MINISTRY OF HEALTH

REFERENCE MANUAL FOR SIMULATION LABORATORIES IN MIDWIFERY EDUCATION PROGRAMMES

USAID FROM THE AMERICAN PEOPLE

MCHIP Maternal and Child Health Integrated Program

AMERICAN COLLEGE of NURSE-MIDWIVES With women, for a lifetime®

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Editor: Catherine A. Carr

The Maternal and Child Health Integrated Program (MCHIP) is the USAID Bureau for Global Health's flagship maternal, neonatal and child health (MNCH) program. MCHIP supports programming in maternal, newborn and child health, immunization, family planning, malaria and HIV/AIDS, and strongly encourages opportunities for integration. Cross-cutting technical areas include water, sanitation, hygiene, urban health and health systems strengthening.

www.mchip.net

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Abbreviations and Acronyms

ACNM	American College of Nurse-Midwives
AMTSL	Active Management of Third Stage of Labor
BEmONC	Basic Emergency Obstetric and Newborn Care
CMT	Core Management Team
HRHD	Human Resource for Health Development
HTI	Health Training Institutions
ICM	International Confederation of Midwives
IP	Infection Prevention
IRB	Institutional Review Board
KATH	Komfo Anokye Teaching Hospital
MCHIP	Maternal and Child Health Integrated Program
MNH	Maternal and Newborn Health
MOH	Ministry of Health
MTS	Midwifery Training School
NMC	Nurses and Midwives Council
NMTC	Nursing and Midwifery Training College
OSCE	Objective Structured Clinical Examination
PAC	Postabortion Care
SBM-R®	Standards-Based Management and Recognition
SLA	Simulation Laboratories Assistant
SLC	Simulation Laboratories Coordinator
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development

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Foreword

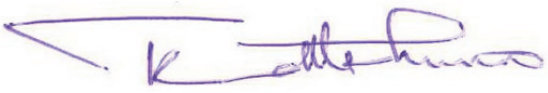
Achieving Millennium Development Goals (MDGs) four and five still remains a priority for the Government of Ghana. The Government's commitment and action is outlined in the MDGs Acceleration Framework Country Action Plan (2010). In addition, the recent National Assessment for Emergency Obstetric and Newborn Care (November, 2011) highlighted a number of priorities for achieving continued progress in decreasing infant, child and maternal mortality including but not limited to addressing the current shortage of midwives and also strengthening the implementation of evidence-based, life-saving interventions.

In support of these efforts, the Ministry of Health has prioritized pre-service education, especially in midwifery. This focus on midwifery training has seen the number of institutions almost doubling between 2010 and 2012. The increase in numbers of institutions, tutors and students has necessitated the adoption of tools and methodologies to assist the educational institutions to manage the process of education to ensure that students not only gain knowledge but more importantly skills and practical experience.

In 2012, the Human Resource for Health Development (HRHD) of the Ministry of Health operationalized a Pre/Post Basic Education unit to strengthen the support provided to the Health Training Institutions (HTI) and to focus on their priorities. As part of these efforts the Pre/Post Basic Education Unit of the HRHD has championed the development of this reference manual to be used as an important managerial tool by relevant stakeholders, particularly principals, tutors and preceptors in midwifery education.

The Reference Manual for Simulation Laboratories in Midwifery Education Programmes aims to support preceptors and students to acquire the best skills for richer practical experience. The manual gives clear guidance with appropriate tools, thus aiding the setting up, utilization and management of skills laboratories in the schools.

Through this commitment, a new generation of highly competent midwives with commensurate skills and clinical experience will reduce the cost and necessity for in-service training. In addition, these midwives will join national efforts to reduce maternal, infant and child morbidity and mortality through the provision of high-quality care and prescription to life-saving interventions. Furthermore, childbearing women, their children and families in Ghana will thus benefit from this great effort.



Hon. Rojo Mettle-Nunoo
Deputy Minister of Health

Chapter 1. Introduction and Background

1.1 OVERVIEW OF MIDWIFERY PRE-SERVICE EDUCATION

The three cornerstones of professional midwifery education are **knowledge, skills,** and **practical experience.** These must be balanced so that educational programmes produce midwives who are able to perform safely and provide high-quality care to mothers and babies.

Midwifery students master a body of knowledge that will serve as the basis for evidence-based practice and clinical decision-making. Knowledge comes alive through the acquisition of key skills, which in turn are practiced in the clinical setting to gain competence. It is now recognized that attention to all three components of midwifery education is a cost-effective, sustainable investment that can impact the survival of women and their newborns.[1] The International Confederation of Midwives (ICM) Global Standards for Midwifery Education state that "the midwifery curriculum includes both theory and practice elements with a minimum of 40% theory and a minimum of 50% practice."[2]

The Ghana Ministry of Health (MOH) has identified strengthening midwifery education as a key strategy to providing quality health care for mothers and babies in Ghana. Because midwives play a primary role in health care delivery, the improvement of pre-service midwifery education can improve the performance of the entire health care system. The development of students into clinically competent midwives requires both the attainment of knowledge and hands-on practice of skills. The Maternal and Child Health Integrated Program (MCHIP) and American College of Nurse-Midwives (ACNM) are collaborators in support of the MOH scale-up of simulation labs in the areas of procurement, manual development, training, and management.

Simulation labs (sometimes called skills labs or simulation centres) are places for teaching and learning skills, for demonstrating and practicing skills and techniques, and for providing simulated experiences. Though the terms are often used interchangeably, there may be differences depending on the context and audience. In this manual, the term used is simulation lab or labs. The role of simulation in clinical teaching is to provide activities that closely approximate the reality of a clinical environment. During the time spent in the simulation lab, students are introduced to a range of clinical skills essential for safe practice. The establishment of a functional simulation lab with essential equipment, robust management, and learning activities integrated with the overall curriculum is a critical first step to helping students practice skills and achieve competency prior to caring for clients in the clinical setting. A well-prepared student enters the clinical practice site with basic skills that are ready to be improved and expanded under preceptor guidance. This preparation improves patient safety, amplifies student learning, and makes preceptors more likely to allow direct hands-on practice by students.

1.2 PURPOSE OF THIS MANUAL

The primary purpose of the *Reference Manual for Simulation Laboratories in Midwifery Education Programmes* is to provide a practical and focused resource for midwifery education programmes for the development, maintenance, and day-to-day management of simulation labs. This manual describes a systematic approach to creating a productive learning environment in the simulation lab. Though developed for midwifery education, the information included is generic enough to be used for other cadres. The manual purposefully does not focus on a specific midwifery curriculum.

[1] World Health Organization, 2012. Trends in maternal mortality: 1990 to 2010. Available at http://www.unfpa.org/webdav/site/global/shared/documents/publications/2012/Trends_in_maternal_mortality_A4-1.pdf.
[2] International Confederation of Midwives, Global Standards for Midwifery Education, 2010. Available at www.internationalmidwives.org.

Users of this manual are most likely to be faculty, administrators, and selected staff who will be involved in using, managing, and maintaining the lab. The *Reference Manual for Simulation Laboratories* is not a clinical teaching skills manual. Excellent programmes for developing teaching skills are on the Online Resources list (see **Appendix 1**), and tutors and instructors are encouraged to take advantage of them. Throughout the manual, various guidelines and templates are discussed and suggested. Each school will be able to assess and adapt the materials to best suit its environment and needs.

Chapter 2. Roles and Responsibilities

The purpose of this section is to describe the roles and responsibilities of the people involved in maintaining and running the Simulation Lab. The overview describes general staffing and is followed by specific descriptions for each role.

2.1 OVERVIEW OF ROLES

Stakeholders

There are a number of stakeholders that will be involved in development and coordination of the simulation lab. Administrative support from the institution is critical, and other stakeholders may include hospital administrators, faculty from departments that will be using the simulation lab, users of the current space, and vendors. In Ghana, the MOH is the main funder of midwifery education and the Nurses and Midwives Council (NMC) and the Ghana Health Services (GHS) are key stakeholders, as are donors working with individual schools.

Core Management Team

It is important to set up and develop a core management team (CMT) for the simulation lab. The CMT is the coordinating body that develops and implements policy related to the simulation lab. This team should include the Simulation Lab Coordinator (SLC), a representative from administration, and at least one tutor from each department. It is also recommended that each class has student representation on the CMT. Though students may not be able to make decisions about policy, their input can be valuable from the end-user perspective and should be encouraged. The CMT should plan to meet regularly every 1–2 weeks to review coordination of the lab. Preparation for the next term should begin before the prior one ends.

Staffing Overview

Effective and efficient management of the simulation lab requires substantial personnel time. A workgroup in Tanzania recommended that each simulation lab have one full-time SLC, who is a tutor, and a non-tutor Simulation Lab Assistant (SLA) who is full-time or nearly so.[3] Though full-time staffing is ideal, it is unlikely that schools are able to fund a full-time SLC, particularly with national shortages of professional teaching staff. However, a designated tutor who takes this role should be given relief time from teaching in order to provide adequate Simulation Lab coordination. The time and attention needed for simulation lab coordination is significant and it is not reasonable or possible for the designated tutor to adequately provide this and also carry a full teaching load. If there is job sharing for roles, such as two tutors named as co-coordinators, clear documentation of responsibilities, and when and how they are split, is important. Following the summary table below is a further description of roles and responsibilities for staffing. Examples provided are suggestions, not mandates, and each institution will necessarily adapt staffing roles to fit its own needs and resources. For all programmes, it is important to consider the specifics of each role and work toward adequate staffing. Third-year students can be responsible teachers for their peers and junior students.

[3] Skills Lab Operations and Maintenance Manual (Draft) 2011. Developed in partnership with the Tanzania Ministry of Health and Social Welfare, Tanzania Nursing Initiative, University of California, San Francisco, and Muhimbili University of Health and Allied Sciences Twinning Partnership, Jhpiego Tanzania and Hamza University.

2.2 SPECIFIC RESPONSIBILITIES OF STAFF ROLES

Table 1: Summary examples of simulation lab roles and responsibilities

ROLE	RESPONSIBILITIES (DETAILED BELOW)
Simulation Lab Coordinator	Communication and coordination
	Organization of lab
	Training and support
	Maintenance and procurement
	Monitoring and evaluation
	Supervision and leadership
Simulation Lab Assistant(s) (May be third-year students)	Lab preparation for practice
	Lab maintenance
	Lab safety and security
	Facilitation and documentation of use
	Supply management
Student Helpers	Assistance with maintenance and operations
	Peer mentoring
	Proctoring skills sessions and open lab hours

Role of Simulation Lab Coordinator (SLC)

The SLC is responsible for the overall management and supervision of the lab at all times. More specifically, the SLC has the following responsibilities under each heading:

Communication and coordination

- Facilitate day-to-day internal communication among students, teachers, support staff, and administrators pertaining to simulation lab.
- Convene and facilitate CMT meetings.
- Coordinate usage of the simulation lab by different parties within the school.
- Develop and manage the simulation lab schedule.
- Report quarterly to head of school and others as appropriate about utilization of simulation lab in the school.

Organization of lab

- Determine optimal organization of lab furniture, equipment, and supplies for ease of use and inventory management.
- Oversee maintenance of the lab in accordance with the organizational plan.

Training and support

- Orient students to the lab's purpose, organization, policies, and guidelines for use.
- Orient faculty and clinical staff to the lab policies, organization of supplies, teaching methodology, and equipment use.
- Support tutors in lab lesson plan development, session preparation, and assessment of students in lab.
- Identify the need for review or development of training materials related to the simulation lab.
- Identify simulation lab-related training needs of tutors.

Maintenance and Procurement

- Ensure proper stock-keeping and procurement of needed items.
- Oversee regular inventory of stock and equipment.
- Oversee maintenance and replacement as well as purchase of additional equipment.
- Identify and respond to challenges in lab operations.
- Prepare annual operations budget for the lab.
- Develop a long-term procurement plan (3–5 years).

Monitoring and evaluation

- Ensure that all utilization activities and forms are completed by the responsible parties.
- Lead the ongoing process of continuous improvement, based on observed successes and challenges.

Supervision and leadership

- Supervise and lead the Lab Assistant and Lab Volunteer(s).
- Oversee the peer education program.

Qualifications of SLC

Ideally, the SLC should be a midwife tutor in the school who:

- Has several years working experience—both in clinical practice and in teaching
- Has computer skills
- Is a good communicator
- Is a good organizer
- Has experience in training others, and has had instruction in clinical teaching skills

The SLC should be identified prior to initial setup of a new lab and should receive training using a standardized curriculum, for example ModCAL® for Training Skills (Jhpiego, 2010). If the simulation lab is already developed, in-service training should be ongoing and provided as needed.

Reporting/managing structure

The SLC reports to the Principal or Director of the program.

Role of the Simulation Lab Assistant (SLA)

The SLA, along with the SLC, is responsible for the overall maintenance and organization of the lab at all times. More specifically, the SLA has the following responsibilities:

Lab preparation

- Assist with the arrangement of work stations in the simulation lab per specific requests by tutors.
- Ensure that students have appropriate guides and checklists.
- Help direct students to their specific stations/areas.

Lab maintenance

- Maintain manikins and models according to instruction manual.
- Maintain, clean, and care for other lab equipment.
- Ensure that the lab is clean after each session.

Lab safety and security

- Guard against theft and misuse of lab equipment.
- Take needed equipment out from storage and return to store after use.
- Ensure that keys are not lost or given to unauthorized persons.
- Maintain an environment safe from laboratory hazards such as infection, trauma, fires, chemical hazards, and slippery floors.

Facilitate and document use

- Maintain a presence in the lab whenever it is in use (or arrange to have the Lab Coordinator be present).
- Log use of the lab during class sessions and open hours.
- Check out/in equipment to students during open hours.

Supply management

- Keep track of inventory and keep an up-to-date inventory book. Schedule and conduct full inventory checks quarterly.
- Compile lists of required equipment/consumables and of damaged/faulty equipment, and provide lists to the SLC for ordering.
- Ensure well-arranged store with labels as necessary to facilitate easy identification of items.
- Ensure economical use of consumables and replenish stock when necessary.

SLA qualifications

Many Simulation Lab Assistants can be non-midwifery personnel, but it is important that they have a willingness to learn about relevant equipment and skills. Some education programmes use responsible third-year students to fulfill parts of this role. An SLA should also be:

- Organized
- Detail-oriented
- Trustworthy

Training

Done by SLC

Reporting/managing structure

Reports to the SLC

Role of Student Helpers/Assistants

Many schools may find that using senior students helps make the lab economically viable and also enhances learning experiences for both senior students and for their junior peers. Responsible students can take on many of the tasks of the SLA role, and may also serve as proctors and graders for skills sessions, help develop cases, and lead clinical study groups. Student helpers can be appointed as part-time staff and can take on some of the workload from the professional staff. Other remuneration options to consider include privileges such

as extended access to computers or library holdings, choices in clinical placements or scheduling of clinicals. Helpers may also assist the Coordinator or Assistant with maintenance activities. The student helpers may have the following responsibilities:

Maintenance/operations

- Assist the SLA with maintenance activities.
- Proctor and grade skill sessions.

Mentoring

- Plan learning activities for fellow students—in some countries student helpers develop simulation cases.
- Lead a learning station during a classroom period.
- Supervise fellow students and give feedback.
- Provide guidance during open hour sessions.
- Recruit future simulation lab volunteers.

Qualifications

Student helpers should be second- or third-year students who have gained competency in the lab setting and the specific skill(s) being practiced in the simulation lab.

Training

Helpers should be re-oriented to the philosophy/policy and rules of the simulation lab. Additional training will depend on what responsibilities they are carrying out.

Reporting

The student helper may be supervised by SLA or SLC.

Chapter 3. Simulation Lab Layout

3.1 OVERVIEW

This section describes the physical needs for an effective simulation lab for midwifery education. Requirements and considerations for space and layout are described, including storage needs. Inventory lists are referenced and included in the appendices.

3.2 PHYSICAL SPACE AND LAYOUT

Determining the location of a simulation lab requires thoughtful collaboration among the administration, simulation lab staff, and teaching staff. It includes identifying a space or room in the school, assessing it for needed repairs and maintenance, and then equipping the space for teaching and learning. Considerations for the site include the following:

- The simulation lab should be located in a dedicated space that is not used for other purposes (e.g., a classroom).
- Accessibility: The site should be easily accessible to students and tutors (e.g., close to classrooms, open during convenient times).
- Security: The lab should be open during hours when students are not in the classroom. A safe, secure setting for the staff and students is essential. The room must be lockable.
- Environment: Equipment can be stored and used, free from damage from the elements.

The layout of the simulation lab will vary depending on the dimensions and shape of the room being used, the types of storage (e.g., closet or cabinets) and the furniture. In determining the layout of the lab, it is important to keep the following factors in mind:

- The layout should be able to meet a range of learning needs and facilitate the creation of various stations where small groups of four to six students can practice procedures and skills. The number of students per station greatly affects learning; it is therefore important to schedule and manage stations to keep groups at an appropriate size so that all students at a station have adequate opportunity not only to observe but also to practice skills.
- There needs to be sufficient space between beds, trolleys, and storage cabinets for students and instructors to move about safely without disturbing others.
- Items not in use will need to be stored where they can be organized and secure and will not create a tripping hazard.
- If the simulation lab is to be used by other programmes, this will affect needs for consumable and non-consumable supplies and secured storage. (Sharing is recommended for reducing cost, but requires additional coordination with tutors and programmes.)

Considerations for Layout

Flexibility

In general, the layout will need to be flexible to accommodate a variety of needs depending on the skill taught, demonstrated or practiced. Flexibility is increased with:

- Movable models and furniture on wheels or castors are important—this adds to flexibility and avoids the “museum” look.
- Locally available and locally made items are often less expensive and can be ordered to fit specific space needs.
- Lightweight, stackable tables and chairs/stools are inexpensive and easy to move.

- Beds and screens are important to simulate clinical settings. Locally made beds can have drawers added to provide storage space for linens, small equipment, and models.

Learning spaces—stations and group learning

Learning spaces should support the main purpose of the simulation lab: to facilitate teaching, learning, and practice of clinical skills. It is important to maximize the available space so that it can be flexibly used for clinical simulations, for example, having trolleys at each station and using lightweight, stackable chairs or stools and tables. Beds, trolleys, and other furniture set up as stations for small group learning should be arranged so that the instructor and the visual aids are easily seen. Movable furniture can be arranged to accommodate work in small groups and allow the teacher to move from group to group as needed. Small group stations provide space for students to gather to review case studies, watch a video, or use reference materials.

Audiovisual equipment and setup

The video monitor or screen should be large enough so that it can be easily seen and placed in a location that avoids collisions with people and furniture, e.g., wall- or ceiling-mounted or on a rolling stand that can be securely stored when not in use.

Area for resource materials and reference manuals

Storage facilities such as cupboards with glass doors are needed for storage of reference materials and other resource materials, e.g., textbooks, checklists, and manuals. Taking an inventory of what will be needed for reference materials will help determine how much and what kind of storage space is needed. Cupboards, file cabinets, and open shelves are all options. It may be useful to have a combination of open and lockable storage.

Curtains and screens for privacy

Curtains and screens in the simulation lab will help students learn how to use them in the simulated situations and then be able to apply the same knowledge and skills when working with live patients. Single screens or draw screens can be used and will model privacy and confidentiality.

Lighting

The simulation lab should have adequate windows for natural light. Reliable electricity is needed for use of televisions and computers. Enough outlets should be available to prevent overloading of one socket. Power surge protectors are needed to protect electrical equipment in case of power fluctuation. Electrical wiring should be done by an expert. Extra extension cords may be required. Flashlights/torches are important for outages and for direct lighting during examinations.

Fans and air conditioning

The simulation lab needs to be kept cool for comfort as well as for preservation of rubber models. Air conditioners are preferable, but if these cannot be provided, enough fans should be provided to ensure ventilation and comfort of both tutors and students. Without air conditioning, models will break down more rapidly in hot and humid climates.

Infection prevention station

Infection prevention (IP) is one of the most important aspects of good patient care and is also critical for the protection of staff. Infection prevention practices that are taught and reinforced in the simulation lab will be much more likely to continue into the clinical setting. All staff, instructors, and students are required to use good infection prevention practices at all times. A dedicated IP station with running water from a tap or veronica bucket is an integral part of the lab and is critically important for modeling the practices that are expected in the clinical setting.

Examples of lab layout

Example diagrams of two layouts follow. Both diagrams include storage areas, handwashing stations, and furniture that is stackable or on coasters. When planning the layout of a simulation lab, it is very useful to work from a scaled floor plan to determine optimal layouts, particularly when determining how many stations to include and where to locate large or permanent items. Directions for making a scaled floor plan are in **Appendix 2**.

