

Normal Child Birth- How to assist in delivery of a newborn.

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Objectives:

1. Describe the evaluation of the pregnant patient.
2. Recognize signs and symptoms of imminent delivery.
3. List and describe the stages of delivery.
4. State the steps in assisting childbirth.
5. Know how and when to cut the umbilical cord.
6. Understand the post partum management of mother and baby.

CASE

You are parked outside the hospital in your ambulance after you completed an inter-hospital transfer. A car speeds up to the ambulance entrance and a man jumps out “the baby is coming.” The mother is a 34-year-old gravida 3 para 2 who stayed home as long as she could as her other deliveries took 20 and 10 hours respectively. She is 39 weeks today. She has had a normal pregnancy without complications. You jump out of the ambulance to assist the mother. Your partner runs into the ER to notify the staff inside. You open the car door and the mother is yelling, “I need to push now.” You don your gloves and goggles and check for crowning. You easily spot the baby's head. With the next push the baby is out and the ER physician and nurse are now outside the car with a stretcher. They assist you in cutting the cord and the nurse wraps the baby in a warming blanket. APGAR scores at 1 minute are 8. The mother receives fundal massage, IV fluids and oxygen as she and the baby are wheeled into the hospital.

Introduction:

Pregnancy and childbirth are natural events. Fortunately for this mother and baby all went smoothly. Complications did not occur in this case. However, complications do occur and you must be prepared to recognize them quickly and understand the management.

Key Definitions:

Gravida: (‘grav-ed-a) this number refers to the number of times a woman has been pregnant.

Para: (‘par-a) this number refers to the number of children a woman has or number of pregnancies carried to full term.

Multigravida: a woman who has been pregnant more than once.

Nulligravida: a woman who has not been pregnant

Umbilical Cord: a cord arising from the naval that connects the fetus with the placenta and contains the two umbilical arteries and the umbilical vein

Placenta: the vascular organ that unites the fetus to the maternal uterus and mediates exchange of nutrients between the maternal and fetal circulation

Uterus: The female organ that contains and nourishes the fetus during pregnancy

General assessment of the obstetric patient:

The approach to the pregnant patient should be the same as any other patient. As always, first concerns are scene safety, Body Substance Isolation, and ABC's. A usual history plus information regarding the details of the pregnancy is in order. The acronym SAMPLE is a useful tool: Symptoms, Allergies, Medications, Past Medical History, Last oral intake, Events preceding the incident.

Information specific to the pregnancy should include

1. Mother's age
2. Gravida and parity (number of pregnancies, deliveries, miscarriages and abortions)
3. Estimated Date of Confinement EDC (Due Date)
4. Prior pregnancy complications
5. Prior birth method (Cesarian section or Vaginal delivery)
6. Name of prenatal care provider
7. Prenatal treatment
8. Prenatal tests (Ultrasound, Blood work, Procedures)

Of special note in the pregnancy history are the following conditions

1. **DIABETES.** Diabetes can often occur during pregnancy (Gestational diabetes), and pre-existing diabetes may become more difficult to control. Pregnant patients who are diabetic are usually controlled with insulin, as oral hypoglycemic agents are usually contraindicated in pregnancy. There are a number of complications due to diabetes in pregnancy.
Infants tend to have high birth weights, making delivery difficult. Newborns of diabetics may develop hypoglycemia and hypothermia after birth. Incidence of birth defects is also higher in these infants.
2. **HEART DISEASE.** During pregnancy, cardiac output needs to increase up to 30%. Patients with prior heart disease may have difficulty maintaining this level of output, placing them at risk for congestive heart failure.
3. **HYPERTENSION.** Hypertension during pregnancy may be a sign of pre-eclampsia (toxemia of pregnancy). Complications of pre-eclampsia can be seizure, stroke, heart and renal injury, and fetal demise. Treatment of choice is delivery of the baby in the hospital.

Physical Exam:

Physical exam of the pregnant patient follows the same principles as the non-pregnant patient, with some special considerations. The following details should be noted.

