Chapter 19: Hormones & Reproduction



Organs of the endocrine system (purple) and other organs containing tissues that secrete hormones (tan)

### **Hypothalamus**

Secretes hormones involved with fluid balance, smooth muscle contraction, and the control of hormone secretion by the anterior pituitary gland

### **Pituitary Gland**

Secretes multiple hormones that regulate the endocrine activities of the adrenal cortex, thyroid gland, and reproductive organs, and a hormone that stimulates melanin production

### **Thyroid Gland**

Secretes hormones that affect metabolic rate and calcium levels in body fluids.

### **Adrenal Glands**

Secrete hormones involved with mineral balance, metabolic control, and resistance to stress; the adrenal medullae release E and NE during sympathetic activation

### Pancreas (Pancreatic Islets)

Secretes hormones regulating the rate of glucose uptake and utilization by body tissues

### **Pineal Gland**

Secretes melatonin, which affects reproductive function and helps establish circadian (day/night) rhythms

### **Parathyroid Glands**

Secrete a hormone important to the regulation of calcium ion concentrations in body fluids

### Organs with Secondary Endocrine Functions

Heart: Secretes hormones involved in the regulation of blood volume

Thymus: Secretes hormones involved in the stimulation and coordination of the immune response

Digestive Tract: Secretes numerous hormones involved in the coordination of system functions, glucose metabolism, and appetite

Kidneys: Secrete hormones that regulate blood cell production and the rates of calcium and phosphate absorption by the intestinal tract

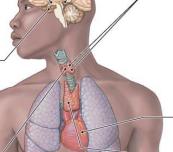
Gonads: Secrete hormones affecting growth, metabolism, and sexual characteristics, as well as hormones coordinating the activities of organs in the reproductive system

### The Endocrine



 Produces chemical messengers called

that control body activities



Testis

Ovary

### How It Works

Endocrine glands produce and/or release hormones

turn on, turn off, speed up, or slow down body organs & activities.

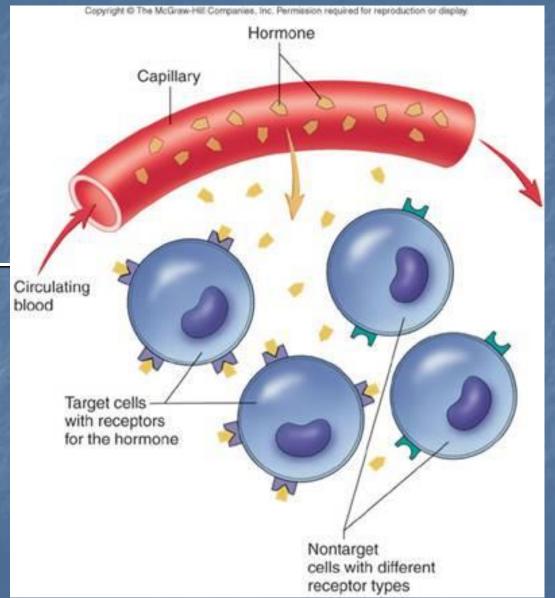


### For Example

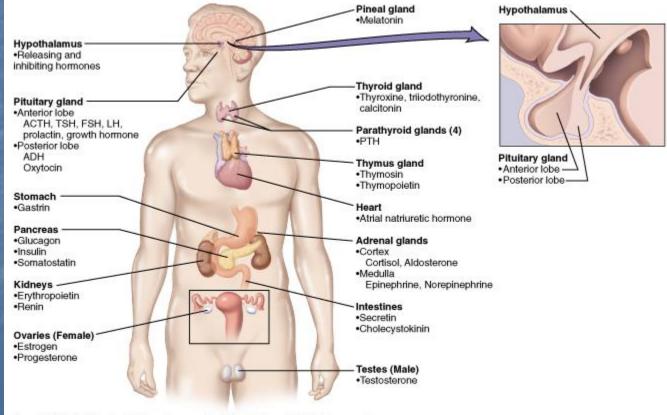
You see a burglar
Nerve impulse to brain
Brain sends impulse to adrenal glands to release adrenaline
Heart and breathing rates increase



