

**AMDD PROJECT WORKSHOP
Marrakech, February 2001**

**IMPLEMENTING
EMERGENCY OBSTETRIC CARE
IN DEVELOPING COUNTRIES**

Dr. Zafarullah Gill

**Averting Maternal Death and Disability Program (AMDD)
Heilbrunn Center for Population and Family Health
Mailman School of Public Health
Columbia University**

ACKNOWLEDGMENTS

The author gratefully acknowledge the contribution of Professor Deborah Maine for her interest, time and many reviews of this handbook. I would also like to acknowledge the valuable professional input of: Professors FH Fathalla, Rashid Lateef Khan, Dr. Barbara E. Kwast, Dr. Sangeeta Pati and Dr. Jerker Liljestrand. I would also like to thank the people in Pakistan and Bangladesh who participated in field tests of this handbook during workshops and visits to hospitals. Last but not the least, I am thankful to Bridget Money Penny, a graduate research assistant, for formatting this handbook.

Please send comments to the author at zg41@columbia.edu

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1. REMOVING BARRIERS TO IMPLEMENTATION

Many development programs face difficulties in achieving smooth program implementation. Implementation is often delayed, and occasionally programs do not achieve the envisioned results. There are many reasons for such situations; sometimes the process of procurement and distribution of equipment, drugs and supplies becomes so extensive that these activities are seen as an end in themselves. By the time most of the needed equipment reaches the facilities, it is difficult to initiate the program.

This handbook is intended to help avoid such problems by spelling out the steps involved in identifying, purchasing, installing and using the equipment needed to provide emergency obstetric care (EmOC) in hospitals in developing countries. Governments, UN agencies and international non-governmental organizations (NGOs) may have their own procedures. The information presented here should be adapted to fit.

2. THE IMPORTANCE OF TEAMS

Higher management often expects hospital staff to begin functioning on their own and provide EmOC services. However, positive results do not happen by themselves. Unless hospital team members (including cleaners, gatekeepers, and other support staff) understand their responsibilities, they cannot respond to an emergency promptly and effectively. The team needs to be organized and responsibilities distributed and adjusted in order to perform the work necessary to save women's lives.

A number of types of teams can be very helpful in improving the availability and quality of EmOC.

- **ERT:** At every facility that provides EmOC, at least two types of teams are needed. One is the Emergency Response Team (ERT) that actually provides the life-saving care needed by women with obstetric complications. At a facility providing Basic EmOC, such as a health center, the ERT might include general physicians, midwives, nurses, physician assistants, etc. At a Comprehensive EmOC facility, the ERT would need to include an obstetrician, surgeon or other person experienced in doing obstetric surgery, and anesthetist, midwives, and skilled nursing staff.
- **FT:** A Facility Team (FT) is necessary to support the ERT. The Facility Team includes people responsible for maintaining the facility (general management, cleaning, electrical and water supply, waste disposal) and ensuring that the ERT has the equipment and supplies that it needs to function (such as blood and drugs).
- **CT:** At a higher administrative level, where a number of facilities are involved, it is important to have a Core Team (CT) to provide technical assistance and supportive supervision. The composition of the Core Team will vary with the situation. In the context of a project to upgrade services in existing facilities, the CT might include the

government's Project Officer, an obstetrician from the medical college, and a representative of the funding or executing agency.

3. CRITICAL COMPONENTS OF IMPROVING SERVICES

The process of improving EmOC services encompasses many components. These include:

1. Conducting a needs assessment;
2. Renovating the facility to make it functional;
3. Procuring equipment, drugs and supplies (based on needs assessment);
4. Distributing equipment and supplies to the facilities;
5. Developing and managing human resources; e.g., training and posting of staff;
6. Organizing the staff;
7. Room-by-room setup of equipment and instruments;
8. Clarifying individual roles of team members;
9. Responding to obstetric emergencies;
10. Recording and reporting data for monitoring and staff use;
11. Treating both service providers and patients with respect and dignity;
12. Providing supportive supervision.

All of these elements are highly interdependent, so if some of them are not implemented there are chances that EmOC services will not be established and sustained.

4. NEEDS ASSESSMENT AND PLANNING

In order to utilize financial resources efficiently it is crucial to build on what is already available in terms of human resources, infrastructure, equipment, instruments, supplies, drugs, laboratory/blood bank, etc. For conducting a needs assessment in hospitals and health centers checklists have been jointly developed by the Averting Maternal Death and Disability (AMDD) Program at Columbia University and UNICEF's Regional Office of South Asia. For copies of these checklists, please contact the author.

