PRONTO℠

Simulation and Team Training for Obstetric and Neonatal Emergencies

PRONTO℠
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Simulation and Team Training for Obsetric and Neonatal Emergencies

Module I

Participant Manual

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Web Resource:

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Click on "Resources for PRONTO Participants"

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TABLE OF CONTENTS

Acknowledgements

Introduction

PRONTO is an Obstetric and Neonatal Emergency Simulation Team Training Program. PRONTO uses an innovative simulation-based curriculum to guide interprofessional teams towards better collaboration and effcective emergency management. PRONTO was developed in response to the critical need for providers to be able to identify, respond to, and treat emergencies in an appropriate and timely manner. The program originated in Mexico in an effort to reduce maternal mortality and meet Millennium Development Goal (MDG) commitments.[1]

Numerous assessments of maternal mortality have shown that the quality of obstetric services, and more specifically immediate emergency response, is the key to reducing rates of both maternal and perinatal morbidity and mortality in the institutional setting. However, traditional training models--such as didactic sessions or the introduction of guidelines and protocols--have not achieved the desired impact on either maternal or neonatal indicators.

The U.S. commission responsible for evaluating and certifying hospitals has identified teamwork and simulations as key factors in preventing medical errors and improving emergency care.[2] Simulation is ideal for identifying the gaps in knowledge, clinical practice, and/or systemic infrastructure that can increase the rate of maternal and neonatal mortality. Therefore, instead of traditional training, PRONTO uses high-fidelity simulation combined with a variety of team-building and skill-strengthening activities based on the Team STEPPS model[3] to build effective interprofessional teams.

PRONTO is an adapatable training program designed specifically to strengthen interprofessional teams within team's actual clinical setting. The PRONTO team has been trained to adjust clinical scenarios, making the training useful for teams working at any level of clinic providing obstetric care: primary-level clinic, community hospital, or referral hospital. This type of training allows interprofessional teams to address clinical situations as they would occur in their actual clinical settings, and thus prevent untimely maternal and perinatal deaths through setting-specific, coordinated emergency response.

Through the use of simulation, the PRONTO program identifies potential system problems or latent errors, i.e. mistakes waiting to happen. Simulation places the interprofessional team in a virtual clinical situation so they can learn and practice how to work together efficiently to successfully respond to life-threatenening emergencies. PRONTO methodology gets to the root of the problems that affect obstetric and neonatal emergency care through improved interprofessional teamwork, enhanced coordination of the various clinical services, and clinic/hospital specific strategic planning.

Background

Globally maternal mortality is a major public health problem. Almost 350,000 maternal deaths occurred in 2008.[4] Neonatal mortality for 2010 was estimated at 3.1 million.[5] While there has been a general decrease in both maternal and neonatal mortality worldwide, many countries remain far from the Millennium Development Goals (MDGs) which aimed for reductions of three-fourths of maternal deaths and two-thirds of deaths of children under five between 1990 and 2015.[6]

Overall, the frequency of maternal deaths in absolute numbers is low compared with other public health problems. However, in societal terms, the death of a woman has far reaching consequences such as collapse of the family structure, high infant mortality and morbidity, school absence, malnutrition, and premature entry of children into the workforce.[7]

Skilled-birth attendance is a proven intervention for decreasing maternal mortality. The World Health Organization (WHO) and other international organizations have made great strides towards the goal of assuring that all women have access to skilled-birth attendance. The initial designation of a provider as as "skilled-birth attendant" is determined by a competency-based set of criteria. However, effective, proven strategies to ensure birth attendants acquire and maintain these competencies are lacking. In a 2010 report on education of health professionals for the 21st century, Frenk et al. describe the failing state of medical education:

"The problems are systemic: mismatch of competencies to patient and population needs; poor teamwork; persistent gender stratification of professional status; narrow technical focus without broader contextual understanding; and weak leadership to improve health-system performance" [8]

PRONTO directly responds to this call for reform in medical education and training. PRONTO trains interprofessional teams, not individuals, in the management of basic obstetric and neonatal emergencies and adapts the training to the particular needs of the clinical settings, the interprofessional participants, and the unique patient populations. Initial data indicates that this type of simulation-based, team-training is effective in improving emergency response in health care settings outside the U.S.[9]

This Manual

Module I of PRONTO:

- Section 1 – Simulation Methodology and Training Objectives
- Section 2 – Teamwork Training
- Section 3 – PRONTO Resources and Concepts
- Appendices – Algorithms for the management of obstetric and neonatal emergencies.

As you work through this manual, you will participate in interactive exercises, activities, and simulations. There are areas set aside in this manual for you to take notes on what you learn. Please use the spaces to organize your material so that it is useful to you outside this training. Your manual and all of the alorithims can be used in an emergency to ground you in evidence-based practice and team communication.

Module I focuses on:

- Teamwork
- Obstetric Hemorrhage
- Neonatal Resuscitation

Acronyms

MVA	Manual Vacuum Aspiration
PPH	Postpartum Hemorrhage
AMTSL	Active Management of the Third Stage of Labor
EBM	Evidence-Based Medicine
MDGs	Millennium Development Goals
DCC	Delayed Cord Clamping
PRONTO	The Program for Simulation and Team Training for Obstetric and Neonatal Emergencies
NR	Neonatal Resuscitation
SBAR	Situation/Background/Assessment/Recommendation (Communication Technique)
Team STEPPS	U.S. Government teamwork training curriculum

1. INTRODUCTION TO THE METHOD OF SIMULATION

Obstetric and neonatal emergencies occur infrequently yet require an immediate, coordinated response. Health care professionals lack the opportunity for repetitive practice of the technical and behavioral skills necessary for the management of emergencies. Simulation allows participants the opportunity to work as a team to respond to emergencies in a "live setting." Through simulated emergencies, professionals can practice how to act, interact, and communicate as a team during an actual obstetric or neonatal emergency.

Simulation is a learning methodology adapted from aviation where precision and communication are essential for safety. Its main objectives are to increase knowledge, solidify skills, and build leadership to ensure the effective mobilization of resources and appropriate coordination of health care.[10]

By using simulation PRONTO aims to immerse the participant in a situation (scenario) which replicates the real environment with enough authenticity to allow the participant to believe it is true.

Simulation methodology includes video recording to accurately capture the behavior of the team in an emergency. Immediate video review by participants allows for team debriefing and personal reflection. During this review, participants can discuss the scenario and the team's functioning in a supportive learning environment.

Simulation has been studied worldwide and is credited for helping to identify major system and team errors that threaten patient safety.[11][12] PRONTO simulation training has been used internationally to help hospital teams identify unique challenges, strategize solutions, and practice the implementation of changes in communication and team functioning within the safe environment of the simulation. For example, PRONTO participants have identified common medication errors and deficences such as improper storage of medication, lack of availability of blood in cases of PPH, failure to use oxytocin in AMTSL, and lack of availability and use of magnesium sulfate in cases of severe pre-eclampsia.