# How Does It Know?



### Links Nervous System to Endocrine System



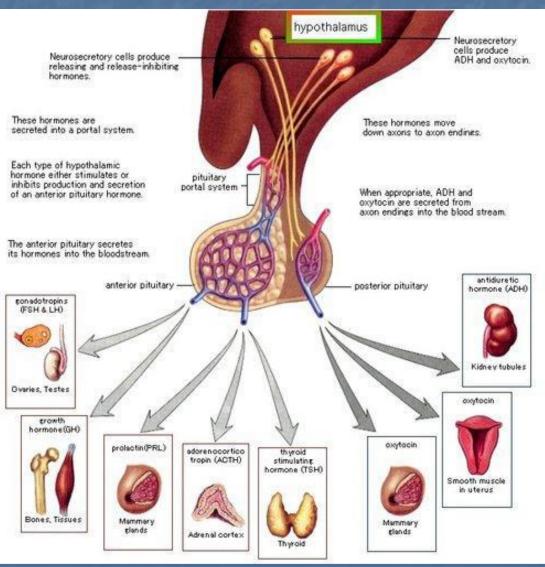
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## Pituitary Gland

11

11

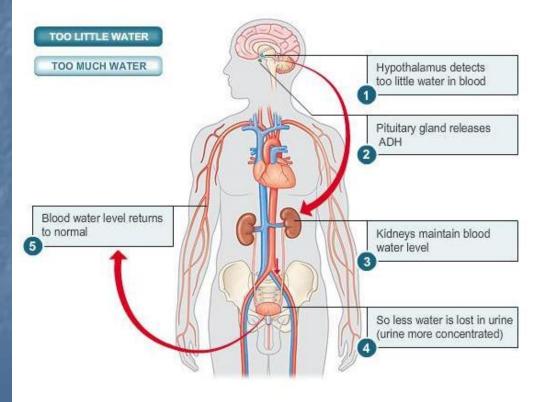
that regulates
metabolism (thyroid)
growth (bones)
puberty (gonads)
water regulation (kidneys)



### **Negative Feedback**

### When levels

## endocrine system signals to

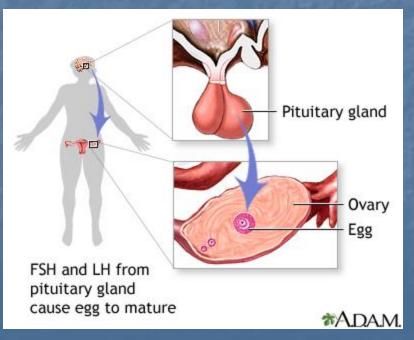


## Puberty "Wake Up" Hormones

Follicle Stimulating Hormone (FSH) from pituitary

Luteinizing Hormone (LH), also from pituitary, signals

Both rise and fall together during menstrual cycle



### **Sexual Reproduction**

Egg – female sex cell
Sperm – male sex cell
\_\_\_\_\_ – joining of sperm & egg

Zygote –

### Chromosomes

Found in nucleus
Contain DNA
Gametes (sperm & egg) carry 1/2 genetic code
When combined make a whole – YOU!



