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**INTERVENTIONS TO IMPROVE
MATERNAL AND NEONATAL HEALTH AND NUTRITION**

WORKING PAPER: 4

November 1990

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**Report Prepared for
The Agency for International Development
Contract #DPE-5966-Z-00-8083-01
Project #936-5966**

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INTRODUCTION

The MotherCare Project aims to improve pregnancy outcomes, for both women and infants, through a household and community-based approach. Unfortunately, a "poor pregnancy outcome" (e.g., death of a woman or baby, stillbirth, low birthweight infant) is not a straightforward problem consisting of one illness that requires one intervention. Improving the outcome of pregnancy means enhancing the wellness of a natural process. It may require intervening at several stages -- before or during pregnancy, during delivery, or during the first month of life. Which interventions are selected depends on the relative importance of the problems in your area.

Before or During Pregnancy

Poor pregnancy outcomes can have roots in the previous generation and continue to impact on the next generation. For example, an underweight woman may give birth to an underweight baby. If the baby is a girl and if she survives, she may receive less food in the household than her brothers and fail to catch up on her growth. She may marry in her early teen years and give birth shortly thereafter to a child similar to herself -- underweight and more vulnerable to infections and early death. This is not an uncommon picture in some parts of the world. Breaking this intergenerational cycle of ill health requires periodic interaction with the woman beginning at some point in the cycle in order to maintain her health and a good nutritional status.

Delivery is a time where infections may be introduced for both the woman and the baby. Protecting against infection must begin prior to delivery, however. Tetanus infection can be prevented with appropriate immunization provided to the mother prior to or during pregnancy. "Clean" delivery techniques may also guard against tetanus, puerperal infections and some forms of neonatal sepsis. Ensuring such protection begins with discussions with the mothers and birth attendants prior to delivery.

During Delivery

Unfortunately, even such preventive measures taken before or during pregnancy and delivery are not enough. Among healthy pregnant women in developed countries, there are still unpredictable obstetrical emergencies that could result in a poor outcome in up to 10-15 percent of cases. In developing countries, these percentages are relatively unknown but assumed to be larger. Causes of obstetrical emergencies in developing countries include hemorrhage (antepartum and postpartum), obstructed labor, infections, and eclampsia, the end result of pregnancy-induced hypertension. For women with such problems, ensuring a healthy outcome for herself and her child requires more than prevention -- it requires early recognition and response to the problem either in the home, the health center and/or in the hospital.

During the First Month of Life

Ensuring an infant's healthy start in life requires first a healthy and well-nourished mother, second a clean delivery, and finally warmth and good nutrition. Once born, exclusive breastfeeding initiated within the first hour of life can provide the necessary nutrition, the protection against infections, and the opportunity for bonding. Even so, the status of the infant at birth may require further assistance. Such conditions as low birthweight, hypothermia, asphyxia, and neonatal sepsis, need to be recognized early and the appropriate response made -- at the home, the health center or the hospital. And again, as with obstetrical emergencies, these are typically emergency problems, requiring identification and quick, appropriate action.

The Manual

Thirteen problems that can result in poor pregnancy outcomes are described in this manual, problems that either can be prevented or require management during pregnancy, delivery or in the first month of life. For each problem noted, signs and symptoms need to be **recognized**, appropriate **responses** need to be made, and **resources** need to be assembled. The level of recognition, responses and resources is determined by the level of provider, whether at the **community** (mother/family, community health worker, and traditional birth attendant), **health post/health center**, or at the **hospital**. There are other problems that impact on pregnancy outcomes, notably sexually transmitted diseases and other infections, that may be more geographically specific than those described here. Prevention of pregnancy, e.g., family planning, is not covered here as much has been written on this issue.

We recognize that countries vary in their protocols and in the level of staff responsible for managing specific problems. These may differ from what is presented here. What we have tried to do is move the response as close to the woman as possible. Such a community-based approach is most appropriate where women do not use services at all or use them only infrequently. Unfortunately, this describes the majority of pregnant women in developing countries.

This manual should be used as a check list in planning programs aimed at improving pregnancy outcomes, but only after an assessment of the problems has been undertaken. In some areas, such as in the Caribbean, hypertension during pregnancy is a relatively major problem. In other areas, such as parts of sub-Saharan Africa, obstructed labor may be more of a problem. The relative importance of problems, along with the availability of resources and the feasibility of the intervention, should determine which interventions are selected for implementation. It is not anticipated that all problems can be managed at once. This manual is not intended to be a technical guide or treatment protocol for clinicians, TBAs, CHWs, or any other provider. It should be used as a reminder of what might be done should a particular problem be relatively important in your area.

We welcome your comments and suggestions on how to improve this manual for your use. Please give us your tips on the messages, educational aids, measurement tools or other means you know of on how to improve pregnancy outcomes.

Best wishes for healthy motherhood!

Marjorie A. Koblinsky, Director, MotherCare

DESCRIPTION OF LEVELS OF CARE

Community Level

- Mother/
Family** This group also includes community members. Since many communities in developing countries lack basic health services, emphasis is placed on family members to take part in their own health care by taking preventative measures, identifying problems and seeking treatment when necessary.
- Community
Health
Worker
(CHW)** Lay health workers and traditional healers may also be included in this group. Community health workers are selected by the community. They can be salaried or work as volunteers. Both men and women work as CHWs. They function in health prevention, basic curative services and health promotion. The length of a CHW training course varies from a few weeks to several months. Their knowledge of obstetric and neonatal care is typically minimal.
- Traditional
Birth
Attendant
(TBA)** Traditional birth attendants also live in the community where they serve. They are mainly women who have acquired their skills through apprenticeship. Most TBAs do not provide antenatal care but focus much attention on labor, delivery and postpartum care. TBA training doesn't always include neonatal care. Some TBAs have received formal training from government or private programs. Many TBAs are illiterate. The experience and activity level of TBAs varies greatly. Some are trained to give injections, dispense contraceptives and perform more complicated procedures at delivery (e.g. episiotomy). TBAs can be salaried, although most receive payment in the form of a gift from the family. TBAs along with CHWs function at the primary level of health care.

Health Post/Health Center

This level varies greatly depending on the country and its location within the country. In some areas these centers provide many curative services while in others they offer mainly preventative care and basic first aid. A health post, being the smaller of the two, minimally has a trained health assistant or a nurse. There may be a midwife (or nurse-midwife) as well. A health center usually is staffed by a nurse and may have a midwife and/or doctor as well. This level typically is unable to provide surgical intervention or administer blood transfusions. Many health centers have maternal-child health programs and some have a maternity service. The level of knowledge of obstetrics, postpartum and neonatal care will depend on whether a midwife is present. Typically other health personnel may have received training but have had little experience in these areas. Since health posts and health centers range from providing a basic to an intermediate level of health care, depending on their resources, they may be viewed as providing either primary or secondary health care.

Hospital

The hospital represents the most sophisticated level of health care available in a particular region and is usually viewed as providing tertiary health care. Services such as surgery, obstetrics, anesthesia, etc. are provided. Laboratory facilities, X-ray and blood transfusion should also be available at this level. Personnel minimally consists of a doctor, nurses and possibly midwives and/or obstetricians.

ANEMIA

Anemia is a deficiency in the red blood cells, in hemoglobin or in blood volume. Anemia is not a disease, rather it is a symptom of various diseases. Therefore, treatment must be specific to the cause.

Potential complications: Anemia causes weakness, fatigue and lower productivity, especially in women during pregnancy. Delivery of low birthweight (LBW) infants is more common in women who are anemic. LBW infants have a greater chance of dying in the first year of life or of having delayed development and possibly mental and/or growth retardation. Anemia contributes to maternal mortality. Severe anemia can lead to heart failure and death before or during delivery. Even a "normal" blood loss at delivery may prove to be fatal to a woman with severe anemia (<8g/dl).

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ANEMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------|--|---|---|
| COMMUNITY Mother/ Family | <p>Know impact of anemia on pregnancy and on mother and baby's health</p> <p>Know causes of anemia:</p> <ul style="list-style-type: none"> - Lack of foods rich in iron (e.g., green leafy vegetables) - Lack of foods rich in folic acid - Malaria - Parasites (e.g., hookworm) - Sickle cell disease - Thalassemia <p>Recognize that pregnant and lactating women have increased needs for iron and folic acid and for food sources rich in these nutrients</p> <p>Know foods/beverages which inhibit iron absorption (e.g., coffee and tea) and foods/beverages which enhance absorption (e.g., vitamin C-rich citrus fruits)</p> <p>Recognize signs of anemia:</p> <ul style="list-style-type: none"> - Fatigue, weakness - Pallor of skin, nailbeds, gums, insides of eyelids - Craving for non-food substances (PICA) | <p>Eat nutritious diet high in iron-rich foods and foods which enhance iron absorption. Increase quality and quantity of foods during pregnancy and reduce foods/beverages that inhibit iron absorption</p> <p>Take iron/folic acid supplements daily but avoid taking simultaneously with foods/beverages that inhibit iron absorption</p> <p>Seek treatment for anemia and/or parasitic diseases before and during pregnancy</p> <p>Use family planning to space pregnancies</p> <p>Take iron/folate enriched food supplements if available</p> <p>Know prevention of anemia:</p> <ul style="list-style-type: none"> - Malaria prophylaxis/mosquito nets - Prevent other parasitic diseases (use shoes) | <p>Education by women's groups and mass media to teach about anemia, importance of diet in pregnancy</p> <p>Iron-folate tablets, available in community</p> <p>Supplemental foods program</p> <p>Women's Cooperatives/local gardening projects</p> <p>Income generating projects which allow women to buy more iron-rich foods</p> <p>Good sanitation in community</p> <p>Shoes, for prevention of hookworm</p> <p>Transportation for referrals</p> <p>Child care</p> |

ANEMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|---|---|
| COMMUNITY Mother/ Family cont. | <p>Recognize importance of breastfeeding and child spacing in prevention of anemia</p> <p>Recognize need to take iron/folic acid supplements daily for treatment of anemia</p> <p>Recognize need for treatment of malaria and other parasitic diseases (e.g., hookworm) during pregnancy to prevent anemia</p> | | |
| COMMUNITY Community Health Worker (CHW) | <p>Same as above, plus:</p> <p>Know risk factors for anemia:</p> <ul style="list-style-type: none"> - Closely spaced pregnancies (less than 2 years apart) - Women with parasitic diseases (malaria, hookworm) or history of same - Women with history of postpartum hemorrhage or history of anemia - Adolescents - Inadequate diet, deficient in iron/folic acid - Dietary inhibitors - Failure to take iron/folic acid supplements - History of sickle cell disease | <p>Same as above, plus:</p> <p>Screen all women for anemia/poor diet</p> <p>Prevent and treat anemia with iron folate tablets and appropriate diet</p> <p>Possibly administer anti-malarials as prophylaxis to pregnant women in endemic areas*</p> <p>Administer anthelmintics when needed (depending on CHW protocols)</p> <p>*Malaria prophylaxis may not be carried out because of resistant strains of malaria – check with local health authorities</p> | <p>Same as above, plus:</p> <p>Protocols for CHWs</p> <p>Home Based Maternal Records (HBMR)</p> <p>Regular supply of iron-folate tablets</p> <p>Possibly anti-malarials</p> <p>Possibly anthelmintics</p> <p>Aids to screen for anemia:</p> <ul style="list-style-type: none"> - Anemia recognition card - Color swatches |

ANEMIA

LEVEL OF CARE

**COMMUNITY
Community
Health
Worker
cont.**

RECOGNIZE

Detect anemia:

- Know signs and symptoms (as noted above)
- Know signs and symptoms of severe anemia:
 - extreme pallor of mucus membranes, nail beds, etc.
 - dyspnea (difficulty breathing)
 - increased heart rate

RESPONSE

Refer all women with severe anemia to health center/hospital (depending on protocol)

Teach prevention of anemia:

- Conduct nutrition education classes and demonstrations using local foods
- Encourage a good diet in pregnancy which is high in iron and foods/ beverages which enhance iron absorption and low in foods/ beverages that inhibit iron absorption
- Obtain diet history to assess dietary needs, cooking methods, etc.
- Investigate cultural beliefs that affect nutrition in pregnancy, compliance with supplements. Discourage food taboos that interfere with nutritional needs

Teach prevention of parasitic diseases (e.g., good hygiene, footwear)

Encourage child spacing, refer for family planning

Encourage prenatal care for all pregnant women and coverage with iron/folate tablets

RESOURCES

Transportation for referrals

ANEMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|--|--|
| COMMUNITY Traditional Birth Attendant (TBA) | Same as above, plus: Recognize excessive blood loss at delivery as additional cause of anemia | Same as above, plus: Minimize excessive blood loss at delivery (avoid tears, proper management of third stage using controlled cord traction, baby to breast immediately after delivery, use oxytocics as indicated) | Same as above, plus: Training and supervision of TBAs by health center personnel Protocols for TBAs |
| HEALTH CENTER/ HEALTH POST | Same as above, plus: Know lab values to detect/differentiate types of anemia | Same as above, plus: Physical exam to assess severity of anemia/presence of other illnesses Monitor vital signs -- detect increased heart rate Perform lab tests -- hemoglobin, hematocrit, CBC, stool for ova and parasites, malaria smear (above depends on capability of center) Treat anemia Possibly give iron injections (depends on availability; training of personnel and protocols) | Same as above, plus: Basic lab equipment and reagents Drugs, including injectable iron, anthelmintics, iron-folate, anti-malarials Prenatal records |

ANEMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---------------|--|---|
| HEALTH CENTER/ HEALTH POST cont. | | <p>Treat other diseases if present</p> <p>Refer cases of severe anemia to hospital. Send 2 family members since blood transfusion may be needed</p> | <p>Same as above, plus:</p> <p>Maternity huts or lying-in ward so that high risk women can be near hospital just prior to and during delivery or whenever condition warrants it</p> |
| HOSPITAL | Same as above | <p>Same as above, plus:</p> <p>Additional tests to rule out hemoglobinopathies (sickle cell disease, thalassemia)</p> <p>Evaluation by doctor/obstetrician</p> <p>Type and cross match blood - Screen for antibodies/viruses if possible (especially HIV)</p> <p>Administer iron injection (possibly)</p> <p>Possibly administer blood (packed cells)*</p> | <p>Lab</p> <p>Blood bank -- blood products/ storage/proper testing equipment</p> <p>Intravenous fluids (IVs)</p> <p>Medicines -- Lasix (a diuretic), oxytocin, antibiotics, etc.</p> <p>Possibly ultrasound, fetal monitoring equipment</p> |

***Caution:** Heart failure can result if too much fluid is given to women with severe anemia.

MATERNAL UNDERNUTRITION

Maternal undernutrition is a condition in which nutrient intake or reserves are inadequate to meet the increased nutrient requirements of pregnancy and lactation.

