments and sharps:
  - Use a pan such as a kidney basin to carry and pass sharp items and suture needles on a needle holder.

Need of surgical drains

- Always leave an abdominal drain in place if:
  - Oozing persists.
  - A clotting disorder is suspected.
  - Infection is present or suspected.
- A closed drainage system is preferred over corrugated drains.
- Remove the drain once the infection has cleared or when no pus or blood-stained fluid has drained for 48 hours.

Suture

- Select the appropriate type and size of suture for the tissue. Sizes are reported by a number of "0"s:
  - Smaller suture has a greater number of "0" s [e.g. 000 (3-0) suture is smaller than 00 (2-0) suture]. Suture labeled as "1" is larger in diameter than "0" suture.
  - A suture that is too small in diameter will be weak and may break easily; a suture that is too large in diameter will tear through tissue.
- Refer to the appropriate section for the recommended size and type of suture for a procedure.

Recommended suture types

Suture Type	Tissue	Recommended Numberof Knots
Plain catgut	Fallopian tube	3
Chromic catgut	Muscle, fascia	3
Polyglycolic	Muscle, fascia, skin	4
Nylon	Skin	6
Silk	Skin, bowel	3

Dressing

At the conclusion of surgery, cover the surgical wound with a sterile dressing.

c) Postoperative Care Principles

Initial Care

- Place the woman in the recovery position:
  - Position the woman with her head slightly extended to ensure a clear airway;
  - Place the upper arm in front of the body for easy access to check blood pressure;
- Assess the woman's condition immediately after the procedure:
  - Check vital signs/symptoms (blood pressure, pulse, respiratory rate and temperature) every 15 minutes during the first hour, every 30 minutes for the next hour. And then 4 hourly for 24 hours & thereafter twice daily for the duration of hospital stay.(pulse, temperature, blood pressure, respiration, pallor, any distention of abdomen, bowel sounds, input output chart, bleeding per vaginum, soakage of dressings).

- Assess the level of consciousness every 15 minutes until the womanis alert.

- Ensure a clear airway and adequate ventilation.
- Transfuse blood if necessary.
- If vital signs become unstable or if the hematocrit continues to fall despite transfusion, quickly reassess the patient because ongoing bleeding may be the cause.

✓ **Note: Ensure the woman has constant supervision till she regains consciousness.**

Nutrition

Gastrointestinal function typically returns rapidly for obstetrical patients. In most of the uncomplicated procedures, bowel function should be normal within 12hours of surgery.

- For initial 12- 24 hours patients require intravenous fluids (2.5 to 3 litres in 24 hours a combination of NS, RL, 5 % dextrose).
- If the surgical procedure was uncomplicated, the woman may be allowed to have liquidsafter 6-8hours if the woman is thirsty.
- If there were signs of infection, or if the caesarean was for obstructed labour/ uterine rupture, wait until bowel sounds are heard before giving liquids.
- When the woman is passing gas, begin giving her solid food.
- If you anticipate that the woman will need i.v. fluids for 48 hours or more, infuse a balanced electrolyte solution & monitor electrolytes every 48 hours.
- Prolonged infusion of IV fluids can alter electrolyte balance.

Dressing & Wound Care

- The dressing provides a protective barrier against infection while healing occurs. The dressing should be changed on 3rd day (after 48 completed hours).
- Remove stitches on 7th day (after 6 completed days) & send the woman home on 7th day.
- If blood or fluid is leaking through the initial dressing, check the wound for infection or wound dehiscence. If absent.
  - Reinforce the dressing.
  - Monitor the amount of blood/fluid lost by outlining the blood stain on the dressing with a pen.
- Always follow sterile techniques while changing the dressings.
- The wound should be clean and dry, without evidence of infection or seroma prior to the woman's discharge from the hospital.

Analgesia

Adequate postoperative pain control is important. A woman who is in severe pain does not recover well. Usually for initial 12-24 hours patient needs parenteral analgesics after a major surgery. Options are

Good postoperative pain control regimens include:

- Non-narcotic mild analgesics such as Paracetamol 500 mg 6-8 hourly.
- Inj. Pentazocine 30 mg + Inj. Promethazine 25 mg IM12 hourly.
- Inj. Tramadol 50/100mg IM12 hourly (Max 300 mg/day).
- Inj. Diclofenac 75 mg IM8-12 hourly.

Note: Avoid over sedation as this will limit mobility, which is important during the postoperative period.

Bladder Catheter

A urinary catheter may be required for some procedures. Early catheter removal decreases the chance of infection and encourages the woman to walk. Hence catheter should be removed as early as possible.

Watch for the urine output and colour of the urine.

- Wait 48 hours after surgery before removing the catheter if there was:
  - Uterine rupture.
  - Prolonged or obstructed labour.
  - Massive perineal oedema.
  - Puerperal sepsis with pelvic peritonitis.
- If the bladder was injured (either from uterine rupture or during caesarean section or laparotomy):
  - Leave the catheter in place for a minimum of 2-3 weeks.
  - If the woman is not currently receiving antibiotics, give Nitrofurantoin 100 mg by mouth once daily until the catheter is removed for prophylaxis against cystitis.

Antibiotics

- If there were signs of infection or the woman currently has fever, continue antibiotics until the woman is fever-free for 48 hours.

Suture Removal

Major support for abdominal incisions comes from the closure of the fascial layer. Remove skin sutures on 7thdayof surgery (after 6 completed days).

Fever

- Fever (temperature ≥ 38°C) that occurs postoperatively should be evaluated.
- Ensure the woman is fever-free for a minimum of 24 hours prior to discharge from hospital.

Ambulation

Ambulation enhances circulation, encourages deep breathing and stimulates return of normal gastrointestinal function. Encourage foot and leg exercises and mobilize as soon as possible, usually within 24 hours.

Bathing

Women must be encouraged to bathe daily starting 48 hours after surgery.

Psychological and emotional supports

Women may have depression in the post-operative period so psychological and emotional support is necessary.

Post-Operative warning signs and symptoms

1. Persistent tachycardia, hypotension & increasing pallor-indicator of hemorrhage
2. Fever, severe pain with or without soakage at wound site --wound infection.
3. Abdominal distension, absentbowel sounds even after 12 hours, excessive vomiting.

   - paralytic ileus
4. Urine output less than 30ml per hour indicator of renal failure.
5. Cough, crepitus in lung - pulmonary infection.
6. Altered sensorium, confusion - electrolyte imbalance.
7. Calf muscle pain specially if patient is on prolonged bed rest or having preeclampsia - deep vein thrombosis.

B. CESAREAN SECTION

Review for indications. Ensure that vaginal delivery is not possible.

Unnecessary cesarean section must never be performed as each cesarean section makes the woman prone for developing placenta accreta in future pregnancies which is associated with high morbidity and mortality.

a) Indication for Cesarean Section

- Contracted pelvis.
- Cephalo-pelvic disproportion.
- Previous 2 LSCS.
- Placenta Previa.
- Fetal distress.
- Abnormal presentation.
- Failed induction.
- Failed Forceps/ Ventouse.
- Non progress of labor.
- Active genital Herpes lesions at the time of delivery.

✓ **There could be other relative indications for LSCS as mentioned in individual chapters.**

Refer woman to District Hospital/ Medical College for Cesarean Section if

- Previous LSCS with Placenta previa in present pregnancy.
- Two previous LSCS.
- Pregnancy after Classical cesarean section, Hysterotomy or Myomectomy.

Anesthesia-

- Ideally caesarean section is performed under spinal anesthesia/ epiduralanesthesia.
- Sometimes general anesthesia may also be given in special situations as per anesthetist's discretion.
- Local anesthesia may be used rarely when trained persons are not available. The use of local anesthesia for caesarean section requires that the provider counsel the woman and reassure her throughout the procedure. The provider should use instruments and handle tissue as gently as possible, keeping in mind that the woman is awake and alert.

Note: In the case of heart failure, avoid spinal anesthesia. Use local infiltration anesthesia with conscious sedation.

Remember

- If the baby's head is deep down into the pelvis as in obstructed labour, prepare the vagina for assisted caesarean delivery.
- Have the operating table tilted to the left or place a pillow or folded linen under the woman's right lower back to decrease chances of Supine Hypotension Syndrome.

Opening the Abdomen-

Do preparation of the incision site as described in chapter on operative care principles.

- Make a midline vertical incision below the umbilicus to the pubic hair line, through the skin and to the level of the fascia. If surgeon is comfortable then he/she may use Pfannenstiel incision for opening abdomen.

Note: If the caesarean section is performed under local anesthesia in emergency/special situations such as non-availability of anesthetists, make the

midline incision that is about 4 cm longer than when general anesthesia is used. A Pfannenstiel incision should not be used as it takes longer, retraction is poorer and it requires more local anesthetic.

Site of Abdominal Incision

- Make a 2-3 cm vertical incision in the fascia.
- Hold the fascial edge with forceps and lengthen the incision up and down using scissors.
- Use fingers or scissors to separate the rectus muscles (abdominal wall muscles).
- Use fingers to make an opening in the peritoneum near the umbilicus. Use scissors to lengthen the incision up and down in order to see the entire uterus. Carefully use scissors to separate layers and open the lower part of the peritoneumto prevent bladder injury.
- Place a bladder retractor over the pubic bone.

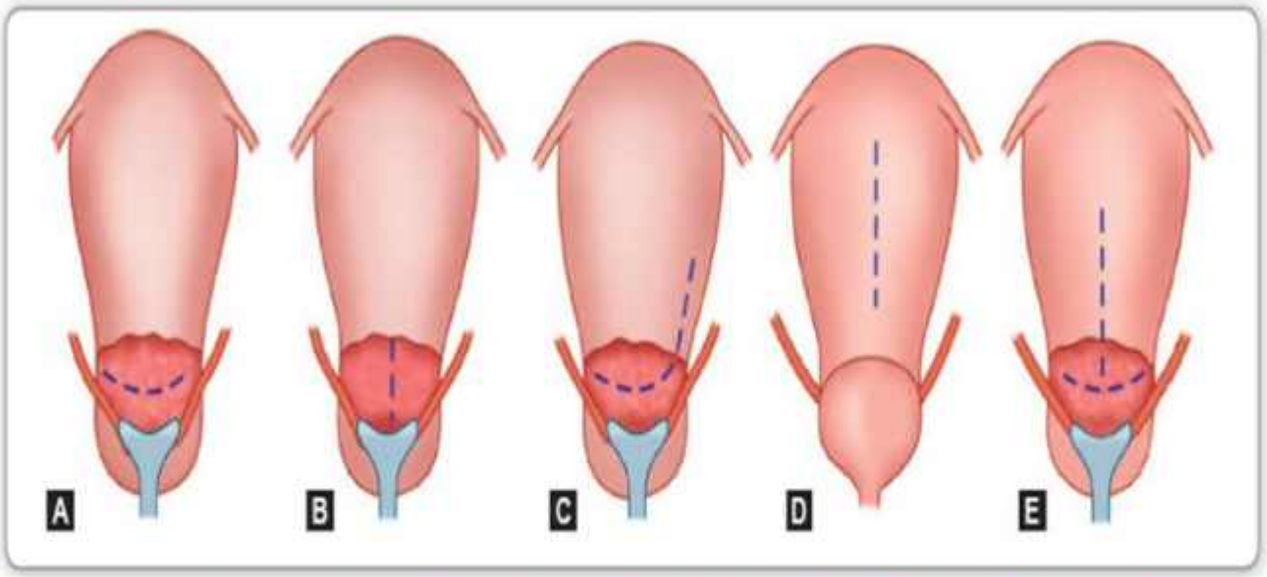
- Use forceps to pick up the loose peritoneum covering the anterior surface of the lower uterine segment and incise with scissors.
- Extend the incision by placing the scissors between the uterus and the loose serosa and cutting about 3 cm on each side in a transverse fashion.
- Use sponge or mounted gauze piece to push the bladder downwards off of the lower uterine segment. Replace the bladder retractor over the pubic bone and bladder.

Opening the Uterus

- Uterine incision is normally given in lower uterine segment transversely.
- A high vertical incision on uterus (classical caesarean section) is indicated in:
  - ✓ an inaccessible lower segment due to dense adhesions from previous caesarean sections.
  - ✓ transverse lie (with baby's back down) for which a lower uterine segment incision cannot be safely performed.
  - ✓ fetal malformations (e.g. conjoined twins).
  - ✓ large fibroids over the lower segment.
  - ✓ a highly vascular lower segment due to placenta praevia.
  - ✓ carcinoma of the cervix.

Making the uterine incision

- Check for & correct dextrorotation prior to making uterine incision.
- Use a scalpel to make a 3 cm transverse incision in the lower segment of the uterus. It should be about 1 cm below the level where the vesico-uterine serosa was incised to bring the bladder down.
- Widen the incision by placing a finger at each edge and gently pulling upwards and laterally at the same time.
- If the **lower uterine segment is thick and narrow,** extend the incision in a crescent shape using scissors instead of fingers to avoid extension to the uterine vessels.



It is important to make the uterine incision big enough to deliver the head and body of the baby without tearing the incision.

Enlarging the uterine incision

Delivery of the Baby & Placenta

- To deliver the baby, place one hand inside the uterine cavity between the uterus and the baby's head.
- With the fingers, grasp and flex the head.
- Gently lift the baby's head through the incision, taking care not to extend the incision down towards the cervix.
- With the other hand, gently press on the abdomen over the top of the uterus to help deliver the head.
- If the **baby's head is deep down in the pelvis or vagina**, ask an assistant (wearing high-level disinfected gloves) to push the baby's head up through the vagina. Then lift and deliver the fetal head.

Delivering the Deeply Engaged Head

- A deeply engaged head may also be delivered by the **Patwardhan technique**. In this method, the arms of the baby are delivered followed by the trunk & the legs. Subsequently the baby is pulled up to deliver the head from the pelvis.
- The medical officer may adopt either technique to deliver the deeply engaged head with which he or she is comfortable.
- Suction the baby's mouth and nose when delivered if indicated. Deliver the shoulders and body.
- Give Inj. Oxytocin 10 units IM immediately after the delivery of the baby.
- Clamp and cut the umbilical cord.
- Handover the baby to the assistant or paediatrician for initial care.
- Keep gentle traction on the cord and massage the uterus through the abdomen.
- Deliver the placenta and the membranes.

Closing the Uterine Incision

- Grasp the corners of the uterine incision with clamps (Allis' forceps, Green armytage or Sponge holder).

- Grasp the bottom edge of the incision with clamps. Make sure it is separate from the bladder.
- Look carefully for any extensions of the uterine incision.
- Repair the incision and any extensions with a continuous locking stitch of 0 or 1 polyglycolic suture or chromic catgut depending upon its availability.
- Routinely a second layer of suture embedding the first layer of suture should be applied with 0 or 1 polyglycolic suture or chromic catgut depending upon its availability. (Recent evidence shows that there are higher chances of rupture uterus in the subsequent pregnancy if uterus is stitched in a single layer.)
- If there is any further bleeding from the incision site, close with figure-of-eight sutures

Note: If a Couvelaire uterus (swollen and discolored by blood) is seen at caesarean section, close it in the normal manner and observe.

Closing the Abdomen

- Look carefully at the uterine incision before closing the abdomen. Make sure there is no bleeding and the uterus is firm. Use a sponge to remove any clots inside the abdomen.
- Examine carefully for injuries to the bladder and repair if found any.
- Confirm the instrument, mop and suture needle counts.
- Close the parietal peritoneum with continuous sutures no.2/0 chromic catgut.
- Close the rectus sheath with continuous 0 or 1 polyglycolic or chromic catgut suture depending on its availability. Polyglycolic suture is always preferred.

Note: There is no need to close the visceral peritoneum (utero-vesical fold) but the parietal peritoneum should be closed.

- Close the skin with vertical mattress sutures of 3-0 nylon (or silk or thread).
- Generally suturing of subcutaneous tissue is not required. However, suturing may be needed if there is bleeding vessels or thickness more than one inch. Use 2-0 chromic or polyglycolic interrupted suture.
- apply a sterile dressing.
- At the end of the procedure clean the vagina with sterile swabs to remove any collected blood & ensure that there is no PPH.

Different centres are practicing different techniques for performing LSCS. The MO may adopt which ever technique he/ she is proficient with. The uterus should preferably be closed in a double layer.

Steps to follow if LSCS is done by MisgavLadach Technique

- Open abdomen using Joel Cohen incision. Make a straight transverse incision about 10 cm long, 3 cm below a line joining the anterior superior iliac spines, involving only the cutis.
- Make a nick 2-3 cm long in the midline cutting the subcutaneous tissue & rectus sheath.
- Extend the incision made in the rectus sheath bluntly using the index & third finger of both the hands in a caudal-cranial direction along with the rectus muscles.
- Make an opening at the cranial end of the parietal peritoneum bluntly using the index finger & extend it to open the peritoneal cavity.
- Give the small nick in the loose utero-vesical fold of peritoneum on the lower segment of

uterus. Extend this incision with the help of fingers transversely.

- Push the bladder down.
- Make the nick in the lower uterine segment 1 cm below the level where the vesico-uterine serosa was incised. Extend the incision on either side in a semilunar fashion with the help of index finger of one hand and thumb of other.
- Deliver the baby & placenta as in the conventional method of cesarean section.
- Close the uterine incision using a double layer of continuous locking stitch with 0 chromic catgut or polyglycolic suture.
- Ensure hemostasis and any other bleeding point may be stitched by interrupted suture to stop bleeding. Visceral& parietal peritoneal layers are not stitched.
- Clean the peritoneal cavity.
- Close the abdominal cavity by stitching the rectus sheath with continuous non locking stitches using1 chromic catgut or polyglycolic suture.
- The subcuticular layer is not stitched.
- Close the skin with 5-6 mattress sutures using 3-0 nylon or silk or thread.

b) Problems During Surgery

Bleeding Is Not Controlled

- Massage the uterus.
- If the uterus is atonic, infuse Inj. Oxytocin 10 U in 500 ml normal saline @ 40-60 drops/ min. OR give Inj. Ergometrine 0.2 mg IM OR prostaglandins, if uterus still not contracted. These drugs can be given together or sequentially.
- Transfuse blood as necessary.
- Have an assistant press fingers over the aorta to reduce the bleeding until the source of bleeding can be found and stopped.
- If bleeding is not controlled, perform uterine compression sutures (B Lynch or Hayman), uterine and utero-ovarian artery ligation or hysterectomy.

Baby Is Breech

- If the baby is breech, grasp a foot and deliver it through the incision.
- Complete the delivery as in a vaginal breech delivery:
- Deliver the legs and the body up. to the shoulders, then deliver the arms;
- Flex (bend) the head using the Mauriceau Smellie Veitmanoeuvre.

Baby is Transverse

- If the baby is transverse reach into the uterus and find the baby's ankles (identify by feeling ankle).
- Grasp the ankles and pull gently through the incision to deliver the legs and complete the delivery as for a breech baby.

Placenta Praevia

- If a low anterior placenta is encountered, try to find out the membrane and rupture, if can't find then incise through the placenta and deliver the fetus quickly. Clamp cord immediately in these cases.
- After delivery of the baby, if the placenta cannot be detached manually, the diagnosis is placenta accreta, a common finding at the site of a previous caesarean scar. If patient is bleeding perform hysterectomy.

- Women with placenta praevia are at high risk of postpartum hemorrhage. If there is bleeding at the placental site, under-run the bleeding sites with chromic catgut (or polyglycolic) sutures.
- Watch for bleeding in the immediate postpartum period and takeappropriate action.

c) Post-Procedure Care

- Review postoperative care principles.
- If bleeding occurs:
  - Massage the uterus to expel blood and blood clots. Presence of blood clots will inhibit effective uterine contractions.
- GiveInj.Oxytocin10 units in 500 ml IV fluids (Normal saline or Ringer's lactate) @ 60 drops per minute and Inj. Ergometrine 0.2 mg IM OR prostaglandins. Refer to PPH Flowchart for more details.
- If there are signs of infection or the woman currently has fever, give a combination of antibiotics until she is fever-free for 48 hours:
  - Inj. Ampicillin 2 g IV every 6 hours PLUS.
  - Inj. Gentamicin 5 mg/kg body weight IV every 24 hours PLUS.
  - Inj. Metronidazole 500 mg IV every 8 hours.
- Give appropriate analgesic and hydration drugs.
- Encourage early feeding and ambulation.

d) Tubal Ligation at Caesarean

Tubal ligation can be done at the time of caesarean section immediately after uterine closure if the woman requested the procedure before labour began (during prenatal visits). Adequate counseling and informed decision-making and consent must precede sterilization procedures; this is often not possible during labour and delivery.

- Review for consent of patient.
- Grasp the least vascular, middle portion of the fallopian tube with a Babcock or Allis forceps.
- Hold up a loop of tube 2.5 cm in length.
- Ligate the tube with 0' plain catgut or 0' chromic catgut.
- Excise the loop (a segment 1 cm in length) with scissors.
- Do not crush the loop by a clamp prior to ligation as there is a greater likelihood of failure.
- Repeat the procedure on the other side.

Tubal Ligation with LSCS

Caesarean Section Kit

S. No	Equipment	Quantity
1	Tray	1
2	Sponge holder	2
3	Towel Clip	4
4	B.P. Knife handle	1
5	Toothed Forceps	
	8"	1
	6"	1
6	Artery Forceps	
	Straight 6"	4
	Curved 6"	2
7	Allie's Forceps 8"	6
8	Lane's Tissue Forceps-	2

9	Moniyan's Tetra Clamps for side guard-	2
10	Green Armytage	2
11	Kocher's cord clamps (Straight)8"	2
12	Morrison's retractor (Large)-	2
13	Needle Holder	1
14	Scissors Straight Stitch cutting Curved Dissecting	 1 1
15	Babcock's forceps	2
16	Suction tubing	1
17	Suction Nozzle	1
18	Kidney Tray	1
19	Katori (Bowl)	1

N.B. Short curved forceps to be kept handy.

C. LAPAROTOMY FOR RUPTURED UTERUS

Ideally women with ruptured uterus should be treated by an obstetrician &/or referred to the nearest District Hospital/ Medical College after stabilization with a properly filled referral slip. In case ruptured uterus/ scar dehiscence is discovered at the time of LSCS, appropriate surgery may be done as follows.

Repair of Ruptured Uterus

- Review operative care principles and start an IV infusion.
- Repair can be done under spinal or general anesthesia.
- Give:
  - Inj. Ampicillin2 g IV PLUS.
  - Inj. Gentamicin 5mg/kg body weight IV PLUS.
  - Inj. Metronidazole 500mg IV.
- Open the abdomen with a midline vertical incision as for caesarean.
- Deliver the baby and the placenta.
- Infuse Inj. Oxytocin 10 units in 500 ml IV fluids (Normal saline or Ringer's lactate) @40-60 drops/ min until the uterus contracts and then reduce to 20 drops per minute.
- Lift the uterus out of the pelvis in order to note the extent of the injury.
- Examine both the front and the back of the uterus.
- Hold the bleeding edges of the uterus with Green Armytage clamps (or ring forceps).
- Separate the bladder from the lower uterine segment by sharp or blunt dissection. If the bladder is adhered to the uterus, use fine scissors.

Method of repair-

Rupture Through Cervix and Vagina

- If the uterus is torn through the cervix and vagina, mobilize the bladder at least 2 cm below the tear.
- If possible, place a suture 1 cm below the upper end of the cervical tear and keep traction on the suture to bring the lower end of the tear into view as the repair continues. No 1 suture of chromic catgut or Vicryl (polyglycolic) may be used for repair.

Rupture Laterally Through Uterine Artery

- If the rupture extends laterally to damage one or both uterine arteries, ligate the injured artery.

- Carefully identify the arteries and ureter prior to ligating the uterine vessels.
- Avoid applying blind clamps as it can damage the ureters.

Rupture With Broad Ligament Hematoma

- If the rupture has created a broad ligament hematoma, clamp, cut and tie off the round ligament.
- Open the anterior leaf of the broad ligament.
- Drain off the hematoma manually if necessary.
- Inspect the area carefully for injury to the uterine artery or its branches. Ligate any bleeding vessels.

Repairing the Uterine Tear

- Repair the tear with a continuous locking stitch of 0 chromic catgut (or polyglycolic) suture. If bleeding is not controlled or if the rupture is through a previous classical or vertical incision, place a second layer of suture.

Ensure that the ureter is identified and exposed to avoid including it in a stitch.

- Perform tubal ligation, (counseling prior to procedure and operation is essential).
- If the rupture is too extensive for repair, proceed with hysterectomy.
- Control bleeding by clamping with long artery forceps and ligating. If the bleeding points are deep, use figure-of-eight sutures.
- Secure hemostasis. Ensure that there is no bleeding. Remove clots using a sponge.
- In all cases, check for injury to the bladder. If a bladder injury is identified, repair the injury (see below).
- Place an abdominal drain.
- Close the peritoneum then rectus sheath with continuous 0 chromic catgut (or polyglycolic) suture.
- Close the skin with vertical mattress sutures of 3-0 nylon (or silk) and apply a sterile dressing.

Post-Procedure Care

High possibility of sepsis, hemorrhage & shock.

Be vigilant, do intensive monitoring, identify and do prompt management

- Review postoperative care principles.
- Routine postoperative antibiotics need to be administered as these women have blood loss > 1500 ml. Give a combination of antibiotics for 48 hours or if she has fever then until she is fever-free for 48 hours:
  - Inj. Ampicillin 2 g IV every 6 hours PLUS.
  - Inj. Gentamicin 5 mg/kg body weight IV every 24 hours PLUS.
  - Inj. Metronidazole 500 mg IV every 8 hours.
- Give appropriate analgesic drugs.
- Remove the abdominal drain when draining < 50ml in 24 hours.
- Transfuse blood & IV iron as indicated. All cases must have haematocrit estimation 48 hours postoperatively.
- Offer other health services.
- If tubal ligation was not performed, offer family planning. If the woman wishes to have morechildren, advise her to have elective caesarean section for future pregnancies at 36-37 weeks.

Because there is an increased risk of rupture with subsequent pregnancies, the option of permanent contraception needs to be discussed with the woman after the emergency is over.

Hysterectomy in cases where repair of rupture is not possible.

In such cases where repair of rupture uterus is not feasible, Hysterectomy has to be done & is usually subtotal unless the cervix and lower uterine segment are also involved. Total hysterectomy may be necessary in the case of a tear of the lower segment that extends into the cervix or bleeding after placenta praevia.

- Review for indications.
- Review operative care principles and start an IV infusion.
- Give preoperative antibiotics:
  - Inj. Ampicillin 2 g IV OR Inj. Cefazolin 1 g IV.
- If there is an uncontrollable hemorrhage following vaginal delivery, keep in mind that speed is essential. To open the abdomen, a midline vertical incision is preferred.
- If the delivery was by caesarean section, clamp the sites of bleeding along the uterine incision.
- In case of massive bleeding, have an assistant press fingers over the aorta in the lower abdomen. This will reduce intra peritoneal bleeding and helps to identify planes and sites to apply the clamps.
- Extend the skin incision, if needed.

Subtotal (Supracervical) Hysterectomy

- Lift the uterus out of the abdomen and gently pull to maintain traction.
- Doubly clamp and cut the round ligaments with scissors. Ligate with 0 or 1chromic or polyglycolic suture.
- Separate urinary bladder from lower uterine segment by sharp & blunt dissection. Using finger or scissors dissect the bladder downwards off the lower uterine segment. Direct the pressure downwards but inwards towards the cervix & the lower uterine segment.
- Apply two long clamps to tube & ovarian ligamentat corneal end. Cut, transfix & ligate pedicle.

Dividing the round ligaments

- Locate the uterine artery and vein on each side of the uterus. Feel forthe junction of the uterus and cervix.
- Doubly clamp across the uterine vessels at a 90° angle on each side of the cervix. Cut and doubly ligate with 0 or 1 chromic catgut or polyglycolic suture.

Dividing the Tube and Ovarian Ligaments

The ureters are close to the uterine vessels. The ureter must be identified & exposed to avoid injuring it during surgery or including it in a stitch

Dividing the Uterine vessels

- Observe carefully for any further bleeding. If the uterine arteries are ligated correctly, bleeding should stop and the uterus should look pale.
- Amputate the uterus immediately above the level where the uterine arteries are ligated, using scissors.

Line of Amputation

- Close the cervical stump with interrupted 0 or 1 chromic catgut (or polyglycolic) sutures.

- Carefully inspect the cervical stump, leaves of the broad ligament and other pelvic floor structures for any bleeding.
- If slight bleeding persists or a clotting disorder is suspected, place a drain through the abdominal wall.
- Ensure that there is no bleeding. Remove clots using a sponge.
- In all cases, check for injury to the bladder. If a bladder injury is identified, repair the injury.
- Close the parietal peritoneum & rectus sheath with continuous 0 or 1 chromic catgut (or polyglycolic) suture.
- Close the skin with vertical mattress sutures of 3-0 nylon (or silk) and apply a sterile dressing.

Total Hysterectomy

The following additional steps are required for total hysterectomy:

- Push the bladder down to free the top 2 cm of the vagina.
- Clamp, cut &ligate the uterosacral ligaments.
- Clamp, cut & ligate the cardinal ligaments, which contain the descending branches of the uterine vessels. This is a critical step in the operation:
  - Grasp the ligament vertically with a large-toothed clamp (e.g. Kocher).
  - Place the clamp 5 mm lateral to the cervix and cut the ligament close to the cervix, leaving a stump medial to the clamp for safety.
  - If the cervix is long, repeat the step two or three times as needed.

The upper 2 cm of the vagina should now be free of attachments.

- Cut the vagina as near to the cervix as possible, clamping bleeding points as they appear.
- Place haemostatic sutures at angle of vagina.
- Place continuous sutures on the vaginal cuff to stop hemorrhage.
- Close the abdomen (as above) after placing a drain in the extraperitoneal space near the stump of the cervix.

Postoperative Care- same as given above for care after repair of rupture uterus

Abdominal Hysterectomy Set

S. No	Equipment	Quantity
1	Tray	1
2	BP Knife handle	1
3	Artery forceps Straight Curved	6 4
4	Allis forceps	6
5	Hysterectomy Clamps Curved Straight	4 2
6	Morrison's retractor (Large)	2
7	Sponge Holder	2
8	Towel Clips	4
9	Moniyan's Tetra Clamps for side guard	2
10	Lavis forceps	2
11	Needle holder	
12	Tooth Forceps 8" 6"	6 1
13	Stitch cutting scissor	1
14	Curved dissecting scissor	1
15	Kidney Tray	1
16	Bowl	1

❖ LAPAROTOMY FOR RUPTURED ECTOPIC PREGNANCY

Ectopic Pregnancy if diagnosed in unruptured state must be referred to district Hospital/ Medical College. If diagnosed in ruptured state then start resuscitative measures and refer with proper liaisoning. Laparotomy may be done if Gynaecologist/ Surgeon is available or patient is in very low condition and not willing for getting referred.

- Indication: Ruptured Ectopic pregnancy.
- Review operative care principles and start an IV infusion.
- Give a single dose of prophylactic antibiotics.
- Inj. Ampicillin 2 g IV OR Inj. Cefazolin 1 g IV.
- Open the abdomen, as described before for Laparotomy.
- Identify and bring to view the fallopian tube with the ectopic gestation and its ovary.
- Apply traction forceps (e.g. Babcock) to increase exposure and clamp the mesosalpinx to stop haemorrhage.
- Aspirate blood from the lower abdomen and remove blood clots.
- Apply gauze moistened with warm saline to pack off the bowel and omentum from the operative field.
- Divide the mesosalpinx using a series of clamps.
- Apply each clamp close to the tubes to preserve ovarian vasculature.
- Transfix and tie the divided mesosalpinx with 2-0 chromic catgut (or polyglycolic) suture before releasing the clamps.
- Place a proximal suture around the tube at its isthmic end and excise the tube.
- Close the abdomen after ensuring haemostasis and checking for any bladder or bowel injury as described before

Clamping, Dividing and Cutting the Mesosalpinx

Post-Procedure Care

- Review postoperative care principles.
- If there are signs of infection or the woman currently has fever, give a combination of antibiotics until she is fever-free for 48 hours:
  - Inj. Ampicillin 2 g IV every 6 hours PLUS.
  - Inj. Gentamicin 5 mg/kg body weight IV every 24 hours PLUS.
  - Inj. Metronidazole 500 mg IV every 8 hours.
- Give appropriate analgesic drugs.
- Offer other health services, if possible.
- Correct anemia by blood transfusion & intravenous iron sucrose or ferric carboxy-maltose.

CHAPTER 11
POSTPARTUM HEMORRHAGE (PPH)

KEY LEARNING OBJECTIVES

By the end of this session, the participants will be able to diagnose and manage appropriately the below conditions during pregnancy:

A. **Primary/ Immediate postpartum Hemorrhage**

B. **Secondary/ Delayed Postpartum Hemorrhage**

C. **Atonic PPH**

D. **Atonic PPH with retained placenta**

E. **Traumatic PPH**

F. **Delayed PPH**

➢ **Important Points:**

- PPH is one of the leading causes of death in mothers
- PPH can occur even in the absence of risk factors
- Active management of third stage of labor prevents PPH
- Atonic uterus is the commonest cause of immediate PPH
- Begin Resuscitation immediately and manage efficiently & rapidly
- Catheterize to facilitate uterine contraction, give oxytocics& uterine massage to manage atonic PPH
- If PPH not controlled, try mechanical methods simultaneously
- Misuse of oxytocics during antenatal & postnatal period should be avoided
- MRP must be urgently performed if atonic PPH occurs with retained placenta
- Traumatic PPH should be surgically repaired under cover of antibiotics
- Cervical tear < 0.5 cm does not require active management if not actively bleeding
- Only acute inversion should be managed by manual replacement of uterus
- For ruptured uterus perform subtotal hysterectomy only if uterus cannot be repaired

Skills

- AMTSL (Prevention)
- Bimanual compression of Uterus
- External Aortic Compression
- Applying Uterine balloon tamponade
- Manual removal of placenta
- Repair of Cervical/Vaginal/Perineal tear
- Uterine compression suturing
- Uterine artery ligation

Introduction

Postpartum hemorrhage is defined as the loss of 500 ml or more of blood from the genital tract after a vaginal deliveryor in excess of 1000 ml in cesarean delivery. This is a life-threatening condition and a major cause of maternal mortality. Incidence of PPH is about 5-8% in India. It can be of two types- Primary PPH- which occurs within 24 hours of delivery and Secondary PPH- which occurs between 24hours to 6weeks post partum.

As it is difficult to measure the exact amount of blood loss, an **operational definition of PPH** is when more than one pad is fully soaked per hour or bright red bleeding with or without clots after delivery. As the same amount of blood loss may have a variable effect in different women (the effect is more in those with Preeclampsia, Dehydration, Short stature, Anemia, Cardiac disease), the **operational definition** is more important. It is important to remember that even a lesser amount of blood loss can cause the woman's condition to deteriorate in these circumstances. PPH includes any amount of blood loss after delivery up to 6 weeks, but which affects the woman's hemodynamic stability.

Often, it is difficult to assess the amount of blood a woman has lost. The blood may be mixed with the amniotic fluid or urine or may simply be dispersed on the linen or on the floor. A woman with normal hemoglobin will tolerate blood loss better; the same amount would be fatal for an anemic woman.

Etiology of PPH

- Primary PPH:
  - Uterine atony 70-80%%.
  - Tissue trauma.
  - Retained placental tissue.
  - Coagulation defects.
- Secondary PPH:
  - Retained placental bits.
  - Metritis.

Risk Factor for PPH

- Poor maternal nutrition.
- Anemia.
- Inadequate antenatal supervision.
- Mismanaged III stage of labour.
- Sometimes it may occur in women with no risk factor at all.

Prevention Strategies of PPH:

- Birth preparedness.
- Skilled provider at childbirth.
- Treatment of anemia.
- Avoid unnecessary procedures (e.g., episiotomy).
- Active management of third stage of labor.
  - Oxytocin 10 units IM.
  - Controlled cord traction.
  - Fundal massage after delivery of placenta.

A. Primary/ Immediate postpartum Haemorrhage

This includes all occurrences of increased bleeding within 24 hours after delivery. Excessive bleeding during the third stage of labour, which is also known as "third-stage haemorrhage" is included in immediate PPH. Immediate PPH is more common than delayed PPH, generally involves heavier bleeding and is associated with greater morbidity.

Immediate PPH is most commonly caused by uterine atony i.e. failure of the uterus to contract properly after childbirth. Other causes include trauma to the genital tract or presence of retained placenta and placental fragments. The placenta is said to be retained when it has not been delivered within half an hour after delivery. Also coagulation defects are seen.

B. Secondary/ Delayed postpartum hemorrhage

All cases of PPH occurring between 24 hours after delivery and 6 weeks postpartum are considered as Delayed postpartum hemorrhage or Secondary postpartum hemorrhage. Bleeding is variable & may be light or heavy, continuous or irregular & foul smelling. Delayed PPH could be because of retained placental fragments or may be a sign of metritis.

Identification of cause of PPH

It is crucial to understand the importance of identifying the cause of PPH in order to provide

Evaluation of PPH

Signs Typically present	Signs Sometimes present	Probable cause of PPH
• Immediate PPH • Uterus is soft & not contracted • Bleeding may be continuous or intermittent	• Shock	Atonic uterus
• Immediate PPH • Uterus contracted • Bleeding is continuous trickle	• Placenta complete on examination	Tears in the cervix or vagina
• Placenta not delivered within 30 minutes after delivery	• Immediate PPH • Uterus relaxed	Retained placenta
• A portion of the maternal surface of the Placenta is missing or the membrane are torn	• Immediate PPH • Uterus relaxed	Retained placental fragments
• The uterine fundus is not felt on abdominal palpation • Slight or intense pain	• Inverted uterus (partial or complete) apparent at the vulva • Immediate PPH	Acute uterine inversion
• Delayed PPH (Bleeding between 24 hours of delivery & 6 weeks postpartum) • Uterus softer and larger than expected for the elapsed time	• Bleeding is variable (light/ heavy, continuous/Irregular) & foul smelling discharge	**Delayed PPH**
• Immediate PPH (bleeding is intra-abdominal and/orvaginal) • Severe abdominal pain (may decrease after rupture of the uterus)	• Shock (may be out of proportion to visible blood loss) • Rapid pulse • Tender abdomen • Uterine contour not felt	Ruptured uterus

Estimation of Blood Loss:

Estimates of blood loss are often low, maybe half the actual loss. Blood is mixed with amniotic fluid and sometimes with urine. It is dispersed on sponges, towels and linen, in buckets and on the floor. The importance of a given volume of blood loss varies with the woman's hemoglobin level. A woman with a normal Hb level will tolerate blood loss that would be fatal for an anaemic woman. Even healthy, non-anaemic woman can have catastrophic blood loss. Bleeding may occur at a slow rate over several hours; then condition may not be recognized until the woman suddenly enters shock. By the time a woman presents with systolic BP< 90mmhg, she has already lost 1/3rd of the circulating volume (an average woman has 6 liters of blood in her circulation).

Blood loss can be estimated clinically or visually. It can be classified into 4 categories based on the severity as follows-

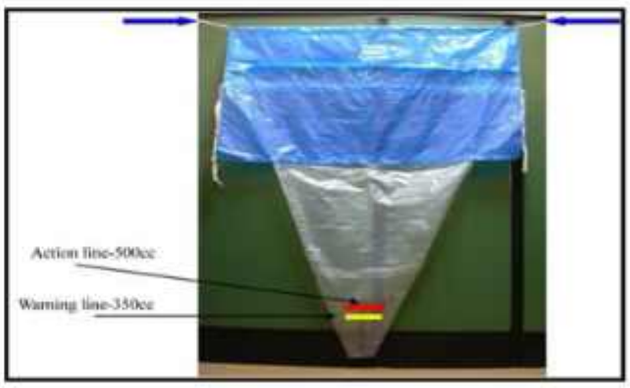
Clinical Estimation:

Clinical signs	Class I	Class II	Class III	Class IV
Blood loss(ml.)	500-1000	1200-1500	1800-2100	>2400
Pulse(beats/min.)	normal	100	120	140
Systolic BP (mm of Hg)	normal	Normal	60-80	60
Mean arterial pressure (mm Hg)	80-90	80-90	50-70	50
Tissue perfusion	Postural hypotension	Peripheral vasoconstriction	Pallor, restlessness, oliguria	Collapse, anuria, air hunger

Visual estimation of blood loss

Estimation by use of Calibrated Delivery Drape Sheet

This is a calibrated drape to measure the volume of post-partum blood loss and is used after delivery of the placenta. Accurate measurement of the amount of blood lost after childbirth helps to quickly diagnose life-threatening hemorrhage. This can improve the timely management of PPH. The blood drape is a plastic sheet that is placed under the woman and siphons the blood into a calibrated measuring pocket on the sheet. The warning line is marked at 350 ml of blood loss and action line at 500 ml blood loss. The sheet is decontaminated and then disposed of as medical waste or incinerated after use.



Coagulopathy

Coagulopathy in PPH can be due to-

1. Severe haemorrhage leading to depletion of clotting factors and platelets by blood loss and in the absence of transfusion resulting in dilutional coagulopathy.

2. Presence of tissue trauma and retained products of conception, after separation of the placenta, can release tissue factor into the maternal circulation which can induce substantial activation of coagulation and generation of thrombin leading to DIC in PPH.

3. Coagulopathy may also lead to PPH in women with an inherited or acquired bleeding diathesis.

4. Acute coagulopathies can also be caused by amniotic fluid embolism, placental abruption, preeclampsia with severe features, or HELLP syndrome.

Laboratory testing includes the following:

a. Complete blood count (CBC) with platelet count and differential cell count.

b. Coagulation studies including prothrombin time (PT), fibrinogen level, and D-dimer.

c. Blood urea nitrogen (BUN) and creatinine.

d. Liver function tests.

Reference values of normal coagulation profile tests:

S. No	Test	Reference values
1.	Bleeding time	2-8 min
2.	Prothrombin time	10.7-13.6 s
3.	Fibrinogen	150-400 mg/dl
4.	D-dimer (FDP)	<250 ng/ml

Prior to the return of the first set of laboratory studies, a crude clotting time may be performed using any of a variety of methods; however, such tests are highly subjective, insensitive, imprecise, and not validated in pregnancy. One method is to determine the clotting time of 5 mL of blood in a red top tube (i.e., no additives) at room temperature; if the blood in the tube clots within 8 to 10 minutes and the clot remains intact, the patient likely has adequate fibrinogen stores. If the blood in the tube does not clot or an initial clot dissolves, it is likely that the patient is markedly deficient in key clotting factors.

Postpartum hemorrhage with Dilutional coagulopathy - Severe bleeding from postpartum hemorrhage (PPH) may result in dilutional coagulopathy. Like DIC, there may be reduced levels of coagulation factors that can prolong the PT. There may be a mixed picture with elements of coagulation factor consumption in PPH.

FFP contains fibrinogen and is generally given to correct hypovolemia and normalize coagulation in cases of hemorrhage due to Obstetric causes. Cryoprecipitate, a source of concentrated fibrinogen, is indicated when large amounts of fibrinogen must be administered in a low-volume product, but takes time to get thawed and prepared for transfusion. A fibrinogen concentration below 100mg/dl is generally treated with 10 units (two pools of 5 units) of cryoprecipitate.

For women with heavy bleeding, a minimum of 6 units of packed red blood cells (pRBCs), 6 units of fresh frozen plasma (FFP), 10 bags of cryoprecipitate (1 dose), and 1 dose of platelets (either 4 to 6 whole blood-derived platelet units or 1 platelet apheresis) are arranged and transfusion of blood products can be started prior to receiving initial lab results on coagulation profile of the patient.

Transfusion of FFP, platelets, and RBCs in a ratio of 1:1:1 in cases of severe hemorrhage is recommended. This ratio is expected to reduce the risk of dilutional coagulopathy.

If the patient has continuous heavy bleeding pervaginum with deteriorating vitals-

points for consideration:

1. Recognition of heavy blood loss must prompt quick corrective measures.
2. Immediate fluid replacement should be priority till blood and its products are available.
3. Uterine balloon tamponade with oxytocics should be done together, if still not responding patient should be shifted to OT for surgical options or referred to higher center for further management.
4. For centers managing complications of pregnancy such as PPH, assured referral linkages and transport facilities to higher centers must be ensured.
5. ICU support to be arranged.

If the patient is severely anemic and/ or with preeclampsia and has PPH- points for consideration

1. In these women the standard definition of amount of blood loss i.e. >500 cc in vaginal deliveryor>1000ml in cesarean section constituting PPH is not valid as even small amount of blood loss is detrimental.
2. More vigilance is necessary and even small amount of blood loss should warrant management of PPH.
3. Methergine as oxytocic should be avoided as it may further precipitate cardiac failure.
4. Oxytocin, misoprostol and 15- methyl PGF2 can be safely used.
5. Care should be taken while administering IV fluids to prevent cardiac overload.

Management of PPH

- Call for Help, RIA - evaluate vital signs: PR, BP, RR & Temp
- Establish two I.V. lines with wide bore cannulae (16-18 gauge)
- Draw blood for grouping & cross matching
- If heavy bleeding P/V, infuse NS/RL 1L in 15-20 minutes
- Give O2 @ 6-8 L /min by mask, Catheterize
- Check vitals & blood loss every 15 min, Monitor input & output

- Give Inj. Oxytocin 10 IU IM (if not given after delivery)
- Start Inj. Oxytocin 10 IU in 500 ml RL @ 40-60 drops per minute
- Give Tranexemic acid 1gm in 100 ml NS IV over 10 min, repeat another dose after 30 min of first dose, if required
- Check to see if placenta has been expelled

Placenta not delivered

- Continue Oxytocin
- Do P/V examination to rule out inversion of uterus
- Attempt Controlled Cord Traction

Placenta not delivered
- **Do MRP under anesthesia**
- Give IV antibiotics

Placenta delivered
- Continue Uterine massage & Oxytocin

Placenta delivered

- Massage uterus and continue oxytocin drip (not to exceed 100 IU in 24 hrs)
- Examine placenta & membranes for completeness (if available)
- Explore uterus for **Retained placental bits** - if present, evacuate uterus

P/A for uterine consistency

Uterus well contracted **(Traumatic PPH)**
- Look for cervical/ vaginal/ perineal tear - Repair tear, Continue Oxytocin
- Scar dehiscence / Rupture uterus – Laparotomy

Uterus soft flabby **(Atonic PPH)**

Manage as Atonic PPH Chart
- Blood transfusion if indicated

If bleeding continues check for Coagulopathy

C. ATONIC PPH

This occurs from the placental site because the uterus is unable to contract adequately and thus the blood vessels are not compressed and bleeding is not controlled. Any condition that interferes with uterine contraction, such as retained placenta, placental bits or fragments will predispose to atonic bleeding. 80% cases of PPH are due to Atonic PPH. Hence, the most important step in making a diagnosis of the cause of PPH is to keep a hand on the lower abdomen of the woman and feel for the uterine tone. If the uterus is soft and not contracted, it indicates atonic PPH (with or without associated genital tract trauma).