Figure 1. Simulation lab layout: Diagram 1

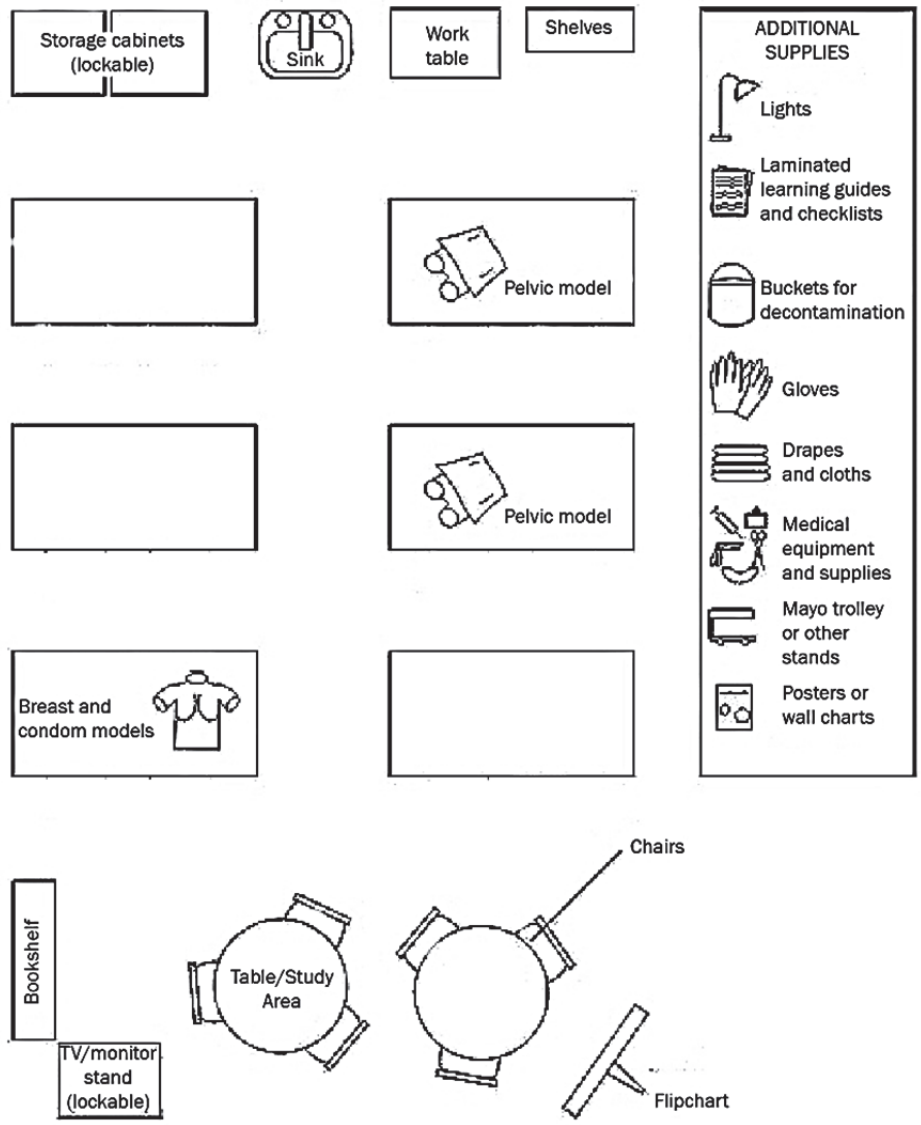
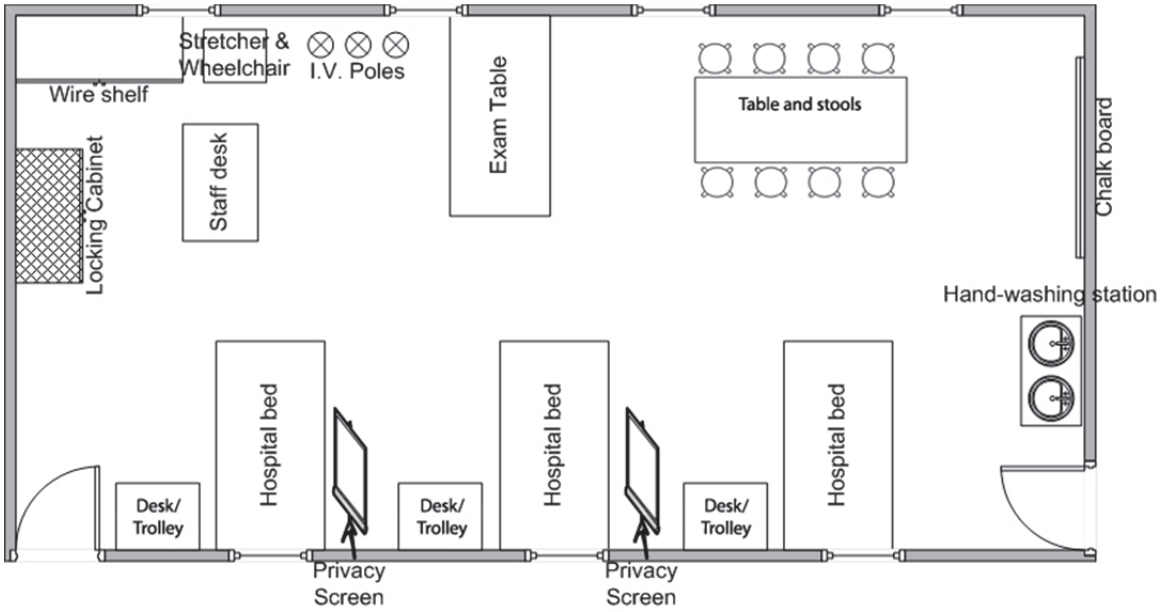


Figure 2. Simulation lab layout: Diagram 2



3.3 STORAGE: SPACE AND EQUIPMENT

A variety of storage space is needed; types and numbers will vary by amount of equipment, size of the simulation lab, and existing storage. The following list includes suggestions for a basic set of storage options:

1. **Closet:** Medical equipment, all plastic bins with medical supplies, etc. Closets and cabinets should be lockable for security; and should include adjustable wire shelving units.
2. **Stackable totes and bins in several sizes.** The largest industrial sized ones are lockable. Storage bins are for supplies of various sizes and can be stacked on the shelves.
    - **Drawers:** Portable sphygmomanometers, stethoscopes, thermometers, etc.
    - **File cabinets:** Learning guides, checklists, case studies, role plays, etc.
    - **Bookshelf or cabinet:** Videos, reference guides, textbooks, other learning materials
3. **Storing equipment**
    - Models need to be stored in their respective bags and neatly arranged and clearly labelled in a cupboard. After use, the models should be packed up in their bags before storing. The models also need to be cleaned from time to time, powdered, and stored. Usually models come with cleaning and maintenance instructions and it is important that these instructions are followed. Models are expensive and will last longer if they are carefully maintained.
    - Storage of sets and instruments: Instruments need to be arranged and stored according to their types or by the system selected by the school—for example, storage by kits or by stations. Clear labelling provides for easy identification, especially by students. This will help students identify them quickly, especially when they are asked to set trays during practice sessions. Storing instruments as kits or sets, for example, an IUD insertion kit or a delivery pack, makes storage, retrieval, and inspection for completeness easier and can save time when setting up stations for specific skills.
    - **Labelling and organizing instruments**: The way instruments are labelled can be an important teaching tool. If instruments are in a glass case, labelling helps the student to identify them and learn the names and uses for each instrument. If instruments are stored in opaque bins and cupboards, a picture of the instrument on the outside serves the same purpose.

Chapter 4. Equipment and Supplies: Inventories and Procurement

4.1 OVERVIEW

This section provides basic guidance for determining what is needed in the simulation lab, a brief discussion of planning for procurement, and advice on selection of anatomic models or manikins, learning materials, tools and equipment, consumables and medical supplies, and a system for tracking inventory.

4.2 INVENTORY LIST

Existing simulation labs have a great variety of equipment from beds and manikins to gauze rolls and tape. No programme has unlimited space or resources, and it is important that the inventory reflect the essential tasks and skills to be taught and that quantities are based on student numbers and student use. Because time is also a precious resource in education programmes, it is important to consider the priority skills that are to be taught when developing an inventory. For example, in a midwifery program, the need for equipment and time to teach family planning, care in the childbearing period, essential newborn care, and life-threatening complications of pregnancy and childbirth would take highest priority. For midwifery education, the International Confederation of Midwives (ICM) Competencies are the basis of tasks and skills the midwife should be able to perform. A list based on these competencies includes necessary equipment and learning resources for each skill (see **Appendix 3**: Standard Equipment Based on ICM Competencies). There are numerous examples of inventory lists for simulation labs, and programmes will need to evaluate them for relevance to their learning needs and environment.

The development of a final inventory list is an important task, and the list should be updated and regularly reviewed by the Core Management Team. It will include both consumable and non-consumable supplies. An inventory list can reflect standards and can be used as an advocacy tool for items that the lab needs but does not have. Recommendations for using the inventory list are under **Tracking Supplies and Equipment** in this chapter.

4.3 PROCUREMENT PLAN

After reviewing an existing or adapted inventory list, plans for procuring materials can be developed. Procurement is guided by immediate and anticipated future needs, and is also highly dependent on existing inventory and cost considerations. A complete procurement process is beyond the scope of this manual. Schools typically must work within a national procurement system and the simulation lab will be expected to function in coordination with established guidelines. There are, however, some planning issues for the simulation lab to consider.

It is important to maintain an ongoing list of items that are expected to be needed, when they will be required, and the anticipated length of time needed to fill an order. Consumables and locally sourced items may have a simple and rapid procurement, but early planning can save resources and avoid problems with supply chains and stock-outs. Expensive, special orders or items from international sources will require a more extensive process and a much longer time line. Because some models and materials are from donors, schools may find it useful to have a detailed list of desired models with source information, model numbers, and any specific requirements. This can save a great deal of time and helps to assure that the most appropriate materials are requested.

4.4 SELECTION OF MODELS, MATERIALS AND SUPPLIES

Locally Made Models

Creativity, imagination, and access to only a small budget have resulted in many innovative simulators. Locally made models are often more cost-effective and sustainable than commercially available models and avoid international procurement issues. **Appendix 4** gives examples of some locally made models and includes directions for making simple models and other items. The following section examines equipment and supplies in greater detail.

Cloth baby, placenta, pelvis

Insertion arm made from utility glove

Anatomic Models/Manikins: Considerations for Selection

The basic models used for teaching midwifery clinical skills and competencies are identified in the list of Standard Equipment Based on ICM Competencies (see **Appendix 3**). There are a number of options for manikins, and programmes may be able to order specific ones for their setting. In general, it is important to consider initial cost when deciding on models, but equally important are the following:

- Flexibility—can the model be used to teach a number of the skills needed or does it have only one purpose? This may not be important for a small model (e.g., the penis model), but for large and expensive models, it is desirable that they be capable of serving multiple purposes.

- Durability—will the model stand up to frequent use by many people in a tropical climate? Does it have specific requirements for temperature settings? Is the model easy to clean and store? Are parts for the model readily available and affordable?
- Size—particularly if space is limited, smaller sized models can be more easily stored. The MamaNatalie©, the Childbirth Simulator, and Madame ZOE models are much smaller and more portable than a life-sized birth manikin.
- Simplicity—in general, the more complex the model the more difficult it is to keep it functional. For example, computerized manikins may break more easily and require specialized technical trouble-shooting and upkeep, as well as a reliable electricity source.
- Are there locally made options? These may be more durable and are usually far less expensive.
- Is it appropriate for a student to simulate a patient? Some skills, e.g., counselling, are more realistic when practiced on a person.

Learning Materials and Physical Supplies

Learning materials include booklets, brochures, laboratory diagnosis manuals, drug reference books, job aids, and wall charts, to name a few. These can be kept in a cabinet or bookshelf. These references should be used ONLY in the simulation lab. Laminated skills checklists can be placed in a binder for students to use during open hours. All learning materials should be labeled with *Property of the (name of school/program)*. Some schools also add *Do not remove from simulation lab*. Whether materials can be checked out, to whom, and for how long will depend on the school's policies. It is important to have materials available to be used during lab hours, but also to ensure that materials are used by those that need them.

General and medical supplies

This category includes a long list of materials from buckets to glucometers, scales to syringes. Some specialized items may have particular storage requirements such as storage away from sunlight, reagents that should not be next to each other, or medications that require a specific temperature range.

Small tools, instruments, and equipment

There are many tools and instruments necessary for teaching and practicing the skills. Because they are small, they can be easily misplaced or placed in a pocket or bag. Items should be organized and stored in plastic bins that are clearly labelled. Some equipment sets include many small items. For example, the MamaNatalie pack has a large number of small and easily misplaced parts. Laminated mini-inventories taped to the container that list the contents for each container helps keep items together.

Medications and drug samples

Medications and drug samples should be kept in protective packaging and stored in clearly labelled plastic containers that keep out moisture.

Consumables

This section is more extensive because acquisition of consumables is a fairly large expenditure that affects the ongoing cost of running and maintaining a simulation lab. Consumable supplies are those that need to be disposed of after one or more uses and will need to be replenished periodically. It is important to be frugal without compromising safety or disrupting the student learning process. As there is generally no exposure to potentially infectious bodily fluids in the lab, there is more opportunity for reuse of consumable supplies as compared to the clinical setting.

In addition to supplies normally used in the clinical setting, some of the simulation lab manikins require use of specific supplies for their maintenance or use. All manikins come with instructions about the type of consumables that should be used on them (e.g., the size of

the catheter that should be used, type of cleaning material, talcum powder). For manikins to function well, these details should be considered when purchasing the consumables.

Table 2. Examples of consumable supplies and their replacement requirements

REGULARLY REPLACED	REPLACED AS NEEDED
Cotton wool	Infusion set
Powder	Crepe bandage
Gauze	Bandages
Plastic tape	Culture swab stick
Non-sterile gloves	Urine collection bags
Sterile gloves	Blood specimen bottles
Long sterile gloves	Feeding tube
Syringes	Suction catheters
Needles	Urinary catheter
Sutures with needles	Face masks
Saline solution	Medication cups
Soap	Latex tourniquets
Antiseptic lotion	Female condoms
Lubricant	CPR manikin airways
Silicone spray	IUDs
Male condoms	Implant training arms or skins

Many of the consumables in the simulation lab can be reused. Some of them rarely need replacements, e.g., catheters. Others need to be replaced more often but only after having been used several times.

It is important to ensure that the students understand that the reuse that is acceptable in simulation lab training is NOT acceptable in the clinical areas because of exposure to potentially infectious body fluids!

In general, consumables can be reused unless:

- They cannot be safely stored again (e.g., needles that are bent and cannot be recapped).
- They are dirty or wet with fluids other than clean water (in which case they should be dried before storage).
- They are no longer in good conditions (e.g., because they have lost shape or are damaged).
- They will damage the materials with which they are stored (e.g., mock blood that has been prepared with water).

Additional ways to save on costs of consumables

In addition to reuse, there are several other ways to reduce the costs of consumables used in simulation labs:

- Sometimes it is possible to buy ***expired items*** because they are not being used on real human beings. Sutures and IUDs are good cost-saving examples, although if gut suture is too old it becomes brittle and breaks easily. There is no harm in using syringes or needles or other consumables past their expiry date, but it is important to clearly note on the boxes that the consumables have expired to prevent their accidental use on humans.
- Practicing gloving can be done using cheaper ***non-sterile gloves*** that have been wrapped like sterile gloves.
- Rather than buying gauze in pre-cut pieces, a roll of gauze can be bought from which the relevant sizes of gauze can be cut.

- Water can be put into antiseptic lotion containers as long as they are clearly labelled "water." On most manikins, it is advised not to use antiseptics as it may adversely affect the material.
- Linens that are regularly washed, dried, well-ironed, and stored in ventilated cupboards will last a long time.
- Empty bottles representing various medications, and expired or simulated reagent strips (e.g., strips of paper) can be used.

4.5 INVENTORIES: TRACKING SUPPLIES AND EQUIPMENT

It is important to establish a systematic way to categorize and track materials. Good management of supplies saves money and avoids running out of supplies as well as over-ordering. Tracking may be alphabetical, by cost, by category, or by station. If supplies are stored at individual stations, a form that is organized to reflect this will facilitate tracking. Computerized forms are more easily updated. The materials tracking form can be used for the inventory report with any additional explanatory notes. A tracking system should include the following:

- Form or forms to track all materials and equipment
- System to replenish both consumable and non-consumable supplies
- Method to track minor or major repairs to equipment

Information about readily available materials and Sample Materials Tracking Forms are in **Appendix 5**.

The tools and equipment list (**Appendix 3**) notes the specific equipment needed to teach skills based on the ICM midwifery competencies. The list includes manikins, models, and learning materials needed for specific skills. Each institution will need to adapt the amounts and numbers needed to fit the size of the class. Equipment can be placed in categories that include the following:

- Anatomic models or manikins
- Learning materials: exercises, videos, learning packages, reference materials
- General and medical supplies
- Consumables

Performing an Inventory of Consumable Supplies

Purpose

The main purpose of performing the inventory is to allow the simulation lab staff to monitor the use of supplies so that supplies can be reordered and are available for use in the lab when they are needed. School administrators and other stakeholders will also be interested in using this information to better understand how the simulation labs are being used and what additional support schools might need for their labs.

Person responsible

The weekly inventory of consumable supplies should be performed by the Simulation Lab Assistant, with assistance from the Simulation Lab Coordinator if necessary.

Timing

The inventory is performed at the end of each school week.

The form

An Example of an Inventory Report Form for Consumable Supplies is included in **Appendix 6**. The Materials Tracking Forms (**Appendix 5**) can also be used as a report form.

Staff review of the data

The Simulation Lab Coordinator and Simulation Lab Assistant should review the data compiled in the inventory report, specifically noting any of the following:

- Areas of unexpected decrease in inventory: Identify the reason for the decrease; e.g., waste, inappropriate use, skills taught that require more of a consumable than anticipated.
- Areas of successful conservation: Identify areas where efforts for conservation have been successful and there is the potential to learn from the successful strategies and apply them to other areas.
- Areas of need for improved conservation: Identify supplies that are being used more quickly than what is sustainable. Identify any strategies that can be used to improve conservation.
- Items not used: Identify items that are not being used at all. Do these items needed to be kept in stock at all? Can they be phased out from use in the lab?
- Restocking: Identify supplies that need replenishing. Follow institutional guidelines for approval of order requests.

Reordering supplies

After performing the inventory annually or as needed throughout the year, the lab staff may identify supplies or equipment that need to be ordered.

Each institution will have specific guidelines and steps for procurement, whether from local or national sources or through donors. Schools may find that having a separate procurement manual with forms, updated vendor contacts, and government-required information makes reordering supplies a smoother process.

Chapter 5. Operations: Managing the Simulation Lab

5.1 OVERVIEW

This section includes several core operations areas of the simulation lab. All are critical to the success of the lab and include:

- Policies that pertain to all users
- Physical plant security
- Personnel and staffing

5.2 SIMULATION LAB POLICIES

All lab users—staff, instructors, students, and visitors—must be oriented to and follow all lab policies. The rules should be carefully considered to ensure that all users of the lab will be able to enter the lab and participate in teaching and learning without delays. Simulation labs are designed to reflect the clinical environment as closely as possible, and lab users' behaviour should reflect good clinical behaviour. Staff, teachers, and students are expected to adhere to all policies.

A list of policies could include open hours, checking out/checking in equipment, room requests, etc. A list of simulation lab policies is not static and will inevitably change as it becomes apparent that a new policy is needed or an old one is ready to be updated or deleted. Annual review of policy documents by the CMT helps maintain current documents needed for smooth operation.

The following is an example of a basic document of expected behaviour. Institutions typically find it valuable to have some form of behaviour code or guideline. As with all guidelines in this manual, schools will want to adapt it for their own use and needs (See **Appendix 6** for a sample of a Simulation Lab Code of Behaviour that can be used as a template.)

Clinical Simulation Lab Code of Behaviour

All users of the Clinical Simulation Laboratory must sign and follow the Clinical Simulation Lab Code of Behaviour (faculty, part time clinical teachers and students)

1. In accordance with humanistic education, all manikins and models are to be treated with respect as though they are real clients. Models and manikins are to be handled gently and carefully, draped appropriately when used, and covered when not in use.
2. Students are to dress for simulations lab as if attending the clinical setting. Name badges and uniform policies are enforced.
3. Tutors are responsible for supervising all students brought to the lab for tutor-led sessions.
4. Universal precautions are to be followed at all times as are all safety guidelines used in the clinical setting. Sharps and syringes are to be disposed of in appropriate containers. Anyone sustaining an injury must report immediately to the Simulation Lab Coordinator.
5. If the programme permits students to check out equipment from the simulation lab, all procedures for signing out and returning equipment are to be followed. Failure to responsibly adhere to the policy may mean loss of check-out privileges. *Note: It is critical to have a clear policy that includes details about which equipment may be checked out, for how long, and responsibility for returning it.*
6. Supervision by faculty or staff (see Open Hours) is required for practicing skills.
7. Students may be digitally recorded during scenarios. Viewing of videos recorded during training are only permitted with faculty members. The videos are the property of the programme and students may not possess simulations lab videos or recordings.
8. Coats, backpacks, and other personal belongings are not to be brought to the simulation lab.
9. Personal electronic devices, including cell phones, are not to be used in the simulation lab.
10. Personal belongings (e.g., papers, pens, stethoscopes, pen lights, etc.) are to be removed after a simulation lab session.
11. Food and drinks are not permitted in the labs.

5.3 SECURITY

The purpose of this section is to provide general guidelines for simulation lab staff on securing the equipment and the room and outlines procedures that should be put into place to ensure security while also providing access to learners. Guidelines on locking up and storing equipment should be clear, available in written form, and shared with all who regularly use the lab. Security is an important area of focus for the Core Management Team. Each section below includes areas that should be considered in the development of simulation lab security policies. Every section is important, but schools may have a variety of approaches to implementation of a particular aspect of security.