Y х

### autosomes

sex chromosomes

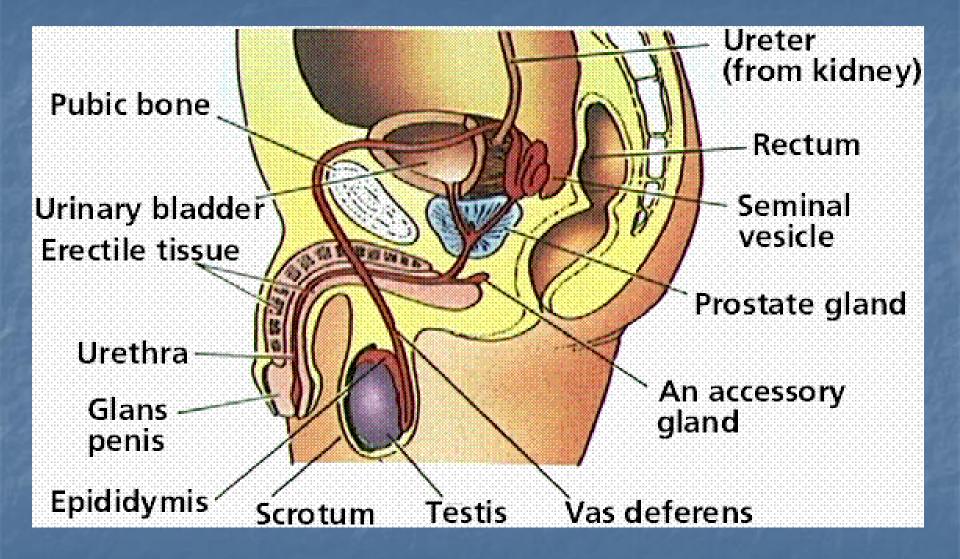
U.S. National Library of Medicine

Male Reproductive System

Produces

 2 testes produce <u>sperm</u>
 Testes protected in (external sac)
 \_\_\_\_\_mix with\_\_\_\_to form semen

when semen leaves the body thru \_\_\_\_\_ of penis



## Circumcision

### Removal of \_

## Foreskin Glans



on penis

### Female Reproductive System

To produce eggs, \_\_\_\_\_ and nourish a developing baby until birth

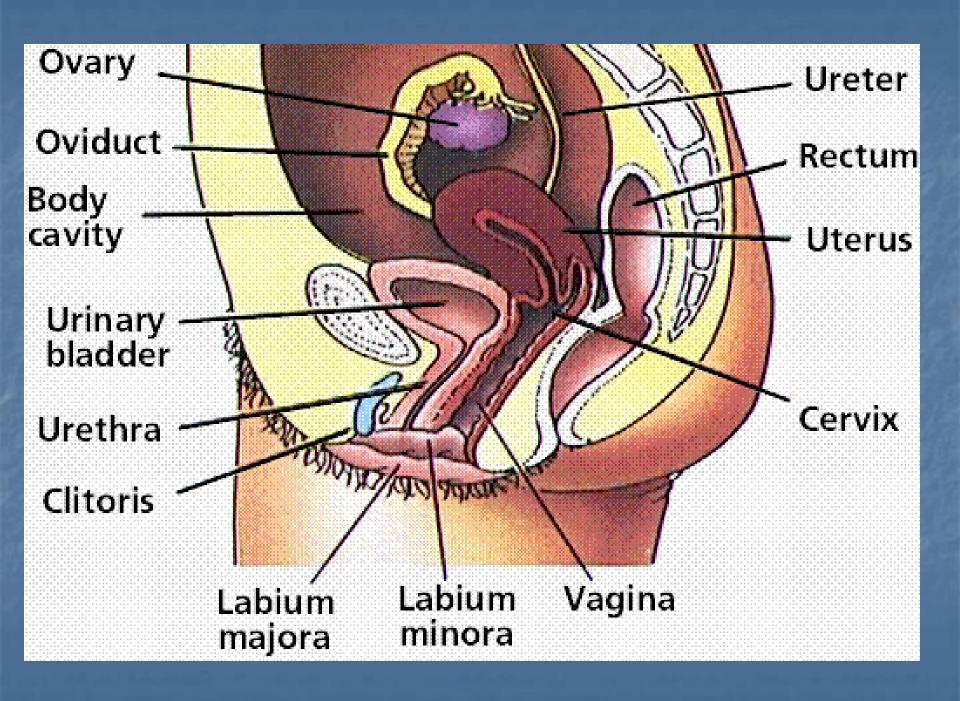
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Egg

