

Cleveland

Fire

1st Quarter

Con-Ed

2009

Emergency Obstetrics

Neonatal Resuscitation

Engine 23 come in.....

Dispatch, this is Eng 23.

Engine 23 take a medical emergency....6924 Kocerek Ct. You have a 19 year old female OB. Medic 16 is your contact on the First Responder channel.

Dispatch, Engine 23 is responding from Madison & 65th.

We all hope that the call goes as routinely as it did when you were training at the FTA enrolled in a refresher class. What if it doesn't go as routinely as we would like? What if there were some REAL complications to deal with. Would you be ready? By the completion of this 1st Quarter Con-Ed we hope to refresh and increase your knowledge base to a level where you won't have any confusion on the scene. You will be ready to act with confidence!

As an EMT or Paramedic, there is a great deal of information to keep in your arsenal to use at a moment's notice. In this Quarterly Con-Ed, we hope to ramp up your knowledge base of the following topics....

- ✓ **Identifying the candidate for immediate childbirth.**
- ✓ **Supportive care of the mother before, during and post- delivery.**
- ✓ **Supportive care of the infant during and post-delivery**
- ✓ **Potential complications of the delivery process**
- ✓ **Neonatal resuscitation efforts**

As in all of emergency medicine, we should have a grasp of the basic Anatomy and Physiology as it pertains to our topics of discussion.

As the **FETUS** develops during pregnancy it takes up residence within the **UTERUS**. The uterus is a muscular organ that provides the warm environment where the fetus can develop. It also is the organ that provides the contractions to help push the baby along the way once labor commences.

The **CERVIX** is the opening at the distal end of the uterus through which the fetus passes to enter the vaginal canal so that delivery can take place.

The **PLACENTA** is the organ that attaches to the uterine wall and is where all of the nutritional exchanges take place between mom and baby. All exchanges, good and bad occur here. Vital nutrients, Oxygen (good things) and alcohol and drugs (bad things) are exchanged through the placenta. Interestingly enough, no blood is exchanged here as the fetus and the mother have independent circulatory systems!

The **UMBILICAL CORD** is the supply line between the infant and the placenta.

The **AMNIOTIC SAC** is the "sac" that contains the fetus and amniotic fluid. This is held within the uterus. It serves multiple purposes including the maintaining of fetal core temperature and a protective cushioning of the fetus during development. Finally, when the "water breaks", it helps lubricate the birth canal to assist with delivery of the infant. Talk about multitasking!

STAGES OF LABOR

Labor is divided into three separate stages. They are explained as.....

First Stage: (Dilation) Beginning of contractions also known as the "dilation stage".

Second Stage: (Expulsion) Baby enters the birth canal until he/she is born.

Third Stage: (Placental) Delivery of the placenta and amniotic sac are delivered.

The normal gestational period for the human is 40 weeks. This period is divided into three "trimesters". This information is very important and should be

extracted as part of your History and Physical exam of the mother. You can start by asking the mother the due date or how many weeks she is into her gestational period and continuing into how many times she has been pregnant and how many live births she has had. This is called the G/P score. G=Gravida (Number of pregnancies) and P=Para (Number of deliveries). Question the duration and interval of the contractions. Ask the mother her age as well. AMA (advanced Maternal Age) is a risk group worthy of notation. Asking her if she has had prenatal care would let you, the rescuer, know if she has been seeing a physician throughout the pregnancy and have had any potential problems revealed to her. Document your findings and pass them along to the transport team.

Now we have all recognized that under certain conditions, it would be far better and safer for us to deliver the baby outside of the hospital in a controlled environment (bedroom, living room) v. walking her down the stairwell. If during history gathering the mother states that she has the need to “push or bear down” or contractions are 2-3 minutes apart, delivery of the baby may be imminent. This is when you would want to do a quick physical exam on the mother. You will be looking for bulging or crowning. If you see the mother start to crown you had better be prepared for imminent delivery. Let’s get the mom prepped in as sterile environment as possible. Break out your O.B. Kit that all first responders carry and make ready all of the contents. Remember BSI for all members! Including eye protection! Don’t forget, if mom has had prior deliveries in the past, this current delivery could come rather rapidly. Be ready. If transport is ready and available and delivery seems like it will wait for a hospital delivery, by all means transport. Babies delivered outside of the hospital environment have the odds stacked against them with potential problems. Viruses, bacteria, life threatening problematic deliveries, airway issues, hemorrhage and others all come into play here.

Now that we have made the decision, (or mom did!) let’s get everything ready.