Introduction

Simulation labs have many materials that are expensive and fragile, and may be difficult to replace. Security of the items and the area where they are stored and used is important. However, it is equally important not to become so worried about protecting the materials and equipment that it becomes difficult for the students to use them. A simulation lab can easily become a useless museum if it is inaccessible to students. If access is difficult or extremely limited, those items for learning will be rarely used and will fail to be of maximum benefit to students, despite the heavy financial investment in them. *Balancing the needs for security and for easy accessibility is one of the most important responsibilities of the Coordinator and the Assistant.*

Responsibility for Security of the Simulation Lab Training Area When It Is Open

The following is a sample guideline for simulation lab security. As with other sample guidelines and templates included, institutions will need to adapt them to their own needs.

The **Simulation Lab Assistant** has the primary responsibility for the day-to-day security of the simulation lab training area as long as it is open. The **Simulation Lab Coordinator** may also perform these duties when the Assistant is not available. This responsibility for security includes, but is not limited to, the following:

- Being physically present in the lab whenever it is opened
- Ensuring that any person entering the lab training area leaves bags and coats behind in a designated space and that food and drinks are not brought into the area
- Registering all sets of training equipment and maintaining up-to-date files of equipment (see **Appendix 6** for a Registration of Equipment Form)
- Checking out: Register to whom, date, any comments on its condition, registration form signed by the person to whom it is issued
- Checking in: Check for completeness and any damage, registration form signed in by person to whom it was issued
- Ensuring that students and staff entering the simulation lab training area register in the attendance book—both for supervised and open hours sessions

Reporting pathways need to be very clear. For example, the Assistant reports to the Coordinator. Rules and regulations regarding the activities mentioned under the following two bullets need to be clear. The Assistant should be allowed to do the following only after explicit instruction by the Coordinator (or by extension her/his supervisor, such as the Principal):

- Removal of simulation lab equipment from the lab training area
- Handing over of responsibilities pertaining to security from the Assistant to other people (e.g., lecturer or designated student volunteer)

In principle, it is only the staff and students of the departments using simulation lab methodology in their training curriculum who are to be allowed to practice in the lab

training area. This is based on the rationale that they are trained in lab methodology and familiar with the operation of the equipment, manikins, and other training models. Any other groups who have been given permission to use the lab but who are not familiar with its contents and operations should be accompanied by a trained person to prevent misuse and potential damage of expensive equipment.

School maintenance staff will need to be provided specific access to the lab from time to time. It is important to have a clear understanding about whether or not supervision of maintenance is required.

Security of the Simulation Lab Training Area: General Locking

The main entrance door to the lab should be locked whenever the lab is not in use and unlocked during training sessions. Though this is ideally done by the Assistant or the Coordinator (if the former is not available), schools will need to formulate appropriate written policies about where the keys are stored and who can check them out, and a documentation procedure.

The doors of locked storage closets and storage cupboards are to be opened only to retrieve materials and should otherwise remain locked. Some schools make the responsibility to retrieve and return materials solely that of the Assistant and the Coordinator. It is important that the simulation lab has clear documentation of who is responsible for materials, how this duty is assigned, and a record of use.

Key security: It is critical to have a written policy that describes key security. Considerations for key security include designating who has access to the keys, who is responsible for keys during the working hours, and how and by whom keys are secured at night or during off hours. An example of key security would be one in which only the Assistant and the Coordinator are allowed to carry keys of the simulation lab during working hours. Upon leaving the workplace in the evening, keys are handed in to a safe place at the general collection point for keys in the school.

School policy would indicate who has access to the lab keys and how and by whom access is granted. Access to the lab is important, and a clear process for returning the keys after working hours is needed in order to extend the time available for practice. A sign-out/sign-in system for the keys will facilitate this process. Regular Core Management Team meetings will improve coordination and help ensure appropriate access to the facilities.

Additional Security Measures

If the storage area has windows, they should be reinforced with bars. The other areas of lab should be assessed for additional security needs. Emergency exits from the simulation lab should be constructed in a way that they are easy to open from inside but not from outside.

The watchman should be aware that the simulation lab area contains expensive equipment as well as many small medical instruments that can be easily picked up and stolen, and therefore extra care and vigilance are required when keeping watch.

Secure Storing, Retrieving, Returning Equipment

Bigger items may be left in the training area as they are difficult to carry in and out of storage every time they are required. This pertains to beds, beddings, examination couches, trolleys, and full-body manikins.

All medical instruments and related equipment (dressing towels, gowns, etc.) and/or a limited number of consumables sufficient for a few sessions (gauze, gloves) can be stored in designated bins and boxes on the shelving in the lab room. Some labs use designated boxes to contain sets of instruments and equipment as well as some consumables needed for

specific skills such as normal delivery, laceration repair, and IUD insertion. This eases retrieving, issuing, and returning as well as inspection for missing or damaged items.

The simulation lab assistant or designated student assistant is responsible for issuing training sets and signing for their return, noting completeness and absence of damage as described earlier. Any missing items should be reported to the Coordinator immediately. Damaged items should be listed and reported to the Coordinator at regular intervals (e.g., once monthly) unless damage hampers conducting of the sessions, in which case it should also be reported immediately.

Additional consumables should be stored in separate cupboards, shelves, or drawers, so that sets can be refilled from the consumable storage. The Assistant should keep an up-to-date inventory of consumables in stock and those being used. The Coordinator should check with the Assistant regularly regarding ordering as per the school procurement system.

Responding to Missing Items/Theft

If items are missing when sets of training materials are returned or if the Assistant detects any items missing from either the store or the training area, he/she should report it to the Coordinator immediately.

In such a case, the Coordinator should investigate and determine whether the missing items were misplaced or stolen. If items are not retrieved or they are retrieved but malice is suspected, the Coordinator should always report to the head of the training institution. If the Assistant detects clear burglary or an attempted break-in, the Principal should be notified immediately.

5.4 STAFFING AND SCHEDULING

Scheduling Guidelines

This section describes responsibilities of staff for the preparation, facilitation, and clean-up when the simulation lab is used for regular training sessions. It is important to understand that class time in the lab requires a substantial amount of organization and preparation. Though the specifics may vary by institution, it is essential to have agreement and documentation that include a central system for requesting and confirming lab time schedules, agreed-on preparation of materials, registration of users, and a system for checking materials in and out and post-session clean-up. All completed forms should be placed in a centralized binder accessible to both the Coordinator and the Assistant.

Schedule Communication

One of the key responsibilities of simulation lab staff is to coordinate and communicate about the schedule with each other and to the tutors and staff. A lab schedule that includes both the tutor reservations and the open hours should be displayed in an area that both tutors and students can view. It is important that this schedule be kept up-to-date and that tutors and students be aware of its presence. Scheduling issues and potential conflicts can be discussed in regular CMT meetings.

Reservations of Simulation Lab by Faculty

Tutors may reserve the lab to use for instruction during a regularly scheduled class or to host additional skills training classes for students outside of class. For either activity, the tutor should fill out a Simulation Lab Reservation Form. Schools may wish to have a separate form for courses (Simulation Lab Course Reservation Request Form) and for equipment requests (Simulation Lab Reservation and Equipment Request Form). Both forms are in **Appendix 6**.

Before the term begins

1. At the beginning of each term, the teaching staff, in consultation with the Principal, identifies the skills from the curricula that need to be covered that term, the time that is set aside for teaching and learning those skills, and the tutors who are responsible for implementation. In general, this step should be like planning any other learning activity in the institution. If a tutor anticipates teaching new skills or procedures that may involve additional equipment, the Coordinator should be notified. After the initial planning meeting at the beginning of the term, tutors can still decide to reserve the lab for teaching skills, but it will be subject to availability. The CMT should review scheduling plans well before the term begins.
2. The tutors should reserve the lab for the period time needed for their class. It is important to keep in mind that large classes will need to be broken up into smaller groups, so multiple sessions may be needed. The Simulation Lab Reservation Form should be completed for the times desired, and it should be submitted to the Coordinator. Reservation start times should also account for the time the tutor needs for setting up stations. A sample schedule that was used for a large class is in **Appendix 7**.
3. The Coordinator confirms with the tutor whether the times requested were successfully reserved in the tutor's name or if there was a time conflict. The tutor should receive written confirmation of the dates and times that have been reserved in the tutor's name. The public simulation lab calendar should be updated as well as any other records of lab scheduling.

During the term

1. At least one week prior to the reserved time in the simulation lab, the tutor should submit a Simulation Lab Reservation and Equipment Request Form to the SLC for the class period in the simulation lab (see **Appendix 6**). The SLA should check on the availability of the equipment and confirm the availability. If the requested supplies or equipment are not available, the SLC and the tutor should be informed. If it is possible to procure more of a needed supply prior to the date needed, the SLC is responsible for doing so.
2. In a weekly meeting, the SLC should review with the SLA all of the classes that will take place in the simulation lab in the upcoming week.
3. Prior to the reservation time, the SLA should take out all the requested equipment and supplies from the stores. Manikins and models should be prepared to be used for the skills specified by the tutor on the Simulation Lab Reservation and Equipment Request Form. For example, if urinary catheterization is being practiced, the bladder reservoir of the Susie/Simon manikin should be filled with fluid. The tutor will arrange the equipment into stations, and the SLA may assist the tutor in this process.

During the session

Registration and signing in of classes: Registration of staff and students present for training sessions serves several purposes:

- Security, in the event that some items get lost or damaged during a certain session
- Class attendance confirmation where attendance of sessions is obligatory
- Documentation of simulation lab use for evaluation purposes:

    1. Upon arrival to the simulation lab, the tutor should sign in on the Simulation Lab Use Log: Scheduled Sessions Form (see **Appendix 6**). Students should sign in on the Simulation Lab Use Log: Student Sign-In for Scheduled Sessions form (see **Appendix 6**). The SLA is responsible for keeping the use log and the registration sheets. The tutor may view the registration sheet or make a photocopy, but the original should stay with the simulation lab records.

2. At the end of the tutor's reservation period, the tutor should sign out on the Simulation Lab Use Log: Scheduled Sessions form. The SLA or SLC should initial the use log after all equipment is accounted for. If any items have been damaged or are missing, a description of what has happened should be recorded. (See Missing/ Damaged Item Report Form in **Appendix 6**.)

Clean-Up of the Area after Sessions

Upon completion of a class session, it is the responsibility of the tutor and the students to ensure that they leave the lab as they found it, so that another group that enters for training can start without a problem. This includes separating the consumables that can be reused, removing sharp waste materials in designated boxes, and reorganizing the trolley, manikin, or other equipment for a new session. The tutor should inform the SLA if any items were missing that need to be added for the next group or if there were problems with the materials during the session. It is the responsibility of the SLA to prepare the consumables for reuse where possible and to replenish as needed. The SLA should also clean and pack the manikins as indicated in their care and maintenance manuals before storing them. The SLA is to maintain general cleanliness of the area with support from the cleaning staff.

Facilitating Open Hours in the Simulation Lab

Overview

This section describes the responsibilities of the staff for the preparation, facilitation, and clean-up when the simulation lab is used for independent learning (open hours). Procedures are reviewed regarding open hours, equipment check-out and check-in, staff backup, clean-up, and closing.

The main purpose of the lab open hours is to allow students to have an opportunity to practice independently outside of the relatively short time in class. People learn at different rates and some students will need more practice than others to attain competence in a simulated environment prior to starting live clinical rotations. In addition to the independent learning, open hours can also be used by teachers who want to spend some extra time with students who need help acquiring a certain skill or who missed their regular session and will have to catch up.

Setting open hours

At the beginning of each term, after the times for classes have been determined, the SLC and the SLA should determine the lab open hours, which are the times that students can use the simulation lab for independent practice.

Issues of staffing and student need and availability are the main considerations for open hours. When all potential users are either in tutor-led theory classes or in the clinical training areas, there is no need for the simulation lab to be open. Students like extra practice time during the term and during the times that practical exams are approaching. Open times for the lab should be set in relation to:

- Time for independent learning within the scheduled roster
- Hours before or after students finish classes for the day
- Hours after students have come back from the clinical area
- During sessions and when approaching exams

Opening and closing the simulation lab training area

Staffing of the lab must be considered. The SLA should be able to carry out her/his duties within a standard number of working hours, and these working hours also include time for both teacher-led and scheduled open hours. In many instances, particularly if morning hours are full with teacher-led activities, open hours for the simulation lab are best organized

towards the end of the day and on Saturdays. The SLA or SLC is to be present and doors unlocked during open hours for independent learning. Staff presence helps ensure that materials are properly checked out, correctly used, cleaned and stored after use, and rechecking by a staff member.

When a well-organized student assistant/student helper system is in place, certain students could be given the responsibility of accessing and locking the simulation lab training area. This removes the need for the SLA to be continuously present and can extend the training hours for independent learning. The student assistant should collect and return the keys from a designated office and sign for them.

Student assistants can also lead or proctor learning sessions as peer educators. This requires knowledge of the use and operation of simulation lab equipment as well as some training in peer learning. If student assistants are to proctor Objective Structured Clinical Examination (OSCE) sessions, they should also have training in observation of clinical practice.

Each week, there should be opportunities for students to practice in the lab when they need to (similar to using the library or the computer lab). If staff constraints are serious, open hours could be limited to a reasonable number per week during hours suitable for the students (after lessons, on weekends) and additional open hours provided when examinations are approaching. A rough guide on a minimum reasonable number of open hours per week would be 8–10 hours, although schools with larger class sizes may need more time, and a very small school might need less. On days of open hours, the SLA should be available from 30 minutes before the open hour time until 30 minutes after. Open hours should be at least for 2 consecutive hours. To fit in with the students' schedule, specifically when minimizing opening hours, the lab could open about 15 minutes after the last class session.

Table 3. Example of minimum open-hour schedule (assuming classes finish at 4:00 pm, total 10 hours)

DAY	OPEN HOURS
Tuesday	4:15 p.m.–6:15 p.m.
Wednesday	4:15 p.m.–6:15 p.m.
Thursday	4:15 p.m.–6:15 p.m.
Saturday	8:30 a.m.–12:30 p.m.

If students wish to practice outside the scheduled hours, they should ask the SLC for such an arrangement. The SLC will then discuss and make arrangements with the SLA. If possible, the request will be honoured.

If students wish to have additional guided training sessions, they should ask the SLC for such an arrangement. The SLC will then discuss with the relevant tutors and make arrangements with them and the SLA. If possible, the request will be honoured. Student assistants can help with guided sessions as peer tutors.

Equipment use in open hours equipment use—checking out and checking in

Open hours can be "drop-in" and can also be for specific guided learning/practice sessions, and both can reasonably occur simultaneously. The student checking out the equipment is responsible for ensuring that all materials are cleaned and go back in training sets or storage units in an organized way. The simulation lab staff member checks the materials for missing items and damage. If there are any problems with the equipment, the responsible student should notify the simulation lab staff on duty. If a tutor wants to use open hours to spend extra time with students on training a skill or if a session was missed and is to be made up, the same regulations apply for checking out and checking in equipment. A sample check in/check-out form (Simulation Lab Open Lab Log) is included in **Appendix 6**.

Providing support to students

Independent student training sessions are not guided by tutors. If questions or issues arise students should be encouraged to share them in class as they are probably important learning points for others as well. The main contact person for students during open sessions is the SLA who can help with practical issues—supplying additional consumables, explaining how to store the manikins, signing out and checking in materials. Depending on whether the SLA is a qualified health worker, she or he may be able to assist in issues pertaining to the actual procedure. The guiding principle should be that students practice among themselves and request assistance only on specific issues and not for the whole session. It is useful to have laminated sets of learning guides and checklists available in the resource area of the lab.

Clean-up of the area after sessions

Upon completion of an independent training session, it is the responsibility of the students to ensure that they leave the lab as they found it. This includes separating the reusable consumables, removing sharp waste materials in designated boxes, and reorganizing the trolley, manikin, or other equipment for a new session. The responsible student should inform the SLA if there is any item missing that needs to be added or if there was any problem with the materials during the session.

It is the responsibility of the SLA to prepare the consumables for reuse, but students should be involved in this as well as in helping to maintain the general cleanliness of the area. The students could assist the SLA in cleaning and maintaining the manikins, but it remains the responsibility of the SLA to ensure that manikins and models are packed and stored appropriately.

Chapter 6. Safety in the Simulation Lab

6.1 OVERVIEW

This section addresses safety in the simulation lab. The importance of injury prevention is emphasized for student and staff safety as well as to reinforce good clinical practice. Responses to specific injuries are summarized by category.

6.2 PREVENTIVE MEASURES

Prevention is the first major component in ensuring safety for both students and instructors in the simulation lab. Although there are numerous potential hazards, this section will address safety with sharps, storage of chemicals, prevention of falls, body mechanics, and safe use of electronics. The practice of good safety techniques is important not only for protecting the safety of students while they are in the laboratory but also for teaching and reinforcing practices that will keep them safe in the clinical setting.

Safety with Sharps

In order to prevent and minimize injury to students and staff, special attention is needed when they are handling or disposing of sharps in the lab. The sharps that are used in the simulation laboratory include syringes with needles, intravenous catheter needles, scalpels, phlebotomy needles, and finger-stick lancets.

General rules for preventing sharps injuries

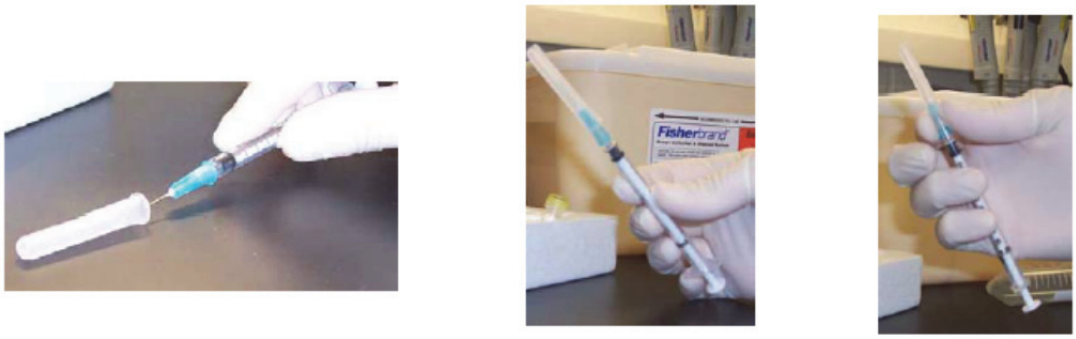
- Instructors and students must wear closed-toe shoes in the simulation lab.
- Avoid using needles whenever possible.
- Do not bend, break, or otherwise manipulate needles by hand.
- **Never** discard sharps into regular trash.
- Use care and caution when cleaning up after procedures that require the use of syringes and needles.
- Do not overfill sharps containers. Close completely when they are three-quarters full.
- Although **recapping needles is not recommended in the lab**, there are times at which it must be done. Teach students how to safely recap needles using the one-handed technique.
- Locate sharps containers in areas in which needles are commonly used. Make containers easily accessible.
- Dispose of needles/syringes **immediately** after percutaneous exposure.
- Give verbal announcements when passing sharps.
- Avoiding hand-to-hand passage of sharp instruments by using a basin or neutral zone.

"One-handed scoop" recapping method

Avoid recapping needles, but when it's necessary, the "one-handed scoop" method can help reduce the risk of a finger stick.

- Place the cap on the bench top and hold the syringe in one hand.
- Keep the other hand by your side.
- Slide the needle into the cap, then lift it up and snap it on securely using only one hand.

Figure 3. One-handed needle recapping method



Sharps containers

The simulation lab staff are responsible for placing sharps containers in the lab. Instructions on how to make a sharps container are in **Appendix 4**. In the creation and placement of sharps containers, the following requirements need to be met:

1. Functionality: Containers should remain functional during their entire usage (i.e., they should be durable, closable, leak-proof on the sides and bottom, and puncture-resistant).
2. Accessibility: Containers should be accessible to students during all procedures so they do not have to carry the sharp across the room. This requires enough sharps disposal containers to be able to have one at each station where a student is practicing a procedure (recommended quantity is between five and seven). They should also be placed at a height where students do not need to bend down or reach up in order to dispose of the sharp.
3. Visibility: The following should be plainly visible to students and staff: the container, the degree to which it is full, and the proper warning labels.

Disposing of sharps after container is full

If possible, establish a partnership with the nearest hospital or clinic that has a system of needle disposal. If they are willing, dispose of your needles through their system.

Chemical Safety

All chemicals should be clearly labelled and carefully stored according to their specific requirements (away from light, temperature requirements, type of container). Instruction sheets that come with chemicals should be kept in a well-labelled and accessible binder. If any chemical is a simulated chemical, this fact should be clearly marked as well. There is no eating or drinking allowed in the laboratory. Nothing should be ingested by or injected into students or any other person. All fluids intended for practice of injections or intravenous therapy should not be used on human subjects.

Falls

Slips and trips are generally caused by a lack of good housekeeping and inadequate maintenance of walking and working surfaces. The simulation lab should be kept clean and orderly. All passages should be clearly visible and uncluttered. Potential hazards include items in walkways, electrical cords on the floor, and fluids spilled on the ground. Simulation lab staff should pay attention to these types of potential sources of falls and remove the hazards.

Body Mechanics

Using good body mechanics techniques is important for both the simulation lab staff and the students who use the facility. Improper body mechanics when lifting, reaching, or turning can causes muscle strains and/or back pain. Lab staff should become aware of proper body mechanics and also remind students or instructors to use safe body mechanics as well. Good body mechanics practiced in the simulation setting are more likely also to be used in clinical sites.

Lifting

- Use the stronger leg muscles for lifting.
- Bend at the knees and hips; keep your back straight.
- Lift straight upward, in one smooth motion.

