



AVERTING MATERNAL DEATH AND DISABILITY

A tool for assessing ‘readiness’ in emergency obstetric care: The room-by-room ‘walk-through’

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Abstract

This article presents a tool that can be used to assess the readiness of a health facility to provide emergency obstetric care. The ‘walk-through’ tool is a checklist that follows the physical path that a woman and her caregivers might follow. The items on the checklist are critical to an enabling environment in which skilled providers can save lives. The article explains how the tool can be used and by whom, and it describes several experiences in the field.

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1. Introduction

Most women who die during pregnancy or childbirth live in resource poor countries. About 80% die from eclampsia, postpartum sepsis, complications of abortion, hemorrhage, uterine rupture and obstructed labor—most of which cannot be pre-

dicted. However, the technology to treat women with these life-threatening obstetric complications has been available for many years. With surgery, blood transfusions, essential drugs and other life-saving procedures, almost all maternal deaths and many more disabilities can be avoided [1].

Organizing health systems to deliver this life-saving technology poses challenges, especially for the low resource settings where most maternal mortality occurs. Inputs and adjustments at the

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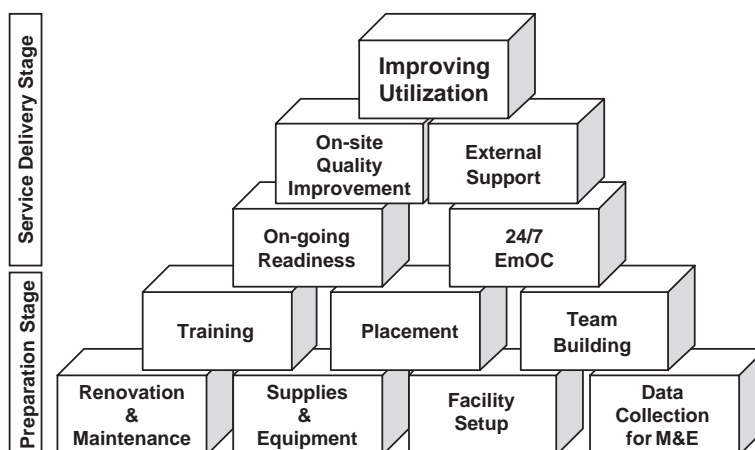


Figure 1 AMDD model for implementation of emergency obstetric care.

policy, advocacy and regulatory levels are needed, as well as ensuring adequate planning, physical infrastructure, logistics, human capacity development and evaluation. However, most critically, tackling the problem of maternal mortality requires that the care facilities function well.

At the facility level, the three key components to reducing maternal mortality are application of good quality medical technology/clinical skills, good management/organization within the facility (including personnel, equipment, drugs and supplies) and a respect for human rights [2]. Management and organization within a facility is often a neglected topic. Further, a common assumption is that improvements at the facility level require considerable external investment in personnel, supplies, equipment, and training. However, poor organization of existing services is a major contributor to poor facility functioning and one that can often be rectified at little or no cost.

This paper presents a tool designed to improve facility organization, management, and oversight in the context of providing emergency obstetric care (EmOC) at either the basic or comprehensive level.¹

2. Planning for improvement

The first step in improving facility functioning is to have a plan for diagnosing the initial status of the facility and monitoring its progress towards improved performance. Fig. 1 shows the process

¹ Emergency obstetric care is a subset of life-saving technologies that include parenteral administration of antibiotics, anticonvulsants, oxytocics, manual removal of the retained placenta, removal of retained products, assisted vaginal delivery, blood transfusion and cesarean delivery. Basic facilities regularly provide the first six functions and comprehensive all eight [3].

of upgrading a facility as a set of sequential building blocks leading from initial pre-function preparation through increasing utilization of services. This figure has been the roadmap or blueprint used by Columbia University's Averting Maternal Death and Disability (AMDD) program for guiding its efforts to improve functioning at the facility level. The visual shows how activities should be synchronized; however, it is important to note that for existing facilities it might be neither possible nor desirable to implement all activities in a strict sequential order. Existing facilities will vary with regards to which elements are already strong and which may need more attention in order to achieve the smooth functioning of the overall facility. The sequencing shown in Fig. 1, from preparation to service to utilization, provides a guide for prioritizing action while recognizing that in existing facilities it is possible, if not likely, for several elements to undergo strengthening at the same time.