Potential complications: The undernourished woman suffers from fatigue, lower productivity and weakness. She is more susceptible to infections and, if severely malnourished, may have insufficient lactation after four months postpartum. There is an increased incidence of mortality in both undernourished women giving birth and their infants. There is a greater chance that the baby will be low birthweight and therefore have an increased chance of having illnesses or dying in the first year of life.

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MATERNAL UNDERNUTRITION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|---|--|
| <p>COMMUNITY Mother/ Family</p> | <p>Know impact of low prepregnant weight and low weight gain in pregnancy on health of mother/health of baby</p> <p>Recognize that pregnant and lactating women have increased nutritional needs</p> <p>Recognize undernutrition in women</p> <p>Know importance of adequate weight gain in pregnancy (women with normal prepregnant weight should gain a minimum of 9kg in pregnancy, approximately 1kg/month. Women with low prepregnant weight should gain more)</p> | <p>Participate in local weight monitoring of women of reproductive age by women with special emphasis on monthly weighing of pregnant women</p> <p>If pregnant woman gaining less than 1kg/month after 20 weeks, advise her to increase her intake</p> <p>Screen for undernutrition in women by weight, weight for height, or arm circumference measurement (range is 21-23 cms.)</p> <p>Eat nutritious diet in pregnancy - Increase quality and quantity of foods</p> <p>Increase rest, decrease workload in pregnancy</p> <p>Participate in food supplement programs for pregnant and lactating women when needed</p> <p>Consume vitamin/mineral supplements, especially iron/folic acid</p> <p>Seek treatment for underlying illnesses (parasites, anemia, TB, etc.)</p> | <p>Community groups to educate on consequences of undernutrition in pregnancy</p> <p>Community/women's groups for education on self-screening for undernutrition</p> <p>Home Based Maternal Records (HBMR)</p> <p>Weighing scales</p> <p>Height board</p> <p>Arm circumference tape (color-coded)</p> <p>Vitamin/mineral supplements</p> <p>Supplemental foods</p> <p>Women's cooperatives</p> <p>Good sanitation services/facilities</p> <p>Transportation</p> <p>Childcare</p> |

MATERNAL UNDERNUTRITION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|---|---|
| COMMUNITY Mother/ Family cont. | | <p>Use family planning to space pregnancies</p> <p>Assist women with income generating projects</p> <p>Assist with local or home gardening projects</p> <p>Improve water supply/sanitation in community</p> | |
| COMMUNITY Community Health Worker (CHW) | <p>Same as above, plus:</p> <p>Know risk factors for maternal undernutrition:</p> <ul style="list-style-type: none"> - Women with poor quality diets - Insufficient food - Low-income women - Adolescents - Closely spaced pregnancies (less than 2 years apart) - Women with underlying illnesses (e.g., parasitic diseases) - Women with heavy physical workload in pregnancy | <p>Same as above, plus:</p> <p>Screen for undernutrition</p> <ul style="list-style-type: none"> - Monitor weight, weight for height, or arm circumference before and during pregnancy | <p>Same as above, plus:</p> <p>Training and supervision of CHWs</p> <p>Teaching materials and educational aids</p> <p>Protocols for CHWs</p> <p>Arm circumference tape (color-coded)</p> <p>Weighing scale</p> <p>Possibly height measure</p> |

MATERNAL UNDERNUTRITION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|---|--|
| COMMUNITY Community Health Worker cont. | Detect undernutrition in women before and during pregnancy | <p>Nutrition education for women/families</p> <ul style="list-style-type: none"> - Teach importance of desirable weight prior to pregnancy/weight gain in pregnancy - Assess adequacy of diet with dietary recall - Counsel on adequate nutritious diet based on locally available foods to meet increased requirements of pregnancy and lactation - Address food taboos in pregnancy, discourage exclusion of important foods - Encourage redistribution of family foods - Encourage reduced workload, more rest for pregnant women <p>Assess for dehydration, excessive vomiting during pregnancy</p> <ul style="list-style-type: none"> - Treat with oral rehydration solution <p>Administer vitamin/mineral supplements</p> <p>Give iron-folate tablets</p> <p>Give food supplements</p> <p>Screen for underlying diseases</p> <ul style="list-style-type: none"> - Treat if trained to do so | <p>Food supplements</p> <p>Iron-folate tablets</p> <p>Vitamin mineral supplements</p> <p>Oral rehydration solution (ORS)</p> <p>Transportation</p> <p>Classroom or teaching area</p> |

MATERNAL UNDERNUTRITION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---------------|---|--|
| COMMUNITY Community Health Worker cont. | | Prevent and treat anemia Refer to health center if very undernourished or poor weight gain in pregnancy or underlying illnesses which cannot be treated by CHW/TBA Provide or refer for family planning to space children Teach importance of increased rest and decreased work load in pregnancy Refer women for prenatal care | |
| COMMUNITY Traditional Birth Attendant (TBA) | Same as above | Same as above | Same as above, plus: Health center personnel for training and supervision of TBAs Protocols for TBAs |

MATERNAL UNDERNUTRITION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|-------------------------------|---|--|---|
| HEALTH POST/ HEALTH CENTER | Same as above, plus: Detect intrauterine growth retardation of fetus | Same as above, plus: Monitor weight gain at prenatal visits Monitor growth of fetus - Measure fundal height Obtain history and perform physical exam to determine presence of underlying illnesses Screen for anemia - Check hematocrit Treat diseases if present Laboratory tests may include: - Stool for ova and parasites - Malaria smear - TB test Depending on protocol may transfer women with severe undernutrition and/or intrauterine growth retardation to hospital | Same as above, plus: Basic lab equipment and reagents Pregnancy weight gain charts Fundal height measure Fundal height chart IV fluids |

MATERNAL UNDERNUTRITION

LEVEL OF CARE

RECOGNIZE

RESPONSE

RESOURCES

HOSPITAL

Same as above

Same as above, plus:

Treatment may include:

- Bedrest
- IV fluids to correct dehydration
- Further tests to rule out underlying illnesses (e.g., thyroid tests)
- Balanced, recuperative diet

Same as above, plus:

Maternity huts or lying-in ward

Lab facility

Food preparation site (kitchen)

PREGNANCY INDUCED HYPERTENSION (PIH)

PREECLAMPSIA, ECLAMPSIA (PREECLAMPSIA WITH SEIZURES, POSSIBLY WITH COMA)

Pregnancy Induced hypertension (PIH) is sometimes referred to hypertensive disorders of pregnancy and is a term which includes: preeclampsia (a disorder which occurs after 20 weeks and is characterized classically by increasing blood pressure, protein in the urine and edema), eclampsia (preeclampsia with the addition of one or more seizures), and chronic hypertension (women who were hypertensive prior to pregnancy). The cause of PIH is unknown.

Potential complications: Preeclampsia untreated can lead to eclampsia which is a major cause of maternal and fetal death. During an eclamptic seizure the fetus can be deprived of oxygen from the placenta causing fetal death in utero or possibly asphyxia at delivery. Preeclamptic women have a greater chance of delivering an infant who is low birthweight (LBW) due to placental insufficiency. Eclampsia often stimulates labor causing an increase in premature births. Other consequences of PIH which contribute to morbidity and mortality of the mother include:

- Renal failure;
- Liver damage;
- Impaired blood clotting; and
- Placental abruption -- a cause of bleeding before and during labor due to premature separation of the placenta which can result in maternal and fetal death.

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PREGNANCY INDUCED HYPERTENSION (PIH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------|--|--|--|
| COMMUNITY Mother/ Family | <p>Know signs of PIH (usually occur after 20 weeks of pregnancy):</p> <ul style="list-style-type: none"> - Swelling, especially of face and hands - Headaches - Blurred vision - Visual disturbances - Epigastric pain (pain in right upper portion of abdomen) - Increased blood pressure - Sudden weight gain <p>Know women at risk:</p> <ul style="list-style-type: none"> - First pregnancy - Very young women pregnant for first time or older women with first pregnancy - Women with multiple pregnancies (twins) - Women who are poorly nourished - Women with history of high blood pressure - Women with diabetes | <p>Go to health center/hospital if signs present</p> <p>Increase rest</p> <p>Increase fluids</p> <p>Obtain prenatal care to identify risk factors/signs of PIH</p> | <p>Women's groups, health educators, mass media, to teach importance of prenatal care, especially blood pressure monitoring</p> <p>Transportation</p> <p>Child care</p> <p>Blood pressure screening in community (prepregnant as well as pregnant women)</p> <p>Home Based Maternal Records (HBMR)</p> |

PREGNANCY INDUCED HYPERTENSION (PIH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------------|---|---|---|
| COMMUNITY Health Worker (CHW) | <p>Same as above, plus:</p> <p>Note increase in blood pressure (BP), if trained to take BP</p> <ul style="list-style-type: none"> - Increase of 30mmHg systolic and/or increase of 15mmHg diastolic from baseline BP (prepregnant or first visit BP) or 140/90 or above (if baseline BP is not known) - Recognize a BP of 125/75 may be high for many young women who normally are 90/60 <p>Know emergency treatment/stabilization of women with eclamptic seizures</p> | <p>Same as above, plus:</p> <p>Screen for women with risk factors for PIH</p> <p>Check blood pressure</p> <p>Screen for danger signs in pregnancy</p> <p>Refer women for prenatal care</p> <p>Refer women to health center/hospital if risk factors and/or danger signs</p> <p>Teach importance of good nutrition, increased rest, increased fluids</p> | <p>Same as above, plus:</p> <p>Transportation</p> <p>Training and supervision of CHWs</p> <p>Protocols for CHWs</p> <p>Sedatives (e.g., Valium, phenobarbital) if protocol allows</p> <p>Blood pressure apparatus/stethoscope</p> <p>Tongue blades</p> <p>Oral airways</p> <p>Emergency coding system to identify reason for transfer</p> |

PREGNANCY INDUCED HYPERTENSION (PIH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|---|---|
| COMMUNITY Community Health Worker cont. | | If the woman has eclamptic seizure: - Maintain airway -use padded tongue blade during seizure -insert plastic oral airway after seizure -clean secretions from mouth - Protect from harm during seizure -check for trauma after seizure - Give sedative if available (e.g., Valium or phenobarbital) to prevent further seizures - Transfer to hospital -accompany woman -give additional sedation en route if needed | |
| COMMUNITY Traditional Birth Attendant (TBA) | Same as above, plus: Recognize polyhydramnios (increase in amniotic fluid) as another risk factor for PIH Know that eclampsia can occur up to 24 hours postpartum | Same as above, plus: Continue close monitoring of danger signs (headaches, blurred vision, etc.) during labor and delivery as well as the early postpartum period | Same as above, plus: Training and supervision of TBAs by Health Center Personnel |

PREGNANCY INDUCED HYPERTENSION (PIH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|-------------------------------|--|--|---|
| HEALTH POST/ HEALTH CENTER | <p>Same as above, plus:</p> <p>Note other physical/lab findings of preeclampsia:</p> <ul style="list-style-type: none"> - Protein in urine - Increase in deep tendon reflexes - Increased weight gain (rapid weight gain, e.g., more than two pounds in one week) - Decreased urine output - Liver tenderness - Retinal changes (hemorrhagic areas may be noted on funduscopic exam) | <p>Same as above, plus:</p> <p>Treatment depends on severity</p> <ul style="list-style-type: none"> - Mild PIH: bedrest (left side), monitor closely for worsening condition (frequent BP checks, check for signs and symptoms) - Moderate to severe PIH: give sedatives to prevent seizures or possibly magnesium sulfate, transfer to hospital <p>In all cases, closely monitor fetus for intrauterine growth retardation (IUGR) through fundal height measurement</p> | <p>Same as above, plus:</p> <p>Transportation</p> <p>Basic lab tests for proteinuria</p> <p>Medications/sedatives (e.g., Valium, phenobarbital, magnesium sulfate) if protocol allows</p> <p>IV fluids</p> <p>Weighing scale</p> <p>Fetoscope</p> <p>Ophthalmoscope</p> |

PREGNANCY INDUCED HYPERTENSION (PIH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---------------|---|---|---|
| HOSPITAL | <p>Same as above, plus:</p> <p>Know that molar pregnancy is an additional risk factor for PIH and symptoms appear prior to 20 weeks gestation</p> | <p>Same as above, plus:</p> <p>Evaluated by doctor/obstetrician</p> <p>May induce labor or do cesarean section (C/S) depending on severity and gestational age of fetus</p> <p>IV fluids</p> <p>May give magnesium sulfate to prevent seizures</p> <p>Lab Tests to check renal function, liver function, coagulation studies, CBC</p> <p>Monitor status of fetus with available technology (e.g., nonstress test, sonogram)</p> | <p>Same as above, plus:</p> <p>Maternity huts or lying-in wards</p> <p>Lab</p> <p>C/S capability - Personnel</p> <p>Blood bank</p> <p>Anesthesia</p> <p>Drugs (especially sedatives and magnesium sulfate if used)</p> <p>Oxygen and suction</p> <p>Ophthalmoscope</p> <p>Possibly ultrasound/fetal monitors</p> <p>Neonatal resuscitation capability</p> |

Note: Lasix (a diuretic) is a potentially dangerous drug when used for preeclampsia on an out-of-hospital basis. It should be used only in a carefully monitored in-hospital setting.