First things first. Take a deep breath. Realize that moms have been doing this procedure for centuries without our help. We are basically there to help mom and baby out by providing supportive care and some coaching. This is a natural

occurrence and usually happens without event thousands of times each day.
Relax!

Have all of the needed equipment available at the scene of delivery. Running back and forth to the squad or rig to retrieve additional equipment is very unprofessional. Bring in the AED, O2 therapy equipment, trauma bag etc.... Be prepared!

Above all, always remember to support the ABC's on all of our patients.

Let's get to work!

Afford some privacy for mom.

All members that may be involved must take BSI. Use the personal protection kits including eye shield.

Get mom into a comfortable place with her hips slightly elevated. Place towels or sheets under her...

The vaginal region should be exposed at this point and communication with the mother should be maintained as it will help keep her at ease. Though mom is exposed at this point for you to examine her, you must still maintain her body temperature.

Physical/visual exam.

When performing a Physical/Visual exam on mom, be professional and extremely modest with your approach. Keep her draped, warm and comfortable. Talk your way through the exam before and during the procedure.

When the first presenting part of the fetus is causing the vaginal opening to bulge, this process is called "CROWNING". We hope and pray that the presentation is that of the fetus' head, this is called a "cephalic" head first presentation. This is very normal and the preferred way of delivery. If the

presenting part is one of the fetus' feet or buttocks this is called a "breech" presentation and is extremely risky in the field. We will discuss both.

Position yourself properly. In the event that you have an explosive delivery, you need to be in place to protect the infant and mom from harm.

Having her relax between contractions is a good idea, she may need every ounce of strength when it is time to push.

Have someone from your crew monitor mom's vital signs throughout the delivery.

Here comes the baby!

Position your hands to control the potential rapid delivery of the baby. Provide firm, yet gentle control. Support the head as it exits the vagina. Keep the field around the vagina as sterile as possible. Remember that if we have fluid and blood draining out we could potentially have bacteria moving in. If mom has a bowel movement during the event remove it from the field and place a clean sterile sheet over the area to help provide a sterile field once more.

If the amniotic sac is still intact once the baby presents be prepared to rupture it manually. Use your fingers and tear it open. Be aware that this sac can contain 500 cc's or more of amniotic fluid. Make notation of the discharge of the fluid. Did it smell foul, clear, cloudy, bloody, meconium present? Aggressively suction the baby if you suspect meconium is present.

Once the head delivers, make certain that the umbilical cord is not wrapped around the neck. If it is, gently remove by loosening the cord and slip it over the baby's head. You **MUST** do this or the baby may not be able to be delivered. Take proper precautions to not injure the baby.

Now that the head is delivered, we need to suction the airway before the baby takes his/her first breath. Remember to first suction the mouth and then the nose. Do this a few times to clear the airway before the baby is fully delivered. Always squeeze the bulb syringe first and then place it in the nose or mouth and then release. This avoids the chance of you inserting it and squeezing the bulb and blowing fluids back into the baby's lungs.

Now deliver the upper shoulder first and then the lower and the rest of the baby's body will soon follow. Be cautious as the baby is extremely slippery. Keep the infant in a head low position once delivered to help facilitate drainage of any additional fluids. Keep the infant at vaginal level until both of the clamps are placed and the cord is cut. Make a note of the time the baby was delivered to assign APGAR scores at the 1 minute and 5 minute intervals of life.

APGAR

The Apgar score was developed by Virginia Apgar, an anesthesiologist, to standardize the assessment of the infant in the first moments of life. The score is assessed at 1 minute and 5 minutes of life. There are 5 components to this score and 2 points for each component. The first three are you ABC's.

Breathing- Baby gets 2 points if he cries or is breathing on his own, 1 point if he makes an attempt to breath and 0 if he requires bagging.

Heart rate- Baby gets 2 points for a heart rate above 100, 1 point for any heart rate and 0 for no heart rate.

Color- Blue is a normal color in the first moments of life. If you are blue you get a zero. If you have a pink body but blue extremities you get 1 point. If you are pink all around you get 2 points, although this doesn't happen very often.

Grimace- This is how the baby responds to you touching them or suctioning them. If they cry hard score them with a 2. If they make a face of annoyance they score a 1. If they do nothing score them with a 0.

Tone- This is how the baby holds themselves. Limp like a dish rag? Score them with a 0. If he lies limp but has tone when he tries to move, score him with 1 point. If they are kicking and screaming they score 2 points.