1.1 What Is Simulation?

Simulation is a training system that allows participants to practice clinical skills in a safe way without being judged and without adverse impact on real patients. In high-fidelity simulation, visual, auditory, and tactile tools are used to reproduce a clinical situation to make it seem as real as possible.

1.2 Why Simulation?

Simulation has proven useful with interprofessional teams to refine cognitive, technical, and communication skills. Simulation offers teams the unique opportunity to identify problems in their systems that often inhibit a rapid and effective response to emergency situations. Through simulation, health care personnel are exposed to clinical situations that are rare but require precise coordination of care.

Simulation methodology stimulates all the senses and targets the various ways people learn and remember:[1]

People remember…

10% of what they read	Read
20% of what they hear	Listen to words
30% of what they see	See photos, videos
50% of what they hear AND see	See a demonstration
70% of what they say or write	Give an interactive presentation
90% of what they do	Do a simulation

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
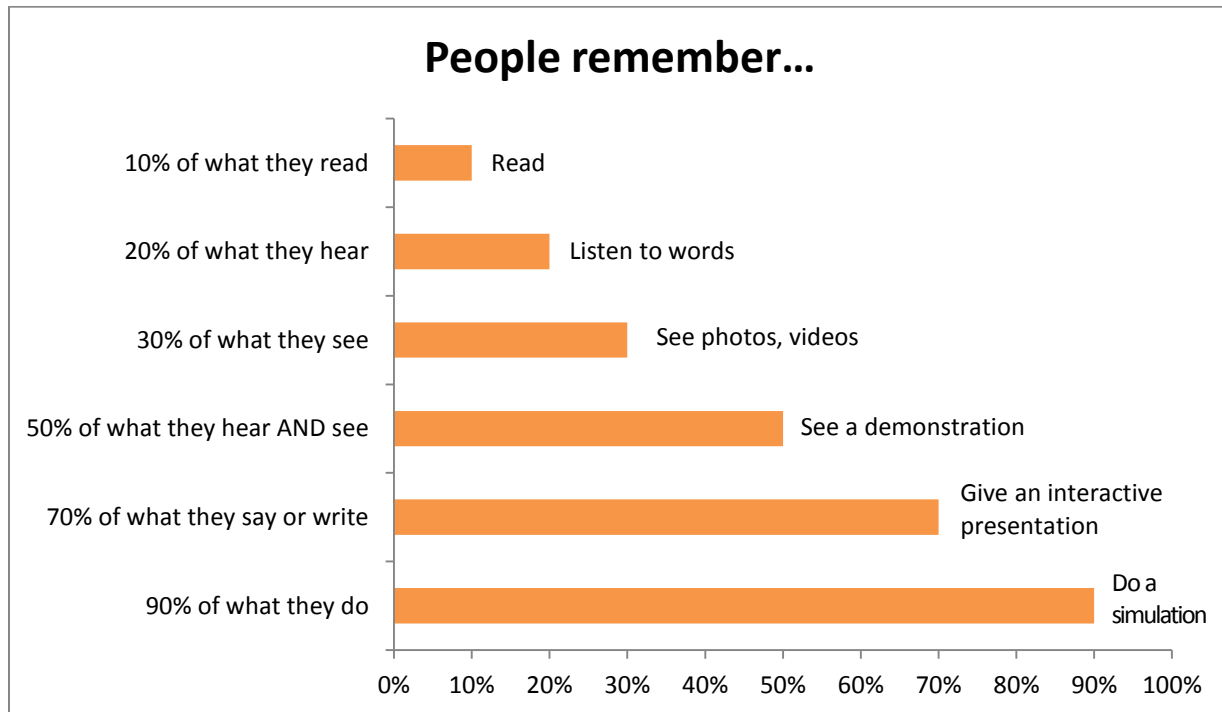
1.3 What Makes Good Simulation-Based Training?

Good simulation-based training replicates real-life situations as closely as possible. First is the creation of the scenario. Ideally PRONTO simulations will occur in your actual clinical setting. However, if this is impossible due to patient flow, the PRONTO team will set up a place that replicates your workplace environment as closely as possible. This means that all of the equipment normally found in a hospital must be available (beds, sterile sheets, infection control equipment such as masks, gowns, sharps containers, delivery equipment, instruments, etc.) and disposables (gloves, intravenous equipment, IV fluids, medicine, syringes, and needles). Making the scenarios true to life also requires bodily fluids (blood, amniotic fluid, and meconium). These are created by the PRONTO team with synthetic agents (gelatin, artificial colors, and green porridge). Most importantly, for successful simulation, one needs a woman in labor and a newborn to care for. PRONTO training uses hybrid simulation models in which a real woman plays the role of the patient. This woman wears a birth simulator (PartoPants™) that allows her to birth and develop complications in a very realistic manner. We also use a newborn mannequin to allow providers to have a very real experience in the initial care and resuscitation of a neonate.

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[1] Graphic adapted from: Wiman, R. V. & Meierhenry, W. C. (Eds.). (1969). Educational media: Theory into practice. Columbus, OH: Merrill.

1.4 What Are the Elements of Simulation-Based Training?

Every PRONTO training has following basic elements:

1. Pre-brief

The simulation segment of your training starts with a focused discussion to prepare your teams for participation in the simulations. You will be asked to "suspend your disbelief" and act as you would in a real emergency.

Then the PRONTO trainers will orient you to the simulation room. You will be given time to familiarize yourself with the site and learn where to find all of the equipment.

2. Video-recorded scenarios

Your team will participant in a 7 to 10 minute clinical scenario in which you must manage an emergency as you would in reality, utilizing hospital resources, relying on the different members of your team, and performing technical skills. You will be given information before the scenario about the particular patient's condition and medical history. Each scenario is different and designed to challenge your thinking and teamwork skills.

3. Debriefing

Immediately after each simulation, the PRONTO trainers will project the video recording of the scenario. The participants and observers will take part in an open and constructive discussion about the case and the teamwork skills demonstrated. The PRONTO facilitator serves as a guide to group-led discussion, making sure that you, the participant, recognize the cognitive, technical, and behavioral objectives of each scenario.

Note: During the simulation, you will be asked to assume the role you have at the hospital. For example, we would not ask a nurse to "play" the role of the doctor, or that a pediatrician "play" the role of an anesthesiologist. The only people who act in different roles, depending on the scenario, are the members of the PRONTO team who are directing the simulation and have to act in a specific role in the scenario, such as playing the family member of the patient. The participants should experience the scenario as themselves. There is no acting in simulation.

2. TEAMWORK TRAINING

Effective teamwork is an integral part of emergency obstetric care. Over the last 10 years, research on significant medical errors in the U.S. has shown that a lack of communication among providers[13] is most often the cause of the problem. Teams that communicate effectively and are mutually supportive have a decreased potential for error, resulting in better performance and increased patient safety.[14]

Developed by the U.S. government, the Team STEPPS curricula aims to ensure patient safety and decrease medical errors by strengthing the way an interprofessional team functions.[15] PRONTO incorporates elements of the Team STEPPS program to help resolve problems with improved team communication and functioning.