ANTEPARTUM HEMORRHAGE (APH)

Antepartum hemorrhage (APH) refers to any bleeding during pregnancy, prior to delivery. The major causes of APH in early pregnancy are abortion (pregnancy loss before 20 weeks gestation) and ectopic pregnancy (implantation of the fertilized ovum in a site other than the uterine cavity). In late pregnancy, placenta previa (placenta implanted in lower uterine segment in front of the presenting part of the fetus) and placental abruption (premature separation of the normally implanted placenta) are the most common causes of antepartum hemorrhage. Uterine rupture, which can also occur in late pregnancy, is another cause of APH.

Potential complications: All types of APH carry the risk of maternal morbidity and mortality. Hemorrhage can lead to anemia which is often severe. There is an increased chance that surgery and blood transfusion will be needed. In remote areas where surgical services are lacking, a ruptured ectopic pregnancy or ruptured uterus is fatal. If the woman with an ectopic survives she has an increased chance of having another ectopic pregnancy as well as a decrease or loss of fertility. Second and third trimester bleeding carry risks to the baby which include prematurity and birth asphyxia.

References:

- Cunningham FG, MacDonald PC, Gant NF. Williams obstetrics. 18th ed. Englewood Cliffs: Appleton & Lange, 1989; 513, 703-5.
Lockwood C. Placenta previa and related disorders. *Contemporary OB/GYN* 1990; 35(1):47-68.
Varney H. Nurse-midwifery. 2nd ed. Boston: Blackwell Scientific Publications, 1987; 188-92.

ANTEPARTUM HEMORRHAGE (APH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---|---|--|
| COMMUNITY Mother/ Family | Recognize bleeding as a danger sign in pregnancy: - May occur any time in pregnancy - Even a small amount can be a danger sign - May be dark brown to bright red. May be clotted Recognize other danger signs that may accompany bleeding: - Abdominal pain, cramping - Uterus feels hard, does not relax - No fetal movements - Dizziness, fainting - Back pain (with placental abruption) | Go to hospital/health center if have danger signs Rest, lie down, keep warm Obtain prenatal care to identify risk factors Take iron/folate supplements to decrease impact of APH Seek trained birth attendant for delivery Seek regular screening and early treatment for sexually transmitted diseases (STDs) | Community groups to educate on danger signs of pregnancy/risks to mother and baby Home Based Maternal Records (HBMR) for identification of risk factors Transportation Child care |
| COMMUNITY Community Health Worker (CHW) | Same as above, plus: Know predisposing factors for ectopic pregnancy: - Tubal infection caused by sexually transmitted diseases (specifically gonorrhea and chlamydia) - History of tubal ligation - Pelvic tumors | Same as above, plus: Refer women with APH to hospital Arrange for 2 family members to accompany woman in case blood needed Avoid vaginal exams (may increase hemorrhage) | Same as above, plus: Health Center personnel for training and supervision of CHWs Protocols for CHWs Transportation |

ANTEPARTUM HEMORRHAGE (APH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|--|--|
| COMMUNITY Community Health Worker cont. | | <p>Refer women for prenatal care</p> <p>Teach danger signs of pregnancy to women and families</p> <p>Screen pregnant women for danger signs</p> <p>Teach prevention of STDs -- limit partners, use condoms</p> <p>Refer women for treatment of STDs</p> | |
| COMMUNITY Traditional Birth Attendant (TBA) | <p>Same as above, plus:</p> <p>Know major causes of APH and their signs and symptoms:</p> <ul style="list-style-type: none"> - First trimester bleeding <ul style="list-style-type: none"> -spontaneous abortion -induced abortion -ectopic pregnancy - 2nd and 3rd trimester bleeding: <ul style="list-style-type: none"> -placenta previa -placental abruption -uterine rupture <p>Recognize type of APH based on above classification</p> | <p>Same as above, plus:</p> <p>Assess gestation of pregnancy in screening for APH</p> <p>Check fetal heart tones (if trained)</p> <p>Check lie and presentation of fetus (may be abnormal with placenta previa)</p> <p>Accompany woman to hospital/health center if possible</p> | <p>Same as above, plus:</p> <p>Health center personnel for training and supervision of TBAs</p> <p>Protocols for TBAs</p> <p>Emergency coding system, for identifying reason for referral</p> <p>Fetoscope for TBAs trained in its use</p> |

ANTEPARTUM HEMORRHAGE (APH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|-------------------------------|---|---|--|
| HEALTH POST/ HEALTH CENTER | <p>Same as above, plus:</p> <p>Know associated conditions/complications of types of APH (e.g., abruptio placenta is associated with hypertension and preeclampsia, placenta previa is more common with multiple pregnancies and uterine rupture is associated with the use of oxytocics in labor, especially in women with high parity)</p> | <p>Same as above, plus:</p> <p>Obtain history and perform physical exam to determine type of APH</p> <p>Give iron-folate</p> <p>No vaginal exam if 2nd and 3rd trimester bleeding</p> <p>Treat for shock if present -- have woman lie down, feet elevated, give fluids, keep warm, keep calm, etc.</p> <p>Monitor vital signs</p> <p>Refer to hospital</p> <p>Possibly manage spontaneous abortion (depends on personnel)</p> | <p>Same as above, plus:</p> <p>BP Apparatus, stethoscope</p> <p>IV fluids, plasma expanders</p> <p>Fetoscope</p> <p>Transportation</p> |
| HOSPITAL | <p>Same as above, plus:</p> <p>Recognize additional physical and laboratory findings for various types of APH</p> | <p>Same as above, plus:</p> <p>Intervention depends on type of APH - If first trimester bleeding: pelvic exam, sonogram and possibly other diagnostic tests are done to rule out ectopic pregnancy (may do culdocentesis, Beta HCG assays and/or laparoscopy)</p> | <p>Same as above, plus:</p> <p>Maternity hut or lying-in ward</p> <p>Operating room/services</p> <p>Oxygen</p> <p>Anesthesia</p> |

ANTEPARTUM HEMORRHAGE (APH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|-------------------|-----------|---|--|
| HOSPITAL cont. | | <ul style="list-style-type: none"> - Treatment for ectopic pregnancy requires laparotomy and possibly tubal resection (depending on site of ectopic) - First trimester abortion-treatment may include dilatation and curettage of the uterus (D&C) if incomplete <ul style="list-style-type: none"> -oxytocics are usually given after D&C <p>2nd and 3rd trimester bleeding</p> <ul style="list-style-type: none"> - May use sonogram to diagnose placenta previa - Treatment of placenta previa depends on extent of bleeding and maturity of fetus - Bedrest and observation/monitoring of fetus is often the treatment if the woman is stable and fetus preterm - Cesarean section if fetus full term or earlier if excessive bleeding <p>Abruptio placenta often necessitates cesarean section unless very mild</p> <p>All types of APH may require:</p> <ul style="list-style-type: none"> - Treatment for anemia - Blood transfusion - IV fluids - Surgical intervention | <p>Laboratory, to type and cross match blood for transfusion, check complete blood count (CBC), platelet studies (for abruption)</p> <p>Sonogram</p> <p>Fetal monitors</p> <p>Laparoscopy equipment</p> <p>Laparotomy kit</p> <p>Neonatal resuscitation equipment</p> <p>Blood bank</p> <p>Oxytocics</p> <p>Iron-folate tablets</p> <p>Parenteral iron</p> |

ANTEPARTUM HEMORRHAGE (APH)

**LEVEL OF
CARE**

RECOGNIZE

RESPONSE

RESOURCES

HOSPITAL
cont.

Anticipate neonatal asphyxia with
placental abruption and placenta previa

OBSTRUCTED LABOR, CEPHALO-PELVIC DISPROPORTION (CPD), UTERINE RUPTURE

Obstructed labor, cephalo-pelvic disproportion (CPD) and uterine rupture are obstetrical emergencies which are interrelated. In obstructed labor, there is a barrier caused by either the fetus or the birth canal/maternal pelvis -- whereby delivery is not possible without medical intervention. CPD (when the size of the fetal head is too large to pass through the maternal pelvis) often results in an obstructed labor. If timely medical intervention is not obtained, obstructed labor leads to uterine rupture.

Potential complications: Obstructed labor, CPD and uterine rupture cause risks to both mother and infant. The risks to the mother include maternal exhaustion and dehydration, increased chance of developing infections and anemia, and increased need for blood transfusion. She may develop fistulas-vesicovaginal and/or rectovaginal. She may die from a ruptured uterus. The risks to the baby include asphyxia at birth, possibly resulting in brain damage and fetal death.

References:

- Cunningham FG, MacDonald PC, Gant NF. Williams obstetrics. 18th ed. Englewood Cliffs: Appleton & Lange, 1989; 377-83.
Division of Family Health. The prevention and treatment of obstetric fistulae -- report of a technical working group. Geneva: World Health Organization, April 1989; 5-7.
Golan A, Mircog O. Rupture of the pregnant uterus. *Obstetrics and Gynecology* 1980; **56(5):549-54.**

OBSTRUCTED LABOR, CEPHALO-PELVIC DISPROPORTION (CPD), UTERINE RUPTURE

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------|---|---|---|
| COMMUNITY Mother/ Family | <p>Know dangers of prolonged labor</p> <p>Recognize when active labor is too long - 8 hours for multipara, 12 hours for primigravida (or 1 whole day or 1 whole night passes)</p> <p>Know dangers of laboring without trained birth attendant</p> <p>Recognize need for prenatal care</p> <p>Know risk factors for obstructed labor, CPD and rupture of uterus:</p> <ul style="list-style-type: none"> - Women with a history of obstructed labor or stillbirth - Women with history of cesarean section - Women who have delivered a large baby previously - Women who have been circumcised - Very young women who are not fully mature (more likely to have small or contracted pelvis) - Very short women (cutoff for height varies, depending on population) - Women with history of vesicovaginal fistula - Women with unstable lie in pregnancy (transverse lie, breech) in late pregnancy | <p>Take woman to health center/hospital if labor prolonged</p> <p>Seek trained birth attendant for delivery (trained TBA, midwife)</p> <p>Consult midwife/go to hospital if risk factors present</p> <p>Families closely monitor length of labor</p> <p>Two family members accompany woman when transferred to arrange for blood transfusion if needed</p> <p>Encourage fluids during labor</p> <p>Encourage woman to empty bladder in labor (very full bladder can impede descent of presenting part)</p> <p>Encourage change of position in labor</p> | <p>Education on dangers of prolonged labor via women's groups, mass media and community groups</p> <p>Transportation</p> <p>Home Based Maternal Records (HBMR)</p> <p>Height measurement</p> <p>System for relaying messages to health center/hospital in case of emergency</p> <p>Child care</p> |

OBSTRUCTED LABOR, CEPHALO-PELVIC DISPROPORTION (CPD), UTERINE RUPTURE

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---|---|---|
| COMMUNITY Mother/ Family cont. | <ul style="list-style-type: none"> - Women who have had rickets or cretinism, polio, or other musculo/skeletal problems - Women with large keloids (possibly resulting from circumcision) <p>Recognize signs of dehydration during labor:</p> <ul style="list-style-type: none"> - Dry tongue - Woman exhausted | | |
| COMMUNITY Community Health Worker (CHW) | Same as above | Same as above, plus: Encourage woman to obtain prenatal care Screen pregnant women for risk factors - Check height If risk factors present refer to health center/hospital for evaluation Assist families in monitoring length of labor when trained birth assistant not available | Same as above, plus: On-going training and supervision of CHWs by Health Center personnel Protocols for CHWs Height measuring device |

OBSTRUCTED LABOR, CEPHALO-PELVIC DISPROPORTION (CPD), UTERINE RUPTURE

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|--|---|
| COMMUNITY Traditional Birth Attendant (TBA) | <p>Same as above, plus:</p> <p>Know signs and symptoms of obstructed labor:</p> <ul style="list-style-type: none"> - May have an indentation between upper and lower uterine segments (Ring of Bandl) - Bladder may be very distended - Fetal arm may be prolapsed - Mother is exhausted and dehydrated (dry tongue), unable to push <p>Know signs and symptoms of ruptured uterus:</p> <ul style="list-style-type: none"> - Abdominal pain on palpation - No fetal heart tones - Fetal parts easily palpated - Unable to feel contractions - Uterus changes shape - Woman goes into shock (rapid, weak pulse; decreased BP; increased restlessness or excitement; marked pallor of skin) | <p>Same as above, plus:</p> <p>Careful abdominal exam to determine lie, presentation, presence of very large baby, descent of head (lie most important, other determinations vary with TBA training)</p> <p>Refer all women with unstable lie or transverse lie (TVL) well in advance of labor (34-36 weeks gestation) to hospital</p> <p>Closely monitor all labors and transfer if prolonged</p> <p>Refer women with obstructed labor or uterine rupture immediately to hospital</p> <ul style="list-style-type: none"> - TBA accompanies woman - 2 family members or friends accompany in case blood transfusion needed | <p>Same as above, plus:</p> <p>Health center midwives to train and supervise TBAs</p> <ul style="list-style-type: none"> - Determine protocols for high risk transfer <p>Emergency coding/system for identifying reason for transfer (illiterate TBA may have color-coded pictograph)</p> <p>Tool to determine length of labor (e.g., mosquito coils -- 1 lasts 8 hours)</p> |

