



# **MLCPC 205:**

***The Miracle of Life:  
Fetal Development and Birth***

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## **Abstract**

This session will take crisis pregnancy coaches through the developmental milestones in a baby that occur from conception to birth. Coaches will be provided with diagrams that highlight the discussed stages. Dr. Christiansen will discuss how coaches may apply this information when speaking with clients and potential mothers. Coaches will learn how ultrasounds and the information provided by the pregnancy resource center may prevent women from choosing abortion.

## **Learning Objectives**

- 1.** Participants will be equipped to speak with clients about the developmental milestones of their unborn baby.
- 2.** Participants will acquire information about pregnancy that will enable them to educate their clients.
- 3.** Participants will identify ways in which ultrasounds may be used in their crisis pregnancy center.

## I. **The First Trimester-Beginnings**<sup>1, 2, 3, 4, 5, 6</sup>

### A. **Pre-fertilization**

1. In the normal menstrual cycle, a woman's egg is released from the ovary mid- cycle (approximately 14 days after the onset of menses).
2. The released egg will remain viable for **24 hours**.<sup>7</sup>
3. Sperm swim at a rate of .5 inches per minute. The first sperm will reach the fallopian tube in **25 minutes**.
4. Of the approximate 50-625 million sperm deposited at the top of the vagina during intercourse, only one will fertilize the egg.<sup>8</sup>

### B. **Conception**

1. Only one sperm may enter the egg. At this exact moment, the electrical charge on the outside of the ovum changes and the remaining sperm fall off.<sup>9</sup>
2. This is the beginning of life, called fertilization or conception.
3. 23 chromosomes from the woman join 23 chromosomes from the man to form a zygote.
4. A unique individual: hair, eye color, and even certain personality traits are established at conception. The DNA of this zygote contains the genetic blueprint for every cell and organ. Given time, safety, and nutrients, these cells will quickly morph into recognizable form.

## II. Biblical Personhood<sup>10</sup>

A. Scientifically, there is no question the fertilized egg is alive. There is no question that this fertilized egg will ever be anything but human (i.e. it will not grow into a dog).

B. The fertilized egg just needs time and food for maturation.

C. "It's alive, but is it human?"

1. God's Word provides a definitive answer to this question:

*"Then God said, "Let us make mankind in **our image**, in our likeness, so that they may rule over the fish in the sea and the birds in the sky, over the livestock and all the wild animals, and over all the creatures that move along the ground."—**Genesis 1:26***

2. **Isaiah 46:3** explains that God recognizes us from conception.

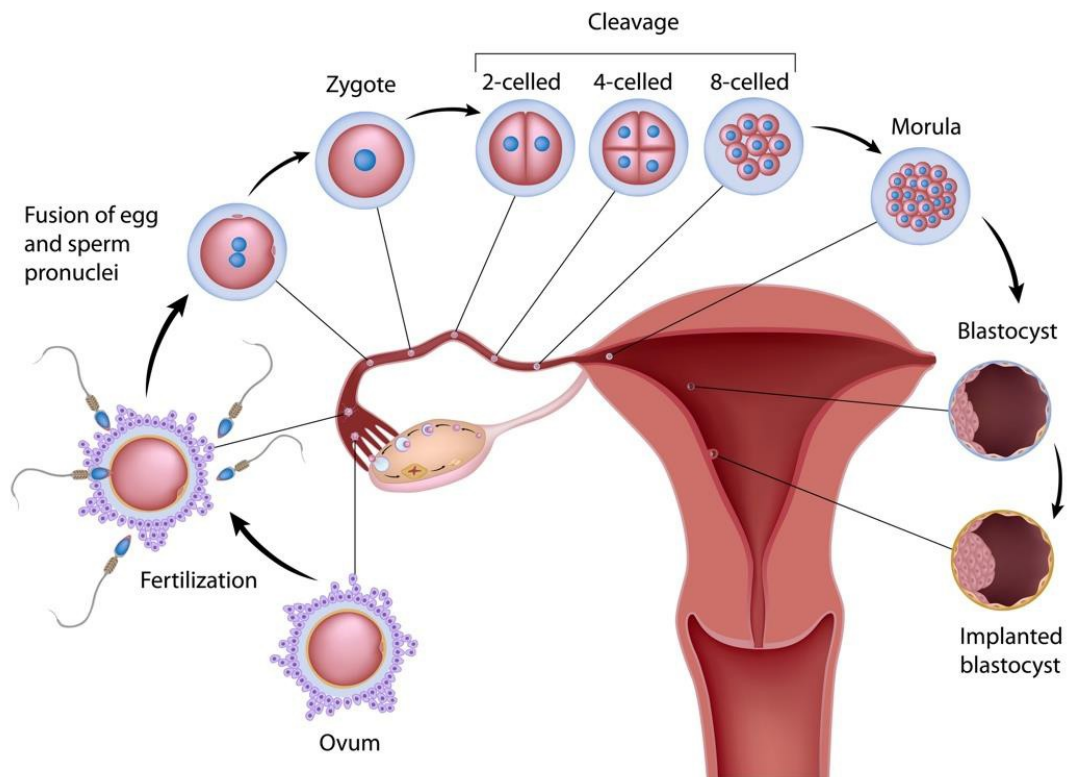
3. **Jeremiah 1:5** states that He knew us **before** we were formed.