2.1 Team Building

Even if the individual members of the team are capable, motivated professionals, they are vulnerable to making mistakes. The strength of a team and its cohesiveness is expressed in the solidarity and sense of belonging felt by the team members. The more cohesiveness a group is, the more likely the group will share the common values, attitudes, and behavioral norms which lead to a better functioning team.

A team that works well together is rewarding not only for the individual, but for the entire team. Effective teamwork results in greater member satisfaction, makes members more social, and also teaches members to respect the ideas of others and recognize the need to be actively supportive of each other.

There are many advantages of teamwork, for the individual as well as for the organization:

FOR THE INDIVIDUAL

- Difficult work is shared, and therefore less stressful.
- The responsibility for finding solutions is shared.
- It is more gratifying to be part of a job well done.
- Economic incentives and professional recognition are shared.
- Decisions made by the team as a whole are more widely accepted than decisions made by one individual.
- More information is available.
- Group work allows different points of view to be considered when it is time to make a decision - enriching work and minimizing frustration.
- Opinions can be shared while respecting the ideas of others.
- More rapid and coordinated response is achieved in emergencies.

- Enhanced quality of work since decisions are made by consent.
- A collective spirit of commitment is fostered within the organization.
- Institutional spending is reduced.
- More knowledge and information exists.
- New ways to address problems are developed.
- Decisions made are better understood.
- Diverse points of view are expressed.

2.2 Barriers to Effective Care (Team STEPPS)

1. Conflict
2. Lack of coordination and follow-up with colleagues
3. Distraction
4. Hierarchy
5. Defensiveness
6. Complacency
7. Fatigue
8. Workload
9. Apathy
10. Differences in styles of communication
11. Misinterpretation of cues
12. Lack of clarity of roles
13. Constant rotation of team members
14. Lack of time
15. Lack of information sharing

3. PRONTO ACTIVITIES

3.1 Schedule, Module I

Module I
PRONTO Day 1
Duration: 8 hours

Time (approx.)	Activity
10 min	Participant Registration
10 min	Evaluations
10 min	Welcome Ceremony Presentation of the Training Team
15 min	PRONTO Presentation
5 min	Interactive Activity: Leave Your Worries at the Door
5 min	Group Rules
15 min	Participant Introductions
30 min	Interactive Activity: Connections
45 min	Teamwork and Concepts of Communication
15 min	Break
45 min	Case Study: Neonatal Resuscitation
20 min	Case Study: Obstetric Hemorrhage
30 min	Review AMTSL
60 min	Exercise: Skill Stations Interactive Activity: Contaminated Waste
20 min	Break and Preparation
15 min	Simulation – Pre-Brief
60 min	Simulation Area Orientation Simulation 1
40 min	Simulation 2
10 min	Recap

Module I
PRONTO Day 2
Duration: 7.5 hours

Time (approx.)	Activity
10 min	Review of the Prior Day/Questions
40 min	Interactive Activity: Observations Interactive Activity: Leadership
20 min	Review: Concepts of Communication
10 min	Simulation Preparation
35 min	Simulation 3
35 min	Simulation 4
30 min	Break and Snack
30 min	Interactive Activity: Telephone
30 min	Simulation 5
15 min	Group Recharger
30 min	Simulation 6
30 min	Break and Snack
30 min	Interactive Activity: EBM Knowledge Game
60 min	Exercise: Hospital Strategic Planning
5 min	Interactive Activity: Making Changes
30 min	Evaluations

3.2 Group Rules

Group rules help create a safe environment within which team members can achieve their goals. Please take a moment to reflect on what rules will make you feel comfortable participating. Remember that:

1. This training should be a safe space for improving skills for working together as a team.
2. "What happens in simulation stays in simulation." This allows people to grow and learn as a team, without having to consider repercussions. We encourage you to share your learning and insights with others. However, information about individual participant behavior or response is to stay within the group and not be shared. This is the concept of confidentiality.

In the table below, write down the rules that your group has established:

Our Group Rules:

1.
2.
3.
4.
5.
6.
7.
8.

3.3 Teamwork Goals

Highly functioning teams have four characteristics. All members:

1. Share a clear vision of the plan.
2. Utilize concise, structured communication techniques.
3. Adapt swiftly to changing situations.
4. Maximize the use of information, skills, and resources to obtain optimal results.

3.4 Four Competencies

There are four competency areas that will improve performance, safety, and quality of care in your clinical setting:

1. **Leadership**: Being able to direct, coordinate, assign tasks, motivate members of the team, and facilitate optimum performance.
2. **Situation Monitoring**: Developing a common understanding about the environment. This involves constantly scanning the environment for changes and sharing those changes with the team. This is a shared mental model, meaning all members of the team are "on the same page."
3. **Mutual Support**: Anticipating the needs of other group members. Mutual support implies that you know what others do and distribute work evenly to achieve balance during stressful, busy times.
4. **Communication**: Effectively sharing information between team members.

We will explore these concepts throughout the training through interactive activities and during the simulations. Try to identify good examples of Leadership, Situation Monitoring, Mutual Support, and Communcation during the training and share your observations with the group.

3.5 Communication Concepts

The following communication concepts are modified from the evidence from Team STEPPS. TeamSTEPPS is a program of the US government which looks to improve team communication and functioning. Interprofessional teams who use these communication techniques are able to avoid medical error and respond more efficiently during and emergency. These techniques, like clinical skills, take practice. During the training you will have the opportunity to practice these concepts with your team members. After this training you will have to continue to practice them until they become routine.

1. **SBAR**
2. **Call-Out**
3. **Check-Back**
4. **Think Outloud**
5. **The Two-Challenge Rule**
6. **Debriefing**

3.5.1 SBAR

SBAR is a technique for rapidly communicating critical patient information. Use the SBAR anytime a new member of the team enters the room, or when the patient situation changes.

SBAR stands for:

Situation
Background
Assessment
Recommendation/Request

Situation: What is happening to the patient?
"Mrs.Kwamboka in bed 2 is bleeding and feels dizzy."

Background: The clinical context or relevant medical history of the patient.
"The patient is a 32-year-old Gravida 4 Para 3003, two hours status post a vaginal delivery complicated by a second degree laceration. She does not have any other problems."

Assessment: What do you think is the problem?
"I think her bleeding is caused by uterine atony."

Recommendation/Request: What can be done to intervene?
"I believe this patient needs to be evaluated right now. Are you available to come evaluate the patient?"

Now practice SBAR with your neighbor.

3.5.2 Call-Out

Call-Out is a quick way of communicating critical information. It enables the whole team to know the severity of the situation quickly and to begin to allocate attention appropriately. When the urgency of the situation is verbalized, everyone knows where the case is headed. It is also a way to keep a team apprised of key clinical information. Examples of call-out communiation include:

- *"The patient is bleeding!"*
- *"The baby has been born!"*
- *"The baby is not crying!"*
- *"There is meconium in the amniotic fluid!"*

Now practice the Call-Out with your neighbor.

