

Pregnancy :

38 week process....embryonic stem cells differentiate into 3 germ layers....giving rise to all body tissues and organs.

3 trimesters....

1. **First 12 weeks / 3 months... 10 cm fetus**
Limbs, eyes, spine
First bone cells about 8 weeks in
All major organs started by week 12
2. **13 - 24 weeks / 4 - 6th month... 30 cm fetus**
Heart beating, gender determined,
rapid nervous system development,
skeleton and muscles forming....slight movement
3. **25 - 38 weeks / 7 to 9th month... 52 cm fetus**
Lots of growth (1 lb / month),
movement, immune system started,
brain development, eyes open

The Placenta and Umbilical Cord :

Nourishment and oxygen diffuse from moms blood supply in her endometrium, crosses the placenta, and through the umbilical cord into the fetus. Fetal CO₂ and other wastes travel in the opposite direction.

Maternal blood and fetal blood DO NOT mix !

Placenta :

- formed from cells of the chorion membrane, which in turn came from trophoblast cells.
- develops a network of “chorionic villi”, which grow into the endometrium, anchoring the fetus and provides surface area for diffusion.
- fully formed by week 10...it makes progesterone and estrogen to prevent ovulation and / or menstruation

Teratogens :

Anything that causes a structural abnormality in the fetus upon exposure.

Things in mom's body or in her environment can affect the fetus in harmful ways....especially in weeks 1 to 9 !!

Mom doesn't know she's pregnant for part of that time !!!

Ex. **Cigarette smoke** : constricts moms blood vessels leading to the placenta, depriving the fetus of some oxygen, nutrition, and makes removing wastes more difficult. Babies are born lighter, often prematurely, or suffer convulsions. Higher rate of respiratory issues.

Alcohol : affects the development of the CNS, causing some degree of FASD. Smaller, sometimes shorter babies with smaller heads and brains. Facial characteristics change, mental disabilities, unusually aggressive and sometimes personality disorders.

Difficulty with higher order thinking and linking actions to consequences.

Prescription drugs : many are potential teratogens, lessons learned from thalidomide use in the 50s and 60s.

Radiation

Heavy metal pollutants...PCB's, Hg, Pb

Birth Process :

Estrogen and progesterone drop, prostaglandins and oxytocin produced. Induces uterine contractions (labour) for a vaginal birth.

Ceasaerean sections (C - sections) performed on small women, breech births, placenta previa, detaching placenta, or umbilical cord problems.

3 stages...

Dilation stage -

cervix dilates to 10 cm, uterine contractions become stronger, amniotic sac ruptures... 2 to 20 hrs

Expulsion stage -

Forceful contractions push the fetus through the cervix and vagina, fetus rotating downwards... 30 mins to 2 hrs.

Airway cleared out, breathing begins. Umbilical cord is clamped and cut. Tied off close to the abdomen.

Placental stage - (afterbirth)

Placenta detaches from the endometrium, and along with the umbilical cord, is pushed out.

Prolactin is produced in mom's AP (suppressed all along by E and P...but their levels have dropped off now)....begins lactation

colostrum fluid first (thin, yellowish, high protein, low fat), followed by milk within several days.

Suckling positively reinforces oxytocin production, contraction of mammary glands in breast tissue....milk discharged

Testing for Abnormalities....

“Karyotyping” and purpose

Amniocentesis :

Withdrawing a sample of amniotic fluid (which contains suspended fetal cells) to collect these cells, culture, and prepare a karyotype.

CVS (Chorionic Villus Sampling) :

Snipping off a piece of the chorion membrane...made of fetal cells. Culture and prepare a karyotype.

Fetoscopy :

Fiberoptic camera and light inserted inside mom, provides images of the fetus...detects structural abnormalities.

Ultrasound :

Passing high frequency sound waves through mom's abdomen to provide a picture of the fetus. Can help detect structural abnormalities, gender