4. **Psalm 139:13-16** states that God created us in the womb and recognized our unformed bodies

5. **Isaiah 49:1** states that God called us before we were born

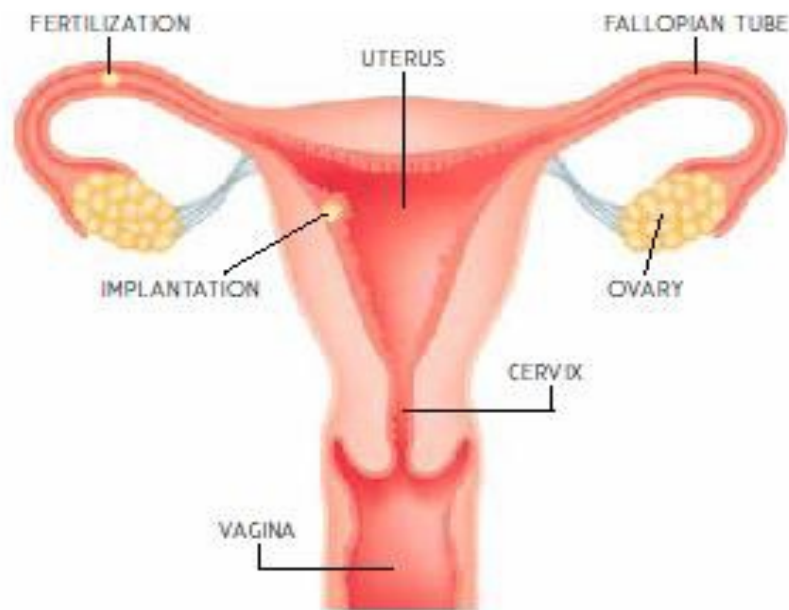
6. Clearly, the tiny status of the zygote does not diminish its inherent God-ordained value.

### III. The First Week of Life<sup>11,12,13</sup>



- A. The tiny human (fertilized egg or zygote) travels down the fallopian tube. Cleavage takes place, which is simply cell division.
- B. It is about a **3-day** journey for the fertilized egg from the fallopian tube to the uterus.
- C. From this point, it takes approximately **3 more days** for the process of **implantation** to take place.
- D. Most of the clients you will see will be at least 3 weeks post conception by the time they come in for a pregnancy test.

# female reproductive system



## E. Implantation

1. Implantation takes place about 1 week after conception (about 3 days after reaching the uterus).
2. Not too long ago, conception was commonly defined as the beginning of life. Today, some in the medical community maintain that pregnancy does not begin until the fertilized egg implants in the uterus. However, the scientific reality is that at the moment the sperm and egg unite, a unique new life has formed.<sup>14</sup>
3. This is a critical distinction to firmly grasp. It is the foundation for a proper understanding of how certain medications, procedures and devices interrupt pregnancy and the continued development of a human life.
4. hCG (Human Chorionic Gonadotropin) production begins. This is found in the woman's blood and urine and is the basis for pregnancy tests.<sup>15</sup>

5. At this stage in development, the fertilized egg is now considered an embryo.
6. It may help clients connect with the personhood of their unborn baby by sharing God's perspective on the preciousness of life, beginning with hers. So many pregnancy center clients do not have a sense of their own inherent value. A core value of pregnancy center work is approaching each person with compassion and respect. When a client feels accepted, she is in a better position to accept her unborn baby.