3.5.3 Check-Back

Unlike open-air orders, check-back ensures that the message reaches the appropriate person and that it is appropriately responded to. It is a strategy used to communicate critically important information, and assigns important responsibilities to a specific individual.

Using check-back to close the loop of communication ensures that the information expressed is understood by the person receiving it:

- The transmitter sends the message.
- The receiver accepts the message and provides feedback.
- The transmitter verifies that the message was received correctly.

For example:

- Doctor: *"Administer 10 units of oxytocin IM."*
- Nurse: *"10 units of oxytocin IM."*
- Doctor: *"Correct."*

Now practice check-back communication with your neighbor.

3.5.4 Think Outloud

Think outloud means anyone on the team can verbalize his/her actions actions. Say outloud what you are doing, feeling, or seeing in order to:

- Inform all members of the team simultaneously of the state of the emergency.
- Help team members to anticipate the next steps.

For example: *"The bleeding continues and her blood loss is 1000 ml. I'm going to perform bimanual compression…. Her uterus does not have any clots and is firming up."*

3.5.5 The Two-Challenge Rule

The Two-Challenge Rule is a communication tool adapted from the aviation industry and tested in medical centers by the program Team STEPPS. It is a good way to resolve conflicts and maintain patient safety. The Two-Challenge Rule states that if a subordinate detects an error or problem that could lead to a dangerous situation, he/she can challenge authority, repeating his/her concern two times. If the superior does not respond to the call on the second occasion, the subordinate can automatically request another person's help in resolving the problem. This allows subordinates to protect the patient without fear of reproach.

It is your responsibility to firmly express your concern at least two times to make sure you have been heard. If the person still does not acknowledge your point or think twice about the order, you can speak more firmly. Say "I'm worried and I'm concerned. This is a patient safety issue." If you are still ignored, you may go to a supervisor or superior in the chain-of-command.

If you are the leader in the situation and you hear your team member repeat his/her concern two times, you should stop and re-think your order or course of action, because it is a patient safety matter.

This allows any member of the team to "break the chain" if he/she suspects or discovers any threat to patient safety.

For example:

- Doctor: *"Administer 0.2 mg of ergonovine IM."*
- Nurse: *"Are you sure, Doctor? This woman is hypertensive and I believe you shouldn't give ergonovine to a hypertensive woman."*

If the superior does not respond, or if he/she asks that you proceed with the order, you ask for clarification again.

- Doctor: *"I am the one who gives the orders, and I'm ordering 0.2 mg of ergonovine immediately! Can't you see that she is bleeding?"*
- Nurse: *"Yes, Doctor, but she is not bleeding heavily and I'm worried about giving her a medication that could be dangerous for her. I can obtain more oxytocin if you wish."*

If the request is still denied, you can choose to go to a superior to contest the issue.

Now practice the Two-Challenge Rule with your neighbor.

3.6 Strenghtening the Team

1. Brief – Planning (3-5 minutes)

Gather your team at the beginning of every shift. This quick meeting allows you to see who is part of your team, assign essential roles, establish expectations, foresee outcomes, and review possible contingency plans. You may also repeat this when necessary, for example, after receiving a call about a patient being referred from another hospital, or when a patient arrives in critical condition.

During the brief, the team should address the following questions:

___ Who is on the team? Who is missing?

___ Do all members understand and agree upon goals?

___ Are roles and responsibilities understood?

___ What is our plan of care?

___ What is staff and provider availability throughout the shift?

___ What is the workload among team members?

___ What resources are available?

2. Huddle – Problem solving (2-3 minutes)

This is a quick regroup of the team. The team may do this as needed to re-establish situational awareness, reinforce the established plans, and evaluate the need to adjust those plans. Also huddle when the situation is getting chaotic and you need to regroup.

3. Debrief – Feedback to improve the team in the future (5 minutes)

After each obstetric or neonatal emergency in your hospital, you should have a debriefing with all members of the medical team with the goal of improving communication in the future. Feedback must be:

- *Timely* — Given soon after the emergency as possible.
- *Respectful* — Focused on behaviors, not personal attributes.
- *Specific* — Specific about what behaviors need correcting.
- *Directed towards improvement* — Provides direction for future improvement.
- *Considerate* — Negative information delilvered with fairness and respect.

The team should address the following questions during a debrief:

___ Was our communication clear?

___ Were our roles and responsibilities understood?

___ Did we maintain situation awareness?

___ Did we distribute the work equally?

___ Did we call for help soon enough? Did help arrive?

___ Did we make any errors? Did we prevent any errors?

___ Did we have all the resources we needed?

___ What went well, what could have gone better, and what should we improve?

3.7   10 Key Behavioral Skills

1. Know your environment.
2. Anticipate and plan for problems.
3. Assume a leadership role.
4. Communicate effectively with your team, the patient, and their family members.
5. Distribute workload and delegate responsibility optimally.
6. Allocate attention wisely.
7. Utilize all available information.
8. Utilize all available resources.
9. Recognize limitations and call for help early enough.
10. Maintain professional behavior.

Stanford CAPE Center, Stanford University,2008

3.8 Exercise 1: Skills Stations

Use the area below to take notes on the skills stations so that you can remember what you learn.

Skill	Notes
Neonatal Resuscitation	
Estimating Blood Loss	
Manual Vacuum Aspiration	
B-Lynch Suture Technique	
Bimanual Compression	
Uterine Tamponade, Other Maneuvers	

3.9 Ground Rules for Simulation

For the PRONTO training to be successful, we ask that you:

1. Suspend your disbelief.
2. Have an open mind.
3. Promise to maintain confidentiality.
4. Allow mistakes to be made in order to learn from them.
5. Be open with the other participants.
6. Work as a team without worrying about personal ego.

3.10 Characteristics of a Good Leader (Team STEPPS)

- Organizes the team.
- Articulates clear goals.
- Makes decisions after considering the suggestions of all the team members.
- Motivates member participation, but also confronts members when appropriate.
- Promotes and facilitates teamwork.
- Is capable of resolving conflicts.

3.11 Situation Monitoring – Activity: Observations

In the following table, write down your responses to the facilitator's questions:

1.	6.
2.	7.
3.	8.
4.	9.
5.	10.

3.12 Exercise: Strategic Planning

The objective of this exercise is to discuss and integrate what was learned in the simulations and activities. The information shared here will remain anonymous in the final report/recommendations that will be presented to the hospital administrators.

Small group work (20 minutes)

In your small groups please reflect on the simulations and brainstorm with your team about the following 4 questions. After 20 minutes the whole group will come back togetner and we will discuss problems and soulations as a big goup. Please be as specific as possible, as the goal is to end up with a clear plan for making changes here in your clinic/hospital.

1. What problems were revealed during the simulations?
2. What changes can be made to address these problems?
3. What are some barriers to making these changes?
4. What action plan can be developed to work towards a solution to these problems?
    Include the WHO, WHAT, WHERE, WHEN and HOW.

