

Prenatal Development

From Conception to Birth

Getting from fertilized Egg to baby.

Influences on Prenatal Development



Goals & Objectives

- Learn the facts!
- Zygote, Embryo, Fetus, oh my!
- Teratogens!
- Apply what you learn!
- The baby game!
- Evaluate



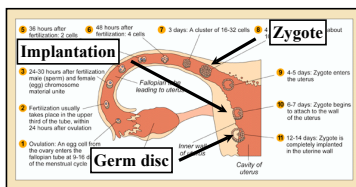
From Conception to Birth

- Period of the Zygote
- Period of the Embryo
- Period of the Fetus
- Not trimesters!!

Period of the Zygote

- Begins when egg is fertilized in the fallopian tube.
- Ends 2 weeks later when the zygote is implanted in the wall of the uterus.

The long long journey



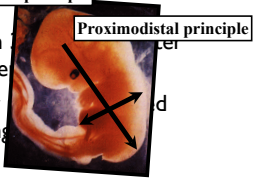
Period of the Embryo

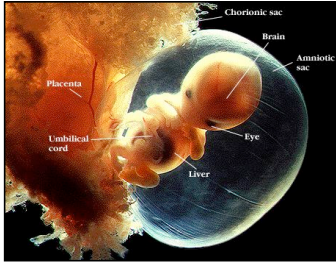
- If it sticks, it is an embryo.
- Three layers of cells
 - **Ectoderm:** hair, skin, and nervous system.
 - **Mesoderm:** muscles, bones, and circulatory system.
 - **Endoderm:** digestive system, and lungs.

Period of the Embryo

Cephalocaudal principle

- From head to tail
- Body grows during





Influences on Prenatal Development

- General Risk Factors
- Teratogens: Diseases, Drugs, and Environmental Hazards
- How Teratogens Influence Prenatal Development
- Prenatal Diagnosis and Treatment

General Risk Factors

- Nutrition
 - Increase eating by 10-20%.
 - Gain 25-30 lbs (1/3 baby, 1/3 fat, 1/3 more blood).
 - Specific tastes (pickles & ice cream)
 - Nausea (linked to teratogens)
 - Not junk food!
 - Folic acid (otherwise *spina bifida*)

General Risk Factors

- Stress
 - Can prolonged stress create problems?
 - Well, if we shock rats or overcrowd them, their kids are underweight.
 - And correlation says this is true for humans, too.

General Risk Factors

- Mother's Age
 - 40 and up: higher risk of Downs.
 - If adequate care, pregnancy can be normal from teens till late 30's.
 - But teens less likely to get adequate care.
 - And older = less likely to get pregnant.

Teratogens

- Teratogen: any substance (agent) that causes abnormal prenatal development.
 - Diseases
 - Drugs
 - Environmental Hazards

Teratogens: Diseases, Drugs, and Environmental Hazards

- Many diseases pass through the placenta directly and attack the fetus.
 - AIDS (infections, neurological disorders, death)
 - Cytomegalovirus (deafness, blindness, retardation)
 - Genital herpes (Encephalitis, enlarged spleen, improper blood clotting)
 - Rubella (Mental retardation, eyes ears and heart)
 - Syphilis (CNS damage, teeth, bones)

Teratogens: Diseases, Drugs, and Environmental Hazards

Potentially dangerous drugs (pg 86):

- Alcohol (fetal alcohol syndrome)
- Asprin (lower IQ, attention and motor skill)
- Caffeine (low birth weight, low tone: controversial)
- Cocaine (retarded growth)
- Marijuana (low birth weight, less motor control)
- Nicotine (retarded growth, cognitive impairments)

Fetal Alcohol Syndrome

Causes

- mental retardation
- learning disabilities
- serious behavioral problems.

Environmental Hazards

- Environmental hazards are treacherous because we're often unaware of their presence (pg 87).
 - Lead. (Mental retardation)
 - Mercury. (Retarded growth, cerebral palsy, mental retardation)
 - Cat litter! (Toxoplasmosis, more likely from undercooked meat)
 - X-Rays. (Retarded growth, leukemia, mental retardation): but not VDT's.
- But your body is!
 - Nausea (linked to teratogens and healthier babies)

How Teratogens Influence Development

1. Depends on the genotype.
2. Influence changes over development (Fig 4-6, pg. 90).
3. Affects specific aspects of development.
4. Depends on the dose.
5. Not always evident at birth.

Goals & Objectives

- Learn the facts.
 - Stages of labor
 - Newborn states, cries, and reflexes
 - APGAR
- Apply what learn
 - Case study set close to home.
- Evaluate infant reflexes.



Happy Birthday!