\_ house eggs

tubes lead to uterus
 Base of the uterus is the

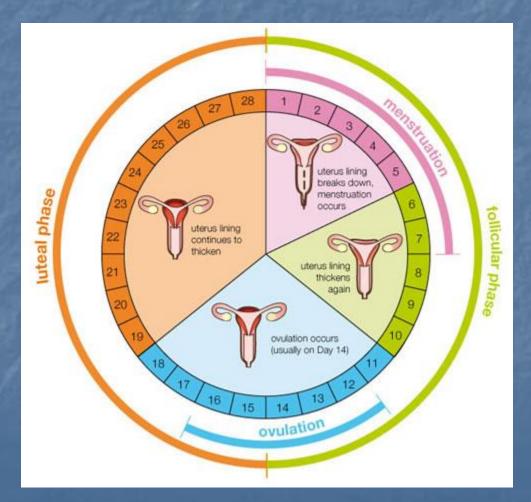
 (a common site of cancer in women: story of Henrietta Lacks)
 to outside of body



### The Menstrual Cycle (about 28 days)

- An egg matures in an
- Lining of uterus begins to thicken
   During

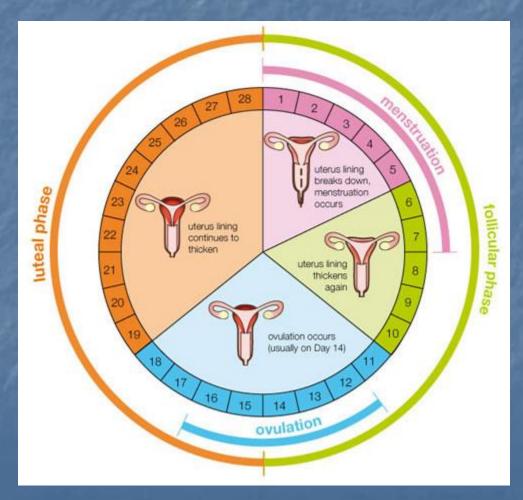
mature egg is released while cervical mucus thins



### The Menstrual Cycle (about 28 days)

If egg not fertilized in a few days, will break down (along with uterine wall)

Thickened lining passes out of body for 4 – 6 days
Another egg begins to mature





## What About the Egg?

 Fertilization? = Pregnant
 No Fertilization? = Menstruation

### Pregnancy

 Implantation - Embryo attaches to uterine wall
 Amniotic sac forms (filled with fluid to protect & cushion)

develops from uterine lining

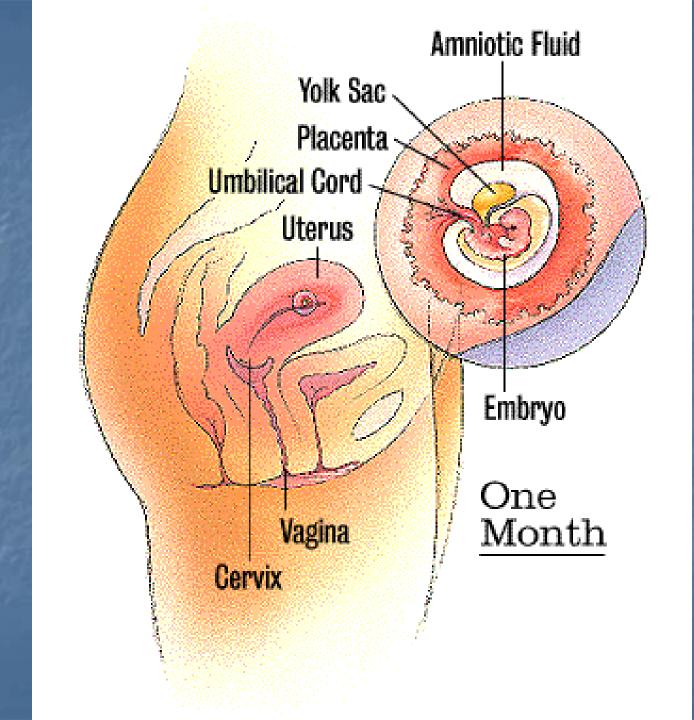
attaches where nutrients, gases & wastes are exchanged