OBSTRUCTED LABOR, CEPHALO-PELVIC DISPROPORTION (CPD), UTERINE RUPTURE

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|-------------------------------|--|---|---|
| HEALTH POST/ HEALTH CENTER | <p>Same as above, plus:</p> <p>Know pelvic findings/clinical findings of obstructed labor/CPD:</p> <ul style="list-style-type: none"> - Cervical and vulvar edema - Possibly foul-smelling vaginal discharge - Caput (swelling) if head presenting - Molding (change in shape of fetal head from pressure) - Possibly prolapsed arm/shoulder presentation - If uterine rupture -- increased pulse, increased vaginal bleeding (possibly) <p>Know signs and symptoms of shock:</p> <ul style="list-style-type: none"> - Rapid, weak pulse - Decreased BP - Increased restlessness or excitement - Marked pallor of skin | <p>Same as above, plus:</p> <p>Abdominal and vaginal exam</p> <p>Assess for CPD/malpresentation/twins</p> <p>Monitor vital signs (blood pressure, temperature, pulse and respirations)</p> <p>Treat shock -- have woman lie down, feet elevated, give fluids, keep warm, keep calm, etc.</p> <p>Urethra! catheterization if needed</p> <p>Refer to hospital if in obstructed labor (alert line on partograph crossed)</p> <p>Send partograph when referred so hospital will know how long has been in labor/interventions in labor</p> <p>Prevention of obstructed labor:</p> <ul style="list-style-type: none"> - correct use of partograph | <p>Same as above, plus:</p> <p>Staff education to teach use of partograph/dangers of obstructed labor</p> <p>Partographs</p> <p>Transportation (vehicles)</p> <p>IV fluids</p> <p>Blood pressure apparatus</p> <p>Stethoscope</p> <p>Fetoscope</p> <p>Possibly vacuum extractor</p> <p>Prenatal records/intrapartal records</p> |

OBSTRUCTED LABOR, CEPHALO-PELVIC DISPROPORTION (CPD), UTERINE RUPTURE

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---------------|---------------|--|---|
| HOSPITAL | Same as above | <p>Same as above, plus:</p> <p>Possibly cesarean section if baby alive</p> <p>May do destructive procedure if baby dead (followed by vaginal delivery)</p> <p>Possible symphysiotomy (division of pubic bone) for some forms of CPD</p> <p>Possibly vacuum extraction if secondary arrest and baby low enough</p> <p>Laparotomy -- if ruptured uterus (and tubal ligation)</p> <p>Secure blood prior to surgery</p> <p>Possible hysterectomy for uterine rupture</p> | <p>Same as above, plus:</p> <p>Maternity village or lying-in ward</p> <p>Lab: - To type and cross match blood - Check hemoglobin/hematocrit</p> <p>Blood bank</p> <p>Operating theater</p> <p>Oxygen</p> <p>Anesthesia</p> <p>Trained personnel -- obstetrician, nurses, midwives</p> <p>Oxytocics*</p> <p>Laparotomy kit</p> |

*Use of oxytocics in labor can cause uterine rupture if used incorrectly/not monitored closely, therefore oxytocics should only be used in facilities with major surgical capability

POSTPARTUM HEMORRHAGE (PPH)

Postpartum hemorrhage (PPH) is defined as a blood loss of 500cc from the genital tract or more following delivery of the baby. In cases where women are very anemic, a lower blood loss may in fact be very dangerous.

Potential complications: Postpartum hemorrhage is a major cause of maternal death in developing countries. PPH is often associated with maternal deaths from other direct causes such as sepsis and obstructed labor. A woman who suffers from a postpartum hemorrhage is likely to become anemic, placing her at even greater risk during subsequent pregnancies. PPH increases the likelihood that a blood transfusion will be needed, posing additional risks in that viruses such as HIV and hepatitis can be transmitted in the blood.

References:

Division of Family Health. The prevention and management of postpartum hemorrhage -- report of a technical working group. Geneva: World Health Organization, July 1989.

Varney H. Nurse-midwifery. 2nd ed. Boston: Blackwell Scientific Publications, 1987; 387-89.

POSTPARTUM HEMORRHAGE (PPH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|---|---|
| COMMUNITY Mother/ Family | <p>Know postpartum danger signs: - Identify increased blood loss after delivery</p> <p>Know ways to possibly prevent/control excessive bleeding after delivery: - Baby to breast (early/exclusive breastfeeding) - Massage fundus (body of uterus) until firm</p> <p>Recognize importance of having trained birth attendant at delivery</p> <p>Recognize importance of preventing anemia by good diet and iron/folic acid supplements</p> | <p>Observe closely for increased bleeding</p> <p>Notify TBA/health worker or go to health center if excessive bleeding after delivery</p> <p>Do not deliver alone. Seek trained attendant for delivery</p> <p>Obtain prenatal care. Obtain treatment for anemia</p> | <p>Community groups, women's groups and mass media to educate on postpartum complications</p> <p>Transportation to health center/hospital</p> |
| COMMUNITY Community Health Worker (CHW) | <p>Same as above, plus:</p> <p>Recognize PPH (know normal vs. abnormal blood loss at delivery)</p> <p>Recognize symptoms of excessive blood loss: - Woman may feel dizzy, pulse weak, rapid, etc. - Know signs of shock (weak, rapid pulse, decreased BP, pallor, etc.)</p> | <p>Same as above, plus:</p> <p>Perform external bimanual compression for PPH</p> <p>Give oxytocics (if available and trained to do so) for PPH</p> <p>Put baby to breast immediately after delivery</p> <p>Give fluids (e.g., ORS)</p> | <p>Same as above, plus:</p> <p>Protocols for CHWs</p> <p>Training and supervision of CHWs</p> <p>Possibly oxytocics</p> <p>Transportation</p> |

POSTPARTUM HEMORRHAGE (PPH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|---|---|
| COMMUNITY Community Health Worker cont. | Know emergency measures to control PPH Know major causes of PPH: - Uterine hypotonia (decreased tone) - Retained pieces of placenta - Tears of cervix, vagina and perineum - Rupture of uterus - Inversion of uterus | Treat for shock -- have woman lie down, feet elevated, give fluids, keep warm, keep calm, etc. Encourage women to have trained birth attendant at delivery Teach women/families danger signs Transfer to health center/hospital if has excessive bleeding/PPH Send 2 family members with patient in case blood transfusion needed | |
| COMMUNITY Traditional Birth Attendant (TBA) | Same as above, plus: Know predisposing conditions for PPH: - Over distended uterus (twins, large baby) - Prolonged labor - Rapid/precipitous delivery - Grand multipara -- woman who has delivered four or more babies - Women with history of PPH or problem delivering placenta - Interuterine death - Placenta previa or abruptio placenta with current pregnancy | Same as above, plus: Prevent PPH/Reduce impact: - Screen all pregnant women for predisposing factors and refer - Reduce impact of PPH by screening all pregnant women for anemia, treating anemia and referring when necessary Manage third stage of labor appropriately. Use controlled cord traction to minimize blood loss. | Same as above, plus: Health center midwives/health personnel for training and supervision of TBAs Home Based Maternal Records (HBMR) Iron/folate tablets Transportation |

POSTPARTUM HEMORRHAGE (PPH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---|---|-----------|
| COMMUNITY Traditional Birth Attendant cont. | <p>Know that anemia exacerbates risk of PPH being fatal</p> <p>Know prevention of PPH</p> | <p>Massage uterus well following delivery of placenta</p> <p>Baby to breast immediately following delivery</p> <p>Careful inspection of placenta for completeness, refer if incomplete</p> <p>Try to avoid tears at delivery -- check for tears after delivery</p> <p>Treatment of PPH:</p> <ul style="list-style-type: none"> - Try to remove placenta (if still undelivered) pass urine, Brandt-Andrews -- use of gentle cord traction with one hand, while other hand applies pressure to anterior surface of uterus. - Placenta delivered -- stimulate contraction by fundal massage, breastfeeding (or nipple stimulation if child not alive), external bimanual compression - Give oxytocic if available (trained TBA) - If bleeding not controlled transfer to referral center (or nearest health center) - Continue external bimanual compression during transport | |

POSTPARTUM HEMORRHAGE (PPH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|--|--|
| COMMUNITY Traditional Birth Attendant cont. | | Careful and frequent observation for bleeding after delivery -- especially first 1-2 hours -- check fundus frequently to make sure it is firm Teach family/mother how to check and massage fundus after delivery Keep bladder empty/encourage mother to void during labor and after delivery Stay with mother at least 2 hours following delivery to monitor closely/check for bleeding | |
| HEALTH POST/ HEALTH CENTER | Same as above, plus: Recognize additional predisposing factors: hepatitis, fibroids, eclampsia, chorioamnionitis, obstructed labor, disseminated intravascular coagulation (clotting disorder) Know clinical signs indicative of increased blood loss: - Increased pulse - Decreased BP - Know signs and symptoms of shock | Same as above, plus: Time episiotomy (if needed) correctly (if done too early, excessive bleeding may occur) Possibly administer prophylactic oxytocic -- after delivery or with anterior shoulder ("Active management of third stage")* *WHO recommends "active" management be used by trained personnel routinely at every delivery | Same as above, plus: Oxytocics if in protocol Syringes and needles Prenatal records Partographs Intravenous fluids (IV) Antibiotics, iron and folate tablets Suture materials -- instruments for suturing |

POSTPARTUM HEMORRHAGE (PPH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|----------------------------------|-----------|--|--|
| HEALTH POST/ HEALTH CENTER cont. | | <p>Use partograph for early recognition of prolonged and obstructed labor</p> <p>Respond to excessive bleeding before 500cc have been lost -- give oxytocic, start IV, massage fundus, etc.</p> <p>If placenta undelivered: attempt to deliver by controlled cord traction, encouraging woman to pass urine and/or manual removal</p> <p>Apply fundal massage</p> <p>If placenta delivered: repeat oxytocic (IV or IM)</p> <p>Bimanual compressions of uterus</p> <p>If uterus firm and bleeding continues, check for lacerations and suture/secure hemostasis</p> <p>Start antibiotic therapy (if manual removal of placenta was performed)</p> <p>If bleeding not controlled and/or placenta retained, transfer to hospital quickly. If necessary, continue external bimanual compression during transfer.</p> | <p>Light source for examination of perineum</p> <p>Ambulance/transport</p> <p>BP apparatus</p> |

POSTPARTUM HEMORRHAGE (PPH)

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|----------------------------------|--|---|--|
| HEALTH POST/ HEALTH CENTER cont. | | <p>Monitor vital signs</p> <p>IV fluids, oral rehydration fluid, or other local fluids to correct fluid losses</p> <p>Treat shock</p> <p>Estimate blood loss</p> <p>Send intrapartal/delivery record</p> | |
| HOSPITAL | <p>Same as above, plus:</p> <p>Recognize additional factors which predispose women to PPH:</p> <ul style="list-style-type: none"> - Oxytocic administration to induce or augment labor - General/epidural anesthesia - Instrument deliveries - Cesarean sections | <p>Same as above, plus:</p> <p>Additional measures depend on cause/severity of PPH and may include:</p> <ul style="list-style-type: none"> - Blood transfusion - Repair of vaginal/cervical lacerations - Surgical repair of ruptured uterus - Uterine curettage (D&C) for retained placental fragments - Laboratory tests to determine extent of anemia, coagulation defects - Possibly perform hysterectomy | <p>Same as above, plus:</p> <p>Operating theater</p> <p>Instruments/suture materials</p> <p>Anesthesia</p> <p>Oxygen</p> <p>Blood bank</p> <p>IV fluids</p> <p>Injectable iron</p> |

PUERPERAL INFECTIONS

Puerperal infection refers to an infection, primarily bacterial, which originates in the reproductive tract and is acquired during labor, delivery or postpartum. Puerperal infection is often used to describe other infections and conditions occurring during the postpartum period (first 42 days after birth). Puerperal infections usually occur between the third and seventh day following delivery.

Potential complications: Endometritis (infection of intrauterine cavity) is the most common type of puerperal infection. If untreated it can spread to other pelvic organs and inside the abdominal cavity (peritonitis). If left untreated, this can be fatal. Other types of puerperal infections include:

- Mastitis (breast infection);
- Pelvic abscesses;
- Pelvic thrombophlebitis (blood clot and vein inflammation);
- Urinary tract infection -- more common in circumcised women; and
- Pelvic hematoma (collection of blood in pelvis).

Sequelae of puerperal infections include: increased risk of ectopic pregnancy and infertility and possible decrease in lactation causing newborn to be at risk for developing nutritional deficiencies.

References:

Cunningham FG, MacDonald PC, Gant NF. Williams obstetrics. 18th ed. Englewood Cliffs: Appleton & Lange, 1989; 461-75.
Niswander K. Manual of obstetrics. Boston: Little, Brown and Co., 1986; 409-11.