Reaching

- Stand directly in front of and close to the object.
- Avoid twisting or stretching.
- Use a stool or ladder for high objects.
- Maintain a good balance and a firm base of support.
- Before moving the object, be sure that it is not too large or too heavy.

Pivoting

- Place one foot slightly ahead of the other.
- Turn both feet at the same time, pivoting on the heel of one foot and the toe of the other.
- Maintain a good centre of gravity while holding or carrying the object.

Avoiding stooping

- Squat (bending at the hips and knees).
- Avoid stooping (bending at the waist).
- Use your leg muscles to return to an upright position.

General considerations for performing physical tasks

- It is easier to pull, push, or roll an object than it is to lift it.
- Movements should be smooth and coordinated rather than jerky.
- Less energy or force is required to keep an object moving than it is to start and stop it.
- Use the arm and leg muscles as much as possible, and the back muscles as little as possible.
- Keep the work as close as possible to your body. It puts less of a strain on your back, legs, and arms.
- Rock backward or forward on your feet to use your body weight as a pushing or pulling force.
- Keep the work at a comfortable height to avoid excessive bending at the waist.

Electronics

Unsafe use of electronics can present a risk for electrical fire or electric shock. The following tips are intended to reduce these risks:

- Inspect electrical equipment before use to be sure insulation is in good condition.
- Check that plugs have a good, tight connection.
- Never bend a three-pronged plug or force it into a two-pronged outlet.
- Be sure equipment doesn't spark or get hot enough to ignite the flammables.
- Don't use cords to raise or lower equipment.
- Don't fasten cords with staples, nails, or anything that could damage insulation.

- Prevent damage by untangling cords.
- Do not run extension cords across doorways or under carpets.
- Replace any or all faceplates that may be cracked or damaged to avoid accidentally touching a plug to a live portion of the receptacle when plugging in an appliance.
- Minimize the potential for water or chemical spills on or near electrical equipment.

6.3 RESPONDING TO INJURY

Needlestick

- Provide immediate first aid. Wash the site of the needlestick with soap and water. There is no scientific evidence showing that antiseptics or squeezing the wound reduces the risk of transmission of a bloodborne pathogen. Do not use caustic agents such as bleach.
- ANY needlestick must be reported immediately to the Coordinator and Supervisor/ Instructor.
- If there is any possibility, even a small one, of exposure to blood/body fluids, then the national protocol must be started immediately with testing, offering post-exposure prophylaxis (PEP) per the national protocol.
- Ensure proper needle disposal.
- Document the event, including the date, and the circumstances of the needlestick using the school protocol.

Laceration

1. *Stop the bleeding*. Minor cuts and scrapes usually stop bleeding on their own. If they don't, apply gentle pressure with a clean cloth or bandage. Hold the pressure continuously for 20 to 30 minutes and if possible elevate the wound. Don't keep checking to see if the bleeding has stopped because this may damage or dislodge the clot that is forming and cause bleeding to resume. If blood spurts or continues flowing after continuous pressure, seek medical assistance.
2. *Clean the wound*. Rinse out the wound with clear water. Soap can irritate the wound, so try to keep it out of the actual wound. If dirt or debris remains in the wound after washing, use tweezers cleaned with alcohol to remove the particles. If debris still remains, refer for medical care. Thorough cleaning reduces the risk of infection and tetanus. To clean the area around the wound, use soap and a washcloth. There is no need to use hydrogen peroxide, iodine, or an iodine-containing cleanser.
3. *Cover the wound*. Bandages can help keep the wound clean and keep harmful bacteria out. After the wound has healed enough to make infection unlikely, exposure to the air speeds wound healing.
4. *Suturing for deep wounds*. A wound that is more than 6 millimeters deep or is gaping or jagged-edged and has fat or muscle protruding usually requires sutures. Adhesive strips may hold a minor cut together, but if the wound cannot be closed easily, see a doctor as soon as possible. Proper closure within a few hours reduces the risk of infection.

Electric Burn

- *Look first. Don't touch*. The person may still be in contact with the electrical source. Touching the person may pass the current through you.
- *Turn off the source of electricity if possible*. If not, move the source away from both you and the injured person using a dry, non-conducting object made of cardboard, plastic, or wood.
- *Check for signs of circulation*. If absent, begin cardiopulmonary resuscitation (CPR) immediately.

- *Prevent shock.* Lay the person down with the head slightly lower than the trunk, if possible, and the legs elevated.
- *Cover the affected areas.* If the person is breathing, cover any burned areas with a sterile gauze bandage, if available, or a clean cloth. Do not use a blanket or towel, as loose fibers can stick to the burns.

Eye Injuries

Specks in the eye

- Do not rub the eye.
- Flush the eye with large amounts of water.
- See a doctor if the speck does not wash out or if pain or redness continues.

Cuts, punctures, and foreign objects in the eye

- Do not wash out the eye.
- Do not try to remove a foreign object stuck in the eye.
- Seek immediate medical attention.

Chemical burns

- Immediately flush the eye with water or any drinkable liquid. Open the eye as wide as possible. Continue flushing for at least 15 minutes. For caustic or basic solutions, continue flushing while on the way to medical care.

Blows to the eye

- Apply a cold compress without pressure, or tape crushed ice in a plastic bag to the forehead, and allow it to rest gently on the injured eye.
- Seek immediate medical attention if pain continues, if vision is reduced, or if blood or discoloration appears in the eye.

Chapter 7. Maintenance

7.1 OVERVIEW

This chapter reviews maintenance activities in the simulation lab. Careful maintenance of equipment is important to ensuring that it lasts as long as possible.

7.2. SCHEDULING MAINTENANCE ACTIVITIES

The simulation lab staff will have the main responsibility for seeing that routine maintenance activities are scheduled and performed.

Though activities will vary depending on the equipment, items used, and lab schedule, there are some basic common needs. An Example Overview Schedule of All Maintenance Activities is in **Appendix 8**. In general, important items to include in a maintenance schedule are tasks, responsible person(s), and the frequency of the task.

7.3 INSTRUCTIONS FOR CLEANING AND MAINTENANCE

General Guidelines Relevant to Most Manikins and Models

- Handle manikins/models with care as if they were real human beings.
- Most manikins/models can be washed with mild soap and normal water to remove soil and grime.
- Never use ink on the manikins/models. Pen marks are not removable.
- Never wrap manikins/models with newspapers or other printed materials. This will stain the manikins/models.
- Never use iodine or iodine substitutes on the manikins/models. These will stain the manikins/models.
- Avoid exposing manikins to high temperatures or direct sunlight.
- Store the items in a cool area in the box or cases provided. Do not stack heavy materials on top of the box/case.
- Check the manufacturers' instruction manuals for detailed instructions for care and use. A notebook of instruction manuals for equipment should be available in the lab.

Removing Lubricants after Use

Susie/Simon, gynecological model

It is important to note that lubricants should be applied when using instruments with some models, including the labor progress model.

- After use, remove any trace of the lubricant.
- Water and mild soap may be used to wipe the surface.
- Make sure that the model has dried completely before putting it into a storage case.
- *NOTE: Petroleum-based lubricants should NEVER be used because they cause the materials to break down.*

Cleaning the Surface

MamaNatalie© model

Textile parts: light cleaning

- Use a soft cloth soaked in soapy water to clean all textile parts of MamaNatalie.
- Rinse in clean water.

- Hang to dry.
- *NOTE: Do not hang MamaNatalie to dry in direct sunlight.*

For a more thorough cleaning:

- Soak the MamaNatalie Stomach Skin in water for an hour (soaking the neoprene in water will dissolve salt and chemical build-up in the material).
- Hang to dry, avoiding direct sunlight.

Hard parts: Use a soft cloth soaked in soapy water to wipe off dirt.

NeoNatalie© model

- Clean the simulator's exterior with a soft cloth wet in soapy water.
- Wipe dry with a clean cloth or paper towel.

Susie/Simon, Gynecological Simulator, Birthing Simulator, Venatech Trainer

- After each day of use, wipe the surface of the manikin or model to remove any normal soiling or substance from procedures.
- The surfaces may be cleaned with a mild detergent, or with soap and water. Use a soft cloth or paper towels to wipe the surfaces.
- Do not clean with harsh abrasives.
- After cleaning, dry thoroughly.
- On surfaces that simulate the texture of skin, you may dust talcum powder after drying to extend the lifespan of the product.

Dilation/Effacement Simulator, Breast Exam Simulator, CPR models

It is important to review the cleaning and storage instructions for each model**.** For example, some rubber models need powdering.

- When needed and at least once a term, wipe the surface of the models to remove any normal soiling or substance from procedures.
- The surfaces may be cleaned with a mild detergent, or with soap and water. Use a soft cloth or paper towels to wipe the surfaces.
- Do not clean with harsh abrasives.
- After cleaning, dry thoroughly.

Empty and Dry Fluid Reservoirs

MamaNatalie

- Do not store *MamaNatalie* with blood in the Blood Tank over a long period.
- Flush the Blood Tank with clean water or, alternatively a 0.2 % NaClO (sodium hypoclorite) solution.
- If improvised blood is used (hibiscus tea, etc.), empty and flush the Blood Tank after every day of use.

Warnings

- Do not use strong washing detergents for cleaning, since it may damage the product.
- Do not leave *MamaNatalie* in direct sunlight.
- Do not leave *MamaNatalie* wet inside a bag. Clean it and dry it after use.

Susie/Simon

- Lower abdominal reservoirs: The reservoirs may be cleansed by introducing a solution of soap and water or detergent with a 60 cc. syringe. Alternatively, the reservoirs can be removed from the lower torso and cleaned. Each is connected using "click" connectors permitting that reservoir to be removed and cleaned or replaced as needed.
- Bladder reservoir: To remove the remaining fluid from the bladder reservoir after catheterization exercises are complete, lift the abdominal cover and remove the reservoir.

Inject-Ed Injection Simulator

- After each day of use, unscrew the Injection Simulator to empty the fluid reservoir.
- Let dry completely before putting the simulator back together again.

Venatech Trainer

- After each class, disconnect the "blood" syringes and flush them with water.
- Next, remove the small red plug in the upper left tube and flush the tubes in the trainer with the syringes.
- The outside of the trainer may be washed with liquid detergent and water.
- Be sure the trainer is dry and excess water is drained from the veins before storing in the box.

7.4 STORAGE OF MODELS

MamaNatalie/NeoNatalie

Store clean, dry models in their respective storage bags out of direct sunlight.

Susie/Simon

- If the hospital bed is not needed for another procedure, the manikins can be stored on the bed. Be sure that both the manikin and the bedding are dry.
- If the beds are needed for a different activity, or if the simulation lab is not going to be used for an extended period of time, store the manikin in a cool area in the box provided. Do not stack heavy materials on top of the box.

Gynecological Simulator

- Store the simulator in the carrying bag provided.

Childbirth Simulator

- Store the simulator in a cool area in the packing carton provided.
- Do not stack or store heavy materials on top of the carton.

Venatech Trainer

- Be sure the trainer is dry and excess water is drained from the veins before storing in the box.

Dilation/Effacement Simulator

- Store simulators in clean plastic bags or in their self-storage containers.
- The soft plastic used in the simulators attracts dust.

Breast Exam Simulator

- Store in supplied container or clean plastic bags to reduce dust accumulation.

CPR Models (Sani-Man and Sani-Baby)

- Remove any used airways from the models.
- Make sure that models are clean and dry.
- Place models in carrying bag originally supplied with the models.
- Do not stack any heavy objects on top of the models.

Disposal of Sharps

- Sharps containers should not be filled beyond 75% full.
- Once the sharps container has reached 75% full, it should be sealed closed.
- The sharps container should be disposed. See Section 6.2: Preventive Measures.

7.5 INSPECT CONDITION OF MANIKINS AND MODELS

The models and manikins have been designed to last for many years. However, it is important to regularly assess the condition of the equipment to ensure that no parts need replacing or repairing. In general, it is important to check models for tears and wearing out of skin, tightness of the fit of their different parts, and function of any moving or jointed parts.

Susie/Simon

- Each semester and as needed, the condition of the manikin should be inspected.
- If the deltoid IM injection site becomes worn, it can be replaced. This part would need to be ordered from the U.S.
- Check fit of urinary catheter. Repeat sterilization can change the size of the catheter. If the catheter is no longer a good fit, a new catheter should be used for practice.
- If joints are too loose, they may be tightened with a screwdriver.

Gynaecological Simulator

- Check that all parts are in working condition.
- Examine the skin for tears that may need to be repaired.
- Check that the inflatable bag and the attachments for the uteri are all in working.

Childbirth Simulator

- Examine overall condition and functionality to see if any parts are in need of repair or replacement.

Venatech Trainer

- Check the condition of the skin, veins, and artery. If there is significant leaking, the parts may be replaced.
- The skin, veins, and artery can be easily replaced. Peel off the old skin revealing the foam “core” with veins and artery. Remove the item to be replaced and then put the new ones in the same location. Pull the skin back over the Venatech Trainer.

Breast Exam Simulator

Replacement parts are available for the breast mass and skin. Should it become necessary to replace any of these components, use the following instructions:

- Remove skin. Disconnect all snaps on back of model. Carefully stretch one corner of skin over frame of model. Other corners should be easily removed.
- Position breast masses. Lay model on its back on table and position both breast masses on foam back. Seams should be against back of model.
- Place skin over model. While lying flat, place skin over model so breast masses will remain in proper location.
- Work skin over each corner of framework. Be careful not to stretch the skin to the extent that tearing will occur.
- Fasten snaps. Tip model upright and fasten snaps.

Wash Dirty Linens Used with Models

- When linens become soiled, they should be washed, thoroughly dried, and ironed.
- All linens that should have been used should be washed at least once a term even if they do not appear soiled.

Equipment Troubleshooting

If you experience a problem with a product, read through the product manufacturer's instruction manual kept in the Equipment Manual. If you are not able to find information in the manual that resolves the problem at hand, contact the manufacturer with your question. Include the name and model number of the product in all communication with the manufacturer.

Chapter 8. Monitoring and Evaluation

8.1 OVERVIEW AND DEFINITIONS

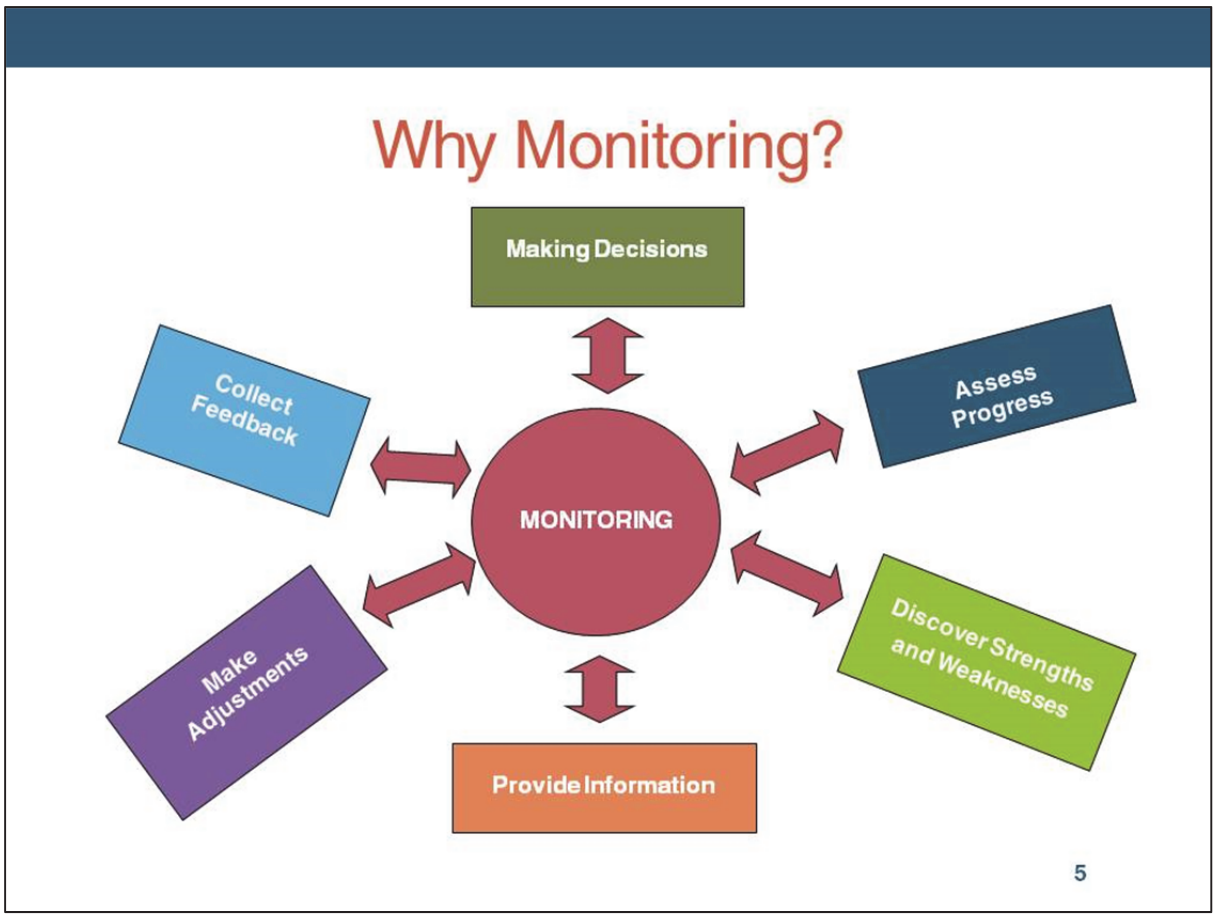
This section defines monitoring and evaluation and their relationship and importance to continuous development and improvement of the simulation lab.

Monitoring is a continuous, cyclic process of collecting information. Monitoring for the simulation lab is important because it documents **utilization**: student sessions and usage of resources including space, equipment, and staff time. Monitoring can also evaluate lab organization, student flow, use of materials, and costs associated with usage.

Evaluation is the periodic assessment of overall processes and final results. Though typically used in academic settings for assessment of student progress and learning, evaluation is also important for assessing the simulation lab as a whole. As goals are developed for the simulation lab, they are **monitored** over time and **evaluated** to assess whether they have been achieved.

8.2 MONITORING

Figure 4. Why monitoring should be done



Source: Jhpiego. 2011. *Simulation Training for Educators of Health Care Workers.* (unpublished)

What Monitoring Includes

Effective monitoring is open and transparent, and information is shared with stakeholders. Though the list of stakeholders is likely to vary by school, stakeholders would include the simulations lab staff, Core Management Team, school administration, and faculty. Monitoring

that is openly conducted with widely shared results can build support for the simulation lab within the institution as well as with relevant partners and stakeholders outside the school. Shared information reduces isolation in approaches and may lead to creative ideas for addressing observed problems. Monitoring of processes and results that are shared amongst schools is an important way to disseminate successes and lessons learned. Though monitoring is continuous, periodic assessment of the findings over several terms or annually may reveal patterns that are important to consider for planning and further evaluation.

Monitoring information for simulation lab operations should include:

1. Process: This area examines the way the lab functions. Efficient processes are important for smooth functioning and affect the ability of staff and faculty to effectively teach in the lab setting.
    - Is the simulation lab organized?
    - How is the student flow?
    - Is there sufficient time for all lab sections to practice?
    - What methods and materials are used?
    - What is the utilization of the lab for tutor-led sessions and for open hours?
2. Immediate Outcomes: These are short-term outcomes that can be monitored fairly frequently, from monthly to every term. Short monitoring intervals can allow for early corrections or adjustments. For example, issues with staffing schedules might quickly be apparent if related to the general schedule, or at the end of the term if related to examination period needs.
    - What is the percentage of requested access time that is granted?
    - What are reasons for inability to fulfil requests for time in the lab?
    - Does the staffing schedule fit the needs of the lab requests?
    - Were the learning objectives (of a session or course) achieved?
    - Do students demonstrate the applied knowledge to the skills and attitudes expected?
3. Outcome assessment of learning: student competency, OSCE results, examination results: The ultimate purpose of having a simulation lab is to facilitate student learning. Monitoring and documentation of learning includes short term (student competency on a particular skill), intermediate (end-of-term OSCE results), and longer term (end-of-programme examinations). Non-lab assessments, such as evaluations and feedback from preceptors, provide valuable data for assessing student learning that is related to the simulation lab. Students should achieve basic skill competency in the simulation lab prior to clinical placement, and success or concerns will be reflected in evaluations done in the clinical setting.
4. Continuous monitoring is the ongoing review of how the lab is working. This type of monitoring typically includes regularly occurring events such as meetings, as well as specific activities like debriefing sessions. Continuous monitoring could include review of the following areas:
    - Set up of the simulation lab: review of noted problems
    - Orientation to models
    - Management of the simulation lab
    - Use of simulation lab for competency based learning
    - Open lab usage
    - Simulation lab management team meetings
    - Debriefing sessions with faculty and students who use the lab

- Equipment and simulator observation of any problems and tracking of maintenance
- An active management binder of simulation lab activities, logs, and forms is a key part of the ongoing function of the lab and an important source of monitoring information.