1. **VITAL SIGNS.** Vitals should be taken in the non-supine position. If the patient needs to be on the stretcher, place her on her side. As the pregnancy progresses and the uterus enlarges, it compresses the inferior vena cava when the patient lies on her back. This prevents venous return and can cause hypotension. Turning the patient allows the uterus to roll off the vena cava, improving venous return.
2. **FUNDAL HEIGHT.** The fundal height is the distance between the pubic symphysis and the very top of the uterine fundus. It is a useful tool in estimation the gestational age of the baby. The number of centimeters corresponds to the number of weeks of the pregnancy.
 - a. For example, a fundal height of 26 centimeter equals a 26-week pregnancy. Normal delivery occurs at 40 weeks.
 - b. So a patient in labor with a fundal height of 26 would be a dangerously pre-term delivery. This patient should be transported without delay. If delivery is imminent and will occur in the field, expect infant complications associated with pre-term delivery. (See the lecture on abnormal pregnancy and delivery for details)
 - c. A 20-week pregnancy should have the fundus at the level of the umbilicus. (the belly button)
 - d. In a normal full-term pregnancy, the uterus should take up most of the abdomen and the fundus will be near the xiphoid process.
3. Palpate the uterus through the abdominal wall. It should be firm but non-tender. Feel for fetal movement. It is common not to feel movement, and is generally not palpable before 20 weeks.
4. Listen for fetal heart tones with your stethoscope. Heart tones can be heard after 18 weeks. Lack of heart tones may be simply due to fetal positioning, or could be an indication of fetal compromise.
5. **GENITAL EXAM.** This should be an external exam only. Look for vaginal bleeding or discharge. Look for presentation of any baby parts, or umbilical cord. Crowning is the bulging of the infant's head during a contraction. This is a sign of imminent delivery.

LABOR:

Labor is the process that allows a mother to deliver her fetus through the birth canal. Before actual labor begins, a number of changes and preparatory events occur.

LIGHTENING: Also referred to as the "baby dropping". This occurs up to 2 weeks before delivery, and happens when the fetal head settles into the pelvis. Externally, the top of the abdomen flattens and the lower part protrudes more. The mother may notice increased urinary frequency due to increased pressure on her bladder.

FALSE LABOR: Also known as **BRAXTON HICKS** contractions. During the last 4-8 weeks of pregnancy, the uterus starts to contract irregularly. These contractions are usually mild, irregular and short in duration. They probably help prepare the uterus and cervix for true labor. It is not usually associated with dilation of the cervix. It can often be confused with pre-term labor, and it is important to distinguish the difference. In the field, any suggestion of labor should be taken seriously, and the patient transported and evaluated.

CERVICAL EFFACEMENT: As the uterus stretches, the cervix thins. This is known as cervical effacement.

BLOODY SHOW: As the cervix effaces and stretches, the mucous plug in the cervical canal may be released. This is known as the “bloody show”. It looks like the passage of a small amount of blood tinged mucous, and may herald the onset of true labor.

MEMBRANE RUPTURE: Also known as water breaking. When the amniotic sac ruptures, the amniotic fluid leaks out. It can occur during any phase of labor, or even before active labor begins. It can be subtle and feel like the mother needs to frequently urinate, or dramatic with a large gush of fluid. The water breaking can often precipitate active labor by stimulating the uterus to contract.

The stages of labor:

Labor is divided into 4 stages.

1. First stage: From the onset of true labor to the complete dilatation of the cervix.
2. Second stage: From complete dilatation of the cervix to delivery of the baby.
3. Third stage: From delivery of the baby to delivery of the placenta.
4. Fourth stage: From delivery of the placenta to stabilization of the patient.

FIRST STAGE OF LABOR: The first stage of labor is sub-divided into two phases.

1. The first phase is EFFACEMENT of the cervix. At the beginning of pregnancy, the cervix is thick and long. Effacement usually begins before the onset of true labor, but progresses rapidly once active labor begins.
2. The second phase of Stage One is the DILATATION of the cervix. The cervix starts as closed, and progresses to full dilatation at 10 cm. Contractions during the DILATATION phase gradually progress from mild, lasting 15-20 seconds every 10-20 minutes, to strong, lasting 60 seconds every 2-3 minutes.