Large group work (40 minutes)

Return to the large group discussion. Facilitators will guide you on the establishment of a strategic plan, with a clear timeline and deligation of responsibilities – this plan will help you implement the changes that you have identified.

| Goal	How?	Who?
1.		
2.		
3.		
4.		
5.		
6.		
7.		

3.13 Simulation Notes

Use the space below to take notes during the simulation and debrief. This will help you gather your thoughts for the debrief and also help you come back, at a later date, to the information that you learned in the simulations.

Simulation	Topic	Notes
1.		
2.		
3.		
4.		
5.		
6.		

Appendix 1: Active Management of the Third Stage of Labor (AMTSL) for All Women
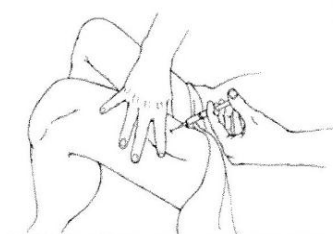
Administration of a uterotonic drug[1]

1. **Administration of a uterotonic drug** (ten international units (IU) of oxytocin administered by intramuscular (IM) injection is the uterotonic of choice).

   Before performing AMTSL, the provider will gently palpate the woman's abdomen to rule out the presence of another baby. At this point, the provider will NOT massage the uterus.

   If there is not another baby, the provider will begin the procedure by giving the woman a uterotonic drug (oxytocin 10 IU IM, Syntometrine 1 mL IM, ergometrine 0.2 mg IM, or misoprostol 600 mcg orally). This should be done within one minute of childbirth.
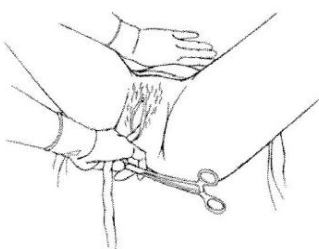
Applying controlled cord traction with counter traction to support the uterus[10]

2. **Controlled cord traction (CCT)**: Controlled traction on the cord during a contraction combined with counter-traction upward on the uterus with the provider's hand placed immediately above the symphysis pubis. CCT facilitates expulsion of the placenta once it has separated from the uterine wall.
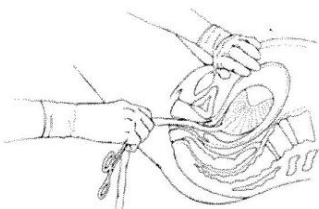
Applying controlled cord traction with counter traction to support the uterus[8]

Countertraction (counter pressure): The action of lifting or elevating the uterus toward the mother's head during CCT to help prevent uterine inversion.

Massaging the uterus immediately after the placenta delivers[11]

3. **Uterine massage**: An action used after the delivery of the placenta in which the provider places one hand on top of the uterus to rub or knead the uterus until it is firm. Sometimes blood and clots are expelled during uterine massage.

USAID FROM THE AMERICAN PEOPLE

MCHIP | Maternal and Child Health Integrated Program
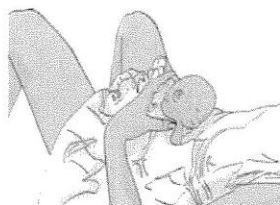
1: Dry the baby, assess the baby's breathing and perform resuscitation if needed, and place the baby in skin-to-skin contact with the mother

2: Administer a uterotonic (the uterotonic of choice is oxytocin 10 IU IM) immediately after birth of the baby, and after ruling out the presence of another baby.

3: Clamp and cut the cord after cord pulsations have ceased or approximately 2-3 minutes after birth of the baby, whichever comes first.

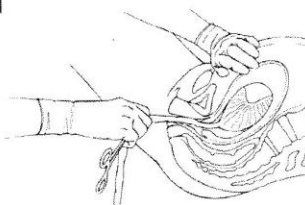WAIT!   OK!
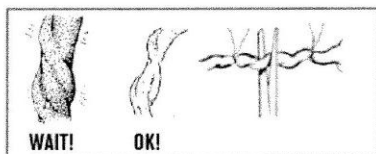
4: Place the infant directly on the mother's chest, prone, with the newborn's skin touching the mother's skin. Cover the baby's head with a cap or cloth.
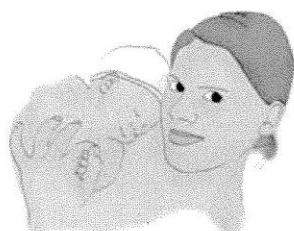
5: Perform controlled cord traction while, at the same time, supporting the uterus by applying external pressure on the uterus in an upward direction towards the woman's head.

6. Massage the uterus immediately after delivery of the placenta and membranes until it is firm.

During recovery, assist the woman to breastfeed if this is her choice, monitor the newborn and woman closely, palpate the uterus through the abdomen every 15 minutes for two hours to make sure it is firm and monitor the amount of vaginal bleeding. Provide PMTCT care as needed.
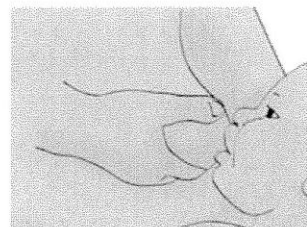
...at every birth, by every skilled provider.

USAID
FROM THE AMERICAN PEOPLE

POPPHI
Prevention of Postpartum
Hemorrhage Initiative

Pan American
Health
Organization
Regional Office of the
World Health Organization
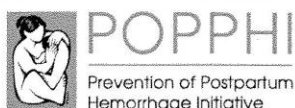
Appendix 3: Guide for Neonatal Resuscitation

Initial Evaluation

Assess for risk factors
Is the baby full term?
Is the amniotic fluid clear?

Assess if newborn is vigorous
Is the baby breathing or crying?
Does the baby have good tone?
Is the baby's heart rate >100?

Yes

No

Provide Routine Care
♦ Keep warm
♦ Clear airway
♦ Dry

Initial Resuscitation
30 Seconds
♦ Place under a source of radiant heat
♦ Open airway with suction and positioning
♦ Dry and stimulate

Evaluation
Respiratory Effort, Heart Rate (HR), Color

Breathing/Crying, HR >100, Pink

Apnea or HR <100 or Central Cyanosis

Evaluate periodically and provide routine care

Positive Pressure Ventilation (PPV)
30 Seconds
Using a bag and mask at rate of 40-60 bpm
"Breathe-two-three"

Evaluation
Respiratory Effort, Heart Rate (HR), Color

Breathing/Crying, HR >100, Pink

HR<60

HR > 60 and improving

Gradually discontinue PPV

Chest Compressions (CC)
30 Seconds
PPV + CC at 90 compressions/min
"And-ONE-and-TWO-and-THREE- and-Breathe"

Evaluation
Respiratory Effort, Heart Rate (HR), Color

Breathing/Crying, HR >100, Pink

HR<60

HR > 60 and improving

Administer Medications
Follow Appendix: Medications for Neonatal Resuscitation

SBAR

SBAR is a technique for rapidly communicating critical patient information. Use the SBAR anytime a new member of the team enters the room, or when the patient situation changes. SBAR stands for:

Situation
Background
Assessment
Recommendation/Request

Situation: What is happening to the patient?
"Mrs.Kwamboka in bed 2 is bleeding and feels dizzy."
Background: The clinical context or relevant medical history of the patient.
"The patient is a 32-year-old Gravida 4 Para 3003, two hours status post a vaginal delivery complicated by a second degree laceration. She does not have any other problems."
Assessment: What do you think is the problem?
"I think her bleeding is caused by uterine atony."
Recommendation/Request: What can be done to intervene?
"I believe this patient needs to be evaluated right now. Are you available to come evaluate the patient?"
Now practice SBAR with your neighbor.