Utilization of the Simulation Lab

Documentation of utilization is important for understanding whether the lab is meeting the objectives of the education programme, that is, providing a place for structured learning, practice, and assessment opportunities for students to develop clinical skills. Stakeholders from the institution, government bodies that fund midwifery education, and donor agencies want to understand how their resources are used to improve pre-service education. Utilization documentation should include:

- Faculty use: Who uses the lab, how often, for what purposes (e.g., OSCE, skills demonstration and teaching, supervised practice)
- Student use: Requests for open hours and independent study, need for assistance, feedback and evaluation from students (See **Appendix 6** for an Evaluation and Feedback Form for the Simulation Lab.)
- Finances: Documentation of ongoing costs including staffing, supplies, consumables
- Evaluation information from faculty and students: This can be in form of surveys, focus groups, interviews

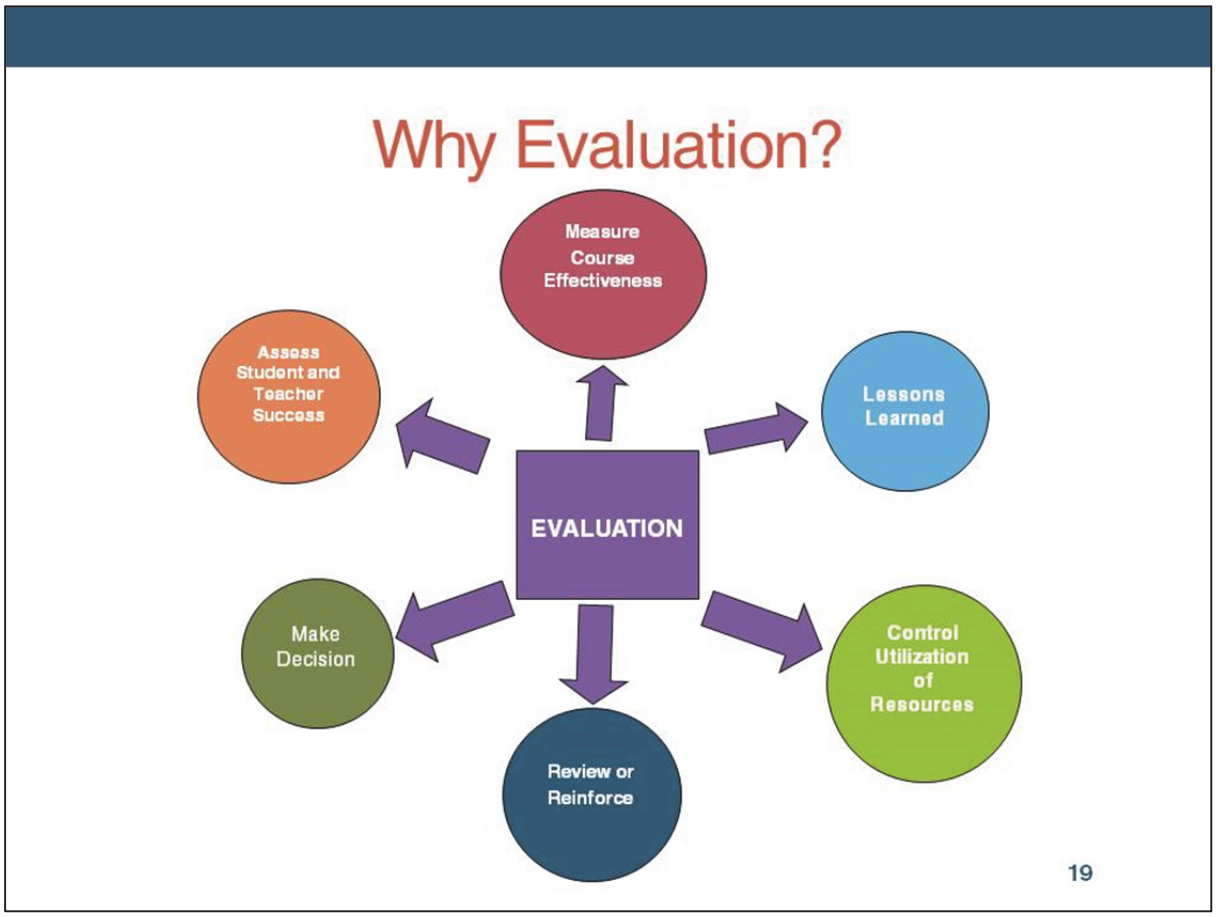
8.3 EVALUATION

As with monitoring, there are several types of evaluation to consider depending on the questions being asked. It is vitally important to include evaluation plans at the beginning of each term, project, or course in order to collect the appropriate data.

> All programmes need to carefully evaluate whether or not evaluation activities fall under the requirements for Human Subjects Review. Sometimes referred to as Institutional Review Board (IRB) review, evaluation that involves obtaining information or data from or about people is very likely to require IRB approval. There are exceptions, including programme evaluation for internal use. It is important to remember that if there are intentions to share the information with a wider audience, such as presenting at a conference, IRB approval may be required.

The diagram below includes some of the reasons to evaluate.

Figure 5. Why evaluation should be done



Source: Jhpiego. 2011. *Simulation Training for Educators of Health Care Workers.* (unpublished)

When to Evaluate

Decisions about when and how often to evaluate depend on the information needed, resources available, and capacity to conduct the evaluation. Monitoring is a type of evaluation that can be done continually or scheduled to obtain useful feedback and information about the performance and outcome of a project. In decisions about which type of monitoring system to use, it is important to remember the limitations and strengths of each type. For example, constant evaluation of monitoring results would be a prohibitively expensive use of staff time. Oftentimes, quarterly, annual, or semi-annual compilation and analysis of monitoring information provides an adequate ongoing picture of performance. It may be feasible to have annual summaries of data and add specific questions or areas of investigation as appropriate. An example would be evaluating how changes in staffing or lab hours affect student performance. This is highly relevant when changes are initiated, but would not need to be evaluated every term or year once adequate feedback about the new intervention had been obtained.

Types of Evaluation

Considering what areas need to be evaluated leads to the type of questions that should be asked. Evaluation can be thought of as related to structure, process, outcomes, effectiveness, and impact. Each of these may be separate evaluations or may be combined. For example, the *impact* of a unit on infection prevention (better hand hygiene) may be affected by an evaluation that examines the *structure* of the environment (availability of soap, location of hand rub). Evaluating the *process* of scheduling open hours in the simulation lab may lead the staff and faculty to a better understanding of the barriers to student access.

Structure refers to both the physical structure, such as where the washing station is located, and to the structure of the systems, such as administration or procurement.

Process refers to the steps or process needed to complete an action. A process that is cumbersome, inefficient, or difficult to understand is less likely to be followed. For example, if the process to schedule simulation lab hours requires many steps and a great deal of time, the scheduling is more likely to be unplanned and haphazard or not done.

Outcome evaluation can be assessment of student learning such as scores on a checklist, OSCE evaluations, or clinical ability as assessed by preceptors. It can also be assessment of staff or faculty training, teaching skills, or the use of simulation lab cases.

Effectiveness is an evaluation of how well something is working. Changes made to improve the simulations lab should be evaluated for how well they work. If the staff and faculty have developed a schedule for using the simulation lab for OSCE, how effective is the schedule? Does it do what it was intended to do, and if not, what are possible reasons?

Impact is measurement of the changes that can be attributed to a particular intervention. The changes may be desired ones, such as a smoother scheduling process leading to higher utilization of the simulation lab, or they may be less desired or unintended, such as higher utilization requiring more frequent cleaning services.

For all evaluations there are important requirements. Some elements are listed below:

1. Plan the evaluation *before* starting the intervention. This avoids having to go back to try to retrace actions to collect data.
2. Ensure that the data collected match the topic evaluated. If the topic is disassembly and storage of models, questions and data collected should pertain to that topic.
3. ALL research planned should be discussed with relevant Human Subjects/Institutional Review Board (IRB) committees. This has to be done prior to data collection.

Using Evaluation Results

- Evaluation results can be used in a number of ways. Routine evaluation includes documentation of numerical data and key quality indicators. This type of evaluation can be done regularly, as discussed in the Monitoring section. Findings provide an overview of the simulation lab, and can assess quality, document effectiveness of innovations, and capture information to answer programmatic questions.
- Targeted evaluation that includes more than numerical monitoring data can add to the knowledge about an area or topic. An example would be an evaluation of effectiveness of using student assistants as peer proctors in skill assessments and whether it affects how well students perform on OSCE.
- As previously noted, evaluation results should be shared broadly with institution stakeholders and relevant outside partners. Results are helpful for use in advocacy, problem evaluation, planning, and policy development in education.
- The Knowledge for Health (K4Health) website features a toolkit on monitoring and evaluation that has extensive resources. http://archive.k4health.org/toolkits/m-and-e.

Appendix 1. Online Resources

WEB-BASED REFERENCES FOR SIMULATION LABS

International Confederation of Midwives: Resources for midwifery practice and education including global standards, competencies, and tools. A new resource (November 2012) is Competency-based List for Basic Skills Training in Midwifery Schools. http://www.internationalmidwives.org/Whatwedo/Policyandpractice/ICMGlobalStandardsCompetenciesandTools/GlobalStandardsEnglish/tabid/980/Default.aspx

Planned Parenthood Federation: Free online resources specific to sexual and reproductive health. www.ippf.org.

Ipas is a global, nongovernmental organization focused on ending preventable deaths and disabilities from unsafe abortion. Site has toolkits, job aids, advocacy papers, research summaries, training manuals, and publications on comprehensive abortion care (CAC). www.ipas.org.

Knowledge for Health: Free online resources that includes POPLINE (world's largest database of reproductive health literature) and toolkits that focus on a variety of areas including family planning, maternal and child health, counselling, postpartum haemorrhage, pre-service education, and pre-eclampsia/eclampsia. Some toolkits are country- or region-specific. http://www.k4health.org/.

Marie Stopes International: Free online resources related to maternal health, HIV/AIDS, family planning, safe abortion and postabortion care. www.mariestopes.org.

Medical Aid Films are teaching films developed for health training and include pregnancy complications and neonatal resuscitation, among others. For information about copies of the films (on DVDs and memory sticks or through Internet download), contact info@medicalaidfilms.org.
To view the films: https://vimeo.com/medicalaidfilms/channels.

ModCAL® for Training Skills uses an interactive, multimedia format to help learners become more effective pre-service faculty or in-service trainers. Key training resources are also provided in the resources section of ModCAL. Available on flash drive or may be downloaded at: http://modcal.jhpiego.org/.

USAID Global Health eLearning Center: This site offers free, continuing education for health professionals. There are numerous short courses on MCH topics, TB, and other health-related subjects. Requires registration. http://www.globalhealthlearning.org/.

WHO Priority Medicines for Mothers and Children 2011 (4 pp, can download pdf). http://www.who.int/medicines/publications/emp_mar2011.1/en/index.html.

WHO 2011 *Essential Interventions, Commodities and Guidelines for Reproductive, Maternal, Newborn and Child Health*. This is a global review of key interventions in tabular format. Short (30 pp) document listing evidence-based findings. http://www.who.int/pmnch/topics/part_publications/essentialinterventions14_12_2011low.pdf.

Appendix 2. Making a Scaled Floor Plan

OBJECTIVE

The goal of making a floor plan is to be able to look at a variety of arrangements for the stations and how they will fit within the existing space. This exercise saves considerable time and money and is particularly important if new equipment will be ordered or purchased. It provides a map for planning the use of the simulation lab. The Core Management Team for the simulation lab is a logical group to work on the floor plan, with consultation and involvement of others as desired or needed.

TOOLS AND MATERIALS NEEDED

- Graph (grid) paper or flip chart paper
- Tape measure
- Notepad/notebook
- Pencils
- Rulers
- Calculator

TIPS

1. Paper: Flip chart paper or poster-sized graph paper is ideal for planning, though smaller sized paper can be used.
2. Measuring: Measure carefully and accurately. The old carpenter's saying of "measure twice and cut once" is a good reminder to be accurate.
3. Recording: Keep a sketch of your information in addition to the grid plan. A sketch can help track all of the relevant information and ideas in one place.
4. Keep copies!

STEPS TO MAKE A SCALED FLOOR PLAN

1. Measure the length and width of the space with a tape measure. Write the measurements on a notepad, being sure to include every wall. To ensure that everyone understands the plan, make a small sketch and either label it with the measurements or give each wall a name, such as "outside wall." Either method can work; the goal is clarity.
2. Transfer the measurements onto the poster or graph paper using a pencil and a ruler."
    - If you use graph paper, use a scale that is large enough to work with, for example, 25 centimetres (1/4 metre) equal 1 square on the paper.
    - If you are not using graph paper, use a ratio that is easy to work with, such as 10:1. Take each measurement and divide by the chosen ratio. For example, a room 4 metres wide would measure 40 cm on your paper (400 cm/10=40 cm); a door 80 cm wide would be 80/10=8 cm on your paper.

Remember that the length of the room multiplied by the width of the room will give you square footage of the space. Use this calculation to check that you have marked the right number of squares on your paper. This paper becomes the floor plan.

3. Draw a line on the graph paper to represent the length of the wall by counting the squares. For example, if the wall is 3.5 metres inches long, draw a line down 14 squares on your grid. Use your ruler to ensure that you draw a straight line.

4. Measure the length of each of the remaining walls and note them on the grid.
5. Measure the distance each door and window opening is from the closest corner. Measure the width of each door and window opening. Add the doors and windows to the grid drawing of the room by counting the appropriate number of squares from the closest corner, then counting the correct number of squares to match the size of the opening. For example, if your door is 1.5 metres from the closest corner, mark the first side of the door six squares from that corner on the grid. If the door is 1 metre wide, mark the opposite side of the door opening 4 squares from the first mark.
6. Measure the location, length, and width of all permanent furniture and built-in shelving and cabinets and add them to your grid. Be sure to draw them as rectangles so you will know how far into the room they project.
7. Draw windows as short, double lines perpendicular to the wall line, and doors with a line and an arc to show which direction the door opens.
8. Outline the entire sketch in black ink with the help of a ruler. This provides a clear, basic floor plan that is clear and easy to read.
9. Make several photocopies of both the floor plan and the small sketch. This provides a record of what you are starting with (the sketch with measurements) and extra copies so that you can work with planning the layout in different ways. It is helpful to save one copy each of the sketch and the floor plan for future projects.

USING YOUR FLOOR PLAN

1. **Cut out shapes:** On a separate piece of paper, cut out shapes to scale (25 centimetres equals 1 square) of all the furniture and equipment that you will put in the simulation lab for different stations: beds, trolleys, screens, tables, stools, etc. Use rectangles for beds, a small circle for stools, and larger circles for tables, but with every item it is important that the shapes be accurately measured. Shapes can be made from grid paper to ensure correct size. Label each shape.
2. **Arrange and rearrange:** To make it easier to view and adjust the layout, put the floor plan on a corkboard and use pins to change the layout. Another method is to use post-it paper (carefully measured from the grid shapes) to designate the furniture.

Appendix 3. Standard Equipment Based on ICM Competencies[4]

ANTENATAL	
Equipment	
▪ Measuring tape ▪ Weighing scale ▪ Patella hammer ▪ Speculum—Cusco ▪ Speculum—Sims ▪ Speculum—Ovard ▪ Kidney dish (sizes) ▪ Cheatle's forceps ▪ Gallipots ▪ Veronica bucket/handwashing station	▪ Foetoscope ▪ Sphygmomanometer ▪ Clinical thermometer ▪ Stethoscope ▪ Tray ▪ Scissors ▪ Waste bin ▪ Plastic bucket ▪ Screen
Job Aids, Forms	
▪ ANC record card ▪ FANC job aid ▪ Register ▪ Foetal growth and development ▪ Gestational wheel	▪ Cervical dilatation chart ▪ Foetal circulation ▪ Lab request forms ▪ Positions in labour
Furniture	
▪ Bed ▪ Table with drawers	▪ Chairs ▪ Couch
Supplies/Drugs	
▪ Gloves (types) ▪ Cotton wool ▪ Gauze ▪ Urine testing kit ▪ Hand sanitizer ▪ RDT kit (Malaria) ▪ RDT kit (HIV) ▪ Syringes	▪ Needles ▪ TT vaccines (sample) ▪ SP (anti-malarial drug) ▪ Iron folate ▪ Dewormers ▪ Malaria drugs ▪ Lubricant
Materials	
▪ Bed sheets ▪ Pillows	▪ Bed ▪ Screen
Models	
▪ Pelvic model (ZOE with landmarks) ▪ Bony pelvis	▪ Breast model ▪ Non-pregnant abdomen
LABOUR AND DELIVERY	
Equipment	
▪ Stethoscope ▪ Light source ▪ Flashlight ▪ Wall clock ▪ Measuring tape ▪ Kidney dish (sizes) ▪ Cheatle's forceps	▪ Artery forceps ▪ Cord scissors ▪ Cord Clamps ▪ Mayo scissors ▪ Sponge forceps ▪ Delivery bowls ▪ Goggles

[4] For full ICM equipment list based on competencies, see: www.internationalmidwives.org/Portals/5/2011/DB%202011/Skills%20List%20FINAL%20-%2013%20November%202012.pdf.

- Gallipots
- Veronica bucket
- Foetoscope
- Sphygmomanometer
- Tray
- Clinical thermometer
- Delivery bowl stand
- Placenta bucket
- Plastic containers

Episiotomy

- Needle holder
- Dissecting forceps
- Episiotomy scissors
- Scissors
- Gallipot
- Speculum (types)
- Light source
- Sutures
- Gloves
- Gauze
- Face mask

Job Aids, Forms

- Lab request form
- RDT HIV
- Stages of labour
- Cervical dilatation and foetal descent
- Mechanisms of birth(vertex and breech)
- Malpresentations
- Uterine involution
- Cervical dilatation model (plastic)
- Charts on positions in delivery
- Chart for types of common stitches
- Chart for MgSO4 regime
- Partograph sheet
- Chart for condom tamponade
- Aortic compression chart
- Bimanual compression charts

Furniture

- Tables
- Chairs
- Foot stool

Supplies/Drugs

- Urethral catheter
- Gauze
- Gloves (types)
- Syringes
- Needles
- Chlorine solution
- Infusions
- Face mask
- Disposable caps
- Vitamin K
- Methylated spirit
- Oxytocin
- MgSO4
- Emergency/precipitous delivery pack
- Eclampsia pack
- PPH pack

Materials

- Bed sheets
- Pillows
- Bed
- Mattress
- Draw mackintosh
- Long mackintosh
- Dressing towels

Models

- Birth simulator
- MamaNatalie
- Handmade models for suturing
- Anatomic model: 3rd trimester foetal model
- Bony pelvis (landmarks identified)
- Foetal skull
- Pregnant abdomen, ZOE or similar
- NeoNatalie
- Cervical dilatation model (plastic)

POSTNATAL

Equipment

- Adult/infant weighing scale
- Measuring tape
- BP apparatus
- Stethoscope
- Thermometer
- Wall clock
- Tray
- Kidney dish
- Screen
- Dust bin
- Plastic bowl
- Baby bath
- Plastic bucket
- Light source

▪ Trolley ▪ Gallipot	▪ Sharps container
Job Aids, Forms	
▪ Family planning methods ▪ Attachment of baby to breast ▪ Vaccination schedule ▪ Handwashing ▪ Nutrition	▪ Uterine involution ▪ Examination of the baby ▪ Swelling and abnormalities on baby's head ▪ Immunization record book
Furniture	
▪ Table ▪ Chairs ▪ Foot stool	
Supplies/Drugs	
▪ ARV ▪ Haematinics ▪ Antibiotics ▪ Analgesics ▪ Antipyretics ▪ Gloves	▪ Alcohol hand rub ▪ Utility gloves ▪ Gauze ▪ Aprons ▪ Sharps container ▪ Chlorine solution
Materials	
▪ Bed sheets ▪ Pillows ▪ Long mackintosh ▪ Draw mackintosh	▪ Drapes ▪ Dressing towels ▪ Bed mattress
Models	
▪ Full-term baby/baby doll ▪ Madame ZOE for symphysiofundal height ▪ MamaNatalie	▪ Placenta ▪ Handmade models for bimanual compression, etc. ▪ Breast model
NEWBORN CARE/NEONATAL RESUSCITATION	
Equipment	
▪ Galipot ▪ Receiver/kidney dish ▪ Artery forceps ▪ Cord scissors ▪ Ambu bag ▪ Light source ▪ Oxygen apparatus	▪ Mucus extractor ▪ Baby weighing scale ▪ Measuring tape ▪ Stethoscope ▪ Wall clock ▪ Rectal thermometer ▪ Incubator
Job Aids, Forms	
▪ Apgar score ▪ Gestational age ▪ Swelling and abnormalities on baby's head	▪ Immunization charts ▪ Immunization record book
Supplies/Drugs	
▪ Vitamin K ▪ Methylated spirit ▪ Chlorine solution ▪ Utility gloves ▪ Disposable gloves	▪ Alcohol hand rub ▪ Cotton swab ▪ Gauze swabs ▪ Syringes and needles ▪ Surgical gloves
Furniture	
▪ Flat surface/table ▪ Chairs	

Materials

- Apron (plastic)
- Dress for baby
- Baby towels
- Cot sheets
- Baby's nappy/diaper
- Plastic bucket
- Plastic bowl
- Mackintosh
- Identification band
- Baby blanket
- Baby cap

Models

- Full-term baby doll with sutures and fontanelles
- Resuscitation doll/NeoNatalie
- Doll for baby bath

FAMILY PLANNING

Equipment

- BP apparatus
- Thermometer
- Speculum
- Light source
- Adult weighing scale
- Stethoscope
- Tenaculum
- Ring forceps
- Scissors
- Kidney dish/receiver
- Gallipots
- Tray
- Screen
- Cheatle's forceps/holder
- Uterine sound
- Scalpel blade holder/surgical blades
- Needle holder
- Dissecting forceps
- Scissors
- Trocar and cannulae
- Mosquito artery forceps (curved and straight)
- IUD retriever
- Alligator forceps
- Drape (arm and pelvic)
- Protective clothing (apron)
- Syringes, needle
- Local anaesthesia
- Sterile and clean gloves

COMPREHENSIVE ABORTION CARE

Equipment

- Manual vacuum aspirator kit
- Cannulae of different sizes
- Container (to receive POC)
- Sieve (strainer)
- Light Source
- Protective clothing and mask
- Drape
- Examination gloves
- Surgical gloves
- Sanitary pad
- Antiseptic solutions
- Local anaesthesia
- Surgical tray
- Gallipots
- Kidney basin (receiver)
- Speculum
- Tenaculum
- Sponge holding forceps
- Syringe
- Needles
- Cotton wool or gauze
- Decontamination bucket
- Chlorine solution

Supplies/Drugs

- Surgical gloves
- Disposable gloves
- Utility gloves
- Cotton swab
- Gauze swab
- Drape
- Injectable (Depo-Provera)
- Pre-packaged IUD
- Implants
- Condom
- Chlorine solution
- Methylated spirit
- Antiseptic solutions (Iodine, Savlon)
- Sharps container
- Dust bin/waste bin
- Sutures
- Syringes
- Local anaesthesia
- Needles
- Plaster/tape

Job Aids

- Methods/options counselling flip chart

Appendix 4. Instructions for Making Cloth Models[5] and Other Items

BABY, PLACENTA, AND CORD

Materials Needed: Baby

1/3 yard light brown material (medium weight cotton or cotton/polyester)

- Light brown sewing thread
- Baby pattern
- Polyester or polyester/cotton stuffing material (stuffing from a bed pillow works well)
- Sewing needle or sewing machine
- Sewing scissors
- Dark brown or black permanent fine tip marker
- Large metal snap (female side)
- Straight pins

Materials Needed: Placenta and Cord

- ¼ yard red material (medium weight cotton or cotton/polyester or polyester)
- ¼ yard white material (medium weight cotton or cotton/polyester)
- Placenta and cord pattern
- Red sewing thread
- White sewing thread
- Sewing needle or sewing machine
- Black permanent marker
- Polyester or polyester/cotton stuffing material (stuffing from a bed pillow works well)
- Large metal snap (male side)
- Sewing scissors
- Straight pins
- Tweezers or artery forceps

Instructions for Baby

Place pattern on a double layer of light brown material (body, leg, and arm). Pin the pattern in place. Cut around pattern with a sharp sewing scissors. Unpin the pattern.

