Fetal Development

Day 1: Fertilization (Conception)

- DNA from the father's sperm combines with DNA from the mother's ova. The embryo is already genetically male or female, and a completely unique individual. All human chromosomes are present; unique human life begins. (11.)

- The single-celled fertilized egg begins growing by dividing into two cells. One of these cells will form the embryo's body and internal organs. The other cell will form the external organs that the embryo will need to survive in the womb; the amniotic sac and chorion (the blood vessels that will later make up the placenta). (4.)

6 to 9 Days

- The embryo implants in his or her mother's uterus. (11.)

2 Weeks

- The embryo grows his or her first brain cells. (11.)

- The embryo's body is divided into three layers. The outer layer of cells in called the ectoderm, and will develop into the outer layer of the skin and the nervous system. The middle cells, or mesoderm, develops blood, bone, cartilage, and muscle. The endoderm, the inner layer, develops eventually into mucus membranes and glands. (8.)

3 Weeks

- The embryo's heart is beating, though it has only one chamber. Throughout his or her development, the embryo's body is fully functional, though the organs are still developing and incomplete. (1.)

- By the end of third week the child’s backbone spinal column and nervous system are forming. The liver, kidneys and intestines begin to take shape.

- The embryo has a separate brain and spine. His or her brain is divided in three segments; the forebrain, midbrain, and hindbrain. (7.,12.)

- The placenta is forming. (5.)

- Limb buds, the beginnings of arms and legs, are forming. (6.)

4 Weeks

- By the end of week four the child is ten thousand times larger than the fertilized egg.

- Circulation to and from the placenta begins. The placenta is a very special, amazing organ that connections your circulatory system with your embryo's. It is made up of the chorion (the embryo's blood vessels) implanted in the endometrium (the lining of the your uterus). The placenta is so important to the embryo that it was being prepared almost as soon as he or she was conceived. (4.) The placenta works like your lungs, your digestive system, and your kidneys work, all at once. (5.) Your body shelters your embryo, and your blood makes nutrients and oxygen available to him or her, but your blood and your baby's can never mix. (11.) So your lungs, your digestive system, and your kidneys can't take care of your embryo's body -- he or she has to do that independently, through the placenta.

  > The placenta filters oxygen out of your blood into your baby's, just the way your lungs take oxygen out of the air and into your blood. It also gathers nutrition for the embryo, the same way your digestive system gathers nutrition from the food you eat. And lastly, the placenta sifts waste out of the embryo's blood, like your kidneys take waste out of your blood (5., 11.). Soon the embryo's own kidneys will begin to function, and share this work with the placenta. (3.)

- The embryo has hands with ridges that will grow into fingers, and two-segmented arms. (6.)

- The embryo has feet, thighs, and calves. (6.)

- Internal organs are growing. The tongue, esophagus and stomach are well developed, as are the kidneys. The embryo's liver, gall bladder, and pancreas have been developing for several days. Lungs begin to develop. Her thyroid and other glands are forming. (13.)

- The embryo's face and sensory organs are forming. He or she has eyes, including a retina that already has color (3.), as well as ears, a nose, and mouth. (3., 6., 11.)

- Reproductive organs are beginning to form. (11.)

5 Weeks

- Eyes, legs, and hands begin to develop.

- The brain divides into more specialized segments. The forebrain develops into two distinct sections, called the telencephalon and the diencephalon. The telecephalon is the primitive cerebrum, the 'thinking' part of the brain. The cerebrum is responsible for sensory perception, memory, learning, and conscious thought. The diecephalon develops into the thalumus and the hypothalumus, the 'feeling' part of the brain. The thalamus serves as a relay station between the senses and the brain. The hypothalamus produces basic drives and emotions such as hunger, thirst, pleasure, and fear. The midbrain continues to develop into brain structures also necessary for processing sensory information, while the hindbrain grows towards becoming the cerebellum, medula, and pons. These parts of the brain are responsible for unconscious physical processes like blood circulation or breathing, as well as reflexes. Also, the structures of the hindbrain are necessary for muscle coordination and movement. (10.)

- At 40 days, about five days after he or she turned 5 weeks old, the embryo's brain waves can be detected by an electroencephalogram. (9.)

- The embryo has a palate (inside of the mouth and tongue), completely with tiny tooth buds (13.)

- His or her face is nearly finished forming and looks reasonably human, though lacking the muscles needed for facial expressions like smiling or frowning. (11., 13.)

- The embryo begins to move. These early movements are important to the development of healthy muscles. (3.)

6 Weeks

- Dr. Harley Smyth, a neurologist, testified before the Canadian Supreme Court that "at 6 weeks there is the possibility of recording electrical activity from the nervous system already so highly organized that it can subserve . . . purposeful and even co-ordinated movements." (2.)

- The embryo looks like a baby in miniature, though his or her head is still very large compared to the rest of the body, because the brain is growing so quickly. (11.)

- The embryo's face and lips are sensitive to touch. (1.)

- The embryo has distinct fingers. (3.)