PUERPERAL INFECTIONS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---------------------------------------|---|---|---|
| COMMUNITY Mother/ Family | <p>Identify danger signs during postpartum period:</p> <ul style="list-style-type: none"> - Fever, chills - Abdominal pain - Pain over kidney region felt through the back when tapped - Pain on urination - Foul smelling vaginal discharge - Painful, engorged breasts <p>Know risk factors for postpartum infection:</p> <ul style="list-style-type: none"> - Prolonged rupture of membranes (water bag broke over 24 hrs. before delivery) - Prolonged labor - Unclean delivery site - Vaginal exams in labor - Postpartum hemorrhage - Poor perineal hygiene - Women with anemia/undernutrition | <p>Prevention of puerperal infections:</p> <ul style="list-style-type: none"> - Prepare clean delivery site (if home delivery) - Seek trained birth attendant for delivery <p>Go to health center if danger sign(s) present</p> <p>Initiate breastfeeding within first hour of delivery, skin-to-skin contact between mother and baby, no prelacteal feeds or separation of mother and baby</p> | <p>Community groups, women's groups and mass media to teach danger signs of postpartum period</p> <p>Transportation</p> <p>Safe delivery kits</p> |

PUERPERAL INFECTIONS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|---|--|
| COMMUNITY Community Health Worker (CHW) | <p>Same as above, plus:</p> <p>Note increased temperature and increased pulse rate</p> <p>Note subinvolution of uterus (uterus large and higher than expected)</p> <p>Uterus may be tender</p> <p>Perineum may be red and swollen if she had a tear</p> | <p>Same as above, plus:</p> <p>Take history. Ask about danger signs</p> <p>Physical exam to determine if puerperal infection (e.g., uterus may be tender and large)</p> <p>Check temperature, pulse</p> <p>Possibly begin treatment with antibiotics (depends on training/protocols of CHW)</p> <ul style="list-style-type: none"> - Use drugs which are safe during lactation (penicillins, tetracycline, cephalosporins) <p>Teach prevention of puerperal infection:</p> <ul style="list-style-type: none"> - Clean hands - Clean delivery site/materials <p>Conduct frequent home visits after delivery (especially first week) to screen for puerperal infection</p> <p>Encourage early initiation of exclusive breastfeeding:</p> <ul style="list-style-type: none"> - No prelacteal feeds - No separation of mother and baby <p>Teach mother prevention and treatment for mastitis and engorgement</p> | <p>Same as above, plus:</p> <p>Protocols/standing orders for treatment or referral</p> <p>Thermometers</p> <p>Antibiotics – if protocol allows</p> |

PUERPERAL INFECTIONS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---|---|--|
| COMMUNITY Community Health Worker cont. | Same as above, plus: | Refer to health center if danger signs present | Same as above, plus: |
| COMMUNITY Traditional Birth Attendant (TBA) | Know additional risk factors for puerperal infection associated with labor and delivery: <ul style="list-style-type: none"> - Perineal tears/trauma - Retained placental fragments - Recto-vaginal or vesicovaginal fistulas | Same as above, plus: <ul style="list-style-type: none"> Avoid vaginal exams Prevention: Hygienic delivery including clean hands, clean surface, and clean perineum Proper management of 3rd stage: <ul style="list-style-type: none"> - Prevent retained placenta - Prevent hemorrhage Clean hands when in contact with woman after delivery Home visits -- especially in first week: <ul style="list-style-type: none"> - Teach good peri-care (cleaning of perineum) - Teach danger signs Good nutrition before and after delivery: <ul style="list-style-type: none"> - Treat anemia - Increase rest - Increase fluids | Protocols for TBAs Training and supervision of TBAs from health center Delivery kits including clean plastic sheet and soap Iron-folate tablets Emergency coding system -- (identifying reason for transfer) |

PUERPERAL INFECTIONS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---------------|--|--|
| COMMUNITY Traditional Birth Attendant cont. | | Refer women with significant perineal/vaginal tear, retained placenta, fistulas | |
| HEALTH POST/ HEALTH CENTER | Same as above | Same as above, plus: Physical exam to determine type of infection/site Pelvic exam -- check for abscesses, assess bleeding, assess perineum Vital signs May have capability to check CBC, urine analysis Treat with antibiotics and possibly oxytocics to aid in uterine involution Assess for transfer if severe or without improvement | Same as above, plus: Blood pressure apparatus Lab facilities (if available) Antibiotics/oxytocics if in protocol IVs if in protocol Ambulance/transport |

PUERPERAL INFECTIONS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---------------|--|--|--|
| HOSPITAL | <p>Same as above, plus:</p> <p>Recognize additional predisposing factors include:</p> <ul style="list-style-type: none"> - Instrument deliveries - Cesarean sections - Delayed initiation of breastfeeding, prelacteal feeds (glucose water) and separation of mother and baby vs. rooming-in | <p>Same as above, plus:</p> <p>May need D&C</p> <p>May need drainage of pelvic abscess</p> <p>May possibly perform fever work-up including: urine, throat, cervical and blood cultures</p> <p>Antibiotic therapy -- IV or IM (Intramuscular) medications</p> | <p>Same as above, plus:</p> <p>Operating theater</p> <p>Anesthesia</p> <p>Laboratory</p> <p>Medications/IVs</p> <p>Blood bank</p> <p>Possibly ultrasound -- to localize pelvic abscess</p> |

SEPTIC ABORTION

Septic abortion is defined as any Infected abortion (pregnancy loss). A septic abortion may result from an incomplete abortion (miscarriage) which is neglected or from a self-induced or unsafe abortion.

Potential complications: Septic abortion can lead to septic shock, renal failure, disseminated intravascular coagulation (clotting disorder) and death. Late effects of septic abortion include chronic pelvic infection, an increased rate of ectopic pregnancies and increased chances of infertility.

References:

Hatcher R, Kowal D, Guest F, Trussell J, Stewart F, Stewart G, et. al. *Contraceptive technology: international edition*. Atlanta: Printed Matter Inc., 1989; 396-403.

SEPTIC ABORTION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------|---|--|--|
| COMMUNITY Mother/ Family | Recognize dangers of unsafe or induced abortion (as listed above) | Seek medical care immediately if any danger sign present | Health education by women's groups, mass media and schools on dangers of unsafe or induced abortions |
| | Recognize danger signs following an abortion: - Fever, chills - Muscle aches, weakness - abdominal pain, backache, cramping - Prolonged bleeding or spotting - Foul-smelling vaginal discharge | Prevent unwanted pregnancies with contraception | Family planning information/services available in community, including schools |
| | Recognize late effects of septic abortion: - Chronic pelvic infection - Increased rate of ectopic pregnancies (pregnancy outside womb) - Increased chance of infertility | Seek safe abortions | Safe abortion services |
| | | | Transportation |

SEPTIC ABORTION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|---|--|
| COMMUNITY Community Health Worker (CHW) | <p>Same as above, plus:</p> <p>Recognize additional signs of septic abortion:</p> <ul style="list-style-type: none"> - May have signs of shock (weak, rapid pulse, decreased BP, pallor, etc.) - Abdomen tender on palpation | <p>Same as above, plus:</p> <p>Take history of woman with suspected septic abortion:</p> <ul style="list-style-type: none"> - Question regarding use of herbs, instrumentation, etc. - Ask when was last menstrual period - Check for signs and symptoms <p>Take vital signs (if trained to do so)</p> <p>Treat for shock -- have woman lie down, feet elevated, give fluids, keep warm, keep calm, etc.</p> <p>Refer quickly to hospital</p> <p>Give first dose of antibiotic (if trained and in protocol)</p> <p>Educate women not to seek unsafe abortions and not to attempt self-induced abortions</p> <p>Teach dangers of unsafe and self-induced abortions</p> <p>Educate women to seek safe abortion services (if available)</p> | <p>Same as above, plus:</p> <p>Health center personnel for training and supervision of CHWs</p> <p>Protocols for CHWs</p> <p>Contraceptives</p> <p>Antibiotics if in protocol</p> <p>Thermometers, stethoscope, blood pressure gauge</p> |

SEPTIC ABORTION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---|---|---|
| COMMUNITY Community Health Worker cont. | | Refer women for family planning services or provide family planning if trained to do so Give information on methods of contraception | |
| COMMUNITY Traditional Birth Attendant | Same as above | Same as above | Same as above |
| HEALTH POST/ HEALTH CENTER | Same as above, plus: Recognize pelvic findings which may be present with septic abortion: - Damage/lacerations to vagina, cervix or uterus - Purulent discharge (pus-like discharge) from cervix - Cervical motion tenderness - Uterus soft, enlarged and tender - Tissue may be seen at cervical opening | Same as above, plus: Pelvic exam to determine extent of infection/presence of trauma Refer to hospital quickly: - Give first dose of antibiotic - Treat shock if present - May need to administer IV fluids if available <u>Note:</u> Depending on center, a mild infection which is confined to the uterus and patient is without signs of shock, may be managed at this level | Same as above, plus: Antibiotics Intravenous fluids (IVs) if available and in protocol Vaginal speculums Sponge forceps Sterile gloves |

SEPTIC ABORTION

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|----------------------|------------------|--|--|
| HOSPITAL | Same as above | Same as above, plus: Empty uterus by suction or sharp curettage (D&C) Intravenous antibiotics Intravenous fluids Oxytocics following D&C May require blood transfusion Give tetanus toxoid Monitor urine output | Same as above, plus: Intravenous antibiotics Operating room Anesthesia Blood bank Laboratory X-ray equipment Laparotomy kit |

SEPTIC ABORTION

LEVEL OF
CARE

RECOGNIZE

RESPONSE

RESOURCES

HOSPITAL
cont.

- Diagnostic work-up may include:
- Blood, urine and endometrial cultures
 - Chest X-ray to check for septic emboli; air under diaphragm indicates uterus has been perforated
 - Abdominal X-ray to check for foreign bodies
 - Complete blood count, urinalysis, BUN, blood type and cross match, platelet studies, blood gases
 - Surgical intervention -- varies depending on extent of infection from D&C to total abdominal hysterectomy
 - Provide sterilization services
 - Teach methods of contraception including sterilization

LOW BIRTHWEIGHT INFANTS AND HYPOTHERMIA

A low birthweight infant is an infant weighing less than 2,500 gms. She or he may be premature (less than 37 weeks gestation) or small for gestational age.

Potential complications: The low birthweight infant is at a much greater risk of dying in the first year of life. Low birthweight is sometimes associated with mental retardation and delayed development or permanent growth retardation.

Hypothermia is a lowered body temperature (skin temperature less than 35.5°C). It is especially dangerous in LBW infants because of their relatively large surface area and lack of subcutaneous tissues (fat).

Potential complications: Cooling causes an increase in metabolic rate and increase in oxygen requirements causing respiratory distress. Hypothermia contributes to an increase in morbidity and mortality rates for all infants, especially those who are low birthweight.

References:

- Behrman RE, Vaughn VC, eds. Nelson textbook of pediatrics, 13th ed. Philadelphia: W.B. Saunders Co., 1987; 363, 375-83.
- Bullough CW. Delivery care technologies. In: Wilson R, Ogosu-Amaah S, Belsey M, eds. Primary health care technologies at the community level. New York: Aga Khan Foundation and United Nations Children's Fund, 1986; 34-37.
- Division of Family Health. Post-congress consultation on birth asphyxia and thermal control of the newborn (draft). Geneva: World Health Organization, July 1989.

LOW BIRTHWEIGHT INFANTS AND HYPOTHERMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------|---|---|---|
| COMMUNITY Mother/ Family | <p>Recognize importance of adequate weight gain in pregnancy and good pre-pregnant weight in preventing LBW babies</p> <p>Know how to prevent hypothermia in newborn</p> <p>Recognize cold baby: - Check foot, should be as warm as central body; - Check color (baby may be pale and mottled)</p> <p>Recognize need for prenatal care/need for trained attendant at delivery</p> | <p>Maintain nutritious diet prior to and during pregnancy. Achieve adequate weight gain in pregnancy</p> <p>Monitor weight gain in pregnancy -- seek medical assistance if under 1 kg/month</p> <p>Reduce workload to a degree possible</p> <p>Obtain prenatal care</p> <p>Provide extra heat source for home delivery, fire (if cool climate), or boiling water. Have draft-free environment</p> <p>Keep baby and mother together, skin-to-skin, covered. Head of infant covered with warm hat</p> <p>Breastfeed right after birth (exclusive breastfeeding)</p> <p>Dry baby quickly and thoroughly at birth, wrap and give to mother</p> <p>Avoid undressing baby</p> | <p>Health education by women's groups and mass media -- on importance of weight gain in pregnancy, risks to low birthweight babies and cold stress in newborns</p> <p>Home Based Maternal Records (HBMR)</p> <p>Weighing scale</p> <p>Locally made caps for newborns</p> <p>Clean cloths for wrapping newborn</p> |

LOW BIRTHWEIGHT INFANTS AND HYPOTHERMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|--|--|
| COMMUNITY Mother/ Family cont. | | Avoid bathing baby immediately after birth: - Bathe normal weight infant only once temperature stabilized -- may take several hours - Delay bathing LBW infant much longer -- blood and meconium can be wiped off with soft, clean cloth | |
| COMMUNITY Community Health Worker (CHW) | Same as above, plus: Identify women at risk for having low birthweight (LBW) infant: - Close child spacing - Malaria in pregnancy - Chronic disease (e.g., heart disease, TB) - Mother with complications in pregnancy (e.g., pregnancy induced hypertension) - Women with history of previous LBW infant - Women carrying twins - Women who smoke or drink alcohol Identify characteristics of LBW infants: - Baby appears scrawny (thin), weak cry, little or no fat | Same as above, plus: Teach importance of good nutrition, prior to pregnancy, plus adequate weight gain and increased rest in pregnancy Stress importance of taking iron-folate Screen for risk factors in pregnancy. Make appropriate referrals Treat diseases in pregnancy or refer for treatment if needed Teach prevention of hypothermia If scale unavailable measure arm or chest circumference or possibly foot length to determine if LBW | Same as above, plus: Protocols for CHWs Training and supervision of CHWs Thermometers Silver or plastic swaddler for transfer (silver swaddler may also be known as aluminum wrap) Weighing scale for baby Arm circumference tapes for mother Arm-circumference tape to identify LBW infant or chest circumference or foot length measure Transportation |

LOW BIRTHWEIGHT INFANTS AND HYPOTHERMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---|--|---|
| <p>COMMUNITY Community Health Worker cont.</p> | <p>Know potential problems of LBW infants: hypothermia, asphyxia, susceptibility to infection</p> <p>Know nutritional value of colostrum and of initiating breastfeeding within first hour after delivery, with skin-to-skin contact between mother and baby</p> | <p>If refer LBW infants:</p> <ul style="list-style-type: none"> - Wait about 6 hours to decrease chance of cold stress if infant stable - Keep with mother skin-to-skin, head covered, etc. (see above measures) - Transfer in this fashion - Continue checking for hypothermia by checking infant's foot or by taking temperature if trained | |
| <p>COMMUNITY Traditional Birth Attendant (TBA)</p> | <p>Same as above, plus:</p> <p>Detect poor uterine growth in pregnancy (in societies where TBAs monitor antenatal progress)</p> <p>Know signs of premature labor such as:</p> <ul style="list-style-type: none"> - Uterine contractions - Menstrual-like cramps - Low backache unrelieved by rest - Pelvic pressure - Increased vaginal discharge, watery fluid or blood from vagina | <p>Same as above, plus:</p> <p>Monitor uterine growth (trained TBAs)</p> <p>Refer if not in normal limits</p> <p>Assess for preterm labor -- refer to hospital if present</p> <p>Assess infant at delivery -- for cry, color, breathing</p> <ul style="list-style-type: none"> - Manage asphyxia if present <p>Maintain warm environment for infant</p> <ul style="list-style-type: none"> - At delivery, dry, wrap and give to mother <p>Encourage early, exclusive breastfeeding, skin-to-skin contact</p> | <p>Same as above, plus:</p> <p>Fundal height measuring tape (color coded for illiterate TBAs)</p> <p>Protocols for TBAs</p> <p>Training and supervision of TBAs</p> |