#### IV. **Pregnancy Dating**<sup>16,17</sup>

- A. Menstrual dating relies on the first day of a woman's **last menstrual period (LMP)**, (the first day of bleeding) to provide an estimated gestational age and estimated due date.
- B. Few women know when they conceived, but most know when their menses occurred, the LMP becomes a useful starting point from which to date a pregnancy.
- C. Recall that ovulation does not begin until about 2 weeks after the start of a woman's menstrual period. Ovulation must take place before conception can occur.
- D. Therefore, a pregnancy that is estimated to be 8 weeks based upon the LMP, has only been in existence for approximately 6 weeks.
- E. Coaches need to be able to clarify this information, to avoid the appearance of deception by implying that a client is further along than she really is.

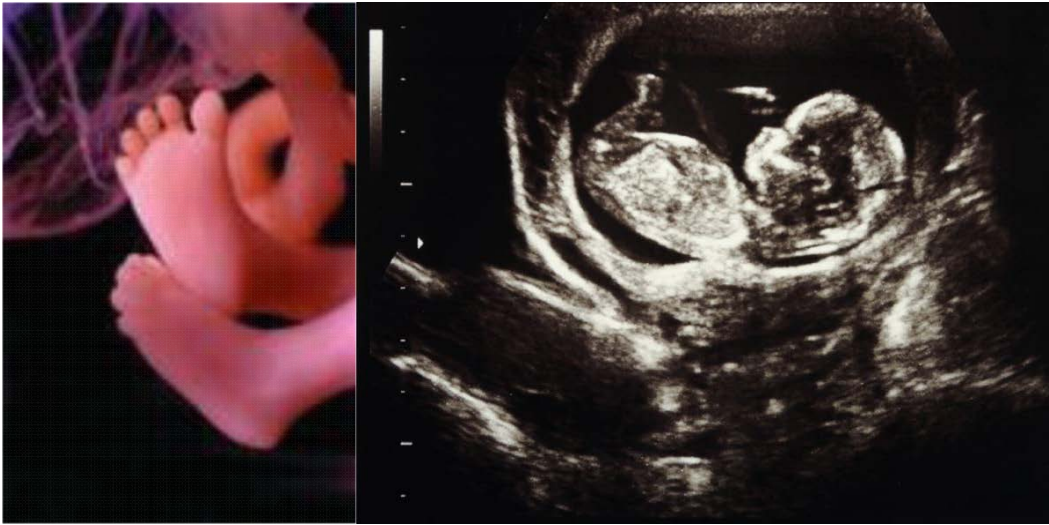
## V. The First Trimester of Fetal Development<sup>18,19,20,21,22</sup>

- A. At 2 weeks after implantation (3 wks from conception), the embryo's heart first begins beating (5 weeks LMP). This is about the time a woman realizes she missed her period.
  
- B. At 4-5 weeks from conception (or 6-7 weeks after a woman's last menstrual period), the embryo's heart has been beating for two weeks.
  - 1. The embryo is approximately one quarter of an inch long.
  - 2. Limb buds appear on the sides of the body and kidneys appear.
  - 3. An ultrasound done at this point will reveal the "diamond on the ring" appearance of the embryo next to the yolk sac and will demonstrate the baby's heart beating.
  
- C. At 7 weeks after conception (or 9 weeks after a woman's last menstrual period), the embryo demonstrates total body movements.
  - 1. The embryo's bones have begun to harden and she has distinct fingers.
  - 2. Unborn babies at this stage can kick and have hiccups.
  - 3. Remarkably, female babies at this stage have ovaries.
  - 4. Primitive brain waves can also be detected in the embryo's developing brain.
  - 5. The embryo is approximately three quarters of an inch in length.