Call-Out

Call-Out is a quick way of communicating critical information. It enables the whole team to know the severity of the situation quickly and to begin to allocate attention appropriately. When the urgency of the situation is verbalized, everyone knows where the case is headed. It is also a way to keep a team apprised of key clinical information. Examples of call-out communiation include:

- "The patient is bleeding!"
- "The baby has been born!"
- "The baby is not crying!"
- "There is meconium in the amniotic fluid!"

Check-Back

Unlike open-air orders, check-back ensures that the message reaches the appropriate person and that it is appropriately responded to. It is a strategy used to communicate critically important information, and assigns important responsibilities to a specific individual.

Using check-back to close the loop of communication ensures that the information expressed is understood by the person receiving it:

The transmitter sends the message.
The receiver accepts the message and provides feedback.
The transmitter verifies that the message was received correctly.
For example:

Doctor: *"Administer 10 units of oxytocin IM."*
Nurse: *"10 units of oxytocin IM."*
Doctor: *"Correct."*

Think Outloud

Think outloud means anyone on the team can verbalize his/her actions actions. Say outloud what you are doing, feeling, or seeing in order to:

- Inform all members of the team simultaneously of the state of the emergency.
- Help team members to anticipate the next steps.

For example: *"The bleeding continues and her blood loss is 1000 ml. I'm going to perform bimanual compression…. Her uterus does not have any clots and is firming up."*

The Two-Challenge Rule

The Two-Challenge Rule is a communication tool adapted from the aviation industry and tested in medical centers by the program Team STEPPS. It is a good way to resolve conflicts and maintain patient safety. The Two-Challenge Rule states that if a subordinate detects an error or problem that could lead to a dangerous situation, he/she can challenge authority, repeating his/her concern two times. If the superior does not respond to the call on the second occasion, the subordinate can automatically request another person's help in resolving the problem. This allows subordinates to protect the patient without fear of reproach.

It is your responsibility to firmly express your concern at least two times to make sure you have been heard. If the person still does not acknowledge your point or think twice about the order, you can speak more firmly. Say "I'm worried and I'm concerned. This is a patient safety issue." If you are still ignored, you may go to a supervisor or superior in the chain-of-command.

If you are the leader in the situation and you hear your team member repeat his/her concern two times, you should stop and re-think your order or course of action, because it is a patient safety matter.
This allows any member of the team to "break the chain" if he/she suspects or discovers any threat to patient safety.

For example:
- Doctor: *"Administer 0.2 mg of ergonovine IM."*
- Nurse: *"Are you sure, Doctor? This woman is hypertensive and I believe you shouldn't give ergonovine to a hypertensive woman."*

If the superior does not respond, or if he/she asks that you proceed with the order, you ask for clarification again.
- Doctor*: "I am the one who gives the orders, and I'm ordering 0.2 mg of ergonovine immediately! Can't you see that she is bleeding?"*
- Nurse: *"Yes, Doctor, but she is not bleeding heavily and I'm worried about giving her a medication that could be dangerous for her. I can obtain more oxytocin if you wish."*

If the request is still denied, you can choose to go to a superior to contest the issue.

Basic Emergency Response

☐ Ask for help

☐ Check the airway/ Check breathing

☐ Administer oxygen (mask)

☐ Obtain IV Access with a #14 or #16 catheter

☐ Initiate and replace volume (crystalloids – 3 to 1)

*Caution in women with pre-eclampsia, anemia, cardiac disease

☐ Watch her vital signs (BP, temp, respirations, and pulse)

☐ Empty the bladder with an indwelling catheter: measure output

☐ Consider the need for a blood transfusion

☐ Send labs →

- CBC
- PT & PTT
- Fibrinogen
- Platelets
- Blood type & screen

Goals
Hemoglobin between 7-10 gr/dL
Platelets >100,000
INR <1.5
Fibrinogen >100m gr/dL
Mean arterial pressure ≥ 65mm Hg
Urine output >30ml / hour

☐ Maintain body temperature

*If she is bleeding postpartum, initiate the Uterine Atony Algorithm

Obstetric Hemorrhage
≥ 500 ml

Institute Basic Emergency Care

See Algorithm: Basic Emergency Care

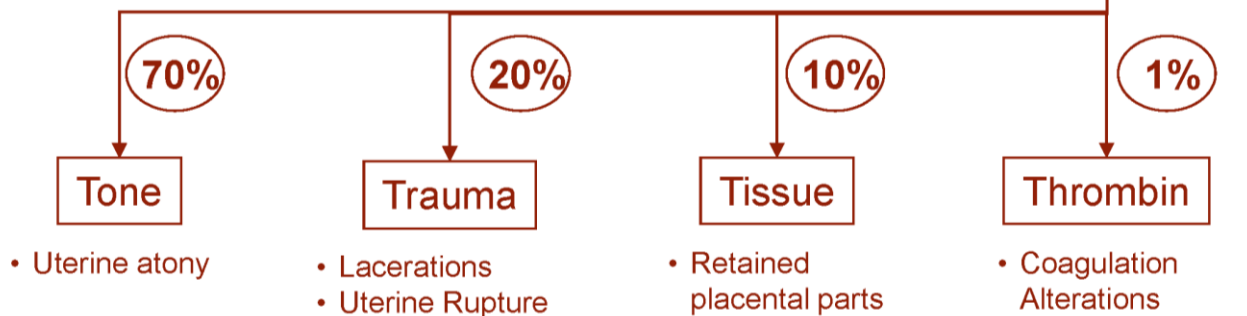------------------------- Diagnose the Problem -------------------------