3. Readiness

The concept of "readiness" is at the core of handling any medical emergency since survival is often highly dependent on timing. Readiness is defined by "achieving and maintaining a state of preparedness in the facility to provide quality EmOC. This includes sufficient numbers of staff available with requisite skills and a willingness to respond to clients 24 hours a day, 7 days a week, available and functional equipment and supplies, and adequate infrastructure" [4].

4. The walk-through tool (WTT)

The 'walk-through' tool was developed with the aim of helping to establish this state of readiness in

the minds of the care providers, and in the expectations of the health system managers. (The WTT can be found at the end of the article in Appendix A because of its length.) The WTT can serve several purposes such as:

- needs assessment,
- guidance for planning,
- guidance for setting up a facility,
- team-building,
- supervision—both internal and external,
- quality assurance, and
- evaluation.

The WTT reflects the physical path that a patient with an obstetric emergency, and the staff who treat her, might follow, from the moment she encounters a “gatekeeper”, through the various possibilities for case management, to recuperation and discharge after delivery/surgery. It is presented as a checklist of items that should be found in this room-to-room trajectory, that, if present and functioning, should constitute an enabling environment for providers to save lives. It informs managers and evaluators about the readiness of the facility, how well a facility is organized and managed, and ultimately reflects on the quality of the services provided.

Checklists play an important role in many walks of life, from pilots who use them routinely in pre-flight preparation to vacationers packing their suitcases. In medical settings, checklists are often used to take a medical history, to screen or assess patients, and as aids in the evaluation of training and quality of care.

The specific items included in the WTT may vary from place to place. International standards of care should support included items, as is the case for the generic version presented in this paper. If international standards are not realistic in a particular setting, local standards that reflect the capacity of a facility in terms of staff and resources should dictate adaptation of the items on the tool. The WTT presented here is minimal and requires the least possible response burden, i.e., it only asks for availability and functioning of the items and leaves space for brief open-ended remarks. This minimalist approach was adopted to give practitioners and other users a starting point that could be adapted to more complex environments and/or fewer time limitations. The WTT could be modified easily to include additional details about the availability of items, number of items, their functioning status or other features as desired.

Fig. 2 depicts the route that a walk-through team might follow. The route should reflect the six critical steps in EmOC [4]

- Arrival
- Evaluation and alert
- Stabilization or initial treatment
- Definitive treatment
- Monitoring and recovery
- Information/counseling and discharge.

These steps in providing EmOC are common to virtually all facilities. What may differ from facility to facility is the design of the physical layout. It

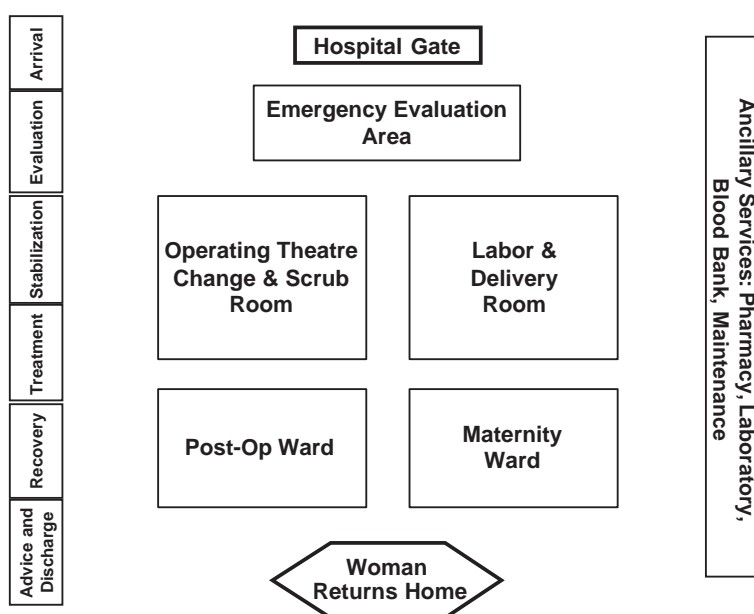


Figure 2 Patient trajectory and critical steps in EmOC.