- D.** At 8 weeks after conception (or 10 weeks after the woman's last menstrual period), the embryo is officially known as a **fetus** from now until birth. The baby becomes much more physically active, moving his entire body and limbs. This tiny person can grasp things, open his mouth, swallow, sigh, suck his thumb, and stretch. He will squint when lightly touched. He is now approximately one and one-half (1 ½) inches in length.
1. All the major organ systems are in place and are functioning.
  2. 75% of babies at this point demonstrate right hand dominance.
  3. The fetus can roll over.
  4. Male fetuses produce testosterone at this point.
- E.** At 9 weeks after conception (or 11 weeks after the woman's last menstrual period), the fetus can swallow.
1. The baby can swallow, grasp things, suck his/her thumb, sigh, and stretch.
  2. The fetus's kidneys are working and producing urine.
  3. The fetus can sense light touch on the face, palms, and soles.
- F.** At 10 weeks after conception (or 12 weeks after the woman's last menstrual period), the fetus has fingernails and fingerprints.
1. The baby's body weight has increased by 75% in just one week.
  2. The fetus has fingerprints and fingernails.
- G.** At 11 weeks after conception (or 13 weeks after the woman's last menstrual period), the fetus is 2 ½ inches long.
1. The fetus's external genitalia have developed sufficiently enough to determine gender on direct inspection, but not via ultrasound.

2. The fetus has fully-formed fingers and toes.



- H. At 12 weeks after conception (or 14 weeks after the woman’s last menstrual period) it is customary to begin speaking about being “three months pregnant” instead of 12 weeks, although obstetricians will continue to refer to weeks during prenatal visits.
  1. The baby now has **taste buds** and is beginning to have bowel movements.
  2. If the baby’s face is touched, he or she will turn towards the touch and open his or her mouth. This is called the **rooting reflex**, which helps the newborn locate the mother’s breast for nursing.
  3. The fetus’s teeth are forming.
  4. Interestingly, female babies are noted to exhibit more jaw motion than their male counterparts at this gestational age.
- I. First Trimester Developmental Milestones Summarized (Dating from conception):
  1. Day 1 (fertilization)—The baby’s features, including sex, hair, and eye color are determined.
  2. Day 7—Implantation; now called embryo
  3. Day 21—Human heartbeat starts.

4. 4 weeks—Amniotic fluid develops; limb buds
5. 5 weeks—Hand plates
6. 6 weeks—Spontaneous and reflexive movements; nipples; elbows
7. 7 Weeks—Hiccups, bones hardening, brain waves; fingers; ovaries in females
8. 8 weeks—Now a fetus; 75% right handed; can roll over; eyebrows; testosterone in males.
9. 9 Weeks—Sucks thumb; face, palms and soles sense light touch
10. 10 Weeks—Fingernails and fingerprints
11. 11 Weeks—Gender on direct inspection
12. 12 weeks—Taste buds; bowel movements; females move jaws more; end of 1st trimester

## VI. The Second Trimester of Fetal Development<sup>23,24,25</sup>

- A. At 15-16 weeks after conception (about 4 months), the baby's gender can be seen on the ultrasound. Most ultrasounds to determine gender are given around 18-20 weeks.
  
- B. At this point, placing a needle into the baby's abdomen causes the release of **adrenalin**, a stress hormone. Establishing when an unborn baby can first experience pain is a matter of considerable controversy. Developing babies within the uterus will respond to painful stimuli, but their ability to actually be aware of pain cognitively is debated.
  1. Some argue that the cerebral hemispheres of the brain and necessary connections to them are not sufficiently developed until the third trimester for the unborn baby to truly be aware of pain, even though his body may reflexively react to unpleasant stimuli.