LOW BIRTHWEIGHT INFANTS AND HYPOTHERMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|---|---|
| COMMUNITY Traditional Birth Attendant cont. | | If baby unable to suck, express colostrum/breast milk and feed with clean spoon | |
| HEALTH POST/ HEALTH CENTER | Same as above, plus: Recognize physical findings of premature infants (<37 wks. gestation) vs. full term and small for gestational age (SGA infants) vs. appropriate for gestational age (AGA) infants Recognize differences in treatment of above infants Recognize differences in level of risk | Same as above, plus: Assess newborn at delivery Assess breathing, heart rate, color Assess gestational age Weigh infant Measure head and chest circumference Check temperature regularly until stabilized Administer vitamin K Keep infant with mother skin-to-skin Check for signs of respiratory distress, jaundice, poor feeding -- refer to hospital if unstable | Same as above, plus: Weighing scale Thermometers Possibly bag and mask for resuscitation Possibly a transport incubator, "silver swaddlers" Scoring chart (pictorial) for assessment of fetal maturity |

LOW BIRTHWEIGHT INFANTS AND HYPOTHERMIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---------------|---------------|--|--|
| HOSPITAL | Same as above | <p>Same as above, plus:</p> <p>Treatment may include:</p> <ul style="list-style-type: none"> - Oxygen therapy - Tube feeding - IV fluids - Warming devices, to provide extra warmth or continued skin-to-skin contact with mother <p>Lab tests -- to check blood glucose level, blood oxygenation, bilirubin level, etc.</p> | <p>Same as above, plus:</p> <p>Warming devices, such as heated mattress, possibly incubator*</p> <p>Suction, oxygen equipment</p> <p>Laboratory</p> <p>Heat source for delivery room</p> <p>Breast milk pumps</p> <p>Refrigeration for breast milk</p> <p>Sterile containers for storing breast milk</p> |

*Incubators are expensive and many developing countries lack trained staff required for adequate function and maintenance of incubators. This can result in excessive cooling or overheating.

BIRTH ASPHYXIA

Birth Asphyxia is respiratory failure in the newborn. Asphyxia is a major contributor to the high perinatal mortality rate in developing countries.

Potential complications: Birth asphyxia can cause damage to the brain, heart, kidneys and intestines. Long-term effects of asphyxia include cerebral palsy, epilepsy, mental retardation, hydrocephaly and visual and hearing defects. The low birthweight infant with severe asphyxia is at a higher risk for developing these complications.

References:

- Division of Family Health. Post-congress consultation on birth asphyxia and thermal control of the newborn (draft). Geneva: World Health Organization, July 1989.
- Shah KP. Risk factors for birth asphyxia and brain damage in pregnancy and labor. *Midwifery* 1990; 6:155-64.
- Shah PM. Birth asphyxia: a crucial issue in the prevention of developmental disabilities. *Midwifery* 1990; 6:99-107.

BIRTH ASPHYXIA

LEVEL OF CARE

COMMUNITY
Mother/
Family

RECOGNIZE

- Recognize dangers of asphyxia:
- Short and long-term effects
 - Cause of perinatal death
 - Cause of permanent disability
- Know risk factors for delivering a baby with asphyxia:
- Previous delivery of stillborn
 - Previous delivery of low birthweight baby
 - Previous obstetrical problem (e.g., obstructed labor, uterine rupture, antepartum hemorrhage)
 - Problems in this pregnancy such as:
 - anemia (pallor)
 - severe undernutrition
 - postdate pregnancy (over 2 weeks beyond expected due date)
 - preeclampsia (may be recognized by swelling -- especially of face and hands, headaches and possibly visual changes)

RESPONSE

- Seek trained birth attendant for delivery
- Obtain prenatal care
- Consult midwife regarding risk factors

RESOURCES

- Community Education by women's groups, mass media -- to increase awareness of problem and teach prevention
- Home Based Maternal Records (HBMR) to identify risk factors
- Transportation

BIRTH ASPHYXIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|--|---|
| COMMUNITY Mother/ Family cont. | <ul style="list-style-type: none"> - Problems during labor: <ul style="list-style-type: none"> - bleeding in labor - cord prolapse - prolonged rupture of membranes (over 24 hours) - Recognize lack of cry at birth as sign of asphyxia | <p>Assume knee-chest position if cord prolapsed and call midwife</p> | |
| COMMUNITY Community Health Worker (CHW) | <p>Same as above</p> | <p>Same as above, plus:</p> <p>Refer pregnant women for prenatal care</p> <p>Teach risk factors for birth asphyxia to mothers/families</p> <p>Assist women in screening for risk factors</p> <p>Consult and/or refer women to hospital depending on risk factor(s)</p> | <p>Same as above, plus:</p> <p>Protocols for CHWs</p> |

BIRTH ASPHYXIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|--|---|
| COMMUNITY Traditional Birth Attendant (TBA) | <p>Same as above, plus:</p> <p>Recognize additional risk factors for birth asphyxia:</p> <ul style="list-style-type: none"> - Women with heart disease, diabetes, hypertension - Bleeding in pregnancy - Multiple gestation - Abnormal presentation - Woman with small for gestational age (SGA) baby - Breech or shoulder presentation - Prolonged labor <p>Recognize factors in labor and delivery which may contribute to asphyxia:</p> <ul style="list-style-type: none"> - Maternal position -- lying flat on back - Tight nuchal cord (cord around baby's neck at birth) - Excessive mucus in mouth and nose of baby - Meconium stained amniotic fluid <p>Recognize additional signs of asphyxia in the newborn:</p> <ul style="list-style-type: none"> - Poor color - Lack of breathing - Absent or decreased heart rate <p>Know treatment of asphyxia</p> | <p>Same as above, plus:</p> <p>Monitor fetal heart rate in labor (if trained)</p> <p>Avoid supine position during labor and delivery. Upright, semi-sitting or side lying improves blood flow to fetus.</p> <p>Observe for signs of asphyxia at birth</p> <p>Anticipate asphyxia</p> | <p>Same as above, plus:</p> <p>Health Center personnel for training and supervision of TBAs</p> <p>Protocols for TBAs</p> <p>Specialized training in management of asphyxia in newborn</p> <p>Fetoscope</p> <p>Possibly bag and mask or mask with mouthpiece if available and in protocol</p> <p>Simple mucus extractors (mucus traps, bulb syringe)</p> <p>Clean cloth</p> |

BIRTH ASPHYXIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---|--|-----------|
| <p>COMMUNITY Traditional Birth Attendant cont.</p> | <p>Recognize traditional practices which are dangerous (e.g., splashing cold water on the baby)</p> <p>Know possible post-asphyxia problems:</p> <ul style="list-style-type: none"> - Hypothermia (low body temperature) - Hypoglycemia (low blood sugar) -- may be exhibited by problems with breathing or nursing (sucking), excessive sleepiness or jitteriness - Sepsis is also more common <p>Know prevention of post-asphyxia problems</p> | <p>Train assistant (another TBA or family member) to assist with resuscitation</p> <p>Check for nuchal cord -- reduce (slip over head) if possible -- if too tight, tie or clamp and cut before delivery of body</p> <p>Clear airway:</p> <ul style="list-style-type: none"> - Wipe secretions with clean gauze - Use postural drainage (keep head lower than body) - If meconium stained fluid, suction nose and mouth well with mucus trap prior to delivery of body <p>If no cry or feeble cry use postural drainage and gentle stimulation. Dry quickly.</p> <p>If still no cry, suction and assess breathing. If no breathing, start assisted ventilation using method which is available:</p> <ul style="list-style-type: none"> - Mouth-to-mouth - Mouth-to-mask, or - Bag and mask <p>(See Birth Asphyxia Management Decision Chart at end of section)</p> | |

BIRTH ASPHYXIA

LEVEL OF CARE

RECOGNIZE

RESPONSE

RESOURCES

COMMUNITY

Traditional
Birth
Attendant
cont.

Keep baby warm throughout resuscitation to prevent hypothermia by putting on cap and vest/sweater or by wrapping well in clean cloth (see Low Birthweight and Hypothermia section)

Use AIDS precautions in resuscitation of newborn:

- Don't suck out mouth with own mouth
- If use mouth-to-mouth ventilation, wipe secretions and suction with mucus trap or bulb syringe first

Assist mother with early exclusive breastfeeding once baby is stable

Observe baby after resuscitation for post-asphyxia problems

Conduct home visits to assess condition of newborn

Teach signs of post-asphyxia problems to parents

Refer babies with signs of post-asphyxia problems to hospital (e.g., problems breathing, difficulty with sucking, etc.)

Refer with mother, skin-to-skin and well wrapped

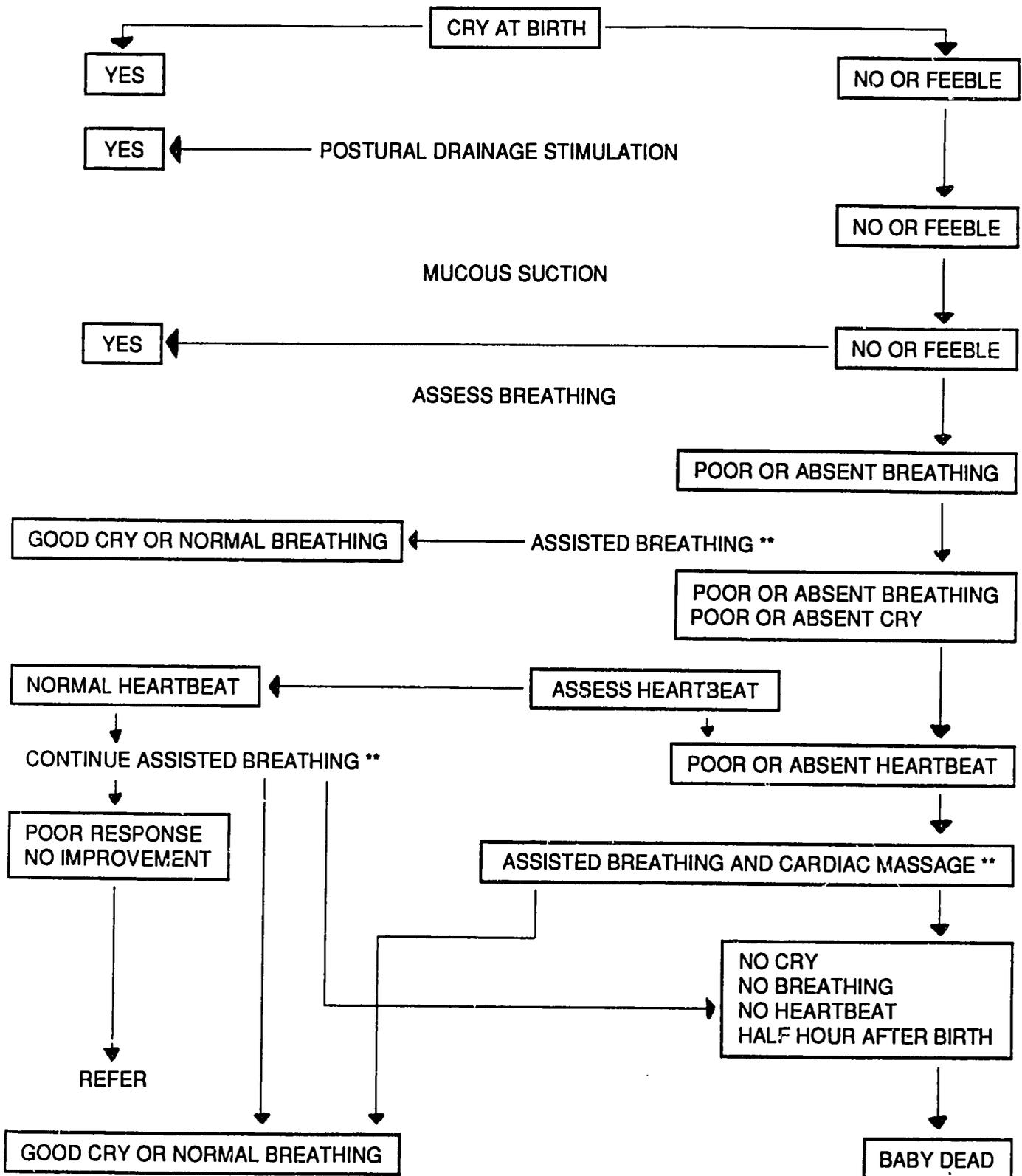
BIRTH ASPHYXIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|----------------------------|---|---|--|
| HEALTH POST/ HEALTH CENTER | <p>Same as above, plus:</p> <p>Know additional risk factors for asphyxia:</p> <ul style="list-style-type: none"> - Fetal distress in labor - Cephalo-pelvic disproportion (CPD) | <p>Same as above, plus:</p> <p>Screen for risk factors (e.g., hypertension, anemia)</p> <p>Refer women with risk factors who are unable to manage at center</p> <p>Perform abdominal palpation to assess lie of fetus and to assess for twins</p> <p>Vaginal exam to determine presentation</p> <p>Monitor fetal heart rate in labor</p> <p>Avoid amniotomy (rupture of water bag) with high presenting part, to avoid cord slipping down into vagina (cord prolapse)</p> <p>Manage resuscitation of newborn as per Birth Asphyxia Management Decision Chart (at end of section)</p> <p>Monitor baby's temperature and general condition following asphyxia episode</p> | <p>Same as above, plus:</p> <p>Bag and mask ventilator (mask should be easy to clean and able to be boiled or autoclaved, e.g., the "Laerdal" face mask)</p> <p>Prenatal records</p> <p>Partographs</p> <p>Possibly vacuum extractor, if trained personnel</p> <p>Possibly oxygen (depends on center)</p> <p>Baby thermometers</p> |

BIRTH ASPHYXIA

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---------------|--|--|--|
| HOSPITAL | <p>Same as above, plus:</p> <p>Recognize additional risk factors for birth asphyxia in hospital setting:</p> <ul style="list-style-type: none"> - Use of general anesthesia - Narcotic use in labor (especially 2-4 hours prior to delivery) - Mismanagement of oxytocics in labor (may cause fetal anoxia) - Mid-forceps delivery - Know pathophysiology of birth asphyxia | <p>Same as above, plus:</p> <p>If fetal distress in labor, may do cesarean section or vacuum extraction</p> <p>Resuscitation measures depend on degree of asphyxia and respond to initial measures. These may include:</p> <ul style="list-style-type: none"> - Supplemental oxygen by face mask - Endotracheal intubation for deep suctioning and ventilation - Ventilator support <p>Have equipment for resuscitation functioning, clean and ready at all times</p> <p>Have warm surface for baby during resuscitation (radiant warmer, warming plate)</p> <p>Train extra person to assist with resuscitation</p> <p>Following resuscitation:</p> <ul style="list-style-type: none"> - Monitor blood sugar for hypoglycemia - Monitor blood gases to assess oxygenation | <p>Same as above, plus:</p> <p>Maternity village or lying-in ward</p> <p>Fetal monitors</p> <p>Oxygen</p> <p>Neonatal resuscitation equipment</p> <p>Neonatal resuscitation drugs</p> <p>Mechanical suction or mucous traps</p> <p>Infant warmer</p> <p>Lab facility -- for blood gases, blood glucose level</p> <ul style="list-style-type: none"> - Dextrosticks <p>IV fluids</p> <p>Possibly ventilators</p> <p>Apgar score charts</p> |

BIRTH ASPHYXIA MANAGEMENT DECISION CHART



* Normal newborn care

** Mouth-to-mouth; mouth-to-mask; bag and mask

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From WHO Post-Congress Consultation on Birth Asphyxia and Thermal Control of the Newborn, Paris, July 29 and 31, 1989.