should be noted that physical layout can inhibit or enhance the quality of EmOC [5] and a review of the physical layout, though beyond the scope of this paper, is recommended. In any case, the path followed by any individual woman may vary based on her condition(s), but all paths should be functional and ready.

Ancillary services, specifically the laboratory, blood bank and autoclave room, are included in the tool. These services, as well as the pharmacy and maintenance services (including backup electricity, water and laundry), and their availability 24/7 is critical to a facility's preparedness for an emergency.

5. How to conduct a walk-through inspection

The WTT was designed for use by two groups of people: on-site managers or service providers, and off-site individuals who might be carrying out supportive supervisory visits for monitoring after planning or training. These individuals might be regional or district level health professionals, staff from teaching hospitals, members of professional societies, or others.

6. Room-by-room

Each room should be set up according to the functions to be performed in that room or physical space. The individual items have been ordered loosely beginning with the more critical items and ending with items that may be less critical to patients' survival but are helpful. These are the authors' choices but readers may be inclined to adapt them to fit their own local circumstances.

6.1. Arrival

The checklist begins where the woman first has contact with the facility. This may be a gate or emergency entrance. Gatekeepers or others present must be sensitive to the urgency of situations. If a pregnant woman is unable to walk, the gatekeeper should immediately transport or facilitate the transport with a trolley or a wheel chair to a predetermined area such as the emergency or evaluation area. Thus, a trolley or wheel chair should be permanently available at the entrance.

Gatekeepers should be included in any team building exercise and their normal procedures should be reviewed to determine if there are times when they are not present, or if the gatekeeper

uses any queue management mechanisms such as giving out tickets, or charging an official or unofficial entrance fee—anything that might delay admitting an emergency.

6.2. Evaluation and alert and stabilization or initial treatment

The emergency or evaluation area may be an actual triage room or it may take place in labor and delivery. The facility staff must determine priority of need and proper place of treatment by taking a quick history, performing a physical examination in privacy and making a provisional diagnosis. After an initial diagnosis, staff will stabilize the vital signs of the patient by using IV fluids, anti-convulsants, oxytocics, pressure on lacerations, oxygen, etc. Emergency drugs should be present or extremely close.

6.3. Definitive treatment

From the evaluation area the patient will be prepared for definitive treatment, which can be defined by the life-saving procedures of EmOC (see footnote 1 for a list of the signal functions that define EmOC) as well as IV fluids and obstetric surgery other than a cesarean section. Definitive treatment can take place in labor and delivery, in a room for minor procedures such as manual vacuum aspiration, or a patient may be sent from evaluation directly to the operating room (OR). The patient's conditions permitting, informed consent should be sought before any intervention.

Labor and delivery staff should be available and prepared to handle emergencies around the clock. Delivery and linen sets should be prepared and placed in the labor/delivery room. The room should be equipped for maternal and newborn interventions and routine care—including furniture, equipment, drugs² and infection prevention materials such as gloves, disposal mechanisms for sharps, etc.

If a woman is sent to the OR, staff should pass through the change and scrub room. Dressing for surgery and then walking across the building will compromise infection prevention principles as will unnecessary traffic in procedure areas. [6] The change room may be separate or combined with the scrub room. These rooms must contain the articles of clothing that staff working in the OR need, a constant supply of running water, and soap. Where

² The team can develop a more detailed listing of the drugs that should be in each room if helpful.

running water is not available, alternate plans must be in place.