1st Trimester
- Abortion
- Ectopic
- Molar

2nd and 3rd Trimester
- Placenta Previa
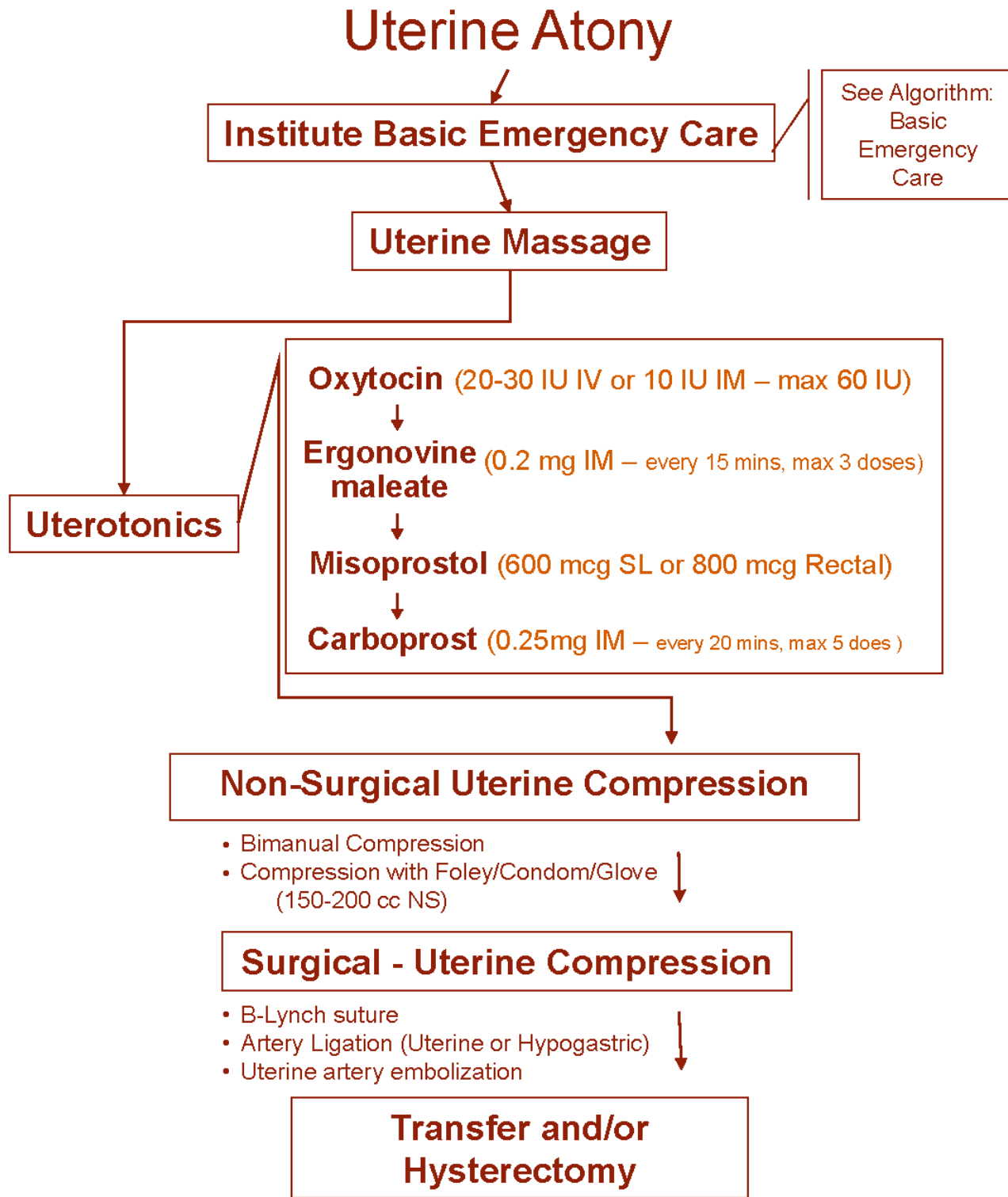- Uterine Rupture
- Placental Abruption

Postpartum

(70%) → **Tone**
- Uterine atony

(20%) → **Trauma**
- Lacerations
- Uterine Rupture

(10%) → **Tissue**
- Retained placental parts

(1%) → **Thrombin**
- Coagulation Alterations

-------------------- Treat the Cause --------------------

- Massage
- Uterotonics
- Compression
- Surgical

→ **Uterine Atony Algorithm**

- Repair
- Surgical
- Transfer for surgical intervention

- Management of retained placenta
- Prophylactic Antibiotics

- Volume replacement
- Blood and blood product Transfusion
- Stabilize and Transfer

Uterine Atony

Institute Basic Emergency Care

See Algorithm: Basic Emergency Care

Uterine Massage

Uterotonics

Oxytocin (20-30 IU IV or 10 IU IM – max 60 IU)

↓

Ergonovine maleate (0.2 mg IM – every 15 mins, max 3 doses)

↓

Misoprostol (600 mcg SL or 800 mcg Rectal)

↓

Carboprost (0.25mg IM – every 20 mins, max 5 does)

Non-Surgical Uterine Compression

- Bimanual Compression
- Compression with Foley/Condom/Glove (150-200 cc NS)

Surgical - Uterine Compression

- B-Lynch suture
- Artery Ligation (Uterine or Hypogastric)
- Uterine artery embolization

Transfer and/or Hysterectomy

Appendix 8: Management of Hypovolemic Shock

Estimation of blood loss, according to the level of shock						
Volume loss (%) and mL, for a pregnant woman between 50-70Kg	Neurological Status	Perfusion	Pulse	Systolic blood pressure	Stage of Shock	Amount of IV crystalloid to replace in the 1st hour
10-15% 500-1000mL	Normal	Normal	60-90	Normal	Compensated	None
16-25% 1000-1500mL	Normal and or agitated	Pale/cold	91-100	80-90	Mild	3000 to 4500mL
26-35% 1500-2000mL	Agitated	Pale, cold and diaphoretic	101-120	70-80	Moderate	4500 to 6000mL
Greater than 35% 2000-3000mL	Lethargic, unconscious	Pale, cold and diaphoretic with prolonged capillary refill	Greater than 120	Less than 70	Severe	Greater than 6000mL

Modifed from Baskett. PJF. ABC of major trauma. Management of hypovolemic shock. BMJ 1990;300: 1453-7.

Appendix 9: Uterotonic Medications

Medication	Route/Dose	Frequency	Observations	Requirements for storage
Oxytocin	IV: 10-40 units in 1 liter of Physiologic Solution or Normal Saline IM: 10 units	Continuous 60 units maximum	Effective within 2-3 minutes Can be used in all women Caution with using oxytocin with excessive amounts of IV fluids	Store between 15˚C and 25˚C Storage in the delivery room at room temperature (30˚C) over a year's time leads to a 14% decrease in efficacy Not destabilized by light
Carboprost	IM: 0.25 mg	Every 20 minutes 5 dose maximum		
Ergonovine maleate	IM: 0.2 mg	Every 20-30 minutes 3 dose maximum	Effective within 2-5 minutes The effect lasts 2-4 hours Contraindicated in hypertension, eclampsia and migraine-sufferers	Store between 2˚C and 8˚C Protect from light and from freezing Requires strict conditions for storage and handling
Misoprostol	Sublingual: 600 mcg Rectal: 800-1000 mcg	Once	Effective within 9-12 minutes Side effects: shivering, nausea, fever, diarrhea	Keep in at room temperature in a closed container

Modified from Dildy G.A. Y Clark S.L. 1993; Velez-Alvarez, G.A, et al. 2009); Pathfinder, 2010.