Risk Factors for Uterine Atony

- Excessive manipulation of uterus.
- Multiparity.
- Uterine over distension-twin, hydramnios.
- Prolonged labour.
- Induced and accelerated labour.
- Potentially infected uterus.
- Placenta praevia.
- Couvelaire uterus.
- Uterine myomata.
- Excessive sedation & use of GA.
- Previous III stage complications.

Atonic PPH with Placenta delivered

Atonic PPH refers to bleeding from the placental site due to lack of tone in the uterus. In this case, the uterus is soft, distended & not well contracted. To stop the bleeding, it is essential to make the uterus contract by emptying it. The management of atonic bleeding when the placenta has been delivered is given below.

- Massage the uterus so that it contracts and expel any clots. You may need the help of an assistant to continue uterine massage.
- Give Inj. Oxytocin 10 IU IM.
- Assess the patient's condition by doing a Rapid Initial Assessment (pulse, BP, colour, consciousness, uterine tone, urinary output) and estimate how much blood has already been lost.
- Establish two IV lines with an 18- or 16-gauge needle.
- Withdraw blood for Hb and grouping & cross matching and clottingtime &clot retraction time.
- For bed side clotting test follow the instructions below.

Clot observation Test/ Clot retraction Test

- Take 2 mL venous blood in a small, dry, clean, plain glass test tube (approx 10 x 75 mm).
- Hold tube in your closed fist to keep it warm (+37°C).
- After 4 minutes, tilt tube slowly to see if clot is forming.
- Then tilt it again every minute until blood clots and tube can be turned upside down.
- Failure of a clot to form after 7 minutes or a soft clot that breaks down easily suggests coagulopathy.
- This clot is further observed for clot retraction to assess platelet function. Plasma should retract away from the sides of the glass tube within a few hours. Normal clot retraction time is 0-2 hrs.

- If bleeding is heavy infuse NS/RL 1 L in 15-20 mins. If the woman is actively bleeding and hemo-dynamically unstable and blood is not available, transfuse 3 units crystalloid for each unit of blood loss.
- Catheterize the patient to facilitate uterine contraction and to assess the urine output in case of shock.
- If the woman is in shock, make sure that the airway is open, turn her head to one side, and give her oxygen @ 6-8 L/minute through a mask or nasal cannula. Raise the foot end of bed (by one foot) in case of shock.
- Position her on her left side.
- Keep patient warm.
- Infuse Oxytocin 10 IU in 500 ml of IV fluids (NS or RL) @ 60 drops/minute to keep the uterus well contracted. Continue Oxytocin infusion @ 40 drops/minute. No more than 100 IU of Oxytocin should be given in 24 hours. Oxytocin should never be given as an IV bolus.
- Monitor the vital signs- BP, Pulse, RR and Urinary output. Check that the expelled placenta and membranes are complete. Infuse RL/ NS until the condition of the woman stabilizes. A rising BP (systolic 90 mmHg) and heart rate/pulse under 100 beats/ minute are signs of stabilization.
- Attach pulse oxymeter if available.
- Transfuse blood as needed.
- Try putting the baby to the breast or use nipple stimulation if the baby does not suckle, to stimulate uterine contractions.
- If the bleeding persists and the uterus continues to be in the relaxed state, perform bimanual compression.
- Continue uterine massage.
- If uterus still not contracted, other Uterotonic drugs like Inj. Ergometrine, Inj. Carboprost (PGF2) & Tab Misoprostol (PGE1) as per recommended doses should be given.
- Uterine Balloon Tamponade should be done if bleeding persists despite above manouvers/ methods.
- In emergency situations, if bleeding continues perform External Aortic Compression.
- Perform laparotomy for uterine compression sutures/ utero overian artery ligation/ subtotal hysterectomy or refer to higher center for the same.
- For centers managing serious complications like PPH by using UBT or by doing arterial ligation etc. it is important to have assured referral linkages and transport facilities to higher center.
- Consider other causes of PPH if bleeding doesn't stop.

Use of Oxytocic drugs for the management of Post-partum hemorrhage

Name of the drug (in order of preference)	Dose and route	Maximum dose	Precautions/ Contraindi-cations	Side effect	Onset of action
Oxytocin	✓ IM: 10 IU ✓ INFUSION: - Initial Dose: Infuse 20 IU in 1 L NS/RL at 60 drops per minute - Continuing Dose: Infuse 20 IU in 1 L NS/RL at 40 drops per minute	Not more than 3 L of IV fluids containing oxytocin	Do not give as an IV bolus	Hypotension (if given as IV bolus)	3-5 mins (IM)

Ergometrine/ Methylergometrine	✓ 0.2 mg IM or IV (slowly), repeat after 15 minutes. ✓ If required, give 0.2 mg IM/IV (slowly), every 4 hours	maximal 5 doses, total 1 mg	Pre-eclampsia, hypertension, heart disease	Vomiting	5-10 mins (oral) 2-5 mins (IM)
15-Methyl Prostaglandin F2	0.25 mg IM every 15 minutes	maximal 8 doses, total 2 mg	Asthma	Nausea/ vomiting	
Misoprostol	800 mcg recta		Asthma	Shivering fever	
Tranexamic Acid	1 gm I/V in 10 ml. over 10 min. (100 mg/ min), may repeat after 30 min				

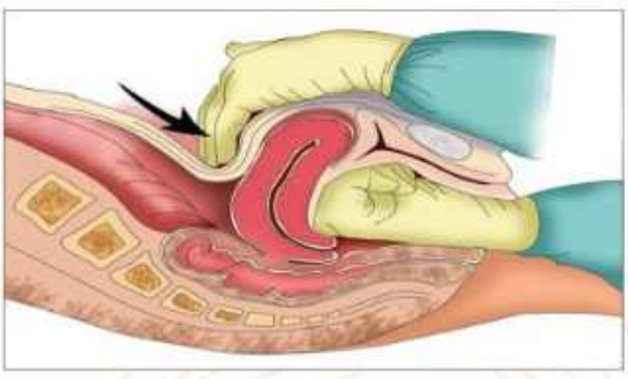
Use of Tranexamic Acid

WHO guidelines on PPH in 2012 recommend use of tranexamic acid for treatment of PPH if oxytocin and other uterotonics fail to stop the bleeding or if it is thought that bleeding may partly be due to trauma.

Dose recommended is Inj. Tranexamic acid 1 g in 10ml NS IV over 10 mins (100 mg/min); repeat another dose after 30 min of first dose if bleeding persists.

Ensure availability of blood and blood products at the earliest, as plenty of fluid if administered earlier causes dilutional coagulopathy or pulmonary oedema.

✓ **Bimanual compression of the Uterus:**



- Wearing elbow length high-level disinfected gloves, insert a hand into the vagina and form a fist.
- Place the fist into the anterior fornix and apply pressure against the anterior wall of the uterus.
- With the other hand, press deeply into the abdomen behind the uterus, applying pressure against the posterior wall of the uterus.
- Maintain compression until bleeding is controlled and the uterus contracts.
- After the procedure, broad-spectrum antibiotics may be started as a prophylaxis against infection.

✓ **Balloon Tamponade:**

If the woman is still bleeding, a uterine balloon can be placed in her uterus and inflated with normal saline. This is useful in atonic uterus and adherent placenta. The balloon presses on the bleeding vessels inside the uterus allowing the bleeding to be controlled. In this way patient can be stabilized and if necessary, transferred to higher center for further observation or treatment. However, there is risk of concealed hemorrhage.

Insertion of Balloon tamponade (condom catheter):

Following are the essential steps for insertion of balloon tamponade-

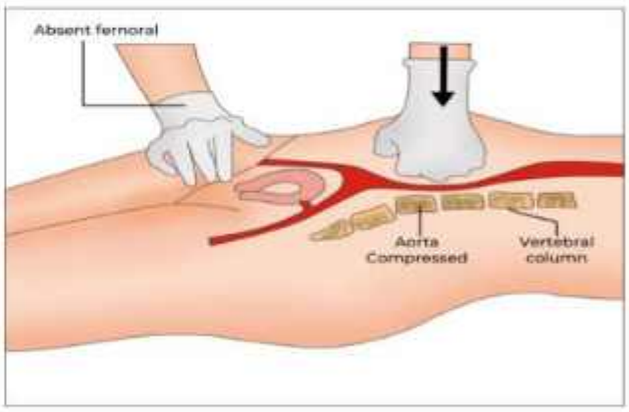
1. Apply antiseptic solution to the perineal area and vagina.
2. Prepare the condom balloon tamponade by tying condom on the tip of Foley's catheter.
3. Gently insert a sterile speculum into the vagina and grasp the anterior lip of the cervix with a ring or sponge holding forceps. By forceps, insert the balloon into the uterine cavity through the cervical opening and not just in the vagina.
4. Now with the help of syringe, inflate the condom balloon with warm saline solution/ water into the catheter port, till bleeding stops. This usually requires300-500 ml of liquid but it can vary.
5. Pack the upper vagina with rolled gauze to prevent expulsion of balloon.
6. Palpate the uterine fundus abdominally and mark with a pen, as a reference line from which any uterine enlargement or distension would be noted during observation.
7. A single dose of antibiotic (Ampicillin 2 gm IV/ single dose Cephalosporin) is recommended.

Once the balloon is in place and bleeding has stopped, patient should be transferred to referral facility. No surgery is required at this stage if bleeding stops for 30 minutes. If bleeding continues, consider surgical interventions. Monitor vital signs, vaginal bleeding and urine output every hour. The balloon should remain inside the uterus for 12-24 hours.

Removal of Balloon tamponade:

1. After 12-24 hours, if the uterine fundus remains at the same level and there is no active vaginal bleeding, balloon then should be deflated from 20ml/hour to 200 ml every hour as long as there is no further bleeding at each interval.
2. If significant bleeding resumes, balloon should be re-inflated.
3. Recommence oxytocin infusion and prepare for surgical intervention when her condition becomes stable.
4. If there is no bleeding after 30 minutes of complete deflation, then remove and discard the balloon and stop oxytocin.

✓ **External Aortic compression Techniques**



Apply downward pressure with a closed fist over the abdominal aorta directly through the abdominal wall. The point of compression is just above the umbilicus and slightly to the left. Aortic pulsations can be felt easily through the anterior abdominal wall in the immediate post-partum period.

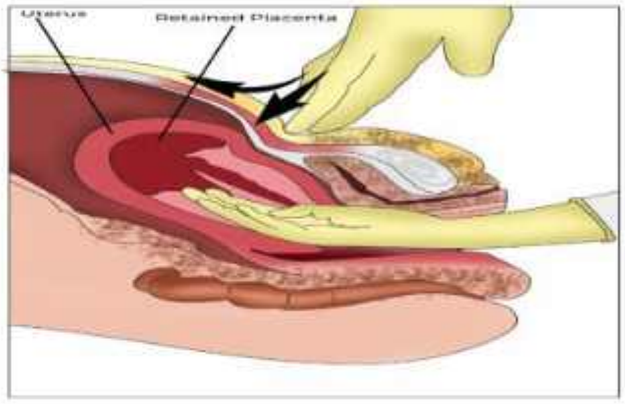
With the other hand, palpate the femoral pulse to check adequacy of compression. If the femoral pulse is palpable during compression, the pressure exerted by the fist is inadequate. If it is not palpable, the pressure exerted is adequate. Maintain

compression until bleeding is controlled. This is a temporary measure to control the bleeding during referral till adequate definitive measures are instituted. The pressure should be exerted intermittently.

D. ATONIC PPH WITH RETAINED PLACENTA

- Follow the same procedure as above with Uterine massage, Expulsion of clots, Inj. Oxytocin IM, starting an IV line with Oxytocin infusion, etc. **Do NOT give Ergometrine** as it causes tonic uterine contraction, which may delay expulsion of placenta.
- Assess clotting status if bleeding continues.
- Assess the patient's condition (pulse, BP, colour, consciousness, uterine tone) and estimate how much blood has already been lost. If the woman is in shock, make sure that the airway is open, turn her head to one side and give her oxygen @ 6-8 L/minute through a mask or nasal cannula.
- Empty the bladder and attempt Controlled Cord Traction (CCT). If it is successful, examine the placenta to ensure that it is complete.
- Keep the uterus contracted by massaging the fundus. Put 10 IU of Oxytocin in 500 ml of RL/NS and run it rapidly @ 60 drops/minute. (You may need to set up a second IV drip). Put the baby to the breast or use nipple stimulation if the baby does not suckleto get natural Oxytocin secreted.
- If CCT is not successful, a gentle vaginal examination should be performed. If the placenta can be felt protruding through the cervix, it should be grasped with the fingers and steadily withdrawn. The other hand fixes the uterus over the suprapubic space, pushing the uterine fundus upwards to prevent inversion of the uterus.
- If the placenta cannot be delivered and the cervix is dilated, Manual removal of the placenta (MRP) should be attempted after starting an oxytocin drip &giving the patient plasma expanders if required.

✓ MANUAL REMOVAL OF PLACENTA



- Start an IV drip (Ringer lactate/ Normal saline) if not started already. Run it fast if hypovolemia has not been corrected yet or give plasma expanders.
- Explain the intervention to the woman and reassure her.
- Do the procedure under GA. If anaesthetist not available, give sedation with inj. pethidine and diazepam iv slowly (don't mix in same syringe) or use Ketamine.
- However, If none is available, give Injection 50 mg Tramadol IM.
- Give the single dose of prophylactic antibiotics
  - Inj. Ampicilin 2g IV/ Inj. Cefazolin 1g/ Inj. Ceftriaxone 2g PLUS.
  - Inj. Metronidizole 500 mg IV PLUS.
  - Inj. Gentamycin 1.5 mg/kg body weight IV.
- Give Inj. Oxytocin 20 U in 1litre IV fluids (NS/RL) @ 60 drops/min.

- Help woman lie on her back with knees bent. Make sure that the bladder is empty. If she is unable to pass urine, pass a catheter & drain the urine, as a full bladder can prevent delivery of the placenta.
- Clean around the vagina and the perineal area with an antiseptic solution.
- Wash and scrub your hands and arms well. Put on a pair of short, sterile gloves first. Then on the right hand, which will be inserted into the vagina, put on a long, sterile glove on top of the short one. This will prevent the introduction of bacteria from the arm.
- Hold the umbilical cord with a clamp & pull it gently until the cord is parallel to the floor.
- Introduce the right hand in the shape of a cone by drawing the fingers and thumb together into the vagina.
- Follow the cord till you locate the edge of placenta.
- Let go off the cord, and place the left hand on the abdomen, steadying the fundus of uterus from above. This will stop the uterus from moving.
- Insinuate the ulnar border of the right hand between the edge of the placenta and the uterine wall with the dorsum of your hand towards the uterine wall. Using a side-to-side movement (i.e. alternate abduction and adduction movements of the hand), the placenta is gently separated from the uterine wall.
- Once you have put your hand into the uterus, do not bring it out until you have separated the placenta and brought it out. Do not go in and out of the uterus as this increases the risk of infection.
- When the entire placenta is separated and comes in the palm of your hand, remove the left hand from the fundus of uterus place it supra-pubically to provide counter-traction. Bring out the placenta and the membranes with therighthand. Re-explore the uterine cavity with the right hand (which is still inside the uterus) for any left-over pieces of the placenta/membranes.
- After making sure that the uterine cavity is empty, withdraw your right hand.
- Continue Oxytocin drip.
- If there is heavy bleeding, give IV Methylergometrine 0.25 mg inj Or Tab Misoprostol 800mcg rectally whichever is available.
- Have an assistant massage the uterus to encourage uterine contraction.
- Examine the removed placenta and check for its completeness.
- Monitor the vital signs of the woman (pulse, blood pressure and temperature).
- Give antibiotics for 5 days
  - Cap. Ampicillin 500 mg 6-hourly, orally.
  - Tab. Metronidazole 400 mg 8-hourly, orally
  - Inj. Gentamicin 80 mg IM, 12-hourly.
- Check for tears in the birth canal.
- Record the procedure fully.

NOTE: If placenta does not separate easily, it is likely to be morbidly adherent placenta. Further efforts to remove may result in heavy bleeding or uterine perforation. Hence, it is advisable to **abandon the procedure and refer** such cases.

➢ **Introducing one hand into the vagina along cord.**

- **Supporting the fundus while detaching the placenta.**
- **Withdrawing the hand from the uterus.**

Post-procedure care in Atonic PPH with/ without Retained placenta

- Monitor the vital signs (pulse, BP, RR) every 10 minutes for the first 30 minutes, every 15 minutes for the next 30 minutes and then every 30 minutes for the next 3-6 hours or until stable.
- Palpate the uterine fundus to ensure that the uterus remains contracted.
- Check for excessive bleeding every 30 minutes.
- Continue infusion of IV fluids & manage shock.
- If the bleeding continues, assess the clotting status using a bedside clotting test. Failure of a clot to form after 7 minutes or formation of a soft clot that breaks down easily suggests coagulopathy. In such cases, refer the woman immediately to higher facility.
- If there are signs of infection (fever, foul-smelling vaginal discharge), give antibiotics.
- Monitor the urinary output (should be more than 400 ml in 24 hours).

Referral and transfer

- The woman may be referred to a higher facility (District Hospital/ Medical Colleges) if
  - The bleeding is not controlled.
  - There is sustained hypotension & woman is not responding to treatment.
  - There are retained bits of placenta which cannot be removed manually.
  - The placenta is retained due to a constriction ring or if hours or days have passed since delivery as in these cases it may not be possible to get the entire hand into the uterus. Do MRP, under anesthesia or refer to higher facility if MRP fails.
- While referring the woman with non-responding atonic PPH, Uterine tamponade may be given as a life saving measure using Foley's catheteralong with a Condom.
- During a cesarean section. The available options are:
  - Uterine artery ligation
  - Uterine compression suture
  - Hysterectomy- Subtotal/Complete

In a facility where resources are unavailable or inadequate, patient should be referred to higher centre. Following are the things to be kept in mind when referring a patient with PPH in shock

1. Keep her warm.
2. IV access (two lines; 16-18 G) with fluids.
3. Uterotonics- Inj. oxytocin 10IU in 500 ml NS@40-60 drops/minute and/or Tab Misoprostol.
4. Uterine tamponade.
5. Vaginal packing to be done if vaginal lacerations.

6. Oxygen by mask.
7. Urinary catheter.
8. Pulse oxymeter if available.
9. External aortic compression.
10. Accompanying person with referral slip duly filled.

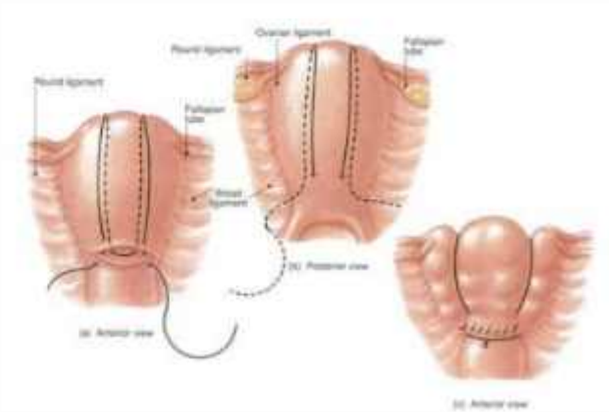
Uterine compression sutures

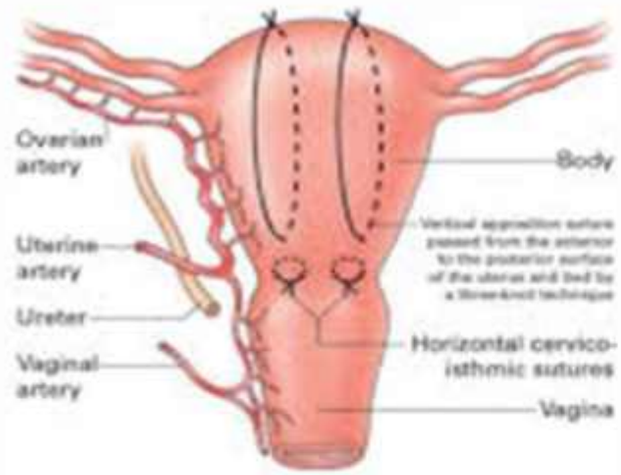
In this technique, the uterine muscles are compressed mechanically. It is simple, life-saving, safe and has capacity to preserve uterus and thus fertility. Uterine compression sutures can be B-lynch, Haymans, Cho-Cho.

Following steps are involved in the application of B-lynch procedure. The procedure is done under general anesthesia.

1. Abdomen is opened by an appropriately sized incision.
2. On opening the abdomen, lower segment incision is made and uterine cavity is entered.
3. The cavity is evacuated, examined and swabbed out.
4. The uterus is exteriorized and re-checked for bleeding. If the bleeding is diffuse, bi-manual compression is first tried to assess potential chances of success of B-Lynch suture. The vagina is swabbed out to confirm adequate control of bleeding.
5. A round body needle with no. 2 chromic catgut suture, is put in the uterus, 3 cm from the right lower edge of the uterine incision and 3 cm from right lateral border.
6. The needle is threaded through the uterine cavity to emerge at the upper incision margin 3 cm above and 4 cm from lateral order.
7. The chromic catgut now visible is passed over to compress the uterine fundus 3-4 cm from right cornual border.
8. The catgut is fed posteriorly at the same level as the entry point.
9. The catgut is pulled under moderate tension assisted by manual compression exerted by the assistant.
10. The length of the catgut is passed back posteriorly through the same surface marking for the right side, suture lying horizontally. The catgut is fed through posteriorly and vertically over the fundus to lie anteriorly and vertically compressing the fundus on the left side as occurred on the right side. The needle is passed in the same fashion on the left side through the uterine cavity and out about 3 cm anteriorly and below the lower incision margin on the left side.
11. The two lengths of the catgut are pulled tight, assisted by bi-manual compression to minimize trauma.

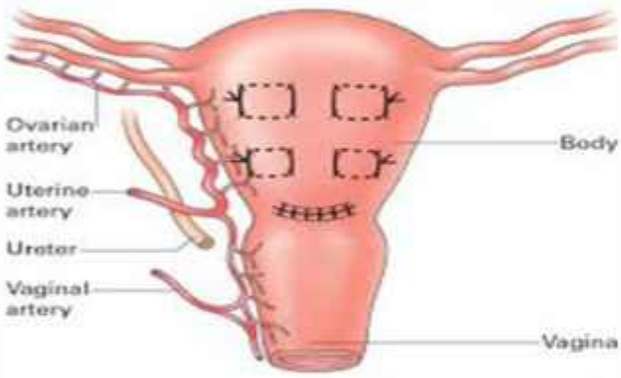
A good hemostasis is secured and knot is made, followed by 2-3 further knots to secure tension. The uterine incision and abdomen are closed in normal way.





Steps of Haymans suture

- Using absorbable suture-no 0 chromic catgut/polyglycolic suture, insert needle in lower uterine segment from anterior to posterior wall and secure with a artery forceps.
- Take another suture in lower uterine segment on other side also.



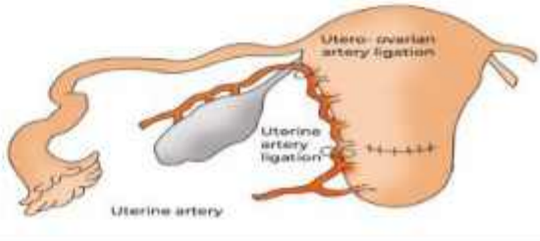
Steps of Cho Cho suture

- Using absorbable suture-no 0 chromic catgut/polyglycolic suture, on a straight needle, multiple square are taken to approximate anterior and posterior walls.

If surgeon is available stepwise devascularisation to be performed which includes uterine artery ligation and ligation of utero-ovarian anastomosis at the junction of cornua.

Uterine artery ligation

- After opening the abdomen, open the uterovesical fold of peritoneum & push the bladder down.
- Pull the uterus to expose the lower part of broad ligament.
- Feel for the pulsations of uterine artery near the junction of uterus and cervix.
- Using 0 chromic catgut/ or polyglycolic suture on a needle, pass the needle around the artery and through 2-3 cm of myometrium at the level where a transverse lower uterine segment incision would be made. Tie the suture securely.
- Place the suture as close to the uterus as possible.
- Repeat on the other side.
- Ligate the utero-ovarian artery just below the point where ovarian suspensory ligament joins the uterus.
- Repeat on the other side.



Management of Atonic PPH

Placenta expelled; uterus soft & flabby

- Call for Help, RIA - evaluate vital signs: PR, BP, RR &Temperature
- Establish two I.V. Line with wide bore cannula (16-18 gauge)
- Draw blood for grouping & cross matching
- If heavy bleeding, infuse NS/RL 1L in 15-20 minutes
- Give O2 @ 6-8 L /min by mask, Catheterize
- Check vitals & blood loss every 15 min, Monitor intake & output

- Perform continuous uterine massage
- Give Inj. Oxytocin 10 IU in 500 ml RL/ NS @ 40 drops/ min
- Do not give Inj. Oxytocin as IV bolus

Uterus still not contracted

If bleeding P/V not controlled

Inj. Ergometrine 0.2 mg IM or IV slowly
Contraindicated in high BP, Severe anemia, Heart disease

- Check for coagulation defects
- If present give blood and blood products

If bleeding P/V not controlled

Tab Misoprostol (PGE1) 800 g Per rectal

Bleeding not controlled by drugs

Explore uterine cavity for retained placental bits

- Perform Bimanual Compression of uterus
- If fails perform External Aortic compression
- Perform uterine tamponade

Surgical intervention
- Uterine compression suture (B-Lynch)
- Uterine artery ligation/Stepwise devascularisation
- Hysterectomy

Bleeding controlled by drugs

- Repeat uterine massage every 15 min for first 2 hrs
- Monitor vitals closely every 10 min for 30 min, every 15 min for next 30 min & every 30 min for next 3-6 hrs or until stable
- Continue Oxytocin infusion (Total oxytocin not to exceed 100 IU in 24 hrs)

If needed
- Inj. Ergometrine can be repeated every 15 mins (max 5 doses, 1 mg)
- Inj. Carboprost can be repeated every 15 mins(max 8 doses, 2 mg)

* Continue vital monitoring * Monitor Input/ Output * Transfuse blood as soon as available

E. TRAUMATIC PPH

Traumatic PPH is recognized when there is bleeding from the genital tract but the uterus is well contracted and placenta has been delivered completely along with the membranes. Suspect traumatic bleeding in cases of instrumental delivery, precipitate labour and previous scar in the uterus. The bleeding may be from any of the following:

- Perineum: tear or episiotomy wound.
- Vulva: ruptured varicosities, tears or a hematoma can occur (hematoma may not be obvious immediately after delivery but can cause severe pain and shock) in Vulval and Para-vaginal areas.
- Vagina: lacerations of the wall or rupture of varicosities.
- Cervix: lacerations/tear.
- Uterus: scar dehiscence, rupture or inversion of the uterus can also occur and is accompanied by marked pain and shock.
- Broad ligament hematomas.

Risk Factors for Perineal Trauma

Known risk factors

- Nullipara.
- Big baby.
- Instrumental delivery esp. forceps.
- Malposition.
- Shoulder dystocia.
- Previous perineal tear.
- Large foetal head.

Possible risk factors

- Increasing age.
- Ethnicity.
- Nutritional status.
- Use of stirrups at delivery.

General management of a case of traumatic PPH

- Check the pulse and BP and observe the general condition.
- Estimate the blood loss.
- Set up an IV line or 2 lines if woman is in shock.
- Give NS/ RL. You may also give plasma expanders if they are available and if the woman is in shock.
- If the bleeding is from the lower genital tract (vulva, perineum, lower vagina) repair the tear with catgut/ lubricated vicryl
- If a small bleeder is seen, catch it with an artery forceps and tie it with catgut/ lubricated vicryl.
- Start the woman on a broad-spectrum antibiotic such as Inj. Ampicillin 1 g stat IM followed by 500 mg orally every 6 hours for five days OR Cap. Amoxicillin 1g stat orally followed by 500 g orally every 8 hours.

Surgical Principles for Perineal Repair

- Perineal trauma should be repaired using aseptic techniques.
- Swabs and needles counted before and after the procedure.
- Good lighting is essential.
- Good anatomical alignment of the wound should be achieved.
- Tell the woman regarding the extent of the trauma, pain relief, diet, hygiene and importance of pelvic-floor exercises.
- Woman should be examined in lithotomy position.

- Visual assessment of the
  - Extent of perineal trauma.
  - Structures involved.
  - Apex of injury.
  - Assessment of bleeding.
- Rectal examination to assess any damage to external or internal anal sphincter.

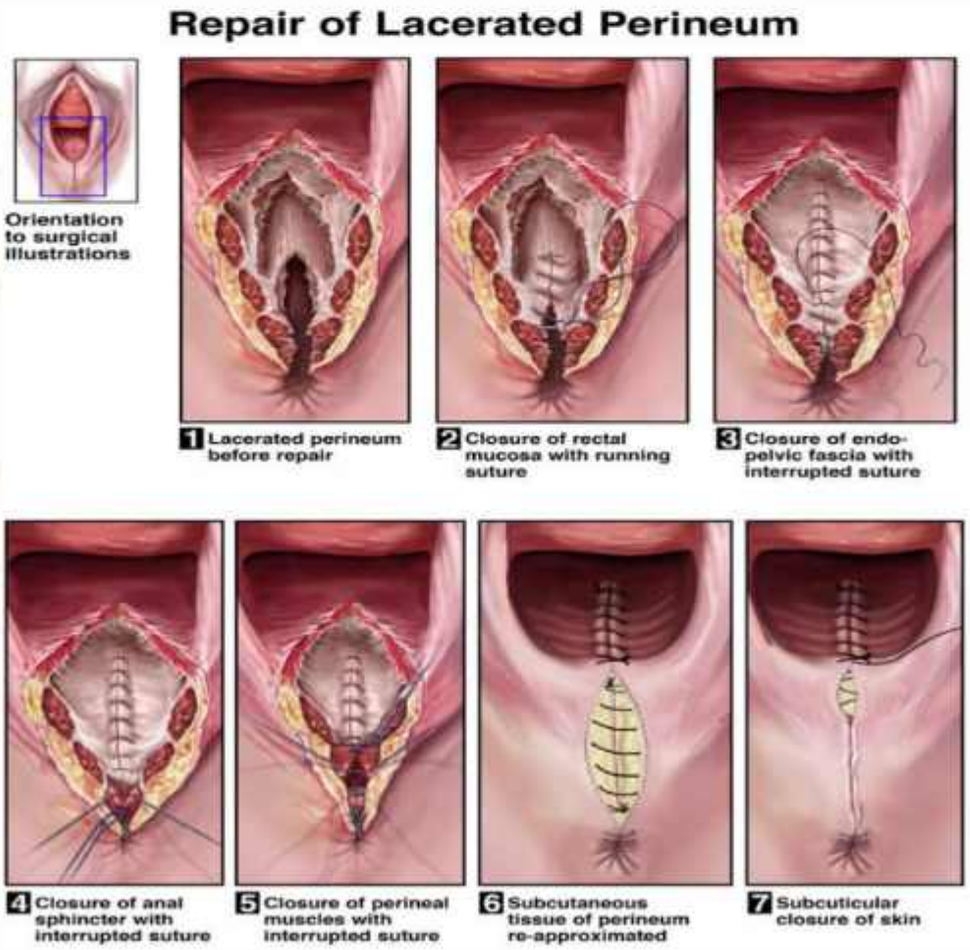
Perineal Tears

There are four degrees of perineal tears that can occur during delivery:

- First degree tears involve the vaginal mucosa and the connective tissue.
- Second degree tears involve the vaginal mucosa, connective tissue and underlying muscles.
- Third degree tears involve complete transaction of the anal sphincte.
- Fourth degree tears involve the rectal mucosa.

NOTE: It is important that absorbable sutures be used for closure. Polyglactin sutures are preferred over chromic catgut for their tensile strength, non-allergenic properties and lower probability of infectious complications. Chromic catgut is an acceptable alternative, but is not ideal.

Degree of Perineal Tears



Repair of First & Second Degree Tears

Most first degree tears close spontaneously without sutures.

- Review general care principles.
- Provide emotional support and encouragement. Use local infiltration with lignocaine.
- Ask an assistant to massage the uterus.
- Carefully examine the vagina, perineum and cervix.
- If the tear is long and deep through the perineum, inspect to be sure there is no third or fourth degree tear:
  - Place a gloved finger in the anus;
  - Gently lift the finger and identify the sphincter.
- Feel for the tone or tightness of the sphincter to access sphincter injury.
- Change to clean, high level disinfected gloves and proceed with repair.

Exposing a Perineal Tear

Local Infiltration with Lignocaine

- Apply antiseptic solution to the area around the tear.
- Make sure there are no known allergies to Lignocaine or related drugs & give local anesthesia.
- Infiltrate beneath the vaginal mucosa, beneath the skin of the perineum and deeply into the perineal muscle using about 10 ml 1% Lignocaine solution.

Note:

- If more than 40 ml of Lignocaine solution will be needed for the repair, add adrenaline to the solution.
- Aspirate (Pull back on the plunger) to be sure that no vessel has been penetrated. If blood is returned in the syringe with aspiration, remove the needle. Recheck the position carefully and try again. Never inject if blood is aspirated. The women can suffer convulsions & death if IV injection of lignocaine occurs.

- After giving Local anesthesia, wait 2 minutes and then pinch the area with forceps. If the woman feels the pinch, wait for 2 more minutes and then retest.

Repairing the vaginal mucosa

- Repair the vaginal mucosa using a continuous 2-0 suture
  - Start the repair about 1 cm above the apex (top) of the vaginal tear. Continue the suture to the level of the vaginal opening.
  - At the opening of the vagina, bring together the cut edges of the vaginal opening.
  - Bring the needle under the vaginal opening and out through the perineal tear and tie.

Repairing the perineal muscles

- Repair the perineal muscles using interrupted 2-0 suture. If the tear is deep, place a second layer of the same stich to close the space.

Repairing the skin

- Repair the skin using interrupted (or subcuticular) 2-0 sutures starting at the vaginal opening.

- If the tear was deep, perform a rectal examination. Make sure no stitches are in the rectum.

Third and Fourth Degree Perineal Tears:

Identification of third and fourth degree perineal tear is made by assessing anal sphincter. Damage to anal spincter alone is third degree perineal tear and damage to anal mucosa along with anal sphincter constitutes fourth degree perineal tear.

Repair of Third and Fourth Degree Perineal Tears

Ideally a woman with a third & fourth degree perineal tear has to be referred to District Hospital/ Medical College for repair. Stabilize the patient, dress the wound, give antibiotics and then refer.

Referral and transfer

- The woman may be referred to a higher facility (District Hospital/ Medical Colleges) if
  - The bleeding is not controlled.
  - There is sustained hypotension & woman is not responding to treatment.

While referring the woman with traumatic PPH, do tight packing of vagina and cervix with ribbon gauze.

In case it is not possible, repair of tear may be done at FRU. The woman may suffer loss of continence of faeces or gas if a torn anal sphincter is not repaired correctly. If a tear in the rectum is not repaired, the woman can suffer from infection and rectovaginal fistula (passage of stool through the vagina).

- Repair the tear in the operating room.
- Review general care principles.
- Provide emotional support and encouragement. The repair can be done using local infiltration with Lignocaine and injection Tramadol i.m.
- Ask an assistant to massage the uterus and provide fundal pressure.
- Examine the vagina, cervix, perineum and rectum.
- To see if the anal sphincter is torn:
  - Place a gloved finger in the anus and lift slightly;
  - Identify the sphincter, or lack of it
  - Feel the surface of the rectum and look carefully for a tear.
- Change to clean, high level disinfected gloves.
- Apply antiseptic solution to the tear and remove any faecal material, if present.
- Make sure there are no allergies to Lignocaine or related drugs.
- Infiltrate beneath the vaginal mucosa, beneath the skin of the perineum, and deeply into the perineal muscle using about 10 mL 1% Lignocaine solution.
- At the conclusion of the set of injections, wait 2 minutes and then pinch the area with forceps. If the woman feels the pinch, wait 2 more minutes and then retest.
- Repair the rectum using interrupted 3-0 or 4-0 sutures 0.5 cm apart to bring together the mucosa. Take care to keep the knots towards the submucosa.
- Cover the muscularis layer by bringing together the facial layer with interrupted sutures;
- Apply antiseptic solution to the area frequently

Closing the muscle wall of the rectum

- If the sphincter is torn:
  - Grasp each end of the sphincter with an Allis clamp (the sphincter retract when torn). The sphincter is strong and will not tear when pulling with the clamp.
  - Repair the sphincter with two or three interrupted stitches of no.1 suture.

Suturing the anal sphincter

- Apply antiseptic solution to the area again.
- Examine the anus with the gloved finger to ensure the correct repair of the rectum and sphincter. Then change. high level disinfected gloves.
- Repair the vaginal mucosa, perineal muscles and skin as done in second degreeperineal tear repair.

Post Procedure Care

- In all cases of Perineal tear repair give injectable antibiotics for 3 days
  - InjAmpicillin 500 mg IV 8 hrs PLUS.
  - InjMetronidazole 500 mg IV 8 hrs PLUS.
  - InjGentamycin 1.5mg/kg IV 8 hrs PLUS.
- Follow this with oral antibiotics for 5 days
  - Tab Ampicillin 500 mg by mouth PLUS.
  - Tab Metronidazole 400 mg by mouth.
- In case of III & IV degree perineal tear repair, keep the woman nil orally & on IV fluid for 2 days
  - Follow up closely for signs of wound infection.
  - Give stool softener by mouth for 1 week, if possible.
  - Avoid giving enemas or rectal examination for 2 weeks

Management of Neglected Cases

A perineal tear is always contaminated with faecal material. If closure is delayed more than 12 hours, infection is inevitable. Delayed primary closure is indicated in such cases. For I & II degree tears, leave them open. For III & IV degree tears, patient is to be referred to medical college/ District Hospital for further management. At the time of referral stabilize the patient give antibiotics and do local dressing.

Complications

- If a hematoma is observed, open and drain it. If there are no signs of infection and the bleeding has stopped, the wound can be reclosed & further follow the steps of post procedure care as given above.
- If there is signs of infection, open and drain the wound. Remove infected sutures and debride the wound- start antibiotics.
  - Ampicillin 500 mg by mouth four times per day for 5 days PLUS.
  - Metronidazole 400 mg by mouth three times per day for 5 days
  - Inj. Gentamycin 80 mg IM 12 hrly x 5days.
- If the infection is deep, involves muscles and is causing necrosis (necrotizing fasciitis), give a combination of antibiotics until necrotic tissue has been removed and the woman is fever-free for 48 hours.
  - Inj. Penicillin G 2 million units IV every 6 hours PLUS.
  - Inj. Gentamicin 5 mg/kg body weight IV every 24 hours PLUS.
  - Inj. Metronidazole 500 mg IV every 8 hours.
- Once the woman is fever-free for 48 hours give:

- Ampicillin 500 mg by mouth four times per day for 5 days PLUS.
- Metronidazole 400 mg by mouth three times per day for 5 days.

NOTE: Necrotizing fasciitis requires wide surgical debridement. Perform secondary closure after 2-4weeks (depending on resolution of the infection).

- Faecal incontinence may result from complete sphincter transection. Many women are able to maintain continence by the use of other perineal muscles. When incontinence persists, reconstructive surgery must be undertaken 3 months or more after delivery.
- Rectovaginal fistula requires reconstructive surgery 3 months or more postpartum.

Cervical Tears

The cervix is lacerated in more than half of all vaginal deliveries. Most of these are less than 0.5 cm and do not require any active management. Sometimes the cervical tear may be deep & may even extend to the upper third to the vagina. These injuries usually follow difficult forceps deliveries through an incompletely dilated cervix. Rarely, cervical tear may extend upward to the lower uterine segment.

Repair of cervical tears

- Review general care principles and apply antiseptic solution to the vagina and cervix.
- Provide emotional support and encouragement. Anesthesia is not required for most cervical tears. For tears that are high and extensive, give anesthesia (Pentazocine & Phenargan IV slowly.), if necessary.
- Ask an assistant to massage the uterus and provide fundal pressure, gently grasp the cervix with ring or sponge forceps at 12 o'clock position. Apply the second ring forceps away from the first. With the help of the third ring forceps if available gently move on in a clockwise direction to see the entire cervix. There may be several tears.
- Apply two ring forceps on either side of any detected cervical tear. Close the cervical tears with continuous 0 chromic catgut (or polyglycolic) suture starting beyond the apex (upper edge of tear), which is often the source of bleeding.
- If a long section of the rimof the cervix is tattered, under-run it with continuous 0 chromic catgut (or polyglycolic) suture.
- If the apex is difficult to reach and ligate, it may be possible to grasp it with artery or ring forceps. Leave the forceps in place for 4 hours. Do not persist in attempts to ligate the bleeding points as such attempts may increase the bleeding. Then:
  - After 4 hours, open the forceps partially but do not remove;
  - After another 4 hours, remove the forceps completely.
  - A laparotomy may be required to repair a cervical tear that has extended deep beyond the vaginal vault.

Repair of a cervical tear

Care after repairing a vaginal/cervical/perineal tear

- Check the woman's vital signs (pulse, BP, temperature) every 15 minutes for 1 hour, then every 30 minutes for the next 2 hours, then monitor as per the condition of the woman.

- Watch for bleeding and/or the development of a hematoma.
- Give IV fluids according to the patient's condition.
- Give prophylactic antibiotics e.g. Cap. Amoxicillin 500 mg orally every 8 hours for 5 days.
- Follow up the patient in 10 days, then in 6 weeks to check that the wound is healing properly.

Complications after repairing a tear and their management

Early complications

1. **Bleeding:** It may occur if the blood vessels have not been ligated properly. Prevent it by carefully ligating the bleeding points while suturing. Make sure that the bleeding is not coming from an atonic uterus.
2. **Hematoma:** This refers to a collection of blood in the vaginal wall, which commonly occurs as a complication of vaginal injury. It may present with vaginal or vulval swelling or intense pain and retention of urine. Prevent it by carefully ligating the bleeding points while suturing. If the hematoma is large and painful, refer the woman to higher facility, as the hematoma needs to be incised and drained under general anesthesia. Arrange blood to be transfused if needed.
3. **Retention of urine:** The woman should be encouraged to pass urine frequently. She can sit or squat for the same. If she is unable to pass urine on her own, a self-retaining catheter may have to be inserted to avoid straining. Keep the catheter in place for 48 hours under antibiotic cover.
4. **Infection:** This is a common complication and may be avoided by giving the woman prophylactic antibiotics and using an aseptic technique to repair the tear. However, if infection sets in, remove the sutures which come out or are lying loose. Remember all the sutures need not be removed at the same time. If the wound is gaping, secondary sutures need to be applied but only after the infection has cleared.

Late complications

1. **Scarring and vaginal stenosis** (narrowing) may occur in some cases of neglected tears of the vagina and may cause pain during intercourse and obstructed labour in subsequent deliveries.
2. **Cervical scarring** due to an unrepaired cervical tear may lead to prolonged labour in subsequent pregnancies because the cervix cannot dilate properly. If cervical tears are not sutured properly, it may lead to repeated abortions on account of "cervical incompetence". There is also a tendency for repeat cervical tear in subsequent deliveries at the site of the previous tear.
3. **Vesicovaginal, Vesicocervical or Recto-vaginalfistulae** can occur if vaginal or cervical tears extend into the bladder or rectum.
4. **Risk of developing Anal Incontinence** or risk of worsening symptoms in subsequent pregnancies. All women who have sustained an obstetric anal sphincter injury in a previous pregnancy and who are symptomatic should have the option of elective caesarean birth.

F. DELAYED PPH

All cases of PPH occurring between 24 hours after delivery and 6 weeks postpartum are considered as Delayed postpartum hemorrhage or Secondary postpartum hemorrhage. Bleeding is variable & may be light or heavy, continuous or irregular & foul smelling. Delayed PPH could be because of retained placental fragments or may be a sign of metritis.

Uterus is softer and larger than expected for the

elapsed time since delivery.

Causes of Delayed or Secondary PPH:

- Subinvolution of the uterus - retained placental tissue and/or endometritis, fibroid uterus.
- Lower genital tract lacerations/hematoma.
- Surgical injury.
- Dehiscence of cesarean section scar.
- Vascular abnormality - arteriovenous malformation.
- Placental abnormality - placenta accreta, percreta and increta.
- Choriocarcinoma.
- Coagulopathies and bleeding disorders.

Risk Factors:

Pre-existing risk factors: history of maternal smoking, history of secondary PPH in previous pregnancies, multi parity

Antepartum risk factors: premature rupture of membranes, threatened abortion, multiple pregnancy, antepartum hemorrhage, hospital admission during the third trimester.

Intrapartum risk factors: delivery by cesarean section, precipitous labor, prolonged third stage, Incomplete placenta or membranes passed at birth, or both.

Postpartum risk factors: primary postpartum hemorrhage, no breast feeding, postnatal sepsis.

Signs and Symptoms:

Clinically, bleeding is variable & may be light or heavy, continuous, or irregular & foul smelling. The amount of blood loss at presentation varies but most patients are hemodynamically stable.

Complete history taking regarding parity, labor, mode of delivery, third-stage or puerperal complications and any relevant medical and family history is important.

Clinical signs and symptoms at the time of presentation may include offensive lochia, abdominal cramping, uterine tenderness, pyrexia, uterus is softer and larger than expected for the elapsed time since delivery with an open cervical os.Delayed PPH could be because of retained placental fragments or may be a sign of metritis.

Investigations: Baseline blood tests include full blood count, coagulation studies, C-reactive protein, serum HCG. Vaginal swabs should be taken at the time of examination for aerobic as well as anaerobic bacterial growth, including swabs from episiotomy or vaginal tear sites.

KEY INVESTIGATIONS

- Full Blood Count
- Urea and Electrolytes
- C-Reactive Protein
- Coagulation profile
- Blood culture

(if the patient has pyrexia)

In women with signs of infection, a mid-stream urine specimen should be collected and, if maternal temperature is more than 38°C, blood cultures should be obtained.

Ultrasound imaging of the pelvis should be considered if there are concerns of retained placental tissue. If this is obtained within 7-14 days of delivery, interpretation may be difficult as remaining blood clots may appear as mixed echogenic material in a similar manner to retained tissue.

Management of Delayed PPH

- Massage the uterus so that it contracts and expel any clots. You may need the help of an assistant to continue uterine massage.
- Give Inj. Oxytocin 10 IU IM.
- Assess the patient's condition by doing a Rapid Initial Assessment (pulse, BP, colour, consciousness, uterine tone, urinary output) and estimate how much blood has already been lost.

- Establish two IV lines with an 18- or 16-gauge needle.
- Withdraw blood for grouping & cross matching and bleeding time &clot retraction time.
- If bleeding heavy infuse NS/RL 1 L in 15-20 mins. If the woman is actively bleeding and hemodynamically unstable and blood still not available, transfuse 3 units crystalloid for each unit of blood loss.
- Catheterize the patient to facilitate uterine contraction and to assess the urine output in case of shock.
- If the woman is in shock, make sure that the airway is open, turn her head to one side, and give her oxygen @ 6-8 L/minute through a mask or nasal cannula. Raise the foot end of bed (by one foot) in case of shock.
- Infuse Oxytocin 10 IU in 500 ml of IV fluids (NS or RL) @ 60 drops/minute to keep the uterus well contracted. Continue Oxytocin infusion @ 40 drops/minute. No more than 100 U of Oxytocin should be given in 24 hours. Oxytocin should never be given as an IV bolus.
- Start broad spectrum antibiotics if signs of infection are present as follows-

✓ Tab.Ampicillin 500 mg by mouth four times per day for 5 days PLUS.