On-call staff should be ready to perform emergency procedures within 30 min [7,8]). The OR should contain a minimum number of sterilized surgical equipment sets, sterilized linen, drugs, equipment such as a laryngoscope, lamp, anesthesia and suction machines, furniture and supplies. All equipment should be functioning and cylinders of oxygen or nitrous oxide should not be empty.

6.4. Monitoring and recovery

Recovery generally takes place in a recovery room or a ward and facilities are likely to have more than one obstetric ward—at least a post-partum ward and a post-operative ward. Staff should be able to receive and monitor patients recovering from emergencies, recognize the signs of new complications and stabilize a patient should any occur. The wards must have furniture such as beds and side tables and emergency drugs, IV stands, mosquito nets in malaria endemic areas, and the equipment needed to monitor vital signs.

6.5. Ancillary services

The ancillary services of a laboratory and blood bank, pharmacy, maintenance and a central sterile supply area should be available 24 hours a day. A laboratory technician should be on call to type, cross match and screen blood, as well as respond to requests for blood. Equipment to process and safely keep the blood is necessary.

Each facility should have a designated central sterile supply area with a person trained in autoclaving and high level disinfection. This area must have key pieces of furniture and equipment including a safe electrical connection or a supply of gas or kerosene oil. In addition to autoclaving and disinfection, the steps of decontamination and washing should not be overlooked such as having buckets with bleaching solution (0.5% chlorine solution) for decontamination of instruments and a supply of utility gloves. Ideally, the facility should have running water 24 hours a day.

7. General principles and procedures

This section addresses select behaviors that may not be observable in a walk-through but that the person(s) doing the walk-through would do well to inquire how and whether these things are done so

as to have some assurance that the systems are working properly. These items play an important role in establishing readiness and quality of care.

An example of readiness preparation is the pharmacy. Although a visit to the pharmacy does not appear on the tool, it should have a stock management system so that drugs are in stock and dispensed by a qualified person. The pharmacy must have an inventory system that is accurately maintained [9]). Drugs must be replenished when supplies drop below a certain level in the emergency triage area, OR, and labor/delivery rooms and wards. At all points in the walk-through trajectory, medicine cabinets must be unlocked or a key readily available. One effective alternative is to set up an emergency drug box that is kept by the head nurse or head of the maternity. This box should have its own inventory monitoring and be restocked from the main pharmacy.

An example of quality of care is the final critical step in EmOC, "information/counseling and discharge," which can take place from a ward or from the emergency department. If a woman is being discharged, we can assume that the emergency has been resolved. A woman who has suffered a life-threatening complication should be informed of what happened and why. She should be counseled about signs of further complications and understand the follow-up recommended for her.

Unlike some of the examples above, measures to prevent infection are easily observable. Cleanliness is an aspect that should be assessed or monitored as the team follows the walk-through circuit. Blood soaked materials should be processed quickly and transported, if necessary, in a predetermined route to avoid contamination. Needles and sharps should be disposed of in puncture proof containers, as they, like other waste materials, pose a hazard to patients and staff if not properly disposed of.

Many rooms are likely to manage a registry or logbook of the patients that are treated in each room. The walk-through team could also assess the completeness of these registries. However, for a more in-depth assessment of registries, Engender-Health and AMDD [4] have developed a separate tool to review a facility's registries and records, which highlights what should be assessed and how to do it.

Often at the Ministry or Directorate level, it is expected that service providers will take the initiative to set up rooms with the necessary equipment and to make the rooms functional to provide services. But service providers may require some guidance on how to better organize their environment in order to set up and bring readiness

to the facility. The person or persons conducting the walk-through inspection should also help staff to understand the tool and encourage its regular use in the facility. Initially, the process may not flow easily, either because it is a new activity, or because the managerial support has not been strong, or perhaps because a sense of team spirit has yet to be firmly established. Notably, because the walk-through highlights the linkages between work areas and tasks, it can be instrumental in team building and facilitating communication between facility management and clinical care personnel.