2. Others maintain that fetuses have other processes in place beginning in the second trimester that could allow them to not only react to pain, but to have an awareness on a different level that could lead to long term developmental problems. Even in adults, pain perception is possible without the involvement of the cerebral cortex, which undermines the rationale that fetuses must have an adequately developed cerebral cortex to feel pain.
  3. There is substantial evidence that an unborn child is capable of experiencing pain by 20 weeks after fertilization. Apart from scientifically determining the precise gestational age that an unborn baby is capable of experiencing pain, some recognize a moral and ethical duty to err on the side of caution and to provide adequate pain control during any procedure or surgery performed on these individuals. Some states have adopted legislation that requires the administration of anesthesia prior to abortions done after 20 weeks gestation.
  4. **Since no clear-cut boundary or gestational age has been firmly established at which a fetus is expected to be able to experience pain, caution needs to be exercised by the pregnancy center in sharing information on this topic.**
  5. For the client who is considering an abortion (especially in the second trimester), it may be reasonable to say, "It is not known exactly at what point a developing unborn baby can first perceive pain; however, there is evidence supporting this. If this is of concern to you, consider discussing this further with your physician or pastor." This issue is too complex to adequately cover in this context; interested readers are encouraged to seek out additional information.<sup>26,27,28</sup>
- C. At 5 ½ months (or 22 weeks after the woman's last menstrual period), the pregnancy is now more than half way completed.

1. Some babies born at this stage can survive, as the lungs are now able to breathe air. Babies in the womb receive oxygen from their mother's bloodstream through the placenta; they do not need to breathe air until they are born.
2. Some babies will have hair on their heads at this age.
3. At this stage, the inner ear is developing and the baby is especially attuned to the mother's voice.

**D. Second Trimester Developmental Milestones Summarized (Dating from conception):**

1. 15 weeks—Bone marrow growing; quickening; gender on ultrasound
2. 20 weeks—Inner ear fully developed; hair on head
3. 21-22 Weeks—Potential to survive outside womb if born
4. 24 weeks—Blink-startle response

## **VII. The Third Trimester of Fetal Development**<sup>29,30,31,32</sup>

- A.** The third trimester is a time characterized by rapid brain growth, requiring half of the baby's energy output. His or her eyes are forming tears now. He or she will swallow a lot more if a sweet substance is put in the amniotic fluid and make faces if a bitter liquid is introduced. Whatever her mom eats will affect the baby's food preferences after birth.
- B.** At 25 weeks after conception (27 weeks after the woman's last menstrual period), the baby produces tears and can do somersaults.
- C.** At 29 weeks after conception (31 weeks after the woman's last menstrual period), the baby has a well-developed inner ear and can distinguish high and low pitch sounds.

- D.** At 32-36 weeks after conception (34-38 weeks after the woman's last menstrual period), the baby develops flavor preferences based upon what mom eats.
- E.** Coaches may use fetal models to help clients better understand their baby's developmental stage, particularly early on, when a woman cannot feel anything yet. (With her first pregnancy, a woman can usually first feel her baby around 18-20 LMP and earlier than that with her subsequent pregnancies).
- 1.** Clients are often surprised to see and hold these fetal models. The models help women gain a greater understanding of what is going on inside their bodies. They serve as a reality check for a process that is hidden and can seem unreal to expectant parents.
  - 2.** As with all educational tools used in a pregnancy center, it is important to ask the client's permission before showing her the models.
  - 3.** Fetal development and maternal growth sheets are also beneficial to have available because the client may take it with her as a resource for tracking her pregnancy.
    - Tear off sheets may be obtained through "Childbirth Graphics" at [www.childbirthgraphics.com](http://www.childbirthgraphics.com).

## **VIII. Birth<sup>33</sup>**

- A.** In a process not yet fully understood, the baby plays a significant role in initiating labor.
- B.** Labor occurs in three phases/stages:
- 1.** Cervical dilation from closed to 10 cm
  - 2.** Pushing the baby out of the birth canal

3. Delivery of the placenta

C. There are few human events more meaningful and life-changing as the birth of a baby.

## **IX. Ultrasounds in the Pregnancy Resource Center<sup>34</sup>**

### **A. Why do ultrasounds?**

1. To reach more abortion-vulnerable clients
2. To empower women with information vital to their decision
3. To help women see what's going on in their bodies
4. To help women understand that their baby is not just a 'blob of tissue', but a marvelous developing human
5. More women choose life after seeing their baby on ultrasound.
6. Increased opportunities to provide life-affirming education and evangelistic outreach

### **B. 5 General Rules of Practice**

1. The ultrasound should be performed under supervision of qualified, licensed physician.

2. The ultrasound should be performed by trained medical personnel.
3. The ultrasound should be performed under appropriate licensure & liability coverage.
4. The ultrasound should be performed in accordance with existing standards of care.
5. The ultrasound should be performed using equipment that meets standards of practice.