NEONATAL TETANUS

Neonatal tetanus (tetanus neonatorum) is a disease caused by an exotoxin of the tetanus bacillus. The disease usually occurs by introduction of the tetanus spores into the umbilical cord when it is cut with an unclean instrument or by application of unclean dressing. Neonatal tetanus is a major cause of neonatal mortality in developing countries. The disease can be prevented through immunization of pregnant women or immunization before pregnancy and cleaner delivery care.

Potential complications: With or without treatment, about 80-85% of all infants who contract tetanus will die -- usually within a few days of onset of symptoms. This rate may be considerably lower in areas where there is partial immunization of women. Studies have shown a drastic decrease in the death rate in babies from tetanus when women are immunized during pregnancy.

References:

- Edwards M. Tetanus. In: Sandler RH, Jones T, eds. Medical care of refugees. New York: Oxford University Press, 1987; 328-33.
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NEONATAL TETANUS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------|---|---|---|
| COMMUNITY Mother/ Family | Recognize dangers of tetanus, prevalence in the community | Educate community re: dangers of tetanus and need for immunization | Health educators, TBAs, women's groups -- to provide health education on prevention of tetanus/"3 cleans" |
| | Recognize need for prenatal care and need for series of TT vaccine (total of 5 injections) | Teach "3 cleans" of delivery (clean surface, clean hands, clean care and cutting of cord) | Distribution and maintenance of safe birth kits |
| | Know cause and prevention of tetanus | Obtain tetanus toxoid (TT) | Home Based Maternal Records (HBMR) to know immunization status |
| | Know about clean delivery -- "3 cleans" in prevention of tetanus | Begin immunization for girls prior to pregnancy | Water supply, antiseptics |
| | Know signs of tetanus in newborn: - Newborn may present with inability to feed and cries when tries to suck, general muscle spasms and stiffness, facial grimacing, unable to open mouth, body becomes rigid | If home delivery, prepare clean site, have trained attendant | Good sanitation |
| | Recognize that the mother is at risk of acquiring tetanus at delivery as well and that she is protected by receiving TT series | Educate mothers/families on prevention of tetanus | Immunization site(s) |
| | Obtain and use safe birth kit | Transportation for referrals | |
| | Take newborn to the health center immediately if tetanus suspect | Soap | |

NEONATAL TETANUS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---------------|---|--|
| COMMUNITY Community Health Worker (CHW) | Same as above | <p>Same as above, plus:</p> <p>Teach all pregnant women and women of childbearing age importance of becoming immunized, importance of clean delivery</p> <p>Encourage women to attend prenatal care facility and obtain TT</p> <p>Possibly administer TT (depending on protocols for CHWs)</p> <p><u>Immunization in Pregnancy</u> WHO Recommendations 1990</p> <p>Dose #1 At first contact or as early as possible in pregnancy Tetanus Toxoid-1 (TT-1)</p> <p>Dose #2 At least 4 weeks after TT-1 (TT-2)</p> <p>Dose #3 At least 6 months after TT-2 or during subsequent pregnancy (TT-3)</p> <p>Dose #4 At least one year after TT-3 or during subsequent pregnancy (TT-4)</p> <p>Dose #5 At least one year after TT-4 or during subsequent pregnancy (TT-5)</p> | <p>Same as above, plus:</p> <p>Protocols for CHWs regarding immunization against tetanus</p> <p>Immunization program/referral site if not in area</p> <p>Cold Chain</p> <ul style="list-style-type: none"> - Procurement of vaccines - Transport of supplies/refrigeration <p>Sterile syringes/vaccines/record keeping system/sterilization procedures/syringe disposal</p> <p>Gentian violet or other antiseptic solution for cord care (type depends on country)</p> |

NEONATAL TETANUS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|--|--|
| COMMUNITY Community Health Worker cont. | | Refer women to obtain TT at health center if necessary Postnatal surveillance of newborns (as described below under TBA) Refer any newborn suspected of having tetanus immediately to health center | |
| COMMUNITY Traditional Birth Attendant (TBA) | Same as above, plus: Recognize harmful cultural practices/treatments of cord found in area | Same as above, plus: Hygienic delivery -- "3 cleans" Avoid putting any substance other than what is recommended by supervising health center on cord (sometimes gentian violet or alcohol used) Cut cord no more than 2-3 fingerbreadths from body Keep cord dry/clean, need not cover Inspect cord daily, clean hands before inspecting Postnatal surveillance: - Home visits -- vital in first 2 weeks to assess newborn for signs of illness/ability to suck - Administer cord care in home | Same as above, plus: Health center midwives/health personnel to train and supervise TBAs TBA delivery kit: (type depends on experience and caseload of TBA) should minimally contain soap, cotton cord ties, clean cord cutting instrument which can be sterilized (boiled) or disposed of - Made locally from available material |

NEONATAL TETANUS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--------------------------------------|---|---|
| COMMUNITY Traditional Birth Attendant cont. | Same as above, plus: | Teach danger signs to mother | Same as above, plus: |
| HEALTH POST/ HEALTH CENTER | Know treatment of tetanus in newborn | Same as above, plus: Assess infant for signs and symptoms of tetanus May be able to treat newborn with tetanus, depending on training and availability of medications Treatment may include: - Procaine penicillin or penicillin G - Give tetanus antitoxoid if available - Give muscle relaxants if available (may include phenobarbital, Valium) - Maintain fluid/nutritional requirements (IVs, tube feeds) - Maintain open airway with position, suction, possibly plastic airway or padded stick - Quiet environment/subdued lights - Monitor vital signs - Clean cord wall (may point with gentian violet) | Trained personnel -- nurses, possibly doctor Tetanus antitoxoid Delivery instruments and method of sterilization Medications -- muscle relaxants, antibiotics IV or IM (penicillin) Suction apparatus IVs, naso-gastric tubes Ambulance/transport Message/communication system to contact hospital |

NEONATAL TETANUS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---------------|---|---|
| HEALTH POST/ HEALTH CENTER cont. | | Refer to hospital if above care unavailable or worsening condition | |
| HOSPITAL | Same as above | Same as above, plus: Administer oxygen if needed Possibly endotracheal intubation and mechanical ventilation | Same as above, plus: Oxygen Possibly ventilators Special room -- quiet, darkened |

NEONATAL SEPSIS

Sepsis results from an invasion of pathogens into the blood stream.

Potential complications: Immunologic responses in the newborn are less developed and they can acquire infection from the amniotic fluid during labor and delivery or afterwards by contact or airborne routes. Sepsis in the newborn progresses rapidly and has a high death rate, especially in low birthweight infants. Other consequences of sepsis include meningitis which can lead to brain damage.

References:

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Geme L, Polin R. Neonatal sepsis -- progress in diagnosis and management. *Practical Therapeutics* 1988; 36:784-98.

NEONATAL SEPSIS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------|--|---|---|
| COMMUNITY Mother/ Family | <p>Recognize signs of sepsis in the newborn:</p> <ul style="list-style-type: none"> - Lethargy (baby seems sad and weak, abnormally sleepy, hard to wake up) - Will not suck (will not nurse) - Fever or below normal temperature (feels cool) - Irritability (cries, will not calm down) - Convulsions (fits) - Grunting | <p>Seek help immediately - take baby to CHW, health center or hospital (depending on which is closest)</p> <p>Keep baby warm during transport, covered and in mother's arms</p> <p>Continue exclusive breastfeeding</p> | <p>Health education, by women's groups, traditional healers, mass media, to teach danger signs in newborn</p> <p>Locally produced, culture specific health education materials for families</p> <p>Transportation</p> |
| | <p>Recognize factors which may prevent sepsis in newborn:</p> <ul style="list-style-type: none"> - Clean delivery site <ul style="list-style-type: none"> -clean materials -clean attendant - Good handwashing prior to handling newborn - Keep sick people/people with skin lesions away from newborn. Avoid newborn's contact with crowds - Early exclusive breastfeeding | <p>Seek trained birth attendant for delivery</p> <p>Prepare clean site/clean materials for home delivery</p> <p>Wash hands before touching baby</p> | |

*Discourage harmful practices in community such as: application of substances to umbilical stump, treating sick infant with leftover medications, uvulectomy of sick infant.

NEONATAL SEPSIS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--------------------------------------|---|---|--|
| COMMUNITY Health Worker (CHW) | <p>Same as above, plus:</p> <p>Recognize additional signs which may be present in a newborn with sepsis:</p> <ul style="list-style-type: none"> - Pale or b/uish skin color - Jaundice - Abnormal breathing <ul style="list-style-type: none"> -fast breathing -chest depressed -periods of apnea (stops breathing for short periods) -full or bulging fontanel (soft spot on head) | <p>Same as above, plus:</p> <p>Teach signs of sepsis to mothers/families (6 signs listed above)</p> <p>Teach prevention of sepsis</p> <p>Educate families to promote referral of sick infant</p> <p>Home visits to evaluate well-being of newborns/detect cases</p> <p>Evaluate newborn for signs of sepsis:</p> <ul style="list-style-type: none"> - Question mother/family regarding signs - Examine newborn - Take axillary temperature if suspect sepsis - Count respiratory rate <p>Refer newborn with signs of sepsis to hospital immediately</p> <p>Give first dose of antibiotic (if trained to do so)</p> <p>Send referral note with mother/family</p> | <p>Same as above, plus:</p> <p>Health center personnel for training and supervision of CHWs</p> <p>Protocols for CHWs</p> <p>Antibiotics</p> <p>Low-reading thermometers</p> <p>Transportation</p> |

NEONATAL SEPSIS

LEVEL OF CARE

COMMUNITY
Traditional
Birth
Attendant
(TBA)

RECOGNIZE

- Same as above, plus:
- Recognize additional risk factors for sepsis in newborn:
- Foul-smelling or purulent amniotic fluid
 - Maternal fever
 - Prolonged rupture of membranes (water bag broken over 24 hours)
 - Prolonged, difficult labor
 - Bloody secretions
 - Baby who was resuscitated at birth
 - Meconium staining of baby's skin
 - Low birthweight infant

RESPONSE

- Same as above, plus:
- Hygienic delivery (see section on neonatal tetanus)
- Avoid vaginal exams
- Avoid rupturing membranes in labor
- Transfer women with fever and/or prolonged labor to health center
- Close observation of infants with risk factors (e.g., low birthweight baby) to detect sepsis and refer promptly
- Conduct postpartum home visits to evaluate newborns

RESOURCES

- Same as above, plus:
- Health center personnel for training and supervision of TBAs
- Protocols for TBAs
- TBA delivery kits (as described under section on neonatal tetanus)
- Transportation

NEONATAL SEPSIS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|-------------------------------|---|---|--|
| HEALTH POST/ HEALTH CENTER | <p>Same as above, plus:</p> <p>Recognize additional signs of sepsis in the newborn:</p> <ul style="list-style-type: none"> - Hepatomegaly (enlarged liver) - Splenomegaly (enlarged spleen) - Elevated white blood cell (WBC) count (if lab facility) - Signs of "septic shock" <ul style="list-style-type: none"> -elevated pulse -lowered BP -pallor -cold, moist skin | <p>Same as above, plus:</p> <p>Examine newborn</p> <p>Monitor vital signs</p> <p>Check WBCs if lab available</p> <p>Refer quickly to hospital, even if sepsis only suspected:</p> <ul style="list-style-type: none"> - Give first dose of antibiotic prior to referral - Send referral note | <p>Same as above, plus:</p> <p>Antibiotics</p> <p>Basic lab facility</p> <p>Thermometers (low-reading)</p> |
| | <p>Know treatment of sepsis in the newborn</p> | <p>If unable to refer treat with full course of antibiotics:</p> <ul style="list-style-type: none"> - Teach supportive care (e.g., continue breastfeeding, temperature control) - Observe closely for improvement - Observe for signs and symptoms of shock | |

NEONATAL SEPSIS

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---------------|---|---|--|
| HOSPITAL | <p>Same as above, plus:</p> <p>Recognize preventative measures to be taken in hospital setting:</p> <ul style="list-style-type: none"> - Rooming-in to keep mother and baby together - Isolate babies with infections and/or skin lesions but keep mother and baby together | <p>Same as above, plus:</p> <p>Keep delivery room and nursery equipment clean and sterilized (resuscitation equipment, respirators, incubators, etc.)</p> <p>All personnel with illnesses and skin infection should avoid contact with babies</p> <p>Sepsis work-up:</p> <ul style="list-style-type: none"> - Cultures of blood, urine and cerebrospinal fluid - Complete blood count - Chest X-ray - Lumbar puncture <p>Start parenteral antibiotics (begin immediately after cultures obtained)</p> <p>In addition to antibiotic therapy, treatment may include:</p> <ul style="list-style-type: none"> - IV fluids - Blood transfusion - Oxygen therapy - Naso-gastric tube or gavage feeding with expressed breast milk - Isolation of infant (possibly use incubator) | <p>Same as above, plus:</p> <p>IV antibiotics</p> <p>IV fluids</p> <p>Laboratory</p> <p>Blood bank</p> <p>Oxygen</p> <p>Nursery and delivery equipment which can be easily cleaned/disinfected (materials for isolettes should be washable)</p> <p>Naso-gastric tubes</p> <p>Breast milk bank</p> <p>Breast pumps</p> <p>Refrigeration</p> <p>Disinfectants</p> <p>Autoclave or other method of sterilization</p> <p>Gowns, gloves</p> |

NEONATAL SEPSIS

LEVEL OF CARE

RECOGNIZE

RESPONSE

RESOURCES

HOSPITAL
cont.