Place the arm and leg pattern again on the double layer of material (to make a second arm and leg). Pin the pattern into place, cut, and unpin. Place the two pieces of the body with the right sides together. Pin into place. Place marks where the arms will be inserted (see marks on the pattern). Stitch ½" (1.2 cm) from edge of material leaving open between the marks where the arms will be inserted and leaving open the bottom of the body where the legs will be inserted. Turn the body right side out and stuff.

[5] Patterns designed and developed by Annie Clark, CNM, American College of Nurse-Midwives. To make any of these models, double the size of the patterns given in this appendix. If a photocopier is available, enlarge the pattern by 200%.

Place the two pieces of one leg with the right sides together. Pin into place. Stitch ½" (1.2 cm) from edge of material leaving the top of the leg open. Remove pins. Turn right side out. Stuff the leg. Repeat with the other leg.

Place the two pieces of one arm with the right sides together. Pin into place. Stitch ½" (1.2 cm) from the edge of material leaving the top of the arm open. Remove pins. Turn right side out. Stuff the arm.

Take one arm and ease into the body (make sure the baby's thumb is up). Turn the raw edges under. Pin in place. Top stitch the arm into place. Remove pins. Repeat with the other arm.

Take one leg and ease into the body. Turn the raw edges under. Pin in place. Take the other leg and ease into the body. Turn the raw edges under. Pin in place. Put additional stuffing into body, if needed. Pin the crotch closed. Top stitch legs into place and top stitch crotch closed.

Sew the female end of the snap in the middle of the body where the bellybutton would be.

Instructions for Placenta and Cord

Place placenta pattern on a double layer of the red material. Pin the pattern in place. Cut around pattern with a sharp sewing scissors. Unpin the pattern. Place the two right sides of the fabric together. Pin together about 1" (2.5 cm) from the edge. Sew the two pieces of material together 1/2" (1.2 cm) from the edge of the material. Leave a 2" (5 cm) space unsewn. Remove the pins. Turn the "placenta" right side out. Stuff with the stuffing material until about 1" (2.5 cm) thick. Turn the edges of the open 2" (5 cm) seam and stitch closed.

Fold over the white material. Place cord pattern with edge indicated on fold of white material. Pin pattern into place. Cut along the edge of the pattern. Unpin the pattern from the material. Fold the material so the two right sides of the fabric face each other. Pin 1 inch (2.5 cm) from the edge. Sew ½" (1 cm) from the edge of the material. Remove the pins. Turn the cord right side out. (Use the tweezers or artery forceps to help pull the material right side out.) Loosely stuff the cord using the tweezers or artery forceps. (Do not overstuff. The cord should be squeezable, not hard like a rope). Turn the raw edges at each end of the cord inward. Stitch one end of the cord closed. Sew the male side of the snap to this end of the cord. Sew the other end of the cord to the middle of the placenta.

On the fetal side of the placenta (the side the cord is sewn onto), draw arteries and veins using the permanent marker.

On the maternal side of the placenta, draw cotyledons.

UTERUS

Materials Needed: Uterus

- ¼ yard pink material (medium weight cotton or cotton/polyester)
- 26" (66 cm) white shoelace or ¼ " (0.5 cm) wide pink or white ribbon
- Pink sewing thread
- Small safety pin (if using ribbon instead of shoelace)
- Straight pins
- Uterus pattern
- Polyester or polyester/cotton stuffing material (stuffing from a bed pillow works well)
- Sewing scissors
- Sewing needle or sewing machine

Instructions

Place placenta pattern on a double layer of the pink material. Pin the pattern in place. Cut around pattern with a sharp sewing scissors. Unpin the pattern. Hold one piece of material so the wrong side of the material is facing you. Fold under ¼" (0.5 cm) of the straight edge (cervix) of the piece, and pin to hold. Stitch by hand or machine. Remove pins. Repeat with the other piece. Now place the two pieces of material with the right sides together. Pin to hold. Stitch ½" (1.2 cm) from the edge all the way around the uterus, but leave the straight edge (cervix) unstitched. Unpin. Now fold the straight edge under again 5/8" (1.5 cm), creating a casing, and pin to hold. Stitch ½" (1.2 cm) from the folded edge leaving ½" (1.2 cm) unstitched. Insert the end of the shoelace through the opening and work it through and out the other end of the casing. Hold the end of the shoelace and slide the material along the shoelace until equal amounts of the shoelace are exposed from each side of the casing. (If using ribbon, attach a small safety pin to the end of the ribbon and work it through the casing in the same manner.) Turn the uterus right side out. Stuff the uterus until about 2" (5 cm) thick. Tie shoelaces or ribbon in a bow to secure.

PELVIS

Materials Needed

- ¾ yard white or beige material (medium weight cotton or cotton polyester)
- Pelvis pattern
- White or beige sewing thread
- Beige embroidery thread-1 skein
- Heavy 3" (8 cm) sewing needle with large eye
- Polyester or polyester/cotton stuffing material (stuffing from a bed pillow works well)
- Aluminum soft drink can
- Sewing needle or sewing machine
- Straight pins
- Sewing scissors
- Pencil

Instructions

Place pelvis pattern on a double layer of white or beige material. Pin the pattern in place. Cut around pattern with a sharp sewing scissors. Unpin the pattern. Take the two pieces you have cut out and put them together so the right sides of the material are facing each other. Pin into place. Stitch ½" (1.2 cm) from edge of material leaving open between the marks at the spine where the stuffing will be inserted. Turn the pelvis right side out. On both sides of the pelvis, mark the pelvis with a pencil where the embroidery stitches will be placed according to the pattern. Cut a piece of aluminum from the pattern for the tailbone with the scissors. Slide the piece of aluminum inside the pelvis where the tailbone will be. Stuff the entire pelvis firmly with stuffing. Bring the two edges of the pubic bone together and stitch both front and back of pubic bone.

Finishing-Thread the heavy needle with the embroidery thread. Stitch along the iliac crest as indicated on the pattern. Use stitches ½" (1.2 cm) long and stitch from the front of the iliac crest to the back and then stitch forward again so your stitches fill in and make a solid line of stitching.

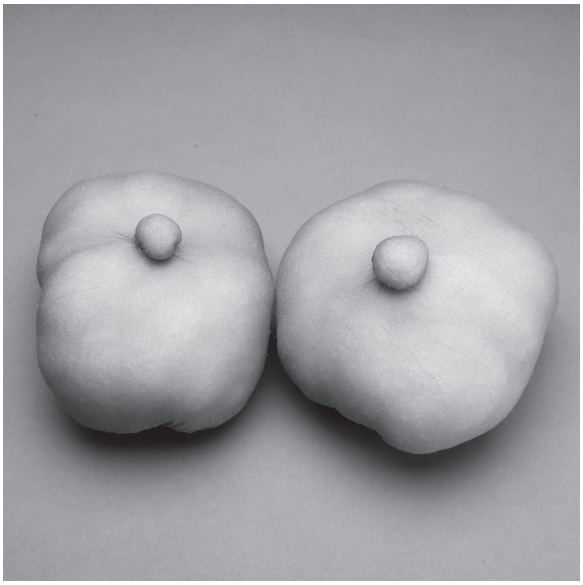
Repeat with the other iliac crest.

Use the heavy needle with embroidery thread. Knot the end of the thread. Insert the needle through one of the pencil marks on the inside of the pelvis and come through the opposite mark on the outside of the pelvis. Pull tight. Insert the needle through the same mark on the outside of the pelvis to the inside of the pelvis. Repeat one more time inserting the needle through the same mark on the inside of the pelvis to the outside of the pelvis. Pull tight and secure with a knot. Cut the thread free being careful not to cut off the knot. Repeat this process for all of the pencil marks. When stitching the tailbone, insert needle through both the material and the aluminum piece inside.

Fold over the raw edges of the spine where the stuffing was inserted, pin together, and stitch closed. Remove pins.

INSTRUCTIONS FOR MAKING A BREAST MODEL

Materials Needed for One Model



- Sewing needle
- Sewing thread (color does not matter)
- (2) Lower legs or upper legs of brown panty hose
- 2 large handfuls of polyester or polyester/cotton stuffing from a pillow
- 2 small plain rubber bands (not colored)
- Black marker with permanent ink
- Piece of white cotton cloth 152 cm long and 10 cm wide (a piece of sheet works well)

Instructions

1. Cut the panty and the toes off of a pair of pantyhose. Cut the two pieces from the legs in half so you have 4 tubes. (You will need 2 tubes).
2. Take a handful of stuffing and push it into the centre of one of the pantyhose tubes. Repeat with a second tube. These will become the breasts.
3. Fold the excess of the pantyhose material so that it overlaps behind the "breast." Take a few stitches with a needle and thread to hold the flaps down. Repeat with the second "breast."
4. Pinch the front of the "breast" to form a nipple and bind with a small rubber band. Repeat with the second "breast."
5. Take the piece of sheet and tie it around your chest. Make a mark on the cloth where you feel your own nipples beneath the cloth.
6. Remove the piece of sheet and sew the "breasts" on over each mark you made.
7. Color the nipple and make an areola with the black marker on each "breast."
8. Tie the model on around your chest for teaching breastfeeding, breast exam, pregnancy, childbirth, or postpartum role plays.

INSTRUCTIONS FOR MAKING INFANT "BEANIES"

Materials Needed for One Beanie

- A size D or 3 crochet hook
- Baby or fingering weight yarn

Crocheting Pattern

Ribbing: Chain (ch) 8 stitches (sts); turn, single crochet (sc) into 2nd ch from hook and each st across. Ch 1, turn. Row 2: Sc into back loop only of each sc across. Ch 1, turn. Repeat (rep) row 2 until there are 24 redges. Fasten off and sew seam in ribbing to form a circle.

Attach yarn at seam and ch 3. Double crochet (dc) in end of each row of ribbing; slip stitch (sl st) to join, ch 3. Work 4 rounds (rnds) of dc joining rnds with sl st.

1st decrease (dec) Rnd: Ch3 * dc 3, dec on next 2 sts; rep from * around, ending dc on any extra sts. Work 1 rnd even.

2nd Dec Rnd: Ch 3 * dc 2, dec on next 2 sts; rep from * around, ending dc any extra sts. Work 1 rnd even.

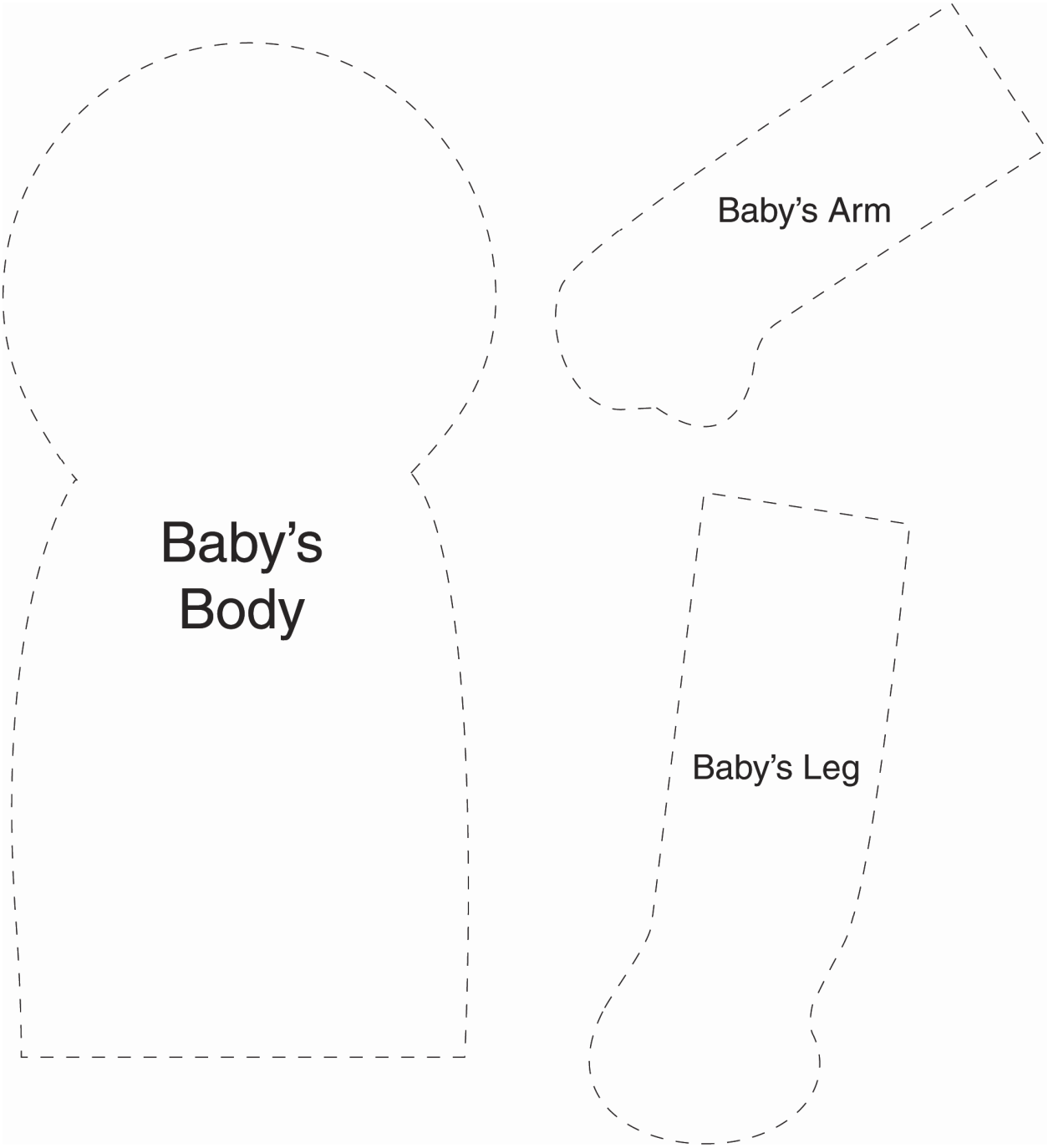
3rd Dec Rnd: Ch 3 * dc 1, dec on next 2 sts, rep from 1 ending dc any extra sts. Work 1 rnd even.

4th Dec Rnd: Ch 3 * dec on next 2 sts; rep from * around, ending dc any extra sts. Draw together remaining sts and fasten off securely.

