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Institute of Nutrition of Central America and Panama (INCAP/PAHO)

Quetzaltenango Health Area

Management of Obstetric and Neonatal Emergencies in Community Health Centers

Quetzaltenango Maternal and Neonatal Health Project

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Guatemala, 1993

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MANAGEMENT OF OBSTETRIC AND NEONATAL EMERGENCIES IN COMMUNITY HEALTH CENTERS

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INTRODUCTION

This document was prepared for community health services with the objective of decreasing maternal and peri-neonatal mortality. It is part of a systematic approach to improve maternal and neonatal care at all levels (The Quetzaltenango Maternal and Neonatal Health Project -Appendix 2-). Included are protocols for the management of those obstetric and neonatal complications that produce the most deaths in mothers and newborns of the rural Guatemalan highlands. The principal causes of maternal mortality are hemorrhage, sepsis, and pre-eclampsia/eclampsia. The principal causes of mortality in the peri-neonatal period are: asphyxia due to prolonged labor and malpresentation, sepsis, and complications due to prematurity and low birthweight. For each complication, we present:

1. **What is it?**
   A brief definition of the complication.

2. **Signs and symptoms of the complication.**

3. **What questions must be asked of the patient?**
   History of the complication.

4. **What to evaluate in the patient?**
   The physical exam that must be performed.

5. **Referral criteria**
   At what point the patient should be referred to the hospital.

6. **Management**
   How to manage the case in the community before and after the referral.
   What to do if the family does not agree to the hospital referral.

7. **Important considerations**
   A few key aspects of the complication are mentioned.

In the first version of this document, very few medications and treatments for use at the level of the health centers and posts were included. The reasons for this are that health centers and posts have very little medicine at their disposal. Furthermore, in the Quetzaltenango Health Area the maximum travel time by vehicle to a hospital is not more than 4-5 hours.

In other health districts and in other countries, the distances and geographical conditions common to rural areas do not allow for referrals to reach a hospital rapidly. This second version of the document, therefore, contains treatments that can be used at the community level, keeping in mind that many health centers and posts may not have the medications mentioned here. Most of the medications mentioned here could, however, be obtained through coordination with the Ministry of Public Health or with other organizations that work in the health sector, or through the participation of the community. We want to emphasize that **MUCH CARE MUST BE TAKEN** in giving any of the medications and/or treatments, and the patient's condition must be constantly monitored.

To begin, a summary of the most essential aspects of normal prenatal, postpartum and newborn care is presented. Protocols for managing obstetric and neonatal emergencies then follow.

A. PROTOCOLS FOR THE MANAGEMENT OF PRENATAL, POSTPARTUM AND NEONATAL CARE

NORMAL PRENATAL CARE

WHAT IS NORMAL PRENATAL CARE

Prenatal care is attention given to the pregnant woman. The objective is early detection and prevention of problems, appropriate treatment, and referral if necessary.

WHAT TO ASK THE PATIENT

1. Age
2. History of previous pregnancies:
   - number of pregnancies
   - previous cesarian sections
3. Date of last menstrual period
4. Edema: hands/face/feet
5. Hemorrhage
6. Premature rupture of membranes
7. Premature labor
8. Signs & symptoms of pre-eclampsia: headache, visual problems, nausea, vomiting, epigastric pain

WHAT TO EVALUATE IN THE PATIENT

1. Blood pressure (sitting)
2. Last menstrual period: calculate gestational age and estimate date of delivery
3. Fundal height
4. Fetal position, number of fetuses (twins)
5. Fetal heart rate
6. Edema: hands/face/lower extremities

REFERRAL CRITERIA

Women with the following conditions should be referred to the hospital for evaluation or delivery:

1. Twins, triplets
2. Hemorrhage
3. Pre-eclampsia
4. Previous cesarian section
5. Premature labor
6. Premature rupture of membranes
7. Malpresentation

MANAGEMENT

EDUCATION FOR THE MOTHER

Risk indicators in pregnancy:

1. Edema, hands/face
2. Twins
3. Hemorrhage
4. Malpresentation
5. Premature labor
6. Premature rupture of membranes
7. Previous cesarian section

Risk indicators in labor:

1. Prolonged labor
2. Postpartum hemorrhage
3. Postpartum infection

MEDICATIONS

Prenatal multivitamin and iron supplements should be taken by all patients at all stages of pregnancy.

IMPORTANT CONSIDERATIONS

1. Always try to check the blood pressure at least once in the seventh, eighth and ninth months, when pre-eclampsia may occur.
2. Always try to check the baby's position in the ninth month. The baby's position is unlikely to change during the last two or three weeks. If the baby is not in the cephalic position (head down) in the ninth month, the patient should be referred to the hospital for delivery.

NORMAL POSTPARTUM CARE

WHAT IS NORMAL POSTPARTUM CARE

Normal postpartum care is the attention given to a woman from the moment she gives birth until 6 weeks after. The goal of postpartum care is early detection and prevention of problems, appropriate treatment, and referral if necessary.

WHAT TO ASK THE PATIENT

1. How many days have passed since she gave birth
2. Type of delivery
3. Place where delivery occurred
4. Who attended the delivery
5. History of fever
6. History of hemorrhage
7. History of foul smelling lochia
8. History of abdominal pain
9. Abnormalities in the breasts
10. Newborn's condition

WHAT TO EVALUATE IN THE PATIENT

1. Temperature, blood pressure, heart rate
2. Lochia
3. Abdominal pain
4. Uterine involution
5. Breasts

REFERRAL CRITERIA

Refer patients with signs of infection or hemorrhage to the hospital (see protocols for postpartum hemorrhage and postpartum infection).

MANAGEMENT

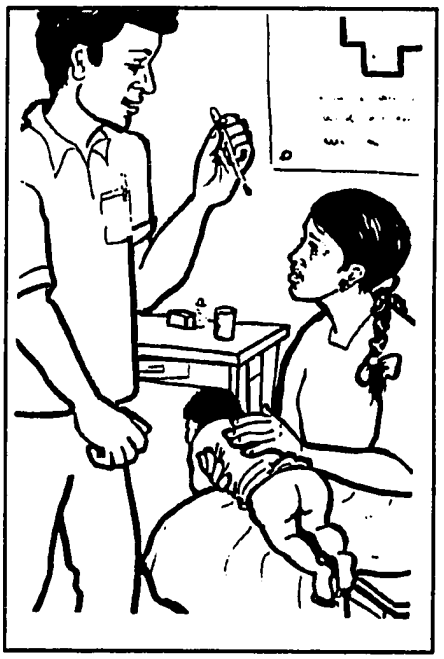
EDUCATION FOR THE MOTHER

1. Personal hygiene
2. Adequate nutrition
3. Breastfeeding techniques
4. Postpartum danger signs:
   - Fever
   - Hemorrhage
   - Abdominal pain
   - Foul smelling lochia

MEDICATIONS

Multivitamin and iron supplements should be taken by all patients.

NORMAL NEWBORN CARE



WHAT IS NORMAL NEWBORN CARE

Newborn care is attention given to a newborn baby from the moment of birth until the baby is three months old. The goal of newborn care is early detection and prevention of problems, appropriate treatment, and referral if necessary.

WHAT TO ASK THE PATIENT

1. Baby's age in days
2. Place where birth occurred
3. Type of birth
4. Who attended the birth?
5. Has the baby had a fever?
6. How is the baby's cry?
7. Is the baby active?
8. Is the baby breastfeeding well?
9. How is the baby's breathing?
10. Is the baby sad, unhappy, irritable?

WHAT TO EVALUATE IN THE PATIENT

1. Age in days
2. Weight
3. Temperature
4. Cry
5. Activity
6. Suction (breastfeeding)
7. Breathing
8. Gestational age at birth

REFERRAL CRITERIA

Refer to the hospital any baby who has signs of infection, prematurity or asphyxia (see Protocols) or if any other abnormality exists.

MANAGEMENT

EDUCATION FOR THE MOTHER

1. Breastfeeding techniques
2. Exclusive breastfeeding
3. Keeping baby warm and clean
4. Risk indicators in the newborn:
   - Abnormal crying
   - Abnormal temperature
   - Abnormal activity
   - Abnormal sucking (breastfeeding)
   - Abnormal breathing

MEDICATIONS

None

B. PROTOCOLS FOR THE MANAGEMENT OF OBSTETRIC EMERGENCIES

PROTOCOL FOR THE MANAGEMENT OF ABORTION OR THREATENED ABORTION

WHAT IS ABORTION OR THREATENED ABORTION

Abortion is the termination of pregnancy during the first six months of gestation (28 weeks).

Threatened abortion exists when there is light to moderate hemorrhage without loss of the baby, during the first six months of pregnancy.