Keep mother and baby together if at all possible (rooming-in)

Encourage parental contact while infant is sick

Have mother breastfeed as soon as possible

If unable to suck give expressed breast milk

Assist mother with breast milk expression

Prevent transmission of infection to other infants

- Use good handwashing technique
- Use gown and gloves if available

EXCLUSIVE BREASTFEEDING

Exclusive breastfeeding refers to breastfeeding which is initiated within the first hour of life and continues without the addition of any liquids, solids or other substances in the first four to six months of life. Studies have shown that breastfed infants are less likely to suffer from diarrhea, acute respiratory infections and many other diseases as well as allergies. Infants who breastfeed exclusively have an even lower rate of these illnesses.

Potential complications: Babies who do not breastfeed exclusively have a greater chance of becoming sick, malnourished and dying in the first year of life and experiencing a shorter interval between their birth and that of succeeding siblings. The benefits of breastfeeding for the mother include a reduced risk of postpartum hemorrhage and reduced risk of reproductive cancers.

References:

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Protecting, promoting and supporting breastfeeding -- a joint WHO/UNICEF statement. Geneva: World Health Organization, 1989.
Winikoff B. Breastfeeding. *Current Opinion in Obstetrics and Gynecology* 1990; 2:548-55.

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---------------------------------------|--|--|--|
| COMMUNITY Mother/ Family | <p>Recognize benefits of breastfeeding:</p> <ul style="list-style-type: none"> - Protects baby from disease and malnutrition - Best source of nutrition for baby - Saves lives - Helps space children - Helps mother and baby establish close relationship/bonding - Aids uterus in returning to normal size faster - Helps reduce bleeding after birth by causing contractions of the uterus - Decreases risk of allergies in infant - Protects mother's health by reducing risk of breast and ovarian cancer - Saves money - Saves energy (fuel) <p>Know importance of breastfeeding within one hour after delivery</p> | <p>Breastfeed exclusively and on demand day and night for first 4-6 months (slightly more or less depending on baby's growth)</p> <p>Start breastfeeding immediately after delivery if at all possible</p> | <p>Education to promote breastfeeding by mass media, women's groups, schools and clinics</p> <p>Food, and vitamin-mineral supplements for pregnant and lactating women</p> <p>Child care in workplace, breastfeeding areas/breastfeeding breaks in workplace, maternity leave</p> <p>Support groups for breastfeeding women</p> <p>Discourage marketing/advertisements and free samples of infant formulas</p> <p>Ban local selling/distribution of bottles and pacifiers (teats)</p> <p>Growth charts</p> |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|---|--|-----------|
| COMMUNITY Mother/ Family cont. | <p>Know importance of giving colostrum and breastfeeding frequently on demand, including night feeds:</p> <ul style="list-style-type: none">- Colostrum protects from infection and is very high in protein and nutrients- Milk comes in faster- Increased milk supply- Less engorgement and other problems such as cracked nipples- Immediate skin to skin contact between mother and baby prevents hypothermia in the newborn <p>Recognize that breast milk alone, if given frequently on demand, meets all the infant's food and fluid needs in the first six months (slightly more or less depending on infant's growth). Exclusively breastfed infants do not need to drink water even in hot climates</p> | <p>Give colostrum and do not give glucose water or other prelacteal feeds</p> <p>Avoid all other substances besides breast milk (including water in hot season for 4-6 months)</p> | |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSL | RESOURCES |
|---|---|---|-----------|
| COMMUNITY Mother/ Family cont. | <p>Recognize dangers of giving any food, liquid or substance other than breast milk during the first 4-6 months of life (e.g., water, sugar, ghee, honey, animal milk, formula, herbs, rice, bananas, etc.):</p> <ul style="list-style-type: none"> - Increased chance of infection such as diarrhea and pneumonia - Increased chance of malnutrition - Increased chance of infant death - Decreased breast milk supply - Increased chance of breast problems such as engorgement and mastitis - Increased risk of allergy in infant - Earlier return of menses and next pregnancy <p>If infant is ill (e.g., with diarrhea), breastfeeding should continue as usual</p> <p>Recognize needs of breastfeeding women:</p> <ul style="list-style-type: none"> - Increased nutritional needs to maintain adequate milk supply and prevent maternal depletion - Increased need for calories and protein as well as increased iron, folic acid, calcium and other vitamins and minerals - Increased rest to conserve energy - Sufficient liquids | <p>Eat a balanced diet with extra food while breastfeeding</p> <p>Drink to quench thirst</p> <p>Take vitamins, food and mineral supplements (e.g., iron-folate) if available</p> <p>Try to get help with housework/avoid unnecessary work</p> | |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|---|-----------|
| COMMUNITY Mother/ Family cont. | <p>Identify problems that can interfere with breastfeeding:</p> <ul style="list-style-type: none"> - Cracked nipples - Engorgement - Blocked ducts - Mastitis/breast infection - Breast pain, fever, chills, area of breast with hard lumps or abscesses <p>Know that breastfeeding can continue even if the mother is sick with very few exceptions (e.g., breast cancer, life-threatening/very debilitating illnesses)</p> <p>Recognize that most medications are excreted in breast milk and may have a negative effect on the baby or may affect milk supply</p> <p>Some medications which are contraindicated when breastfeeding include:</p> <ul style="list-style-type: none"> - Estrogen containing contraceptives - Chloramphenicol - Valium (diazepam) - Bromocriptine - Antineoplastic drugs (cancer drugs) - Prolonged use of ergometrine | <p>Prevent breast problems by nursing frequently on both breasts, airing breasts, changing positions for feedings and avoiding soap on nipples</p> <p>See that baby takes whole nipple and areola into its mouth and latches on and off properly to avoid sore nipples</p> <p>Seek prompt medical treatment of breast problems/illnesses</p> <p>Know how to express breast milk to maintain milk supply -- if unable to breastfeed temporarily (e.g., low birth-weight baby without ability to suck or separation of mother and baby)</p> | |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|--|---------------|---|---|
| COMMUNITY Community Health Worker | Same as above | <p>Same as above, plus:</p> <p>Promote exclusive breastfeeding for 4-6 months</p> <p>Teach benefits of breastfeeding frequently and exclusively 4-6+ months</p> <p>Begin counselling about preparation for breastfeeding as early in pregnancy as possible. Teach basic physiology of lactation</p> <p>Teach dangers of giving supplemental foods, liquids and breast milk substitutes to baby as well as dangers of bottle feeding</p> <p>Teach benefits of colostrum/importance of immediate initiation of breastfeeding and dangers of prelacteal feeds</p> <p>Encourage good nutrition for mother while breastfeeding</p> <p>Give iron-folate and vitamin-mineral supplements to the mother</p> <p>Refer for supplemental food for the mother if needed and available</p> | <p>Same as above, plus:</p> <p>Supervision and training of CHWs by health center personnel</p> <p>Special educational sessions to aid CHW in promoting and supporting breastfeeding</p> <p>Teaching aids for educating community members</p> <p>Protocols for CHWs</p> <p>Growth charts</p> |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|-----------|---|-----------|
| COMMUNITY Community Health Worker cont. | | <p>Discourage dietary taboos that restrict important foods/food groups for lactating women. Encourage those cultural practices that promote consumption of important foods for lactating women.</p> <p>Conduct home visits to evaluate breastfeeding, condition of infant and mother, and to support mother</p> <p>Monitor growth of infant to determine when exclusive breastfeeding is no longer sufficient</p> <p>Teach management of breastfeeding, care of breasts, prevention and identification of breast problems</p> <p>Teach manual expression of breast milk when needed (e.g., premature infant with poor suck, very engorged breasts)</p> <p>Refer women with breast infections and/or other illnesses to health post/health center for treatment. Treat certain conditions if trained and have needed drugs</p> | |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|---|--|--|--|
| COMMUNITY Community Health Worker cont. | Know appropriate methods of contraception for lactating women | <p>Counseling on family planning methods with least effect on quantity and quality of breast milk (spermicides, barrier methods, progesterone only pills or injections, IUDs or abstinence)</p> <p>Teach ways to increase contraceptive benefits of breastfeeding (e.g., exclusive and frequent demand feeding first six months)</p> | |
| COMMUNITY Traditional Birth Attendant (TBA) | Same as above | <p>Same as above, plus:</p> <p>Breast exam prenatally to determine condition of nipples</p> <p>Teach nipple preparation for flat or inverted nipples before delivery</p> <p>Put baby to breast within one hour after delivery</p> <p>Conduct postpartum visits</p> | <p>Same as above, plus:</p> <p>Training and supervision of TBA by health center personnel</p> <p>Special training program on breastfeeding</p> |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|----------------------------|---------------|--|---|
| HEALTH POST/ HEALTH CENTER | Same as above | <p>Same as above, plus:</p> <p>Have policy which protects, promotes and supports early and exclusive breastfeeding at center</p> <p>Avoid unnecessary separation of mother and infant after delivery</p> <p>Avoid pre and post lacteal feeds</p> <p>Limit use of bottles and formula to special medical circumstances in center</p> <p>Avoid prolonged use of ergometrine (methergine) as prophylactic for bleeding as it may interfere with lactation. Oxytocics can be used as they have not been shown to interfere with lactation.</p> <p>Urge that low birthweight babies who are able to suck (>1500 gms.) are exclusively breastfed</p> <p>Some babies between 1500-1800 gms. may not be able to suck and should be fed exclusively on their mothers' expressed breast milk by cup</p> | <p>Same as above, plus:</p> <p>Breastfeeding education for health personnel</p> <p>Contraceptives appropriate for breastfeeding women (e.g., non-estrogenic)</p> <p>Specialized training in lactation management for staff</p> <p>Prenatal records -- with area to indicate intention to breastfeed, examination of breasts, experience with breastfeeding</p> <p>Breast milk pumps and refrigerator for expressed breast milk. Cups for feeding expressed breast milk.</p> |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|----------------------------------|--|--|--|
| HEALTH POST/ HEALTH CENTER cont. | | <p>Refer babies <1500 gms. to hospital</p> <p>Treat breast infections</p> <p>Treat illnesses that may interfere with breastfeeding</p> <p>If contraception desired administer method less likely to interfere with lactation (methods as noted above)</p> <p>Arrange for follow-up home visit or appointment in center to evaluate/support breastfeeding</p> <p>Arrange for support system in case mother has problems with breastfeeding</p> | |
| HOSPITAL | <p>Same as above, plus:</p> <p>Recognize the low rate of breastfeeding in hospital settings due to the increased number of high risk deliveries as well as negative and unnecessary hospital procedures.</p> | <p>Same as above, plus:</p> <p>Assist with breastfeeding, comfort measures and positioning following operative deliveries</p> <p>Safe medication for pain to women post cesarean section, post tubal or with episiotomy pain</p> | <p>Same as above, plus:</p> <p>Rooming-in arrangement (mother and baby cared for in same room, preferably in same bed, without separate cribs)</p> |

EXCLUSIVE BREASTFEEDING

| LEVEL OF CARE | RECOGNIZE | RESPONSE | RESOURCES |
|----------------|--|--|---|
| HOSPITAL cont. | <p>Recognize special situations in which early initiation of lactation may be difficult and extra assistance is needed:</p> <ul style="list-style-type: none"> - Women who have undergone difficult deliveries, (e.g., forceps, cesarean section, tubal ligation) - Women who have had general anesthesia during or after delivery - Premature baby with poor ability to suck | <p>Assist with expression of milk if necessary</p> <p>Administer expressed breast milk to premature or low birthweight infant by naso-gastric or gavage feeding if unable to suck (often <1500 gms. birth-weight)</p> <p>Feed babies (1500-1800 gms.) who are unable to suck exclusively with the expressed breast milk of their mothers by cup</p> <p>For low birthweight babies who are able to suck assure that they are exclusively breastfed by their mother</p> <p>Avoid prolonged use of ergometrine (methergine) as a prophylactic for postpartum hemorrhage (see Health Center section)</p> <p>Use local or regional anesthesia for surgery if possible. Where possible, avoid general anesthesia which is associated with poor sucking response and difficulty initiating breastfeeding</p> | <p>Refrigerator for expressed milk</p> <p>Breast milk pumps</p> <p>Tubing and cups for feeding expressed breast milk</p> <p>Staff education on importance of exclusive breastfeeding/ways to promote breastfeeding</p> <p>Educational program for postpartal women -- use of videos and other visual aids</p> <p>Printed materials to take home</p> <p>"Lactation Specialist" -- recruit and train women from community who have successfully breastfed or enlist breastfeeding mothers support group to work on postpartum wards to encourage and help women with breastfeeding -- also, to provide continuing support and advice after hospital discharge</p> |