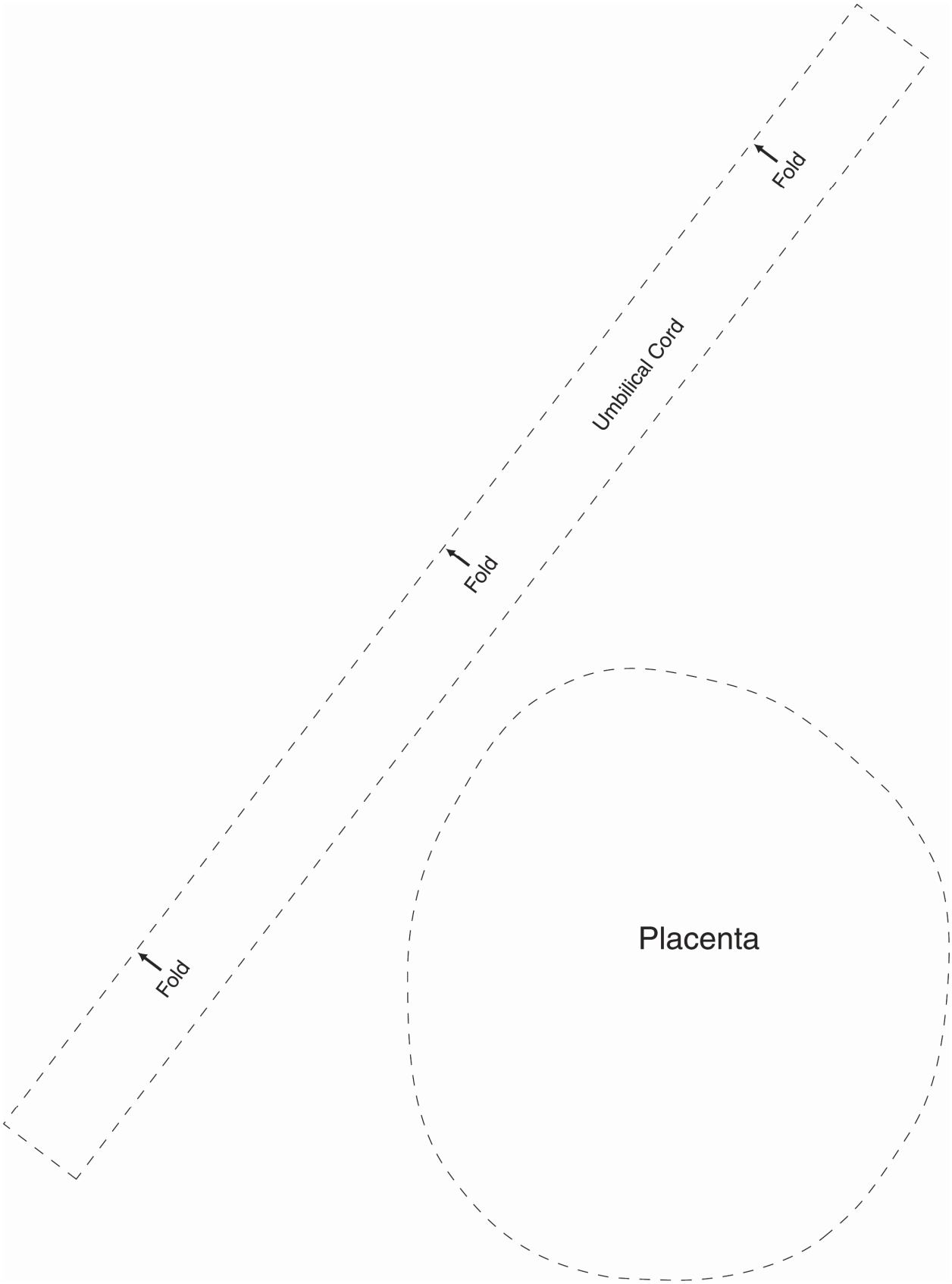
Knitting Pattern

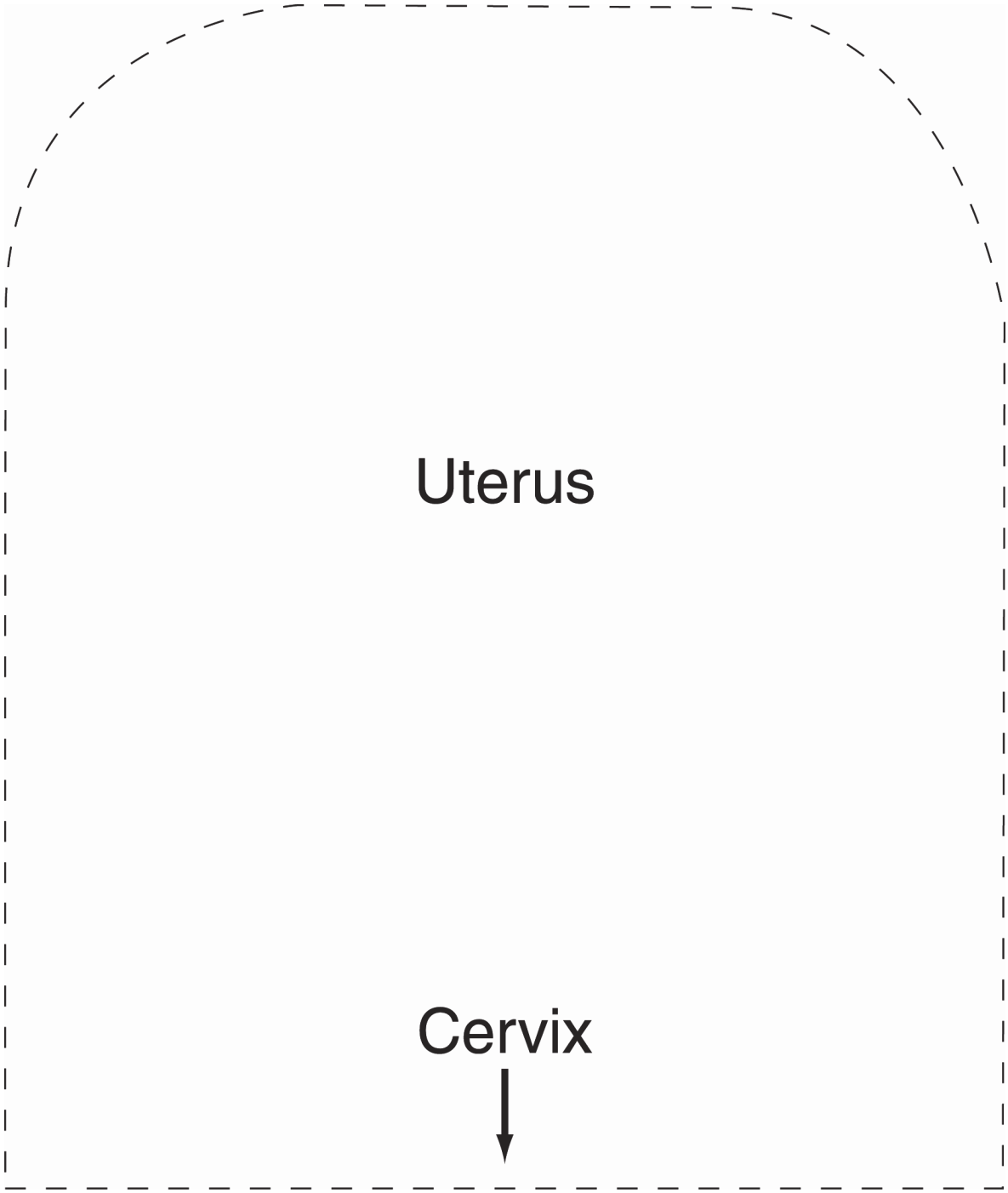
- Use #4 needles and baby weight yarn.
- Cast on 72 stitches (sts).
- Knit (k) 2, Purl (p) 2 or 3 inches.
- K the next 2 rows to make a ridge on the right side.
- P one row.
- Work in Stockinette Stitch (st st; k one row, p one row) for 14 rows.
- K the next 2 rows to make another ridge.
- P one row. Next row: k2 together (tog) across row.
- Repeat the last two rows until you have 9 sts remaining on the needle.
- Leave a strand of yarn long enough to weave the back seam together, draw the strand through the 9 sts and fasten.
- Weave the back seam together.

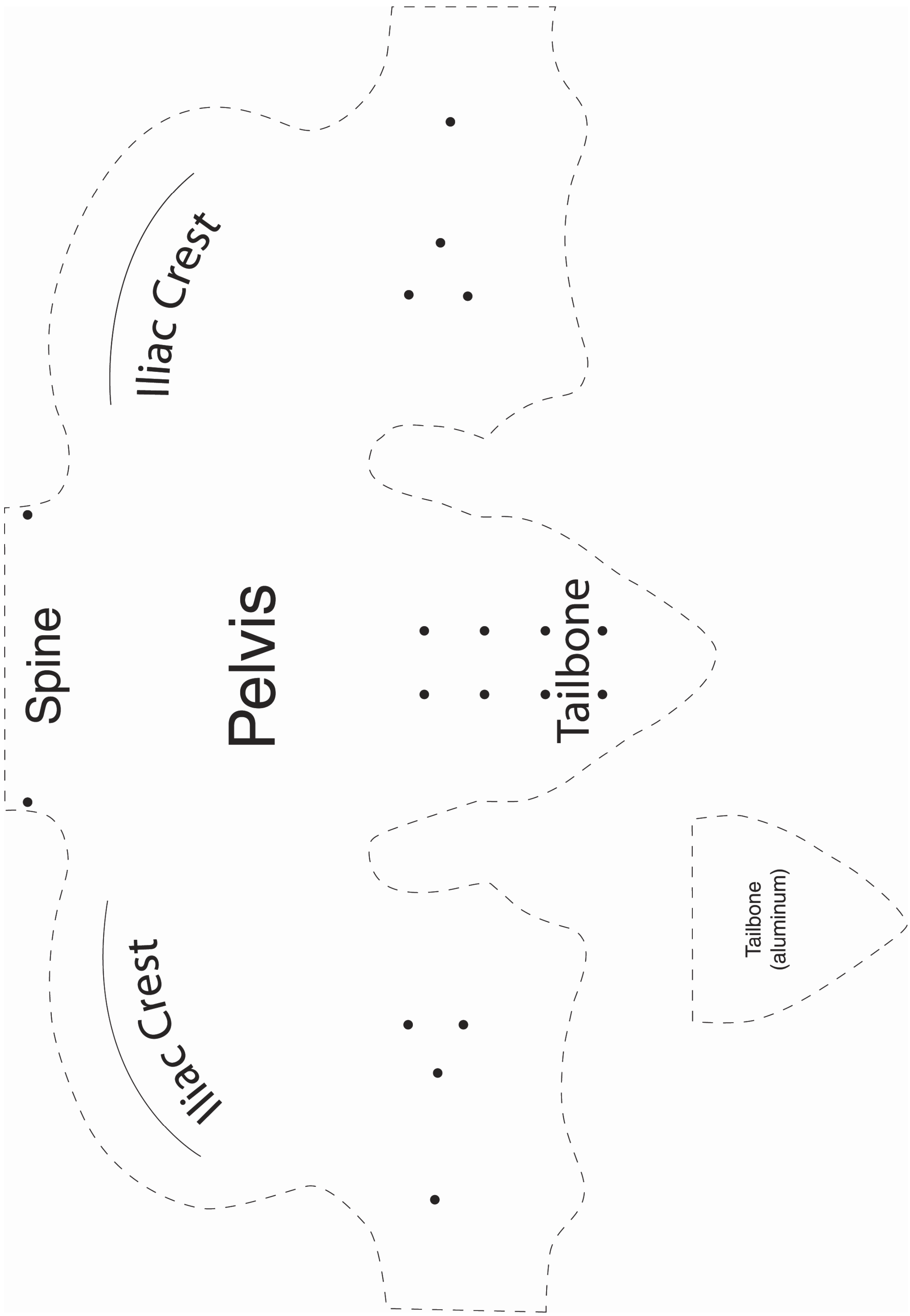
Patterns[6]



[6] To make any of these models, double the size of the pattern. If a photocopier is available, enlarge the pattern by 200%.


Fold
Umbilical Cord
Fold
Fold
Placenta


Uterus
Cervix



Spine
Pelvis
Tailbone
Iliac Crest
Iliac Crest
Tailbone
(aluminum)

PLACENTA MODEL

Materials required

- White cloth
- Wine colored cloth
- ½ inch thick foam,
- Red cord, blue cord
- Plain and opaque polythene bags
- Hand sewing needle
- Sewing thread
- Scissors

Procedure

1. Cut both white and wine colored cloth in circles about 6 inches in diameter.
2. Sew the two together all round about ¼ inch away from the edge leaving 3 inches of space unsewn.
3. Cut foam about 5-1/2 inches in diameter (slightly smaller than cloth circles).
4. Push the foam through the opening of the two cloths sewn together and ease out to take the shape of a circle.
5. Overstitch the opening together.
6. Make an opening in the centre.
7. Cut two pieces of blue and one piece of white cord about 12 inches long.
8. Bring the edges of the 3 pieces together and sew them to the centre of the foam where you made an opening.
9. Make small holes in the closed ends of the polythene bags.
10. Pass the cords through the open ends of the holes in the polythene bags into the hole at the other end starting with the opaque one and then the light one.
11. Secure the polythene bags to the cords near the holes.
12. Twist the three cords together.
13. Sew up the end of the twisted cord.

IMPLANT ARM

Materials required

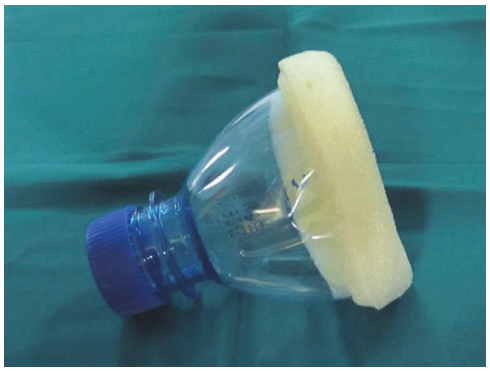
1. Empty plastic bottles *or* card stock about the size of A4 paper sheet
2. Adhesive glue
3. Needle and thread
4. Toothbrush for application of glue
5. Newsprint sheets
6. Utility gloves
7. Scissors
8. Cutter or knife
9. Foam sheet

Procedure

1. Make a cylinder (2 versions):
   - A. Cut both ends of the plastic bottle open with the knife or cutter so you have only a cylinder shape.
   - B. Roll the A4 paper size card into a cylinder and tape edges.
2. Fill the cylinder (plastic or card stock) with rolled newsprint or foam to make it firm.
3. Cut two strips of foam measuring 2” by 10”.
4. Put the strips on a flat surface.
5. Apply the adhesive glue to one surface of the foam.
6. When glue is dry, use the foam strips to cover the cut end edges of the cylinder to make them smooth and slightly padded.
7. Cut a sheet of the foam measuring 10” by 11”.
8. Place on a flat surface and apply glue completely on one surface.
9. Allow glue to dry and roll the foam firmly around the cut out cylinder you have prepared.
10. Tie or sew up the thumb of the utility glove at the base.
11. Tie tightly or sew the other fingers together at the base of the fingers.
12. After tying or sewing fingers and thumb, turn glove inside out so that tied portion is inside.
13. Push the prepared cylinder into the glove.
14. Stitch or tie the open end of the glove to complete making the improvised arm.

SKAMGOA (RESUSCITATION DEVICE FOR THE NEWBORN)

Materials required



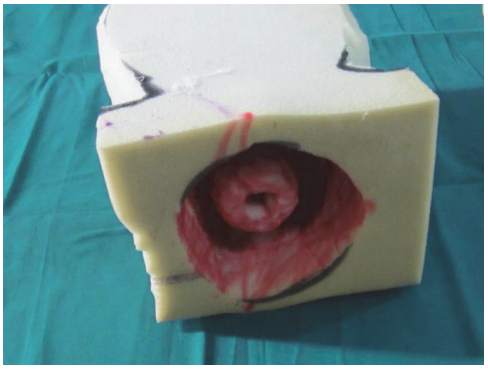
1. Small size plastic water bottle
2. One inch foam sheet
3. Adhesive glue
4. Tooth brush
5. Knife or cutter
6. Tape measure

Instructions

1. Measure 3 inches from the spout of the bottle down and mark.
2. Cut round the bottle on the mark made.
3. Cut 1” by 12” of the foam sheet.
4. Apply adhesive glue to one surface of the foam using the tooth brush.
5. Allow glue to dry.
6. Cover the cut edge of the piece of bottle with the spout.

FOAM UTERUS

Materials required



1. Thick foam cushion (approximately 24” x 24”); One cushion should be enough for approximately nine blocks.
2. Cutter or knife
3. Markers

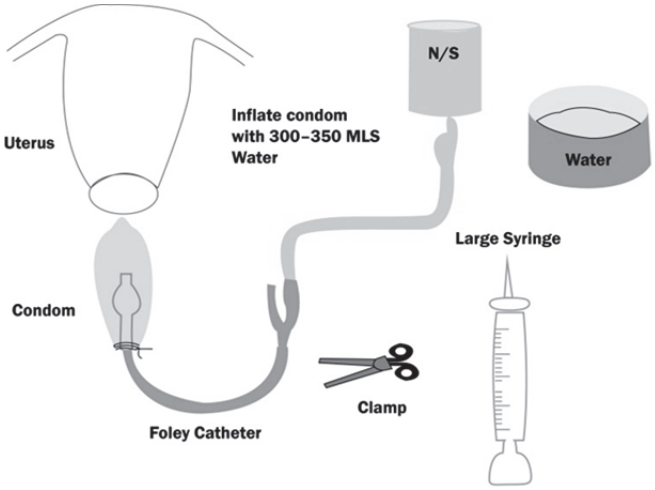
Procedure

1. Cut the foam up into blocks approximately 8”x8”.
2. Draw the shape of the uterus on the widest portion of the piece.
3. Shape the piece of foam out by cutting of the extra bits around the drawing.
4. Make a circle about 3 inches on the narrow side.
5. Cut out the circle and bore a hole into the foam deep enough to accommodate a fist.

CONDOM TAMPONADE FOR SEVERE POSTPARTUM HAEMORRHAGE (PPH)

Materials required

- Uterus model
- Normal saline/clean water (approximately 1 Litre) NOTE: in clinical setting would use 500ml saline IV
- Condom
- Foley catheter (#14 or 16)
- Ligature/string
- Large syringes (20-cc or larger)
- IV set
- Clock



Instructions

1. Place inner end of Foley catheter inside condom.
2. Using suture, securely tie condom to catheter.
3. Place condom inside uterine model.
4. Attach outer end of catheter to IV set with 500 ml fluid bag/bottle.
5. Infuse 250–500 ml fluid into condom until bleeding stops (or 250–500 ml with model).
6. Clamp catheter off.
7. Condom is held in place with vaginal packing.
8. When deflating condom (after 6–8 hours if patient stable), deflate gradually by withdrawing 50 ml fluid at a time, re-clamping to assess bleeding, etc.

HOW TO CREATE A SHARPS CONTAINER

If the school does not have access to premade sharps containers, the simulation lab staff should construct containers for the lab. It is recommended that the containers be made from sturdy plastic bottles. Each practice area where sharps are used should have a container that is conveniently available.

1. Look for a sturdy plastic bottle (2L to 4L) that is empty. Large soda bottles, detergent, or cleaner bottles are often readily available.
2. Using a permanent marker, draw a line around the circumference of the bottle at the point where the bottle would be three-quarters full.
3. Immediately above the line, write “DO NOT FILL ABOVE THIS LINE” with a permanent marker.
4. Also, clearly mark the container to read “BIOHAZARD” and “SHARPS DISPOSAL.”
5. Uncap the container, but reserve the cap to be used to close the container once it is full.

Appendix 5. Materials Tracking Forms

SIMULATORS AND MODELS

INVENTORY Date: Number of Stations Desired: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Simulators: List Make, Model, and Number of Each Type				
Gynecologic Simulators				
Make and model:				
Make and model:				
Make and model:				
Total # of gyn simulators				
Storage bags and/or drapes				
Birth Simulators				
Make and model:				
Make and model:				
Make and model:				
Total # of birth simulators				
Storage bags and/or drapes				
Newborn Resuscitation Simulators				
Make and model:				

INVENTORY Date: Number of Stations Desired: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Make and model:				
Make and model:				
Total # of newborn resuscitation simulators				
Storage bags and/or drapes				
Contraceptive Implant Simulators (including homemade)				
Make and model:				
Make and model:				
Make and model:				
Total # of implant simulators				
Storage bags and/or drapes				
Other Simulators				
Make and model:				
Make and model:				
Make and model:				
Make and model:				
Make and model:				

INVENTORY Date: Number of Stations Desired: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Storage bags and/or drapes				
Models				
Female reproductive system (circle all included on model): Uterus Pelvic floor Urinary system Make and model:				
Cervical dilatation make and model:				
Bony pelvis				
Foetal skull				
Breast make and model				
Non-resuscitation newborn dolls				
Adult manikin				
Other models				
Other models				
Other models				
Other models				
Storage bags and/or drapes				

EQUIPMENT AND SUPPLIES

INVENTORY **Date:** **Number of Stations Desired:** **Assessor Name:**	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
General Equipment				
Blackboard				
Whiteboard				
Flip chart				
Chalk/markers				
Cabinets with locks describe:				
Running water or covered bucket w/tap				
DVD player				
Television or screen w/ projector				
Posters				
Newborn resuscitation				
Name:				
Name:				
Name:				
Name:				

INVENTORY Date: Number of Stations Desired: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Individual Station Equipment				
Beds and/or tables acting as beds				
Trolley				
Dust bin				
Instrument holder/tray				
Plastic container for decontamination solution				
Sharps container (needle disposal)				
Bottle of talcum powder				
Lamp or other light source				
Instruments				
Speculum/Cusco				
Uterine sound				
Tenaculum				
Sponge forceps				
Long scissors (cord)				
Short episiotomy scissors				

INVENTORY **Date:** **Number of Stations Desired:** **Assessor Name:**	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Gallipots/kidney dish				
Scalpel blade				
Insertion trocar/plunger for contraceptive implants				
Mosquito forceps				
Full set of MVA cannulae				
MVA syringe				
Clamps (2x # of stations)				
Needle holder				
Tooth dissecting forceps				
Cheatle forceps (IP)				
Forceps holder (IP)				
Vacuum extractor and cups				

INVENTORY Date: Number of Stations Desired: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Other Basic Equipment and Supplies				
Thermometer				
Foetoscope				
BP apparatus				
Stethoscope				
Infant Ambu bag				
Small mask size 0 or 1				
Bulb syringe				
Linens (3x # of stations)				
Baby wrapper				
Tape measure				
Container for aspirate contents/products of conception (for PAC)				
Fine mesh strainer				
Newborn IV giving set				
Specimen container (for PAC)				

INVENTORY Date: Number of Stations Desired: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
FP and PAC				
Complete FP counselling packs containing: oral contraceptive pill packs, condoms, injectables, implants, IUDs				*If individual items are missing from any packs, do not count them as complete. Make notes here as to what items are missing.
Additional IUDs for insertion practice				
Additional implants for insertion practice				
Drugs and Reagents: Consider Simulating w/ Empty Bottles or Drawings				
Antiseptic				
1% lignocaine w/out adrenaline				
Oxytocin				
Bottles to represent various pills				
Something to represent newborn specimen bottles				
Urinalysis reagents tray				
Dextrostix				
Multistixs				
IP—Set up 1–2 Stations for Practice				
Mechanism for sterilization or high-level disinfection				
Clock or timer for disinfection exercises				

INVENTORY **Date:** **Number of Stations Desired:** **Assessor Name:**	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Drum/sterile/HLD towel where instruments are placed to dry and/or store after cleaning				
Sterile or HLD gloves				
Individual hand towel				
Hand soap				
Chlorine (Jik)				
Scrub brush for cleaning instruments				
Thick household rubber gloves				
Eye protection				
Apron				
Cap				
Gum boots				
Mask				

INVENTORY Date: Number of Stations Desired: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Consumables				
Pens				
2-cc syringe				
5-cc syringe				
10-cc syringe				
20-cc syringe				
20–21-gauge needles				
Cotton swabs				
Maternity pads				
Cord clamps/thread				
Gauze				
Suture				
Incontinent sheets				
Gloves				

CHECKLISTS, GUIDES, FORMS

STANDARD NUMBER (If using SBM-R standards)	LAMINATED SKILLS CHECKLISTS	DO SKILLS CHECKLISTS ALREADY EXIST? (Y/N)	MODEL THAT WILL BE USED
	FP counselling skills		Contraceptive samples; students role-playing patients
	IUD insertion and removal		ZOE
	Contraceptive implant		RITA or homemade arm model
	MVA		ZOE
	Birth simulation		MamaNatalie
	Episiotomy		Can pretend to perform during labor simulation, teach on foam models
	Newborn resuscitation (*consider Helping Babies Breathe training)		NeoNatalie
	Infection prevention		IP equipment – only need enough sterilizing gear for 1–2 stations, PPE for all stations
	Physical examination		Students to role-play patients on parts of exam, e.g., vital signs, as appropriate
	Vaginal exam		Can perform on ZOEs but won't be able to assess cervical dilatation/effacement
	Antenatal booking		Students role-play patients
	Immediate postnatal period		May include as part of birth simulation or separately as appropriate
	Instrumental delivery		Can use vacuums with MamaNatalie, but not forceps
	Admitting a sick baby		Role play with NeoNatalie or newborn doll
	Newborn exam		NeoNatalie or doll
	Postnatal exam		Students role-play for parts of exam such as history, vital signs, counseling, as appropriate; ZOE model has attachment for immediate postpartum uterus
	Breech delivery		MamaNatalie
	Cervical laceration		Can make a homemade sock model
	Manual removal of placenta		MamaNatalie, Childbirth Simulator
	Other Forms		

STANDARD NUMBER (If using SBM-R standards)	LAMINATED SKILLS CHECKLISTS	DO SKILLS CHECKLISTS ALREADY EXIST? (Y/N)	MODEL THAT WILL BE USED
	FP counselling kit		
	FP protocols		
	FP guidelines to assist in counselling		
	Infection prevention guidelines		
	Antenatal cards		
	Antenatal lab forms		
	Record sheets for postnatal exam		
	Hgb scale book		