SIGNS AND SYMPTOMS

Abortion:

* Hemorrhage (moderate to heavy)
* Pain similar to labor (contractions)
* Expulsion of the products of pregnancy

Threatened abortion:

* Light vaginal hemorrhage (like a menstrual period)
* Mild lower back and abdominal pain
* No expulsion of products of pregnancy. The baby remains alive.

WHAT TO ASK THE PATIENT

1. When did the bleeding start? Is it a lot or a little?
2. Do you have pain? Where? When did it start? How bad is it?
3. Have you passed anything resembling a piece of skin or meat (placental fragments)?
4. Have you had a fever?

WHAT TO EVALUATE IN THE PATIENT

1. Look **OUTSIDE** the vagina to see if there is bleeding and if so, how much.
2. Look at the underwear to see what type of discharge the woman has passed.
3. Take her temperature to see if she has a fever.
4. Take her blood pressure and pulse.

REFERRAL CRITERIA

Any amount of hemorrhage is abnormal during pregnancy. **All** pregnant patients with hemorrhage must be referred to the hospital. The amount of blood seen on the outside is not representative of the internal problems that may exist.

MANAGEMENT

Referral process:

1. Explain everything to the family.
2. Refer the patient to the hospital with a referral note.
3. If available, begin i.v. solutions (saline, Hartman's). If no i.v. solutions are available, give liquids p.o. Continue hydrating the patient during transport.
4. If possible, bring two people to the hospital to donate blood.

If the family does not agree to referral:

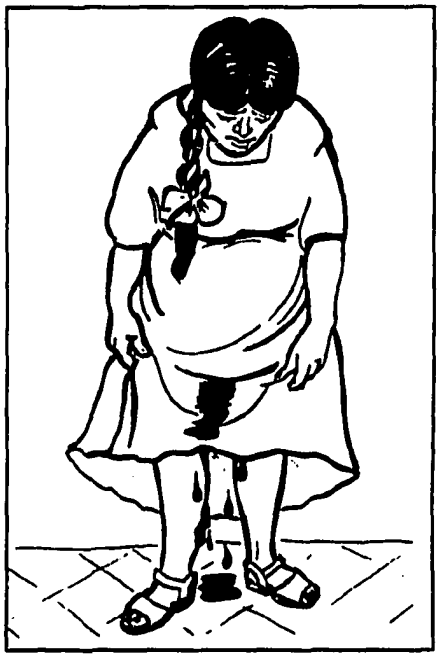
1. Explain to the family and the midwife the danger that the mother and the baby face.
2. Recommend absolute bedrest.

3. Begin i.v. fluids if personnel are available to monitor the patient in the health center or post. Give i.v. fluids (saline, Hartman's) until the bleeding stops. If it is not possible to administer i.v. fluids, it is very important to give p.o. fluids.
4. Pelvic rest (no sexual relations).

IMPORTANT CONSIDERATIONS

1. When there is hemorrhage in pregnancy, the mother's and the baby's lives may be in danger.
2. The blood pressure and pulse must be closely monitored to detect hypotension secondary to hemorrhage.
3. If the patient does not lose the pregnancy, the delivery must take place in the hospital.
4. Investigate, when possible, to see whether the termination of the pregnancy was provoked. If it appears to be a provoked abortion, treat it like a septic abortion (see protocol for septic abortion).
5. If a fever or foul smelling vaginal discharge exists, see protocol for septic abortion.

PROTOCOL FOR THE MANAGEMENT OF SEPTIC ABORTION



WHAT IS SEPTIC ABORTION

Septic abortion is pregnancy loss during the first six months of gestation with secondary infection.

SIGNS AND SYMPTOMS

1. Hemorrhage (may be light, moderate or heavy).
2. Pains similar to labor (contractions).
3. Lower abdominal pain.
4. Passage of tissue (placental fragments).
5. Fever.
6. Foul-smelling vaginal blood or discharge.

WHAT TO ASK THE PATIENT

1. When did the bleeding start? Is it a lot or a little?
2. Do you have pain? Where? When did it start? How bad is it?
3. Have you passed anything resembling a piece of skin or meat (placental fragments)?
4. Was this a provoked abortion? Ask this with sensitivity and discretion.
5. Have you noticed a foul odor in the blood or discharge?
6. Have you had a fever or chills?

WHAT TO EVALUATE IN THE PATIENT

1. Look **OUTSIDE** the vagina to see if there is bleeding and if so, how much.
2. Look at and smell the underwear.
3. Take her temperature to see if she has a fever or is hypothermic.
4. Take her blood pressure and pulse.
5. Check the odor of the vaginal blood or discharge.

REFERRAL CRITERIA

Abortion always places the mother's life in danger. If it is a septic abortion, the danger is much greater. The patient must be referred to the hospital so that a curettage can be performed. Curettage is the most important part of treatment together with the administration of antibiotics.

MANAGEMENT

Referral process:

1. Explain everything to the family.
2. Refer the patient to the hospital with a referral note.
3. Begin i.v. solutions (saline, Hartman's) if there are personnel available to monitor the patient in the health center or post while awaiting transfer. If it is not possible to administer i.v. fluids, it is very important to give liquids p.o.
4. Initial treatment:

   a. **First choice medications:**
   Procaine penicillin 800,000 I.U. i.m. in the external border of the thigh every 12 hours **PLUS**
   Chloramphenicol 1 g p.o. initial dose, followed by 500 mg p.o.every 6 hours.

b. **Second choice medications:**
Ampicillin 1 g p.o., followed by 500 mg p.o. every 4 hours **PLUS**
Metronidazole 500 mg p.o. every 6 hours.

c. **If the previous antibiotic combinations are not available, the following combinations may also be used:**
- Ampicillin and Chloramphenicol
- Penicillin and Metronidazole
- Ampicillin and Gentamicin
- Penicillin and Gentamicin
utilizing the doses mentioned above.

If the family does not agree to referral:

1. Begin i.v. solutions (preferably saline or Hartman's) if there are personnel available to monitor the patient in the health center or post. If it is not possible to administer i.v. fluids, give liquids p.o. Begin antibiotic therapy:

   a. **First choice medications:**
   Procaine penicillin 800,000 I.U. IM in the external border of the thigh every 12 hours **PLUS**
   Chloramphenicol 1 g p.o. initial dose, followed by 500 mg p.o.every 6 hours.

   b. **Second choice medications:**
   Ampicillin 1 g p.o., followed by 500 mg p.o. every 4 hours **PLUS**
   Metronidazole 500 mg p.o. every 6 hours.

   c. **If the previous antibiotic combinations are not available, the following combinations can also be used:**
   - Ampicillin and Chloramphenicol
   - Penicillin and Metronidazole
   - Ampicillin and Gentamicin
   - Penicillin and Gentamicin
   utilizing the doses mentioned above. (Gentamicin dose, see page 45)

   These treatments must be continued for ten days.

2. Give acetaminophen.

3. Increase liquid intake. Patients with serious infections and blood loss need a lot of fluid to maintain their blood pressure and help decrease fever. They can become dehydrated very rapidly.

4. Visit the patient every day if possible.

5. Vulvar hygiene with constant change of underclothes.

NOTE:
Oral and intramuscular medicines do not have the same effect as those given intravenously (i.v.). It is better if you can get i.v. medicines (see Appendix 1).

IMPORTANT CONSIDERATIONS

1. It is difficult to cure a septic abortion in the home. The patient needs a curettage as soon as possible to evacuate all the infected material from the uterus.
2. This infection may produce a complication called septic shock. The symptoms are fever or hypothermia, tachycardia, air hunger, icterus, confusion and/or anxiety, and hypotension. Septic shock is extremely serious. Patients with septic shock are very near death and require immediate transfer to the hospital as the only way to save their lives.

PROTOCOL FOR THE MANAGEMENT OF VAGINAL BLEEDING IN PREGNANCY CAUSED BY PLACENTA PREVIA AND ABRUPTIO PLACENTAE

WHAT IS VAGINAL BLEEDING

Vaginal bleeding during pregnancy whose cause may be placenta previa or abruptio placentae, usually presenting in the last trimester of pregnancy. Any vaginal bleeding after 28 weeks or 6 months gestation should be assumed to be due to either placenta previa or abruptio placentae unless proven otherwise.

SIGNS AND SYMPTOMS

1. Placenta previa
   - Hemorrhage (may be scant or heavy)
   - No pain
   - Soft uterus

2. Abruptio placentae
   - Hemorrhage (may be scant or heavy)
   - Constant abdominal pain
   - Hard, tense uterus

WHAT TO ASK THE PATIENT

1. When did the bleeding start? Is there a lot or a little blood?
2. Is there pain? Where? When did the pain start? Is the pain strong?
3. Have you noticed if the uterus is soft or tense (hard)?
4. Have you had this problem in other pregnancies?
5. Is the baby moving?

WHAT TO EVALUATE IN THE PATIENT

1. Look on the **OUTSIDE** of the vagina to see if there is bleeding? If there is, how much? Do not examine the patient internally.
2. Palpate the uterus to determine if it is soft or tense.
3. Take the pulse and blood pressure.
4. Check the fetal heart rate.