7 Weeks

- All the embryo's organs and organ systems have been developed, though they are still immature and need time to finish growing. Several organ systems, including the circulatory system (heart) and nervous system (brain) are already functioning. (13.)

- The embryo has distinct toes. (11.)

- Eyelids, and toes form, nose distinct. The baby is kicking and swimming.

8 Weeks

- The unborn baby is now called a “fetus” because he or she has finished with the process of organogenesis (the creation of new organs). (11.) Fetus means "young one" in Latin. Every organ is in place, bones begin to replace cartilage, and fingerprints begin to form. By the 8th week the baby can begin to hear. (3.)

- The fetus's genital area is sensitive to touch. (1.)

- Eyelids begin to form. (11.)

9 to 10 Weeks

- Teeth begin to form, fingernails develop. The baby can turn his head, and frown. The baby can hiccup.

- The fetus touches his or her own face and sucks his or her thumb, and makes breathing and swallowing motions. (3.)

- The palms of the fetus's hands and the soles of his or her feet are sensitive to touch. (1.)

- The sense of smell begins to develop. (1.)
- The fetus urinates and experiences hiccups. (3.)
- He or she is moving almost constantly, and can step, kick, somersault, stretch, and move his or her arms. (3.)
- The baby can “breathe” amniotic fluid and urinate.

11 to 13 Weeks

- The baby can grasp objects placed in its hand; all organ systems are functioning. The baby has a skeletal structure, nerves, and circulation.
- The fetus's bone marrow begins to produce white blood cells. (11.)
- The baby has all the parts necessary to experience pain, including nerves, spinal cord, and thalamus. Vocal cords are complete. The baby can suck its thumb.
- The fetus's external reproductive organs are visibly male or female; prior to this month, the penis and clitoris looked too similar to tell apart at a glance. (3.)
- The inner parts of the ear are formed, and the fetus may be able to hear. (3.)
- The bones undergo "ossification" -- they become hard, like an adults bones, whereas they had previously been soft. (11.)
- The sense of taste develops. (1.)
- The fetus's face continues to mature, and by the end of the 3rd month, each baby has unique, individual facial features. (3.)

14 Weeks

- It can be scientifically demonstrated that the fetus hears and reacts to sound. (1.)
- At this age, the heart pumps several quarts of blood through the body every day.
- Fetuses display individual personality. When a needle for amniocentesis (a method of prenatal testing for genetic anomalies) is introduced into the uterus, the fetus will react. Different fetuses react differently to this experience. Some kick or punch at the needle, some grab it, some shy away. (1.)
- The fetus can experience pleasure and happiness or displeasure and fear. Male fetuses of this age sometimes have erections while sucking their thumbs; the baby boy's body reacts to his enjoyment of sucking his thumb. Fetuses at this age are also startled, and their heart rates increased, by loud unpleasant noises. (1.)
- You, the mother, may first feel your baby kicking. He or she is finally strong .

15 to 16 Weeks

- The fetus's entire torso is sensitive to touch. (1.)
- The baby has an adult's taste buds.
- The fetus's nerves are being coated with a fatty substance called myelin. Myelin makes faster nerve transmissions possible and insulates the nerves so that impulses can be sent over longer distances. (14.)
- The fetus has fingerprints. (14.)
- Bone Marrow is now beginning to form. The heart is pumping 25 quarts of blood a day. By the end of month 4 the baby will be 8-10 inches in length and will be one half of its birth weight.

17 Weeks

- The baby can have dream (REM) sleep.

19 Weeks

- This is the youngest that any baby has been born and survived. Babies born this young may have problems with infections, since their immune systems are still immature, and may have trouble breathing. They may also suffer from developmental problems later in life.

20 Weeks

- The earliest stage at which Partial birth abortions are performed.
- At 20 weeks the baby recognizes its' mothers voice.

21 Weeks

- Babies can routinely be saved at 21 to 22 weeks after fertilization, and sometimes they can be saved even younger.

24 Weeks

- This is the age at which the law considers a baby "viable", or able to survive outside the womb. This is a legal distinction, not a medical one. Babies born younger than 24 weeks may survive.
- The baby practices breathing by inhaling amniotic fluid into its developing lungs. The baby will grasp at the umbilical cord when it feels it. Most mothers feel an increase in movement, kicking, and hiccups from the baby. Oil and sweat glands are now functioning. The baby is now twelve inches long or more, and weighs up to one and a half pounds.

29 weeks

- Months 7 through 9: Eyeteeth are present. The baby opens and closes his eyes. The baby is using four of the five senses (vision, hearing, taste, and touch.) He knows the difference between waking and sleeping, and can relate to the moods of the mother. The baby's skin begins to thicken, and a layer of fat is produced and stored beneath the skin. Antibodies are built up, and the baby's heart begins to pump 300 gallons of blood per day. Approximately one week before the birth the baby stops growing, and "drops" usually head down into the pelvic cavity.

38 Weeks

- This is the age at which a baby should, ideally, be born. At 38 weeks the baby's lungs are fully functional and his or her immune system is ready for the outside world.

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