MATERIALS TRACKING BY STATION

Simulators and Models

INVENTORY Date: Number of Stations: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Simulators: List Make, Model, and Number of Each Type				
Gynecologic Simulators				
Make and model:				
Make and model:				
Make and model:				
Total number of gyn simulators				
Storage bags and/or drapes				
Birth Simulators				
Make and model:				
Make and model:				
Make and model:				
Total number of birth simulators				
Storage bags and/or drapes				
Newborn Resuscitation Simulators				
Make and model:				
Make and model:				

INVENTORY Date: Number of Stations: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Simulators: List Make, Model, and Number of Each Type				
Make and model:				
Total number of newborn resuscitation simulators				
Storage bags and/or drapes				
Contraceptive Implant Simulators (including homemade)				
Make and model:				
Make and model:				
Make and model:				
Total number of implant simulators				
Storage bags and/or drapes				
Other Simulators				
Make and model:				
Make and model:				
Make and model:				
Make and model:				
Make and model:				

INVENTORY Date: Number of Stations: Assessor Name:	NUMBER PER STATION(S)	NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
Simulators: List Make, Model, and Number of Each Type				
Storage bags and/or drapes				
Models				
Female reproductive system (circle all included on model): Uterus Pelvic floor Urinary system Make and model:				
Cervical dilatation make and model:				
Bony pelvis	1			
Foetal skull	1			
Breast make and model:				
Non-resuscitation newborn dolls				
Adult manikin	1			
Other models				
Other models				
Storage bags and/or drapes				

Equipment and Supplies

INVENTORY Date: Number of Stations: Assessor Name:	STATION NUMBER								NUMBER PER STATION(S)	TOTAL NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
	1	2	3	4	5	6	7	8				
General Equipment:												
Blackboard												
Whiteboard												
Flip chart												
Chalk/markers												
Cabinets with locks; describe:												
Running water or covered bucket w/tap												
DVD player												
TV or screen w/projector												
Posters												
Newborn resuscitation												
Name:												
Name:												
Name:												
Name:												

INVENTORY Date: Number of Stations: Assessor Name:	STATION NUMBER								NUMBER PER STATION(S)	TOTAL NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
	1	2	3	4	5	6	7	8				
Individual Station Equipment												
Beds and/or tables acting as beds												
Trolley												
Dust bin												
Instrument holder/tray												
Plastic container for decontamination solution												
Sharps container (needle disposal)												
Bottle of talcum powder												
Lamp or other light source												
Instruments												
Speculum/Cusco												
Uterine sound												
Tenaculum												
Sponge forceps												
Long scissors (cord)												

INVENTORY Date: Number of Stations: Assessor Name:	STATION NUMBER								NUMBER PER STATION(S)	TOTAL NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
	1	2	3	4	5	6	7	8				
Short episiotomy scissors												
Gallipots/kidney dish												
Scalpel blade												
Insertion trocar/plunger for contraceptive implants												
Mosquito forceps												
Full set of MVA cannulae												
MVA syringe												
2 clamps/station												
Needle holder												
Tooth dissecting forceps												
Cheatle forceps (IP)												
Forceps holder (IP)												
Vacuum extractor and cups												

INVENTORY Date: Number of Stations: Assessor Name:	STATION NUMBER								NUMBER PER STATION(S)	TOTAL NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
	1	2	3	4	5	6	7	8				
Other Basic Equipment and Supplies												
Thermometer												
Foetoscope												
BP apparatus												
Stethoscope												
Infant Ambu bag												
Small mask size 0 or 1												
Bulb syringe												
3 lines/station												
Baby wrapper												
Tape measure												
Container for aspirate contents/products of conception (for PAC)												
Fine mesh strainer												
Specimen container (for PAC)												
Newborn IV giving set												

INVENTORY Date: Number of Stations: Assessor Name:	STATION NUMBER								NUMBER PER STATION(S)	TOTAL NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
	1	2	3	4	5	6	7	8				
FP and PAC:												
Complete FP counselling packs containing: oral contraceptive pill packs, condoms, injectables, implants, IUDs												* If individual items are missing from any packs, do not count them as complete. Make notes here as to what items are missing.
Additional IUDs for insertion practice												
Additional implants for insertion practice												
Drugs and Reagents: Consider Simulating w/Empty Bottles or Drawings												
Antiseptic												
1% lignocaine w/out adrenaline												
Oxytocin												
Bottles to represent various pills												
Something to represent newborn specimen bottles												
Urinalysis reagents tray												
Dextrostix												
Multistixs												

INVENTORY Date: Number of Stations: Assessor Name:	STATION NUMBER								NUMBER PER STATION(S)	TOTAL NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
	1	2	3	4	5	6	7	8				
IP—Set up 1–Stations for Practice												
Mechanism for sterilization or high-level disinfection												
Clock or timer for disinfection exercises												
Drum/sterile/HLD towel where instruments are placed to dry and/or store after cleaning												
Sterile or HLD gloves												
Individual hand towel												
Hand soap												
Chlorine (Jik)												
Scrub brush for cleaning instruments												
Thick household rubber gloves												
Eye protection												
Apron												
Cap												
Gum boots												

INVENTORY Date: Number of Stations: Assessor Name:	STATION NUMBER								NUMBER PER STATION(S)	TOTAL NUMBER IN LAB	GAP (NUMBER MISSING)	NOTES ON CONDITION OF SIMULATORS OR EQUIPMENT, MISSING OR TORN PARTS, AND PROCUREMENT PLAN
	1	2	3	4	5	6	7	8				
Mask												
Consumables												
Pens												
2-cc syringe												
5-cc syringe												
10-cc syringe												
20-cc syringe												
20–21-gauge needles												
Cotton swabs												
Maternity pads												
Cord clamps/thread												
Gauze												
Suture												
Incontinent sheets												
Gloves												

Checklists, Guides, Forms

STANDARD NUMBER (If using SBM-R standards)	LAMINATED SKILLS CHECKLISTS	DO SKILLS CHECKLISTS ALREADY EXIST? (Y/N)	MODEL THAT WILL BE USED
	FP counselling skills		Contraceptive samples; students role- playing patients
	IUD insertion and removal		ZOE
	Contraceptive implant		RITA arm model
	MVA		ZOE
	Birth simulation		MamaNatalie
	Episiotomy		Can pretend to perform during labor simulation, teach on foam models
	Newborn resuscitation (*consider Helping Babies Breathe training)		NeoNatalie
	Infection prevention		IP equipment – only need enough sterilizing gear for 1–2 stations, PPE for all stations
	Physical examination		Students to role-play patients on parts of exam, e.g., vital signs, as appropriate
	Vaginal exam		Can perform on ZOEs but won't be able to assess cervical dilatation/effacement
	Antenatal booking		Students role-play patients
	Immediate postnatal period		May include as part of birth simulation or separately as appropriate
	Instrumental delivery		Can use vacuums with MamaNatalie, but not forceps
	Admitting a sick baby		Role play with NeoNatalie or newborn doll
	Newborn exam		NeoNatalie or doll
	Postnatal exam		Students role-play for parts of exam such as history, vital signs, counseling, as appropriate; ZOE model has attachment for immediate postpartum uterus
	Breech delivery		MamaNatalie
	Cervical laceration		Can make a homemade sock model
	Manual removal of placenta		MamaNatalie, Childbirth Simulator
	Other Forms		

STANDARD NUMBER (If using SBM-R standards)	LAMINATED SKILLS CHECKLISTS	DO SKILLS CHECKLISTS ALREADY EXIST? (Y/N)	MODEL THAT WILL BE USED
	Family planning counselling kit		
	FP protocols		
	FP guidelines to assist in counselling		
	Infection prevention guidelines		
	Antenatal cards		
	Antenatal lab forms		
	Record sheets for postnatal exam		
	Hgb scale book		

Appendix 6: Forms

EXAMPLE OF INVENTORY REPORT FORM FOR CONSUMABLE SUPPLIES

ITEM NUMBER	NAME OF MATERIAL	AMOUNT ON HAND	NUMBER TO FLAG WHEN REPLENISHMENT IS NEEDED	SUPPLIER	DATE REORDERED	AMOUNT ORDERED	ESTIMATED DATE OF ARRIVAL	SIGNATURE/ DATE

Comments: *Include such things as variation in expected use rate and why (if known), any considerations about supplies' availability, and any foreseen changes in usage patterns such as change in class size, new/different skills taught. A copy of the completed form should be kept in the Simulation Lab binder.*

NAME OF SCHOOL: _____

SIMULATION LAB CODE OF BEHAVIOUR

Note: The following is an example of a basic document of expected behaviour. Institutions typically find it valuable to have some form of behaviour code or guideline. As with all guidelines in this manual, schools will want to adapt it for their own use and needs.

All users of the Clinical Simulation Laboratory must sign and follow the Clinical Simulation Lab Code of Behaviour (faculty, part-time clinical teachers and students)

1. In accordance with humanistic education, all manikins and models are to be treated with respect as though they are real clients. Models and manikins are to be handled gently and carefully, draped appropriately when used, and covered when not in use.
2. Students are to dress for simulation lab as if attending clinical. Name badges and uniform policies are enforced.
3. Tutors are responsible for supervising all students brought to the lab for tutor-led sessions.
4. Universal Precautions are to be followed at all times, as are all safety guidelines used in the clinical setting. Sharps and syringes are to be disposed of in appropriate containers. Anyone sustaining an injury must report immediately to the Simulation Lab Coordinator.
5. If the programme permits students to check out equipment from the simulation lab, all procedures for sign-out, use, and timely check-in must be strictly followed. Failure to do so may result in loss of privileges.
6. Supervision by faculty or staff (see Open Hours) is required for practicing skills.
7. Students may be digitally recorded during scenarios. Viewing of videos recorded during training is permitted only with faculty members. The videos are the property of the programme and students may not possess simulation lab videos or recordings.
8. Coats, backpacks, and other personal belongings are not to be brought to the simulation lab.
9. Personal electronic devices, including cell phones, are not to be used in the simulation lab.
10. Personal belongings (e.g., papers, pens, stethoscopes, pen lights, etc.) are to be removed after a simulation lab session.
11. Food and drink are not permitted in the labs.

Name (print)	Title (student/tutor/lab staff)	Signature/Date

REGISTRATION OF EQUIPMENT FORM

DATE	DESCRIPTION OF ITEM/CATALOG CODE	SOURCE	QUANTITY ORDERED	QUANTITY RECEIVED	COMMENTS	NAME/INITIALS OF PERSON REGISTERING

SIMULATION LAB COURSE RESERVATION REQUEST FORM

Please return completed form to the Simulation Lab Coordinator

Requested by (Name) _____ Date Requested _____

View simulation lab calendar for availability.

Course title _____ Number of students _____

DAY OF WEEK	DATE	START TIME (INCLUDING SET-UP)	FINISH TIME

Please notify the Simulation Lab Coordinator of any schedule changes or cancellations.

Please note any special requests or needs:

ONLY THE SIMULATION LAB COORDINATOR TO WRITE BELOW THIS LINE

Initial and date when completed:

_____ _____ Request received

_____ _____ Availability confirmed

_____ _____ Calendar updated

_____ _____ Confirmation given to requestor

SIMULATION LAB RESERVATION AND EQUIPMENT REQUEST FORM

Use one form per date requested

Date of request _____

Faculty requesting _____

Course name/number _____ Best contact number _____

Date simulation lab desired:_____ Start time: _____ End time: _____

Number of students per session _____ Number of sessions (if repeating) _____

Clinical content of session to be practiced (e.g., normal delivery, FP counselling):

Equipment needed (give amounts/numbers of each):

Supplies needed (give amounts):

Specific set-up required:

SIMULATION LAB USE LOG: SCHEDULED SESSIONS

DATE	TUTOR NAME AND SIGNATURE	COURSE	NUMBER OF STUDENTS	CHECK-IN TIME/INITIALS	CHECK-OUT TIME/INITIALS	RETURNED EQUIPMENT INSPECTION: STAFF INITIALS

SIMULATION LAB USE LOG: STUDENT SIGN-IN FOR SCHEDULED SESSIONS

DATE	TUTOR NAME	COURSE	STUDENT NAME (PRINT)	STUDENT SIGNATURE

MISSING/DAMAGED ITEMS REPORT FORM: (LOSS, DAMAGE, DESTRUCTION, OR EXCESSIVE CONSUMPTION)

Simulation lab staff: _____ Contact number: _____

Description of item: (Detailed, e.g., 6-inch mosquito forceps, curved)

The circumstances of how and when the property or materials were lost, stolen, damaged, destroyed, or excessively consumed:

Actions taken by Simulation Lab staff to locate missing item and results of those actions:

Steps taken to avoid future property loss, if needed:

_____ _____
Simulation Lab Coordinator Date

_____ _____
Simulation Lab Coordinator Date

Comments: (e.g., note if security incident report, any follow-up needed)

NAME OF INSTITUTION: _____

SIMULATION LAB OPEN LAB LOG

DATE	ATTENDEE (PLEASE PRINT)	PRACTICED ON (MODELS, SIMULATION, PROCEDURES)	SUPPLIES USED (GLOVES, SYRINGES, OTHER CONSUMABLES) *MAY WISH TO NOTE QUANTITIES	SIGNATURE	STAFF INITIALS

EVALUATION AND FEEDBACK FORM FOR THE SIMULATION LAB

Date lab used: _____ Course name/number: _____

Set-up: Was the lab set up in a way that facilitated the planned learning activities? Note if requested special set up.

Supplies: Were there sufficient supplies for the planned activities?

Were the lab staff able to assist with any questions?

Was the equipment in working order?

Were there any problems with supplies or equipment that needed repairing or replacing?

What supplies and equipment would you want to have available the next time you do this activity? (Please be detailed)

Other comments?

_____ _____

Instructor Completing Date

Thank you! Your feedback is important and will help us continue to improve the Simulation Lab.

Appendix 7. Example of a Schedule for Large Class

EXAMPLE OF MASTER CALENDAR FOR SIMULATION LAB COURSE

The example calendar is broken down by week and includes what students are expected to study as well as what tutors are expected to teach or facilitate. This course is taught to a large group of students, approximately 100–150. Cohorts or small groups of students are utilized as a way to make learning more accessible and provide all students with maximum hands-on practice in the simulation lab. This example has 16 groups/cohorts of students. A school with smaller classes could use the same basic template with fewer cohorts. This type of course calendar relies heavily on the mastery learning model, where learning is the responsibility of the student and multiple opportunities to learn and practice applying the learning in various settings is used. This calendar was developed by the Kumasi Nursing and Midwifery Training College in Kumasi, Ghana.

This example shows the IUD module of the family planning course, but any learning module would fit. The module is covered in the first 4 weeks of the 13-week course and includes orientation to the simulation lab on the first day. Note that each cohort has assigned study time (can be in classroom or other space) and scheduled simulation lab hours. The calendar also includes optional open hours. There is also time scheduled for faculty to supervise skills review and remediation if needed. Though this is only part of the schedule for the family planning course, it shows how the next topics are added.

WEEK	MODULES	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	IEC IUD	**HOUR 1:** **Orientation to course methods** Instruction packet, expectations, schedule **HOUR 2:** **Orientation to sim lab** **HOMEWORK:** **Read course book**	**HOMEWORK:** **Read course book**	**HOUR 1:** **Tutor-led discussion** **HOUR 2:** **Tutor-led sim lab** 1. Pelvic exam 2. Students practice with cohort	**WEEKEND HOMEWORK:** **Read course book** IUD **Complete quiz** IEC, Client screening, and IUD **Answer study questions** IEC, Client screening, and IUDs (May be done with study group) **Open sim lab** Independent practice (allow students to sign up for access times. Students may work in small groups of 2–4 people)	
2	IEC IUD	**SUBMIT:** Quiz/study questions **HOUR 1:** **Cohorts 1–4 sim lab** Training IUD placement and removal **Cohorts 5–8 study group** Complete IUD exercises **HOUR 2:** **Cohort 5–8 sim lab** Training IUD placement and removal **Cohorts 1–4 study group** Complete IUD exercises **HOURS 1/2:** **Cohorts 9–16 study group** Pair students to practice pre- and post-procedure patient counselling for IUD placement and removal	**HOMEWORK:** **Review** Answer to quiz and study questions	**HOUR 1:** **Cohorts 9–12 skills lab** Training, IUD placement and removal **Cohorts 13–16 study group** Complete IUD exercises **HOUR 2:** **Cohorts 13–16 sim lab** Training, IUD placement and removal **Cohort 9–12 study group** Complete IUD exercises **HOURS 1/2:** **Cohort 1–8 study group** Pair students to practice pre- and post-procedure patient counselling for IUD placement and removal	**WEEKEND HOMEWORK:** **Read course book** Follow-up clinical visit **Complete quiz** Follow-up clinical visit **Answer study questions** Follow-up clinical visits and IUD placement/removal (may be done with study group) **Open sim lab** Independent practice (allow students to sign up for access times. Students may work in small groups of 2–4 people)	

WEEK	MODULES	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
3	**IEC** **IUD** **EXAM 1** **IUD** **ASSESSMENT** **NFP** **LAM** **COC** **POP**	**SUBMIT:** Quiz/study questions **HOUR 1:** **Exam 1** **HOUR 2:** **Tutor-led discussion**	**HOMEWORK:** **Review** Answer to quiz and study questions **Read course book** Traditional methods **Complete quiz** NFP/LAM **Answer study questions** NFP/LAM	**SUBMIT:** Quiz/study questions **HOUR 1/2:** Students must participate in 2 hours in any combination of the following activities: **1. Remediation review** With tutor (as directed) OR **2. Study groups** Paired students practice pre- and post-procedure patient counselling for IUD placement and removal **3. Open sim lab** Independent practice (allow students to sign up for access)	**Friday only—Open sim lab** Independent practice (allow students to sign-up for access times. Students may work in small groups of 2–4 people) **WEEKEND HOMEWORK:** **Review** Answer to quiz and study questions **Read course book** OCP **Complete quiz** COC/POP **Answer study questions** COC/POP. (May be done in study groups)	**IUD Assessment** **Cohort 1–8**
4	**IUD** **IUD** **ASSESSMENT** **NFP** **LAM** **COC** **POP** **CIC** **POI** **IMPLANTS**	**SUBMIT:** Quiz/study questions **HOUR 1:** **Tutor-led discussion** Contraception: 1. Short-term 2. Long-term **HOUR 2:** Students must participate in 1 hour in any combination of the following activities **1. Remediation review** With tutor (as directed) OR **2. Study groups** Paired students practice counselling patient for NFP and LAM	**HOMEWORK:** **Review** Answer to quiz and study questions **Read course book** Injectable/ Implants **Complete quiz** CIC/POI/Implants **Answer study questions** CIC/POI/Implants. (May be done with study group)	**SUBMIT:** Quiz/study questions **HOUR 1/2:** Students must participate in 2 hours in any combination of the following activities: **1. Remediation review** With tutor (as directed) OR **2. Study groups** Paired students practice counselling patients for NFP/FAM OR Paired students practice pre and post procedure patient counselling for IUD placement and removal OR **3. Open sim lab** Independent practice (allow students to sign up for access)	**Friday only—Open sim lab** Independent practice (allow students to sign-up for access times. Students may work in small groups of 2–4 people) **WEEKEND HOMEWORK:** **Review** Answer to quiz and study questions **Read course book** Jadelle rods **Complete quiz** Jadelle rods **Answer study questions** Jadelle rods (may be done with study groups)	**IUD Assessment** **Cohorts 9–16**

Appendix 8. Example Overview Schedule of All Maintenance Activities

MAINTENANCE TASK	MODEL/EQUIPMENT	PERSON RESPONSIBLE	END OF CLASS OR OPEN HOURS	END OF DAY	EACH WEEK	EACH SEMESTER	EACH YEAR	AS NEEDED
Clean floor/table tops/windows/ cupboards/sink		Cleaner			X			X
Remove any trace of lubricant	Susie/Simon, Gynecological Simulator, Childbirth Simulator, Cervical Dilatation/Effacement Simulators	Student Assistant, Sim Lab Assistant	X					
Wipe down manikin/model and let dry	Susie/Simon, Gynecological Simulator, Childbirth Simulator, Venatech Trainer, Cervical Dilatation/Effacement Simulators, Penis Models	Sim Lab Assistant	X	X				X
	Breast Exam Simulator, CPR Models	Sim Lab Assistant				X		X
Empty and dry fluid reservoirs	Susie/Simon, Inject-Ed Injection Simulator, Venatech Trainer, MamaNatalie	Sim Lab Assistant		X				X
Store models (when clean and dry)	Susie/Simon, Gynecological Simulator, Childbirth Simulator, Venatech Trainer, Cervical Dilatation/Effacement Simulators, Breast Exam Simulator, CPR Models, Penis Models	Sim Lab Assistant		X				
Change CPR airway systems	CPR Models (airway changed after each individual user)	Sim Lab Assistant	X					
Dispose of sharps		Sim Lab Coordinator						X
Inspect condition of manikins and models	Susie/Simon, Gynecological Simulator, Birthing Simulator, Venatech Trainer, Breast Exam Simulator, Cervical, Inject-Ed Injection Simulator, CPR Models, Penis Models	Sim Lab Coordinator/ Sim Lab Assistant	X			X		X
Wash dirty linens and curtains						X		X
Inventory consumable supplies		Sim Lab Assistant			X			
Perform full inventory		Sim Lab Coordinator					X	X
Re-order supplies		Sim Lab Coordinator					X	X