REFERRAL CRITERIA

Any amount of vaginal bleeding in pregnancy is abnormal. Therefore pregnant patients with vaginal bleeding must always be referred. The amount of blood seen outside the vagina is not representative of the internal problem that may exist. There may be very little blood visible outside, even when there is a large internal hemorrhage.

MANAGEMENT

Referral process:

1. Explain everything to the family.
2. Refer the patient to the hospital with a referral note.
3. Begin i.v. solutions (saline, Hartman's) if there are personnel available to monitor the patient in the health center or post while awaiting transport. Continue i.v. fluids during transport.
4. Place the woman in the left lateral position.
5. If possible, bring two people to the hospital to donate blood.

If the family does not agree to referral:

1. Explain to the family and the patient that she and her baby will soon be in serious danger if they do not get further care only available at the hospital. In the case of either placenta previa or abruptio placenta, the mother and the baby can both die.
2. Recommend absolute bedrest and pelvic rest (no sexual relations). Place the woman in the left lateral position.
3. Give i.v. liquids (saline, Hartman's) if there are personnel available to monitor the patient in the health center or post. Continue i.v. fluids until the bleeding stops. If it is not possible to administer i.v. fluids, give liquids p.o.

IMPORTANT CONSIDERATIONS

When there is vaginal bleeding in pregnancy, the life of the mother and baby may be in danger:

1. The delivery must always be in the hospital, even if the bleeding stops on its own.
2. While the patient is being evaluated and prepared for referral, find transportation for her immediate transfer to the hospital.

The following must be evaluated:

1. Fetal heartbeat and fetal movements to see if the baby is alive. If the baby is dead, the mother's life can still be in danger from bleeding, and she should be sent to the hospital as soon as possible.
2. Maternal blood pressure and pulse to determine hypotension secondary to hemorrhage. These should be checked regularly.

PROTOCOL FOR THE MANAGEMENT OF PREMATURE RUPTURE OF MEMBRANES

WHAT IS PREMATURE RUPTURE OF MEMBRANES

The premature rupture of membranes is when the membranes break before the beginning of labor and there is leaking of amniotic fluid.

SIGNS AND SYMPTOMS

1. Abnormally heavy discharge of liquid from the vagina.
2. The liquid may be clear, transparent or may be pink, yellow, green or brown.
3. The liquid may leak constantly or only when walking, standing up after sitting, lying down, or when pushing.
4. There may be fever when there is an infection.

WHAT TO ASK THE PATIENT

1. Has she noted an abnormally heavy vaginal discharge (liquid)?
2. Does the liquid leak constantly? If not when? When walking, pushing?
3. Does it feel as if she is urinating without being able to control it or stop it?
4. Is the fluid clear, transparent, or is it red, pink, yellow, green or brown?
5. Does she feel like she has a fever?
6. Is the baby moving? Is she having contractions?
7. How many months pregnant is she?

WHAT TO EVALUATE IN THE PATIENT

1. Without doing an internal exam, inspect the vagina from the **OUTSIDE** to see if liquid is dripping out. If so, how much is there, what color is it, and is the cord prolapsed?
2. Take the woman's body temperature.
3. Evaluate fetal movement, heartbeat and contractions.
4. Determine the baby's presentation.
5. Determine gestational age.

REFERRAL CRITERIA

1. Refer the patient to the hospital if the mother has a pregnancy at term and if membranes have been ruptured for 12 hours or more but the patient is not yet in labor.
2. Refer the patient to the hospital if she has a fever, or if the baby is not moving.
3. If an abnormal or unstable presentation exists, there is a greater risk of cord prolapse. Always refer the patient to the hospital in this situation. When the cord has prolapsed, check for pulsations in the cord and for a fetal heart rate to see if the baby is alive.
4. Refer the patient to the hospital immediately if the mother has a pre-term pregnancy (before 38 weeks) and ruptured membranes. **DO NOT WAIT** if the mother has not reached 38 weeks of pregnancy. Send her to the hospital right away.

MANAGEMENT

Referral process:

1. Explain the dangers of the premature rupture of membranes to the family.
2. Write a referral note and refer the patient to the hospital.

3. Evaluate heart rate and cord pulsation to see if the baby is alive. If the baby is alive and the cord has prolapsed, insert two fingers into the vagina and elevate the position of the baby's head or presenting part (buttocks, etc.). Take care not to compress the cord. Transport the woman to the hospital with her hips elevated.
4. Wrap any loops of cord that are outside the vagina in warm moist towels covered with plastic and keep them warm. Handle the cord as little as possible while still keeping it warm.
5. If a fever is present, begin treatment with antibiotics:

   a. **First choice medications:**
   Procaine penicillin 800,000 i.u. i.m. in the external border of the thigh **PLUS**
   Chloramphenicol 1 g p.o.

   b. **Second choice medications:**
   Ampicillin 1 g p.o. **PLUS**
   Gentamicin 1.5 g per kg weight, intramuscular.

   c. **If the previous antibiotic combinations are not available, the following combinations may also be used:**
   - Ampicillin and Chloramphenicol
   - Penicillin and Gentamicin
   utilizing the doses mentioned above.

   Refer patient to hospital immediately.

If the family does not agree to referral:

1. Explain the dangers of premature rupture of membranes to the family.
2. Recommend as much bedrest as possible. The patient must be lying down because of the danger of cord prolapse. No sexual relations.
3. Visit the patient in her home.
4. Initiate antibiotics:

   a. **First choice medications:**
   Procaine penicillin 800,000 i.u. i.m. in the external border of the thigh every 12 hours for ten days **PLUS**
   Chloramphenicol 1 g p.o. followed by 500 mg p.o. every 6 hours for ten days.

   b. **Second choice medications:**
   Ampicillin 1 g p.o. followed by 500 mg p.o. every 4 hours for ten days **PLUS**
   Gentamicin 1.5 g per kg weight, intramuscular, every 8 hours for ten days.

   c. **If the previous antibiotic combinations are not available, the following combinations may also be used:**
   - Ampicillin and Chloramphenicol
   - Penicillin and Gentamicin
   utilizing the doses mentioned above.

5. Explain to the family that if there is cord prolapse and the baby is born in the home, the baby will probably die.

6. Monitor for signs of infection: tachycardia (maternal or fetal), fever, uterine tenderness, foul smelling vaginal fluid. If any of these signs develop, try again to convince the patient to go to the hospital.

IMPORTANT CONSIDERATIONS

Ruptured membranes for more than 12 hours without the onset of labor can predispose to a serious illness in the mother (uterine infection) and the prolapse of the baby's umbilical cord which can cause death.

PROTOCOL FOR THE MANAGEMENT OF PRE-ECLAMPSIA

WHAT IS PRE-ECLAMPSIA

Pre-eclampsia is hypertension that appears in the last trimester of pregnancy with blood pressure greater than 140/90, accompanied by protein in the urine and sometimes by edema in the hands and face. If the patient's blood pressure rises by 30 mm Hg systolic or 15 mm Hg diastolic, this may also indicate pre-eclampsia, even if the blood pressure is not above 140/90.

SIGNS AND SYMPTOMS

1. High blood pressure may be the only sign.
2. Edema of hands and/or face.
3. Headache.
4. Dizziness or blurred vision.
5. Nausea, vomiting and/or epigastric pain.
6. Convulsions are present in few cases. When present, they are a sign of extreme danger.

WHAT TO ASK THE PATIENT

1. Does she feel swollen? Where? When did it start?
2. Does she have a headache? For how long?
3. Does she have blurred vision or dizziness? For how long?
4. Does she have nausea, vomiting or epigastric pain (in the mouth of the stomach)?
5. Did she have high blood pressure before this pregnancy or during other pregnancies?
6. Does she suffer from chronic high blood pressure diagnosed by a doctor?

WHAT TO EVALUATE IN THE PATIENT

1. Take her blood pressure in the sitting position. If the pressure is high, retake it one-two hours later in the sitting position to determine if it remains high.
2. Examine thoroughly to see if there is edema in the face or hands.
3. Check fetal heart rate.

REFERRAL CRITERIA

1. The mother's blood pressure is greater than or equal to 140/90 mm Hg on two separate occasions.
2. A rise of 30 mm Hg in the systolic blood pressure or 15 mm Hg in the diastolic blood pressure.
3. Refer every pregnant patient who has convulsions.

MANAGEMENT

Referral process:

1. Explain the dangers of pre-eclampsia to the family.
2. Refer the patient to the hospital with a referral note.
3. a) If the patient has elevated blood pressure (140/90 or higher), plus headaches, dizziness or epigastric pain **OR**
   b) If she has a blood pressure of 160/110 or higher as the only sign **OR**
   c) If the patient has convulsions.