5. RENOVATION

Renovation is a long process and even a small job can sometimes take a long time to complete. Many steps are involved, such as needs assessment, making drawings (keeping in mind the patient flow and barriers to reducing infection), approval by competent authority, funding, and contractor selection. Delays can be due to weather, lack of availability of material, or the diversion of resources from one renovation/construction site to another. The person responsible should try to anticipate delays and plan ahead to overcome them. The key is knowing the steps involved, closely monitoring the renovation schedule, and taking timely action if faced with delays.

6. PROCUREMENT

Procurement can be an extensive process, with much time lapsing between decision-making, order/ purchase, and final delivery. The project should be planned in such a way that by the time facility is renovated and ready and the emergency response team is trained and returned to the facility, the equipment, drugs and supplies have also reached the facility. Steps for local and offshore procurement described below are drawn from South Asia experience. Managers from other regions should adjust the procedure as appropriate.

Local Purchase

Even when purchased locally, procurement can take a long time. In some countries, the following steps are involved in procurement:

- Needs assessment
- Request to director of logistics and supplies
- Approval by higher authority (e.g., Director General)
- Preparation of bidding documents
- Publication of bids
- Receipt of bids
- Technical evaluation of bids
- Approval of bids by procurement committee
- Provision of work order
- Acceptance of goods by standing committee

Offshore Procurement

Offshore procurement is usually done through a donor agency, and each agency will have its own procedures. Usually the steps are as follows:

- Prepare a list of items requested according to the needs assessment.
- Bidding and procurement is conducted by the supply and procurement section of the donor agency.
- Receive the shipping documents and hand over to clearing agent for customs clearance. (Sometimes the government has not made any provision for custom/duty charges, which can delay the process.)
- After customs clearance, goods go to the government warehouse for distribution to hospitals/centers.

General Points:

Look ahead for ways to catalyze the process by facilitating the bidding procedure, accepting tender, and ensuring timely delivery of quality goods and supplies.

It is important to have a signed after-sale service agreement with the supplier for items such as anesthesia machines. The supplier should have a representative in the country and the product should be one that is commonly used in the country.

When ordering electrical goods (such as an electric suction machine or a refrigerator), ensure that the right voltage (220 or 110) is ordered.

A designated person should keep in touch with the concerned authorities and suppliers for timely decision-making and delivery of goods. Any sign of delay should be taken seriously and proactively pursued to accelerate the processes of decision making, procurement, and delivery of goods.

7. DISTRIBUTION

- Prepare a distribution list, showing what goes to each facility.
- Arrange for a competent authority (such a Director General) to send a directive, with the distribution list attached, to the warehouse, A copy of the same should be sent to the person in charge of the hospitals/centers.
- Make sure that timely arrangements are made for the transport of goods to their final destination.

8. STAFF ORGANIZATION

- In each hospital or health center, set up a small committee which, along with the Emergency Response Team, to be responsible for opening and setting up equipment.
- Prepare an inventory list and record in the inventory register.
- See that all equipment – delivery table, operating theater (OT) table, OT light, suction machine, vacuum extractor, etc. -- are installed and functional.
- Prepare instrument and linen packs. Place equipment and instruments in the OT and labor/delivery room; drugs in the pharmacy; and blood reagents and equipment in the laboratory/blood bank.
- Post lists in the appropriate rooms:
 - instruments for cesarean section, D&C, delivery, episiotomy
 - linens
 - emergency and anesthesia drugs
- The anesthesia machine should be installed by the representative of the company supplying the machine.

- The anesthetist should ensure that oxygen and nitrous oxide cylinders are filled, and attached to the machine, and that flows appear in the flowmeter. Cylinders vary and may need special adjustments.
- The anesthetist should make sure that he/she is comfortable with the use of the machine.
- If an electric generator is available, make sure that wiring is properly done and staff knows how to operate it in emergencies.
- Develop a system so that crucial keys are readily available – e.g., OT door, medicine cabinets, etc.