Once the walk-through is complete and observations noted, the team or individual meets with staff to discuss findings from the visit. They should congratulate staff on work well done and progress achieved. The group should analyze problems and discuss concrete recommendations, for example, what items are missing and how to obtain them; and how to reorganize a room in order to have the emergency materials at hand. Implementing the solutions is likely to take place at a later date, but they should be revisited the next time the walk-through is performed, or through regular management or clinical review meetings.

8. The human element

Institutional management support is critical to the effectiveness and sustainability of quality improvement exercises. Although the actual involvement of management may be limited, as decision makers management can facilitate processes and enable changes especially if they require funding.

Setting up each room with equipment, instruments, linen, drugs and supplies to be ready to respond to emergencies may be the easy step. The presence of everything that might be required in an emergency does not guarantee quality; staff must know how to use the equipment and administer treatment. And equally important, staff must actively participate and support the goal of readiness. Staff participation has long been recognized as essential in good management and critical to finding creative solutions [10].

One way to organize staff is by teams. The AMDD program used a model that organized two teams within each facility: an emergency response team (ERT) and a facility team (FT). The ERT actually provides the life-saving care needed by women with obstetric complications. The ERT might include obstetricians, general physicians, persons experienced in obstetric surgery, anesthetists, midwives, paramedics/technicians and nursing and

auxiliary staff. The FT supports the ERT and includes people like administrators and accountants who are responsible for managing the facility, people who maintain the facility (general management, gate-keeper, cleaning, electrical and water supply, waste disposal) and ensure that the ERT has the equipment and supplies that it needs.

Each team member is responsible for playing her/his role efficiently and effectively, and s/he should respect duty roster for nights and weekends. This begins with a clear understanding of what that role is. It may include preparing a patient for surgery, cleaning the facility, ensuring a regular supply of reagents for blood tests, or making blood available for transfusion. All these tasks contribute to keeping the facility ready for emergencies.

Each team member and supervisor can take daily steps to ensure “readiness” of the facility. The supervisor should use supportive supervision methods to ensure that steps are followed regularly so that the facility is ready to respond to emergencies. A detailed list of the tasks involved with establishing “readiness” in the processing of instruments and linen sets, house-keeping and facility cleaning, anesthesia, waste disposal, utilities maintenance can be found elsewhere [11].

9. Experience from the field

AMDD developed this tool to assist facilities to assess readiness for and respond to obstetric emergencies. Partner organizations (Save the Children, CARE, UNFPA and UNICEF) and their project teams have used this tool when making monitoring visits to the project sites—facilities that are being upgraded to provide quality EmOC services in more than 15 countries. They have modeled the process so that local supervisors are comfortable using it. Some countries benefited from clinical support visits from external technical experts, who have used the tool and taught local staff how to use it. In all of these cases the WTT has served as much as a job aid for off-site personnel monitoring facility readiness as a needs assessment or planning tool for on-site staff. But this is an artifact of the timing of the tool’s development in the context of the overall AMDD program.

The tool is often the basis on which an ‘action plan’ is made. The visiting team and the facility team meet to discuss where improvements are needed, the proposal of solutions, those responsible and dates by which the solution might be

achieved. This methodology is much like that proposed by many quality improvement exercises [4,12,13]. At the conclusion of the visit, the action plan might be co-signed by someone representing the facility and the visiting team. The use of ‘contracts’ has been reported in Vietnam and in Peru.³

In Vietnam, the use of a walk-through tool has also been incorporated into workshops on how to conduct supportive supervision and is used by trainers in emergency obstetric care at Hue Medical School. In Peru, the project’s supportive supervision model, which includes the WTT, is being adopted and adapted by the country’s leading training center. In Bangladesh, the WTT was incorporated into Hospital Action Planning, a process for initiating service improvement efforts and orienting staff to EmOC in more than 80 facilities.

Project staff have reported the need to adapt and simplify the original generic form so that it can be used at the health center level where obstetric surgery is not provided but where the infrastructure for referral is needed. Such adaptation is a sign of ownership and responsiveness to local needs.