✓ Tab. Metronidazole 400 mg by mouth three times per day for 5 days.

✓ Inj. Gentamycin 80 mg IM 12 hrly x 5days.

- Remove large clots & placental fragments if cervix is dilated. If cervix is not dilated, evacuate the uterus.
- If patient is anemic, manage with blood transfusion or oral anemia supportive care as required.
- Rarely if bleeding continues, refer the woman to a District Hospital or Medical College for further management.
- Send evacuated tissue for histologic examination to rule out trophoblastic tumour.
- Consider Uterine/Utero-ovarian artery ligation if bleeding continues.

Uterine inversion

Acute inversion of the uterus is a rare condition. The inversion may be complete or incomplete. Acute inversion of the uterus is often followed by circulatory collapse that may be associated with neurogenic shock due to pull on the infundibulo-pelvic ligaments. The woman needs immediate management, as the condition can be fatal.

Causes

- There may be a h/o pulling on the umbilical cord in the absence of a uterine contraction, during the third stage of labour, in an effort to deliver the placenta OR
- There may be a h/o pulling on the cord in the presence of "placenta accreta" (i.e. an implantation of the placenta in which there is an abnormally firm adherence to the uterine wall) OR
- There may be a h/o excessive fundal pressure given on a relaxed uterus in an effort to deliver the baby or placenta.

Examination

- The woman may present in shock.
- The uterus may be contracted or relaxed, depending on whether the placenta has been delivered or not.
- The uterine fundus is seen outside the introitus or in the vagina.

Prevention

- Do not pull on the cord in the absence of a uterine contraction.
- Always apply "counter-traction" with the other hand while carrying out CCT.
- Do not apply fundal pressure to deliver the baby or the placenta.

Management

- Manage only those cases where the inversion has occurred in health facility at the time of delivery.
- The moment inversion is diagnosed, call for the anesthetist.
- All cases of uterine inversion brought from the community or after some delay should be referred to higher facility after stabilization, do dressing of the inverted uterus by saline soaked gauge and appropriatefilling up a Referral Form.
- Rapidly evaluate the woman's condition.
- Examine her vital signs i.e. pulse, BP and look for pallor to assess for the presence of shock.
- Ask/ look whether the placenta has been delivered or not.
- Take a written informed consent of the woman or any family member accompanying her, in case the woman is not in a position to give informed consent.
- Start IV fluids (RL) to be infused fast

Manual repositioning of the uterus:

- Give general anaesthesia. If not available, give pethidine and diazepam i.v. slowly (don't mix in same syringe). If none available, give Inj Tramadol 50mg i.m.
- Ensure aseptic precautions i.e. wear sterile gloves and clean perineum with antiseptic swabs.
- Insert a hand into the vagina. Feel for the cervical rim.
- Repose the uterus back, starting with the part that comes out last. (Remember, during inversion, the fundus comes out first and the portion of the uterus just above the cervix comes out last.) Thus, the part of the uterus just above the cervix is reposed first, gradually going up.
- Usually after a certain point, the fundus moves up on its own.
- If the placenta is not separated even after the procedure, remove the placenta manually. Do not remove the placenta, if retained, before vaginal replacement of the uterus as it can lead to severe hemorrhage.
- Give an oxytocic drug (Oxytocin or Misoprostol) before removing the hand from the vagina. Start 10 U of Oxytocin infusion in 500 ml RL/NS @ 40-60 drops/min.
- Monitor the pulse, BP and uterine fundal height every 15 minutes for the next 2 hours, every hour for the next 4 hours and every 6 hours for the next 24 hours.
- If inversion of the uterus recurs, cover the inverted uterus with saline soaked gauze and refer her to higher facility after stabilization and properly filling up the Referral form.
- Start the woman on antibiotics.
  - Cap. Ampicillin, 500 mg 8 hourly.
  - Tab. Metronidazole 400 mg 8 hourly.
  - Inj. Gentamicin 80 mg IM every 12 hours.

Placenta to be removed only after manual reposition of uterus.

- All cases of uterine inversion brought from the community or after some delay should be referred to higher facility. Following measures are to be taken at the time of referral-
- Stabilization.
- Fill the Referral Form appropriately.
- Cover the inverted uterus with saline soaked gauze.

CHAPTER 12

POSTPARTUM ASSESSMENT AND CARE OF MOTHER AND NEWBORN

KEY LEARNING OBJECTIVES

By the end of this session, the participants will be able to diagnose and manage appropriately the following conditions and situations:

A. **Postpartum Assessment and Care of Mother**

B. **Puerperal pyrexia**

C. **Puerperal sepsis**

D. **Post natal care of neonate**

E. **Septicemia**

F. **Neonatal jaundice**

➢ **Important points:**

- The first 48 hours following delivery is the most critical in the entire postpartum period
- Heavy bleeding per vaginum, convulsions or loss of consciousness, abdominal pain & fever, foul smelling discharge are important danger signs
- Postpartum checkup at facility should take place within first 24 hrsand at 6th week following delivery
- Home visits on 3rd day, 7th day, 14th day,21th day, 28th day and 42nd day of post natal period by ASHA/ANM
- Rooming in of Neonate.
- Initiate early and exclusive breast feeding
- Every visit explain danger signs and reinforce the need for subsequent postnatal visit

A. POSTPARTUM ASSESSMENT AND CARE OF MOTHER

Research has shown that more than 50% of maternal deaths take place during the postpartum period. Conventionally, the first 42 days (6 weeks) after delivery are taken as the postpartum period. Of this, it is the first 48 hours, followed by the first one week, which are the most crucial periods for the health and survival of both the mother and her newborn, as most of the fatal and near-fatal maternal and neonatal complications arise during this period.

Of all the components of maternal and child health care delivery, postnatal care (PNC) and early newborn

care are the most neglected components. In India, where 1 in 5 births occur at home, 13% of newborns born at home are reported to receive PNC within 24 hours of birth. Only 1 in 6 women receives care during the postpartum period in India. The National Family Health Survey 4 (NFHS 4) data suggest 62.4% of the mothers receiving postnatal care by a health worker within 2 days of delivery. Even out of this fraction of women, most were not provided the entire range of information and services that should have been provided to a woman during a postpartum visit.

Postnatal check-ups

The number and timing of PNC visits

Visits	After Home delivery/ delivery at SC*	After delivery at PHC/ FRU* (Woman discharged after 48 hrs)
First Visit	1st day (within 24 hrs)	Not applicable
Second Visit (home visit)	3rd day after delivery	3rd day after delivery
Third Visit (home visit)	7th day after delivery	7th day after delivery
Fourth visit (home visit)	14thday after delivery	14thday after delivery
Fifth Visit (home visit)	21st day after delivery	21st day after delivery
Sixth Visit (home visit)	28th day after delivery	28th day after delivery
Seventh Visit (facility based)	6 weeks after delivery	6 weeks after delivery

The first 48 hours following delivery are the most critical in the entire postpartum period. Most of the important complications of the postpartum period which can lead to maternal death occur during these 48 hours. Hence, a woman who has just delivered needs to be closely monitored during the first 48 hours.

- If you have been involved in the delivery, make sure that the woman is not discharged before at least 48 hours have elapsed since delivery. Hence, the important complications, which are likely to occur during this period, can be taken care of.
- The next most critical period is the first week following delivery. A substantial number of complications can occur during this period, both for the mother as well as for the baby.

First postpartum check-up: Mother

The first postpartum visit should take place within the first 24 hours after delivery. Proper history taking is especially important if you were not present for the delivery. Review the events of labour and birth to identify any risk factor or events during the birth that may be important in the management of the mother and the baby.

Counselling for General and Perineal Hygiene of Mother

- She should wash the perineum (with or without episiotomy) from front to back daily and after passing urine or stools.
- The perineal pads must be changed every 4-6 hours or more frequently if there is heavy lochia.
- She should bathe daily.
- She should wash her hands before and after handling the baby, especially after cleaning and before feeding the baby.

SEE

Look for

- Pulse, BP, temperature & respiratory rate.
- Pallor.
- If uterus is well contracted (hard and round) and to rule out the presence of any uterine tenderness.
- any foul-smelling lochia, tear, swelling at perineumor pus discharge.
- Excessive bleeding per vaginally.
- Lump or tenderness in breasts.
- Condition of nipples.
- Observe breast feeding.

SAY (Counsel)

Counsel regarding.

1. General and Perineal Hygiene of Mother.
2. Rooming in of the mother with the baby.
3. Diet & rest.
4. Resumption of sex.
5. Contraception.
6. Breast feeding.
7. Registration of birth.
8. IFA supplementation.

Counselling for General and Perineal Hygiene of Mother

- She should wash the perineum (with or without episiotomy) from front to back daily and after passing urine or stools.
- The perineal pads must be changed every 4-6 hours or more frequently if there is heavy lochia.
- She should bathe daily.
- She should wash her hands before and after handling the baby, especially after cleaning and before feeding the baby.

Diet & rest

- Inform the woman that during lactation she needs approximately 550 kcal (approx. 25% more) extra in a day during the first 6 months, and then 400 kcal extra during the next 6 months compared to her pre-pregnancy diet.
- Foods rich in calories, proteins, iron, vitamins and other micronutrients should be advocated.
- Whatever is cooked at home should be encouraged for lactating women.
- Non vegetarian diet including eggs, well cooked meat should also be advised
- Advise her to refrain from observing taboos that exist in the community against nutritionally healthy foods (e.g. the taboo against eating solid food for six days after delivery).
- Encourage foods that promote lactation as shown in **Fig 1.**

Counseling for Caring for Newborn

- How to bathe the newborn
- Maintain warmth.
- Exclusive breast feeding.

Resumption of sex

- The couple should be advised to abstain from having sex during the first 6 weeks following delivery or till the perineal/episiotomy wound heals (if present). This is to allow the genitalia and the reproductive organs to involute to their original size. Women have relative hypo-oestrogenaemia during the postpartum period. This will result in lack of vaginal lubrication & a dry vagina will make the act of intercourse painful for the woman.

Contraception

- Advise the couple on birth spacing or limiting the size of the family.
- The various choices of contraceptive methods available to the couple must be explained so that they can make an informed choice.

Assess Breastfeeding

Ask the mother if she has already put the infant to the breast. If the mother has already started breastfeeding, praise the mother for starting the breastfeeding in time. If the mother has not yet started breastfeeding, counsel her to put the infant to the breast. Talk to the mother to answer any questions about breastfeeding that she may have.

If infant has not been fed in the previous hour, ask the mother to put her infant to the breast. Observe the breastfeeding for 4 minutes.

- Is the infant able to attach? To check attachment, look for:

  Chin touching breast.

  Mouth wide open.

  Lower lip turned outward.

  More areola above than below the mouth.

Good attachment

Poor attachment

- Poor attachment results in the following:
  - It causes pain and/or damage to the nipples, leading to sore nipples.
  - The breast does not get completely emptied of milk, resulting in breast engorgement.
  - The milk supply becomes poor, so that the baby is not satisfied and is irritable after feeding.
  - The baby does not put on enough weight.
- If not well attached, help the mother to position so that the baby attaches well to the breast.

Proper position of the baby while breast feeding involves:

- Baby's body is well supported.
- The head, neck and the body of the baby are kept in the same plane.

  - Entire body of the baby faces the mother.
  - Baby's abdomen touches mother's abdomen.
- Is the infant suckling effectively (that is, slow deep sucks, sometimes pausing)?
  - If not sucking well, then look for ulcers or white patches in the mouth (thrush).
  - If the baby has oral ulcers or thrush, teach the mother to apply 0.25% GV paint locally twice daily for 5 days. Follow up in 2 days.
- If there is difficulty or pain while feeding, then look for
  - Engorged breasts or breast abscess.
  - Flat or inverted, or sore nipples.

Breast Milk Expression

It is useful for all mothers to know how to express and store their milk.

Expression of breast milk is required in the following situations:

- To maintain milk production and for feeding the baby who is premature, low birth weight or sick and cannot breast feed for some time.
- Working mothers, who plan to return to work can express the milk in advance and store it for ensuring exclusive breast feeding for their babies.
- To relieve breast problem e.g. engorgement.

Expressing breast milk into cup:

The mother should:

- Wash her hands.
- Sit or stand comfortably and hold the clean container near her breast.
- Put the thumb on her breast above the nipple and areola and her first finger opposite the thumb below the nipple and areola. Support the breast with other fingers.
- Press the thumb and first finger slightly inwards towards the chest wall.
- Press the breast behind the nipple and areola between the forefingers and thumb. Press the areola in the same way from the sides, to make sure that milk is expressed from all segments of the breast.
- Express one breast for at least 3-5 minutes until the flow slows; then express the other side; and then repeat on both sides.

Technique to express breast milk by hand

- Place finger & thumb each side of the areola & press inwards towards the chest wall
- Press behind the nipple & areola between your finger & thumb
- Press from the sides to empty all segments
- Wash the container thoroughly with soap and water before collecting milk in it.
- Cover the container of expressed breast milk (EBM) with a clean cloth or a lid.
- EBM can be kept at room temperature for 8 hours, in the refrigerator for 24 hours and in the deep freeze at -20°C for 3 months.
- EBM stays in good condition longer than animal milk because of the protective substances it contains. It is not advisable to boil the EBM. If it needs to be warmed, place the container in a bowl of warm water.
- Gently shake the container to recombine the separated fat globules with the rest of the milk before feeding.

Feed with cup or spoon or paladai, never feed with bottle.

Cup/spoon feeding with expressed breast milk:

If the baby is not sucking effectively on the breast, the baby may be given expressed breast milk. Counsel mother to shift back to breast feeding as soon as possible. One can use a cup of glass or stainless steel which has rounded edge. One can also use a paladai or spoon.

Ask mother to:

- Measure a quantity of milk into cup/spoon.
- Hold the baby in a semi-upright, sitting position on her lap.
- Hold the cup of milk/spoon to the baby's lips
  - Touch the edge of cup/spoon to outer parts of upper lip.
  - Tilt cup/spoon so that milk reaches the baby's lips.
  - Do not pour milk into baby's mouth. It can cause aspiration.

Feeding by cup (A), paladai (B), or cup and spoon (C).

Counselling

Advise the Mother and the Family on Home Care.

Home care advice includes the following:

- To breastfeed the infant frequently, as often and as long as the infant wants, day and night, during sickness and health.
- The best way to maintain temperature or warm a baby with low temperature is by placing the baby in skin to- skin contact with the mother (or any adult).

Points to remember about breast Feeding

- Start breastfeeding as soon as possible after birth especially within ½ hour. Advise her to feed the baby colostrum.
- Prelacteal feeds should not be given.
- Ask her to breastfeed in a relaxed environment, free from any mental stress. Explain that breast milk is sufficient and the best for the baby. Stress exclusive breast feeding and demand feeding.
- She should breastfeed frequently, i.e. at least 6-8 times during the day and 2-3 times during the night. She should not give water or any other liquid to the baby. Emphasize that breast milk is enough in quantity to satisfy the baby's hunger and that the baby does not even require water while on breastfeeds even during hot weather.
- She should breastfeed from both breasts during a feed. The baby should finish emptying one breast to get the rich hind milk before starting on the second breast.
- If she continues to experience discomfort, she should feed expressed breast milk with a clean spoon from a clean bowl.
- If the breasts are engorged, encourage the mother to let the baby continue to suck without causing too much discomfort to the mother. Putting a warm compress on the breast may help to relieve breast engorgement.

Breast Problems during Lactation

Sore and fissured nipples, breast engorgement, mastitis and breast abscess are painful conditions of the breast commonly seen in a woman during the postpartum period. Hence, breast examination should be an essential part of routine postpartum examination of the mother.

Diagnosis

To diagnose conditions affecting the breasts examine the woman for the following:

- Measure the body temperature of the woman.
- Look at the breasts for
  - Swelling
  - Shiny skin
  - Redness
- Palpate the breasts for any tenderness.
- Look at the nipples for fissuring.
- Observe the woman during a breastfeed, if you have not yet done so.

Diagnosis of breast problems during the postpartum period.

Symptoms and signs typically present	Symptoms and signs sometimes present	Probable diagnosis	Treatment
• Retracted Nipple • Nipple sore or fissured		Retracted nipple Baby is not well attached	**Retracted nipple:** Manually stretch and roll out the nipple several times a day or with 10 ml plastic syringe- pull out the nipple **Nipple sore/ fissued:** Check attachment and apply hind milk
• Breast pain and tenderness • Occurs 3-5 days after delivery • Temperature is <38 ºC • The baby is not attaching well	• Hard and enlarged breasts • Breasts are shiny and patchy red • Both the breasts are affected	Breast engorgement	Described later
• Breast pain and tenderness • Reddened, wedge-shaped area on the breast • Occurs 3-4 weeks after delivery	• Inflammation preceded by engorgement • Usually only one breast is affected	Mastitis	Treat with antibiotics, analgesics Continue breast feeding
• Firm, acutely tender breast • Overlyingerythema	• Fluctuant swelling in the breast • Draining pus	Breast abscess	Treat with antibiotics, analgesics Continue breast feeding Drain the abscess

Not enough milk- Many mothers complain that they do not have enough milk.

- Reassurance is needed if baby is gaining weight adequately, passing urine 6-8 times/day and sleeps for 2-3 hrs after each feed.
- Common causes of not enough milk include -
  - Less fluid intake,

- Not enough frequency of breast feeding,
- Too short or hurried breastfeeds,
- Poor suckling position,
- Poor oxytocin reflex,
- Breast engorgement or mastitis.

- If baby is not gaining weight adequately, ask the mother to feed the baby more frequently and feed especially during the night (exclusive breast feeding). Make sure that attachment is proper.
- Advise plenty of fluids, and milk.
- Any painful condition in mother such as sore nipple, mastitis should be managed promptly.
- Initiating early suckling prevents breast feeding problems.

Breast engorgement

Breast engorgement is an exaggeration of the lymphatic and venous engorgement that occurs before lactation. It is not the result of over distension of the breast with milk.

- If the woman is breastfeeding and the baby is not able to suckle, encourage the woman to express milk by hand or with a pump.
- If the woman is breastfeeding and the baby is able to suckle.
  * Encourage the woman to breastfeed more frequently, using both breasts at each feeding.
  * Show the woman how to hold the baby and help it attach (proper positioning and attachment).
  * Relief measures before feeding include:
    - Apply warm compresses to the breasts just before breastfeeding, or encourage the woman to take a warm shower.
    - Massage the woman's back and neck.
    - Have the woman express some milk manually before breastfeeding.
  * Relief measures after feeding may include:
    - Support the breasts with a binder or brassiere.
    - Apply cold compresses to the breasts between feeds to reduce the swelling and pain.
    - Give Tablet Paracetamol 500 mg orally as needed.
  * Follow up in 3 days to ensure response.
- If the woman is not breastfeeding (due to separation from the child or death of the child).
  * Support the breasts with a binder or a brassiere.
    - Apply cold compress to the breast to reduce the swelling and pain.
  * When the breasts are tender and full, express just enough to give the woman relief. Do NOT empty the breasts fully. This will help suppress lactation gradually.
  * Avoid massaging or applying heat to the breasts.
  * Avoid stimulating the nipples.
  * Give Tablet Paracetamol 500 mg orally as needed.
  * Follow up in 3 days to ensure response.
  * To suppress lactation in case the baby expires, use dopamine agonists like bromocriptine/ cabergolin.

Mastitis

- Treat with antibiotics:
  - Cap. Ampicillin 500 mg orally three times a day for 10 days: if there is no improvement after 72 hours, change to another antibiotic OR
  - Tab Erythromycin 250 mg orally three times a day for 10 days.
- Encourage woman to:
  - Continue breastfeeding.
  - Support the breasts with a binder or a brassiere.
  - Apply cold compresses to the breasts between feeds to reduce the swelling and pain.
- Give Tablet Paracetamol 500 mg orally.
- Follow up in 3 days to ensure response.

Breast abscess

- Treat with antibiotics:
- Cap. Ampicillin 500 mg orally four times a day for 10 days: if there is no improvement after 72 hours change to another antibiotic OR
- Tab Erythromycin 250 mg orally three times a day for 10 days.
- Drain the abscess taking aseptic precautions.
  - Ideally perform drainage under GA or IM analgesia.
  - Make a radial incision on the breast from alveolar margin towards periphery of breast to avoid injury to milk ducts.
  - Use a finger or tissue forceps to break up the pockets of pus.
  - Loosely pack cavity with gauze.
  - Remove gauze after 24 hrs & redress the wound.
  - If there is pus in the cavity, place a small gauze in the cavity & bring the edge out through the wound as a wick to facilitate drainage of remaining pus.
- Encourage woman to:
  - Continue breastfeeding from the normal breast even when there is a collection of pus.
  - Express milk from the diseased breast.
  - Support the breasts with a binder or brassiere.
  - Apply cold compresses to the breasts between feeds to reduce the swelling and pain.
  - Give Tablet Paracetamol 500 mg orally as needed.

IFA supplementation

- She should take one IFA tablet daily for three months.
- If she was anemic before delivery, recheck her Hb level.
- If Hb< 11 g/dl, then advise her to take two IFA tablets daily for three months & if after one month her Hb level has not improved, refer her to higher center for investigation & management.
- If Hb< 7g/dl transfuse blood or give parenteral iron sucrose.

Counsel about Danger signs of Mother

Counsel mother to come to the FRU in case of the following:

- Excessive bleeding, i.e. soaking more than 1 pad every hour in postnatal period.
- Convulsions.
- Fever.
- Severe abdominal pain.
- Difficulty in breathing.
- Foul-smelling lochia.

Second Third and fourth postpartum check-ups: Mother

As mentioned earlier, the second, third and fourth partum check-up should take place on the 3rd, 7thand 14thday respectively, following delivery. This checkup is to be done at home by ASHA/ANM.

During each visit, ASHA/ANM must ask same questions about how she is feeling and look for any danger signs. ASHA/ANM At the same time, exclusive breastfeeding, contraception and general counseling about perineal hygiene, diet, rest, supplements must be reinforced.

Fifth Postpartum check-up: Mother

As mentioned earlier, the fifth postpartum check-up should take place at the 6th week of delivery. Special mention should be to know if her vaginal bleeding has stopped, if her menstrual cycle resumed. Rest of it remains same as earlier visits. Motivate for contraception.

Discharge of the Mother and the Baby

Mother	Baby
Ensure that the uterus is hard and is not bleeding. • Counsel the mother about: • Diet and rest • Exclusive breastfeeding • Need to take IFA tablets • Family planning • Hygiene to prevent infection of mother and baby • Avoiding sexual intercourse till perineal wound heals • When to return for follow-up	Ensure that the baby is warm, breathing normally, accepting and retaining breast milk, and that the cord is clean. • The baby should receive: • BCG • OPV-0 • Hepatitis B-0 vaccinations preferably before discharge from the health facility. A record of these vaccinations should be entered in the baby's card. • Complete immunization of baby
Danger signs - return Immediately • Increase in vaginal bleeding • Convulsions • Fast or difficult breathing • If mother has fever and is too weak to get out of bed • Severe abdominal pain • Swollen red or tender breast • Dribbling of urine or inability to pass urine • Pain in the perineum or draining pus	Danger signs - return immediately • If baby is breastfeeding poorly • If baby develops fever or feels cold to the touch • Has difficulty in breathing • Has blood in the stool • If the palms and soles are yellow • Has convulsions

Checklist at discharge

- Confirm stay at facility for 48 hours.
- Does the mother need antibiotics- Yes/ No
  - If the mother has temperature≥38 C, or foul-smelling vaginal discharge- give antibiotics and delay discharge.
- Is the Blood pressure normal - Yes/ No
  - If the mother has BP≥140/90 mm Hg, and/or feature of severe preeclampsia, start antihypertensive and magsulf if required and delay discharge.
- Is the mother bleeding abnormally- Yes/ No
  - If the mother has pulse≥110, or and blood presuure<90 mm Hg- start IV fluids and delay discharge.
- Does the baby need antibiotics- Yes/ No
  - If the baby has respiratory rate >60/ min or <30/min or chest indrawingor poor movement on stimulation or temperature< 35C or temperature≥38 C, or stopped breast feeding or umbilicus draining pus- give antibiotics and delay discharge and give special care.
- Is the baby feeding well- Yes /No
  - If no establish good breast feeding practices and delay discharge.
- Discuss contraception.
- Schedule next follow up visit.

Postpartum Psychological Problems

Postpartum emotional distress is fairly common after pregnancy and ranges from mild postpartum blues (affecting about 80% of women) to postpartum depression or psychosis. Postpartum psychosis can pose a threat to the life of the mother or baby.

Symptoms and signs typically present	Symptoms and signs sometimes present	Probable diagnosis	Treatment
Exhaustion, irritability, weepiness, low energy and motivational levels, feelings of helplessness and hopelessness	Obsessional thinking, fear of harming the baby or self, suicidal thoughts	Postpartum depression	Psychological support In severe cases anti depressants to be started
Delusions or hallucinations, insomnia, preoccupation with the baby, severe depression, anxiety, impulses	Despair and suicidal or infanticidal thoughts	Postpartum psychosis	Psychological support In severe cases anti psychotics to be started

Postpartum Depression

Postpartum depression affects up to 34% women. It typically occurs in early postpartum weeks or months and may persist for a year or more. Depression is not necessarily one of the leading symptoms although it is usually evident. Other symptoms include exhaustion, irritability, weepiness, low energy and motivational levels, feelings of helplessness and hopelessness, loss of libido and appetite and sleep disturbances. Headache, asthma, backache, vaginal discharge and abdominal pain may be reported. Symptoms may include obsessional thinking, fear of harming the baby or self, suicidal thoughts and depersonalization.

The prognosis for postpartum depression is good with early diagnosis and treatment. More than two-thirds of women recover within a year. Providing a companion during labour may prevent postpartum depression.

Trigger Factors for postpartum depression

- Lack of social support.
- Sleep deprivation.
- Previous history of bipolar disorder or depression.
- History of abusive domestic violence.
- Fetal demise.
- Neonatal complications.
- Preeclampsia/eclampsia.
- Substance abuse/ alcohol.
- Unwanted pregnancy.

- Provide psychological support and practical help (with the baby & home care).
- Listen to woman and provide encouragement and support.
- Assure the woman that the experience is fairly common and that many other women experience the same thing.
- Assist mother to rethink the image of motherhood and assist the couple to think through their respective roles as new parents.
- If depression is severe, consider prescribing antidepressant drugs. Be aware that medication can be passed through breast milk and that breastfeeding should be reassessed.
- Care can be home-based or can be offered through day-care clinics. Local support groups of women who have had similar experiences are most valuable.

Postpartum Psychosis

- Postpartum psychosis typically occurs around the time of delivery and affects less than 1% of women. The cause is unknown, although about half of the women experiencing psychosis also have a history of mental illness. Postpartum psychosis is characterized by abrupt onset of delusions or hallucinations, insomnia, preoccupation with the baby, severe depression, anxiety, despair and suicidal or infanticidal impulses. Care of the baby can sometimes continue as usual. Prognosis for recovery is excellent but about 50% of women will suffer a relapse with subsequent deliveries.
- Provide psychological support and practical help (with the baby as well as with home care).
- Listen to the woman and provide support and encouragement. This is important for avoiding tragic outcomes.
- Lessen stress.

- Avoid dealing with emotional issues when the mother is unstable.
- If antipsychotic drugs are used, be aware that medication can be passed through breastmilk and that breastfeeding should be reassessed.

PUERPERAL PYREXIA & PUERPERAL SEPSIS

KEY LEARNING POINTS:

- Temperature of ≥ 38° C (≥100.4° F) in first 24 hours of delivery is a warning sign for puerperal sepsis.
- Pre existing anemia & malnutrition and prolonged labor is an important cause of sepsis.
- Prophylactic antibiotics should be given 15- 60 minutes min before incision of LSCS.
- In Puerperal sepsis, start broad spectrum parenteral antibiotics immediately till woman is fever free for 48 hours.
- No response after 72 hours of initiating antibiotics requires re-evaluation (check culture reports).
- Laparotomy should be done if signs of general peritonitis are present.

B. PUERPERAL PYREXIA

Low-grade fever is very common in the postpartum period, especially in the first 24 hours. The causes include dehydration, tissue trauma, reaction to foetal proteins and breast engorgement. Although fever occurring in the first 24 hours after delivery has generally been regarded as being unrelated to infection, a temperature of ≥ 38° C (≥100.4° F) or higher within the first 24 hours should alert you to the possibility of puerperal sepsis developing in the patient.

Infective causes of Puerperal Pyrexia/ Sepsis

- Localized infection of a vaginal/cervical laceration or episiotomy;
- Infection of a laceration or episiotomy which has spread to the underlying soft tissue, e.g. ischiorectal abscess;
- Infection of the uterine lining-endometritis;
- Infection of the fallopian tubes-salpingitis;
- Parametritis;
- Generalized peritonitis;
- Septic thrombophlebitis;
- Tubo-ovarian abscess;
- Broad ligament abscess;
- Abscess in the pouch of Douglas (peritoneal abscess);
- Abscesses at other sites in the abdomen or chest;
- Septicaemia (an infection that has entered the blood stream and is a very serious condition);
- Septic shock (may complicate septicaemia).
- Breast infection such as mastitis or, at a later stage, breast abscess
- UTI
- Wound infection (e.g. of the caesarean section incision).
- Thromboembolic disorders, including superficial thrombophlebitis and deep vein thrombosis, sometimes give rise to fever and tachycardia.

Diagnosis of fever after childbirth		
Presenting Symptom and Other Symptoms and Signs	**Symptoms and Signs Sometimes Present**	**Probable Diagnosis**
• Fever/chills • Lower abdominal pain • Shock • Purulent, foul-smelling lochia • Tender uterus	• Light" vaginal bleeding	**Metritis**
• Lower abdominal pain and distension • Persistent spiking fever/chills • Tender uterus	• Poor response to antibiotics • Swelling in adnexa orpouch of Douglas • Pus obtained upon culdocentesis	**Pelvic abscess**
• Low-grade fever/chills • Lower abdominal pain • Absent bowel sounds	• Rebound tenderness • Abdominal distension • Anorexia • Nausea/vomiting • Shock	**Peritonitis**
• Breast pain and tenderness 3-5 days after delivery	• Hard enlarged breasts • Both breasts affected	**Breast engorgement**
• Breast pain and tenderness • Reddened, wedge-shaped area on breast • 3-4 weeks after delivery	• Inflammation preceded by engorgement • Usually only one breast affected	**Mastitis**
• Firm, very tender breast • Overlying erythema	• Fluctuant swelling in breast • Draining pus	**Breast abscess**
• Unusually tender wound with bloody or serous discharge	• Slight erythema extending beyond edge of incision	**Wound abscess, wound seroma or wound haematoma**
• Painful and tender wound • Erythema and oedema • beyond edge of incision	• Hardened wound • Purulent discharge • Reddened area around wound	**Wound cellulitis**
• Dysuria • Increased frequency and urgency of urination	• Retropubic/suprapubic pain • Abdominal pain	**Cystitis**

• Dysuria • Spiking fever/chills • Increased frequency and urgency of urination • Abdominal pain	• Retropubic/suprapubic pain • Loin pain/tenderness Tenderness in rib cage • Anorexia • Nausea/vomiting	**Acute pyelonephritis**
• Spiking fever despite antibiotics	• Calf muscle tenderness	**Deep vein thrombosis**
• Fever • Difficulty in breathing • Cough with expectoration • Chest pain	• Consolidation • Congested throat • Rapid breathing • Rhonchi/rales	**Pneumonia**
• Fever • Decreased breath sounds	• Typically occurs postoperative	**Atelectasis**
• Fever • Chills/rigors • Headache • Muscle/joint pain	• Enlarged spleen	**Uncomplicated malaria**
• Symptoms and signs of uncomplicated malaria • Coma • Anaemia	• Convulsions • Jaundice	**Severe/ complicated malaria**
• Fever • Headache • Dry cough • Malaise • Anorexia • Enlarged spleen	• Confusion • Stupor	**Typhoid**
• Fever • Malaise • Anorexia • Nausea • Dark urine and pale stool • Jaundice • Enlarged liver	• Muscle/joint pain • Urticaria • Enlarged spleen	**Hepatitis**

C. PUERPERAL SEPSIS

Puerperal sepsis is an infection of the genital tract at any time between the onset of rupture of membranes or labour and the 42nd day following delivery or abortion in which any two or more of the following signs and symptoms are present:

- Fever of ≥ 38° C (100.4° F) or higher, measured orally on any one occasion;
- Abnormal vaginal discharge;
- Abnormal smell, foul odour of the vaginal discharge;
- Pelvic pain;
- Delay in the rate of reduction of the size of the uterus (subinvolution of the uterus; < 2 cm/day).

How puerperal sepsis occurs

Puerperal sepsis occurs due to colonization of the genital tract by microorganisms. These organisms can be introduced from within (infection of endogenous origin), or from outside (infection of exogenous origin).

Endogenous infections are caused by bacteria that normally live in the vagina and rectum without causing harm (commensals). These bacteria can become harmful if:

- They are brought into the uterus by the examining finger or by instruments during pelvic examinations
- There is bruised, lacerated or dead tissue.
- They ascend into the uterus during premature and prolonged rupture of the membranes.

Exogenous infections are introduced into the vagina from outside the body, by:

- Unclean hands and unsterile instruments.
- Foreign substances introduced into the vagina, e.g. herbs oils, etc. during an illegal and unsafe abortion.
- By sexual activity.

Puerperal sepsis can occur both intrapartum and postpartum.

- During the intrapartum period, due to PROM, the bacteria ascend and can cause chorioamnionitis. This is a very serious condition and can endanger the life of both the mother and the baby.
- During the postpartum period, puerperal sepsis may be localized to the perineum, vagina, cervix or uterus; or it can spread and also infect the fallopian tubes, the ovaries, etc. It can lead to parametritis, peritonitis and even septicaemia. It can result in complications such as DIC, and can be rapidly fatal for the woman.

Women are vulnerable to infection during the puerperium due to the large, raw placental site that is warm, dark and moist. It has a rich blood supply. The site is not far from the outside environment and the rectum. These factors make it very easy for bacteria to enter and colonize the genital tract. The scars in the cervix, vagina, and/or perineum which may have occurred during the birthing process make the genital tract even more susceptible to infection, and for the infection to spread to the underlying tissues.

The most common site of infection in puerperal sepsis is the placental site in the uterus. Other sites of infection are tears of the cervix, vagina, perineum and the site of episiotomy.

Risk factors for puerperal sepsis

Patient-related risk factors

- Poor patient hygiene
- Pre-existing anaemia and malnutrition.

- Pre-existing sexually transmitted infections (STIs)/RTIs.
- Not immunized against tetanus.
- Pre-existing diabetes.

Risk factors related to the delivery process and interventions

- Failure to follow aseptic techniques.
- Frequent vaginal examinations.
- High manipulations in the birth canal.
- Presence of dead tissue in the birth canal (due to IUD, retained placental fragments or fragments of membranes, necrosis of tissue due to prolonged labour, etc.).
- PROM.
- Prolonged/obstructed labour.
- Caesarean section, or other assisted deliver (forceps, ventouse).
- Unrepaired vaginal/cervical lacerations
- PPH.

Risk factors related to health service delivery

- Delivery by untrained persons.
- Lack of asepsis during delivery.
- Lack of routine postpartum care.
- Inadequate monitoring of the temperature during prolonged labour and after delivery.
- Non-availability of proper antibiotics.
- Inadequate management with appropriate antibiotics in a case in whom puerperal sepsis has set in.
- Further operative intervention in a case where puerperal sepsis has set in.

Providing Prophylactic Antibiotics

It is preferable to start prophylactic antibiotics before following procedure to prevent infection including:

- Cesarean section.
- Manual removal of placenta.
- Correction of uterine inversion.
- Repair of ruptured uterus.
- Postpartum hysterectomy.
- Prolonged rupture of membranes (Group B streptococcus).

Give prophylactic antibiotics 30 minutes before skin incision. Recommended antibiotic is Inj Cefazolin 1g IV or Inj Ampicillin 2g ivi. Except with cesarean section, give antibiotics when cord is clamped after delivery of newborn. One dose is enough (as effective as 3 doses or 24 hours of antibiotics). If procedure is longer than 6 hours or blood loss is 1,500 ml or more, give second dose. Ampicillin and 1st generation cephalosporin have similar efficacy in reducing postoperative endometritis. No need for more broad spectrum agents or multiple doses. If infection is suspected or diagnosed, therapeutic antibiotics are more appropriate.

Management

The basic principles of infection control should be followed to prevent the spread of infection to other women and their babies.

Women will die of puerperal sepsis and septicaemia if appropriate antibiotic therapy is not given early enough. The aim of starting antibiotic therapy immediately is to manage/treat the current infection and to stop it from spreading

further. Treat specific infection with specific antibiotics.

If response is poor after 48 hours:

- Ensure adequate dosages of antibiotics are being given.
- Re-evaluate woman for other infection or abscess.
- Treat based on reported microbial sensitivity.

End point is when:

- Woman is fever-free for 48 hours.
- Clinical examination shows woman is improving.
- Woman completes course of antibiotics.

Prevention

Puerperal sepsis is to a great extent preventable, provided certain measures are undertaken during antenatal, intranatal& postnatal period.

- Antenatal:
  - Improve Hb level to >11 gms%.
  - Treat any septic focus (skin, throat & tonsils, etc).
- Intranatal:
  - Asepsis during delivery.
- Postpartum:
  - Maintain perineal hygiene.
  - Use clean sanitary pad.

Metritis

Metritis is infection of the uterus after delivery and is a major cause of maternal death. Delayed or inadequate treatment of metritis may result in pelvic abscess, peritonitis, septic shock, deep vein thrombosis, pulmonary embolism, chronic pelvic infection with recurrent pelvic pain and dyspareunia, tubal blockage and infertility.

- Give a combination of antibiotics until the woman is fever-free for 48 hours:
  - ampicillin 2 g IV every 6 hours;
  - PLUS gentamicin 5 mg/kg body weight IV every 24 hours;
  - PLUS metronidazole 500 mg IV every 8 hours;
  - **If fever is still present 72 hours after initiating antibiotics**, re-evaluate and revise diagnosis.

Note: Oral antibiotics are not necessary after stopping IV antibiotics.

- If retained placental fragments are suspected, perform a digital Exploration of the uterus to remove clots and large pieces. Use ovum forceps or MVA if required.
- If there is **no improvement** with conservative measures and there are **signs of general peritonitis** (fever, rebound tenderness, abdominal pain), perform a laparotomy to drain the pus.
- If the uterus is **necrotic and septic**, perform subtotal hysterectomy.

Pelvic Abscess

- Give a combination of antibiotics before draining the abscess and continue until the woman is fever-free for 48 hours:
  - ampicillin 2 g IV every 6 hours.
  - PLUS gentamicin 5 mg/kg body weight IV

every 24 hours.

- PLUS metronidazole 500 mg IV every 8 hours.

- If the abscess is fluctuant in the cul-de-sac, drain the pus through the cul-de-sac. If the **spiking fever continues**, perform a laparotomy.

Peritonitis

- Provide nasogastric suction.

Infuse IV fluids.

- Give broad spectrum antibiotics until the woman is fever-free for 48 hours:
  - ampicillin 2 g IV every 6 hours;
  - PLUS gentamicin 5 mg/kg body weight IV every 24 hours.
  - PLUS metronidazole 500 mg IV every 8 hours.
- If necessary, perform laparotomy for peritoneal lavage (wash-out).

Breast

Breast Engorgement, Mastitis & Breast Abscess should be managed as discussed.

Infection of Perineal and Abdominal Wounds.

Wound Abscess, Wound SeromaAnd Wound Haematoma.

- If there is pus or fluid, open and drain the wound.
- Remove infected skin or subcutaneous sutures and debride the wound. Do not remove fascial sutures.
- If there is an abscess without cellulitis, antibiotics are not required.
- Place a damp dressing in the wound and have the woman return to change the dressing every 24 hours.
- Advise the woman on the need for good hygiene and to wear clean pads or cloths that she changes often.

Wound Cellulitis and Necrotizing Fascitis

- If there is fluid or pus, open and drain the wound.
- Remove infected skin or subcutaneous sutures and debride the wound. Do not remove fascial sutures.
- If infection is superficial and does not involve deep tissues, monitor for development of an abscess and give broad spectrum antibiotics:
  - ampicillin 500 mg by mouth four times per day for 5 days;
  - PLUS gentamicin 5 mg/kg body weight IV every 24 hours
  - PLUS metronidazole 400 mg by mouth three times per day for 5 days.
- If the infection is deep, involves muscles and is causing necrosis (necrotizing fasciitis), give a combination of antibiotics until necrotic tissue has been removed and the woman is fever-free for 48 hours:
  - penicillin G 2 million units IV every 6 hours;
  - PLUS gentamicin 5 mg/kg body weight IV every 24 hours;
  - PLUS metronidazole 500 mg IV every 8 hours;
  - Once the woman is fever-free for 48 hours, give:
  - ampicillin 500 mg by mouth four times per

day for 5 days;

- PLUS metronidazole 400 mg by mouth three times per day for 5 days.

Note: Necrotizing fasciitis requires wide surgical debridement. Perform secondary closure 2-4 weeks later, depending on resolution of infection.

- If the woman has a severe infection or necrotizing fascitis, refer the patient after first dose of antibiotics.

D. POSTNATAL CARE OF NEONATE

KEY Learning Points:

- Postnatal checkup at facility should take place within first 24 hrs and at 6th week following delivery.
- Home visits six in number on 3rd day, 7th day, 14th 21st, 28thand 42ndday of post natal period (in case of institutional delivery) and seven visits on 1st , 3rd, 7th, 14th, 21st, 28th and 42nd day of postnatal period (in case of home delivery)by ASHA/ANM.
- Rooming in of Neonate.
- Initiate early and exclusive breast feeding
- Explain danger signs at every visit and reinforce the need for subsequent postnatal visits.

Of all the components of maternal and child health care delivery, postnatal care (PNC) and early newborn care are the most neglected components.

Postnatal check-ups

The number and timing of PNC visits

Visits	After Home delivery/ delivery at SC*	After delivery at PHC/ FRU* (Woman discharged after 48 hrs)
First Visit	1st day (within 24 hrs)	Not applicable
Second Visit (home visit)	3rd day after delivery	3rd day after delivery
Third Visit (home visit)	7th day after delivery	7th day after delivery
Fourth visit (home visit)	14thday after delivery	14thday after delivery
Fifth Visit (home visit)	21st day after delivery	21st day after delivery
Sixth visit (home visit)	28th day after delivery	28th day after delivery
Seventh visit(Facility visit)	6 weeks after delivery	6 weeks after delivery

The first 48 hours and the first week following delivery are the most critical in the entire postnatal period. A substantial number of complications can occur during this period, both for the mother as well as for the baby.

Neonate

First postnatal check-up: Neonate

The first check-up is very important and should take place in the post natal ward as part of routine

morning rounds and certainly within first 24 hours of delivery.

Postnatal Environment

A postnatal room should be kept warm with no draughts from open doors or windows. A temperature of 26-28°C is required to help keep a baby warm. A mother and her baby should be kept together in the same bed right from birth. This helps the mother to get to know her baby and form an early close loving relationship (bonding), she can also respond quickly when her baby wants to feed, which helps establish breastfeeding and reduces breastfeeding difficulties.

It is important to greet the mother appropriately before starting the examination of the baby. An important reason for this is to open good communication with the mother. Using good communication helps to reassure the mother that she & her baby will receive good care.

ASK

Review the labor and birth record to identify any risk factors or any events during the birth which may be important in the management of the mother and the baby. This is especially important if you were not present at the delivery. Keep the following in mind and ask the mother:

- Does she or the baby have any problems? Record what she says.
- Has the infant passed stools? Meconium should be passed by 24 hours. If not it needs evaluation. Consult the pediatrician.
- Has the infant passed urine? Urine is passed by 48 hours, if not it is not normal & needs evaluation. Consult the pediatrician.
- Have you started breast feeding the infant?
- Is there any difficulty in feeding the infant?
- Do you have any pain while breast feeding?
- Have you given any other foods or drinks to the infant?
- If Yes, what and how?

SEE

Examine the newborn for

1. Cry and activity.
2. Check the baby's colour.
3. Check the baby's body temperature.
4. Count the respiratory rate for one minute.
5. Look for respiratory distress (severe chest indrawing, nasal flaring & grunting).
6. Look for jaundice.
7. Examine the umbilicus for any bleeding, redness or pus.
8. Examine the eyes for discharge.
9. Examine for congenital malformations and any birth injury.
10. Weigh the baby if not weighed earlier.

Cry and Activity

1. If the newborn is not alert and/or has a poor cry; is lethargic/unconscious; or if the movements are less than normal, he/she needs to be referred to the Pediatrician.
2. A LETHARGIC YOUNG INFANT is not awake & alert, is difficult to waken by stimulation & has movements less than normal. An unconscious infant cannot be wakened at all.

Respiratory rate

- Count the respiratory rate for one minute.
- The normal respiratory rate is 40-60 breaths per minute.
- Breathing rate of 60 or more breaths per minute is taken as 'fast breathing' in a neonate.
- 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'. This may be a possible sign of pneumonia.

Respiratory Distress (Chest indrawing, nasal flaring & grunting)

- Mild chest indrawing -normal in a neonate because the chest wall is very soft.
- Severe chest indrawing- (lower chest wall goes in when the infant breathes in) is a sign of pneumonia and is serious in a neonate.
- 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.

Presence of severe chest indrawing &/or nasal flaring &/or grunt indicate severe respiratory distress. Management will be discussed later.

Check the baby's body temperature.

- Temperature can be assessed by recording axillary temperature or feeling the baby. Always use a digital thermometer. Mercury thermometers are no longer used.
- Axillary temperature is recorded by placing the bulb of digital thermometer against the roof of dry axilla parallel to the body and free from moisture. Baby's arm is held close to the body to keep thermometer in place.

Severity of Hypothermia	Axillary temperature	Assessment by feeling	Initial Action
Mild	36.0C to < 36.5C	Cold feet, Warm abdomen	• Skin to skin contact (KMC) • Clothe baby adequately covering head & extremities • Ask the mother to Breast feed
Moderate	32C to < 36.0C	Cold feet and abdomen	• Put the clothed baby under Radiant warmer (Remove wet clothes) • Perform Skin to skin contact (KMC) if stable • Breast feed the baby or give expressed breast milk through paladai, spoon or oro-gastric tube in case baby is not able to breast feed.
Severe	< 32 °C	Cold feet and abdomen	• Put clothed baby under Radiant warmer (Remove wet clothes) • Give expressed breast milk through paladae/ orogastric tube. In case of feed intolerance, consult the pediatrician.

