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.

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.

The long long journey

Germ disc

Implantation

Zygote

Figure 3-1 Zygote Implantation

Germ disc
Period of the Embryo
- Cephalocaudal principle
- Proximodistal principle
- From 3 to 8 weeks after conception.
- Body parts are formed during this period.

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, eye ears and heart)
- Syphilis (CNS damage, teeth, bones)

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 (Pernicious anemia)
- Mercury (Retarded growth, cerebral palsy, mental retardation)
- Cat litter (Toxoplasmosis, more likely from undercooked meat)
- X-rays (Retarded growth, leukemia, mental retardation) but use VDT.
- 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! Membranum)
• 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 mouse trap 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.