9. ROOM-BY-ROOM SETUP

Emergency Room (Casualty)

The emergency room (ER) must be ready around the clock to receive emergency cases. A wheelchair, trolley or stretcher must be available at the hospital gate or reception area, and someone should be designated to transport the patient to the ER. Core staff must be available 24 hours a day, and the ER should be equipped with the following items:

- Emergency drugs and IV solutions
- Examination table with privacy
- BP apparatus, stethoscope, thermometer, kidney basin, sterile gloves, etc.
- Waiting room with seats for relatives

Labor / Delivery Rooms

Labor and delivery staff should be available and prepared to handle emergency cases around the clock. The rooms should be kept ready with the following items:

- 3 sterilized delivery sets
- Sterilized gloves, gauze, cotton balls
- Clean linen, e.g., gowns
- Sterilized forceps set
- Functioning vacuum extractor
- Functioning suction machine with suction tube
- Mucus suckers for neonates
- Filled oxygen cylinder with cylinder carrier and key
- Emergency drugs (replace if expired)
- Antiseptics
- Working BP apparatus, stethoscope, thermometer, IV stands, IV needles and cannulas
- Delivery table with lithotomy stirrups

Change/Scrub Room

The change and scrub rooms, whether separate or combined, should have the following items:

- OT gowns for changing from street clothes
- OT shoes/shoe covers
- Caps and masks
- 24-hour running water and a wash basin with elbow tap
- Scrub brushes and soap
- Wall clock

Operation Theatre

On-call staff should be ready to perform emergency procedures within 30 minutes. The OT should be cleaned regularly and after surgery according to infection prevention principles. It should be equipped and made functional with the following items:

- 3 sets of sterilized cesarean section instruments
- sterilized linen packs
- sterilized gloves, gowns, gauze, cotton balls
- sterilized suction tubing and nozzle
- Functioning OT light with spare bulbs
- OT table
- Functioning suction machine
- Emergency drugs, with list showing quantity and expiration dates
- Resuscitator/ambu bag
- Laryngoscope with battery cells and spare bulbs
- Endotracheal tubes
- Functioning anesthesia machine with spare, filled oxygen and nitrous oxide cylinders
- Anesthetic agents, with list showing quantity
- Spinal needles, epidural kits
- Antiseptics
- Suture materials, with list showing quantity
- Functioning BP apparatus, stethoscope, thermometer
- IV stands, IV needles and cannulas
- Stretcher or trolley

Obstetric Ward

The obstetric ward staff should be ready to receive emergencies. The ward should have the following items:

- Beds: mattress covered with clean rubber sheet , bed sheets and pillows
- Bedside locker
- Bench or chair for attendant
- Emergency drugs and IVs in the medicine cabinet

- Functioning BP apparatus, stethoscope, thermometer
- IV stands, IV needles and cannulas
- Filled oxygen cylinder with facemask, cylinder carrier and key

Pharmacy

A system should be established in the pharmacy so that drugs for obstetric emergencies are available 24 hours. A qualified person should be on call to dispense necessary drugs at all times. The following should be in place:

- EmOC drugs are in stock
- Drugs are replenished when supply reaches a certain minimum level.
- Emergency drugs are supplied in a timely manner to emergency room, OT, labor/delivery room and wards.
- Inventory register is accurately maintained

Laboratory, Blood Supply

Laboratory service should be available 24 hours. A lab technician should be on call to process blood supply requests for obstetric emergencies. The lab must have the following items:

- Blood type, cross matching reagents
- Blood collection bags
- Microscope
- Register for recording the events
- Functioning refrigerator

Autoclave Room

Each EmOC facility should have a designated area or separate autoclave room with a person trained in autoclaving and the following items:

- Functioning autoclave machine with temperature and pressure gauges
- Supply of indicator papers
- Reliable and safe electric connection or supply of kerosene oil/gas
- Table with marked areas-indicating space for unsterile and sterile areas

10. TEAM MEMBERS' RESPONSIBILITIES FOR READINESS

Each team member is responsible for playing her/his role efficiently and effectively, thus ensuring 24-hour "READINESS" for emergencies.

Processing Instruments and Linen Sets

After use, instruments should be decontaminated by soaking them in 0.5% chlorine solution for 10 minutes. Then they should be rinsed, washed, dried, packed in a cloth wrapper or drum, and autoclaved at 121 degree Celsius, under 15-20 lbs. pressure for

30 minutes for instruments and linens, and 15 minutes for rubber and glass goods. Always keep 3 instrument sets ready for emergencies in OT and labor/delivery room.

After use of other items (gloves, rubber suction tubing): decontaminate, wash, dry, wrap separately, and autoclave them. Keep 3 sets always ready for emergencies in OT and labor/delivery room.

If linens are soiled with blood or other body fluids, use heavy-duty gloves for transporting to sluice room for soaking and removal of blood etc. Then transport for laundry. After wash wrap them for autoclaving.