### **C. Staffing**

#### **1. Nurse Manager:**

- Paid staff
- Runs the medical services under the physician
- Performs sonograms
- One option is to begin as part-time staff (ex. 20 hours/week)

#### **2. Medical Doctor:**

- Usually a volunteer
- His/her license is the bases of all medical services

### **D. Licensing**

1. Performing sonograms is the practice of medicine.
2. Pregnancy is diagnosed.

3. In most states, pregnancy resource centers operate under physician with active license (Exceptions: CA, NY, NJ, CT and MA).
4. Check the laws in your state!

#### **E. Policies and Procedures**

1. OSHA: Occupational Safety and Health Administration
2. CLIA: Clinical Laboratory Improvement Act
3. ADA: Americans with Disabilities Act
4. HIPAA: Health Insurance Portability and Accountability Act

#### **F. Limited Obstetrical (OB) Ultrasound**

1. Refer to AIUM (American Institute of Ultrasound Medicine) Guidelines<sup>35</sup>
2. Types of OB ultrasounds:
  - First trimester exam
  - Standard 2<sup>nd</sup> or 3<sup>rd</sup> trimester exam
  - Limited exam
  - Specialized exam

3. Limited OB ultrasound exam:

“A limited examination is performed when a specific question requires investigation. For example, a limited examination could be performed to confirm fetal heart activity in a bleeding patient or to verify fetal presentation in a laboring patient. In most cases, limited sonographic examinations are appropriate only when a prior complete examination is on record.”<sup>36</sup>

4. Limited OB Ultrasounds are diagnostic and should be performed by a trained and licensed professional.
5. Perform scans **for clear medical indications**. Stepping outside these indications moves into the realm of prenatal care or recreational scanning.
6. Indications for a Limited OB Ultrasound:
  - Confirmation of pregnancy
  - Diagnose intrauterine pregnancy
  - Diagnose fetal viability
  - Determine the estimated gestational age
7. How early in the pregnancy should scans be performed?
  - At risk for abortion: 6-7 weeks LMP
  - Likely to carry: 9-10 weeks LMP
  - Crisis pregnancy centers should generally avoid doing an ultrasound less than 6 weeks after the woman's last menstrual period because they run the risk of it being too early to confirm a living baby, leaving the client with the impression that "there's nothing there but a blob of tissue."
  - In some circumstances, doing an ultrasound this early may be worth the risk so that the client has an opportunity to connect with the nurse and perhaps gain a new perspective from their interaction. Clients respond differently to medical staff and will often disclose more personal information and place more emphasis on the information they receive from medical professionals.

## **X. The Ultrasound Visit<sup>37</sup>**

### **A. The Pregnancy Test**

## **B. The Consent Form**

## **C. The Ultrasound Appointment**

1. Duration: the entire sonogram visit from consent, to history, to the scan and post scan discussion will last 30-60 minutes.
2. Client Advocate present: she attends to the client's emotional well-being and acts as a chaperone for the medical professional
3. Consent form: witnessed by the client advocate

## **D. In the Exam Room**

1. Physical exam: Be prepared to respond to abnormal findings from any assessment.
2. Blood pressure: centers may opt to obtain this measurement as it is an important health screen for all people, but especially pregnant women.
3. Only the Client Advocate is present initially.

## **E. The Ultrasound Exam**

1. Use warmed gel
2. Always start with trans-abdominal scan: it helps ease the patient into the exam, allows for quick discovery of later gestations or twins and it gives an important overview to the entire pelvis.
3. Explain every step of the way and ask permission if she would like to look at the screen or not. Some abortion-minded women prefer not to, and should not be pressured.