Give:
- Diazepam 10 mg im or p.o.
  (if the patient is convulsing it **CANNOT** be given p.o.) **PLUS**
- Nifedipine 10 mg tablet, perforated, sublingual.

THEN
- Check the blood pressure in 20 minutes. If the pressure is not less than or equal to 140/90, repeat the dose of Nifedipine immediately.

This emergency treatment is to be given while the patient is transported to the hospital.

4. If the patient returns from the hospital without having delivered the baby, give her follow-up:
   - Check what medications she was given in the hospital.
   - If the pressure again rises to greater than or equal to 160/110, or if the symptoms described above in #3 return or worsen, repeat the doses of nifedipine (10 mg, perforated, sublingual) and diazepam(10 mg i.m. or p.o.).
   - AND, REFER THE PATIENT TO THE HOSPITAL AGAIN.

If the family does not agree to referral:

1. Bedrest as much as possible, trying to lie on the left side.
2. Drink as much liquid as possible, such as juice, water with lemon and honey, natural teas (especially chamomile) and whole milk. Do not drink liquids with caffeine such as coffee, coca-cola, black tea and cocoa.
3. Eat well. Important foods in Guatemala are beans, eggs, meat, milk, cheese and tortillas. Where possible, recommend home remedies to lower the blood pressure, for example, parsley and cucumbers (with the peel).
4. If the mother has advanced symptoms of pre-eclampsia (dizziness, blurred vision, nausea and vomiting, stomach pain, convulsions), she should return to the hospital for continued follow-up.
5. If the patient's blood pressure is greater than 160/110, or has high blood pressure (140/90) with dizziness, headache, epigastric pain or blurred vision, give:

   a. First choice medications:
   - Nifedipine 20 mg capsule, perforated, p.o. 1 or 2 times daily **PLUS**
   - Diphenylhydantoin 100 mg p.o. every 6 hours, (as an anti-convulsant).

   b. Second choice medications:
   - Atenolol 50 mg p.o. 1 or 2 times daily **PLUS**
   - Diphenylhydantoin 100 mg p.o. every 6 hours (as an anti-convulsant).

6. Continue these medications until 48 hours postpartum.
7. Visit the patient daily or as often as possible.
8. Continue encouraging the patient to go to the hospital.

IMPORTANT CONSIDERATIONS

1. If the obstetrical patient convulses during pregnancy, delivery or postpartum, her life and the life of her baby are in danger. She should be referred immediately to the hospital to receive early treatment.
2. It is important to take the blood pressure of every pregnant women at each visit during the seventh, eight and ninth months in order to detect pre-eclampsia in its early stages.
3. A patient who has had eclamptic convulsions should not leave the hospital until delivery.

PROTOCOL FOR THE MANAGEMENT OF PREMATURE LABOR

WHAT IS PREMATURE LABOR

Premature labor are regular contractions that produce dilation of the cervix prior to 37 weeks of gestation.

SIGNS AND SYMPTOMS

Regular contractions every 3-4 minutes that last at least 45 seconds for a period of at least two hours.

Important Note:

In active labor, the contractions increase in intensity and frequency when the mother is walking.

WHAT TO ASK THE PATIENT

1. What is your due date? Are you sure? When was your last menstrual period? This information is vital for making the diagnosis.
2. Ask all of the questions related to premature rupture of membranes.
3. Contractions:
   When did they start?
   How often?
   Are they strong or mild?
4. Is there bleeding? If so, how much?
5. Ask the mother about her previous pregnancies. Has she had other premature deliveries?

WHAT TO EVALUATE IN THE PATIENT

1. Palpate the uterus to determine the frequency, duration and strength of the contractions as well as the position of the fetus. Determine whether it is noncephalic or a twin gestation.
2. Measure the fundal height to try to estimate the gestational age. Do not measure during a contraction.
3. Evaluate fetal heart rate.
4. Inspect the **OUTSIDE** of the vagina to see if there is leakage of amniotic fluid or blood.
5. Calculate the estimated delivery date from the date of the last menstrual period (LMP):
   a. Find out the date of the last menstrual period and subtract 3 from the month.
   b. Add 7 to the first day of the last menstrual period.
   c. If the delivery will be in the following year, add 1 to the year.

Examples:

Last menstrual period (LMP):	5-2-90
Estimated delivery date (EDD):	2-9-91

a. 5 - 3 = 2 (month)
b. 2 + 7 = 9 (day)
c. 90 + 1 = 91 (year)

Last menstrual period (LMP): 9-10-90
Estimated delivery date (EDD): 6-17-91

a. 9 - 3 = 6 (month)
b. 10 + 7 = 17 (day)
c. 90 + 1 = 91 (year)

If the LMP is in the first three months of the year (January, February, March), it is easiest to consider them as:

January = 13th month
February = 14th month
March = 15th month

If the subtraction of three is then made from each month, the delivery month is obtained.

Examples:

Last menstrual period: 1-7-91
Estimated delivery date: 10-14-91

It is the seventh day of the "13th" month of 1991

a. 13 - 3 = 10 (month)
b. 7 + 7 = 14 (day)
c. 91 + 0 = 91 (year)

Last menstrual period: 2-10-91
Estimated delivery date: 11-17-91

It is the 10th day of the "14th" month of 1991

a. 14 - 3 = 11 (month)
b. 10 + 7 = 17 (day)
c. 91 + 0 = 91 (year)

REFERRAL CRITERIA

If the gestational age of the fetus is less than 37 weeks, refer the patient to the hospital.

MANAGEMENT

Referral process:

1. Explain everything to the family.
2. Refer the patient to the hospital with a referral note.
3. If the patient is less than 36 weeks pregnant, initiate treatment in the community before referring the patient:

- Hydrate the patient well. Give her one liter of water to drink over 30 minutes and then evaluate to see if the contractions have stopped.

- If the contractions have not stopped, give:
  Fenoterol 5 mg p.o. single dose (first choice) **OR**
  Ritodrine 10 mg p.o. single dose (second choice) **OR**
  Ibuprofen 400 mg p.o. single dose (third choice).

4. Accompany the patient to the hospital and be prepared to attend a delivery on the way.

If the family does not agree to referral:

1. If you detect twins or malpresentation in addition to premature labor, try again to convince the family to go to the hospital.
2. If the family does not agree to referral, begin treatment immediately:
   - Hydrate the patient well. Give her one liter of water to drink over 30 minutes and then evaluate to see if the contractions have stopped.
   - If the contractions do not stop, give:
     Fenoterol 5 mg p.o. every 6 hours until two days have passed without contractions (first choice medication), **OR**
     Ritodrine 10 mg p.o. every 4 hours until two days have passed without contractions (second choice medication), **OR**
     Ibuprofen 400 mg p.o. every 8 hours until labor stops (third choice medication).

INSTRUCTIONS FOR THE MOTHER:

- Rest and drink plenty of liquids, especially chamomile tea which decreases contractions.
- No sexual relations.

INSTRUCTIONS ON THE CARE OF A PREMATURE BABY:
(See protocol for premature babies).

* Do not bath the baby.
* Immediately put the baby to the breast as in all births.
* Maintain the baby's body temperature.
* If the baby is very small, convince the family that they must go to the health center or post to have the baby evaluated.

IMPORTANT CONSIDERATIONS

1. Remember that premature babies are more susceptible to sepsis, hypothermia and hypoglycemia. For this reason, it is very important to educate the family about their care (see management of premature babies).
2. Do **NOT** use any of the medications described in the treatment section if the patient has hypertension or signs of pre-eclampsia, vaginal bleeding, signs of uterine infection (foul smelling vagi

PROTOCOL FOR THE MANAGEMENT OF MALPRESENTATION

WHAT IS MALPRESENTATION

Malpresentation is when the baby is NOT in cephalic presentation.

SIGNS AND SYMPTOMS

Fetal movements in the pelvic region or below the umbilicus.

WHAT TO ASK THE PATIENT

Where do you feel the baby move? When the baby is breech, the mother usually feels the movements in the pubic area or the area below the umbilicus.

WHAT TO EVALUATE IN THE PATIENT

1. Measure fundal height.
2. Palpate the uterus to determine where the fetal head is.

   If the fetus is in breech position:

   * The head will be in the highest part of the uterus where the buttocks would be if the baby were in cephalic presentation.

   If the fetus is in transverse position:

   * The fetus will be in a horizontal position instead of vertical, resulting in a smaller fundal height and a broader appearing abdomen.
   * The head will be on one side of the uterus.

REFERRAL CRITERIA

Always refer the patient to the hospital for delivery if the presentation is breech or transverse after the 36th week of pregnancy.

MANAGEMENT

Referral process:

1. Explain everything to the family.
2. Refer the patient to the hospital with a referral note for delivery.

If the family does not agree to referral:

❑ If the baby is in the breech position, you must do the following:

1. The majority of breech deliveries occur on their own using the force of gravity and the mother's efforts. It is better to place the mother in the squatting or standing position so that she can push better. It is she with her pushing who delivers the baby. It is better not to touch the baby because this can stimulate the baby to stretch its arms inside the uterus, which complicates the delivery. The baby should be born in 3-4 contractions.