Anesthesia

- Follow instructions supplied by the manufacturer for regular maintenance of the machine
- Establish system of periodic engineer/technician visits for preventive maintenance of anesthesia machine
- Check each morning that there are extra filled cylinders of oxygen and nitrous oxide
- Check each morning and after use that anesthetic agents and emergency drugs are present as per list.
- Replace drugs and anesthetics agents each day after use.
- Make sure endotracheal tubes and connectors are available
- Make sure laryngoscope is working and has spare bulbs and battery cells
- Make sure spinal needles/epidural kits are available
- Check that Ambu bag is working

Housekeeping and Facility Cleaning

Housekeeping includes general cleaning of the ward, emergency room, OT and other clinic environment, including floors, walls, tables and other surfaces.

Daily

- Clean facility before starting daily work
- Keep the floors of OT and labor/delivery room clean and dry all the time
- Check supplies and drugs in the cabinet/store/tray every day and replace if used
- Review the expiration date of drugs; replace them if expired

Between the cases in OT

- Wear gloves; decontaminate the OT table and floor (use 0.5 % chlorine solution).
- Remove used instruments and linens and place them in the proper containers for decontamination and wash
- Remove the decontamination solution that contained the instruments used during surgery
- Resupply decontamination solution as needed

Weekly

- Clean OT table, trolleys and other equipment with soap and water
- Thoroughly scrub the OT, including walls and floor
- Wash walls from top to bottom, so that the debris that falls to the floor will be cleaned up last
- Use utility gloves to clean areas where there are spills of blood and body fluids
- Change disinfectant solution (0.5% chlorine solution) when it is dirty

Building, Electricity, Water and Sewage Maintenance

- Check every morning that all electrical and mechanical appliances in the OT and labor/delivery room are in working order.
- Check for water leakage from taps and toilets, or any other problems in the building. Notify maintenance department. Remind them if action is delayed.

Waste Disposal

- Containers for different kinds of waste should be placed in convenient places which pose no risk of injury or infection.
- Use a separate container for medical waste, such as items contaminated with blood, tissue, body fluids. Do not throw on the floor. Dispose in incinerator or other designated place.
- Use a separate container for sharp items such as needles, scalpel blades etc. Bury the container (For details consult infection prevention manual- AVSC)
- Use a separate container for papers, bottles, plastic etc. Dispose of waste in appropriate place such as incinerator or dump.

Laboratory, Blood Supply

Daily, check that trained personnel and the following are available:

- 24 hour coverage by laboratory personnel
- At least two units of O+ blood
- All the reagents are present; replace if expired
- All items for blood collection are present and in working condition

Pharmacy

- Conduct regular inventory to ensure 24 hour availability of essential drugs for obstetric emergencies
- Ensure 24 hour coverage for pharmacy
- Procure drugs if stock reaches a minimum level
- Review expiration dates of drugs and replace them as needed
- Maintain inventory register

11. RESPONSE TO EMERGENCY CASES

From the moment a woman with an obstetric emergency arrives at the facility, each step should be taken responsibly and effectively to save her life.

- When an emergency case arrives at the main entrance of the hospital, the gate keeper should immediately arrange transport of the patient (with a trolley or wheelchair permanently available at gate) to a predetermined area (emergency room/casualty, labor/delivery room) for evaluation. The gate keeper should be sensitive to the urgency of the situation.
- There, the health personnel (i.e., midwife, nurse or doctor) should take a quick history, do a physical examination and make a provisional diagnosis.
- After initial diagnosis, they should stabilize patient according to the condition (with IV fluids, anti-convulsant, oxytocics, pressure on lacerations, trendelenberg position, oxygen, CPR).
- While stabilizing, evaluate further, and order blood or lab tests, monitor mother and fetus, date pregnancy, determine fetal position. If full ERT is needed for primary treatment, alert the members immediately upon the patient's arrival.
- Reconfirm diagnosis for treatment.
- Administer treatment, e.g., cesarean section, vacuum/forceps delivery, uterine evacuation, manual removal of placenta, oxytocin, blood transfusion, IV, laceration repair etc., without delay.
- During recovery period, conduct intense monitoring (vital signs, fluid intake and output, bleeding, lab) for 24-48 hours and then routine monitoring.
- The doctors must make rounds in the morning, evening, and when required. After treating the patient, the ERT should remain on the premises for 2 hours or until the patient's condition is stable.
- Midwives/nurses and paramedical staff should be scheduled to provide 24 hour coverage of patient care.
- Make discharge plans once patient is stable. Provide health education, diet advice, immunization for newborn, family planning methods, information on danger signs and advice for return to facility and follow up visits.