10. Conclusions

The walk-through was designed as an instrument to assist providers and managers to become better prepared to respond to obstetric emergencies and provide a higher quality of care. The tool is simple and straightforward and requires neither excessive time to complete nor special resources to implement. It can be easily adapted to meet the specific needs of individual EmOC facilities, and, although not the primary intention of the authors, it could also be easily adapted to assist with the organization and management of other medical specialties. In addition to its benefits to emergency obstetric care, the WTT helps to develop generally stronger and more efficient health care delivery service that affect not only obstetric outcomes, but also other medical emergencies that depend on common systems such as pharmacy, laboratory, infection prevention and surgical services. The field experience with the WTT is testimony to its feasibility and the benefits of its use. In the future research should be conducted to more precisely quantify the benefits of using the

WTT and provide guidance for adapting its use to local settings.

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Appendix A. The Walk-Through Tool⁴ [14–16]

| | Available & Functioning | Remarks |
|---|-------------------------|---------|
| Gate | | |
| Wheel chair, trolley or stretcher | | |
| Person to transfer patient | | |
| Emergency Evaluation Area | | |
| Emergency drugs & IV solutions | | |
| BP apparatus, stethoscope, thermometer | | |
| Sterile gloves | | |
| Oxygen cylinder w. facemask, cylinder carrier and key | | |
| Examination table with privacy | | |
| Waiting room with seats for relatives | | |
| Labor/Delivery Room | | |
| Sufficient sterilized delivery sets | | |
| Sterilized gloves, gowns, gauze | | |
| Clean linen sets | | |
| Sterilized forceps set | | |
| Vacuum extractor | | |
| Laceration repair pack | | |
| Suction apparatus with suction tube | | |
| Oxygen cylinder w. facemask, cylinder carrier and key | | |
| Light | | |
| Emergency drugs (within expiration limits) | | |
| Antiseptics | | |
| BP apparatus, stethoscope, thermometer, IV fluids, stands, needles and cannulae | | |

(continued on next page)

³ Hoang Thi Bang (personal communication, 2003) and Raúl Luna (personal communication, 2004).

⁴ For additional items, please consult the JHPIEGO *EmOC Quick Reference Guide for Frontline Providers* (2003), the WHO *Mother-Baby Package: Implementing safe motherhood in countries* (1994) or WHO *Essential elements of obstetric care at first referral level* (1991).

Table continued

| | Available & Functioning | Remarks |
|---|-------------------------|---------|
| Labor/Delivery Room | | |
| Mucus extractor for neonates | | |
| Delivery table with lithotomy stirrups | | |
| Baby weighing scale | | |
| Ambu bag for newborn | | |
| Bucket for decontamination | | |
| Sharps disposal container | | |
| Change/Scrub Room | | |
| OT gowns for changing from street clothes | | |
| 24-hour running water | | |
| Wash basin with elbow or knee tap | | |
| Scrub brushes and soap | | |
| Caps and masks | | |
| OT shoes/shoe covers | | |
| Wall clock | | |
| Operation Theatre | | |
| Sufficient sets of sterilized cesarean delivery instruments | | |
| Sterilized suction tubing and nozzle | | |
| OT lamp with spare bulbs | | |
| Suction machine | | |
| Emergency drugs, with list showing quantity and expiration dates | | |
| Resuscitator/ambu bag | | |
| Laryngoscope with battery cells and spare bulbs | | |
| Endotracheal tubes | | |
| Anesthesia machine with spare cylinders of oxygen and nitrous oxide | | |
| Anesthetic agents, with list showing quantity | | |
| Spinal needles, epidural kits | | |
| Antiseptics for skin preparation | | |
| Suture materials, with list showing quantity | | |
| IV stands, fluids, needles and cannulae | | |
| BP apparatus, stethoscope, thermometer | | |
| Sterilized gloves, gowns, gauze | | |
| Sterilized linen packs | | |
| Stretcher or trolley | | |
| Obstetric Wards | | |
| Emergency drugs | | |
| BP apparatus, stethoscope, thermometer | | |
| IV stands, fluids, needles and cannulae | | |
| Oxygen cylinder with facemask, cylinder carrier and key | | |
| Sharps disposal containers/rubbish bins | | |
| Beds with mattress covered with clean rubber sheet, bed sheets and pillow | | |
| Side table or bedside locker | | |
| Bench or chair for attendant | | |