Severity of Hypothermia	Axillary temperature	Assessment by feeling	Initial Action
Fever	>37.5°C	Feels hot	• Remove excess clothing • Assess Breast feeding • Change environment (take baby to cooler place) • Perform Sepsis screen

Remember fever or hypothermia can be signs of septicemia, consult the pediatrician. Management of septicemia will be discussed later.

Examine the umbilicus:

- Umbilical stump should be inspected after 2 to 4 hours of birth. Bleeding may occur at this time due to shrinkage of cord and loosening of the ligature. If knot loose, tie again.
- The cord must be left open without any dressing.
- Do not apply any medication on the cord. The cord usually falls after 4 to 10 days. The stump should be inspected for any discharge or infection and kept clean and dry till complete healing takes place.
- If umbilical redness or umbilicus draining pus give (As per F-IMNCI)
  - Oral Amoxicillin 50mg/ kg twice a day for 5 days as syrup/ drops.
  - Follow up in 2 days.

Examine for skin infection:

- If there are pustules manage as local bacterial infection &consult the pediatrician.
- Give (F- IMNCI)
  - Oral Amoxicillin 50 mg/ kg twice a day for 5 days as syrup/ drops OR
  - Follow up in 2 days.

Check the baby's colour

- Check for jaundice. It is not normal if appears less than 24 hours after birth.
  - Get Blood group report of mother and baby.
  - Start phototherapy.
  - Consult the pediatrician.
- Check for central cyanosis (blue tongue and lips). This is an abnormality and such cases should be given oxygen. Urgently call the pediatrician.

Examine the eyes for discharge.

Check if there is discharge from eyes or they are red or if the eyelids are swollen. Refer the baby to the pediatrician.

Examine for congenital malformations and any birth injury. If there are any, refer the newborn to the pediatrician.

Weigh the baby if not weighed earlier.

Breast Feeding.

Early initiation of exclusive breast feeding is essential for a healthy baby and mother. Details on breast feeding and associated problems are discussed in detail in the chapter on Postnatal care of the mother.

When to seek care for Neonate

Advise the mother to return immediately if the neonate has any of these **danger** signs:

- Baby is unable to cry.
- Difficult breathing (severe chest indrawing or Nasal flaring or grunting)/ Fast Breathing (RR > 60 bpm).
- Breastfeeding or feeding poorly.
- Develops a fever / feels cold to touch.
- Convulsions/ Lethargic or unconscious.
- Yellow palms and soles (Jaundice).
- Inability to pass urine and stool/ Blood in stool.
- More than 10 pustules over body or one large boil.
- Eyes are red or infected.
- Any other complication.

Immunization

- The baby should receive
  - BCG
  - OPV-0
  - Hepatitis B (Hep B-0)

Follow-up

Schedule a postnatal check-up within the first week on day 3, 7, 14, 21, 28 at home by ASHA/ANM and 6 weeks of life at facility. In the follow up the baby should be assessed for growth, development and early diagnosis & management of illnesses. In addition, health education of parents should be done.

Additional home visits will be conducted by the health care worker in the 3rd month, 6th month, 9th month and 15th month. (for details refer to guidelines on Home Based Care for Young Child).

Discharge of the Baby

Baby

Ensure that the baby is warm, breathing normally, accepting and retaining breast milk, and that the cord is clean.

- The baby should receive:
- BCG
- OPV-0
- Hepatitis B-0 vaccinations preferably before discharge from the health facility. A record of these vaccinations should be entered in the baby's card.
- Complete immunization of baby.

Danger signs - return immediately

- If baby is breastfeeding poorly.
- If baby develops fever or feels cold to the touch.
- Has difficulty in breathing/ fast breathing.
- Has blood in the stool.
- If the palms and soles are yellow.
- Has convulsions.

Checklist at discharge

- Confirm stay at facility for 48 hours.
- Does the baby need antibiotics- Yes/ No
  - o If the baby has respiratory rate >60/ min or <30/min or chest indrawing or has poor movements on stimulation or temperature< 35C or temperature≥38° C, or has stopped breastfeeding or umbilicus draining pus- give antibiotics and delay discharge and give special care.
- Is the baby feeding well- Yes /No
  - o If no establish good breast-feeding practices and delay discharge.
- Schedule next follow up visit.

LBW babies (also follow the guidelines of Home-based neonatal care)

- Definition - weight < 2500 gm.
- Over 30 % neonate born are LBW.
- Nearly 75% neonatal deaths and 50%infant deaths occur among LBW.
- More prone to malnutrition, recurrent infections and neuro development handicaps.
- **Problems of LBW babies**
  - Perinatal Asphyxia.
  - Hypothermia.
  - Inability to Breast Feed.
  - Respiratory Distress Syndrome.
  - Apneic Spells.
  - Intra-Ventricular Hemorrhage.
  - Metabolic Problems like Hypoglycemia,
  - Infection, Hyperbilirubinemia.
  - Retinopathy of Prematurity.
- **LBW babies can be discharged when:**
  - Gaining weight for 3 consecutive days on breast feeding.
  - No signs of illness.
  - Able to maintain normal body temperature when roomed-in with mother.
  - Mother confident of taking care of baby.
- **Nutritional supplements**
  - All LBW 1500-2499 grams : Receive Vitamin D @ 400 IU/day and Iron supplements @ 2-3 mg/kg/day (started at 4 weeks of age) to be continued till 1 year of age.
  - All VLBW <1500 grams: Receive oral vitamins and mineral supplement as follows:
  - Vitamin D drops 400-800 IU per day till 12 months of age.
  - Multivitamin preparation 0.3-0.6 ml /day (5-10 drops)- given till 40 weeks PMA.
  - Calcium (@ 80-100 mg/kg/day) and Phosphorous (@ 40-50 mg/kg/day) given till 40 weeks PMA.
  - Iron started at 2-3 mg/kg/day at 2-4 weeks of age and provided till 12 months.
- **Counseling at Discharge**
  - Providing exclusive breast milk to baby.
  - How to keep baby warm at home.
  - Identifying 'Danger signs" for seeking medical help.
  - Scheduled visits for assessing growth, monitoring illness and providing immunization. Visits should be at weekly intervals till infant reaches 2.5kg.
  - Mother informed about her nutrition and health.

Second, Third and Fourth postpartum check-ups: Neonate.

If patients are not able to come to facility for visit, schedule home visit by ASHA or ANM(refer to Home based neonatal care).

History-taking

The same questions should be asked during history-taking as during the first postpartum check-up. If any of the problems inquired about is present, refer the baby to the Pediatrician.

Look for Normal Phenomena.

There are several phenomena after birth that are normal and mothers only need reassurance. These developmental variants may be present and be of concern to the mother.

Normal Phenomenon include:

- Milia, epstein pearls, mongolian spots, enlarged breasts, capillary nevi etc. Reassure the mother.
- Transitional stools are the passage of frequent, loose stools, yellowish-green in color between day 3 and day 14 of life. It needs NO treatment.
- Vaginal white discharge/bleeding in female babies is normal.
- Red rashes on the skin may be seen on 2nd - 3rdday of life.
- Weight loss of 5-10% (10-15% in preterms) in the first few days of life is normal and most neonates regain their birth weight by by 7 (term) -14 (preterm) days.

Examination

Observe the baby and record the following:

- Whether he/she is lethargic or not sucking well.
- If there is difficulty in breathing (fast or slow breathing and chest indrawing).
- If there is fever or the baby is cold to the touch.
- If there is jaundice (yellow palms and soles).
- Whether the cord is swollen or there is discharge from it.
- If the baby has diarrhea with blood in the stool.
- If there are convulsions or arching of the baby's body.

Refer the baby to the Pediatrician if any of the above is present.

Counselling

In addition to the lines along which counseling was provided during the first check-up, counsel the mother on the following:

- Hygiene of the baby: While bathing the baby, special attention should be paid to the head, face, skin flexures, cord and napkin area. These should be dried properly with a soft cloth.
- Inform the mother when to seek help and where to go in case the baby shows any signs of illness.
- Immunization: If baby has not received immunization at birth the baby should be immunized as per the first check-up schedule. Thereafter the schedule of Universal Immunization Programme should be followed.

Management of sick newborn

Monitoring the signs of sick newborn:

Checklist for Monitoring of Sick Newborn			
S. No.	**Checklist**	**Assessment**	**Action**
1.	Temperature	Mild Hypothermia	Re-warm by KMC
		Hypothermia (Moderate/Severe)	Re-warming under radiant warmer
		Fever (temperature 37.5°C)	Removal of excess clothing, change environment, Sepsis screening
2.	Airway	Obstructed	Open the airway (position & suction)
3.	Breathing	Apnea/ Gasping	PPV with Bag & Mask
		Respiratory Distress	Oxygen
4.	Circulation	Shock	Give 10 ml/kg Normal saline/RL over 30 min Oxygen
5.	Fluids	No Shock	Maintenance Fluid
6.	Medication & Other Management	Suspected sepsis, Jaundice	Antibiotics, Phototherapy
7.	Feeding	As per weight & age guidelines	
8.	Monitor	Temperature, Respiration, Color, Heart Rate, CRT, Danger Signs	
9.	Communication		For Home Care • Exclusive Breast feeding • Maintenance Temperature • Cord & Eye Care • Danger Sings • Maternal Death • For care during referral
10.	Follow-up		• 2 weekly for initial 2-3 visits, every month there after • Check weight, feeding, problems • Immunization

1. Septicemia

a. Diagnosis of septicemia

Bacterial sepsis in a young infant is usually suspected by the presence of one or more of the following signs:

- Unable to feed
- Convulsions
- Fast breathing (60 breaths per minute or more)
- Severe chest indrawing
- Nasal flaring
- Grunting
- Bulging fontanelle
- Axillary temperature 37.5°C or above (or feels hot to touch) or temperature less than 35.5°C (or feels cold to touch).
- Lethargic or unconsciousness,
- Less than normal movements

b. Treatment of Septicemia

- Admit in hospital.
- Consult the Pediatrician
- Where blood cultures are available, take blood for culture & start antibiotics.
- Provide supportive care for the sick neonate as described below.
- Start antibiotics. Give Injection Ampicillin and Gentamicin. Refer to Table for dose, duration and frequency.
- Most bacterial infections in neonates should be treated with antibiotics for at least 7-10 days except meningitis, Arthritis, deep abscesses and staphylococcal infections, which would require 2-3weeks of therapy.
- If not improving in 2-3 days of the antibiotic treatment, consult Pediatrician.

c. Antibiotic Therapy of Sepsis

Antibiotic	Each Dose	Frequency		Route	Duration
	(mg/kg/dose)	< 7 days age	7 days age		(Days)
Inj. Ampicillin or	50	12 hrly	8 hrly	IV.IM	7-10
Inj. Cloxacillin	50	12 hrly	8 hrly	IV	7-10
AND					
Inj. Gentamicin or	5	24 hrly	24 hrly	IV.IM	7-10
Inj. Amikacin	15	24 hrly	24 hrly	IV.IM	7-10

d. Supportive care of neonate

- Provide warmth, ensure consistently normal temperature.
- Provide bag and mask ventilation with oxygen if breathing is inadequate.
- Start oxygen by hood or mask, if cyanosed or grunting.
- Provide gentle physical stimulation, if apneic.
- Start intravenous line.
- Infuse glucose (10 percent) 2ml/kg stat if Blood sugar < 45mg/dl.
- If perfusion is poor as evidenced by capillary refill time (CRT) of more than 3 seconds, manage shock.

- Inject Vitamin K1 1mg intramuscularly.

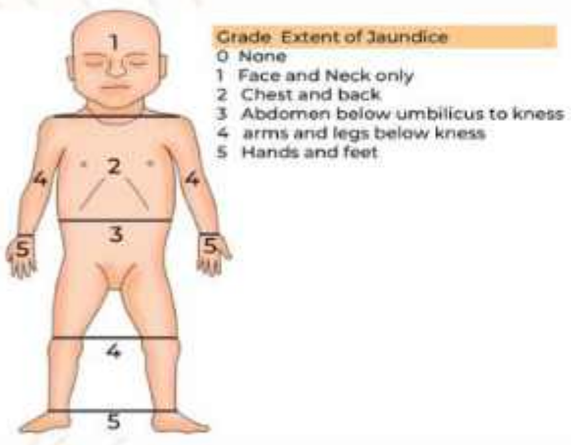
Avoid enteral feed if very sick, give maintenance fluids intravenously.

2. Neonatal Jaundice

More than 50% of normal newborns and 80% of preterm infants have some jaundice. Jaundice can be physiological or pathological. If newborn is jaundiced, the progression of skin staining is from head to toe and the level of bilirubin can be clinically assessed by extent of skin staining (Fig). Kramer's criteria are used to clinically estimate severity of jaundice. Depending on the part of the body involved, bilirubin levels can be estimated, for example if forehead and face is involved bilirubin levels would be 5-6 mg%. The box below gives a clinical guide to severity of jaundice.

Jaundice Restricted to	
Face & Trunk	S.bili < 12 mg%
On Hand & Feet	S.bili > 15 mg%

a) Assessment of Jaundice Clinically



Classical pattern of physiological jaundice: (All of the following)

- Jaundice that first appears between 24-72 hours of age.
- Maximum intensity is seen on 4-5th day in term and 7th day in preterm neonates.
- Does not exceed 15 mg/dl.
- Clinically undetectable after 14 days.
- No treatment is required but baby should be observed closely for signs of worsening jaundice.

Pattern of Pathological Jaundice

- Onset of jaundice is within 24 hrs of life.
- Clinical assessment: Jaundice beyond abdomen.
- Exceed 15 mg/dl.
- Baby is more than 14 days of age.

If any one of the above is 'yes' then do the following investigations:

- Serum bilirubin (total/direct).
- Hemoglobin/hematocrit.
- Blood groups of baby and mother (other investigations that may be required in some babies with suggestive history and relevant examination findings include sepsis screen, thyroid function test, LFTs, Ultrasonography of abdomen etc.).

b. Treatment of Jaundice

- Treatment of pathological jaundice is usually phototherapy or an exchange transfusion.
- Call or refer to pediatrician.

Steps for transfer and referral of the baby

If the baby needs to be transferred to Special Newborn Care Unit (SNCU) of your hospital or to a tertiary health facility, ensure that the transfer is safe and timely. It is important to prepare the baby for the transfer, communicate with the receiving facility and provide care during the transfer.

Preparation

- Explain to the family the reason for transferring the baby.
- Encourage transfer the mother with the baby so that she can continue to breastfeed or provide expressed breast milk.
- You or another health care worker should accompany the baby.
- Ensure that the baby is not exposed to heat or cold.

Communication

- Fill up a referral slip with the baby's essential information and send it with the baby.
- If possible, contact the health care facility in advance so that it can be prepared to receive the baby.

Care during transfer

- Keep the baby in skin-to-skin contact with the mother. If this is not possible, keep the baby dressed and covered and have the mother/relative accompany the baby.
- In hot weather, ensure that the baby does not become overheated.
- Ensure that the baby receives breastfeeds. If the baby cannot be breastfed, give expressed breast milk with a clean spoon or from a cup.
- Maintain and clear the airway, if required.
- If the baby is receiving oxygen, check the oxygen flow.
- Assess the baby's breathing. In case baby develops apnea i.e. stops breathing, give gentle tactile stimulation by rubbing the back of the baby (twice).

Skin to Skin contact (Kangaroo mother care)

- Provide privacy to the mother.
- Request the mother to sit or recline comfortably.
- Undress the baby gently, except for cap, nappy and socks.
- Place the baby prone on mother's chest in an upright and extended posture, between her breasts, in skin-to-skin contact; turn baby's head to one side to keep airways clear.
- Cover the baby with mother's blouse, 'pallu' or gown; wrap the baby-mother duo with an added blanket or shawl.
- Breastfeed the baby frequently.
- If possible, warm the room with a heating device.
- If mother is not available, skin to skin contact may be provided by the father or any other adult.

- **When skin to skin contact not possible:**
  - Keep the room warm with a home heating device.
  - Clothe the baby in 1-2 layers (Summer).

- Clothe the baby in 3-4 layers (Winter) and cover the head, hands and feet with cap, gloves and socks respectively.
- Let the baby and mother lie together on soft, thick bedding.
- Cover the baby and the mother with additional quilt, blanket or shawl in cold weather.

- **Hygiene and cord care:**
  - She should maintain hygiene while handling the baby. Advise mother to wash hands with soap and water, after defecation and after cleaning the bottom of the baby.
  - She should delay the baby's first bath to beyond 24 hours after birth.
  - She should not apply anything on the cord, and must keep the umbilicus and cord dry.

- **Danger Signs:**
  - Also teach the mother when to return immediately. The signs mentioned below are particularly important signs to watch for. Teach the mother these signs. Use local terms that the mother can understand. Ask her checking questions to be sure she knows when to return immediately.
    - o If baby is breastfeeding poorly.
    - o If baby develops fever or feels cold to the touch.
    - o Has difficulty in breathing.
    - o Has blood in the stool.
    - o If the palms and soles are yellow.
    - o Has convulsions.

CHAPTER 13
ESSENTIAL NEWBORN CARE & RESUSCITATION

KEY LEARNING OBJECTIVES

By the end of this session, the participants will be able to diagnose and manage appropriately the below condition:

A. **Essential newborn care**

B. **Neonatal resuscitation**

C. **Bag and Mask ventilation also known as Positive Pressure Ventilation (BMV/ PPV)**

D. **Chest compression**

➢ **Five essentials:**

- Prevent hypothermia (maintain temperature between 36.5-37.50C)
- Establish respiration (within first golden minute)
- Prevent infection
- Start breastfeeding within one hour
- Identify at risk neonates (congenital malformations, danger signs)

➢ **Routine care: (For spontaneously breathing babies)**

- On mother's abdomen
- Immediate drying (Do not wipe away vernix) with prewarmed sheet
- Remove wet sheet and cover the baby with dry and warm sheet
- Delayed cord clamping
- Keep baby in skin-to-skin care with mother during first golden hour
- Initiate Breastfeeding as early as possible within hour
- Inj. vitamin K1 to be given after breastfeeding
- Routine suction and providing oxygen is not required and is harmful

➢ **Resuscitation:**

- Out of 100 deliveries only 10 require resuscitation
- Only one out of 10 requires resuscitation beyond PPV
- At least 1 skilled personnel must be available 24*7 for resuscitation
- Cut cord immediately
- Place baby underpreheated radiant warmer
- Position, clear airway, dry, stimulateand reposition baby
- If still not breathing well begin bag and mask ventilation with room air
- Effective bag and mask ventilationis the most important step in resuscitation

A. ESSENTIAL NEWBORN CARE

Care of Normal Newborn

- Preparation before delivery.
- Immediate care at and after birth.
- Essential postnatal care.

Personnel

- The care at birth is same irrespective of the birthing place or the person attending the birth (medical or paramedical personnel).
- Medical officer/trained health care provider is responsible for the care.
- At least one health care provider trained in neonatal resuscitation must be physically available before birth of all infants irrespective of risk status.
- The attending personnel should document the baby details such as time of birth, weight, gender and any other relevant information in all cases.

Physical facilities for resuscitation (At hospital)

- Resuscitation care under warmer.
- Contents of resuscitation kit.

Equipment needed for essential newborn care in baby tray at delivery

- 2 prewarmed clean and dry towels.
- Cord clamp.
- Mucus extractor.

Equipment Needed for Neonatal Resuscitation in delivery room/OT

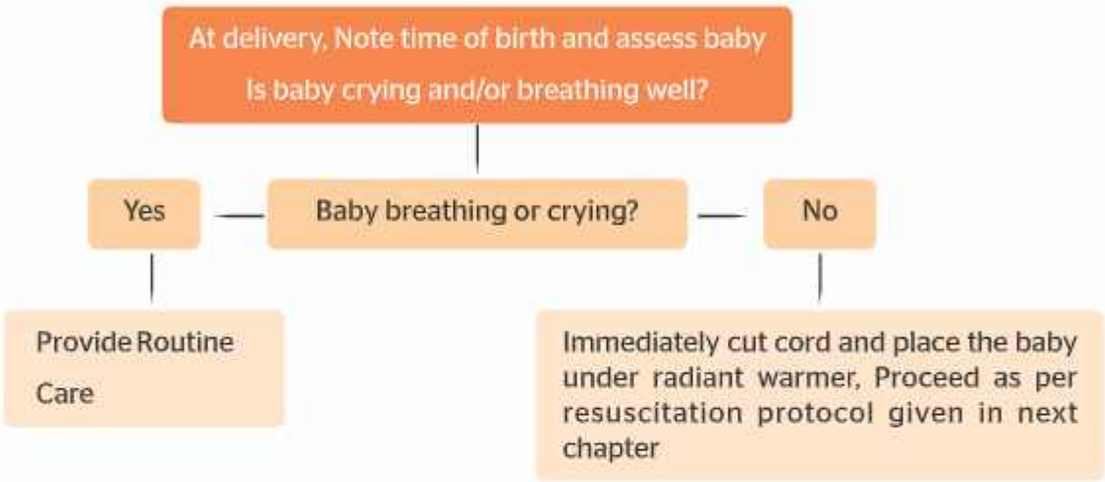
- Radiant warmer.
- Clock with seconds hand.
- Warm linen.
- Shoulder roll.
- Oxygen source.
- Mucus extractor.
- Suction facilities with 10,12 and 14 F suction catheters.
- Positive- pressure device: Self-inflating bag (250-500ml.), masks (size 0 and 1); and oxygen tubing. Self-inflating bag must have oxygen reservoir.
- Laryngoscope with an extra set of batteries and extra bulbs. Blades: No. 1 (term newborn), No. 0 (preterm newborn), No. 00 (optional for extremely preterm newborn). Use straight blade.
- Endotracheal tubes with internal diameters of 2.5, 3.0, 3.5 and 4.0 mm.
- Endotracheal tube stylet (optional).
- Scissors and adhesive tape for fixing endo-tracheal tube.
- Medications: Epinephrine, Normal saline and Ringer's Lactate.
- Umbilical catheters 3.5, 5F.
- Three way stop-cock.
- Syringes 1, 5, 10, 20 ml.
- Sterile gloves.
- 8 French feeding tube.

Immediate care after birth

1. Prevent hypothermia.

2. Establish respiration.
3. Prevent infection.
4. Breast feed within 1hr of birth.
5. Identify at risk neonates (congenital malformations, birth injuries, danger signs).

FLOWCHART 1. An algorithm for providing care at birth to a newborn infant



Note the time

- Receive the baby in a clean, dry and warm sheet.
- Place the baby on the mother's abdomen.
- Turn the head to the side. This will allow secretions to collect in the cheek where they can be removed easily by wiping.
- Dry the baby with a warm clean sheet. Do not wipe off vernix.
- No routine suctioning is to be done.
- Cover the baby with a warm cloth including head.
- Delayed cord clamping-Clamp the cord after 1-3 min and cut with a sterile instrument.
- Tie the cord with a sterile tie. Do not apply any substance or medication to stump. Do not bind or bandage stump. Leave stump uncovered.
- Place the baby between the mother's breasts to initiate breast feeding and continue skin-to-skin care for 1 hour.
- Note the sex of the baby.
- Place an identity label on the baby.
- Give injection vitamin K1, 1 mg IM to babies weighing more than 1000 grams at birth (0.5 mg for babies weighing less than 1000 grams at birth).
- Examine the baby quickly for danger signs malformations/birth injury/and refer if required.
- Support initiation of breast feeding within 1 hour.
- Record the baby's weight.
- Record the baby's temperature.
- Look for danger signs.

- Transfer to NICU/Refer if required.

1. Prevention of Hypothermia

Hypothermia (body temperature <36.5 °C) can occur within the first few minutes after birth if preventive steps are not taken.

Prevention of hypothermia at birth

- Delivery in warm room (between 26-28 °C).
- Receive the baby in a dry warm towel and place on mother's abdomen.
- Dry the baby immediately with warm clean towel and discard the wet towel after drying baby.
- Place the baby in between the breasts of the mother and cover the mother and baby together including head and feet.
- Don't bathe immediately after birth, delay bathing for 1 week in case of Preterms and LBW.

Warm chain

- Warm delivery room (26-28 °C).
- Warm resuscitation.
- Immediate drying with dry, warm & clean cloth.
- Skin-to-skin contact.
- Breast feeding initiated as early as possible.
- Bathing to be postponed.
- Appropriate clothing.
- Mother & baby together.
- Warm transportation.
- Professional alert.

2. Establish breathing

3. Prevention of Infection

'Five cleans' to prevent infection

i) Clean attendant's hands (washed with soap).

ii) Clean delivery surface.

iii) Clean cord- cutting instrument (i.e. razor, blade).

iv) Clean string to tie cord.

v) Clean cord (Do Not apply anything on cord).

4. Initiation of breast feeding:

Counsel the mother and provide adequate support to ensure that breast feeding is initiated immediately after birth, preferably within one hour, even if the birth has been by caesarean section.

5. Search for malformations and look for danger signs

Danger Signsin New Born

Signs of sickness in a newborn may often be subtle and therefore a high index of suspicion is required. Daily monitoring of the baby in the post-natal ward will not only help in prompt detection of the illness but also in initiating appropriate action.

Danger signs in a baby suggest serious illness requiring immediate medical attention. These, therefore, should be explained to the mother before discharge and she should be advised to bring the baby to the facility if any of the following danger sign is observed. The signs elaborated are as under:

- Poor feeding.
- Respiratory difficulty, apneic attacks or cyanosis.
- Undue lethargy:

- Sudden rise or fall in body temperature.
- Appearance of jaundice within 24 hours of age or yellow staining of palms or soles.
- Failure to pass meconium within 24 hours / urine within 48 hours/persistent vomiting/ drooling of saliva or choking during feeding
- Excessive crying / seizures (abnormal movements of the body)

Bleeding from any site:

Evidence of superficial infections such as conjunctivitis, pustules, umbilical sepsis (redness at base of the stump and discharge), oral thrush, etc. need appropriate treatment to avoid serious bacterial infections,

Common visible congenital Malformations to look for are mainly midline like.

[1] Cleft lip, cleft palate.

[2] Choanal atresia.

[3] Diaphragmatic hernia.

[4] Imperforate anus.

[5] Omphalocele.

[6] Neural tube defects.

Birth Injuries

[1] Cephalohematoma.

[2] Brachial plexus injury.

[3] Facial paralysis.

[4] Fracture.

[5] Dislocation of hip.

Identification of 'at risk neonates' needing hospitalization in SNCU

- Babies with birth weight < 1800 grams.
- Babies with gestational age< 34 weeks.
- Babies with major congenital malformations.
- Babies with asphyxia (Needing post-resuscitation care).
- Babies with breathing difficulty.

Communication With the family

- The health provider must communicate the time, birth weight, gender and condition of the infant to the mother and other family members.
- The infant should be shown to the family with particular attention given to the fact that family members get to know the gender and the identity tag on the infant.

Postnatal care

- Maintain temperature (rooming in with mother, KMC and proper clothing).
- Continue breast feeding
- Eye care (NO Kajal, treat with antibiotics drop if there is discharge, Routine antibiotic prophylaxis for prevention of Opthalmia Neonatorum in Indian settings is not recommended).
- Cord care (keep dry and clean; Routine application of 4% chlorhexidine is Not Recommended).
- Delay bathing (bathe after 1week).
- Check feeding, urination and stool pattern, jaundice (especially in babies whose mothers have blood group O or Rh negative).
- Look for danger signs.
- Inj. Vitamin K1 (to be given in Labour room

preferably within one hour of birth and definitely within first 24 hours.

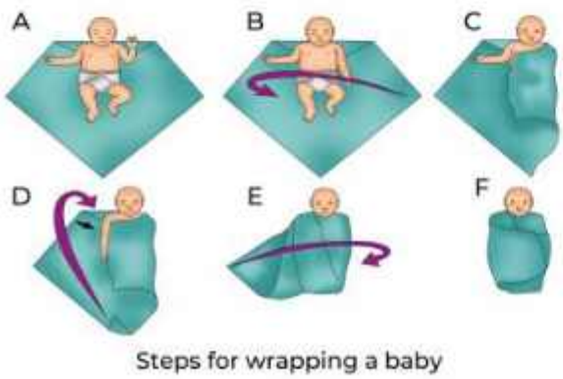
- Immunization as per schedule.
- Follow up after 48 hours, 1 week then monthly for 3 months and 3 monthly thereafter.

Skills

1. **Drying a baby** - The baby should be dried at birth with a clean and sterile cloth. The drying should be gentle (Pat drying) and should not remove the vernixcaseosa (whitish greasy material on the skin). The vernix protects skin of the infant and helps maintain temperature. This gets absorbed on its own after some time.

2. **Steps for wrapping and covering baby**

- Wrap baby using a sheet.
- Spread sheet.
- Fold one corner on itself.
- Place baby's head on the infolded corner so as to cover the head till the hairline on forehead.
- Cover over the right shoulder, and tuck on left side.
- Fold from the foot end and tuck beneath the chin.
- Finally cover the left shoulder and tuck on the right side.



Steps for wrapping a baby

3. **Providing skin to skin care**

4. **Clearing the airway:** First do suction from mouth by inserting the tube of suction device no more than 5 cm beyond the lip. Apply the suction while withdrawing the tube. Then insert the suction tube 1-2 cm into each nostril and apply suction while withdrawing the tube. For suctioning attach the mucus trap to a suction machine or suck from your mouth. Stop suctioning when secretions are cleared, even if the baby does not breathe. Then dry the baby as described above. Always do suction first from mouth then nose. Be careful not to do suction vigorously or deeply (more than 5 cm in mouth and more then 2 cm in nose) as it can produce a vagal response, causing the heart rate to slow down or breathing to stop.

5. **Hand washing:** 40-60 seconds with handwash and 20-30 seconds with handrub. Wash hands with soap and water when visibly soiled.

- Wet hands up to elbow.
- Apply soap.
- Rub hands, first palms and fingers.
- Then back of hands.
- Follow by rubbing of thumbs.
- Finally rub fingertips in the palms.
- Lastly rub wrists and forearm up to the elbow.
- Keep elbows dependent and rinse in the same order.

Do not routinely wash hands with soap and water immediately before or after using an alcohol based hand rub. After handwashing or handrubbing, let your hands dry completely before putting on gloves.

FIVE moments of Hand Hygiene

1. Before touching a patient.

2. Before clean/ aseptic procedure.
3. After body fluid exposure risk.
4. After touching a patient.
5. After touching Patients surroundings.

6. Cord clamping

Steps:

1. After 1-3 minutes. Place ties (using a sterile tie) tightly around cord at 2 cm and 5 cm from the abdomen.
2. Cut between the ties with a sterile instrument (e.g. blade).
3. Observe for oozing blood. If blood oozes, place a second tie between the skin and first tie.
4. DO NOT APPLY ANY SUBSTANCE TO THE STUMP.
5. DO NOT bind or bandage stump.
6. Leave stump uncovered.

   Applying traditional remedies to the cord may cause infections and tetanus.

7. Examination of the baby- The baby should be thoroughly examined at birth from head to toe and the findings should be recorded in neonatal record sheet. Examine midline structures for malformations (e.g. cleft lip, neck, masses, chest abnormality, omphalocele, meningocele, cloacal abnormality). Special attention should be given to identity and document the patient anal opening. There is no need for routine passage of catheter in the stomach, nostrils and the rectum for detection of esophageal atresia, choanal atresia and anorectal malformation, respectively. The baby should be examined for presence of birth injuries. The axillary temperature of the baby should be recorded before the baby is shifted out of the birthing place.
8. Weighing the baby- The baby should be weighed after stabilization and when the temperature is documented to be normal. A sterile preheated sheet (or a single use paper towel) should be placed on weighing scales are ideal. Zeroing of the machine should be performed. The baby is then gently placed on the weighing machine and the weight is recorded.
9. Measuring temperature.

Precautions:

Wash your hands before taking the baby's temperature.

Keep the baby warm throughout the procedure. He/she does not need to be in a special position for the temperature to be taken.

Steps:

1. Make sure that the thermometer is clean.
2. Shake it down, so that it reads less than 35 °C. Switch on the digital thermometer.
3. Place the silver / red / bulb end of the thermometer under the baby's arm, in the apex of the armpit, parallel to the body.
4. Gently hold the baby's arm against the body.
5. Keep the thermometer in place till the thermometer beeps.
6. Remove the thermometer and read the temperature. DO NOT add 0.5 or 1 degree C to this.
7. Keep thermometer in a sterile container after cleaning bulb with spirit.
8. Record the temperature in the baby's case notes.

B. NEONATAL RESUSCITATION

The Principles of Resuscitation

The cardinal principles of resuscitation are T, A, B, C.

T. Prevent Hypothermia (Temperature < 36.5 degree centigrade)-provide warmth, dry the baby and remove the wet linen.

A. Ensure an open AIRWAY through proper position and clearing the passage of any secretions.

B. To initiate BREATHING by tactile stimulation and PPV when necessary.

C. To maintain CIRCULATION with chest compressions and medication.

Preparation for delivery:

At every birth, adequate preparations are to be made to resuscitate a newborn because the need for resuscitation cannot always be predicted.

- Before every delivery ensure that all essential equipment is in place and in working condition.
- Replace the broken equipment.
- Equipment of the appropriate size should be always available.
- The volume of the bag should not be more than 500 ml and the pressure of an electrical suction machine should not exceed a negative pressure of 100 mmHg.
- Mucus extractor and suction catheter are disposable and should be discarded after single use.
- Bag and mask, stethoscope, radiant warmer and suction machine should be disinfected.

Once you have assessed that the newborn requires resuscitation, the steps should be initiated as per the algorithm.

Initial Steps of Resuscitation (steps for resuscitation are mentioned at the end of the chapter as Annexure 1)/

If the baby does not initiate breathing or crying at birth, cut the cord immediately and place the baby under radiant warmer to proceed with resuscitation as per protocol.

Provide initial steps under radiant warmer

The warmer should be pre warmed prior to the delivery for at least 20 minutes in the manual mode. Place the baby supine under pre radiant warmer, with the head positioned towards the side opposite to the display panel. This shift under the warmer helps in full visualization of the baby, prevents the baby from getting hypothermic and gives enough space to work and move around the baby.

i. Position by slightly extending the neck

The baby should be positioned on the back, with the neck slightly extended in the "sniffing" position (to open the airway). To help maintain the correct position, you may place a rolled blanket or towel under the shoulders 1/2 to 3/4th inch). This will bring the posterior pharynx, larynx, and trachea in line, which will facilitate unrestricted air entry. Care should be taken to prevent hyperextension or flexion of the neck, since either may restrict air entry.

Position of baby for Resuscitation

ii. Clearing of the airway

Procedure of Oro-pharyngeal suction

Secretions may be removed from the airway by wiping the nose and clearing the oropharynx by applying suction through a suction catheter of 10-12F size (12-14 F in case of meconium).

The negative pressure for suction should be between 80-100 mm Hg, not exceeding 100 mm Hg.

The mouth is suctioned before the nose to ensure that there is nothing to aspirate if the baby takes gasp while the nose is being suctioned. You can remember mouth before nose because "M" comes before "N" in alphabets. Do not do deep or prolonged suction (no more than 5 cm in mouth and 2 cm in nose and for not more than 3-5 seconds) Suction should be gentle and avoid stimulating posterior pharyngeal wall.

Caution: Vigorous suctioning may cause bradycardia and apnea due to vagal nerve stimulation. If bradycardia occurs, stop suctioning and re-evaluate the heart rate.

iii. Dry the baby using warm towels. Discard wet towels

iv. Stimulate the baby

Both drying and suctioning stimulate the newborn. For many newborns, these steps are enough to induce respiration. If the newborn does not have adequate respiration, additional tactile stimulation may be provided briefly to stimulate breathing.

Safe and appropriate method of providing additional tactile stimulation is only by gently rubbing the newborn's back (twice). Inappropriate and vigorous stimulation is not helpful and can cause serious injury.

v. Reposition the baby

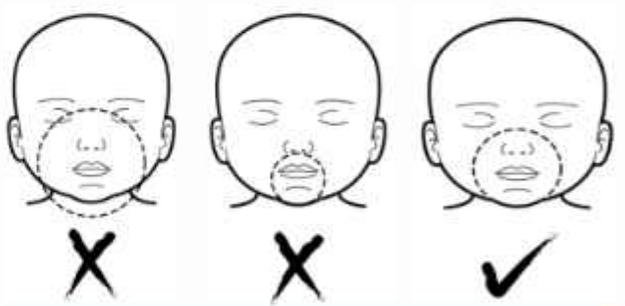
C. Bag and Mask ventilation also known as Positive Pressure Ventilation (BMV/ PPV).

If a baby is still not breathing well/ gasping /apneic after initial steps, positive pressure ventilation should be immediately initiated.

Continuing to provide tactile stimulation or administering free-flow oxygen to a non-breathing baby is deleterious and delays appropriate management.

Equipments needed for PPV

1. Self-inflating bag: Appropriate size of bag should have a volume of 250-500 ml.
2. Appropriately sized masks- Too big masks cover eyes & extends beyond the lower border of chin and too small masks don't cover the nose & the mouth effectively. Recommended sizes of masks.



Too Big | Too small | Appropriate

Position yourself at the bedside

You should position yourself at the side or head of the baby to use the resuscitation bag effectively. Either position will allow you to hold the mask on the baby's face comfortably and allow you to have an unobstructed view of the abdomen and chest. If you are right- handed, you probably will feel most comfortable controlling the bag with your right hand and the mask with your left hand. If you are left- handed, you will probably want to control the bag with your left hand and hold the mask with your right hand.

It is important that the bag is positioned so that it does not block your view of the baby's chest, since you need to be able to observe chest movement during ventilation. It is reiterated again that the functionality of the bag and mask should be checked always before any delivery so that one is well prepared if need be.

Positioning the baby and mask on the face

The mask should be placed on the face so that it covers the nose and mouth, and the tip of the chin rests within the rim of the mask. You should begin by cupping the chin in the mask and then covering the nose.

The mask usually is held on the face with the thumb, index, and/or middle finger encircling the rim of the mask in shape of letter "C" while the ring and fifth fingers bring the chin forward to maintain a patent airway. Once the mask is positioned, using light downward pressure on the rim of the mask can form an airtight seal. Care should be taken in holding the mask.

Observe the following precautions:

- Do not "jam" the mask down on the face. Too much pressure can mould (flatten) the back of the head and bruise the face.
- Be careful not to rest your fingers or hand on the baby's eyes.
- Make sure that adequate seal has been made between mask and face otherwise air would leak from the mask leading to ineffective ventilation.

Initiation of ventilation

Start ventilation by squeezing the bag to deliver breath. Remember, the lungs of a fetus are filled with fluid, so the first few breaths will often require higher pressures and longer inflation times than will subsequent breaths. Adequate pressure required to squeeze the bag should be just enough to produce gentle chest rise as it happens in normal breathing.

Remember if the baby appears to be taking a very deep breath, the lungs are being over inflated. You are using too much pressure and there is danger of producing an air leak in the lungs.

Initiate ventilation at room air (21% FiO2) in babies ≥ 35 weeks gestation and at 21-30% FiO2 in babies <35 weeks gestation.

How often should you squeeze the bag?

During the initial stages of neonatal resuscitation, breaths should be delivered at a rate of 40 to 60 breaths per minute (Fig 1.11). To help maintain a rate of 40 to 60 breaths per minute, try saying to yourself as you ventilate the newborn: "Breathe - Two - Three, Breathe - Two - Three". If you squeeze the bag on "Breathe" and release while you say "Two, Three", you will probably find you are ventilating at a proper rate.

After 5 breaths check chest rise.

Correct positions to visualize chest movements

Ensure chest rise

Start ventilation with bag and mask, look for chest movement with each breath to ensure adequacy of ventilation. If the chest movement is absent or inadequate during the initial 5 breaths then you should immediately take "steps to improve ventilation".

If there is no chest rise or there is no rise in **HR-Take ventilation corrective measures**

Techniques to improve PPV using bag and mask

	Problem	Remedial step
M	Inadequate seal	Mask adjusted to ensure airtight seal
R	Inappropriate position	Reposition the head in sniffing position
Try PPV and Reassess Chest Movement		
S	Blocked	Suction the airway
O	Airway	Open baby's mouth and ventilate
Try PPV and Reassess Chest Movement		
P	Inadequate pressure	Increase Pressure by squeezing the bag with more pressure till a chest rise is visible
Try PPV and Reassess Chest Movement		
A	No improvement with above steps	Consider Alternative airway like endotracheal intubation (or laryngeal mask airway if expertise present)
Try PPV and Reassess Chest Movement		

Adequate passive ventilation is usually indicated by either a rapidly increasing heart rate or a heart rate that is maintained faster than 100 beats/per min. Continue ventilatory support until the baby has established normal regular breathing.

If the baby is breathing adequately then gradually reduce the rate and volume of breaths and watch for the baby's breathing. If the baby is breathing well then stop positive pressure ventilation while continuing to gently stimulate the baby to take deeper breaths. Provide observational care.

An oxygen reservoir is an appliance that can be placed over the bag's air inlet. The advantage of reservoir is to get 90-100% oxygen at the patient outlet as compared to only 40 % without reservoir, with oxygen connected to oxygen inlet. If no oxygen is attached to the bag, it provides only 21% i.e. room air.

After providing 'Effective PPV' (that inflates lung) for 30 seconds assess Respiration and HR, following situations are possible.

A) If heart rate is above 100/min with Sustained spontaneous breathing.

1. Stop PPV.

B) If the heart rate is 60-100bpm.

1. Continue PPV.
2. Reassess respiratory effort, heart rate every 30 seconds.

C) If heart rate is < 60 /min.

1. Start chest compressions with PPV.

D. Chest compressions

- **When to initiate**

1. If after 30 seconds of effective PPV, the heart rate remains below 60 bpm.

- Technique of chest compression.

1. Thumb technique.

2. Two finger technique is not recommended.

- **Site of compression**

It is done in lower third sternum in midline. The area lies between nipples. This can be located by running fingers along costal margin and localizing the xiphoid and placing the fingers above the xiphoid.

- **Pressure for compression**

Sternum should be depressed to a depth of approximately one-third of the anterior-posterior diameter of the chest.

- **Rate of compression**

Chest compressions should be accompanied by PPV with 100% O2. For every 3 compressions, 1 breath is delivered (hence in a minute, 90 compressions and 30 breaths are given). The adequate chest compression rate is 90 compressions per minute synchronized with 30 bpm and given with a cadence of "one-and-two-and-three-and-breath".

- **When to stop chest compressions**

After 60 seconds of coordinated Chest compressions with PPV, assess the baby.

1. **If the heart rate is above 60bpm**

   Stop chest compressions but continue PPV effectively @ 40-60 breaths per minute. Then withdraw PPV gradually later when heart rate is more than 100bpm and the baby is breathing spontaneously. This baby will need post observational care in SNCU.

2. **If the baby is not improving**

   Look for effective PPV; intubate if you have not and provide100% supplemental oxygen. Check the depth of chest compressions & coordinate it well with PPV.

   If the baby's heart rate is still < 60/min despite total 60 seconds of coordinated chest compression and PPV, insert an umbilical catheter and give IV adrenaline and continue chest compressions and PPV using 100% O2.

Drugs

The role of drugs is very limited. In few infants who fail to improve with ventilation and chest compression, medication becomes necessary. Only the following drugs are required for neonatal resuscitation:-

1. Adrenaline.
2. Volume expanders (Normal Saline).

Remember atropine, dexamethasone, calcium, dextrose etc. are not indicated for resuscitation in the delivery room.

- **Adrenaline**

Indication: Heart rate is below 60 beats per min despite continuing both chest compression and PPV for 60 sec.

Dose and route:

- In order to prepare Injection adrenaline @ 1:10,000 dilution, mix 1ml of injection adrenaline (1:1000) with 9 ml of normal saline.
- Through intravenous route in a dose of 0.1 to 0.3 ml per kg of 1:10,000 dilutions. Awaiting IV access, it may be given through endotracheal route in a dose which is 10 times the intravenous dose (0.5-1 ml/kg of 1: 10,000 dilution). Absorption through intratracheal route is unpredictable.

Check the baby's HR 60 seconds after administering Adrenaline. Dose can be repeated after 3-5 minutes if no response.

- Volume Expanders are indicated if the baby is in shock, there is evidence of blood loss and baby is responding poorly to resuscitation.

1. Give 10 ml/kg of Normal Saline over 5- 10 minutes intravenously.

Skill

Giving free flow oxygen- Central cyanosis requires supplemental oxygen, which can be provided by an oxygen mask or oxygen tube held in cupped hand over baby's face or by flow inflating bag and mask. The flow of oxygen should be at least 10L/minute.

or

2. Ringer's Lactate.
3. O Rh negative packed red blood cells should be considered as a part of the volume replacement when severe fetal anemia is documented and expected.

Management of Meconium-stained Amniotic Fluid (MSAF)

Procedures like routine intrapartum suctioning of mouth and nose before delivery of shoulder and post-natal tracheal suctioning of non-vigorous babies are no more recommended.

Skill

How to provide ventilation using a self-inflating bag.

1. Ensure the device is assembled correctly.
2. Call for help.
3. Place the baby on a firm, flat and clean surface.
4. Position the head of baby in a sniffing position.
5. The rescuer should stand at the head end of the baby.
6. Apply the face mask firmly and gently to fit snugly covering the chin, mouth and nose to achieve an airtight seal.
7. Squeeze the bag between thumb and two fingers using the dominant hand in room air.
8. Deliver a rate of 40-60 breaths per minute. Call loudly 'squeeze, two-three'. Deliver a breath when you call squeeze and allow the bag to recoil during calling 'two-three'.

Skill

Disinfection of Bag and mask

Face Mask

- Disinfect daily and sterilize weekly.
- Clean with detergent daily and after each use.
- Immerse in 2% gluteraldehyde for 30 minutes.
- Rinse with clean water and dry with sterile linen (washed and sun dried).

Resuscitation bag

- Disinfect daily and sterilize weekly.
- Clean with detergent.
- Immerse in 2% gluteraldehyde for 30 minutes.
- Rinse with clean water and dry with sterile linen.

Cleaning and disinfection of Bag & mask:

Disassemble all parts, wash thoroughly with warm water and soap. Soak in glutaraldehyde 2% for 30 minutes for disinfection and for 6 hours for sterilization. After removing from glutaraldehyde rinse with clean water, dry with sterile cloth and then reassemble. Disinfect daily and sterilize weekly. Clean mask with spirit between patient use.

Annexure-1

Steps for Newborn Resuscitation

	Sl NO	Steps
0-30 Seconds	1.	Ensures all the equipments/ material are kept in readiness prior to delivery.
	2.	Receives the baby in pre warmed, dry, sterile linen. Dries the baby.
	3.	Discards wet towel and wraps the baby in another towel.
	4.	Assesses breathing.
	5.	If breathing, place on mother's abdomen to provide. **Routine care** • warmth (skin to skin care). • Assure open airway if needed, • Cut cord in 1-3 min. Ongoing evaluation of neonate.
	6.	If not breathing: Clamps and cuts the cord immediately.
	7.	Shifts the baby under Radiant Warmer (which is switched on at least 20mins before the delivery).
	8.	Positions the baby's head in sniffing position with a shoulder roll (rolled towel/sheet).
	9.	Performs gentle suction of the airway if visible secretions are present: Gently suctions the mouth by using Dee lee's mucus trap.
	10.	Dry the baby and remove wet linen.
	11.	Evaluates if baby is breathing well. If not, provide tactile stimulation (Gently rubs the back of the baby).
	12.	If baby is still not breathing, Starts bag and mask ventilation.