Primipara: 6-18 hours

Multipara: 2-10 hours

CLINICAL MANAGEMENT OF THE FIRST STAGE:

1. Positioning: The patient may sit or recline on the stretcher as long as she is not in the supine position. If lying on the stretcher, place her in the lateral recumbent position to assure perfusion of the fetus.
2. Fluids: Avoid PO intake. For ALS, start an IV for administration of fluids per protocol.
3. Monitoring: Vitals should be recorded frequently.

SECOND STAGE OF LABOR: The second stage starts with the full dilatation of the cervix and ends with the birth of the baby. At the beginning of the second stage, the mother usually gets the urge to bear down or push with each contraction. The abdominal pressure combined with the uterine contraction helps expel the fetus. As delivery nears, CROWNING occurs. During contractions, you will be able to see the fetus' head (or other presenting part) visible at the vaginal opening. This is a sign that delivery is imminent. The most common way to present is headfirst, face down, called the vertex position.

Primipara: 30 minutes to 3 hours

Multipara: 5-30 minutes

THIRD STAGE OF LABOR: The third stage of labor begins immediately after the birth of the infant and ends with the delivery of the placenta. Signs of placental delivery are a gush of blood, and a change in the shape of the abdomen. The umbilical cord will appear to lengthen as the placenta migrates down the birth canal, and the mother will have the urge to push.

Primipara: 0-30 minutes

Multipara: 0-30 minutes

FOURTH STAGE OF LABOR: The fourth stage of labor is the time immediately following delivery of the infant. It lasts until the mother is stable. The first hour after delivery is the critical time for monitoring the patient. Check frequently for signs of excessive bleeding, and monitor vitals frequently. Do not delay transport.

Management of the patient with imminent delivery.

After assessing the pregnant patient and determining the stage of labor, you must now decide whether to deliver the baby on scene or transport to the hospital. The vast majority of the time, transport is indicated. Only deliver the infant on scene if you feel delivery is imminent and transportation would be unsafe for the mother and infant. It is often difficult to determine likelihood of immediate delivery and many factors must be taken into account.

1. Number of previous deliveries. Multiparous women tend to deliver more quickly.
2. Duration of labor in previous pregnancies. Rapid labor in the past correlates with rapid labor in subsequent deliveries.
3. Urge to push. Indicates second stage of labor may have begun.
4. Crowning. The baby is on the way.

Delivery:

If you need to deliver the baby in the field, prepare using the following steps.

1. As always, remember scene safety and BSI.
2. Place a towel underneath the mother's buttocks and another draped across the lower abdomen.
3. Open your OB kit and don gloves, mask, gown, and eye protection.
4. Oxygen for the mother.

5. The patient may be positioned in the lithotomy position (on her back with knees up and apart) or on her side if necessary.
6. As the baby crowns, support the head gently to control the rate of delivery. The pressure is only to prevent rapid expulsion, which may cause injury to the mother and infant.
7. As the head emerges, have the mother stop pushing and use your index finger to find if the umbilical cord is around the infant's neck. If it is, gently unwrap the cord by bringing it around the baby's head. (If the cord is wrapped so tightly around the neck that you cannot unwrap it, clamp it and cut it now. Place 2 clamps 5 cm apart and cut BETWEEN the clamps)
8. After the head emerges, support the head and suction first the mouth, then the nose using the bulb syringe or mechanical suction. Note: always suction the mouth first to prevent gasping and aspiration of oral secretions or meconium.
9. As the mother pushes, the baby's head will start to rotate. Continue to support the head and guide the head downward to allow delivery of the upper shoulder. (NEVER pull on the infant's head!)
10. After delivery of the upper shoulder, guide the baby upward to facilitate delivery of the lower shoulder.
11. The rest of the baby will now deliver very quickly. Be prepared to support the weight of the entire baby. Use both hands. THE BABY WILL BE SLIPPERY!!
12. Cut the cord. (see the next section)
13. Wrap the baby.
14. Place the infant on the mother if both she and the baby are stable.
15. Deliver the placenta (See below)
16. Transport to the closest appropriate facility.
17. Congratulations!

“Know how and when to cut the umbilical cord.”