Table continued

| | Available & Functioning | Remarks |
|---|-------------------------|---------|
| Laboratory/Blood Bank | | |
| Blood type, cross matching and reagents for screening syphilis, hepatitis, HIV and others | | |
| Blood collection items and bags | | |
| Centrifuge and test tubes | | |
| Microscope | | |
| Register for recording events | | |
| Refrigerator | | |
| Autoclave Room | | |
| Autoclave machine with temperature and pressure gauges | | |
| Supply of indicator paper | | |
| Reliable and safe electric connection or supply of kerosene oil/gas | | |
| Table with marked areas indicating sterile and non sterile areas | | |

References

- [1] Maine D, Akalin MZ, Chakraborty J, de Francisco A, Strong M. Why did maternal mortality decline in Matlab? *Stud Fam Plan* 1996;27:179-87.
- [2] Freedman L. Using human rights in maternal mortality programs: from analysis to strategy. *Int J Gynecol Obstet* 2001;75:51-60.
- [3] UNICEF, WHO, UNFPA. Guidelines to Monitoring the Availability and Use of Obstetric Services. New York.
- [4] EngenderHealth and AMDD. Quality improvement for emergency obstetric care. Leadership Manual and Tool-book; 2003.
- [5] Abreu E, Potter D. Recommendations for renovating an operating theatre at an emergency obstetric care facility. *Int J Gynecol Obstet* 2001;75:287-94.
- [6] EngenderHealth. Infection prevention practices in emergency obstetric care. A Supplement to Infection Prevention: A Reference Booklet for Health Care Providers; 2003. New York.
- [7] Lurie S, Sulema V, Kohen-Sacher B, Sadan O, Glezerman M. The decision to delivery interval in emergency and non-urgent cesarean section. *Eur J Obstet, Gynecol, Reprod Biol* 2004;113:182-5.
- [8] Royal College of Obstetricians and Gynecologists. The Use of Electronic Fetal Monitoring: the Use and Interpretation of Cardiotocography in Intrapartum Fetal Monitoring, vol. 8. London: RCOG Press; 2001.
- [9] Trap B, Todd C, Moore H, Laing R. The impact of supervision on stock management and adherence to treatment guidelines: a randomized controlled trial. *Health Policy Plan* 2001;16:273-80.
- [10] Benjamin S, Abdulla Ahmed A, Al-Darazi F. Management in the ministry of health: what are the vital signs? *World Hosp Health Serv* 1997;33(1):2-12.

- [11] Gill Z, Smith JB. Implementing Emergency Obstetric Care in Developing Countries. AMDD Project Workshop, Marrakech, February; 2001. <http://www.amdd.hs.columbia.edu/marrakechplenaries.html>.
- [12] Weeks A, Alia G, Ononge S, Mutungi A, Otolorin E, Mirembe F. Introducing criteria based audit into Ugandan maternity units. *BMJ* 2003;327:1329-31.
- [13] Bailey P, Fortney J, Freedman L, Goodman E, Kwast B, Mavalankar D, et al. Improving Emergency Obstetric Care Through Criterion-Based Audit. New York: Columbia University; 2002.
- [14] JHPIEGO. Emergency obstetric care quick reference guide to frontline providers. USAID and maternal and neonatal Health Program; 2003.
- [15] WHO. Mother–baby package: implementing safe motherhood in countries, Maternal Health and Safe Motherhood Programme, Division of Family Health, World Health Organization, Geneva, WHO/FHE/MSM/94.11; 1994.
- [16] WHO. Essential elements of obstetric care at first referral level. Geneva: World Health Organization; 1991.