2. The woman should only push when she has a contraction, resting between contractions to save energy.

- If the baby is not born within this time period, do the following:

1. **DO NOT TOUCH THE BABY** until it has emerged to the level of the umbilicus. At this point, you must put the woman in the squatting position and ask her to push with every contraction. If the arms and the shoulders of the baby do not spontaneously deliver, have the woman lie back and introduce two fingers into the vagina, find an elbow or arm, and gently pull it across the baby's chest and out the vagina. Rotate the baby **GENTLY** to gain access to the other arm and do the same with the other arm. Deliver the shoulders one at a time, rotating the baby **GENTLY**. Remember that the back must always face up, never the abdomen. If the head does not spontaneously deliver, you must rely on the help of an assistant to provide suprapubic pressure with a fist to maintain the baby's head in a flexed position. At the same time, again introduce two fingers into the vagina, find the baby's mouth, and gently put one or two fingers inside it and flex it slightly. Apply gentle traction to guide the head down the birth canal.

2. You must be prepared to execute these maneuvers rapidly, and to resuscitate the baby afterwards, as the baby will probably have suffered from some asphyxia.

IMPORTANT CONSIDERATIONS

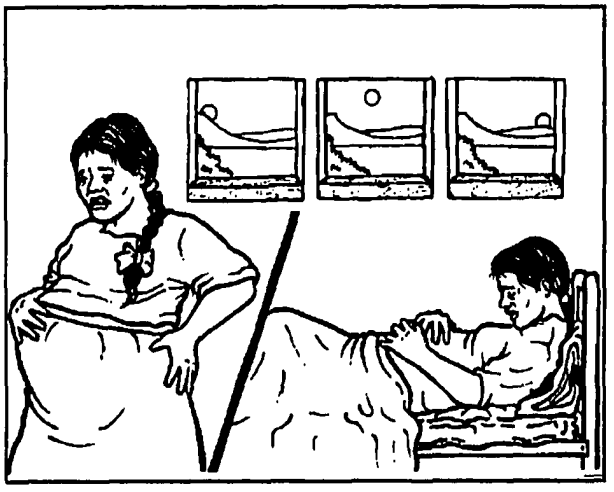
The Mother:

The uterus may rupture as a result of prolonged labor, causing massive hemorrhage and possibly the death of the mother and baby. To avoid this danger it is imperative that the mother have a cesarian section in the hospital as soon as possible if malpresentation exists.

The Baby:

The baby cannot be born in the transverse position. Therefore, when a cesarian section is not performed as soon as possible, the baby dies of asphyxia and the mother can have a ruptured uterus.

PROTOCOL FOR THE MANAGEMENT OF PROLONGED LABOR



WHAT IS PROLONGED LABOR

Prolonged labor is when active labor lasts for more than 12 hours in both multiparas and primiparas.

SIGNS AND SYMPTOMS

Regular contractions (every 3-4 minutes) that last at least 45 seconds for more than 12 hours in both multiparas and primiparas.

Important Note:

In active labor, the contractions increase in intensity, duration and frequency when the mother is walking. She can not sleep through the contractions.

WHAT TO ASK THE PATIENT

1. At what time did the contractions begin? How frequent are they? How long does each one last?
2. When did the membranes (water) break? This information can help confirm the diagnosis of active labor. However, in many cases the membranes do not break until the birth of the baby.

WHAT TO EVALUATE IN THE PATIENT

1. The frequency, duration and intensity of the contractions.
2. Inspect the vagina from the outside to determine the presence of liquid and/or blood.
3. Determine the fetal position (see Protocol for Malpresentation).
4. Evaluate fetal heart rate.
5. Determine whether the mother's bladder is full. A full bladder can block the baby's descent and cause prolonged labor. Women in labor should urinate frequently.
6. Vaginal exam with sterile glove every three hours to see if the patient is dilating at least 1 cm per hour. If there is no progress made on the second vaginal exam, refer the patient to the hospital.

REFERRAL CRITERIA

Refer the patient to the hospital if the mother has active labor for more than 12 hours in both multiparas and primiparas, or if dilation does not progress while three hours have passed.

MANAGEMENT

Referral process:

1. Explain the dangers of prolonged labor to the family.
2. Write a referral note and refer immediately to the hospital.

If the family does not agree to referral:

1. Inform the family of the risk of death for the mother and baby.
2. Hydrate the patient (give water with sugar, honey, orange juice, etc.)
3. Advise the mother to alternate between brief periods of walking and rest.

IMPORTANT CONSIDERATIONS

In prolonged labor the mother's and baby's lives may be in danger. You must evaluate:

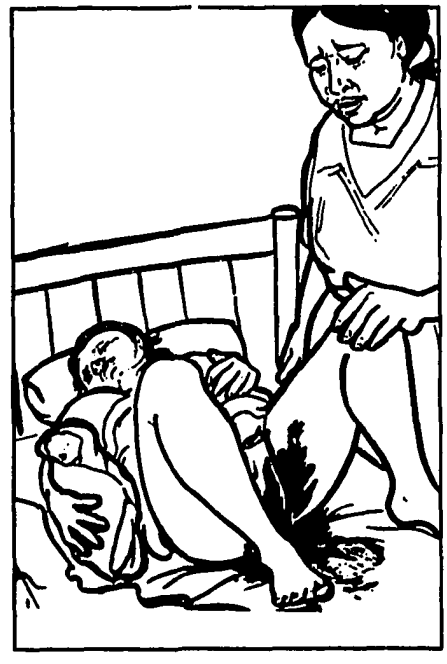
The Baby:

1. Fetal heart rate.
2. The presence of meconium (green or brown amniotic liquid). If present, meconium indicates that the baby already has fetal distress and may die soon.

The Mother:

In the mother, the uterus may rupture as a result of prolonged labor, causing massive hemorrhage and the death of the mother and baby. For this reason, it is imperative that a cesarian section be performed in the hospital as soon as possible.

PROTOCOL FOR THE MANAGEMENT OF POSTPARTUM HEMORRHAGE



WHAT IS POSTPARTUM HEMORRHAGE

Postpartum hemorrhage is abnormally heavy hemorrhage after the birth of the baby. It may be seen immediately or up to 6 weeks postpartum. The most frequent causes are: retained placenta, retention of portions of placenta, uterine atony (failure of uterus to contract) and vaginal or cervical lacerations.

SIGNS AND SYMPTOMS

1. Hemorrhage
2. Hypotension
3. Tachycardia
4. Sleepiness, dizziness, diaphoresis
5. Weakness, nausea

WHAT TO ASK THE PATIENT

1. What time (hour) was the delivery?
2. How much blood was lost?
3. When did the bleeding start?
4. Is there nausea, sleepiness, dizziness?
5. Did the placenta deliver?

WHAT TO EVALUATE IN THE PATIENT

1. Vaginal bleeding
2. See if the placenta has been delivered
3. See if the delivered placenta is complete
4. Blood pressure
5. Pulse
6. State of consciousness
7. Palpate the uterus - is it firm or soft?
8. Quantity of blood in the bed sheets.

REFERRAL CRITERIA

1. Retained placenta for more than 30 minutes without hemorrhage.
2. Retained placenta with hemorrhage. **REFER IMMEDIATELY, do not wait 30 minutes.**
3. Retention of portions of the placenta.
4. Abnormally heavy bleeding for any cause including cervical or vaginal laceration.
5. Uterine atony (absence of uterine contractions).
6. Any hemorrhage of bright red blood even in small quantities. Passage of large clots that make the woman feel dizzy, nauseous, cold and/or sweaty.

MANAGEMENT

Referral process:

1. Find transportation immediately. This is a serious emergency and there is little time.
2. Massage the uterus vigorously and continuously. Have someone else (mother-in-law, midwife, husband) take over the massaging while you proceed with the following steps:

❑ **IF THE PLACENTA HAS NOT DELIVERED AND THERE IS BLEEDING:**

a. Have the woman squat and push. At the same time, have her urinate to empty her bladder. Sometimes a full bladder can keep the uterus from contracting.

b. Give the mother an injection of methylergonovine 0.2 mg i.m. or i.v.(slowly). Repeat once in 10 minutes if the uterus has not contracted.

c. Try to encourage the delivery of the placenta by pushing the uterus in an upward direction with the palm placed immediately above the pubic symphysis. At the same time place careful, sustained traction on the cord with the other hand and follow the course of the birth canal. Avoid jerky movements.

d. Start an i.v. solution of 500 cc Hartman's or saline (NOT dextrose) with 30 units oxytocin (Syntocin) wide open until the uterus contracts. After the uterus has contracted, continue i.v. solutions with oxytocin at a slower rate (40 drops per minute). After the first 500 cc of i.v., solution with 30 units of oxytocin have infused, prepare another solution of 500 cc Hartman's with 10 units of oxytocin and infuse at 40 drops per minute.

e. Put the baby to the breast to nurse or roll the nipples between 2 fingers. This can help the uterus contract. The person who is massaging the uterus can be rolling a nipple at the same time with the other hand.

f. Inspect the vaginal opening to see if the bleeding is coming from a tear. If so, press a clean cloth or gauze on the tear for 10 minutes to try to stop the bleeding.