Appendix 10: Instant Coagulation Test

Instant coagulation test
Place 2 ml of venous blood in a clean 10 mm test tube.
Hold the tube in a closed fist (+37˚ C).
After more than four minutes, turn the tube to the side to see if there are any clots that have formed.
Then check every minute until you can turn the tube upside down without the blood dripping down.

The absence of clot formation or a soft clot beyond 7 min indicates COAGULOPATHY.

Modified from Dildy G.A. Y Clark S.L. 1993; Velez-Alvarez, G.A, et al. 2009); Pathfinder, 2010.

Appendix 11: Assigning APGAR

APGAR

Apgar is a method used to evaluate the baby after birth to determine the degree to which it has adapted to the extrauterine environment.

The evaluation is done at the 1st and 5th minute of life. If the APGAR at the 5th minute of life is less than 7, you should continue to evaluate the baby every five minutes until you get to 7.

Sign	0 points	1 point	2 points
Respiratory Effort	Absent	Slow or irregular, gasping, weak cry	Strong cry
Heart Rate	Absent	$\leq$ 100 beats per minute	> 100 beats per minute
Color	Pale or blue	Body pink with blue extremities	Pink throughout
Tone	Floppy and flaccid tone	Some tone	Active movement
Irritability/reflexes	Doesn't react to stimulation	Grimace	Strong cry

0 – 3   Severe neonatal depression

4 – 6   Moderate neonatal depression

7 – 10   Lack of problem in adjusting to the extrauterine environment

APGAR should not be used to guide steps related to neonatal resuscitation.

Appendix 12: Medications for Neonatal Resuscitation

Medications for Neonatal Resuscitation				
Medications	Concentration	Route	Dose/Preparation	Speed/Precautions
Epinephrine **Warning:** **2 ROUTES** **2 DOSES**	1:10,000	Umbilical vein	0.1 to 0.3 mL/kg IV In 1 mL syringe	Give rapidly Flush with .5 to 1 ml of saline to ensure that the medication rapidly enters circulation
	1:10,000	OK to administer through ET tube while establishing IV access	0.3 a 1 mL/kg through endotracheal tube In a 3 or 5 mL syringe	Give rapidly Give directly through ET tube following various respirations with positive pressure ventilation.
Volume expanders	Normal Saline Acceptable to give Hartmann's Solution or packed red blood cells	Umbilical vein	10 mL/kg Load the estimated volume into a syringe	Give over 5 to 10 minutes. Use syringe or infusion pump.

Modified from the American Academy of Pediatrics. NRP Trainer Guide. 2009

# Steps for Performing Manual Vacuum Aspiration (MVA) Using the Ipas MVA Plus® and Ipas EasyGrip® Cannulae

Step One: Prepare Instruments

- Position the plunger all the way inside the cylinder.
- Have collar stop in place with tabs in the cylinder holes.
- Push valve buttons down and forward until they lock (1).
- Pull plunger back until arms snap outward and catch on cylinder base (2).
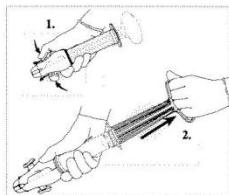
Step Two: Prepare the Patient

- Ask the woman to empty her bladder.
- Conduct a bimanual exam to confirm uterine size and position.
- Insert speculum and conduct speculum exam to confirm findings of clinical assessment.
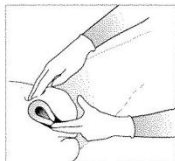
Step Three: Perform Cervical Antiseptic Prep

- Follow no-touch technique – no insrument that enters the uterus can contact contaminated surfaces before insertion through the cervix.
- Use antiseptic-soaked sponge to clean cervical os.
- Start at os and spiral outward without retracing areas.
- Continue until os has been completely covered by antiseptic.
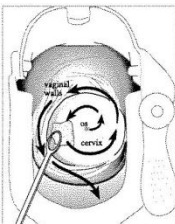
Step Four: Perform Paracervical Block

- Paracervical block is recommended when mechanical dilatation is required with MVA.
- Using local protocols, administer paracervical block and place tenaculum.
- Use lowest anesthetic dose possible to avoid toxicity – for example, if using lidocaine, the recommended dose is less than 200mg/person.
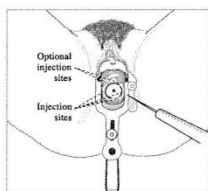
Step Five: Dilate Cervix

- If cervix is insufficiently dilated, use mechanical dilators or progressively larger cannulae to dilate.
- Dilate cervix to allow a cannula approximate to the uterine size to fit snugly through the os.

Step Six: Insert Cannula

- While applying traction to tenaculum, insert cannula through the cervix, just past the os and into the uterine cavity or until it touches the fundus, and then withdraw it slightly.
- Do not insert the cannula forcefully.
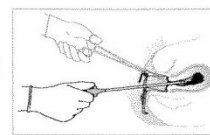
Step Seven: Suction Uterine Contents

- Attach the prepared aspirator to the cannula.
- Release the vacuum by pressing the buttons.
- Evacuate the contents of the uterus by gently and slowly rotating the cannula 180° in each direction, using an in-and-out motion.
- When finished, depress the buttons, detach cannula or withdraw.
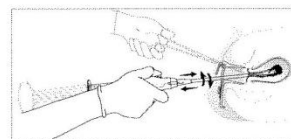
Signs that indicate the uterus is empty:

- Red or pink foam without tissue is seen passing through the cannula.
- A gritty sensation is felt as the cannula passes over the surface of the evacuated uterus.
- The uterus contracts around or grips the cannula.
- The patient complains of cramping or pain, indicating that the uterus is contracting.

Step Eight: Inspect Tissue

- Empty the contents of the aspirator into a container.
- Inspect tissue for products of conception, complete evacuation and molar pregnancy.
- If inspection is inconclusive, strain material, float in water or vinegar and view with a light from beneath.

Step Nine: Perform Any Concurrent Procedures

- When procedure is complete, proceed with contraception or other procedures, such as IUD insertion or cervical tear repair.

Step Ten: Process Instruments

- When procedure is complete, immediately process or discard all instruments, including the aspirator and cannulae, according to local protocols.

Notes

[1] http://www.un.org/millenniumgoals

[2] http://www.jointcommission.org

[3] http://teamstepps.ahrq.gov

[4] Hogan, M. C., Foreman, K. J., Naghavi, M., Ahn, S. Y., Wang, M., Makela, S. M., et al. (2010). Maternal mortality for 181 countries, 1980—2008: a systematic analysis of progress towards Millennium Development Goal 5. *The Lancet, 375*, 9726, 1609-1623. doi:10.1016/S0140-6736(10)60518-1

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[12] Ziv, A., Ben-David, S. & Ziv, M. (2005). Simulation Based Medical Education: an opportunity to learn from errors. *Medical Teacher, 27,* 3, 193-199 doi:10.1080/01421590500126718

[13] http://www.jointcommission.org

[14] SSM Health Care's Foundation of Safety and Care. STEPPS: Producing Effective Medical Teams to Achieve Optimal Patient Outcomes AHRQ Annual Conference Sept. 10, 2008.

[15] Ibid.