		Use of bag and mask
31- 60 seconds	1.	Repositions the baby using the shoulder roll to keep the neck slightly extended.
	2.	Identifies the correct size of the mask.
	3.	Places the mask over newborn's mouth and nose correctly covering the tip of the chin, mouth and bridge of the nose to make an airtight seal.
	4.	Squeezes the resuscitation bag at the rate of 40-60 breaths per minute. Squeeze.....Two.....Three.....Squeeze Looks for chest rise with each ventilation. Start resuscitation at room ait in babies > 35 weeks gestation and at 21-30% FiO2 in babies below 35 weeks gestation.
	5.	If the chest is not rising. • Repositions the baby's head and try again. • Repositions the mask and checks that the seal is airtight. • If there are a lot of secretions, sucks the airway again. • Squeezes the bag little harder.
	6.	After 30 seconds of bag and mask ventilation, assess the baby's breathing.
	7.	If not breathing well, count heart rate /cord pulsation for 6 seconds. • If heart rate > 100/minute, continues bag and mask ventilation and reassess every 30 seconds. If baby is breathing well, stops ventilation. • If heart rate <100/minute, continues bag and mask ventilation and refer to higher center • Start Oxygen if required.

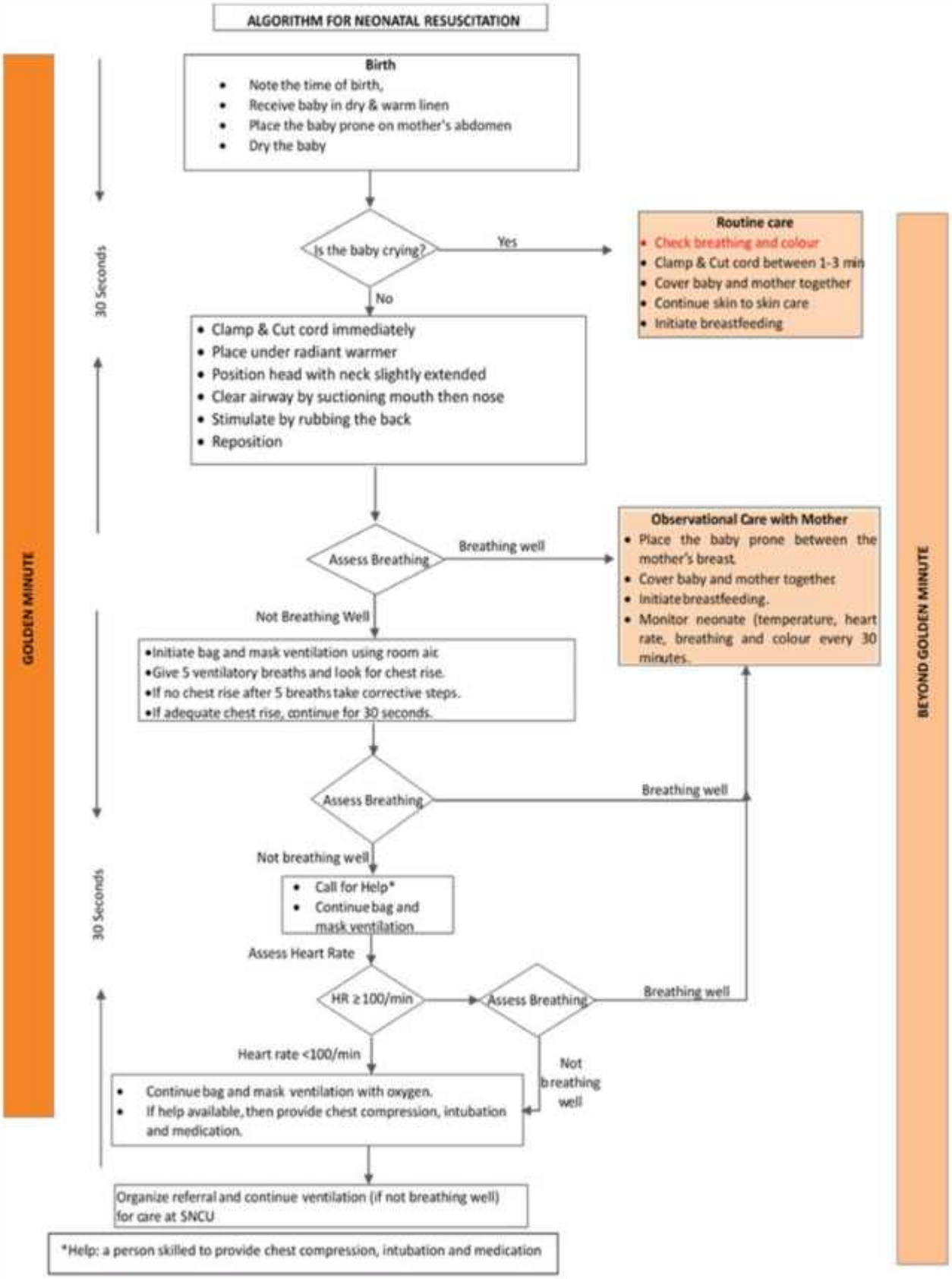
Chest Compression and Medication

SI NO	Steps
1.	Evaluate if baby is breathing well after 30 seconds of effective bag and mask ventilation.
2.	If baby is not breathing well, checks heart rate, calls for help. • If HR >60 continue bag and mask ventilation. • If HR <60 continue bag and mask ventilation and calls the other partner to administer chest compression for 60 seconds. Squeeze.....Two.....Three.....Squeeze

3.	Evaluates breathing and heart rate after 60 seconds. • If heart rate > 60 and not breathing- continues bag and mask ventilation and stop chest compressions. Once the baby is breathing well and HR > 100 slowly withdraws bag and mask ventilation and provides post-resuscitation care. • If heart rate < 60 and not breathing- continue bag and mask ventilation with chest compression and administers medication (Epinephrine 0.1 - 0.3 ml/kg of 1:10,000 solution IV).

Key points

- If baby is not breathing, call for help.
- Keep the bag and mask always ready to be used in emergency.
- The mask comes in "0" and "1" size for preterm and term baby.
- The newborn respiratory rate is 40-60 breaths/min.
- Oropharyngeal suction should be brief and gentle, and should be performed only if the baby is not crying and secretions are blocking the airway.
- Routine suction is not recommended if the newborn is crying even if the liquor is meconium stained.
- Keep the emergency drug tray updated; it must not have any expired drug.


ALGORITHM FOR NEONATAL RESUSCITATION
GOLDEN MINUTE
BEYOND GOLDEN MINUTE
30 Seconds
30 Seconds
Birth
Note the time of birth,
Receive baby in dry & warm linen
Place the baby prone on mother's abdomen
Dry the baby
Is the baby crying?
Yes
Routine care
Check breathing and colour
Clamp & Cut cord between 1-3 min
Cover baby and mother together
Continue skin to skin care
Initiate breastfeeding
No
Clamp & Cut cord immediately
Place under radiant warmer
Position head with neck slightly extended
Clear airway by suctioning mouth then nose
Stimulate by rubbing the back
Reposition
Assess Breathing
Breathing well
Observational Care with Mother
Place the baby prone between the mother's breast.
Cover baby and mother together
Initiate breastfeeding.
Monitor neonate (temperature, heart rate, breathing and colour every 30 minutes.
Not Breathing Well
•Initiate bag and mask ventilation using room air.
•Give 5 ventilatory breaths and look for chest rise.
•If no chest rise after 5 breaths take corrective steps.
•If adequate chest rise, continue for 30 seconds.
Assess Breathing
Breathing well
Not breathing well
Call for Help*
Continue bag and mask ventilation
Assess Heart Rate
HR ≥ 100/min
Assess Breathing
Breathing well
Heart rate <100/min
Not breathing well
Continue bag and mask ventilation with oxygen.
If help available, then provide chest compression, intubation and medication.
Organize referral and continue ventilation (if not breathing well) for care at SNCU
*Help: a person skilled to provide chest compression, intubation and medication

CHAPTER 14
CONTRACEPTION

INTRODUCTION

Ensuring healthy timing and spacing of pregnancies is now considered the most important intervention affecting reproductive, maternal, neonatal, child and adolescent health. The impact of family planning (FP) can be gauged by the fact that if safe and affordable family planning services are provided, it:

- Reduces maternal mortality by 35%.
- Reduces abortions by 50%.
- Reduces infant and child mortality.
- Stabilizes population.

(Source- Alternative strategies to reduce maternal mortality in India: A cost effective analysis).

This makes family planning a very important and integral intervention to improve the health of the mother and the child and also to reduce their morbidity and mortality.

A. Strategies under the National Family Planning Programme:

The comprehensive RMNCH+A approach has transformed the family welfare program and thrust has been laid on ensuring healthy birth spacing. Studies indicate that unmet need for family planning in post-partum period is as high as 65% (USAID ACCESS 2009), and 90% of the maternal mortality related to unsafe abortions could be averted by use of contraceptives in the post abortion period. Further, studies have shown that more than half of abortion clients want to use contraception to avoid further pregnancies (Family Planning High Impact Practices 2012).

Keeping this in view, mainstreaming of post partum and post abortion contraception was done under the National Family Planning program. Further, the basket of choice has been expanded with the inclusion of Injectable contraceptive Medroxy Progesterone Acetate under Antara program and non hormonal pill Centchroman (Chhaya).

The Government is laying renewed emphasis on ensuring quality of services, and improving access to contraceptives by improving availability of contraceptives, as well as focusing on demand generation activities through a 360-degree media campaign. The National Family Planning programme is guided by the following key tenets:

Policy Level	Service Level
• Target free approach • Voluntary adoption of FP Methods • Based on felt need of the community • Children by choice and not by chance	• More emphasis on spacing methods • Assuring Quality of services • Expanding Contraceptive choices

Post Pregnancy Period for Family Planning Services:

The outcome of pregnancy can be full term delivery or miscarriage/abortion. The adoption of family planning method after these events is termed as postpartum family planning (after delivery) and post abortion family planning (after miscarriage/abortion). Return to fertility may be as early as 4 weeks (even before return of menses)

after delivery, and within 10 days after abortion. Since many women approach health facilities for delivery and abortion/miscarriage services, this is an opportune time for providing family planning information and services. A spacing of at least 24 months is recommended between two pregnancies, and 6 months between abortion and subsequent pregnancy. Contraceptive use can help women and couples in delaying their first pregnancy, and spacing or limiting subsequent pregnancies, thereby preventing unplanned pregnancies and abortions. Therefore, providing family planning services as an integral component of post-partum and post-abortion care can improve contraceptive acceptance and help break the cycle of repeated unwanted pregnancies.

Timings of Initiation of Contraceptive options in Post-partum and Post-abortion contraception

Timing of initiation	COC (Mala N)	Copper IUCD (380A & 375)	Female Sterilization	MPA (Antara program)	Centchroman (Chhaya)	Condom (Nirodh)	NSV
Post Partum							
Breastfeeding:							
< 6 wks postpartum	No	Post Placental within 10 minutes after delivery; Intra caesarean during caesarean delivery; Immediate Post Partum< 48 hours after delivery	Post-partum sterilization within 7 days of delivery	No	Yes	Any time	Any time
> 6 wks to < 6 months postpartum	No	Yes	Yes	Yes	Yes	Any time	Any time
> 6 months postpartum	Yes	Yes	Yes	Yes	Yes	Any time	Any time
Non-breastfeeding:							
< 21 days	No	< 48 hours after childbirth	within 7 days of delivery	Yes	Yes	Any time	Any time
> 21 days	Yes	> 6 weeks post partum	> 6 weeks postpartum	Yes	Yes		
Post Abortion							
Immediatel y or < 7 days	Yes	Yes (Concurrently or within 12 days of completion of abortion*)	Yes	Yes	Yes	Yes	Yes

* Post abortion contraception may be provided anytime after abortion if it is reasonably certain that client is not pregnant but it is recorded as post abortion contraception only if provided in above mentioned time period.

Contraceptive choices under National Family Planning Program

Spacing Methods:

Male Condoms:

Condoms are a very effective barrier method of contraception that protects against both pregnancy and RTI/STI including HIV/AIDS. They can be used as a regular, temporary or back-up method of contraception as long as the couple desires. Since condoms provide protection against sexually transmitted infections, they can be used in addition to a regular method of contraception in high risk settings.

The brand supplied free of cost by the Government is 'Nirodh'. Many other brands are available, which are either socially marketed or available in the open market.

Side effects:

None, but some people may report allergy to latex.

Oral Contraceptive Pills

Oral contraceptives are safe, effective, reversible methods to prevent pregnancy and need to be taken regularly. They are an important component of the National Family Planning Program's contraceptive method mix. However, they do not provide protection against RTI/STI or HIV infection.

Types of Oral Contraceptive pills

Hormonal

a) Combined Oral Contraceptive Pill-

Combined Oral Contraceptives pills (COCs) contain low doses of two synthetic hormones progestin and an oestrogen which are similar to the natural hormones in a woman's body. The mechanism of action is by inhibition of ovulation. Mala N is the brand available in the national program. It is supplied free of cost through government health centres and hospitals. Each strip of Mala-N contains 21 hormonal tablets and 7 non hormonal (iron) tablets.

COCs affect the quality and quantity of breast milk, hence should not be given to breast feeding women till 6 months postpartum. In non-breast feeding women, these can be given any time 21 days after giving birth. In post abortion period, they can be started immediately or within 7 days after first- or second-trimester miscarriage or abortion. In normal menstruating women, they can be started anytime within 5 days of start of monthly bleeding.

COCs have several non-contraceptive benefits, like protection against endometrial and ovarian cancer, iron deficiency anaemia, polycystic ovarian syndrome and endometriosis.

Schedule: One pill is to be taken every day. For greatest effectiveness, a woman must take pills daily without any break (28 pills packet). Missing pills increases the risk of unwanted pregnancy.

Management of Missed Pills:

Missed Pills	How to Manage
Missed 1 or 2 pills/started new pack 1 or 2 days late?	• Take one hormonal pill as soon as possible or two pills at scheduled time.

Missed 3 or more pills in the first or second week/ started new pack 3 or more days late?	• Take one hormonal pill as soon as possible and continue the scheduled pill. • Use a backup method for the next 7 days. • Also can consider taking ECPs, if she had sex in the past 72 hours.
Missed 3 or more pills in the third week?	• Take one hormonal pill as soon as possible and finish all hormonal pills in the pack as scheduled. Throw away the 7 non-hormonal pills in a 28-pill pack. • Start a new pack the next day. • Use a backup method for the next 7 days. • Also can consider taking ECPs, if she had sex in the past 72 hours.
Missed any non-hormonal pills? (last 7 pills in 28-pill pack)	• Discard the missed non-hormonal pill(s). • Keep taking COCs, one each day. Start the new pack as usual.
Severe vomiting or diarrhoea	• If she vomits within 2 hours after taking a pill, she should take another pill from pack as soon as possible and continue taking the scheduled pills. • If she has vomiting or diarrhoea for more than 2 days, follow instructions for 1 or 2 missed pills above.

Side effects:

COCs may cause irregular/ unexpected bleeding, or no bleeding in some cycles. These side effects require provider's attention, and reassurance to ensure continuation.

b) Emergency Contraceptive Pill (Ezy Pill)-

Emergency contraceptive pill is used to prevent pregnancy after unprotected sexual intercourse, sex was coerced or contraceptive accidents like condom rupture or missed pills. It is not a regular method of contraception and to be used only in cases of emergencies. In the National Program, Ezy pill contains 1.5 mg Levonorgestrel per tablet, and is taken as a single dose within 72 hours of unprotected sexual intercourse. The sooner they are taken the more effective they are.

Side effects:

Some women may experience minor side effects like nausea or vomiting. If vomiting occurs within 2 hours of taking pill, she can take another dose with anti-emetic.

Non-hormonal

Centchroman (Chhaya)-

Centchroman (Ormeloxifene) is a non steroidal,

non- hormonal contraceptive pill. It acts as a selective estrogen receptor modulator (SERM). It is also safe for breast feeding women and can be started earlier than 6 weeks as it does not affect quality and quantity of breast milk. It is commonly known as weekly pill. For initiation of Centchroman (Ormeloxifene) in normal menstruating women, the first pill is to be taken on the first day of period (as indicated by the first day of bleeding) and the second pill three days later. This pattern of days is repeated through the first three months. Return of fertility is prompt on discontinuation of pill.

Schedule of Centchroman

If the first Day of pill is	First 3 Months	After 3 Months
	Pill to be taken on	
Sunday	Sunday and Wednesday	Sunday
Monday	Monday and Thursday	Monday
Tuesday	Tuesday and Friday	Tuesday
Wednesday	Wednesday and Saturday	Wednesday

Management of 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 client needs to use a back-up method (e.g. Condoms) till the next period starts.
- If pill is missed by more than 7 days, client 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.

Side effects:

It causes delayed periods in some women due to prolongation of the menstrual cycle. This tends to settle down with regular use.

Intra Uterine Contraceptive Device (IUCD):

The copper bearing intra-uterine contraceptive device, popularly known as IUCD, is a small, flexible plastic frame containing coiled copper impregnated with barium sulfate. It is inserted in the uterus by a trained service provider after proper screening.

The IUCD is a Long Acting Reversible Contraceptive (LARC) which can be inserted in post-partum period (PPIUCD), **Post Abortion period (PAIUCD), or Interval period (Interval IUCD)**. After informed verbal consent from the client, the IUCD can be inserted by trained providers. Written consent is not required for IUCD insertion.

The IUCD is effective immediately after insertion. A woman's fertility returns promptly after an IUCD is removed. Therefore, another IUCD should be inserted immediately after removal or an alternate contraceptive method can be adopted by the client unless she wants to conceive. The IUCD can also be used for emergency contraception if inserted within 5 days of unprotected intercourse. IUCDs can reduce the risk of pregnancy by 99.9%. Once inserted, the IUCD can be left in place to prevent pregnancy for as long as the woman wants, until the IUCD remains effective.

Currently two types of IUCDs are available under the National Family Planning Programme viz. IUCD 380 A, effective up to 10 years, and IUCD 375, effective up to 5 years. Both IUCD 380 A and IUCD 375 have same mechanism of action:

- Copper ions decrease sperm motility and function by altering the uterine and tubal fluid environment, thus preventing sperm from

reaching the fallopian tubes and fertilizing the egg.

- The device stimulates foreign body reaction in the endometrium that releases macrophages and prevents implantation.

Side effects:

There may be increase in the duration/amount of menstrual bleeding or spotting or abdominal cramps during the first few days or months after insertion. These are temporary changes and settle down in few months. In order to address these changes timely, and ensure continuation of the method, the client is advised to come for follow up at 6 weeks or after last menstrual period whichever is earlier, at 3 months and at 6 months after insertion. In most cases, counselling and reassurance during follow up visits is sufficient for continuation of the method.

Injectable contraceptive Medroxy Progesterone Acetate (MPA)

Injectable Contraceptive is a Long-Acting Reversible Contraceptives (LARC) containing synthetic hormones (progestin) resembling the natural female hormones. Under the National Family Planning Program, Medroxy Progesterone Acetate (MPA) has been added to the basket of choice (Antara program). When administered intramuscular, there is a slow release of hormone into the blood stream and one dose protects against pregnancy for a duration of three months. Each vial contains 150 mg MPA.

Mechanism of Action:

- Inhibiting ovulation - by suppressing mid cycle peaks of LH and FSH.
- Thickening of cervical mucus - due to depletion of oestrogen. The thick mucus prevents sperm penetration into the upper reproductive tract.
- Thinning of endometrial lining - due to high progesterone and depleted oestrogen, making it unfavorable for implantation of the fertilized ovum.

MPA is a safe contraceptive, and all women who want a highly effective contraceptive can use it, including women who are breast feeding or who are not eligible to use estrogen-containing combined oral contraceptives. It has a long grace period, implying that it can be given 2 weeks prior and 4 weeks after due date of injection. There may be some delay in the return of fertility (average 4-6 months after 3 months effectivity of last injection is over) on discontinuation of method. However, it does not provide protection against RTI/STI and HIV infection.

Side effects:

It may cause irregular/ prolonged bleeding, and eventually amenorrhea due to its mechanism of action i.e. thinning of endometrium. It causes a decrease in bone mineral density, however, this is reversible and normalizes upon discontinuation.

Permanent Methods (Sterilization):

Sterilization is currently the world's most widely used contraceptive method, in developing and

developed countries alike. Female sterilization is much more common than Male sterilization.

Female Sterilization (Minilap Tubectomy/ Laparoscopic Tubal occlusion):

Female Sterilization is one of the most popular, safe and permanent methods of contraception. It is a relatively simple procedure that involves permanently blocking the fallopian tubes to prevent fertilization. There are two common surgical techniques for female sterilization:

a) Minilap Tubectomy

b) Laparoscopic Tubal occlusion.

Both procedures are done under local anaesthesia and are equally safe. In Minilap, a small incision is made in the abdomen, and a portion of the fallopian tube is ligated and excised. The other technique is laparoscopic, which involves inserting a laparoscope into the abdomen through a small incision to occlude the fallopian tubes with Falope rings. Clients must be provided informed choice and written consent should be taken prior to surgery. Sterilization done concurrently/within 7 days of delivery and abortion is known as Post partum (PPS) and Post abortion sterilization (PAS) respectively. PPS is done by Minilap technique. PAS done after first trimester abortion can be done by both techniques, while PAS after second trimester abortion is done only by Minilap technique.

Male Sterilization (Conventional/ Non-Scalpel Vasectomy):

Vasectomy is one of the safest and most effective contraceptive methods having very low complication and failure rates. It is a very simple, minor surgical procedure that provides life-long protection against pregnancy. The acceptor can walk back home within 30 minutes after the procedure and recover much faster with almost negligible post procedure discomfort or complications. After vasectomy, it is necessary to use a back-up contraceptive method (condom) until azoospermia is achieved (usually this takes three months; sometimes longer).

Currently, the two most common surgical techniques for approaching the vas during vasectomy are the incisional method (Conventional) and the No-scalpel method (NSV). The latter is the recommended technique and is becoming the standard technique of vasectomy around the world.

MEDICAL ELIGIBILITY CRITERIA & CLIENT ASSESSMENT

The WHO Medical Eligibility Criteria form the scientific foundation for client assessment regarding family planning methods. It gives detailed guidance regarding whether a person with a certain condition can safely use a given method of family planning. The MEC has four categories:

Medical Eligibility Criteria (MEC) Categories

Category	Eligibility of the provider	With clinical judgement	With limited clinical judgement
1. Safely use- A condition for which there is no restriction for the use of the contraceptive method.	Nursing personnel (SN/ANM/LHV) and medical officers (MBBS and above/ AYUSH)	Use method in any circumstances	Yes (Use the Method)
2. Generally use- A condition where the advantages of using the method generally outweigh thetheoretical or proven risks.	Medical officers (MBBS and above)	Generally use the method	

3. Generally do not use- A condition where the theoretical or proven risks usually outweigh the advantages of using the method.	Gynecologist/ Specialist	Use of method not usually recommended unless other appropriate methods are not available or not acceptable	No (Do not use the method)
4. Do not use- A condition which represents an unacceptable health risk if the contraceptive method is used.	No Provider (absolutely contraindicated)	Method not to be used	

Medical Eligibility Criteria (MEC) Wheel for Contraceptive Use

Medical Eligibility Criteria (MEC)Wheel for Contraceptive Use- India 2015 was adapted from WHO MEC 2015. It is one of the useful tool /job-aid which guides the service providers as to what type of contraceptive method she should adopt if presenting with a known medical or physical condition.

The wheel contains medical eleigibility criteria for starting use of selected contraceptive method.

For more details: Kindly refer to the GoI Guidelines on Reference Manula for IUCD Service, March 2018

➢ Counselling

Counselling is a client-provider interaction (verbal and nonverbal), to facilitate or confirm a decision by the client or address the problems/ concerns of the client, if any. It is an important parameter for ensuring quality family planning services and also enables the provider to adopt a client centered approach, wherein the inputs are based on client's unique needs, preferences and concerns, helping him/ her to voluntarily choose an appropriate contraceptive method.

Stages of counseling

General Counselling: It is based on information on a range of methods and to assist in choosing a method that is appropriate for the couples. Aim should be to-

- Discuss reproductive goals and needs of clients.
- Orient the clients on methods available for family planning.
- Clarify myths and misconceptions.

Method-specific Counselling: The client is provided more information about the chosen method, as well as instructions on how to use it safely and effectively. The focus should be on-

- Screening process based on Medical Eligibility Criteria and explaining procedures.
- Instructions about how and when to use the method.
- What to do if there are problems and when to return for follow-up.
- Providing hand-outs to take home.

Return/Follow up counselling: To be done during each visit to-

- Assess client experience and satisfaction with the method.
- Discuss and manage the problems / side effects.
- Encourage continuation of the method unless major problems exist.
- Refer for complications, if required.

Counselling in Post Pregnancy Period

Post-Partum period:

- **During antenatal visits:** Woman should be ideally counselled in the antenatal period for postpartum family planning.
- At the time of admission/ early labour: Woman has to be given information about postpartum family planning during admission/ early labour when she is relatively comfortable and is able to concentrate on the information.
- **At the time of admission during elective cesarean:** Woman, who arrives at the hospital for a scheduled cesarean section, can be counselled prior to the operation.
- **Within 48 hours of delivery:** A woman who could not be counselled prior to delivery can receive counselling after delivery.

Post Abortion Period:

- **On confirmation of pregnancy, if the woman wants termination of pregnancy:** Safe abortion services should be provided and simultaneously counselled for adoption of post-abortion family planning method.
- **Before initiating the abortion procedure at the health facility** information should be given about post abortion family planning.
- **After completion of abortion** once she is comfortable when counselling could not be done prior to abortion, (e.g. in case of woman with incomplete abortion requiring emergency management).

Recording and Reporting System:

Record keeping and reporting is an integral component of service provisioning. Correct and timely reporting helps in monitoring of the programme, identification of gaps and effective implementation of strategies.

Following records must be maintained to ensure timely decision making for addressing service and supply related issues:

Registers- The relevant information of all beneficiaries should be recorded along with other relevant findings of client examination in Oral Pills /IUCD Service delivery / IUCD Follow up / MPA / Sterilization Register.

IUCD/ MPA cards- Along with facility data recording, each beneficiary of IUCD/ MPA must be provided with an IUCD/MPA card that contains details of the method, date of insertion/ administration, due date for follow up etc. (Figure below)

Sterilization documents: Facility should maintain following documents for every case of sterilization as per GoI guidelines:

- Written Informed consent.
- Medical Record checklist.
- Post-Operative Instruction Card.
- Sterilization certificate:
    - In case of female sterilization (PPS/ PAS/Interval), client is asked to visit the facility at 1 month or on return of menses, whichever is earlier. Once pregnancy is ruled out sterilization certificate is issued to the client.
    - After male sterilization, client is asked to

visit facility at 3 months for semen examination. Semen results should show azoospermia; in case azoospermia is not achieved, semen examination is repeated monthly till 6 months. Certificate is only issued once semen shows azoospermia (male sterilization).

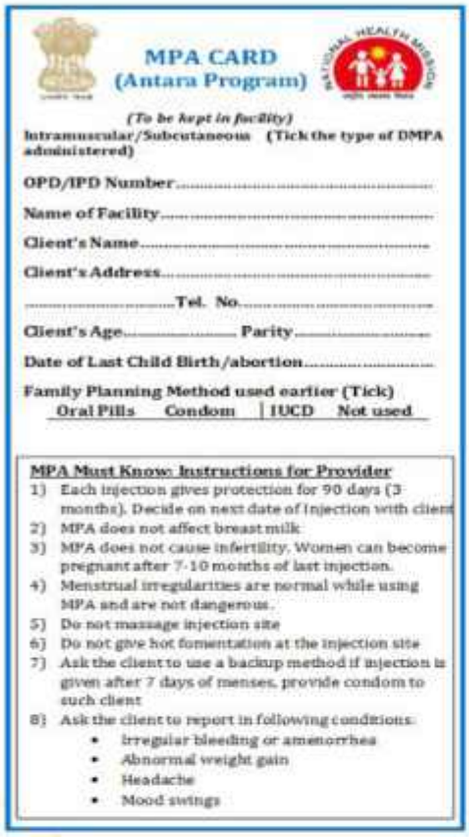
HMIS:

All facilities should report service delivery parameters/ indicators regularly in National Portal.

Stock information should be regularly updated at the facility level through FP-LMIS (Family Planning Logistic Management Information System).

Side effects/complications identified during follow up visits, must be documented and reported, along with the management of the same.

IUCD card



MPA CARD
(Antara Program)

(To be kept in facility)

Intramuscular/Subcutaneous (Tick the type of DMPA administered)

OPD/IPD Number.....

Name of Facility.....

Client's Name.....

Client's Address.....

.....**Tel. No**.....

Client's Age..... **Parity**.....

Date of Last Child Birth/abortion.....

Family Planning Method used earlier (Tick)

Oral Pills	Condom	IUCD	Not used

MPA Must Know: Instructions for Provider

1) Each injection gives protection for 90 days (3 months). Decide on next date of Injection with client
2) MPA does not affect breast milk
3) MPA does not cause infertility. Women can become pregnant after 7-10 months of last injection.
4) Menstrual irregularities are normal while using MPA and are not dangerous.
5) Do not massage injection site
6) Do not give hot fomentation at the injection site
7) Ask the client to use a backup method if injection is given after 7 days of menses, provide condom to such client
8) Ask the client to report in following conditions:
   - Irregular bleeding or amenorrhea
   - Abnormal weight gain
   - Headache
   - Mood swings

Record of First MPA Injection (The first injection should be given under the guidance of trained doctor)

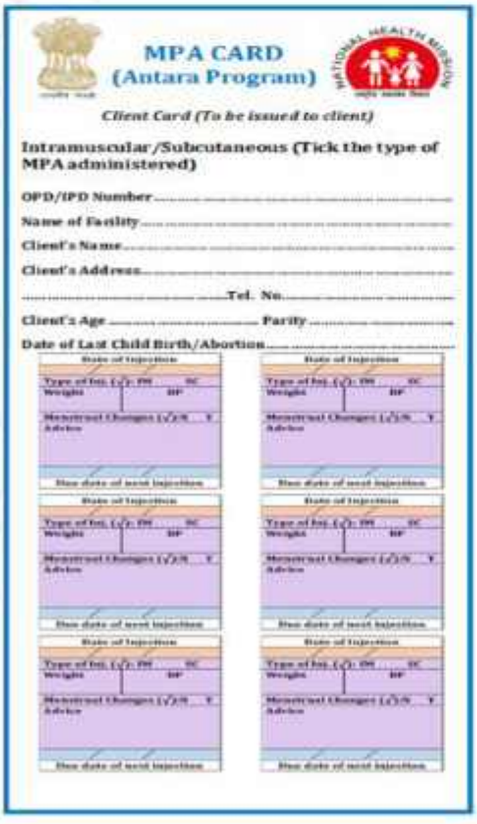
Date of Injection	LMP	Weight	Blood Pressure	Timing of Injection: PP/IP/Interval	Due Date of next Injection

Record of MPA Injection

DMPA Injection	Due Date of Injection	Date of Injection	Weight	BP	Menstrual Changes	Any Complaint	Advice, if any complaint
2nd							
3rd							
4th							
5th							
6th							

Mid-course Follow up Visit

Sno.	Date of Follow up	Weight	BP	Menstrual Changes	Other Complaints	Advice



MPA CARD
(Antara Program)

Client Card (To be issued to client)

Intramuscular/Subcutaneous (Tick the type of MPA administered)

OPD/IPD Number.....

Name of Facility.....

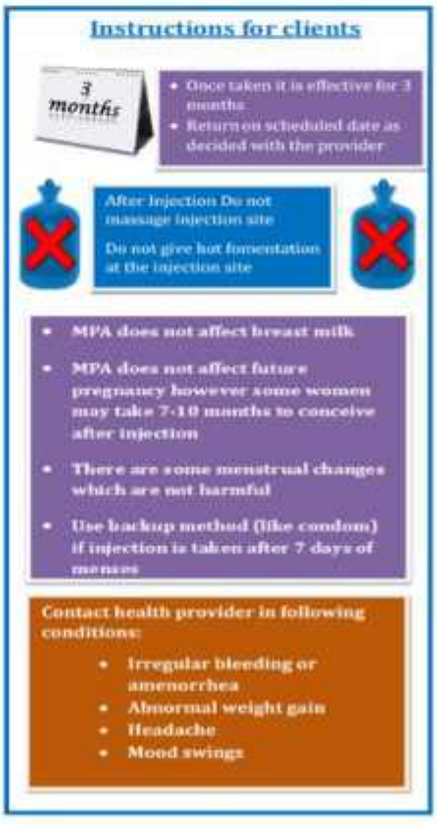
Client's Name.....

Client's Address.....

.....**Tel. No**.....

Client's Age..... **Parity**.....

Date of Last Child Birth/Abortion.....



Instructions for clients

3 months

- Once taken it is effective for 3 months
- Return on scheduled date as decided with the provider

After Injection Do not massage injection site

Do not give hot fomentation at the injection site

- **MPA does not affect breast milk**
- **MPA does not affect future pregnancy however some women may take 7-10 months to conceive after injection**
- **There are some menstrual changes which are not harmful**
- **Use backup method (like condom) if injection is taken after 7 days of menses**

Contact health provider in following conditions:

- **Irregular bleeding or amenorrhea**
- **Abnormal weight gain**
- **Headache**
- **Mood swings**

MPA card

Service Provisioning at different levels of health facilities:

Family planning services provided at different levels of health facilities and relevant GoI Guidelines for service providers:

S. No.	Level of facility	Class of contraceptive	Contraceptive method	GoI guidelines
1.	**District Hospital/ Sub Divisional hospital or equivalent Community Health Centre (CHC)**	Combined Hormonal Contraceptive	Mala N - Ethinyl estradiol (30mcg) and Levonorgestrel (0.15mg) with Ferrous Fumarate	Yes (Use the Method)
		Non-hormonal contraceptive	Chhaya (Ormeloxifene 30mg)	
		Emergency Contraceptive	Ezy Pill (Levonorgestrel 1.5mg)	
		Progestin only injectable contraceptive	Antara Program (Injection Medroxy Progesterone Acetate 150 mg)	Reference Manual for Injectable Contraceptive MPA
		Copper bearing Intra Uterine Contraceptive Device	IUCD 380A	Reference Manual for IUCD services
			IUCD 375	
		Barrier method	Nirodh- Male Condom	
		Permanent method	Female Sterilization* (Lapascopic and Minilap)	Standards & Quality Assurance in Sterilization Services; Reference Manual for Male Sterilization & Reference Manual for Female Sterilization
			Male Sterilization* (Conventional /Non- Scalpel Vasectomy)	
2.	**Health and Wellness Centre (in PHC) (in Sub Centre) / Health Sub Centre**	Combined Hormonal Contraceptive	Mala N** - Ethinyl estradiol (30mcg) and Levonorgestrel (0.15mg) with Ferrous Fumarate	Reference Manual for Oral Contraceptive Pills

		Non-hormonal contraceptive	Chhaya **(Ormeloxifene 30mg)	
		Emergency Contraceptive	Ezy Pill ** (Levonorgestrel 1.5mg)	
		Progestin only injectable contraceptive	Antara Program (Injection Medroxy Progesterone Acetate 150 mg)	Reference Manual for Injectable Contraceptive MPA
		Copper bearing Intra Uterine Contraceptive Device	IUCD 380A	Reference Manual for IUCD services
			IUCD 375	
		Barrier method	Nirodh- Male Condom**	

*Sterilization services may be provided in FDS mode by visiting team in CHC or PHC in case service provider is not posted in facility

** These contraceptives are also available with ASHA under Home Delivery of Contraceptives Scheme.

CHAPTER 15
INFECTION PREVENTION

KEY LEARNING OBJECTIVES

By the end of this session, the participants will be able to gain knowledge on the following topics:

A. **Universal Precautions for Infection Prevention**

B. **Hand washing/ Hand hygiene**

C. **Personal Protective Equipment**

D. **Instrument Processing & Sterilization**

E. **Biomedical waste management**

F. **Fluid waste management**

➢ **Important Points:**

- IP practices are a must for the prevention of healthcare-associated infections (HCAIs). They are everyone's responsibility.
- Standard precautions (universal precautions) should be followed with every client regardless of whether or not you think the client might have an infection.
- Hand washing is the most important procedure for preventing infection.
- After surgical scrubbing, drying of hands is a must.
- Use personal protective equipment when there is a chance of contact with blood & other body fluids.
- Putting on and putting off surgical gloves is a must-learn skill for every health worker.
- Povidone iodine is the most acceptable antiseptic on skin & mucus membranes.
- Aseptic technique during surgical procedures is essential.
- Sharps & needles should be handled carefully & disposed of puncture-proof of containers.
- Soiled instruments should be decontaminated in 0.5% chlorine solution followed by cleaning & sterilization or HLD.
- Waste should be segregated & disposed of in leakproof containers.

Healthcare facilities are prone to acquire infection either through their compromised protocol, or through the practice of service providers, patients' attendants, and beneficiaries using health facilities. Healthcare-associated infection (HAI), previously referred to as "nosocomial" or "hospital" infection, occurs in a patient during the process of care in a hospital or other healthcare facility (HCF), but was not present or incubating at the time of admission. HAIs include occupational infections among healthcare providers.

HAIs are one of the most common adverse events during healthcare delivery and a major public health issue affecting morbidity, mortality, and quality of life. At any time, up to 7% of patients in developed and 10% in developing countries will acquire at least one HAI, causing a considerable economic burden to society. However, HAIs are largely preventable through effective infection prevention and control (IPC) measures.

A WHO Report (2010) on the Burden of Endemic Health Care-Associated Infection (systematic review), reported that the worldwide prevalence of HCAI varied from 5.7% to 19.1% with a pooled prevalence of 10.1%. Surgical site infection (SSI) is the most surveyed and most frequent type of infection in low- and middle-income countries with incidence rates ranging from 1.2 to 23.6 per 100 surgical procedures and a pooled incidence of 11.8%. By contrast, SSI rates vary between 1.2% and 5.2% in developed countries. The risk of acquiring HCAI is significantly higher in intensive care units (ICUs), with approximately 30% of patients affected by at least one episode of HCAI with substantial associated morbidity and mortality. Pooled cumulative incidence density was 17.0 episodes per 1000 patient days in adult high-risk patients in industrialized countries.

In any health set up adopting practices and protocols which are safe and prevent infection are of immense importance in minimizing healthcare-associated infections (HCAI).

Without precautions for infection prevention, healthcare facilities can cause the spread of infections and diseases which are known as healthcare-associated infections (HCAIs). When providing health services, it is essential to always prevent the transmission of infection.

* WHO. Healthcare-associated infections, Fact Sheet (https://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf, accessed 25 July 2019)

A. UNIVERSAL PRECAUTIONS FOR INFECTION PREVENTION

➢ Infection in health care settings:

Healthcare facilities are ideal settings for the transmission of disease because:

- Invasive procedures can introduce microorganisms into the patient's body parts.
- Service providers and other staff are constantly exposed to potentially infectious materials as part of their work.
- Many of the people seeking health care services are already sick and may be more susceptible to infection.
- Some of the people seeking services have infections that can be transmitted to others.
- Services are sometimes provided to many clients in a limited physical space, often during a short period.

With appropriate infection prevention practices, you can:

- Prevent post-procedure infection, including surgical site infections and pelvic inflammatory disease (PID).
- Prevent infections in service providers and other staff.
- Protect the community from infections that originate in healthcare facilities.
- Prevent the spread of antibiotic-resistant microorganisms.

- Lower the cost of health care services, since prevention is cheaper than treatment.

➢ **Stopping transmission of infections:**

The best way to prevent infections at a health facility is by following standard precautions. These are a set of recommendations designed to help minimize the risk of exposure to infectious materials by both clients and staff.

Summary of Standard/ Universal Precautions:

1. Wash your hands/ Hand hygiene
2. Use of personal protective equipment (PPE)
3. Prevent injuries with sharps.
4. Correctly process instruments and client-care equipment.
5. Maintain correct environmental cleanliness
6. Biomedical waste management

Standard precautions should be followed with every client/beneficiary regardless of whether or not you think the client/ beneficiary might have an infection. This is important because it is not always possible to tell who is infected with viruses such as HIV and hepatitis viruses, and often the infected persons themselves do not know that they are infected. It is safer to act as if every client is infected rather than apply standard precautions to some clients and not others.

Hand washing is the most important way to reduce the spread of infections in health care settings.

B. Hand washing/ Hand hygiene

Indications for hand hygiene: 5 moments of hand wash (WHO 2009).

Moment 1	Before touching a patient	**WHEN?** Clean your hands before touching a patient when approaching him/her **EXAMPLES:** shaking hands, helping a patient to move around, clinical examination
Moment 2	Before clean/aseptic procedure	**WHEN?** Clean your hands immediately before any aseptic task **EXAMPLES:** oral/dental care, secretion aspiration, wound dressing, catheter insertion, preparation of food, medications
Moment 3	After body fluid exposure risk	**WHEN?** Clean your hands immediately after an exposure risk to body fluids (and after glove removal) **EXAMPLES:** oral/dental care, secretion aspiration, drawing and manipulating blood, clearing up urine, faeces, handling waste.

Moment 4	After touching a patient	**WHEN?** Clean your hands after touching a patient and her/his immediate surroundings, when leaving the patient's side **EXAMPLES:** shaking hands, helping a patient to move around, and clinical examination.
Moment 5	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 **EXAMPLES:** changing bed linen, perfusion speed adjustment

A sink and elbow tap is a must for hand hygiene

ENSURE THE FOLLOWING

- Nails should be trimmed.
- All ornaments (rings, bangles, watch) should be removed.
- Dry your hands in the air or single-use towel (if available).

Three kinds of hand washing:

a) Routine hand washing with plain soap and running water.

b) Surgical scrub.

c) Surgical alcohol hand rub.

a) Routine hand washing with plain soap and running water:

This is appropriate in most situations. Soaps containing 4% w/v chlorhexidine with detergent are used. Duration of hand wash: 40-60 seconds.

(Source: https://www.who.int/docs/default-source/patient-safety/how-to-handwash-poster.pdf?sfvrsn=7004a09d_2)

b) Surgical Scrub:

This is appropriate before invasive procedures (inserting central venous catheter; spinal tap, etc) and before contact with clients at high risk of infection (newborns, immunosuppressed clients etc), and before surgical procedure. 4% w/ chlorhexidine/iodine based with detergent is used. Ideally, it should be performed before every procedure. In busy theaters, if hands are not visibly dirty, an alcohol hand rub may be used between cases. But surgical scrub must be performed after every four cases or 1 hour whichever is earlier, or if hands are visibly soiled.

c) Surgical alcohol hand rub:

This kills and inhibits microorganism but does not remove micro-organism. Alcohol hand rub is used when washing with soap and water is not possible and practical in a busy OT or surgical unit in between procedures e.g. Lap ligation - but only if hands are not visibly dirty.

Because using alcohol alone tends to dry the skin, it is best to use an alcohol hand rub solution containing 70% alcohol with emoluments and moisturizer.

To use an alcohol hand rub solution: pour 3-5 ml of an alcohol hand rub solution into the palm of your hand and rub hands together until they dry (put a picture). Rub till the elbow. For details see below:

C. Personal Protective Equipment:

Donning on surgical gloves:

Surgical gloves are cuffed to make it easier to put them on without contaminating them. When putting on surgical gloves, remember that the first glove should be picked up by the cuff only. Only the other glove should then touch the second glove. Remember that the outside of the glove package is not sterile. If you will open the outer package of gloves yourself, do so before you perform a surgical scrub.

Removing contaminated surgical gloves (doffing)

As you remove the gloves, do not allow the outside surface of the gloves to come in contact with your skin. Avoid letting the gloves snap, as this may cause contaminants to splash into your eyes or mouth or onto your skin or other people in the area. Remove used gloves before touching anything: countertops, faucets, and pens and pencils are frequently contaminated because health care workers touch them while wearing used gloves.

Donning and doffing of PPE:

More than one donning method may be acceptable. Training and practice using your healthcare facility's procedure is critical. Below is one example of donning.

- Identify and gather the proper PPE to don. Ensure choice of gown size is correct (based on training).
- Perform hand hygiene using alcohol-based hand sanitizer.
- Put on isolation gown. Tie all of the ties on the gown. Assistance may be needed by other healthcare personnel.
- Facemask: Mask ties should be secured on crown of head (top tie) and base of neck (bottom tie). If mask has loops, hook them appropriately around your ears.
- Put on face shield or goggles. When wearing an N95 respirator or half facepiece elastomeric respirator, select the proper eye protection to ensure that the respirator does not interfere with the correct positioning of the eye protection, and the eye protection does not affect the fit or seal of the respirator. Face shields provide full face coverage. Goggles also provide excellent protection for eyes, but fogging is common.
- Put on gloves. Gloves should cover the cuff (wrist) of gown.
- Healthcare personnel may now enter patient room.

How to Take Off (Doff) PPE Gear

More than one doffing method may be acceptable. Training and practice using your healthcare facility's procedure is critical. Below is one example of doffing.

- Remove gloves. Ensure glove removal does not cause additional contamination of hands. Gloves can be removed using more than one technique (e.g., glove-in-glove or bird beak).
- Remove gown. Untie all ties (or unsnap all buttons). Some gown ties can be broken rather than untied. Do so in gentle manner, avoiding a forceful movement. Reach up to the shoulders and carefully pull gown down and away from the body. Rolling the gown down is an acceptable approach. Dispose in trash receptacle.*
- Remove face shield or goggles. Carefully remove face shield or goggles by grabbing the strap and pulling upwards and away from head. Do not touch the front of face shield or goggles.
- Remove and discard respirator (or facemask if used instead of respirator). Do not touch the front of the respirator or facemask.*
- Facemask: Carefully untie (or unhook from the ears) and pull away from face without touching the front.
- Perform hand hygiene after removing the respirator/facemask and before putting it on again if your workplace is practicing reuse.*

➢ **Part preparation for surgical intervention:**

Preparation with antiseptics before a clinical or surgical procedure is critical, since bacteria from a client's skin or mucous membrane cause infection.

Shaving the surgical/ procedure site is no longer recommended because it causes small nicks and breaks in the skin where bacteria can grow and multiply, and it can lead to increased risk of post procedure infections. Hair round the surgical/ procedure site may be clipped very short if it interferes with the procedure. If the shaving is inevitable: 1) use antimicrobial soap and water or shave dry, and 2) shave immediately before the procedure, in the operating theater or procedure room.

Surgical/ procedure site preparation:

- Wash the area with soap and water.
- Apply the antiseptic (10% Povidone Iodine) and gently scrub the skin in the circular motion, beginning in the center of the site and moving out, using sterile cotton balls, cotton wool, or gauze sponge forceps.