❑ **IF THE PLACENTA HAS DELIVERED AND THERE IS BLEEDING:**

a. Put the baby to the breast to nurse or roll the nipples while massaging the uterus.

b. Have the woman urinate to empty her bladder.

c. Give the mother an injection of methylergonovine 0.2 mg i.m. or i.v. slowly. Repeat once 10 minutes later if the uterus has not contracted.

d. Start an i.v. solution of 500 cc Hartman's with 30 units oxytocin (Syntocin) wide open until the uterus contracts. After the uterus has contracted, continue i.v. solutions with oxytocin at a slower rate (40 drops per minute). After the first 500 cc of i.v, solution with 30 units of oxytocin have infused, prepare another solution of 500 cc Hartman's with 10 units of oxytocin and infuse at 40 drops per minute.

e. Inspect the vaginal opening to see if the bleeding is coming from a tear. If so, press a cloth or gauze on the tear for 10 minutes to try to stop the bleeding.

3. Give the mother plenty of liquids to drink in the health post or center and during the trip to the hospital.
4. Continue massaging the uterus and rolling the nipples during transport. Keep the mother flat on her back with her legs and hips elevated, if possible, during transport.
5. Refer the patient to the hospital with complete documents.

❑ **IF THE PLACENTA HAS NOT DELIVERED AND THERE IS NO BLEEDING:**

Proceed as follows:

a. Have the woman urinate to empty her bladder.

b. Put the baby to the breast to nurse.

c. Have the woman squat and push.

d. Try to encourage the delivery of the placenta by pushing the uterus in an upward direction with the palm placed immediately above the pubic symphysis. At the same time, place careful, sustained traction on the cord with the other hand and follow the course of the birth canal. Avoid jerky movements.

e. Massage the uterus.

f. Refer the patient to the hospital if the placenta has not delivered in 30 minutes.

If the family does not agree to referral:

1. Massage the uterus vigorously and continuously. Have someone else (mother-in-law, midwife, husband) take over the massaging while you proceed with the following steps:

❑ **IF THE PLACENTA HAS NOT DELIVERED AND THERE IS BLEEDING:**

a. Have the woman squat and push. At the same time, have her urinate to empty her bladder. Sometimes a full bladder can keep the uterus from contracting.

b. Give the mother an injection of methylergonovine 0.2 mg i.m. or i.v.(slowly). Repeat once 10 minutes later if the uterus has not contracted.

c. Try to encourage the delivery of the placenta by pushing the uterus in an upward direction with the palm placed immediately above the pubic symphysis. At the same time, place careful, sustained traction on the cord with the other hand and follow the course of the birth canal. Avoid jerky movements.

d. Start an i.v. solution of 500 cc Hartman's with 30 units oxytocin (Syntocin) wide open until the uterus contracts. After the uterus has contracted, continue i.v. solutions with oxytocin at a slower rate (40 drops per minute). After the first 500 cc of i.v, solution with 30 units of oxytocin have infused, prepare another solution of 500 cc Hartman's with 10 units of oxytocin and infuse at 40 drops per minute.

e. Put the baby to the breast to nurse or roll the nipples between 2 fingers. This can help the uterus contract. The person who is massaging the uterus can be rolling a nipple at the same time.

f. Inspect the vaginal opening to see if the bleeding is coming from a tear. If so, press a clean cloth or gauze on the tear for 10 minutes to try to stop the bleeding.

❑ **IF THE PLACENTA HAS DELIVERED AND THERE IS BLEEDING:**

a. Put the baby to breastfeed, and roll the nipples while massaging the uterus.

b. Have the woman urinate to empty her bladder.

c. Give the mother an injection of methylergonovine 0.2 mg i.m. or i.v.(slowly). Repeat once in 10 minutes if the uterus has not contracted.

d. Start an i.v. and hang a solution of 500 cc Hartman's with 30 units oxytocin (Syntocin) wide open until the uterus contracts. After the uterus has contracted, continue i.v. solutions with oxytocin at a slower rate (40 drops per minute). After the first 500 cc of i.v, solution with 30 units of oxytocin have infused, prepare another solution of 500 cc Hartman's with 10 units of oxytocin and infuse at 40 drops per minute.

e. Inspect the vaginal opening to see if the bleeding is coming from a tear. If so, press a clean cloth or gauze on the tear for 10 minutes to try to stop the bleeding.

2. Start an i.v. if possible, even if other medications are not available. Give the mother plenty of liquids to drink in the health post or center and re-emphasize the importance of continuing to drink liquids. Drinking plenty of fluids helps increase the circulating volume of blood and may prevent hypotension.

3. Keep the mother lying down with her legs and hips elevated. Continue massaging the uterus to expel any accumulated blood and to stimulate contractions.

4. Explain to the family and the midwife that serious danger exists for the mother and baby if they do not go to the hospital.

IMPORTANT CONSIDERATIONS

1. Remember that hemorrhage is the primary cause of maternal mortality and that rapid, aggressive action is necessary to save the life of the mother.

2. The majority of maternal deaths from hemorrhage occur in the first 12 hours postpartum. Some can die as soon as 1 or 2 hours postpartum.

3. Sometimes, massaging the uterus before the placenta has delivered will cause the contraction of the uterus. The hemorrhage may stop while the placenta is trapped inside. THIS IS OKAY. The placenta can be removed in the hospital, but only if you stop the bleeding so that the woman can reach the hospital alive.

PROTOCOL FOR THE MANAGEMENT OF POSTPARTUM UTERINE INFECTION

WHAT IS POSTPARTUM UTERINE INFECTION

Postpartum uterine infection follows delivery and is caused by the entry of microbes into the vagina and uterus during delivery and postpartum.

SIGNS AND SYMPTOMS

1. Fever
2. Constant lower abdominal pain. This is a very important sign. The pain is different from afterbirth pains.

WHAT TO ASK THE PATIENT

1. When was your baby born?
2. Do you have fever? When did it start?
3. Do you have lower abdominal pain?
4. Do you have foul-smelling vaginal discharge? If so, is there pus?

WHAT TO EVALUATE IN THE PATIENT

1. Evaluate the lower abdomen and pelvis to determine if there is pain on palpation.
2. Take the patient's temperature, blood pressure and pulse.
3. Inspect the vagina to see if there is vaginal discharge with foul odor or pus.

REFERRAL CRITERIA

Refer every patient to the hospital who has any positive finding in the history or physical exam, especially high fever for more than 24 hours.

MANAGEMENT

Referral process:

1. Explain the dangers of postpartum infection to the family.
2. In the health center or post, give initial dose of antibiotics in the external border of the thigh, not in the gluteal.

First choice medications:

a) Procaine penicillin 800,000 units i.m. in the external border of the thigh every 12 hours **PLUS**
b) Chloramphenicol 1 g. p.o. followed by 500 mg. p.o. every 6 hours.

Second choice medications:

a) Ampicillin 1 g p.o. followed by 500 mg. p.o. every 4 hours **PLUS**
b) Metronidazole 500 mg. p.o. every 6 hours.

If the above mentioned combinations are not available, the following combinations may also be used:

a) Ampicillin and Chloramphenicol
b) Penicillin and Metronidazole
c) Ampicillin and Gentamicin
d) Penicillin and Gentamicin

Use dosages described above (see page 45 for Gentamicin dosage).

3. Give acetaminophen.
4. Insist on an increase in oral intake of fluids.
5. Refer the patient to the hospital with a referral note.

If the family does not agree to referral:

1. Explain the risks that the mother incurs with a postpartum infection.
2. Give initial dose of antibiotics in the health center or post:

First choice medications:

a) Procaine penicillin 800,000 units i.m. in the external border of the thigh every 12 hours for ten days **PLUS**
b) Chloramphenicol 1 g. p.o. followed by 500 mg. p.o. every 6 hours for ten days.

Second choice medications:

a) Ampicillin 1 g p.o. followed by 500 mg. p.o. every 4 hours for ten days **PLUS**
b) Metronidazole 500 mg. p.o.every 6 hours for ten days.

If the above mentioned combinations are not available, the following combinations may also be used:

a) Ampicillin and Chloramphenicol
b) Penicillin and Metronidazole
c) Ampicillin and Gentamicin
d) Penicillin and Gentamicin

Use dosages described above (see page 45 for Gentamicin dosage).