Example 1. Baby handed to you, he isn't breathing, you dry and stimulate him and he cries and then starts to breathe on his own. His heart rate is above 100 bpm and is blue in the feet and hands. He moves and kicks when you try to suction him.

Example 2. Baby above does not start to breathe on his own and you have to bag him 3 times then begin to breathe on his own. Heart rate stays above 100bpm. His tone was limp at first but at the 3 minute mark was improved but not active. His color was blue until 5 minutes when only the hands and feet were blue. At 4 minutes he cried when you attempted suctioning.

Answer. 1. 9 at one minute and 9 at the 5 minute mark.

2. 2 at one minute and 8 at the 5 minute mark

Now that the baby is delivered you need to focus on the immediate care of the neonate but do not neglect the mother!!

Put yourself in the shoes of the new neonate for just a minute.....

He just came from an environment that was temperature controlled, dark and relatively quiet and being totally oxygenated by mom into a colder, brighter, louder environment and to top it off, he is breathing room air!

Let's make certain that he has a patent airway. Let's maintain body temperature with aggressive warming but remember that drying him off is the first step to temperature control. We need to stimulate him to get him to exchange air to take his first few breaths. We do this by rubbing the babies back with tactile stimulation or using a controlled flick on the bottom of the feet. If the infant does not begin breathing on his own after 30 seconds of stimulation, we must begin resuscitative measures. For now we will assume that that we were able to stimulate the infant into breathing on their own. Blow-by oxygen would be beneficial at this point.

In a normal delivery after the baby is breathing on his own and the umbilical cord has stopped pulsating, it is now time to cut the cord. First place a clamp about 10 inches from the infant. Place the second clamp about 4 inches closer to the baby and cut in-between the clamps. Make sure that you are using a sterile pair of scissors when doing this. If the cord still leaks after cutting place another clamp and do not try to readjust any clamps in place.

Never tie or cut the umbilical cord of a baby who is not breathing on his own unless you have to do so to remove the cord from around the babies neck during birth, or unless you have to perform CPR on the infant. Do not cut a cord that is still pulsating.

Now that the baby has arrived the placenta should arrive here in about 20 minutes or so (3rd stage).

Although this was considered a routine delivery never forget to manage the needs of the mother. Mom needs to be continually assessed during the event. Pay attention to mom's oxygen needs as well as her circulatory needs. If mom has some serious blood loss let's address that by proper body positioning (legs elevated) and fundal massage to help with stimulating the uterus into contracting the stem blood loss. We can also let the infant breast feed to help the uterus to contract as well. Put mom on some oxygen to reduce her cardiac workload. Childbirth is tough!!! Keep both the mom and baby warm.

COMPLICATIONS

What happens when things don't go as routinely as we would like? We as first responders must train and educate for the worst case scenarios as well as for routine calls. We will discuss some of the abnormal obstetrical presentations that may be encountered in the field. It is here in these anomalies that your actions can save lives, not to just the infants but the mother as well.

The topics of discussion will be.....

- **Placenta previa**
- **Abruptio Placentae**
- **Prolapsed cord**
- **Limb Presentation**
- **Breech Delivery**

Placenta Previa and Abruptio Placentae

Placenta previa occurs when the placenta attaches to the uterine wall and partially or completely covers the opening to exit the uterus. When labor begins the placenta can fully or partially tear away from the uterine wall and the mom begins to hemorrhage. Abruptio placentae occurs when the placenta tears away from the uterine wall with regard to the location in the uterus. Remember how we said that the mother and fetus have two separate circulatory systems? We also said that oxygen exchange occurs at this membrane (placenta) right? So if the lifeline is somehow severed would this not place the fetus in distress?? Absolutely! This condition is usually associated with a very poor outcome. It goes without saying that mom is at great risk too. We need to oxygenate mom and fetus with high flow O₂. By oxygenating mom you oxygenate junior. Get it done. Treat for shock if there are signs and symptoms from hemorrhage.

Elevate her legs: Shock position

Maintain body temperature: Keep her warm

Oxygen therapy: 15 liters via NRB

Rapid transport to appropriate facility.

Prolapsed cord

Prolapsed cord is when your visual/physical exam of the vaginal area on mom reveals the umbilical cord presenting first or even hanging out of mom. We know that if the cord precedes the infant the risk of the infant compressing the cord within the vaginal canal is present and not good. This would basically cut off the infants oxygen supply.

What would you do if you if during your visual exam you find a 4" section of umbilical cord protruding from mom?