For the vagina, cervix, and other mucous membranes: Do not use alcohol or alcohol-based antiseptics on mucous membranes. Using sterile cotton balls, cotton wool, or gauze sponges held by forceps, apply an antiseptic liberally to the cervix and vagina before instrumentation of the uterus.

➢ **Use of prophylactic antibiotics:**

The use of prophylactic antibiotics (giving antibiotics before a procedure to prevent infections from developing) does not take the place of good infection prevention. In general prophylactic antibiotics may be indicated in contaminated or clean-contaminated surgical procedures, or when the client is severely immunosuppressed.

Prophylactic antibiotics are often prescribed inappropriately (e.g., when they are not effective against micro-organism likely to cause infections) or given at the wrong time in relation to the procedure (e.g., when given postoperatively instead of pre-or intra-operatively), thus decreasing the likelihood that they will have any effect.

Avoid routine use of prophylactic antibiotics: it increases cost and increases the likelihood of promoting antibiotics resistance.3. Sharp injuries:

Health care workers can accidently stick each other when passing sharps during a procedure.

This can cause risk of exposure to various blood borne infections like Hepatitis B, Hepatitis C, HIV.

Injuries most often occur (CDC 2008).

- During use of sharps (41%).
- After use and before disposal of sharps (40%).
- During or after appropriate or inappropriate disposal (15%).

Always pass sharps in such a way that the surgeon and assistant are never touching the item at the same time. This is known as the "hands-free" technique.

To avoid injuries while handling sharps:

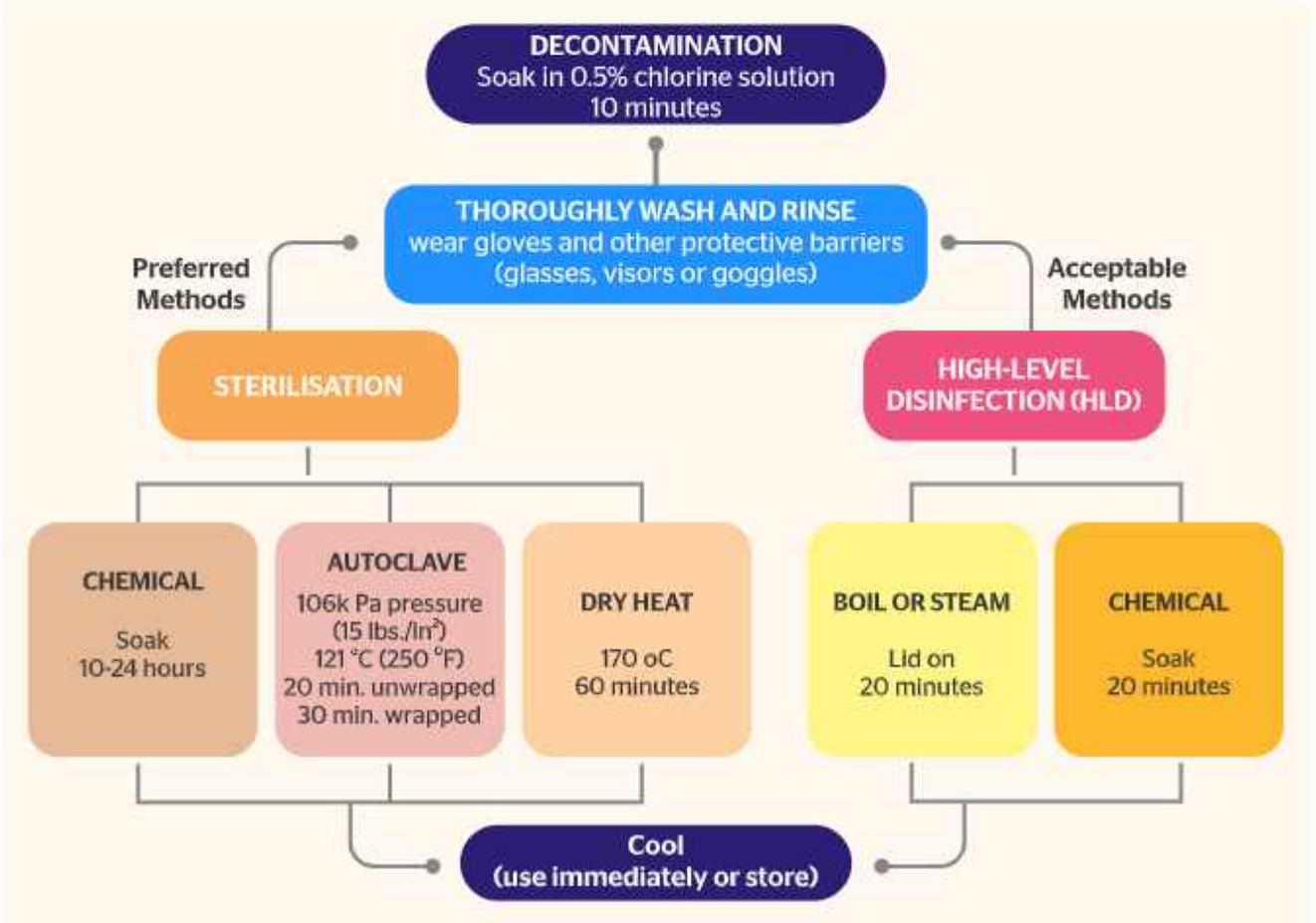
- Do not recap the used needles.
- Do not bend, cut, or break needles.
- Do not remove needles from syringes before disposal.
- Dispose of sharp in a puncture-resistant sharps container; such as a metal box, heavy cardboard box, or an empty plastic jug.
- Wear utility gloves when disposing of sharps containers.

D. Instrument Processing & Sterilization

Proper processing is critical for reducing infection transmission during clinical or surgical procedures. Correct handling and processing also reduce staff's risk of infection.

➢ The step of processing

There are four steps to processing instruments after items are used during clinical and surgical procedures: decontamination, cleaning, sterilization or high-level disinfection (HLD), and use or storage.



Steps for processing instruments

a) Decontamination

- Place the used items/instruments unlocked and in an open position in 0.5% chlorine solution in a plastic container. Let them soak for 10 mins.
- Wear utility gloves, remove instruments from chlorine solution and rinse them in water.

b) Cleaning

- Cleaning: Soak the instruments in water (Soak the instruments in water with detergent immediately after use or keep the instruments in a bucket and cover with wet towel).
- Clean the instrument with detergent with neutral pH and cold water using a soft brush. Scrub the instruments, with special attention to toothed areas and locks, in a container filled with water to avoid splashing.
- Rinse them thoroughly to remove all detergent and air-dry them.

c) Sterilization

- Autoclave: Fill the bottom of the autoclave with water up to the ridge.
- Place the items in the autoclave drum loosely, close the lid and adjust the temperature and pressure and put on the stove or into an electrically connected system.
- Note the time when steam emits from the pressure valve. Keep the items wrapped for 30 mins and unwrapped for 20 mins at 15 lbs/sq. inch (106 kPa) at 121°C. Used for cotton, instruments and surgical dressing (20 min).
- Open the pressure valve to release the steam and allow the autoclave to cool for 15-30 mins before opening.
- For chemical sterilization - Soak in 2% activated Glutaraldehyde solution for a minimum of 10 hours. Rinse with sterile water* and dry. For e.g. endoscope, laparoscope, sharps *(For sterile water, leftover water from Autoclave may be used).
- Boil or Steam: - Lid on, 20 minutes after water boils. Articles should be completely immersed in water. Do not add or remove more instruments after the water starts boiling. (Used for instruments).
- High level Disinfection with chemicals: - Soak in 2% activated Glutaraldehyde solution for a minimum of 20 minutes. Rinse with sterile/ HLD water and dry. For e.g. endoscope, laparoscope, sharps.
- Prepare the 2% Glutaraldehyde solution as per the manufacture's instruction on the bottle and label the date of reconstitution on the container for reference, as the solution has to be changed after 15 days or as per the instructions on the bottle.
- Rinse the items with sterile water to remove the Glutaraldehyde solution.

d) Storage:

Store the instruments in a clean, dry, sterile container with a lid. If the container is not opened, the instrument scan be used within 7 days. If the lid is opened, resterilize the remaining instruments within 24 hours. Instruments processed with wet methods (boil/steam) are to be re-sterilized after 24 hours, if unused.

Key points to remember:

- Place the items loosely in the autoclave to allow steam to circulate.
- The sterilization method is preferred over HLD.

- For chemical sterilization, immerse instruments in 2% glutaraldehyde for 2 hours.
- While autoclaving, use a steam indicator to ensure the items are sterilized.
- Periodically take samples from the autoclave and send them for lab investigation to rule out bacterial/viral/ fungal presence.
- For the HLD by boiling method, allow 20 mins after water starts boiling.
- While boiling the instruments, make ensure that the lid is closed and the instruments are well covered in water, and that there is no adding or taking out of water and/ or instruments during the process.
- Avoid splashing while decontaminating or cleaning instruments.
- Do not use soap while cleaning the instruments.

➢ Steam sterilization (autoclaving)

Key Learning Points:

- Autoclaving is best method of sterilization.
- Autoclave is unsuitable for Heat sensitive objects.
- Proper temperature (121degree C) at proper pressure (15 psi) for proper time (30 min) is must for best results.
- Proper loading and unloading of objects from autoclave should be done.

Steam sterilization in an autoclave is one of the most common forms of sterilization used in health care facilities. Steam sterilization requires moist heat under pressure, so there must be sources of both water and heat. Heat can be provided by electricity or by another fuel source (e.g., kerosene burner), depending on the type of autoclave being used. Each delivery tray, caesarean tray should be separately packed and loaded in autoclave before use.

Sterilization Log Sheet - Attached as Annexure

➢ Housekeeping and Waste Disposal

The general cleanliness and hygiene of a facility are vital to the health and safety of staff, clients, visitors, and the community at large. Good housekeeping and waste disposal practices are foundation of good infection prevention. Housekeeping and waste disposal staffs are at a high risk of infection because they are exposed to blood, other body fluids, used sharps, and other contaminated objects as a routine part of their jobs.

➢ Linen

The basic principles of linen management are as follows:

- Place used linen in appropriate bags at the point of generation.
- Contain linen soiled with body substances or other fluids within suitable impermeable bags and close the bags securely for transportation to avoid any spills or drips of blood, body fluids, secretions or excretions.
- Sort in laundry / appropriate area for decontamination and washing. Do not rinse or sort linen in patient care areas or toilets.
- Handle all linen with minimum agitation to avoid aerosolization of pathogenic micro-organisms
- Separate clean from soiled linen and transport/store separately.
- Soiled Linen: Hot water washing for 25 minutes at 71 degree celsius. Use of chlorine assures an extra margin of safety. Addition of 50-150 ppm

(0.015% hypochlorite) available chlorine residual is recommended. Wash used linen (sheets, cotton blankets) in hot water (70°C to 80°C) and detergent, rinse and dry preferably in a dryer or in the sun. (Heavy duty washers/ dryers are recommended for the hospital laundry).

- Autoclave linen before being supplied to the operating rooms/theatres.
- Wash woollen blankets in warm water and dry in the sun, in dryers at cool temperatures or dry-clean.

E. Biomedical waste management

Hospital waste is a potential reservoir of pathogenic microorganisms and requires appropriate, safe and reliable handling. The main risk associated with infection is sharps contaminated with blood. There should be a person or persons responsible for the organization and management of waste collection, handling, storage and disposal. Waste management should be conducted in coordination with the infection control team.

Definitions:

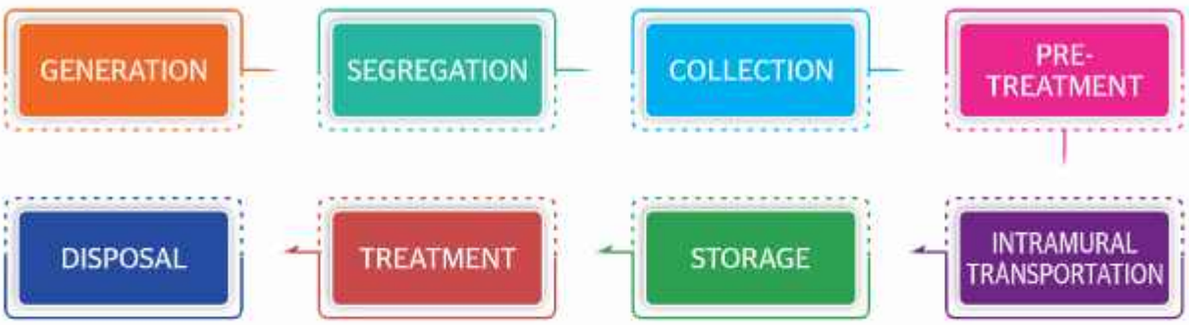
Bio-medical waste is defined as any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps.

Bio-Medical Waste Treatment and Disposal Facility is defined as any facility wherein treatment, disposal of bio-medical waste or processes incidental to such treatment and disposal is carried out, and includes common bio-medical waste treatment facilities.

Principles of Waste Management:

- Develop a waste management plan that is based on an assessment of the current situation and which minimizes the amount of waste generated.
- Segregate clinical (infectious) waste from nonclinical waste in dedicated containers.
- Collect and store sharps in sharps containers. Sharps containers should be made of plastic or metal and should have a lid that can be closed.
- Mark the storage areas with a biohazard symbol.
- Ensure that the carts or trolleys used for the transport of segregated waste collection are not used for any other purpose - they should be cleaned regularly.
- Identify a storage area for waste prior to treatment or being taken to final disposal area. This area should also have restricted access.
- All plastic bags should be as per BIS standards and all plastic bags should be properly sealed when 3/4th full, labelled and recorded before disposal.
- Each healthcare facility should identify a method for the treatment of clinical/ infectious waste. This may consist of transportation of infectious waste to a centralized waste treatment facility or on-site treatment of waste. The biomedical waste of a hospital should be outsourced to an authorized contractor for the management and handling of biomedical waste as designated by the State Pollution Control Board.

Process flow of BMW:



BIO MEDICAL WASTE MANAGEMENT:

Category	Waste	Type of bag or Container to be used	Options
1	2	3	4
Yellow	a. Human Anatomical Waste: Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).	Yellow Colored non-chlorinated plastic bags.	Incineration or Plasma Pyrolysis or deep burial.
	b. Animal Anatomical Waste: Experimental animal carcasses, body parts, organs, tissues including the waste generated from animals used in experiments or testing in veterinary Hospitals or Colleges or animal Houses.		
	c. Soiled Waste: Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bag containing residual or discarded blood and blood components.	Yellow Colored non-chlorinated plastic bags.	Incineration or Plasma Pyrolysis or deep burial. In the absence of the above facilities, autoclaving or microwaving/hydroclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery.

	d. Expired or discarded medicines: Pharmaceutical waste like antibiotics cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.	Yellow Colored non-chlorinated plastic bags or containers	Expired 'cytotoxic drugs and items contaminated with cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature > 1200oC or to common biomedical waste treatment facility or Hazardous waste treatment, storage and disposal facility for incineration at > 1200 °C or encapsulation or plasma pyrolysis at >1200 °C. All other discarded medicines shall be either sent back to manufacturer or dispose by incineration.
	e. Chemical Waste: Chemicals used in production of biological and used or discarded disinfectants.	Yellow Colored containers or non-chlorinated plastic bags.	Disposed of by incineration or plasma pyrolysis or encapsulation in Hazardous waste treatment, storage and disposal facility.
	f. Chemical Liquid waste: Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X-Ray film developing liquid, discarded formalin, infected secretions aspirated body fluids, liquids from laboratories and floor washing cleaning, house-keeping and disinfecting activities etc.	Separate collection system leading to effluent treatment system	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other waste water. The combined discharge shall conform to the discharge norms given in Schedule-III.
	g. Discarded linen, disinfection mattresses, bleeding contaminated with blood or body fluids, routine mask & gown.	Non-chlorinated yellow plastic bags or suitable packing materials	Non-chlorinated chemical followed by incineration of plasma pyrolysis or for energy recovery. In absence of above facilities, shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery or incineration or Plasma Pyrolysis.

	h. Microbiology, Biotechnology and other clinical laboratory waste: Blood bags, Laboratory cultures, stocks or specimens of micro-organisms, live or attenuated vaccines, human and animals call cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.	Autoclave or Microwave or Hydroclave safe plastic bags or containers	Pre-treat to sterilize with non-chlorinated chemicals on-site as per World Health Organization guidelines and thereafter sent for incineration.
Red	i. Contaminated Waste (Recyclable): Wastes generated from disposal items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes and vacutainers with their needles cut) and gloves.	Red colored non-chlorinated plastic bags or containers	Autoclaving or micro-waving/ hydroclaving followed by shredding or combination of sterilization and shredding. Treated waste to be sent to registered or authorized recyclers or for energy or plastics to diesel or fuel oil or for road making, whichever is possible. Plastic waste should not be sent to landfill sites.
White	j. Waste sharp including metals: Needles, syringes with fixed needled, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp objects that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps.	Puncture proof, Leak proof, tamper proof containers	Autoclaving or dry heat sterilization followed by shredding or mutilation or encapsulation in metal containers or concrete cement, combination of shredding cum autoclaving and sent for final disposal to iron foundries(having consent to operate from the State Pollution Control Boards or Pollution Control Committees) or sanitary landfill or designated concrete waste sharp pit.
Blue	k. Glassware: Broken or discarded and contaminated glass including medicine vials, metallic body implants and ampoules except those contaminated with cyototoxic wastes.	Puncture proof and leak proof boxes or containers with blue colored marking.	Disinfection soaking (by the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.
	l. Metallic Body Implants.	Puncture proof and leak proof boxes or containers with blue colored marking	

Disposal by deep burial is permitted only in rural or remote areas where there is no access to common bio-medical waste treatment facility. This will be carried out with prior approval from the prescribed authority and as per the Standards specified in Schedule-II. The deep burial facility shall be located as per the provisions and guidelines issued by Central Pollution Control Board from time to time.

Decontamination of BMW:

Sterilization is best practice for inactivating biological waste and is defined as effectively giving a 100% kill. Temperature (121 °C) Pressure 15(bar) and Holding time (30minutes) should be maintained. Operating times should take into account the time taken to reach the temperature as determined by the validation procedure. Chemical disinfection should be used routinely for decontamination of discarded liquid cultures, possibly small amounts of solid material (e.g. small sample tubes), surfaces and spillages. Various disinfectants available are hypochlorite, per oxygen, alcohol, formaldehyde. (Ref to Annexure 1).

F. Fluid waste management:

The guidelines in the Bio Medical Waste (Management and Handling) Rules, 1998, explicitly state that, hospitals should set up their own Effluent Treatment Plants (ETPs), for treating the waste water that can eventually be reused. In hospitals that do not have ETPs, the water can be chemically treated and released into the common sewage pipeline, provided it is connected to the local municipal water treatment facilities All the infectious liquid waste such as blood and body fluids of the patients must be treated with chemical disinfectant of 2% sodium hypochlorite or bleach solution for at least 30 minutes and then can be flushed into the sewage system. 2% of bleaching solution with at least 30% residual chlorine for 20 minutes is added in equal amount of liquid waste. Diluted bleach or hypochlorite solution has a shelf life of only 24 hours, so it should be freshly prepared daily. The person who disinfects this liquid waste must wear PPE before starting the process.

Spill management:

Blood and Body Fluid Spills Management.

- Blood and body fluid spillages should be dealt with immediately or as soon as it is safe to do so.
- Other persons should be kept away from the spillage until the area has been cleaned and dried.
- Care should be taken if there are sharps present and if so, should first be disposed of appropriately into a sharp container.
- Spills should be removed before the area is cleaned.
- Adding liquids to spills increases the size of the spill and should be avoided.
- Chlorinating agents should be used (10% hypochlorite) in a well-ventilated area only and are generally recommended on a small spill.
- Chlorinating agents should not be placed directly on spillages of urine.
- Chlorinating agents are not suitable for use on soft furnishings.
- It is recommended that supplies of personal protective equipment, paper towels and yellow waste bags are made available for spills management.
- If non-disposable cloths/mops are used to clean spillage area, they must be thermally or chemically disinfected.

Spill Kit

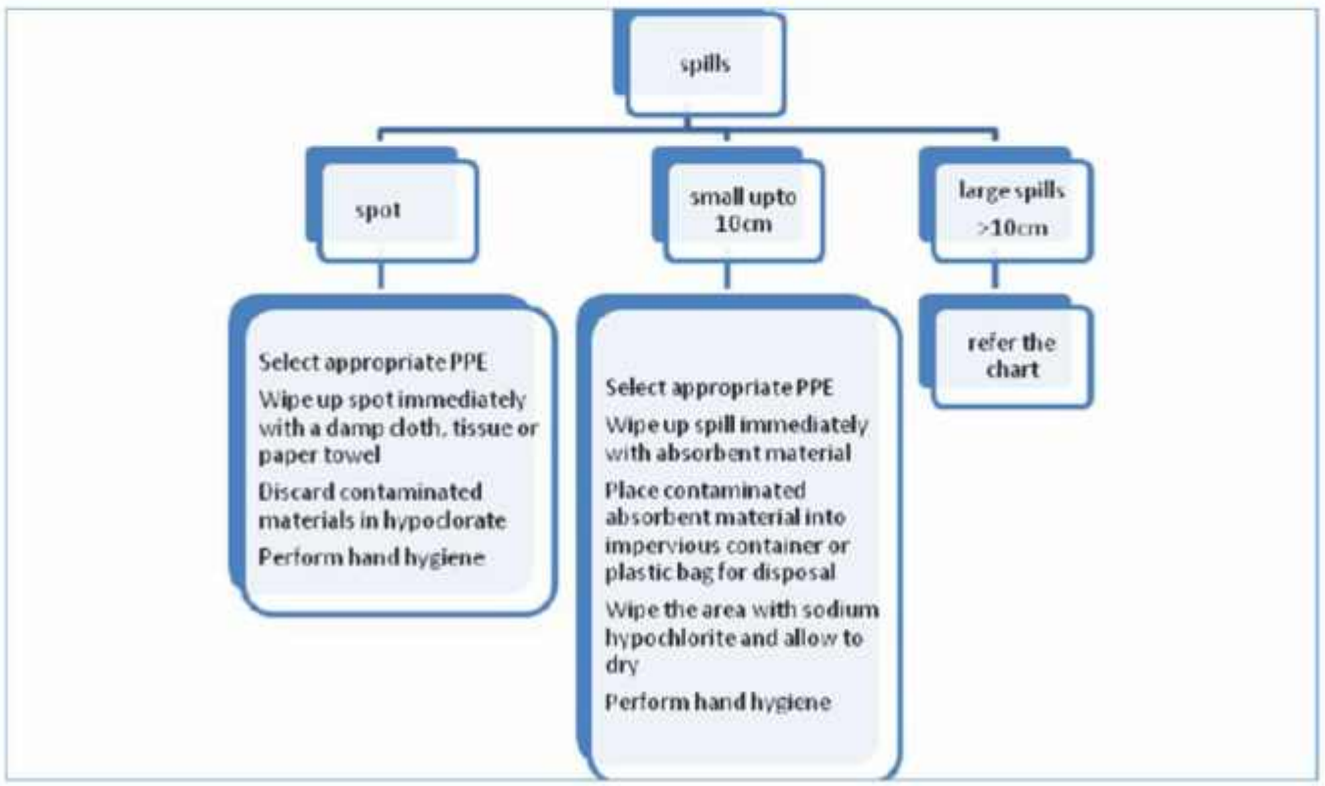
A spill kit should be readily available in each clinical area and should include the following-

Scoop and Scraper	Absorbent Agent	Rough Cloth
Single-use gloves	Clinical waste bags and ties	Bleach
Protective apron	Disposable Forceps	Two cardboard pieces
Surgical mask & eye protection	Detergent	Instruction chart

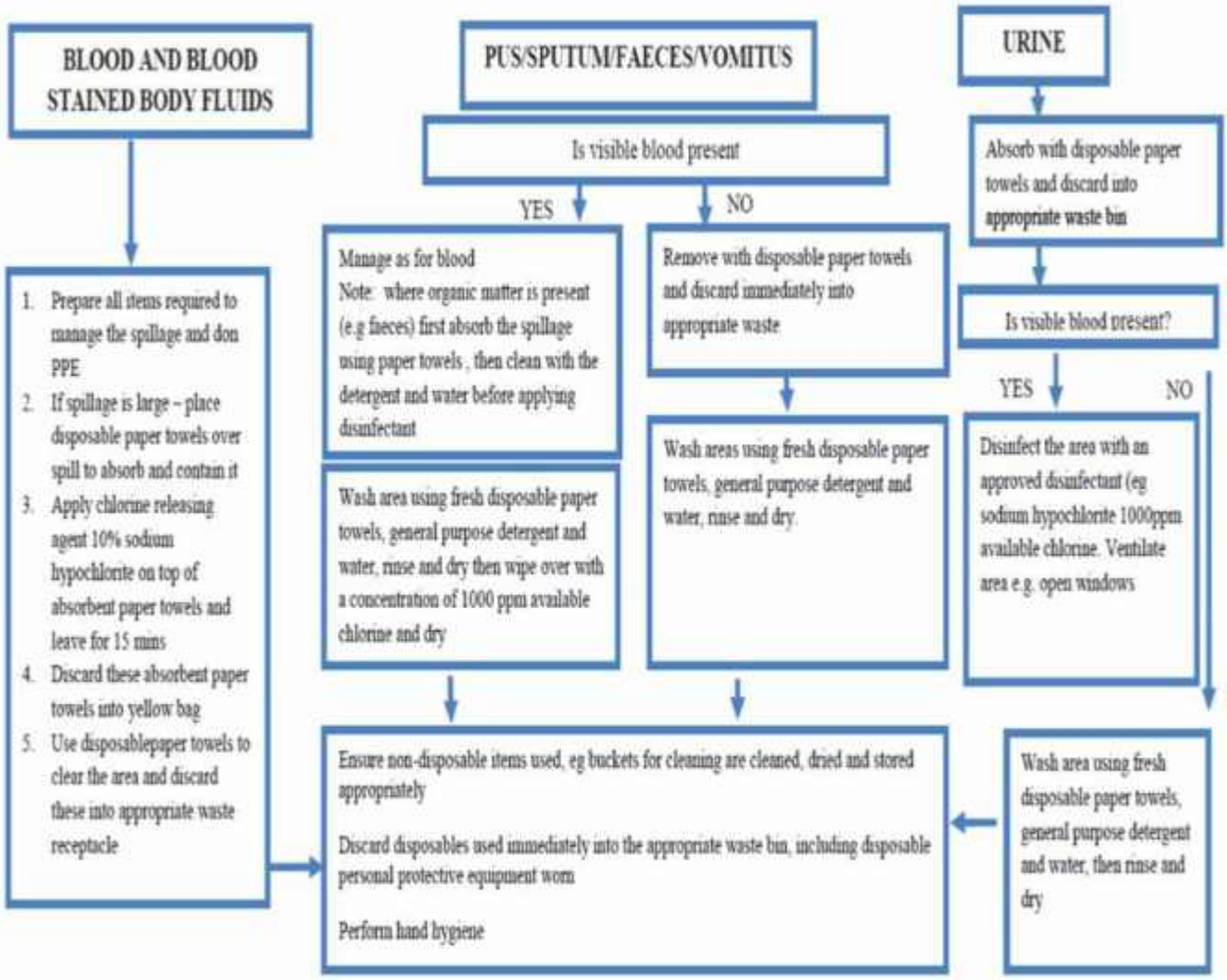
Buckets and mops of spills should be different from the regular mops & buckets and should be cleaned separately.

Small spill: 0.05% hypochlorite: 500ppm (1:100 dilution of 5.25% hypochlorite/ household bleach).

Large spill (>10ml): 0.5% hypochlorite: 5000ppm (1:10 dilution of hypochlorite/ household bleach) Contact Time: 10 minutes).



MANAGEMENT OF LARGE SPILLS (>10 cm) OF BLOOD AND OTHER BODY FLUIDS



Activity	Agent used	Frequency
Floor Mopping (including blood spill)	Routine cleaning morning, evening and once in two hours. Damp mop with detergent and water followed by aldehyde free high-level disinfectant/0.5% chlorine in areas other than operative zone.	4hourly apart from that as and when required in case of blood spill.
Furniture	Ethyl alcohol (70-90%) Sodium hypochlorite or (5.25-6.15% household bleach diluted 1:500 provides >100 ppm available chlorine).	Morning and Evening
Metallic surfaces. eg OT tables and stretchers/ metallic surfaces	Metallic surfaces eg. OT tables and stretchers/ metallic surfaces- 70% ethyl or isopropyl alcohol after every procedure.	Morning, evening and after every procedure
Bed rails	3-5 % Sodium hypochlorite for 30 minutes followed by washing with soap and water.	Morning and evening, as and when required
Soiled linen	Hot water washing for 25 minutes at 71 degrees Celsius. The use of chlorine assures an extra margin of safety. The addition of 50-150 ppm (0.015% hypochlorite) available chlorine residual is recommended.	As and when required
Cleaning of Mops	Disinfect the mop by soaking them in water with 0.5% hypochlorite solution for 30 minutes. Wash with detergent & water and dry in sunlight upwards down at 45° angle. Use separate mops for surfaces, floor and crticial areas.	After every use
Instruments	Cleaning is the first and most essential step before any process of disinfection or sterilization can be carried out. Soaking of instruments in 0.5% chlorine solution or any other disinfectant before cleaning is not recommended. Medical devices/instruments which are grossly soiled should first be cleaned by rinsing with detergent and water. If blood or exudates have dried or hardened, soaking in a warm solution of an enzymatic cleaner is required. Cleaning of the devices & instruments in running water should be avoided and instruments should be cleaned in a tray with water.	After every procedure

	The contaminated water after cleaning should be treated & decontaminated before discharging into the water disposal system of the health care facility. After cleaning, sterilization needs to be done by autoclaving and in case of heat-sensitive equipment by ETO. For, instruments like endoscopes, high level disinfection with glutaraldehyde, ortho-phthaldehyde, and peracetic acid is to be used.	
Buckets and Utility Gloves	Disinfect buckets and utility gloves with 0.5 % hypochlorite solution for 1 minute • _Wash the utility gloves with soap and water and hang for drying.	After Every Use
Laparoscopy/endoscopy disinfection	2% glutaraldehyde for 20 mins (ensure that the device was first cleaned).	After every procedure
Rectal/vaginal probes, cryosurgical instruments, and diaphragm fitting rings	3% hydrogen peroxide, or 5000 ppm chlorine, or 70% ethyl alcohol, or 70% isopropyl alcohol.	After every procedure
Rubber/polyethylene Tubing and Catheters	ETO is preferred OR else soak in 2% glutaraldehyde for 20mins (ensure that the device was first cleaned).	After every procedure

Cleaning Protocols for OT (within different zones):-

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		
Doctor's/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.	– Agent 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.***

Fogging in OT: - Routine fogging/fumigation not recommended. OTs not having AHUs or HvAC system with HEPA filter, may carry out periodically after repair/renovation/construction or suspicion of any microbial infection. In such cases chemical to be used for fogging is silver nitrate and hydrogen peroxide.

Frequency of Cleaning Labour Room

Cleaning & disinfecting the Labour Room (twice a day, weekly, monthly and every 3 months).

Twice a day: Floor and sinks with detergent (soap) water/hospital grade phenyl at fixed times.

Labour table, tabletops & surfaces - light shades, almirahs, lockers, trolleys in 2% aldehyde-based preparation*Toilets with disinfectants.

Weekly: Walls, roofs, floors, furniture and fixtures thoroughly cleaned/washed.

Monthly: Air sampling should be done on monthly basis Random swab sample from surfaces & disinfected areas.

Every 3 months: Microbial water testing to be done every 3 months and after source changed/major repairs in supply system/water related outbreak suspected.

General Measures

- Restrict unnecessary entry and use of external footwear.
- LR doctors and paramedics should wear mask, cap and slippers/shoe covers all the time.
- Proper clothing of LR personnel including cap, mask, slippers/shoe covers and gown at the time of delivery.
- Bio medical waste management in LR as per guidelines.
- Disinfect buckets and utility gloves with 0.5 % hypochlorite solution for 1 minute.
- Wash the utility gloves with soap and water and hang for drying.

CHAPTER 16
COUNSELLING AND COMMUNICATION WITH THE FAMILY

KEY LEARNING OBJECTIVES

By the end of this session, the participants will be able to learn the following:

A. **Importance of counselling in RMNCH+A**

B. **Process of counselling (GATHER) approach**

C. **Counselling based on time of pregnancy**

   a. **Preconception**

   b. **Antenatal**

   c. **Postnatal**

D. **Domestic violence**

E. **Intimate partner violence**

F. **Birth preparedness and complication readiness**

G. **Facility readiness and communication to family during emergency**

Counselling is the application of mental health, psychological or human development principles, through cognitive, affective, behavioral, or systemic interventions, strategies that direct wellness, personal growth etc. It is a process in which clients learn how to make decisions and formulate new ways of behaving. It also helps address and resolve specific problems, make decisions, cope with crisis, develop personal insights and knowledge, work through feelings of inner conflict, or improve relationships with others.

People go through an array of emotions when experiencing health issues or going through changes in life. These issues not only affect the physical and mental health of the individual but also can affect the relationship with family, friends and colleagues. If a member of the family suffers with any of the health issues, the whole family gets involved emotionally. Therefore, counselling becomes an important aspect which can help an individual to cope up with the situation.

Counselling Environment:

- Welcoming
- Comfortable
- A place with few distractions
- Privacy and confidentiality
- Non-threatening

Counselling attitude:

- Be genuine
- Try to be brief
- Use your own words to reflect back

- Avoid using a shocked or disbelieving tone of voice.
- Be focused and attentive.
- Don't get deviated or interrupted.

Effective Counselling Skill Includes:

- Active listening.
- Being aware of nonverbal communication.
- Building rapport.
- Trust worthy.
- Silence.
- Reflecting and paraphrasing.
- Clarifying and the use of questions.
- Focusing.
- Summarizing.
- Non commanding communication.

A. Importance of counselling in RMNCH+A:

RMNCH+A is a major group and has various areas where counselling is prime. Hence, it is essential that all the medical officers and other service providers need to develop counselling techniques. So that their advices are effectively followed up.

In the era of continuum of care, counselling plays an indelible role under RMNCHA in imparting knowledge and boosting confidence which leads to behavior change resulting in positive health outcome. The continuum of care demands continued counselling which means that at all ages from neonate to adolescent and women in reproductive age adequate and healthy care is accessed in a life cycle approach initially by the parents and family and later on during adulthood develops self-understanding for healthy care.

Steps in the Counselling Process

The steps for counseling are to establish basic ground rules in what you do and how you operate. These steps are -

1. Encourage the client to talk about the feeling and listen carefully.
2. Provide missing information where needed.
3. Talk about the client's views and goals.
4. Communicate what it takes to get to the point needed.
5. Encourage client to develop positive energy to wards devising a solution.
6. Establish a regular schedule for follow-up discussions and give feedback.

Agree on what steps are needed to be taken by the client to change the current situation.

B. Process of Counseling (GATHER Approach)

Counseling of New Client

G: Greet - This step is to make the client feel welcomed and to create a conducive atmosphere, including audio visual privacy.

- Be polite, friendly and respectful: Greet the client, give your full attention, introduce yourself, and offer a seat.
- Ask how you can help to fulfill purpose of the visit.
- Explain what the client can expect during the visit.
- Provide privacy and assure the client that all information discussed will be confidential.

A: Ask - This step is to understand client's situation and needs for a service/ healthy behaviour.

- Ask for all the information needed to complete the client's records.
- Ask about his/ her specific needs for a health service, any health problems, any measures already been taken to solve the problem.

- By asking simple questions, assess what the client already knows.
- Listen actively to what the client says to understand their situation and current needs.
- Identify information gaps that need to be filled or misconceptions that need to be corrected.
- Help the clients express their feelings, needs, wants, any doubts, concerns or questions.
- Keep questions simple and brief.

T: Tell - This step is to provide correct information and guidance about the healthy behaviours and services needed by the client.

- Tell the client about healthy behaviours/ services that are needed in the client's current situation e.g. while counseling a pregnant woman, tell her about the importance of taking tetanus injections and iron and folic acid tablets, eating nutritious diet and taking appropriate rest and care at home.
- Use counseling job aids effectively while giving relevant and specific information e.g. a pictorial flipbook, brochure and samples. Deliver key messages with simple pictures or samples, while explaining the relevant information. Help the client remain focused and understand the information easily. Encourage the client to ask questions on information being shared.
- Tailor information to the client's needs.
- Put risks into perspective (e.g.: the risks associated with carrying a pregnancy to term are much higher than risks associated with using a contraceptive method).
- Ask if the client wants to learn more and answer his/ her concerns and questions.

H: Help - This step is to help the client in decision making and availing services. Some clients are able to make a quick decision, while others need help in doing so. The counselor should use a consultative approach and try to understand what barriers/ challenges the client is likely to face and suggest ways of overcoming them.

- Help the client understand what the shared information means to him/ her personally (e.g.: what would it take or mean to start a new contraceptive method, to cope with side eff ects, to discontinue or to switch to another method? what would it mean to adopt safe abortion service at the health facility and how to avoid unwanted pregnancies in the future?).
- Help the client to arrive at a decision to adopt the healthy behaviour/ avail services.
- Ask if the client wants anything to be made clearer. Reword and repeat information as needed.
- Check whether the client has made a clear decision. Specifically ask, "What have you decided to do?"
- Wait for the client to answer.

E: Explain - This step is to explain healthy behaviour and services in details and remove any doubts that the clients may have.

- Dispel myths and remove misconceptions, if any, helping the client to overcome barriers in adopting the healthy behaviours/ availing services.
- If the health service cannot be given at once, tell the client how, when, and where the services will be provided.
- Ask the client to repeat instructions to make sure that the client understands and remembers them.
- If possible, give the client printed material to take home.
- Thank the client for coming and invite him/ her to visit if any side effects are noticed.

R: Return/ referral - This step is to fix the next visit and ensure appropriate referral, if required.

- Schedule return visit by the client for availing/ follow up of services provided.
- If required, refer to a service provider/ appropriate place for further services

(For details may refer to- https://nhm.gov.in/images/pdf/programmes/family-planing/guidelines/RMNCAH+N_Manual_on_Counseling_2021.pdf).

Maternal and Neonatal health:

This chapter gives a special focus on counselling to pregnant women during ANC. INC, PNC and for her neonate after birth. During the counselling sessions women are made aware about the important of timely check ups, dietary intake, routine investigations, regular intake of Iron and calcium etc. which helps in positive outcome of pregnancy. This also orients her on complications that may occur during pregnancy/after delivery, what danger signs should not be ignored and when she should contact the health workers or visit the health facility. The sessions also provide emotional, psychological support before-during and even after childbirth which helps in practicing the correct techniques of breast feeding and baby care along with their own health.

Types of Counselling

Depending upon the theme/ situation the counsellor should choose the type of counselling required. It can be:

TYPES OF COUNSELLING	
Interpersonal Counselling	**Group Counselling**
• When the counsellor interacts with the client or beneficiary one to one with privacy and provides information or gives psychological/ mental support as per the client/beneficiary's individual need after adequate assessment is known as interpersonal counselling. • Some of the eg of IPC are: helping the client/beneficiary in decision making for family planning out of the basket of choice available. • Another eg can be interaction with the individual after he/she found to be HIV +ve etc.	• When the counsellor interacts with the client or beneficiary in a homogenous group to provide knowledge and awareness about a particular situation or health condition so that the participants in the group are informed and aware about the healthy practises, do's and dont's etc for achieving postitive health outcome is known as Group counselling. • Some of the examples of such counselling are: providing knowlege and raising awareness of a group of antenatal women on importance of regular check up, improved dietary intake, IFA and calcium supplementation, benefits of institutional delivery etc. • Another example can be a group of adolescent boys and girls on drug addiction and substance abuse, reproductive health, safe sex practises etc. • General awareness regarding HIV transmission, prevention and treatment may be disccussed in a group.

Key areas of counselling in Maternal Health:

1. Environmental exposure and addictions

- Enquire about workplace exposures to toxicants: industries, dry cleaning, printing, manufacturing, and agriculture.
- Assess for household exposures to potentially harmful agents such as heavy metals, solvents, and pesticides.
- Counsel patients about avoiding mercury exposure by not consuming large fish (e.g., shark, swordfish, tilefish, and king mackerel).
- Provide tobacco cessation advice, intensive behavioural counselling services and pharmacotherapy if needed.
- Screening for smoking and informing about harmful effects of active and passive smoking in pregnant women and unborn children such as preterm labour and Sudden Infant Death Syndrome.
- Counselling to maintain hygiene including hand washing, general cleanliness and menstrual hygiene.

2. Family/ Genetic history

- Screen for personal or family history of congenital anomalies or genetic disorders.
- Refer couples for genetic counselling when risk factors are identified, and provide carrier testing, when appropriate, to determine risk to future pregnancy.

3. Mental health and Psychiatric illness

- Screen for depression and anxiety disorders.
- Counsel patients about the risks of untreated depression during pregnancy.
- Counselling to avoid stress.

4. Psychological factors

- Meet the partner & the family to understand personal & social circumstances.
- Elicit history of domestic violence
- Evaluate patient's safety and provide referral to appropriate resources.
- Provide age-appropriate comprehensive sexuality education that addresses gender equality, human rights, education and empowerment.

5. Infectious disease screening

- Screening for Tuberculosis, HIV, Syphilis, Herpes Simplex Virus, Chlamydia and Gonorrhoea.
- Inform about safe sex practices and promote condom use for dual protection against STIs and unwanted pregnancy.
- HIV counselling and testing, including male partner testing.
- Provide anti-retroviral prophylaxis for women not on anti-retroviral therapy to prevent mother-to-child transmission and determine eligibility for lifelong antiretroviral therapy.
- Screening for Malaria in endemic regions.

6. Nutritional factors and drugs

Counselling to maintain adequate water intake.	
Screen and treat anaemia: counsel for iron rich diet and oral iron if required and deferring pregnancy till Hb is ≥ 11gm %.	
Screen for vitamin D3: add oral Vit D3 if found deficient and counsel for deferring pregnancy till levels are normalized (20 ng/ml to 50 ng/ml).	
Folic acid	400 mcg daily started before pregnancy and continued until 12 weeks post conception, reduces rate of neural tube defects by nearly 75%. Higher dosage 4 - 5 mg / day. • Women taking folic acid antagonists. • History of neural tube defects in the previous pregnancy/ies.
Vitamin B12	250 mcg daily as it is found to have beneficial role in preventing fetal malformations and diabetes.
BMI > 23 kg/m2	Assess for eating disorder and counsel for achieving normal Body Mass Index so as to or < 18.5 kg/m2have optimal pregnancy outcome.
Iodization of salt	Encourage to take Iodine rich salt.

7. Medical conditions:

- Enquire about chronic medical diseases like Diabetes Mellitus, Hypertension, Epilepsy, Autoimmune diseases, Hypothyroidism, Bronchial Asthma and Heart disease& counsel for optimal control of these diseases.
- Inform that status of remission of these diseases is associated with better pregnancy outcomes.
- Refer to higher centre for further management, if needed.

8. Pregnancy Spacing and Maternal Age:

- Counsel to avoid too early, unwanted and rapid successive pregnancies.
- Provide contraceptives for preventing early pregnancy.
- Provide contraceptives to adolescents.
- Educate that both teenage pregnancy as well as pregnancy after 35 years have more complications than those in the ideal age of reproduction.

9. Vaccine Preventable Diseases:

- Vaccination against Rubella (also explain to defer pregnancy till one month post vaccination) and against Hepatitis B.

C. Counseling based on time of pregnancy

A) Preconception Counselling.

B) Antenatal Counselling.

C) Postnatal Counselling.

A) Pointers for preconception counselling:

1. Help in decision making regarding conception.
2. Avoid stress and anxiety.

3. Say 'No' to dieting. Maintain a healthy weight.
4. Take regular folic acid tablets.
5. Quit smoking and alcohol.
6. If you are a strict vegetarian, you must make sure your intake of iron, folic acid, zinc and vitamin B-12.
7. Stay active but do not over-exert.
8. Safe sex.
9. Positive thinking.
10. H/o any chronic illness-asthma, epilepsy etc and h/o any drug intake.
11. Get tested for BG with RH, Hemoglobin, Sexually Transmitted Infections (STIs)/HIV.
12. NCD screening: any family history of NCD and patient history -DM, HTN, Cancers, Hypothyroidism,
13. Avoid exposure to harmful chemicals and radiation.
14. Don't take unnecessary drugs without consulting a doctor or health care provider.
15. Explain when during the menstrual cycle is the fertile period and there is a higher chance of conception.

B) Antenatal Counselling:

During pregnancy, the body undergoes hormonal changes to sustain pregnancy. In this phase the woman requires psychological support, empathy, along with adequate healthy diet, exercise and regular antenatal checkups. The family plays a crucial role in providing a safe, healthy and stress-free environment. While the ANC provider prepares and discusses the issues faced by the woman during the gestational period.

Importance of antenatal care:

Explain importance of a proper antenatal care to the pregnant woman and family members. The couple and family must realize the benefits of a planned and well supervised pregnancy and pregnancy interval. Early registration and proper adherence to healthcare in pregnancy is the basic foundation of a good outcome.

Pregnant woman should be made to understand that this journey of nine months can be made easier and more comfortable by following few important points like a stress-free healthy lifestyle, good diet and adequate rest. Family members at the same time should be counselled for their pivotal role in taking care of to be mother, herneeds, emotional support, making family environment free of any mental tension and violence.

Diet and rest:

Eating during pregnancy is not simply to satisfy hunger but to take care of the special needs of baby. The woman should be advised to eat more than her normal diet throughout her pregnancy. Remember, a pregnant woman needs about 300 extra kcal per day compared to her usual diet. She should be told that she needs these extra calories for:

- Maintenance of her health as a mother and required weight gain
- The needs of the growing foetus
- Successful lactation.

Diet must include one from each group -

✓ Cereals - Rice, Wheat, Ragi, Bajra, Jowar in form of chapati, halua, idli, dosa, upma, poha etc. Avoid white bread, biscuits and other foods made with refined flour (Maida).

- ✓ Fruits and vegetables - Eat seasonal fruits and vegetables liberally. Diet must include 2 katoris green leafy vegetables, 1 katori of starchy vegetables like potato, beet, carrot and 1 katori of other vegetables, like lady's finger, brinjal, tomato, beans etc. The more colorful the fruit or vegetable, the more nutritious it is.
- ✓ Protein - If you are a non-vegetarian, choose fish, full boiled eggs, and cooked meat. If you are a vegetarian, choose any pulses like moong, masoor, tuvar, rajma, at least 2 katoris a day.
- ✓ Milk and milk products - You can choose between 2 glasses of milk, or 2 katoris of curd or 60 gm paneer.
- ✓ Fat - Try to get your fat intake from vegetable sources like mustard oil and rice bran oil. Use a mixture of mustard oil and rice bran oil or mustard oil and groundnut oil, to ensure adequate quantities of Omega 3 and Omega 6 fatty acids in your diet. You can also consume flax seeds (Alsi) to get enough Omega 3 fatty acids in your diet.
- ✓ Water - Drink at least 10 - 12 glasses of water every day.