3. Give acetaminophen.
4. Increase oral intake of fluids.
5. Visit the patient everyday in her home, if possible.
6. Good vulvar hygiene. Change underclothes frequently.

IMPORTANT CONSIDERATIONS

This infection can produce a complication called "septic shock." The symptoms of septic shock are fever or hypothermia, tachycardia, air hunger, confusion and/or anxiety, and hypotension. This situation is extremely serious. Patients with septic shock are very near death and require immediate transfer to the hospital following the initial dose of antibiotics. This is the only way to save their lives.

C. PROTOCOLS FOR THE MANAGEMENT OF NEONATAL EMERGENCIES

PROTOCOL FOR THE MANAGEMENT OF PREMATURITY AND LOW BIRTH WEIGHT

WHAT IS PREMATURITY AND LOW BIRTH WEIGHT

Prematurity is when a baby is born before nine months or 37 completed weeks of pregnancy.

Low birth weight is when a baby weighs less than 2500 grams (5 pounds 8 ounces).

- Low birth weight and premature babies need the same basic care and are, therefore, discussed here together.

SIGNS AND SYMPTOMS

1. Weight of neonate less than 2500 grams (5 lb. 8 oz)
2. Baby is born before nine months or 37 weeks
3. Neonate looks small

WHAT TO ASK THE MOTHER

1. Date of last menstrual period. To determine the gestational age of the baby, calculate as follows:
   a) Add 7 to the day
   b) Subtract 3 from the month
   c) The year remains the same unless the delivery will be in the following year, in which case add one to the year.

   (For more detail, see section on Premature Labor).

2. Ask the mother if the baby:
   a) has the strength to breastfeed
   b) cries lustily or weakly
   c) breathes normally or with grunts or whines
   d) breathes normally or irregularly
   e) when the baby breastfeeds, does his/her mouth feel hot or cold
   f) is the baby sad or limp
   g) does the baby get blue or purple.

WHAT TO EVALUATE IN THE PATIENT

1. Baby' size and weight. Weigh the baby if possible.
2. How is the baby's breathing? Does he/she make any noise when breathing, ie. whine or become blue in the face? Is there intercostal retraction (indrawing between the ribs)?
3. How does the baby breastfeed? Does the baby have energy to breastfeed? Ask the mother to put the baby to the breast and observe.
4. Is the baby's body temperature adequate? It should not be less than 36.5 degrees Centigrade or greater than 37.8 degrees Centigrade. Feel the baby's hands and feet to see if they are hot or cold.
5. How is the baby's cry? Stimulate the baby to see if he/she cries lustily.
6. The activity of the baby. Does he/she move? Is he/she sad looking?

REFERRAL CRITERIA

1. If the baby does not breastfeed
2. If the baby weighs less than 4 pounds 8 ounces (2000 grams)
3. If the baby is less than 8 months or 36 weeks gestational age.
4. If the baby gets blue.

- Obviously if there are other signs of problems (for example, sepsis) the baby should be referred.

MANAGEMENT

Referral process:

1. Do not bathe the baby unless he/she has had contact with maternal feces during delivery.
2. Give only breast milk and give it immediately.
3. Breastfeed the baby during the trip to the hospital.
4. Maintain the baby's temperature. Clothe the baby well with a hat, gloves and socks. At least 4 layers of clothing is best.
5. If possible, have the mother go to the hospital with the baby so that baby will be able to continue breastfeeding.
6. Refer the baby to the hospital with complete documents.

If the family does not agree to referral:

1. Do not bathe the baby unless he/she has had contact with maternal feces during delivery.
2. Give only breast milk and give it immediately.
3. Maintain the baby's temperature. Clothe the baby well with a hat, gloves and socks. At least 4 layers of clothing is best.
4. Instruct the family regarding danger signs:
   - The baby does not breastfeed
   - The baby does not maintain his/her body temperature (gets cold hands or feet)
   - The baby does not breathe well
   - The baby lacks energy to cry
   - The baby does not move
   - The baby looks sad.

   Explain each sign in detail.
5. Bring the baby to a health center or post every 2-3 days for frequent check-ups and to detect danger signs.
6. Do not allow sick people near the baby.
7. Put the "kangaroo mother" technique into practice, teaching the mother how to do it. She must place the baby inside her blouse with skin to skin contact, so that he/she can breastfeed all the time. The mother should sleep semi-sitting and must cover herself well to keep the baby warm.

IMPORTANT CONSIDERATIONS

The two most important complications of low birthweight and prematurity are:

1. Hypothermia/hypoglycemia
2. Sepsis

Thorough educational orientation is very important for the family. The survival of these babies depends on it.

PROTOCOL FOR THE MANAGEMENT OF SEPSIS IN THE NEWBORN

WHAT IS SEPSIS IN THE NEWBORN

Sepsis is a serious infection of the newborn's entire body that may begin as an upper respiratory tract infection, omphalitis, dermatitis etc., or without any visible or apparent source of infection.

SIGNS AND SYMPTOMS

1. The baby does not breastfeed or breastfeeds less (very important sign).
2. Hypothermia (baby feels cold) or hyperthermia (baby has fever, feels hot).
3. Listlessness or irritability (baby cries a lot, is discontent or inconsolable, or listless).
4. Respiratory difficulty, grunting, panting (like a dog), rapid respiration, whining between breaths. Stops breathing for brief periods of time.

WHAT TO ASK THE MOTHER OR CARETAKER OF THE NEWBORN

1. **Breastfeeding**
   Is the baby breastfeeding well? If not, when did he/she stop breastfeeding well? Has it been one day, a few hours, a few days? Ask the mother to put the baby to the breast and observe if it nurses well.
2. **Temperature**
   Does the baby feel hot or cold? Does the baby's mouth feel hot or cold when he/she is breastfeeding?
3. **Cry**
   Is the baby crying a lot? Is the cry different? Is it a weak cry? Is the baby inconsolable?
4. **Activity**
   Has the baby been limp, listless, discontent? For how long?
5. **Respiration**
   Has the mother noticed irregular or rapid breathing, or has the baby been grunting or whining with each breath?

WHAT TO EVALUATE IN THE PATIENT

1. **Temperature**
   Feel the hands and feet of the baby, and take his/her temperature. Fever is greater than 37.8 degrees Centigrade. Hypothermia is less than 36.5 degrees Centigrade.
2. **Breastfeeding**
   Ask the mother to put the baby to the breast and observe how she/he breastfeeds.
3. **Cry**
   Stimulate the baby to cry and observe the cry. Is it a normal cry, or a weak one? Is it an inconsolable cry?
4. **Activity**
   Observe if the baby appears sad, listless, or very irritable.
5. **Respirations**
   Observe the baby breathing to see if there is irregular breathing, intercostal retraction (indrawing between the ribs), or grunting with each breath.
6. **Clean the baby's nostrils with saline solution and observe whether the breathing improves.**

REFERRAL CRITERIA

DO NOT assume that a fever in a newborn is unimportant, or that a baby who does not breastfeed or appears discontent or listless will get better. If any of the signs or symptoms is present, refer the baby to the hospital. These babies can die in one day if they do not receive adequate treatment. **REMEMBER, YOU MUST REFER THEM TO THE HOSPITAL.**

MANAGEMENT

Referral process:

1. Explain everything to the family including the urgency of the situation and how quickly the baby can die.
2. The baby should be breastfed as much as possible during the trip to the hospital.
3. Keep the baby clothed and covered during the trip to the hospital (including a hat, gloves and socks) and with as much contact with the mother's body as possible (kangaroo mother). Keep the baby's nostrils clear.
4. In the health center or post, give an initial dose of antibiotics in the external border of the thigh, not in the buttock:
   Ampicillin 75 mg/kg, intramuscular **PLUS**
   Gentamicin 2.5 mg/kg, intramuscular.
5. Refer the patient to the hospital immediately with a referral note.

If the family does not agree to referral:

1. Explain the urgency of the situation and how quickly the baby can die.
2. The baby should be breastfed as much as possible.
3. Keep the baby well clothed to maintain body temperature.
4. Keep the baby's nostrils clear with saline solution and give the mother a thorough educational orientation.
5. In the health center or post, give an initial dose of antibiotics in the external border of the thigh, not in the buttocks:
   Ampicillin 75 mg/kg, intramuscular every 12 hours for ten days **PLUS**
   Gentamicin 2.5 mg/kg, intramuscular every 12 hours, for ten days.

IMPORTANT CONSIDERATIONS

Included in the most important high risk factors that can contribute to neonatal sepsis are:

1. Maternal fever/infection.
2. Foul smelling amniotic fluid.
3. Prolonged rupture of membranes
   (more than 24 hours prior to the birth of the baby).
4. Prematurity/low birth weight.
5. Prolonged labor.

Many babies, however, develop sepsis without any of these risk factors.

REMEMBER that sepsis is the major cause of death in neonates. Without adequate treatment they can die in 24-48 hours. **DO NOT** treat a newborn with a fever as if he/she had only an upper respiratory tract infection. **DO NOT WAIT**. If you encounter any suspicious sign, it is better to treat it like sepsis.