4. Patient sees sonogram herself before her partner/support person comes in. If there is an unexpected finding, it is best to handle that one-on-one with the client before bringing anyone else into the picture. The Sonographer in charge of how many people are in the room.
5. Client Advocate/Coach plays an integral role as attendant and chaperone.
6. The Sonographer's role:
  - Completely in charge of this portion of the client visit
  - Uses life-affirming language
  - Avoids 'medical speak' that is not easily understood by the client
  - Is the ONLY one in the room who may comment on the ultrasound exam; this is a medical-legal issue
7. The Client Advocate's role:
  - Mainly nonverbal; attendant and chaperone
  - Focus remains on the client and how she is experiencing the ultrasound
  - Closely observes patient's reactions and provides appropriate support. She may ask, "Are you doing okay?"
  - Provides supportive words and actions (may get a tissue, for example)
  - Observes the partner's response
  - Refrains from any comments about the baby's appearance on ultrasound

#### **F. Post-ultrasound Counseling**

1. Review images of the baby; photo-print image of baby offered to client (image should include client's name, date, but avoid including measurements or placing descriptors)

2. Provide dates/measurements: each center should determine their policy on providing this information (verbally and/or in written form)
3. Review fetal development: fetal models, “tear-off” sheets that summarize fetal growth stages, DVD clips with fetoscopy images are particularly powerful
4. The client is the main focus, but address her partner as well

## **XI. 4D Ultrasound Video Clip**

## **XII. Real Life Stories**

**A. Maria:** \_\_\_\_\_  
\_\_\_\_\_

**B. Crystal:** \_\_\_\_\_  
\_\_\_\_\_

1. When a client chooses abortion, grieve with her. Sometimes pregnancy center work means that you are the only one who will stand in the gap for that baby and that woman and grieve the loss.
2. Debrief and talk as a staff. Remember why you are there—you are called by God to be in this ministry. He equips the called; he doesn’t call the equipped. He will provide. He will make a way for us to grieve those losses and walk with clients through those difficult times.

**C. Unexpected Client:** \_\_\_\_\_  
\_\_\_\_\_

## Endnotes

<sup>1</sup>American Pregnancy Association, "Fetal Development: First Trimester." Last modified, 2007. Accessed September 17, 2012, <http://www.americanpregnancy.org/duringpregnancy/fetaldevelopment1.htm>

<sup>2</sup>National Geographic, "The Biology of Prenatal Development," 2006, DVD.

<sup>3</sup>Steven Gabbe, *Obstetrics: Normal and Problem Pregnancies*, Sec.2, Chap. 8, "Drugs and Environmental Agents in Pregnancy and Lactation: Embryology, Teratology, Epidemiology" (Amsterdam: Saunders, an imprint of Elsevier, 2012).

<sup>4</sup>Gretchen Lentz et al., *Comprehensive Gynecology*, 6th edition, Pt. I, Chap. 1, "Fertilization and Embryogenesis" (Amsterdam: Mosby, an imprint of Elsevier, 2012).

<sup>5</sup>American Life League, "Baby Steps: 16 Stages of Pre-birth Development," 2009, DVD.

<sup>6</sup>American Pregnancy Association, "Determining Your Fertility Window." Last modified, 2011. Accessed September 16, 2012, <http://www.americanpregnancy.org/gettingpregnant/PEFertilityWindow.html>

<sup>7</sup>Ibid.

<sup>8</sup>Fred Ferri, *Ferri's Clinical Advisor*, 1st Ed., Chap. 4., "Semen Analysis" (Amsterdam: Mosby, an imprint of Elsevier, 2012).

<sup>9</sup>National Geographic, "The Biology of Prenatal Development," 2006, DVD.

<sup>10</sup>*Ryrie Study Bible New International Version* (Chicago: Moody Press).

<sup>11</sup>Steven Gabbe, *Obstetrics: Normal and Problem Pregnancies*, Sec.2, Chap. 8, "Drugs and Environmental Agents in Pregnancy and Lactation: Embryology, Teratology, Epidemiology" (Amsterdam: Saunders, an imprint of Elsevier, 2012).

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<sup>13</sup>K.L. Moore, *The Developing Human: Clinically Oriented Embryology*, 7th Ed. (Philadelphia: W.B. Saunders, 2003).