- The woman should be advised to refrain from taking alcohol or smoking & coffee intake during pregnancy.
- The woman should be advised NOT to take any medication unless prescribed by a qualified health practitioner.
- The woman should be advised to sleep for 8 hours at night and rest for another 2 hours during the day. She should be advised to refrain from doing heavy work, such as construction work and full-time farm labour work, as it can adversely affect the birth weight of the baby. The other members of the household should be taken into confidence and advised to help the woman in carrying out her routine household chores.
- All pregnant women should be told to avoid lying in the supine position, especially in late pregnancy, as it affects both the maternal and the foetal circulation. During pregnancy, the pressure exerted by the uterus on the main pelvic veins results in a reduced quantity of circulating blood reaching the right side of the heart. This causes reduced oxygenation to the brain and can therefore lead to a fainting attack, a condition referred to as the supine hypotension syndrome. It can also result in abnormal FHR patterns, and may also cause a reduction in the placental blood flow. If the supine position is necessary, a small pillow under the lower back at the level of the pelvis is recommended.

Hydration:

Pregnant women should be well hydrated as water prevents urinary tract infections, carries nutrients to the baby, used in the amniotic sac and prevents contractions caused by dehydration.

Counselling to maintain hygiene throughout pregnancy

- Washing hands frequently with soap and water, especially before cooking and eating.
- Maintain hygiene after using the toilet.
- Avoid coming in contact with people who are sick especially with communicable diseases e.g. chicken pox, tuberculosis.

Exercise

Simple exercises, such as walking, during pregnancy are highly beneficial. It helps the mother prevent pelvic and back pain, reduces the risk of gestational diabetes and hypertension, improves heart function, reduces constipation,

bloating and swelling and ensures the right weight gain.

Daily fetal movement count (DFMC): Women with bad obstetric history or coming with diminished fetal movements should be counseled for DFMC. Mother should be instructed to count the fetal movements for one hour each after breakfast, lunch & dinner and if less than 3 in each hour or if less than 10 in twelve hours, it indicates the need of further evaluation.

Ensure if women is not fasting or has taken drugs like sedatives.

- Ask her to eat more and watch FHS more carefully.
- If fetal distress (bradycardia, irregular, unexplained tachycardia) - LSCS
- If fetal heart rate normal and gestational age ≥ 37 weeks - induction of labour.
- If preterm - confirm gestational age and if between 24-37 weeks give first dose of corticosteroids dexamethasone 6 mg IM and refer to higher center for further evaluation.

Counselling about Sex during pregnancy

- It is safe to have sex throughout the pregnancy, as long as the pregnancy is "normal".
- Sex should be avoided during pregnancy if there is a risk of abortion (h/o previous recurrent spontaneous abortions), or a risk of preterm delivery (h/o previous preterm labour), leaking or bleeding per vaginum.
- Some women experience a decreased desire for sex during pregnancy. The husband should be informed that this is normal and the woman's consent should be sought before engaging in sex. This is extremely important as forced and unsafe sex can have adverse consequences on the health of the mother and the foetus, resulting in an abortion or preterm labour.
- Some couples find engaging in sex uncomfortable during pregnancy. The comfort of the woman should be ensured by her husband during sex
- Provide advice and counseling about sexual relations and safer sex monogamy, use of condoms, change in sexual desire during pregnancy and STIs.

Counseling about family support

Care and support by husband and mother-in-law give emotional support and confidence in dealing with the process of childbearing. Mothers-in-law can share their experience to reduce anxiety.

Stress of any kind can cause anxiety, sadness, and loneliness and can cause harm to mother and has adverse impact on the foetus as well at birth or later in life.

Fathers and family members can help the mother by creating a positive, supportive and safe home environment.

Counseling about government schemes and incentives.

Explain the scheme's incentives and entitlements that the woman and child can avail under SUMAN package. For more details, refer to chapter no. 20.

C) Post-natal counselling:

Important issues to discuss with women and their families, immediately following birth.

- The importance of having someone nearby for the first 24 hours.
- Brief the couple/family about the postnatal visits by ASHA/ANM.

- The importance of the new mother eating more and healthier foods - discuss in the context of local practices and taboos which are harmful, to ensure women have access to good health and nutrition. The new mother should also drink plenty of clean, safe water.
- The importance of rest and sleep and the need to avoid hard physical labour.
- Discuss the positive effects of exclusive and complementary breast feeding and breast care, the importance of only taking prescribed medicines when breast feeding. All efforts to be made for continuing breast feeding in first 6 months of life, avoid ghutti, honey etc.
- Orient about HBNC visits by the ASHA.
- Discuss the danger signs for the woman and baby and the importance of seeking medical help quickly.
- Discussion of normal postpartum bleeding and lochia - discuss with women how much blood loss they can expect, for how long. When bleeding is more than normal, they should seek care urgently.
- Personal hygiene in the context of local practices and the environment. Discuss with women the type of pads they will use and their disposal, and care of episiotomy in the context of home conditions. Hand washing is particularly important to prevent infections. It is also important not to insert anything into the vagina.
- Talk to them about when they can resume sexual relations and the importance of condom use to prevent STI and HIV transmission. Sexual intercourse should be avoided until the perineal wound heals. Discuss the importance of birth spacing and counsel on the use of a family planning method.
- Discuss the importance of the home environment for promoting the health of the baby and recovery of the mother. For example, discuss the need for warmth, good ventilation and hygiene for both mother and baby. Care of cord, avoid putting kajal in eyes of the baby.
- Discuss the importance of immunization, explain the schedule for full and complete immunization and how immunization protects the infant/children from various morbidities.
- In an area with malaria, discuss the importance of mother and baby sleeping under an insecticide-treated bed net.
- Explain about the scheme's incentives and entitlements that the woman and child can avail under SUMAN package.

✓ **Initiation of breastfeeding**

Counsel the mother that breast feeding should ideally be initiated immediately after birth, preferably within one hour even if the birth has been by caesarean section.

It is common practice in India to delay initiation. Colostrum (the first milk) is thrown away, and pre-lacteal feeds are given instead. This has obvious disadvantages. One, the pre-lacteal feed may not be hygienic and can cause an intestinal infection in the baby. Second, the baby is deprived of colostrum, which is very rich in nutrition for the baby and protective antibodies.

Most importantly, the sucking and rooting reflexes in the child, which are essential for the baby to successfully start breast feeding, are the strongest immediately after delivery, making the process of initiation much easier for the mother and the baby. These reflexes gradually become weaker over a span of a few hours, thus making breast feeding difficult later on.

✓ **Exclusive breastfeeding for 6 months:**

Emphasizes to the mother that only breast milk and nothing but breast milk should be given to the baby day and night for the first 6 months, not even water. Assure the mother that breast milk contains enough water to quench the baby's thirst (even in the peak of summer) and satisfy its hunger for the first 6 months. Take special care in the case of a female child to ensure that she is adequately breast fed and not discriminated against because of her sex.

✓ **Demand feeding:** This refers to the practice of breast feeding the child whenever he/she "demands" it, as can be made out by the child's crying and searching for the breast. The practice of feeding the child by the clock should be actively discouraged. After a few days of birth, most children will develop their own "hunger cycle" and will need to be fed every 2-4 hours as judged by the baby's cry. Remember that each child is different as far as the feeding requirements and timings are concerned. Every woman has the capacity to produce enough milk for her baby.

Breast Feeding should continue up to 2 years

Feeding bottles should be strictly discouraged as they are a strong potential source of infection to the newborn

Rooming in: This refers to the practice of keeping the mother and baby in the same room and preferably on the same bed. This practice should be encouraged as it has certain advantages.

* Makes demand feeding easier to practice, as the mother can hear the child's cry.
* Keep the baby warm, thus preventing hypothermia in the newborn.
* Helps build a bond between the mother and the baby.

✓ **Contraception**

The woman should be advised regarding postpartum birth spacing (or limiting, as the case may be). Explain to the woman and her partner that after birth, if she has sex and is not exclusively breast feeding, she can become pregnant as early as six weeks after delivery.

Ask about the couple's plans for having more children. If they desire more, advise them that a gap of 3years between children is healthier for both the mother and the child.

D. DOMESTIC VIOLENCE

- Pregnancy should be a time of peace and safety, but for many women it can be a time when they face violence. According to the National Family Health Survey V (2015-16), in India 29.3% of ever married women suffer from either physical and/or sexual violence.
- Domestic abuse and violence against pregnant women have immediate and lasting effects both on the pregnant woman and the fetus.
- Complications might be visible directly, such as blunt trauma to the abdomen, hemorrhage (including placental separation), uterine rupture, miscarriage/stillbirth, pre-term labour and PROM, all of which need to be ruled out. At times such trauma/violence can have indirect effects leading to psychological stress which might have long-lasting effects both for the mother and fetus.
- The husband and immediate family members of the pregnant woman should be briefed about the serious consequences that violence could have on the pregnancy, on the woman's health and on the physical and mental health of the child to be born.
- The woman herself should be counseled in private and enabled to access support systems

from within or outside the family, during and after the pregnancy.

- Health workers should be alert to signs of continuing violence even in the post-partum period. If domestic violence is identified, then notification to the facility's appropriate authority needs to be done.

E. INTIMATE PARTNER VIOLENCE

WHO's recommendations identify ANC as a setting where routine enquiry can be implemented if providers are well trained in a first-line response, and minimum requirements are met.

- Women who disclose any form of violence by an intimate partner (or other family member) or sexual assault by any perpetrator should be offered immediate support.
- First-line support by a health care provider involves being non-judgmental and supportive and validating what the woman is saying, providing practical care and support that responds to her concerns, but does not intrude.
- Ask about her history of violence, listening carefully, but not pressuring her to talk
- Access information about resources, including legal and other services that might be helpful in assisting her in increasing safety for herself and her children.
- Providers should ensure that the consultation is conducted in privacy and confidentially while also informing women of the limits of confidentiality (e.g. when there is mandatory reporting).
- If health-care providers are unable to provide first-line support, they should ensure that someone else (within their health-care setting or another that is easily accessible) is immediately available to do so.

Important points to remember.

- Every pregnant woman must receive at least 4 checkups during pregnancy (Registration and 1st check-up within 12 weeks and rest in 14-26 weeks, 28-34 weeks and 36-40 weeks).
- Ensure proper history is elicited and general physical and abdominal examinations are performed at every visit.
- Ensure that all investigations - hemoglobin, blood grouping & Rh typing HbsAg, HIV, RPR Blood sugar testing& urine routine microscopic examination are done at 1st visit. Repeat hemoglobin and urine examination should be done at subsequent 3 visits.
- The first dose of Td. should be given as soon as the woman registers for ANC. The second dose is to be given 4-6 weeks after the first dose, but preferably at least 2 weeks before the EDD.
- Administer tablet of IFA (60 mg of iron and 0.5 mg of folic acid) daily for at least 180 days, after 1st trimester for prophylaxis against anemia during pregnancy and 180 days during lactation and 2 tablets dose in case anemia is diagnosed during pregnancy followed by Hb estimation after one month.
- Every pregnant woman should receive 1000 mg of elemental calcium per day in two divided doses post-meal.
- During every visit emphasize on return for follow-up. Tracking should be done for missed and left-out cases. Women should carry MCP card during each antenatal visit.
- Counsel about diet, rest, warning signs, birth preparedness, complication readiness, breastfeeding, safe sex and postpartum contraception.
- In endemic areas administer anti-malarial and

anti-helminthic prophylaxis to all pregnant women as per the National ANC guidelines.

- Establish linkages with ICTC for voluntary counseling and testing for HIV and initiation of antiretroviral therapy if required.

F. BIRTH PREPAREDNESS AND COMPLICATION READINESS

It is estimated that 4 out of 10 pregnant or postpartum women will experience some complication related to their pregnancy; in about 15% of them, the complication will be potentially life-threatening and will require emergency obstetric care. Since most of these complications cannot be predicted, every pregnancy necessitates preparation for a possible emergency.

Emphasize institutional deliveries

Every pregnant woman should be advised and encouraged to go in for an institutional delivery. However, about 30-40% of the deliveries in India still occur at home. There are medical/obstetric conditions during a pregnancy when the chances of a complication occurring are high, and a home delivery may be risky and potentially life-threatening. Under such conditions, explain to the woman why the delivery needs to be at a facility level only and strongly advise her to deliver only in an institutional setting. Also, inform her on the benefits and entitlements offered to the woman for choosing institutional delivery

Birth preparedness

Identification of a skilled provider for birth: All pregnant women should be helped to reach a decision regarding the health provider they want for conducting their delivery.

Other factors such as the condition of the pregnancy (complicated or uncomplicated), the distance to the health facility, transport facilities, financial situation, etc. all need to be kept in mind before finally reaching a decision about the choice of facility for delivery.

Women should also be counseled to prepare a bag at seven months with clothes for herself and her baby, clean pads, warm clothes, cap, socks for the baby, some money for her attendants/companions for their food etc.

Explain to her why delivery at a health facility is recommended. Tell her that-

- Any complication can develop during delivery; complications are not always predictable; they can cost the life of the mother and/or the baby.
- A health facility has staff, equipment, supplies, and drugs available to provide the best care, if needed. It even has a referral system should the need arise to refer to a higher facility.

Identify support people: People are needed to help the woman care for her children and/or household, arrange for transportation, and/or accompany the woman to the health facility in an emergency. Advise the woman and her family to identify such people and to seek help from either the close relatives of the woman or community-based health functionaries such as the ANM, AWW, accredited social health activist (ASHA) and the TBA. Ask the ANM of the area to assist the woman for this purpose.

Identify birth companion: Any person from the family who can accompany pregnant women during the process of childbirth. (Details given in intra-partum care).

Signs of labor: Advise the woman to come to the health facility if she has any one of the following signs which indicate initiation of labor:

- A blood stained, sticky mucous discharge P/V.
- Regular painful abdominal contractions every 20 minutes or less.

- The bag of waters has broken, and she has clear fluid coming out P/V ("leaking").

Complication readiness

Danger signs: The woman and her family/ caretakers should be informed about potential danger signs during pregnancy, delivery and the postpartum period. She must be told that if she has any of the following during pregnancy, delivery or the postpartum/post-abortion period, she should immediately visit the nearest health facility, WITHOUT WAITING, be it day or night.

Danger signs: must visit the nearest health facility

- Severe headache with blurred vision.
- Convulsions or loss of consciousness.
- Labour lasting for more than 12 hours for primi& 10 hours for multi.
- Failure of delivery of the placenta within 30 minutes of delivery.
- Preterm labour (onset of labour before 34 weeks of gestation).
- Cases with leak P/V (PROM).
- Continuous severe abdominal pain.
- Any bleeding P/V during pregnancy, and heavy (>500 ml) vaginal bleeding during and following delivery.

Location of the nearest health center/FRU: The woman and her family members should be aware of the nearest health facility, both the PHC where 24-hour functioning emergency obstetric care services are available and the FRU where facilities for a blood transfusion and surgery are available.

Identification of transportation facilities: Delay in reaching a health care facility is one of the major "delays" responsible for maternal mortality. If the woman has decided to deliver at a health facility, appropriate information should be sent to the concerned health facility so that the woman may be transported to the health facility at the earliest. The pregnant woman and her family should be made aware of the transport facilities of 102, 108 or any other transport available at their village with the contact numbers of the owner/driver.

Preparedness for blood donation: Hemorrhage, both antepartum and postpartum, is an important cause of maternal mortality. Blood transfusion can be life-saving in such cases & availability of blood should be ensured. Relatives and the attendants accompanying the pregnant woman should be encouraged to donate blood for replacement.

G. FACILITY READINESS AND COMMUNICATION TO FAMILY DURING EMERGENCY

FACILITY READINESS

Any complications require immediate identification and initiation of appropriate management. Availability of clinicians is a prime necessity, however, initiating immediate response for identification and management requires support from all the staff present in the emergency unit. Some of the key requirements for ensuring readiness are-

- Training all staff- including clerks, guards, door-keepers or switchboard operators - to react in an agreed-upon fashion ("sound the alarm", call for help) when a woman arrives at the facility with an obstetric emergency or pregnancy complication or when the facility is notified that a woman is being referred.
- Clinical or emergency drills with staff to ensure their readiness at all levels.
- Ensuring that access is not blocked (keys are available) and equipment is in working order (daily checks) and staff are properly trained to use it.

- Having norms and protocols (and knowing how to use them) to recognize a genuine emergency and know how to react immediately.
- Clearly identifying which women in the waiting room - even those waiting for routine consultations - warrant prompt or immediate attention from the health worker and should therefore pass to the front of the queue.

COMMUNICATION WITH THE WOMEN & THEIR FAMILY

Pregnancy is typically a time of joy and anticipation. It can also be a time of anxiety and concern. Talking effectively with a woman and her family can help build the woman's trust and confidence in her healthcare providers.

- Respect the woman's dignity and right to privacy.
- Be sensitive and responsive to the woman's needs.
- Be non-judgmental about the decisions that the woman and her family have made thus far regarding her care.

It is understandable to disagree with a woman's risky behavior or a decision that has resulted in a delay in seeking care. It is not acceptable, however, to show disrespect for a woman or disregard for a medical condition that is a result of her behavior. Provide corrective counseling after the complication has been dealt with, not before or during the management of the problem.

Emergency situations are often very disturbing for all concerned and evoke a range of emotions that can have significant consequences. How each member of the family reacts to an emergency situation depends on the:

- Marital status of the woman and her relationship with her partner.
- Social situation of the woman/couple & their cultural & religious practices, beliefs and expectations.
- Personalities of the people involved and the quality and nature of social, practical and emotional support.
- Nature, gravity and prognosis of the problem and the availability and quality of the health care services.

COMMUNICATION TECHNIQUES & EMOTIONAL & PSYCHOLOGICAL SUPPORT

Speak in a calm, quiet manner and assure the woman that the conversation is confidential. Be sensitive to any cultural or religious considerations and respect her views. In addition, providers should:

- Encourage the woman and her family to speak honestly and completely about events surrounding the complication.
- Listen to what the woman and her family have to say and encourage them to express their concerns; try not to interrupt.
- Use supportive nonverbal communication such as nodding and smiling.
- Explain what steps will be taken to manage the situation or complication.
- Ask the woman to repeat back to you the key points to assure her understanding.

If a **woman must undergo a surgical procedure**, explain to her the nature of the procedure and its risks and help to reduce her anxiety. Women who are extremely anxious have a more difficult time during surgery and recovery.

CHAPTER 17

RESPECTFUL MATERNITY CARE & SUPPORTIVE CARE OF WOMAN DURING LABOR

KEY LEARNING OBJECTIVES

By the end of this session, the participants will be able to learn the following:

A. **Role of Behaviour Change in Implementation of RMC Importance of counseling in RMNCH+A**

B. **Supportive Care to The Woman During Labour**

C. **Support and counsel**

D. **Nonpharmacological methods for relieving pain during labor**

E. **Birth companion**

F. **Alternative birthing positions during labor**

G. **Analgesic during labor**

Respectful Maternity Care (RMC) is an integral part of Quality of Care (QoC), and is a critical aspect of maternal and newborn health care.It includes **respect for women's autonomy, dignity, feelings, privacy, choices, freedom from ill treatment and coercion and consideration for personal preferences including option for companionship during the maternity care**.

After launch of Janani Suraksha Yojna (JSY) and Janani Shishu Suraksha Karyakram (JSSK), there has been tremendous increase upto 80% institutional deliveries in the country (NFHS-4 2015-16). While the country has been successful in expanding the coverage of maternal health care services, provision of quality services for women during pregnancy, labour, delivery and postpartum period is of paramount importance. India is committed to ensure safe, respectful and dignified motherhood to every pregnant woman.

Key strategies implemented by GoI for addressing current gaps in care for pregnant women and accelerating the pace of decline in MMR is PMSMA. LaQshya, Midwifery and SUMAN. Access to care alone does not guarantee a positive outcome. Care for pregnant women must be of high quality and delivered with respect and dignity throughout the continuum of care. Improving the quality of care with respectful maternity care integrated with all services around the intrapartum period will help in encouraging women to seek and utilize institutional maternity services and help in further decreasing maternal and newborn mortality and morbidity by making childbirth a unique and satisfying experience for the mother, her family and the health care providers.

Seven categories of commonly observed disrespect and abuse to women around childbirth have been identified globally and their seven corresponding rights of childbearing women are

mentioned in annexure 1 and annexure 2 the Charter of RMC. The Citizen's Charter of Patient's Rights is provided in annexure 3). Annexure 2 and 3 with clear mention of maternity and transport services provided free of cost must be displayed at prominent places of the health facility for the information of the clients and all staff must comply to ensure these rights to the clients.

Respectful and dignified care and communication should be provided at all health facilities by all health care providers including the support staff while performing any health care service and interpersonal communication with clients, patients and their families.

❖ Role of Behaviour Change in Implementation of RMC

Every woman to have dignified and respectful care during pregnancy, delivery and postpartum, both the health care provider and beneficiary need to work together for successful implementation of RMC. For behavioral change to happen, the health institutional enabling environment and the mindset of the staff must change to allow favourable implementation of the RMC initiative.

The RMC initiative will be implemented at all public health facilities of India for the whole spectrum of antenatal, intranatal and postnatal care of women with priority to initiate at all LaQshya and Aspirational district facilities.

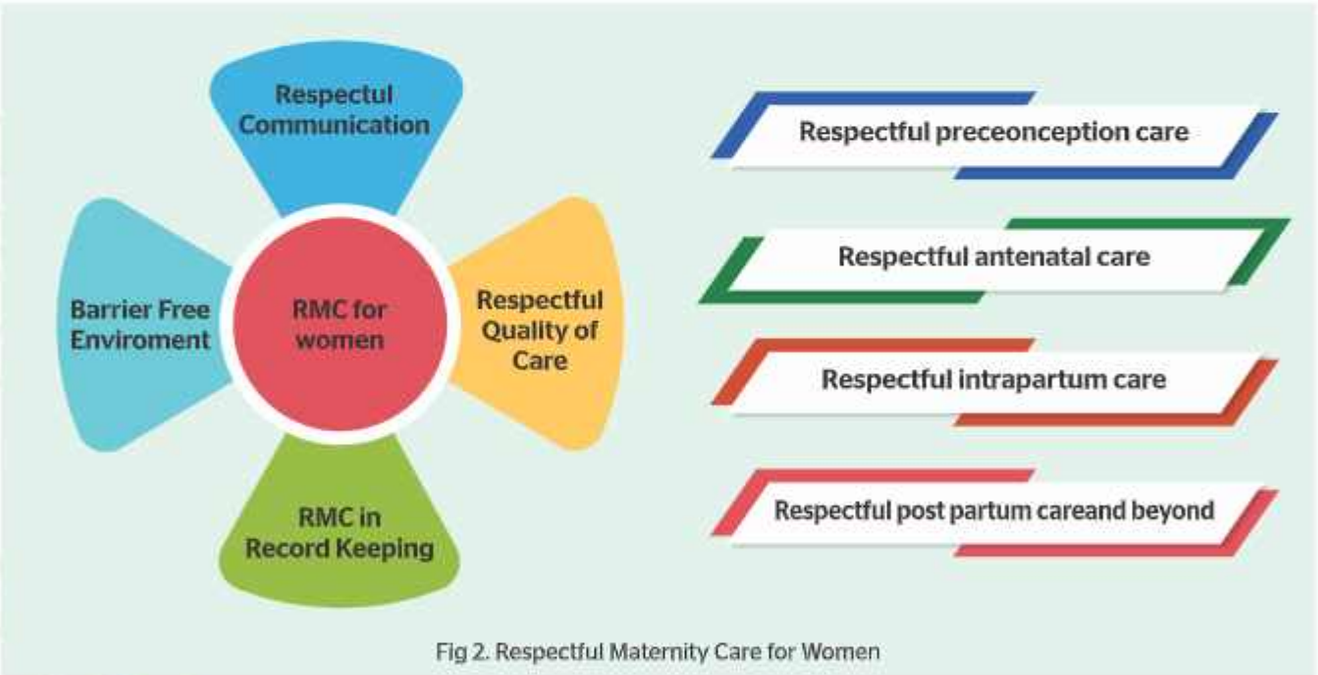


Fig 2. Respectful Maternity Care for Women

1. Create Barrier-Free Environment

- Health facility building including corridors, patient care areas, pavements, open spaces, toilets etc., should be accessible to the pregnant women to create barrier free structures for smooth movement and prevent falls.
- The health facility must have clear signages and boards in English and Hindi/local language displayed for different areas of care in the OPD, labour area, OT, and wards including labs, pharmacy, toilets, with arrows directing towards the area for easy navigation of the woman and her companion.

- Provision of comfortable furniture, such as examination tables, steps beside examination and labour tables, beds, chairs and stools should be made available at the health facility in ANC OPD, labour rooms, and maternity wards.
- The hospital ambulance, referral transport vehicles for PW should have features such as side supports, pedestal for wheel chairs, adjustable slope over steps of vehicle for easy sliding of wheel chairs and comfortable for pregnant or sick woman to ascend on to the vehicle.
- Availability of wheelchair/stretcher round the clock at the entrance of the obstetric emergency and in the ANC OPD.
- Soft music in waiting room for a pleasant and relaxing environment for the pregnant women and their companions.
- Sufficient seating space for pregnant women while waiting to register at the desk, or for antenatal care or for lab tests.
- Pregnant women should NOT be made to stand for hours to receive basic services.
- Posters on RMC and free of cost services clearly written must be displayed on the walls of the facilities so that women seeking maternity care are well informed about them.
- Healthcare workers demanding money for services from the woman or her companion should be informed and warned by the facility in-charge to refrain from such behaviour in future.

2. Respectful Communication

Pregnancy is a time of joy and anticipation. It is also a time of anxiety and concern. Listening and talking respectfully and sensitively with the woman and her family can help build the woman's and her family's trust and confidence in her health care providers.

Communication plays the most important role in imparting RMC. Listen to women's need, respect her demands and support her as much as is possible. This is described in detail in Chapter 5- Talking to Women and their Families.

Good Interpersonal Communication

- Speak in a calm, quiet manner and assure the woman that the conversation is confidential. Be sensitive to any cultural or religious considerations and respect her views.
- Ask the woman whom she would like present near her during the communication. Facilitate the presence of only those she chooses to be present. To avoid risk of infection, explain to avoid too many people near her or frequent movement in and out of the place where the client is.
- Encourage the woman and her companion/ family to speak honestly and completely about events surrounding any complication or problem. Encourage them to express their concerns, try not to interrupt.
- Let the woman know she is being listened to and understood. Rephrase her sentence to make her know you have understood her correctly.
- Use supportive non-verbal communication such as nodding and smiling. Maintain eye contact with the woman or the person being talked to. Do not smile if the woman's condition is serious or a mishap has occurred.
- Answer the woman's/companion's questions directly and in a calm, reassuring manner.
- Explain what steps will be taken to manage her situation or complication.
- Ask the woman and her companion to repeat back the key points to ensure their understanding.
- If a woman must undergo a surgical procedure, explain to her the nature of the procedure and

its risks and help to reduce her anxiety. Women who are extremely anxious have a more difficult time during surgery and recovery.

- Let her read and understand or the service provider must read each word of the consent form and help the woman and her companion to understand it before the client gives consent for any procedure.
- Respect the woman's sense of privacy and modesty by closing the door or drawing curtains around the examination/labour table.
- Good communication includes-an explanation of events, findings of action that will assist the woman in making informed decisions; an opportunity to discuss feelings such as loss, fear, anger and self-blame; social support; and a discussion of future childbearing.

3. Respectful Quality of Care for RMC Services

Respectful maternity care includes mother and newborn as a unit. While they should receive high quality care at all times, certain sub-groups are more vulnerable to discrimination such as Woman with HIV, girl child, preterm baby, baby of mother with HIV, newborn with congenital anomaly/ies, women and newborns in strife prone situation and during natural calamities and must get the same sensitive respectful and quality care.

Preconception

It is important that pre-conception care and counselling should be given for any couple who is considering pregnancy. This would ensure that they are in good health and mentally prepared for parenting role prior to conceiving and are provided complete support right from the very beginning.

During ANC

- Antenatal care should be offered in spaces which ensure privacy, dignity and respect. This can be achieved with curtains or doors with a commitment to ensuring only one woman and her attendant in the examination room at any given time. The high volumes in outpatient clinics demand more cubicles and certainly professional midwives to work along with doctors to help care for uncomplicated pregnancies. Women need to feel safe to disclose sensitive information such as gender-based violence and abuse.
- Heath care providers should introduce themselves and seek consent prior to any examination. Intimate examinations should never be performed without a companion in the room.
- Ask detailed history during the woman's ANC check-ups about her complaints, focus on her general health status, any illness and medications taking for treatment. Counsel and guide her on different visits, how to care for herself during pregnancy and how to prepare for childbirth and what to do during labour.
- Follow the recommended four visits and one PMSMA visit for ANC and identification and management of high risk pregnancy respectively.
- Conduct triage and prioritize women as per their need for care.
- Inform the woman and her companion regarding the examination and any procedure and lab tests required and take her permission prior to performing them.
- Help the woman and her family prepare a birth preparedness and complication readiness plan.
- Along with the MCP card, counsel the woman and her family members on the required documents for her to avail her entitlements and benefits under various government schemes.
- Provide her all services required for ANC without any stigma and discrimination.
- Women should be given the right information regarding nutrition, exercises, pain manage-

ment and process of labour and birth. This can be organized through group childbirth preparation classes being held in the antenatal clinic. These classes help the women to be mentally prepared, empowered with confidence and assured of support.

During Labour

- PW are often anxious and concerned during labour. Comfort her and her companion, reassure them of support and care during the entire labour and delivery and later.
- Conduct triage and prioritize women as per their need for care.
- Inform the woman and her companion regarding the examination and any procedure and lab tests required and take her permission prior to performing them.
- Maintain confidentiality and privacy while conducting clinical examination, during the process of child birth and after. It is important to explain throughout the examination what is being done and what sensations she may feel.
- Allow birth companion of choice and train her on how to support the woman and when to inform the service provider if any danger sign appears.
- Assess and plan for delivery in consultation with the woman herself.
- During labour, allow the PW to be mobile, take light food and fluids.
- Inform the woman and her companion about **pain relief measures** if she requires. This may provide the woman knowledge of having pain-free or bearable pain during labour and delivery and may prevent them from requesting for quickening the labour or caesarean delivery. Pain relief during labour and delivery can be **non-pharmacological** or pharmacological. GoI recommends non-pharmacological verbal and manual techniques such as verbal encouragement to the woman, gentle lower back massage or application of warm packs for healthy pregnant women requesting pain relief during labour. Service providers can provide information to the woman on pain relief option and methods during ANC in third trimester or during labour. She can explain to the woman and her birth companion the process of labour, gradual increase in intensity, duration and frequency of labour pains to deliver the baby vaginally normally. She should explain the benefits of deep breathing during labour pains for herself and her baby, allowing gradual and normal progress of labour for an easy and smooth normal vaginal delivery. The service provider must educate the birth companion during ANC third trimester or by staff nurse when the woman comes in labour on how to provide relief from pain by verbal analgesia- encouraging the woman on her efforts during labour, to take deep breaths during pains, moisten the woman's face with a wet cloth or towel and lips with sips of water, gently massage her lower back during labour and allow her to take the position in which she is comfortable and support her to walk slowly close to her bed. The gentle and encouraging words of the service provider also go a long way in the woman feeling cared for and confident and feel involved in her labour process. This will make the woman not feel scared of the unknown and participate as a team with the service provider and birth companion during the process of labour and delivery and feel proud.

(Pharmacological pain relief during labour and delivery is being provided and explored by some countries and facilities in India, especially in the private sector and medical colleges using medication such as spinal epidural analgesia and nitrous oxide. There is limited evidence on their benefits and it requires trained manpower to perform it. More research and evidence for this mode of pain relief is required. WHO and GoI

recommend back massage for pain relief and positive childbirth experience. Medications for pain relief may be provided if there is a medical indication or surgical intervention during delivery under trained expert judgement and care).

During Delivery

- Allow PW to deliver in position of her choice. Help her to take the position.
- Ask the birth companion to provide support to the woman by gently massaging her back during pains, encouraging her to take deep breaths, talking gently encouraging her efforts, wiping her face and lips with moist cloth.
- The staff assisting the birth must talk to the woman during the delivery process, encourage her for her efforts and keep her informed of her progress and the condition of the baby. This will help in better cooperation and involvement of the woman in her delivery and may feel less pain as she will feel in control of her labour.
- Women with HIV positive status must be provided with respectful care without any discrimination taking special precautions for infection prevention.
- Avoid harmful practices e.g., shaving the vulva, giving enema, doing frequent PVs, ironing the cervix and the vaginal introitus, giving unnecessary episiotomy, pushing the abdomen to get the baby out, asking the woman to push when the presenting part has not crowned.
- Allow the woman to bear pains of II stage of labour to enable the perineum to stretch gradually. Do not intervene unnecessarily.
- Perform supportive care by providing perineal support when the head is about to deliver, help flex the head/presenting part by the hand for easy delivery.
- The birth environment is crucial for a laboring woman to feel safe. The number of people in the birthing room must be restricted to the minimum. She should be given complete privacy by avoiding healthcare workers walking in and out of the birthing room.
- Women must be encouraged to give birth in positions of their choice. No woman must be forced to give birth lying on the flat of her back with her legs in stirrups.
- Conduct delivery as per SOP/guidelines.
- Availability of running water, clean toilets in the labour room are important aspects of RMC.

During Postpartum Period

- Women must be offered individual bed of their own after childbirth even if this means a mattress on the floor bed.
- During postpartum period, provide routine care for the mother and the newborn, perineal care, counsel for self-care, diet, exercise, breastfeeding positions, correct attachment and support to hold their baby for breastfeeding, importance of colostrum and initiating breastfeeding early and keeping newborn warm.
- Educate the woman and her companion to avoid harmful practices such as-giving prelacteal feeds, delaying breastfeeding, not giving colostrum, removing vernix by oil massage and bath for the baby, restricting food, fluids and mobility of the woman.
- Ensure the baby gets Vit K1 injection within 24 hours of birth and zero doses of immunization at birth before discharge.
- Support the women in receiving all the benefits and entitlements under various government schemes such as JSSK, JSY, PMMVY and PMSMA.
- In case the newborn is transferred to SNCU, inform the PW about the condition of newborn,

support her for breastfeeding and Kangaroo Mother Care if needed and provide referral transport services if required.

- At the level of community, ASHA workers should provide HBYC and postnatal care to all women and their newborns through home visits, without any discrimination.

Talking to Women and Their Families Respectful Communication

Pregnancy is a time of joy and anticipation. It is also a time of anxiety and concern. Listening and talking respectfully and sensitively with the woman and her family can help build the woman's and her family's trust and confidence in her health care providers.

Good Interpersonal Communication

- Speak in a calm, quiet manner and assure the woman that the conversation is confidential. Be sensitive to any cultural or religious considerations and respect her views.
- Ask the woman whom she would like present near her during the communication. Facilitate the presence of only those she chooses to be present. To avoid risk of infection, explain to avoid too many people near her or frequent movement in and out of the place where the client is.
- Encourage the woman and her companion/ family to speak honestly and completely about events surrounding any complication or problem. Encourage them to express their concerns, try not to interrupt.
- Let the woman know she is being listened to and understood. Rephrase her sentence to make her know you have understood her correctly.
- Use supportive non-verbal communication such as nodding and smiling. Maintain eye contact with the woman or the person being talked to. Do not smile if the woman's condition is serious or a mishap has occurred.
- Answer the woman's/companion's questions directly and in a calm, reassuring manner.
- Explain what steps will be taken to manage her situation or complication.
- Ask the woman and her companion to repeat back the key points to ensure their understanding.
- If a woman must undergo a surgical procedure, explain to her the nature of the procedure and its risks and help to reduce her anxiety. Women who are extremely anxious have a more difficult time during surgery and recovery.
- Let her read and understand or the service provider must read each word of the consent form and help the woman and her companion to understand it before the client gives consent for any procedure. Consent forms are provided in Annexur Respect the woman's sense of privacy and modesty by closing the door or drawing curtains around the examination/ labour table.
- Good communication includes-an explanation of events, findings of action that will assist the woman in making informed decisions; an opportunity to discuss feelings such as loss, fear, anger and self-blame; social support; and a discussion of future childbearing.

❖ SUPPORTIVE CARE TO THE WOMAN DURING LABOUR

Expected Learning Outcomes:

- ✓ Support and counselling during labor
- ✓ Birth companion - Role and responsibilities.
- ✓ Positions during labor.
- ✓ Non-Pharmacological methods for relieving

pain during labor.

✓ Analgesic Drugs During Labour.

1. SUPPORT AND COUNSEL

- Praise the woman, encourage her and reassure her that things are going well.
- Maintain and respect the privacy of the woman during examinations and discussions.
- Explain all the procedures, seek permission for examination and carrying out the procedures, and discuss the findings with the woman.
- Keep the woman informed about the progress of labour.
- Encourage the woman to bathe or wash herself and her genitals with soap and water at the onset of labour. Ensure availability of hot water in cold weather condition.
- Encourage the woman to empty her bladder frequently. Remind her every 2 hours or so.

2. NON-PHARMACOLOGICAL METHODS FOR RELIEVING PAIN DURING LABOR

Other non-pharmacological methods of relieving pain during labour include:

- Calm and gentle voice of the birth attendant.
- Offering the woman encouragement, reassurance and praise.
- Relaxation techniques performed by the woman such as deep breathing exercises and massage.
- Placing a cool cloth on the woman's forehead.
- Assisting the woman in voiding urine and in changing her position.

For service providers

- Always wash your hands with soap and water before examining the woman.
- Ensure cleanliness of the birthing area.
- Enema should NOT be routinely given during labour. Enema should be given only when needed, e.g. when the woman complains of constipation.

3. BIRTH COMPANION

- The presence of a second person or a birth companion of the woman's choice in addition to an SBA is beneficial. Birth companions are recommended as part of respectful maternity care. The presence of a birth companion has been shown to make labour easier, associated with less pain& shorter duration of labour.
- Birth companions provide comfort, emotional support, reassurance, encouragement and praise. On a practical level too, the presence of a second person is valuable, in that if at any point during the labour additional assistance is required, or in an emergency, this second person can be useful, even if it is only to seek help.
- But one must ensure cleanliness and concentrate on preventing infection.

➢ **Procedure of selection of Birth Companion:**

- During the first ante-natal care (ANC) visit, expectant mothers shall be informed of the Birth companion Policy and shall be encouraged to provide the name and contact information of their birth companion at the next ANC visit.
- ANMs providing ANC shall document on the ANC record the name and contact information of the birth companion.
- Birth companion shall be encouraged to

accompany expectant mothers during subsequent ANC visits.

- Birth companion shall be counseled on their role during labour, delivery and child birth at a date and time agreed with the healthcare providers. A minimum of two sessions shall be provided (one theoretical and one on site visit) to the hospital where the delivery shall occur.
- Birth companion should be allowed to remain beside the expectant mother during labour and delivery in the maternity ward.
- A Childbirth attended by a companion at birth shall be documented in the medical records.
- Birth companion will be educated not to interfere in medical procedures.
- Birth companion must be a woman who herself is a mother.

➢ Pre-requisite for a birth companion

- The birth companion has to be a female relative and preferably one who has undergone the process of labour.
- In facilities where privacy protocols are followed in the labour room, the husband of the pregnant woman can be allowed as a birth companion.
- Should maintain good personal hygiene,
- Should have been informed or made aware of danger signs for mother and newborns.
- Should be ready to provide emotional and physical support during labor and after.
- S/he should not suffer from any communicable diseases.
- S/he should wear clean clothes.
- S/he should be willing to stay with the pregnant women throughout the process of labour and after to take care of the mother and baby.
- S/he should not interfere in the work of hospital staff and the treatment, procedures.
- S/he should not attend to other women in the labour room.
- S/he should not carry mobile phones, cameras, audio-visual aids to capture any photographs and talks.
- S/he should respect and comply with the advice of the doctor.
- S/he should not comment /announce the condition of the mother or baby or sex of the baby to anyone outside the Labour Room unless advised.

➢ Role and Responsibility of Birth Companion

- The key role of the companion is to help support, encourage and reassure the woman throughout labour.
- The companion should always try to be with the woman and praise and encourage her throughout the process. Provide comfort and reassurance throughout.
- The companion can also carry out simple tasks such as helping her to breathe and relax or rubbing her back, providing sips of water as allowed, wiping her brow with a wet cloth, or doing other supportive actions.
- Informs about progress of labour.
- Speak to medical professionals on behalf of the mother.
- Helps initiating breast feeding immediately after birth.
- Supports the mother in providing newborn care.
- Keeps the baby warm, well covered and close to the mother.
- The birth companion should be told about the danger signs in labor, and in neonate after delivery and counseled to inform heath care provider if she observes any of the danger signs.

➢ **What the birth companion SHOULD NOT DO and explain why:**

1. Don't give any medicine without doctor's advice
2. DO NOT encourage the woman to push.
3. DO NOT give any advice to the expectant woman, other than that given by the health worker.
4. DO NOT keep the woman in bed if she wants to move around.
5. DO NOT administer any local herbs or med.

4. POSITIONS DURING LABOR

Traditionally during labour women were kept in bed in supine and in 2nd stage of labour in lithotomy position. With time it was realized that these positions are neither comfortable for the woman nor conducive to fetal/maternal wellbeing & occurrence of vaginal delivery.

- Women should be allowed to remain ambulatory during labour, especially the first stage, as this helps in having a shorter and less painful labour.
- The woman should be free to choose any position she desires and feels comfortable in during labour and delivery. She may choose from the left lateral, squatting, kneeling, or even standing (supported by the birth companion) positions. Remember, given a choice, the woman will often change positions as no position is comfortable for very long.
- To relieve the woman of pain and discomfort, a change in position and mobility is helpful. Encourage the birth companion to massage the woman's back if she finds this helpful, to hold the woman's hand and sponge the woman's face between contractions.

Now it is recommended that position during labour and birth

✓ Should be one which gives mother more comfort & less pain and speeds up the progress of labor.

✓ Should be one with minimum adverse effect on fetal physiology and perineum of the woman.

✓ Mother should change from one to other position during labor depending on her comfort level. This prevents developing a cramp or straining of the muscle.

✓ Changing positions also changes the shape of birth canal, helps the baby to make required movement prior to birth and ensures good oxygen supply.

✓ Use of pillows at different places gives enough support.

Different positions which may be adopted by the woman includ

- Standing - better fetal oxygenation
  - ✓ More effective & less painful contractions.
  - ✓ Gravity assists labour& descent of fetus.
- Walking - reduces backache & baby better aligned in pelvis.
- Sitting - good for resting.
  - ✓ Gravity assists progress of labour.
- Sitting on Toilet - helps relax perineum.
- Semi-sitting.
- Squatting - good fetal oxygenation.
  - ✓ Increases diameter of pelvic outlet by 2cm.
  - ✓ Facilitates rotation of fetal head.
- On Hands & Knees - good position for delivery of baby when there is shoulder dystocia.
- Supine - Must be used with a wedge on the right side-to prevent Supine hypotension.
- Lithotomy - on back with legs raised.
- Side-lying- good fetal oxygenation.

- ✓ Good for resting.
- ✓ Can be used by women with pre-eclampsia or with epidural catheter.

- Leaning - more comfortable than standing & facilitates back rub.
- Kneeling, leaning forward with support - good for pelvic rocking.
- Use of birthing ball - reduces pain of contractions & promotes pelvic rocking facilitating fetal descent.
- Under water Birth - relaxing for mother.
  - ✓ Safe for fetus from one fluid to other.
  - ✓ Less requirement of analgesia.
  - ✓ Should be tried if facility available and service provider is comfortable with this position.

5. ANALGESIC DRUGS DURING LABOUR

- Inj. Tramadol 50 mg IM (6 hourly) is drug of choice for pain relief in early labour & for painful diagnostic & surgical procedures.
- If woman complains of nausea, Inj. Promethazine 25 mg IM may be added but with caution as it causes respiratory depression in neonate. It should not be given if delivery is anticipated in 2 hrs. Or Injection Ondansetron 4 mg IV, may be given as it does not cause respiratory depression.
- Watch vitals carefully. Extra vigilance is needed in patients having chronic respiratory problems with pregnancy.
- If still pain is not relieved, epidural analgesia is recommended (in active phase of labour).
- Women are encouraged to have light, easily digestible, low fat food and drink plenty of fluids during labour.

CHAPTER 18
MATERNAL DEATH SURVEILLANCE & RESPONSE

KEY LEARNING OBJECTIVES

By the end of this session, the participants will be able to learn about the following:

A. **Maternal death surveillance and response**

   a. **Community-based MDSR**

   b. **Facility-Based MDSR**

   c. **Confidential review**

B. **Maternal Near Miss Review**

➢ **Important Points:**

- **Maternal death-** Death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.
- **Maternal Mortality Ratio (MMR)-** Ratio of the number of maternal deaths during a given time period per 100,000 live births during the same period. It is used as a measure of the quality of a healthcare system.
- **Maternal death surveillance &response (MDSR) -** The MDSR system is a continuous cycle of identification, notification, and review of maternal deaths followed by actions to improve quality of care and prevent future deaths.
- **Confidential Review (CR)** - Multi-disciplinary anonymous investigation into all or a sample of maternal deaths, to critically observe the line of management adopted in instances of maternal morbidities & mortalities and to identify the avoidable or remediable factors associated with them, so that the same could be corrected in the future.

A. MATERNAL DEATH SURVEILANCE AND RESPONSE

Levels of maternal mortality vary greatly across the regions, due to variations in underlying access to emergency obstetric care, antenatal care, anemia rates among women, education levels of women and other factors.

The Maternal death review (MDR) process initiated by Government of India in 2010 attempted to improve the quality of obstetric care and reduce maternal mortality and morbidity by providing a detailed analysis of various factors at community, facility, district, regional and national level that are required to be addressed to reduce maternal deaths. Unfortunately, the states have instituted the maternal death review process with varying degree of reporting, review and action planning. Less than 50% of the estimated maternal deaths in India get reported under the health

management information systems. While the institutional mechanisms for reviews have been established, the capacity to undertake quality review at various levels are weak and the translation of key findings into action, in other words the 'mechanism for response' lagged behind.

Based on this feedback there is now a focus on surveillance (for improving reporting) & response (for improving analysis and action planning) and a component of confidential review has been incorporated. There are also precise mechanisms for review of deaths of migrant population. No disciplinary action is to be initiated against any of the service providers. The entire process of reviewing is not to blame or find fault with anybody. The purpose of the discussion is to identify gaps at different levels and to take appropriate corrective measures and to sensitize the service providers to improve the accountability.

Objectives

1. To strengthen the mechanisms and processes for maternal death surveillance & response.
2. To institute a system of conducting a confidential review into maternal deaths.

a). Community based MDSR

Community based MDSR is a method of identifying personal, family or community factors that may have contributed to the death of the woman, by interviewing people such as family members or neighbors who are knowledgeable about the events leading to her death. Interview is done by using a verbal autopsy format. It must be taken up for all deaths that occur in the specified geographical area, irrespective of the place of death, be it at home, facility or in transit. District Nodal Officer (DNO) will ensure that all the maternal deaths reported by facilities will be investigated at community level also.