PROTOCOL FOR MANAGEMENT OF ASPHYXIA IN THE NEWBORN

WHAT IS ASPHYXIA

Asphyxia is when a newborn delays or doesn't start breathing on its own because it did not receive enough oxygen during labor. Without appropriate intervention, this condition results in brain damage or death. With rapid resuscitation, however, the newborn can recuperate completely.

SIGNS AND SYMPTOMS

1. Baby does not cry or cries very weakly.
2. Baby does not breathe or breathes with difficulty, moaning or grunting.
3. Does not move, extremities limp.
4. Skin color is blue or pale.
5. Heart rate is slow or absent.

WHAT TO EVALUATE IN THE NEWBORN

1. Observe how the baby cries. Is it a weak cry or is the baby not crying at all?
2. Observe how the baby breathes. Is it slow, irregular, accompanied by moans or grunts?
3. Observe how the baby moves. Is it limp?
4. Observe the color of the baby's skin. Is it blue or pale?
5. Listen to the baby's heart rate. Can you hear it? Is it very slow (less than 100 beats/minute)?

REFERRAL CRITERIA

If the baby has any sign of having been asphyxiated, it is better to refer the baby to the hospital. These babies are more likely to get sick than normal babies.

MANAGEMENT

1. Rapidly clean the baby's nose and mouth of blood and mucus. Dry the baby with a clean towel or cloth, rubbing the head and back vigorously.
2. See if the newborn reacts by beginning to breathe or move.
3. If there is no response, do the following:
   Put the baby on his/her back on a flat surface. Put your mouth firmly over the baby's nose and mouth. Hold the baby's head steady with one hand and gently but rapidly breathe air into the baby's lungs 30 times, making sure to remove your mouth from the baby's mouth between breaths to allow the air to escape from its lungs.
4. See if the baby responds.
5. If there is no response, give another 30 breaths, mouth to mouth, and evaluate the baby again.
6. If there is still no response, give another 30 breaths.
7. If there is no response after a total of 90 breaths given mouth to mouth (3 x 30), the baby is declared dead.

IMPORTANT CONSIDERATIONS

1. Do not blow too much air into the newborn's lungs because they can explode. The amount of air in your mouth is sufficient.
2. Once the baby has been successfully resuscitated, he/she must be taken to the hospital because he/she is very susceptible to getting sick.

APPENDIX 1

ANTIBIOTIC DOSES FOR NEONATES

AMPICILLIN				
BODY WEIGHT				
KILOGRAMS	POUNDS	DOSE	cc(ml)	FREQUENCY
1.5	3 lbs 4 oz	150 mg	0.75	Every 12 hours
2.0	4 lbs 7 oz	200 mg	1.00	Every 12 hours
2.5	5 lbs 8 oz	250 mg	1.25	Every 12 hours
3.0	6 lbs 9 oz	300 mg	1.50	Every 12 hours
3.5	7 lbs 12 oz	350 mg	1.75	Every 12 hours

GENTAMICIN (40 mg/bottle)				
BODY WEIGHT				
KILOGRAMS	POUNDS	DOSE	cc(ml)	FREQUENCY
1.5	3 lbs 4 oz	7.5 mg	0.4	Every 12 hours
2.0	4 lbs 7 oz	10.0 mg	0.5	Every 12 hours
2.5	5 lbs 8 oz	12.5 mg	0.6	Every 12 hours
3.0	6 lbs 9 oz	15.0 mg	0.7	Every 12 hours
3.5	7 lbs 12 oz	17.5 mg	0.8	Every 12 hours

INTRAVENOUS ANTIBIOTIC DOSAGES

SEPTIC ABORTION AND POSTPARTUM INFECTION

First choice medications:

a) Penicillin G 4-5 million units, i.v., every 4-6 hours **PLUS**
b) Chloramphenicol 1 g, i.v., every 8 hours.

Second choice medications:

a) Ampicillin 1 g, i.v., every 4 hours **PLUS**
b) Metronidazole 500 mg, i.v., every 6 hours.

Other combinations possible if the above combinations are not available:

a) Ampicillin 1 g, i.v., every 4 hours **PLUS**
   Chloramphenicol 1 g, i.v., every 8 hours.
b) Ampicillin 1 g, i.v., every 4 hours **PLUS**
   Gentamicin 1.0-1.5 mg/kg weight, i.v., every 8 hours **PLUS**
   Clindamycin 900 mg, i.v., every 8 hours.
c) Ampicillin 1 g, i.v., every 4 hours **PLUS**
   Gentamicin 1.0-1.5 mg/kg weight, i.v., every 8 hours **PLUS**
   Metronidazole 500 mg, i.v., every 6 hours.

PREMATURE RUPTURE OF THE MEMBRANES

If there is fever:

First choice medications:

a) Penicillin G 4-5 million units, i.v., every 4-6 hours **PLUS**
b) Chloramphenicol 1 g, i.v., every 8 hours.

Second choice medications:

a) Ampicillin 1 g, i.v., every 4 hours **PLUS**
b) Gentamicin 1.0-1.5 mg/kg weight, i.v., every 8 hours.

Other combinations possible if the above combinations are not available:

a) Ampicillin 1 g, i.v., every 4 hours **PLUS**
   Chloramphenicol 1 g, i.v., every 8 hours.
b) Penicillin G 4-5 million units, i.v., every 4-6 hours **PLUS**
   Gentamicin 1.0-1.5 mg/kg weight, i.v., every 8 hours.

ABBREVIATIONS

i.v.	=	intravenous
p.o.	=	given orally
i.u.	=	international units
i.m.	=	intramuscular
sublingual	=	under the tongue
LMP	=	Last menstrual period
EDD	=	Estimated delivery date

APPENDIX 2

QUETZALTENANGO MATERNAL AND NEONATAL HEALTH PROJECT

The Quetzaltenango Maternal Neonatal Health Project took place between 1988 and 1993 in the Quetzaltenango Health Area of Guatemala. This was a collaborative project between the Quetzaltenango Health Area and the Institute of Nutrition of Central America and Panama, under the direction of the Ministry of Public Health. The objective of the project was to reduce the rates of maternal and neonatal mortality through more efficient utilization of existing resources for interventions at the community and hospital levels. The intervention focused on the early detection and adequate management of the most common obstetric complications, hemorrhage, sepsis and eclampsia, and neonatal complications - asphyxia, sepsis and complications due to prematurity and low birthweight.

The project was comprised of three phases: assessment, intervention and evaluation. In the assessment phase, studies were performed to determine the limiting factors and other problems in the management of obstetric and neonatal cases at the levels of the families, traditional birth attendants (TBAs), health centers and posts, and the hospital (in this document the term "traditional birth attendant" refers to community-level women who may or may not be trained). To identify the factors which influence the appropriate management of obstetric and neonatal cases and the adequate utilization of the health care services, surveys were taken of the users of the health services, health service personnel, and TBAs. Studies were also performed to determine the principal causes of maternal and neonatal death.

One of the principal findings of these studies is that 95% of maternal deaths were caused by hemorrhage, sepsis or eclampsia. Of the peri-neonatal deaths, 92% were caused by asphyxia due to either malpresentation and prolonged labor, sepsis, and complications related to prematurity or low birthweight. Since their initial training, health service personnel had not received any refresher or advanced training in the principal obstetric and neonatal emergencies. Specific management protocols for these complications did not exist. Furthermore, the referral and counter-referral system was not functional.

In the second phase of the project, interventions based on the diagnosis were developed to improve the detection and management of the principal obstetric and neonatal emergencies. Health service management protocols were established and training sessions were given for health service personnel and traditional birth attendants (TBAs). Meetings were held with health service personnel to encourage them to improve their working relationship with TBAs and their patients. Attempts were also made to improve the health personnel's perceptions of TBAs. Meetings between personnel at different levels of the health system were arranged in order to strengthen the referral and counter-referral system. TBA trainers were taught to improve their technical knowledge of the management of obstetric and neonatal emergencies, and were familiarized with participatory teaching methods for adult education. Practical, low cost, easily constructed visual materials were developed to facilitate TBA participatory training.

In the evaluation phase of the project, the impact of the interventions was evaluated and the monitoring and evaluation systems were established in the health services and communities involved.

Preliminary data show an increase of 396% in TBA referrals of complicated obstetrical cases to the hospital. Neonatal mortality in the hospital decreased from 38 per 1000 live births in 1989 to 32 per 1000 live births in 1992. The traditional birth attendants report better acceptance by the hospital personnel, who are beginning to welcome their participation during the in-hospital births of their referred patients. In the health centers and health posts, the information registered in the clinical charts of prenatal, postnatal and neonatal care has improved. Additionally, an increase in skills performed by health personnel during prenatal clinical exams has been observed.

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