- Labor and Delivery
- Approaches to Childbirth
- Postpartum Depression
- Birth Complications

But when is it?

- Signs that Labor is near: week or so (Grubb,2001).
- Vaginal discharge, engagement (lightening, dropping), increased Braxton Hicks, lose a few pounds, dull backache, frequent loose bowel movements and cramping, "nesting," softening, thinning, or minor dilation of cervix.

But when is it?

- Signs that Labor is imminent: day or so (Grubb,2001).
- A: Water breaks (amniotic sac): 10-15% before. (Watch for crap! Merconium)
- B: "Bloody show (i.e., blood-tinged mucus draining from the vagina)."
- C: Regular contractions: more frequent, more intense, and longer.

Labor and Delivery

- Stage 1 (12-24 hours): starts when the muscles of the uterus contract and ends when the cervix is fully enlarged (about 10 cm).
- Stage 2 (1 hour): baby is pushed down the birth canal.
- Stage 3 (10 - 15 min): placenta is expelled.

Key terms

- **Crowning** - see the top of the baby's head
- **Breech presentation** - feet first.
- **Afterbirth** - 10 - 15 short minutes.

Natural Childbirth

- Advantages.
- If can't feel, can't push.
- If can't push, get the forceps.
- Do you really want your child on drugs?
- Emphasis is no drugs
- Instead *Relax* by deep breathing, picturing a happy place, and squeezing someone's hand. (Preferably a coach or doula).

Birth Complications

- Lack of Oxygen (**hypoxia**).
- Placental abruption - placenta detaches.
- Often leads to surgical removal of the fetus (C-section 25%).

Prematurity and Low Birth Weight

- **Prematurity** - less than 38 weeks. Less serious than low birth weight.
- **Small-for-date**
 - Born to mothers who drink or don't eat.
 - Less than 3.3 pounds at 9mo, not good.
 - But quality care is critical.

Low Birth Weight

- Werner, 1995.
- Infants with low birth weight who grew up in stable homes are indistinguishable from normal babies. (two supportive, healthy parents).
- In contrast, divorce, alcoholism (the parent's not the baby), or mental illness amplified the problem.
- Thus, good prenatal care is critical.
- And we don't get it. US has more low birth weight babies than any other industrialized nation.

Low Birth Weight

- Number one risk factor!!
- Leads to our **infant mortality** rate of 9/1000.
- What causes it, besides no prenatal care?
 - Hypertension, rubella (1st 16 wks), urogenital infections, diabetes, 4+ pregnancies, teen moms or over 35, mom is underweight, malnourished, cigarette or marijuana smoking, 2+ abortions, anemia, teratogens, maternal stress.

Postpartum Depression

- 10-15% of mothers have persistent irritability, disturbed sleep, and apathy.
- Environmental & biological factors.
- Could be passed on to baby.

4.4 The Newborn

- Assessing the Newborn
- The Newborn's Reflexes
- Newborn States
- Perception and Learning in the Newborn

Is this child healthy? (0, 1, 2)



Appearance: blue, body pink, pink
Pulse: none, fewer than 100, more than 100
Grimace: no response, grimace, cries (loud)
Activity Level: flaccid, weak, strong
Respiratory Effort: Absent, irregular, good

Reflexes (Table 4-6, p105)

- Babinski
- Blink
- Moro (hands up!)
- Palmar
- Rooting
- Stepping
- Sucking
- Withdrawal
- Swallowing
- Swimming

Newborn States

- 4 primary states:
 - sleeping
 - alert inactivity
 - waking activity
 - crying



3 types of cries

- 2-3 Hours a day!
- Types
 - Basic Cry : soft first, then more insistent later.
 - Mad Cry: sudden onset, rapid conclusion.
 - Pain Cry: AHHHHH!
(breath) AHHHHHH!

How do you stop the crying?

- If cries because hungry, wet, or in pain.
 - Feed, change diapers, remove the mousetrap from finger.
- Rocking, Stroking, Singing
 - 45% less crying if held more. We have 25% contact.
- Swaddling.
- Sucking.
- Home remedies??
 - The baby tamer: SHHHHHHH

Sleep

- 16 to 18 hours daily.
- But awake 1 out of every 4 hours.
- 1/2 of sleep is **REM** (Dreaming?, consolidating memories? We don't know.)
- By age 1, REM drops to 25% the rest is good ole **regular** sleep.

Sudden Infant Death Syndrome

- It is what it says.
- And no one knows why (by definition).
- But risk factors include:
 - Premature birth, low birth weight, smoking..
 - Lying on stomach.
 - Overheating.

Infant perception

- Newborns can perceive their environment and learn from it.
- They can see, smell, hear, feel, and, of course,
- Taste!
- But that's for another time.