1. Notification of maternal deaths:

- All deaths of women in the age group of 15 to 49 years irrespective of the cause i.e. maternal or non-maternal will be notified by the primary informant to the ANM & Block Medical Officer/ Health Officer-in- charge of a zonal area/ equivalent (for urban areas) within 24 hours of death. VHSNC members/local panchayat/ward counsellor is encouraged to inform about women deaths in their area. ASHA will be designated as the Primary informant for reporting deaths of women in her village/ coverage area. In urban area, urban ASHA/link worker will be the primary informant. She will notify the deaths of all women in the age group of 15 to 49 years by telephone to the ANM/ Urban Health Worker/Urban ANM by filling Form 1 and gets an incentive of Rs 200 for reporting within 24 hrs of death. After verification that it is a case of maternal death, ANM will counter sign the format before onward submission to BMO office within first week of receiving death information.

In-transit deaths: Deaths occurring during pregnancy or in post-natal period (within 42 days) in ambulance/any recognized patient transport system will be reported by ambulance technician to the DNO who in turn informs the respective BMO for conducting community-based investigation. In case the woman has been referred from a facility and dies during transit, facility-based review must be conducted at the facility from where the woman was referred as well. In case the woman is a migrant, report will go to respective DNO/SNO.

2. Investigation:

All maternal deaths will be investigated, within 3 weeks of reporting, using verbal autopsy format (Form 5) within three weeks of reporting maternal death. An investigation team is constituted by BMO & that comprises of 3 persons including at least one woman. The members can be chosen from the

LHV, block PHN, Health Supervisor, or ANM or even MO as per the availability.

Prior to visit, ASHA/AWW/ANM will inform the family about the purpose of visit & obtain their consent about the same. Family members, relatives, neighbors or other informants and care providers are interviewed to elicit information on the events leading to the death of the mother in their own words to identify the medical and non-medical (including socio-economic) factors involved in the death of the mother. The Form 5 will be handed over to BMO for preparation of summary (Form 6) & further transmission to DNO.

3. Data Transmission:

- ✓ BMO will receive notification of death telephonically through primary informant/ ASHA/ANM within 24 hours of death of woman aged 15-49 years.
- ✓ BMO must report all suspected maternal deaths to the DNO by telephone within 24 hours of receiving this information from the primary informant.
- ✓ The primary informant will fill Form 1 for each reported death which ANM will verify whether reported death has occurred or not during pregnancy or in post-natal period (within 42 days) and then submit the duly filled form 1 to BMO office within one week of notification of death.
- ✓ BMO office will prepare the line list of all women deaths (Form 2) and maternal deaths (Form 3) reported by ANM every month.
- ✓ BMO Office will send the list of reported deaths to DNO by the 5th of every month in Form 3. In case of no death, nil reporting will be done for the month. Form 3 should also be entered in HMIS.
- ✓ BMO will constitute an investigating team for conducting verbal autopsy as per the details in Form 5 which should be filled within 3 weeks of reporting of death. The team will also assist BMO in filling Form 6.
- ✓ BMO will prepare MDSR case summary with help of Verbal Autopsy Team and assign cause of death.
- ✓ Copy of formats of all the investigated deaths (Form 5, 6) will be sent to DNO office every month. All the formats filled for notification, detailed investigation and line listing will be entered in MDSR software.

4. Analysis

BMO will do the analysis of the data collected and present the findings in the district level review being conducted by CMO. BMO will also share the findings in the block level monthly meeting for sensitization of the workers and initiating necessary corrective measures at this level.

5. Review and Response

Review of maternal deaths is the most essential component of this process. Data collected from the community will be reviewed at district level by district MDSR Committee chaired by CMO and then a few selected cases would be reviewed by the district Collector on a quarterly basis.

b). Facility Based MDSR

Facility Based Maternal deaths reviews are undertaken with the objective of improving the quality of services and responsiveness of the facility in the emergency situations by assessing the details of services provided with the help of format filled, from the case sheet and by interviewing the close family members if needed. It is a process of learning lessons from the events happened in the past to prevent similar incidences in future. FBMDSR will be taken up for all Government teaching hospitals, referral hospitals and secondary level hospitals under other departments like Corporation, Railway etc., District hospital, sub-district and CHCs conducting more than 1000 deliveries/ year. If regulatory mechanisms exist, states should instruct private tertiary care institutions to undertake maternal

death reviews.

1. Notification

All Maternal deaths occurring in the hospital, including abortions or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy, should be informed immediately by the Medical officer who has treated the mother and was on duty at the time of death to the facility nodal Officer (FNO) of the institution. Each health facilities reporting maternal death should maintain a register (Form 3) for all deaths in their facility.

The FNO of the hospital should inform the maternal death to the district nodal Officer (DNO) by telephone within 24 hours of the occurrence of death. The FNO should ensure completion of the primary informant format (Form 1) and send it to the DNO within 24 hrs of the occurrence of maternal death. All Maternal deaths occurring in the hospital must be reported irrespective of the department in which it takes place.

2. Investigation

Any maternal death which occurred in the hospital should be investigated within 24hrs by the Medical Officer who had treated the mother and was on duty at the time of occurrence of death using the Facility Based Maternal Death Review (FBMDSR) format (Form 4). The format should be copied in three, one copy would be retained by the FNO, one would be sent by the FNO to the DNO within 24 hrs and the other will be submitted to the Medical record department of the facility.

3. Data transmission

- ✓ Office of DNO will receive notification form (Form 1) from FNO within 24 hours of maternal death.
- ✓ Office of DNO will receive the investigation form (Form 4) from FNO within 48 hours of maternal death.
- ✓ FNO will also send the line list of maternal deaths (Form 3) electronically to DNO every month.
- ✓ In case there is no death in a month, the facility should report that there was no death in that month (nil death report).
- ✓ DNO will prepare the line list of all the maternal deaths (Form 3) received from all the facilities conducting MDSR including facilities in urban area.
- ✓ By the 7th of every month, line list of maternal deaths (Form 3) will be updated and submitted to SNO and all the data will be entered in the MDSR software.

4. Analysis

All the deaths reported and investigated will be analyzed every month. The focus of analysis would be to discuss the line of management followed in particular instances. If problems with medical care are identified, a clinical audit may be required to provide additional information.

5. Review

Facility level review will be conducted every month by the FBMDSR committee constituted at facility level. FNO will fix the date for the meeting and will conduct the review of all the maternal deaths occurred in the previous month. Committee will suggest the corrective measures to be taken to improve the services in the facility. Actions taken for the suggestions made in the last meeting will also be reviewed for their completion. Minutes of the meeting will be recorded and forwarded to DNO.

- Following five key decisions need to be discussed during MDSR meeting:
  - Cause of death,
  - Death classification (direct/indirect/incidental),
  - Relevant delays,

- Preventability (Lessons learnt are applied to prevent further deaths) and
- Actions.

DNO is the overall in-charge of the MDSR process in a district. He receives reports from community (Block MO) and facility (FNO). He prepares a report on the death reported for presentation before the DMDSR committee meeting chaired by CMHO.

MDSR process in Migrant death

- Death in the facility: If a facility reports maternal death, FBMDSR of the death will be conducted in the same facility, which reported the death irrespective of her migrant status.

✓ FNO will report this migrant death to DNO and also submit the filled in FBMDSR formats.

✓ FNO will inform the respective DNO (if migration is within the state) from where the mother actually belongs to, for initiating CBMDSR, through the BMO.

✓ DNO of the parent district will determine the place where community-based investigation should be conducted. In case deceased had developed complications in the parent district before proceeding to any other place, CBMDSR need to be conducted in the parent district and respective BMO will be directed to carry the investigation.

✓ In case the mother is from another state, the SNO, upon receiving information from DNO would communicate the same to the SNO of the parent state for further action. SNO of the parent state will inform the DNO along with the original formats of FBMDSR received from the SNO of the state from where case was referred (copy to be retained at both districts) to complete the process of MDSR.

- Death at home or in transit: Maternal death of migrant from other district/state reported from community or through ambulance in a transit death; DNO will assess where MDSR process has to be initiated.
- If transit death has occurred in an ambulance, the ambulance technician is mandated to report the death to DNO of the district where ambulance is located.
- If a migrant death is reported from community, DNO will inform the parent district (if in same state) or SNO (if another state) about the maternal death for information and records.
- BMO will collect the information and send it to the DNO to share it further with DNO of other district (if same state) to carry out the detailed investigation or share it with SNO to further share it with SNO of respective state to initiate the MDSR process in the parent state.

c). Confidential Review of Maternal Deaths

Confidential review is a multi-disciplinary anonymous investigation into all or a sample of maternal deaths, to critically observe the line of management adopted in instances of maternal morbidities & mortalities and to identify the avoidable or remediable factors associated with them, so that the same could be corrected in the future. The objective of CR will be to check adherence to protocols and line of management adopted for a particular case. It is recommended that all the states conduct the confidential review of the facility deaths but states with low MMR should compulsorily conduct it because in these states, cause of maternal death is usually due to indirect causes including systemic diseases.

Committee for Confidential Review of Maternal Deaths

- State Nodal Officer (SNO) Maternal Health should constitute committee for CR.
- SNO will be nodal officer for this committee.
- Committee will have 15-20 members with 70% obstetricians and remaining experts can be physicians, surgeons and other specialists.

- Committee should have representation from FOGSI.
- The committee shall meet once in a quarter.

Process of Confidential Review of Maternal Deaths

SNO will select sample of cases randomly or purposefully to understand real issues. SNO will ensure that all relevant documents for those particular cases are available. The cases then have to be prepared to ensure that all identifier information for patient and facility is removed before sending it to the expert. These selected cases will be sent in sealed cover to two external experts of the committee.

SNO will ensure that cases and expert should not be from the same college. One expert can be given maximum of two cases for any meeting. Based on the case sheets, referral sheets and other documents expert will prepare report to present in state level committee meeting. The formats for CR will be same as used for Facility Based Maternal Death Review (FBMDR - Form 4).

Recommendations based on MDSR & CR

Entire purpose of MDSR and CR is to identify causes of maternal death and take corrective actions. No punitive actions shall be taken against health care workers based on findings of CR. SNO should minutize all the recommendations made during quarterly review committee and initiate action accordingly at appropriate level. Review of actions taken based on previous meeting shall be part of agenda of next meeting.

For more details: Kindly refer to GoI Guideline on MDSR - http://www.nhm.gov.in/images/pdf/programmes/maternalhealth/guidelines/Guideline_for_MDSR.pdf.

B. MATERNAL NEAR MISS REVIEW

A Woman Who Survives Life Threatening Conditions during Pregnancy, Abortion, and Childbirth or within 42 Days of Pregnancy Termination, irrespective of Receiving Emergency Medical/Surgical Interventions is called Maternal Near Miss.

Complication readiness during pregnancy and child birth in terms of infrastructure, HR, equipment etc. for timely management of complications at all the basic and emergency obstetric care health facilities is important to reduce mortality & morbidity. The Maternal Death Surveillance & Response is a tool available with health managers and policy makers at various levels to critically look at health system performance, identify gaps and initiate corrective steps through convergent action.

The advantages of the review process are that the number of such cases is more as compared to maternal deaths and the women are alive to narrate their incidences. Besides, it also provides a great learning opportunity to improve the quality of service provision. Thus, investigating such cases of life-threatening obstetric morbidity or Maternal Near Miss would help bring further improvements to the programme. However, a major limitation of the MDR process is that the stakeholders involved in the service delivery fear that it puts the blame squarely on their shoulders & exposes them to public scrutiny and outrage. Thus, it must be kept in mind that the finding of MNMR should not be used to take punitive action against service providers.

Indicators for Assessing & Improving Quality of Maternal Health

- Severe maternal outcome ratio **(SMOR)** refers to the number of women with life-threatening conditions **(MNM + MD)** per 1000 live births (LB). This indicator gives an estimate of the amount of care and resources that would be needed in an area or facility **[SMOR = (MNM +MD)/ per 1000 LB].**

- MNM ratio (MNMR) refers to the number of maternal near-miss cases per 1000 live births **(MNMR = MNM/ per 1000 LB)**. This indicator gives an estimation of the amount of care and resources that would be needed in an area or facility.
- Maternal near-miss mortality ratio **(MNM: 1 MD)** refers to the ratio between maternal near miss cases and maternal deaths. Higher ratios indicate better care.
- Mortality index refers to the number of maternal deaths divided by the number of women with life-threatening conditions expressed as a percentage [MI = MD/(MNM + MD)]. The higher the index the more women with life-threatening conditions die (low quality of care).

Purpose of Maternal Near Miss review (MNM-R)

- To understand the extent of MNM.
- To identify the technical and non-technical causes of MNM.
- To identify the health system response to maternal emergencies.
- To identify the gaps and contextualize corrective measures to be taken in the health care system.
- To provide regular feedback and response needed to achieve the goals.
- Identify best practices.

Process of MNM-R

The process of MNM-R involves:

1. Notification (MO/HOD-if case meets inclusion criteria).
2. Data Transmission (Institution to district to State).
3. Review (Institutional & district level).
4. Analysis & Feedback for initiating necessary action.

Once the MNM is confirmed using the tool given in the guideline for diagnosing MNM, the MO/HOD of OBG-GYN notifies it to the FNO within 24 hours. There upon FBMNM-R form is filled by MO/HOD with support from FNO and submitted to district within a week. A copyof the same is kept with the institution for records. The Medical Superintendent with support from FNO and taking inputs from HOD/MO of the department will review the case. In the monthly review meeting the MNM-R committee members will be invited. The review reports will be sent to the district for further action.

Reporting

There are two formats in which the data need to be entered

- Facility based Maternal Near Miss Review (FBMNM-R) form.
- MNM-R case register.

Indicators for monitoring MNM Review

- Total number of MNM cases in the reporting month.
- MNM cases reviewed by CMHO.
- Type of gaps identified after review.
- Out of total MNM cases, indicate the number against the following complication PPH/ Eclampsia/Anemia/Septic Abortion/Others.
- Status of the corrective action taken for the gaps identified.

Diagnosis of MNM

Inclusion criteria

Critically ill pregnant, laboring, post-partum and post-abortal women admitted to notified health institutions.

Criteria for identification of MNM case

Whenever any pregnant woman comes to the health facility in a critical condition, she needs to be given urgent medical treatment. However, prior to the discharge of such cases, there is a need to identify whether the case falls under the category of Maternal Near Miss. For identification of an MNM case the following criteria minimum three (one from each category) must be met with:

- Clinical findings (either symptoms or signs),
- Investigations.
- Interventions.

OR any single criteria which signifies cardio respiratory collapse (indicated by a heart symbol)

The clinical findings, investigations and interventions have been put under three broad categories

- Pregnancy specific obstetric and medical disorders.
- Pre-existing disorders aggravated during pregnancy.
- Accidental / Incidental disorders in pregnancy.

These broader categories have further been segregated under different clinical situations like hemorrhage, sepsis, hypertension etc. So, it is important for the MO in-charge of the case to carefully see criteria for identification of MNM Case and scrutinize the suspected MNM case.

For further details: Kindly refer to GoI Guideline on MNM

http://www.nhm.gov.in/images/pdf/programmes/maternalhealth/guidelines/Maternal_Miss_Operational_Guidelines.pdf.

CHAPTER 19
RCH PORTAL, RECORDS AND REGISTERS

REPORTING MECHANISM

Good recording practices are necessary for effective case-management. Record keeping is a key responsibility of health care workers in any health facility. Effective and accurate recording and reporting systems, whether paper-based or electronic, are essential to ensure high-quality care in healthcare facilities and accurate sharing of information. Ministry of Health and Family Welfare recommended recording and reporting system consists of detailed forms for each patient that are completed at the point of care. Report should be generated every month from each facility. This report will be comprehensive and will have provision for generating program level analysis for state and national level.

Data Collection mechanism:

Present data collection mechanism comprises of single facility level format which has to be filled & signed by facility in-charge and shared with district and state. These data should be compiled at state level in excel sheet and shared with ministry.

Areas for data collection

Following areas will require to be covered to capture data

- ANC ward
- Labour Room
- Operation Theatre
- PNC Ward
- SNCU/NBSU
- FBMDR Committee meeting records.
- OPD

Various registers for data collection are recommended which include ANC register, Standardized labour room register and Case Sheets, PNC ward register, OT register, FBMDR Register (MDSR guidelines) and FBMCDR committee minutes of meeting etc.

(For details kindly refer to MNH toolkit https://nhm.gov.in/images/pdf/programmes/maternal-health/guidelines/MNH_Toolkit_23_11_2013.pdf).

PORTALS AND APPLICATIONS

RCH Portal

Reproductive & Child Health (RCH) "an augmented version of MCTS" application has been designed for early identification and tracking of the individual beneficiary throughout the reproductive lifecycle. The application facilitates timely delivery of full components **of antenatal, postnatal & delivery services and tracking of children for complete immunization services**.

RCH portal meets the requirements of RMNCH program with the provision of Family Planning services, Quality & comprehensive ANCs, and alerts to ANMs, Beneficiaries, and Health Managers.

The RCH portal will further strengthen the healthcare delivery system; improve service coverage and monitoring mechanism. The use of this information for early identification and management of basic complications during

pregnancy, childbirth, and post-partum period at the field level will help in reducing maternal, neonate, and infant mortality rates.

SUMAN Portal

SUMAN Portal aims to capture components like **SUMAN Notifications, Grievance redressal, maternal death reporting etc**. Timely redressal of grievance is imperative for satisfaction of clients. The system needs to be extremely prompt in resolution of the grievances if the services are related to pregnant women and the newborn.

Process of Grievance Registration:

Beneficiaries can register their grievances through any of the following mechanisms:

- 104 health helpline-Beneficiaries can call on toll free number.
- Portal- Register at https://suman.nhp.gov.in/
- Help Desk at high case load SUMAN Facilities (to be set up by States/ UTs).

All the grievances received through any channel needs to be registered at web portal.

Mera Aspataal Portal

Mera Aspataal (My Hospital) is Ministry of Health and Family Welfare, Government of India initiative to capture patient feedback for the services received at the hospital through user-friendly multiple channels such as Short Message Service (SMS), Outbound Dialling (OBD) mobile application and web portal. The patient can submit the feedback in seven different languages on mobile app and web portal; for the hospitals visited in last 7 days. The patient can also check the already submitted feedback. The collected feedback is compiled, analysed and visualized in the form of a dashboard accessible to the different stakeholders at facility, district, state and national level.

My Hospital will help the government to take appropriate decisions for enhancing the quality of healthcare delivery across public facilities which will improve the patient's experience. The patient will be able to receive an effective and appropriate care. My Hospital will ultimately help establish patient driven, responsive and accountable healthcare system.

PMSMA Portal

PMSMA portal helps in Tracking of High-Risk pregnancies: MCP card of pregnant women detected with High Risk Factor should be marked with a red sticker. Health functionaries must maintain a line list of such women and they must be individually tracked to ensure that they receive appropriate care and follow-up and ultimately deliver at FRUs / District Hospitals.

PMSMA portal can be accessed through http://www.pmsma.nhp.gov.in and is a centralized location for accessing all the information related to PMSMA Services. This portal provide access to various stakeholders who can access the information as per their jurisdiction

Monitoring of PMSMA:

- Information on services provided under PMSMA is uploaded onto the PMSMA portal by the District PMSMA Nodal Officer.
- States/UTs, Districts and Blocks designate teams/officials for field monitoring on the PMSMA day.
- All monitoring teams and personnel (National/ State/DPs etc) are advised to use a standardized common format recommended by GoI (refer annexure III of Operational Framework).
- State/District PMSMA Nodal officer coordinate all monitoring and supervision activities.

KILKARI APP

It delivers free, weekly, time-appropriate 72 audio messages about pregnancy, child birth and child care delivery to families' mobile phones.

Toll-free number: 1800-3010-1703

ANM on Line (ANMOL) APP

A tablet-based application for Integrated RCH Register which allows ANMs to enter and update data for beneficiaries in their jurisdiction.

MPCDSR Portal

Maternal Perinatal Child Death and Surveillance Response (MPCDSR) software was launched by Hon'ble HFM on 17 September 2021, for continuous surveillance and response to maternal and Child Deaths linking the health information system and quality improvement processes from local to national level. This IT-based system aims to create a one-stop integrated information platform to capture, generate, and use timely, reliable, and actionable data for both maternal and child deaths (including perinatal deaths) using login credentials, thus transitioning from physical/ email-based reporting to portal-based reporting.

CHAPTER 20

NATIONAL HEALTH PROGRAMS AND SCHEMES FOR MATERNAL AND NEWBORN CARE

Improving the well being of the mothers, infants and children has been an important public health goal for all welfare societies and governments. Under NHM India has made a fast progress in order to improve care during pregnancy and childbirth.

Several program initiatives had been taken since the launch of the National Health Mission (NHM), which were helpful in scaling up, improving newborn, and child survival rate. Programs like Janani Suraksha Yojna (JSY), Janani Shishu Suraksha Karyakram (JSSK), provisions under operationalization of FRUs, NAS etc. and newer initiatives under the Pradhan Mantri Surkashit Matritva Abhiyan (PMSMA), LaQshya, Pradhan Mantri Matritva Vandana Yojna (PMMVY), Midwifery-led Care etc. have helped in providing quality maternity and newborn care services.

In 2019, MOHFW launched **"SUMAN- Surakshsit Matritava Aashwasan"**, an initiative that subsumes all existing initiatives under one umbrella. This is a comprehensive initiative that provides a service guarantee for the entitlements which are delivered with care in a congenial environment. Simultaneously it also underlines the commitment of the government for addressing the existing inequities in maternal and newborn health care services and move towards zero preventable maternal and newborn deaths.

SUMAN promotes safe pregnancy, childbirth and immediate postpartum care with respect and dignity by translating the entitlements into a service assurance which is more meaningful to the beneficiaries.

The broad attributes of a SUMAN compliant facility would be:

For details may refer to SUMAN guideline on https://www.nhm.gov.in/index1.php?lang=1&level=3&sublinkid=839&lid=377https://suman.nhp.gov.in/

SUMAN Service Guarantee Packages

Under the SUMAN initiative, all Pregnant Women/ Newborns visiting public health facilities are entitled to a set of free services. However, since all services cannot be provided at all facilities, each health facility is expected to notify the service guarantee package on the basis of their current resources and service availability with measures put in place to reach 100% of the expected service standards for the level of that facility. The packages

under SUMAN has been divided into **Basic, BEmONC and CEmONC** for both maternal and newborn services.

All the existing programs will continue to remain in place and shall be part of the SUMAN under this initiative. A brief about these programs and actions required under the newer initiatives is mentioned below:

Janani Suraksha Yojna (JSY)

JSY is a demand promotion scheme which provides conditional cash transfer of incentives to pregnant women coming into the institutional fold for delivery. It ensures timely antenatal care (ANC), institutional delivery and postnatal care (PNC).

Under this program, the facility in-charge and program officers will ensure that all entitled beneficiaries get the payment through DBT (direct benefit transfer) at the time of discharge from the hospital.

Janani Shishu Suraksha Karyakram (JSSK)

JSSK is operational in the entire country from the year 2011. It provides free and cashless maternity services and infant care in all government healthcare institutions including diet, so that no out-of-pocket expenditure is incurred by the beneficiary on drugs, disposables, diagnostics, blood transfusion, referral transport and drop back facility. Under this program, it is the responsibility of the facility in-charge from tertiary to primary care center to ensure provision of all entitlements so that there is zero expense by the beneficiaries on care during pregnancy, childbirth and post-natal period, including infants.

Pradhan Mantri Surkashit Matritva Abhiyan (PMSMA)

PMSMA has been launched to provide quality antenatal services to women in the 2nd and 3rd trimesters of pregnancy on the 9th day of every month across the country by the Medical Officer/ OBGY specialists. These doctors (volunteers) can also be from private health facilities. The program has a focus for identification and line listing of HRPs so that assured care can be provided to the identified HRPs.

Under this program it will be the responsibility of program officers at all levels to ensure that every pregnant woman receives ANC/PNC and in case she is identified as HRP, her line listing and delivery plan is prepared and executed.

Extended PMSMA

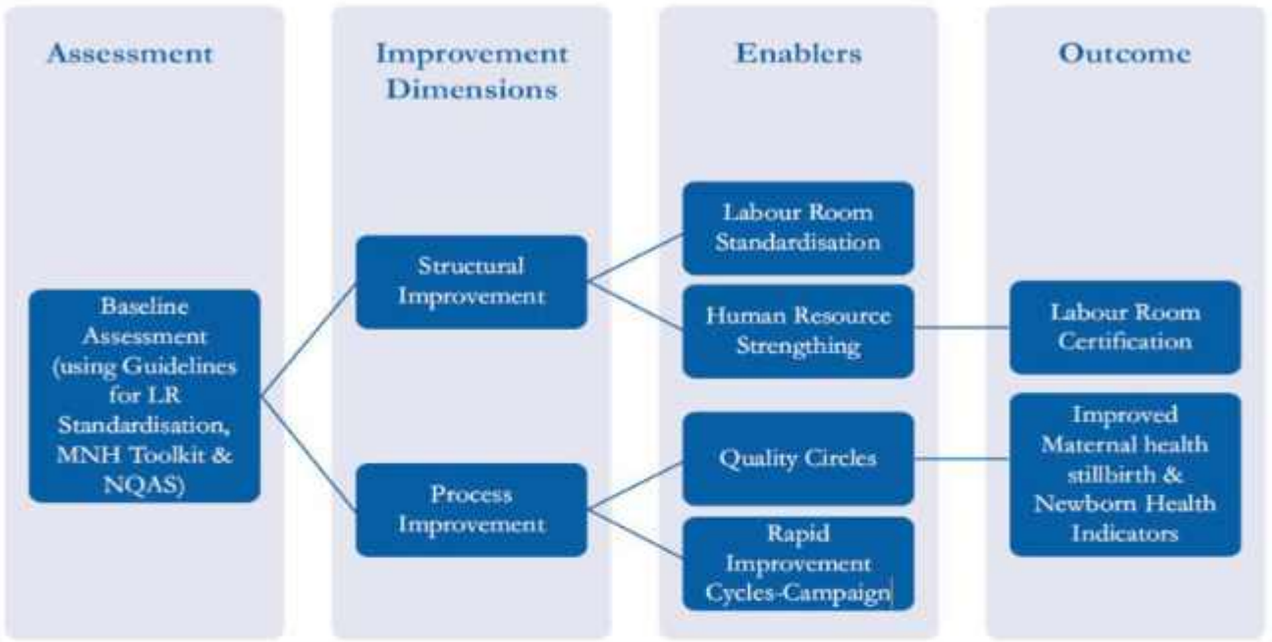
E-PMSMA has been launched recently for improving the individual HRP tracking and strengthening the follow-up activities, through cash-based incentives for ASHA as well as beneficiaries. An additional day of the month is identified (over and above the existing 9th of every month) for organizing the PMSMA clinics, to make up for missed out HRP cases or those requiring frequent follow ups.

To further strengthen the service provision by qualified service providers, BEmONC training of Medical Officers, deputation of trained doctors at lower-level facilities once a month to conduct PMSMA clinic and teleconsultation from a specialist are other strategies under E-PMSMA.

LaQshya

Access to care alone does not guarantee a positive outcome. Care for pregnant women must be of high quality and with respect and dignity. Highly trained doctors, nurses and other health workers, who adhere to quality standards mandated by the government, are critical to minimizing risk of pregnancy complications and stillbirths.

In view of this Government of India launched "LaQshya program" to improve quality of care in labour room and Maternity OTs in public health facilities.



The LaQshya program is an evidence-based approach to improve quality of maternal and newborn care and provide respectful care, particularly during the intrapartum and immediate postpartum periods, which are the most vulnerable periods for a woman and contribute to a significant proportion of maternal and newborn deaths.

Its implementation involves infrastructure upgradation, ensuring availability of essential equipment, providing adequate human resources, capacity building of health care workers, adherence to clinical guidelines and improving quality processes in labour room and maternity OT.

The Quality Improvement in Labour Room and Maternity OT will be assessed through NQAS (National Quality Assurance Standards). Every facility achieving 70% or more score on NQAS and also meeting the other established criteria (defined quality indicators and 80% satisfied beneficiaries) will be certified as LaQshya certified facility. Facilities achieving LaQshya certification will be provided incentive of Rs 6 lakh, Rs 3 lakh and Rs 2 lakh for Medical College Hospital, District Hospital and FRUs respectively.

Once a facility achieves the LaQshya Certification, they have to undergo annual surveillance by the State Quality Assurance Committee (SQAC) for two years further to continue receiving the incentives for three years.

Pradhan Mantri Matritva Vandana Yojna (PMMVY)

Malnourishment is highest among poor pregnant women and newborn babies. In a bid to do away with this grave threat, PMMVY has been launched in 2017.This is a financial assistance scheme from central government for expecting and lactating mothers. PMMVY offers Rs. 5,000 to all eligible applicants. This financial assistance will help candidates to procure nutritious food and obtain medical help as and when needed. The cash shall be transferred directly to the beneficiary's account amounting to Rs. 1,000/- on registration, Rs. 2,000/- on first ANC, and Rs. 2,000/- after delivery and 1st round of vaccination.

Under this program, it will be the responsibility of AWW and ICDS supervisors at district and block level to create awareness and help the entitled beneficiaries in getting the amount transferred to their account.

Provisions under Operationalization of FRUs

Under NHM, states have been given flexibility to ensure availability of blood banks/blood storage centres, hiring of HR on differential salary/ incentives, placing requisite equipment and infrastructure, so that all the designated first referral units are functional round the clock.

Under this program, it will be the responsibility of the District RCH (Reproductive and Child Health) Officers and Program Managers to operationalize all the FRUs in their districts and clearly defined onward and upward linkages of health facilities below the FRU. The ambulance network operational in the district should have knowledge about operational FRUs to avoid any high-risk cases (pregnant women and infants) from being shunted from one facility to another.

National Ambulance Services (NAS)

In the country, more than 28,000 ambulances are running with a state level centralized call center. Besides this, additional ambulances are running under JSSK exclusively for pregnant women and infants. This vast network of ambulances transports both normal and complicated cases for delivery and serves as a medium in case of emergency complication management.

Under this program, the state and district program officer is responsible for adequate sensitization training of call center executives, EMTs (emergency medical technicians) and pilots regarding the importance of timely transportation to an appropriate health facility, which is functional as FRU.

Other Maternal and Newborn Health Care Guidelines

Guidelines pertaining to MNH Toolkit, labour room, Obstetric HDU, OT, IPHS, MCH, SBA, Dakshata, Skill Labs, NSSK, FBNC (Operational guidelines & training package), ETAT, IMNCI,F-IMNCI, HBNC/ HBYC, MAA etc. will help the program officers at all levels in utilizing the provisions and norms for creating infrastructure, recruiting qualified and experienced Human resource, logistics including procurement process for equipment and capacity building of service providers, so that good quality care can be given.

Midwifery-led Care

Recognizing the critical role of skilled midwives, the Government of India developed the Guideline on Midwifery Services (2018) with an aim to strengthen the midwifery services of the country to ensure quality care for every mother and newborn. Introduction of midwifery led care will promote the following objectives-

- To provide access to quality maternal and new born health services and promote natural birthing by promoting positive child birthing experience.
- To promote respectful maternity care throughout pregnancy and child birth.
- To identify, manage, stabilize and/or refer as needed, women and their newborns experiencing complications.
- To decongest higher level of healthcare facilities.
- To expand access to quality maternal and neonatal services in remote areas including pockets of high home delivery rates and urban slums.

The 'Midwifery Services Initiative' aims to create trained Nurse Practitioners in Midwifery who are skilled in accordance to competencies prescribed by the International Confederation of Midwives (ICM) and are knowledgeable and capable of providing compassionate women-centered, reproductive, maternal and newborn health care services.

Qualified and certified Nurse Practitioners in Midwifery would be posted at Midwifery Led Care Units that would be established at all high caseload public health facilities. Under this Midwifery Led Care Unit Model, normal deliveries are expected to be handled by professional midwives and complicated deliveries are expected to be handled by specialists.

Approximately 85% of pregnancies and births do not require specialized obstetric interventions. Midwifery led care can play a critical role in promoting physiological births and reducing over medicalization.

CHAPTER 21
C- SECTION AUDIT

An increasing trend in Cesarean Section (CS) is being observed worldwide at all levels of care irrespective of whether it is a public or private facility. It is also noted that in certain situations caesarean section rates are very low indicating low levels of access to and utilization of comprehensive obstetric care for complicated deliveries.

Rising C-Section rates are a major public health concern and cause worldwide debates due to potential maternal and perinatal risks associated with this increase, inequity in access and cost issues. Governments and clinicians have expressed concern about the rise in the number of caesarean section births and the potential negative consequences for maternal and infant health. When medically justified, a caesarean section can effectively prevent maternal and perinatal mortality and morbidity. However, there is no evidence to show that C-section delivery has any benefits for women or infants who do not require the procedure.

In India, the rate of cesarean deliveries has increased from 17% to 21.5% in NFHS-5. The rate ranges from 5.2% in Nagaland to 60.7% in Telangana. The rise has been seen in 31 out of 36 States/UTs. Some of the States/UTs like Telangana, Andhra Pradesh, Tamil Nadu, Sikkim, Punjab, Kerala, Goa and Jammu and Kashmir have recorded exorbitantly high rates which are being driven by both public and private sector.

In 1985, a panel of WHO reproductive health experts stated that there is no justification for any region to have a C-section rate higher than 10-15% of all deliveries. In 2015, the WHO re-examined available evidence and stated that "At population level, caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates". Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate. At hospital level, there is a need for a universal classification system for caesarean sections.

In 1985, a panel of WHO reproductive health experts stated that there is no justification for any region to have a C-section rate higher than 10-15% of all deliveries. In 2015, the WHO re-examined available evidence and stated that "At population level, caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates". Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate. At hospital level, there is a need for a universal classification system for caesarean sections.

Objective of C section audit:

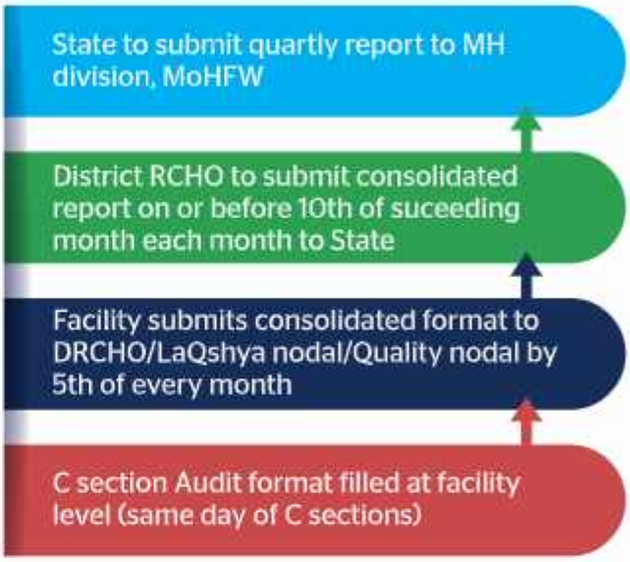
1. **To curb rising trend of cesarean births:** Implementing C-section audit at facility level is one of the effective non clinical interventions to curb the rising trend of cesarean births and forms an integral part of LaQshya initiative.
2. **To ensure judicious use of 'C' Sections in medically indicated cases only:** Operationalization of 'C' Section audit and implementing corrective & preventive actions for ensuring that 'C' Sections are undertaken judiciously in those cases having robust clinical indications forms one of the key process interventions under LaQshya.

Modality of audit:

All CEmONC high case load delivery points to conduct audits using the prescribed format and shall share consolidated report to next level at

recommended frequency. State shall also notify the consolidated report to national level on quarterly basis.

1. The purpose of the audit is to rationalize the CS rates at all levels of facilities.
2. **Cases to be included:** CS audit should be conducted for all Primary Sections as well as for repeat sections.
3. **Frequency:** The audit should be conducted on a daily basis reviewing the CS done on the same/previous day.
4. **Who shall conduct the audit:** The audit form should be filled strictly by the person conducting C section. preferable on the day of operation. If the operating doctor is not available on next day, then, she/he shall conduct audit when she joins her subsequent shift.
5. The doctor conducting the audit should give his/her opinion about the necessity for that CS
6. **Use of audit findings:** Findings of the audits to be discussed in monthly LaQshya-quality circle meetings. Participation from all the obstetrician faculty members (including PGs in MCH and DNB candidates in DHQs), qualified CEmONC trained doctors, hospital quality manager/LaQshya nodal should be mandatory.
7. **Flow of data and timelines:**
   a. A monthly consolidated report of the audit findings (format enclosed) shall be filled by facility and sent to district by 5th of every month.
   b. District shall send the consolidated report to State by 10th of every month, and
   c. State shall consolidate report and send to MH division, MoHFW quarterly.
8. Findings of the report shall be discussed for actions deemed appropriate in monthly RCH review meetings at district and state.



Cesarean Section Audit format

(To be filled by doctor conducting C-section)

Name of the Facility:

Encircle type of facility: MCH/DH and equivalent/ SDH and equivalent /AH and equivalent /FRU-CHC and equivalent

Mention unit: ..... (Applicable for medical college/ tertiary setting / District hospital)

Date:

I	Patient Information	Response
1	Name of the woman undergone C-section	
2	Age of woman	
2	Hospital No. / Patient identification no.	
3	G/P/L/A	
4	Booking status	Booked/ Booked elsewhere/Un-booked
5	Maternal height and weight	Ht: cm Wt: kg
6	Date of Admission	
7	Date and time of delivery by CS	Date: Time: 9am -6pm 6pm- 9pm 9pm-12am 12am-6am 6am-9am
II	**Obstetric History**	**Response**
1	Estimated gestation, in completed weeks	
1a	Encircle the appropriate basis of estimated gestational	LMP/USG/Clinical assessment
2	Number of previous stillbirths >24 weeks, if any	
3	Was the mother referred to this hospital from another facility	If yes, name of the transferring facility
3a	Gestational age at the time of referral	Term/Pre term
3b	If preterm, was AN corticosteroid given prior to referral	Yes/No

4	Tick the appropriate group in which the pregnant woman belongs to	**Group 1:** Nulliparous, with a single cephalic pregnancy, <37 weeks gestation in spontaneous labour. • **Group2:** Nulliparous, with a single cephalic pregnancy, <37 weeks gestation who had labour induced or were delivered by CS before labour. • **Group 3:** Multiparous, without a previous CS, with a single cephalic pregnancy, <37 weeks gestation in spontaneous labour. • **Group 4:** Multiparous, without a previous CS, with a single cephalic pregnancy, <37 weeks gestation who had labour induced or were delivered by CS before labour. • **Group 5:** All multiparous, with at least one previous CS, with a single cephalic pregnancy, <37 weeks gestation. • **Group 6:** All nulliparous, with a single breech pregnancy. • **Group 7:** All multiparous, with a single breech pregnancy including women with previous CS(s). • **Group 8:** All women with multiple pregnancies including women with previous CS(s). • **Group 9:** All women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s). • **Group 10:** All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s).
III	**Details of Caesarean Section**	**Response**
1	Name the senior most obstetrician involved in the decision to perform the caesarean section?	Unit chief/ Duty Assistant /HoD/ Assoc. professor/ Assistant professor/others3
2	Decision - delivery interval	
3	Which of the following best describes the indication for CS?	• Singleton breech • Malpresentation/Unstable lie • Multiple pregnancy • Presumed fetal Distress/IUGR/Abnormal CTG • Cord prolapse • Sepsis/Chorioamnionitis

		• Placenta praevia, actively bleeding • Placenta praevia, not actively bleeding • Postdatism • Oligohydramnios • Previous Cesarean Section • Placental abruption • Intrapartum haemorrhage • Pre-eclampsia/eclampsia/HELLP • Failure to progress (induction/in labour) • Maternal medical disease (see Key)* • Uterine rupture/ scar dehiscence • Previous poor obstetric outcome (BOH) • Long period of infertility • Others (Specify) ----------	
5	Was partograph used prior to decision for CS (if yes, attach a copy of filled partograph)		
6	Were the membranes ruptured (ROM) prior to the caesarean section?	Spontaneous ROM/ ARM	
7	Duration of first stage of labour	Hr:	Mins:
8	Duration of second stage of labour	Hr:	Mins:
9	What cervical dilatation was reached prior to the caesarean section?		
11	Were prophylactic antibiotics given?		
12	What was the estimated blood loss?		
13	Blood/ component transfusion	If so, mention no. of unit	
IV	**In case of previous Caesarean Delivery**	**Response**	
1	Mention the indication and gestation of previous LSCS (start from most recent LSCS)	LSCS 1_____Gestation___ LSCS2_____ Gestation___ N/A	
2	Was the mother offered a trial of vaginal delivery during this pregnancy?	Yes / No/ Not known	
3	Post OP complications, if any		

V	Current status	Response
4	Does this mother require 'special' care post-caesarean section in addition to routine' post-op care?	Yes/No
4a	If 'Yes' where is she being managed currently?	Obs HDU/ICU General HDU/ICU Referred to another hospital
5	Whether Fetal heart monitoring - Manual/ Electronic was done (tick appropriately)	(a) Normal (b) Abnormal (c) Severely abnormal (d) Not done
6	Whether Meconium-stained liquor present (tick appropriately)	(a) Yes (b) No (c) Not known
7	Other methods of delivery attempted (tick appropriately)	(a) None (b) Forceps (c) Ventuse
8	Delivery outcome (tick appropriately)	(a) Livebirth (b) Stillbirth
9	Sex of the baby (tick appropriately)	(a) Male (b) Female (c) Unknown
10	Birth weight	_____ gms
11	Apgar score (tick appropriately)	(a) Score at 1 minute_____ (b) Score at 5 minutes_____ (c) Not done
12	Transferred to SNCU/ NICU (tick appropriately)	(a) Yes____, where_____ (b) No
13	Maternal Outcome (tick appropriately)	• Stable and in satisfactory condition • Shifted to Obstetric HDU/ICU due to any complications or for close monitoring • Maternal Near miss • Maternal death. Mention cause of death _____
14	Newborn Outcome (tick appropriately)	• Stable and in satisfactory condition • Admitted in SNCU due to complications or for close monitoring • Still birth • Born alive and died (mention cause of death)____
15	Tick appropriately on the need for C section	• Absolutely essential at that time • More time could have been given before deciding for CS

Name and Designation of doctor

Signature with Date

***Key for Medical Disorders:**

1. Heart Disease Complicating pregnancy.
2. Past history of cardiac surgery like valve replacement.
3. Jaundice Complicating pregnancy.
4. Bronchial asthma/COPD.
5. Tuberculosis- pulmonary/extra pulmonary.
6. Known seizure disorder - on treatment/ not on treatment/treatment discontinued.
7. Known hypertensive - on treatment/ not on treatment/treatment discontinued.
8. Known diabetic - on treatment/ not on treatment/treatment discontinued.
9. Chronic renal disease.
10. Anemia other than iron deficiency anemia.

Glossary

- **Gravida** denotes a pregnant state both present and past, irrespective of the period of gestation
- **Parity** denotes a state of previous pregnancy beyond the period of viability.
- **Nullipara:** A nullipara is one who has never completed a pregnancy to the stage of viability. She may or may not have aborted previously.
- **Multipara:** Multipara is one who has completed two or more pregnancies to the stage of viability or more.

Month wise consolidated report for C-section Audits

(To be submitted by hospital quality manager)

State:	**Encircle type of facility:** MCH/DH and equivalent/ SDH and equivalent /AH and equivalent /FRU-CHC and equivalent.
District:	
Block:	**Date:**
Name of Facility:	

S.N.	Indicators	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A	Total number of institutional deliveries during the month (include all units in case of a medical college)												
B	Total no. of CS done during month												
C	C-Section Rate (B/A*100)												
D	No. of night C sections (9PM to 9 AM)												
E	% Night C section = (D/B*100)												
F	Total no. of C -sections audited												
G	Groups with highest no. of c section in a month (mention highest 3 groups (eg 1,2,3)												
H	No. of C sections where more time could have been given before deciding for CS												
I	No. of Women undergoing C section requiring Obs. HDU/ICU admission												

J.	No. of Maternal death post C sections												
k	Suggestions for further reducing CS in the facility, if any												

Name and designation of hospital quality manager

Name and Signature of Medical Superintendent

Month wise consolidated report for C-section Audits

(To be submitted by District Quality nodal/LaQshya nodal)

State:	**Date:**
District:	

S.N.	Indicators	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A	Total number of institutional deliveries during the month (include all units in case of a medical college)												
B	Total no. of CS done during month												
C	C-Section Rate (B/A*100)												
D	No. of night C sections (9PM to 9 AM)												
E	% Night C section = (D/B*100)												
F	Total no. of C -sections audited												
G	Groups with highest no. of c section in a month (mention highest 3 groups (eg 1,2,3)												
H	No. of C sections where more time could have been given before deciding for CS												
I	No. of Women undergoing C section requiring Obs. HDU/ICU admission												
J	No. of Maternal death post C sections												
k	Suggestions for further reducing CS in the facility, if any												

Name and designation of district quality nodal/ LaQshya nodal

Name and signature of District RCHO/ LaQshya nodal

Month wise consolidated report for C-section Audits

(To be consolidated in office of State quality nodal/LaQshya nodal)

State:	Date:

S.N.	Indicators	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A	Total number of institutional deliveries during the month (include all units in case of a medical college)												
B	Total no. of CS done during month												
C	C-Section Rate (B/A*100)												
D	No. of night C sections (9PM to 9 AM)												
E	% Night C section = (D/B*100)												
F	Total no. of C -sections audited												
G	Groups with highest no. of c section in a month (mention highest 3 groups (eg 1,2,3)												
H	No. of C sections where more time could have been given before deciding for CS												
I	No. of Women undergoing C section requiring Obs. HDU/ICU admission												
J.	No. of Maternal death post C sections												
K	No. of districts with have not submitted C section audit report												
L	Suggestions for further reducing CS in the facility, if any												

Name, designation signature of state quality nodal/ LaQshya nodal

Name, designation signature of state RCHO

Quarter wise consolidated report for C-section Audits

(To be submitted by State quality nodal/LaQshya nodal to MH division, MoHFW)

State:	Date:

S.N.	Indicators	Q I	Q II	Q III	Q IV
A	Total number of institutional deliveries during the month (include all units in case of a medical college)				
B	Total no. of CS done during month				
C	C-Section Rate (B/A*100)				
D	No. of night C sections (9PM to 9 AM)				
E	% Night C section = (D/B*100)				
F	Total no. of C -sections audited				
G	Groups with highest no. of c section in a month (mention highest 3 groups (eg 1,2,3)				
H	No. of C sections where more time could have been given before deciding for CS				
I	No. of Women undergoing C section requiring Obs. HDU/ICU admission				
J.	No. of Maternal death post C sections				
k	No. of districts with have not submitted C section audit report				
L	Suggestions for further reducing CS in the facility, if any				

Name, designation signature of state quality nodal/ LaQshya nodal

Name, designation signature of state RCHO

Ministry of Health & Family Welfare
Government of India
Nirman Bhavan, New Delhi - 110108
www.tbcindia.gov.in