Immediately after delivery of the baby, keep the infant at the level of the vagina to prevent over or under transfusion of blood from the cord and placenta. Take care not to pull or put pressure on the cord and do not “milk” the cord. Using the two clamps provided in the delivery kit, clamp the cord approximately 10 and 15 cm from the BABY'S belly button. Carefully cut the cord BETWEEN the two clamps. Inspect the two ends of the cord to ensure there is no bleeding. The baby is no longer attached to the mother and can be moved for better resuscitation.

Continue to suction the infant's mouth and nose until the airway is clear. Dry the baby, and wrap in warm, dry towels or blankets.

Stage 3: Delivery of the Placenta....

After delivery of the baby, the placenta will usually deliver within 0-30 minutes. Do not delay transport to deliver the placenta. After delivery there will be a slight ooze of blood from the vagina. As the placenta separates from the uterine wall and delivery begins, there will be a short gush of blood and the umbilical cord will appear to lengthen. Never pull on the cord! As the

placenta delivers, use the cord to help guide it into a bucket or plastic biohazard bag. Perform fundal massage. This helps stimulate uterine contraction and prevent blood loss. Continue massage until the uterus is firm and contracts down to the size of a grapefruit. Transport the placenta with the patient to the hospital for inspection. It is important to keep the placenta to determine if there are any parts retained in the uterus. Retained placenta can cause hemorrhage or infection.

Stage 4: Post delivery care and stabilization...

After delivery, monitor the mother and child closely. You now have 2 patients. Watch for continued hemorrhage or vaginal tears. If vaginal tears are present, control bleeding with direct pressure.
Monitor Vital Signs.
ALS: Treat hypotension with IV Normal saline bolus.

Care of the Neonate: See our lecture on neonatal resuscitation for more details.

Remember, newborns are slippery!!!

Use two hands to hold them.

Continue to suction mouth and nose until the airway is clear of secretions.

Newborns need to be kept warm. Quickly dry the infant using soft towels. After drying, wrap the infant in a clean, dry towel and place on the mother's chest if both patients are stable.

Assessment:

The newborn infant should start to cry and breathe without difficulty by gentle stimulation when drying with the towels. If not, stimulate by gently flicking the sole of the foot or rubbing the back. Check vitals. The usual vitals are

Heart Rate 100-180

Respiratory Rate 30-60

Skin: As the baby cries, the skin color should become pink. It is common for the extremities to stay dusky after the face and trunk have "pinked up". This is called acrocyanosis and is a common finding in otherwise healthy infants.

The Apgar score

- Performed at 1 minute and 5 minutes after delivery
- Examines 5 objective signs and rates them 0-2
- If the 5-minute Apgar score is < 7; retest every 5 minutes for a total of 20 minutes

- The Apgar score CANNOT determine the need for resuscitation
- Do **NOT** delay resuscitation efforts to obtain APGAR Scores
- In preterm infants, the Apgar score is more likely to be affected by gestational age than by asphyxia

	0 Points	1 Point	2 Points
HEART RATE	Absent	Less than 100	Greater than 100
RESPIRATORY EFFORT	Absent	Weak Cry	Strong Cry
MUSCLE TONE	Flaccid	Some Flexion	Active Movement
REFLEX IRRITABILITY	No Response	Some Motion	Vigorous Cry
COLOR	Body Blue or Pale	Extremities Blue	Body Fully Pink

- A score of **7-10** usually requires supportive care only
- A score of **4-6** shows moderate depression
- A score of less than **4** Requires aggressive resuscitation

Summary:

1. When you have a pregnant patient, you have 2 patients, the mother and the fetus
2. Keeping the mother stable is usually the best way to support the baby
3. The approach to the pregnant patient is similar to the approach to any other patient, with a few added details
4. Pay special attention to previous medical problems, especially hypertension, diabetes, and heart conditions
5. Remember to ask
 - a. Maternal age
 - b. Number of prior pregnancies
 - c. History of pregnancy complications
6. Do not lie a woman with advanced pregnancy in the supine position
7. The Fundal Height in centimeters approximates the fetal age in weeks
8. Most women in labor can be safely transported to the hospital

9. If you can see the baby's head at the vaginal opening, delivery is imminent
10. Never pull or push the infant's head during delivery
11. Newborns are slippery. Use 2 hands
12. Cut the cord BETWEEN the clamps
13. Monitor Mother and Child Closely

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