<sup>14</sup>American Congress of Obstetricians and Gynecologists, "ACOG Statement on 'Personhood' Measures." Last modified, 2012. Accessed September 16, 2012, [http://www.acog.org/About\\_ACOG/News\\_Room/News\\_Releases/2012/Personhood\\_Measures](http://www.acog.org/About_ACOG/News_Room/News_Releases/2012/Personhood_Measures)

<sup>15</sup>Robert Kliegman et al., *Nelson Textbook of Pediatrics*, 19th Ed. (Amsterdam: Saunders, an imprint of Elsevier, 2011).

<sup>16</sup>American Pregnancy Association, "Calculating Your Dates: Gestation, Conception and Due Date." Last modified, 2012. Accessed September 17, 2012, <http://www.americanpregnancy.org/duringpregnancy/calculatingdates.html>

<sup>17</sup>Steven Gabbe, *Obstetrics: Normal and Problem Pregnancies*, Sec.2, Chap. 6, "Assessment of Gestational Age" (Amsterdam: Saunders, an imprint of Elsevier, 2012).

<sup>18</sup>Gretchen Lentz et al., *Comprehensive Gynecology*, 6th edition, Pt. I, Chap. 1, "Fertilization and Embryogenesis" (Amsterdam: Mosby, an imprint of Elsevier, 2012).

<sup>19</sup>American Congress of Obstetricians and Gynecologists, "ACOG Patient Education Pamphlet 156: How your baby grows during pregnancy." Last modified, 2010. Accessed September 17, 2012, [http://www.acog.org/Resources\\_And\\_Publications/Patient\\_Education\\_Pamphlets/Files/How\\_Your\\_Baby\\_Grows\\_During\\_Pregnancy](http://www.acog.org/Resources_And_Publications/Patient_Education_Pamphlets/Files/How_Your_Baby_Grows_During_Pregnancy)

<sup>20</sup>Steven Gabbe, *Obstetrics: Normal and Problem Pregnancies*, Sec.2, Chap. 8, "Drugs and Environmental Agents in Pregnancy and Lactation: Embryology, Teratology, Epidemiology" (Amsterdam: Saunders, an imprint of Elsevier, 2012).

<sup>21</sup>National Geographic, "The Biology of Prenatal Development," 2006, DVD.

<sup>22</sup>American Life League, "Baby Steps: 16 Stages of Pre-birth Development," 2009, DVD.

<sup>23</sup>National Geographic, "The Biology of Prenatal Development," 2006, DVD.

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<sup>25</sup>American Pregnancy Association , "Fetal development: Second trimester." Last modified, 2007. Accessed September 17, 2012, <http://www.americanpregnancy.org/duringpregnancy/fetaldevelopment2>

<sup>26</sup>C. Lowery, "Neuro-developmental Changes of Fetal Pain," *Seminars in Perinatology* 31 (2007): 275-282.

<sup>27</sup>S.A. Lee, "Fetal Pain: A Systematic Multidisciplinary Review of the Evidence," *JAMA* 294, no. 8 (2005): 947-954.

<sup>28</sup>Doctors on Fetal Pain, "Fetal Pain: The Evidence." Last modified, 2012. Accessed September 17, 2012, <http://www.doctorsonfetalpain.com/fetal-pain-the-evidence/>

<sup>29</sup>American Pregnancy Association , "Fetal development: Third Trimester." Last modified, 2007. Accessed September 17, 2012, <http://www.americanpregnancy.org/duringpregnancy/fetaldevelopment3.htm>

<sup>30</sup>American College of Obstetricians and Gynecologists, *How Your Baby Grows During Pregnancy*, Patient Education Pamphlet (AP156 Ed.), 2011.

<sup>31</sup> National Geographic, "The Biology of Prenatal Development," 2006, DVD.

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<sup>35</sup>American Institute of Ultrasound in Medicine, "AIUM Practice Guideline for the Performance of Obstetric Ultrasound Examinations," Effective October 1, 2007, Accessed October 1, 2012, <http://www.aium.org/resources/guidelines/obstetric.pdf>

<sup>36</sup>Ibid.

<sup>37</sup>Care Net and Heartbeat International, *Medical Perspectives: A Manual for Pregnancy Centers*, available at <http://www.heartbeatinternational.org/resources/medical>