Body position: Get mom in a head low hips high position using blankets to allow gravity to work with us and let the fetus slide back down a bit to relieve pressure on the cord. Maintain body temperature.

Oxygen therapy: 15 liters via NRB

Assess the cord: We can assess the cord by palpating for detectable pulses. We are permitted and must place a gloved hand into the vagina to keep the infants head from totally cutting off the blood flow to the infant.

Tactile assist: With your gloved hand in the vagina, we must assess the cord for pulsations to see if our actions are allowing the flow of blood to be maintained throughout transport. Cover the umbilical cord with a moist sterile dressing.

Transport: RAPID transport in this position will be most beneficial for a best fetal outcome.

Monitor: Vitals should be monitored throughout transport.

Limb Presentation

Let's say you pull the sheets back off of mom to do a pelvic exam and find an arm or leg protruding. First, never forget to maintain ABC's on everyone. Including the baby. Again, this will be head low hip high position for the mother. This is the best position for the fetus because of the rule of gravity. It could help keep the infants body off of the cord to allow circulation. NEVER pull on the presenting limb.

Management

Body position: Mom is head low hip high (use blankets) to allow gravity to work with you. Maintain body temperature.

Oxygen therapy: 15 liters via NRB

Transport: RAPID transport to the appropriate facility. Have the mother pant if she has the urge to push.

Monitor: Vitals should be monitored throughout.

Breech Delivery

Breech presentation is the most common abnormal delivery. It involves a buttocks first or foot/feet first delivery. It is a high risk delivery with trauma to the fetus expected. Prolapsed cord is also a risk associated with breech births. Though mothers still can birth naturally this way the complication rate remains quite high. RAPID transport is essential upon discovery of a breech presentation. Never pull on a presenting part. Always prepare yourself for a spontaneous delivery. Don't get caught with your guard down. Always have all of the pieces

of equipment ready to deploy. The infant may just deliver whether you are ready or not.

Management

Body Positioning: Mom is head low hips high. Again gravity is our friend.

Oxygen: 15 liters via NRB

Transport: Rapid transport to the nearest appropriate facility

Monitor: Vitals should be monitored throughout the event. If the buttocks and legs are out, get ready to deliver the head and shoulders quickly. Otherwise you risk head entrapment which is very bad. Make certain that mom pushes with all of her might. If the head becomes entrapped you will need to insert a gloved hand into the vagina and form a V-shaped "wedge" alongside of the infant's nose. This provides a route for the infant to breathe in some room air until the head can be delivered. NEVER pull on the infant's body to help facilitate the delivery of the head because you can just about guarantee a poor outcome if you do.

Neonatal Resuscitation

Post delivery....

Dry the infant as this will help keep him warm. Use clean/sterile blankets for this.

Stimulate the infant to breathe. Rubbing the back, flicking the bottom of the feet...

Suction the infant airway to remove all of the drainage that remains. Always maintain and assess the airway of the infant. Due to its small size, it will not take much to totally obstruct the airway. ABC's first and foremost.

PPV with BVM. If the baby does not begin breathing within the first 30 seconds of delivery begin bagging the infant using the infant sized BVM that we all carry

in our first responder bags. If the baby does not start breathing on his own and the heart rate is absent or below 60 begin chest compressions. Landmarks for compressions are:

Center of the chest at the nipple line.

Compress straight down to the depth of 1/3 to 1/2 of the infants depth. Use two fingers if you are the sole rescuer or the encircling hands technique when you have someone assisting you. Always follow the American Heart Association guidelines when performing CPR.

Keep compression rates up at 100 compressions per minute.

Keep compression depth at 1/3 to 1/2 the infant's depth

Keep compression ratio at 15 to 2

Ventilate only enough to see adequate chest rise. More is not better.

Your job is to continue CPR until the infant is resuscitated or you transfer care to a higher medical authority.

Reassess your patient every minute of your resuscitative efforts. Rule of thumb, if your infant is crying or breathing the heart is generally over 100bpm. This is true only of neonates.

FYI: The heart rate is directly correlative to respirations. If you are adequately supporting the airway and breathing chances are that you will not need to perform compressions. Proper continuous assessment is the true measure. Document!!

Manage the airway aggressively!! Adequate suctioning and ventilations is what is needed in most situations to get the heart rate up. The infant's heart rate can go from 60 bpm to 160 bpm just by stimulation, suctioning and ventilating the

infant. Don't be too quick to begin chest compressions without aggressive measures first being taken to manage the airway. Chest compressions can easily lacerate delicate organs of the neonate, controlling the airway is key.