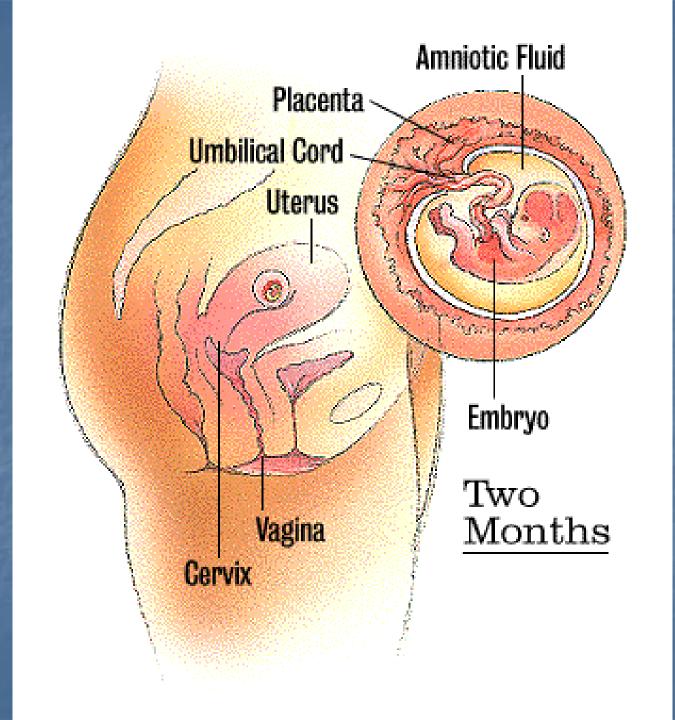
## Human Development

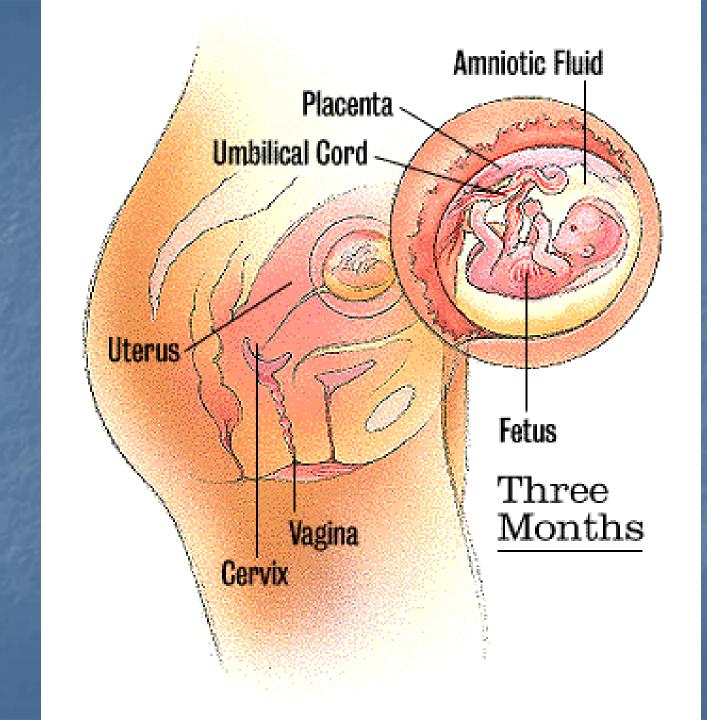
## Zygote – fertilized egg – til 8 weeks – 9 wks to birth



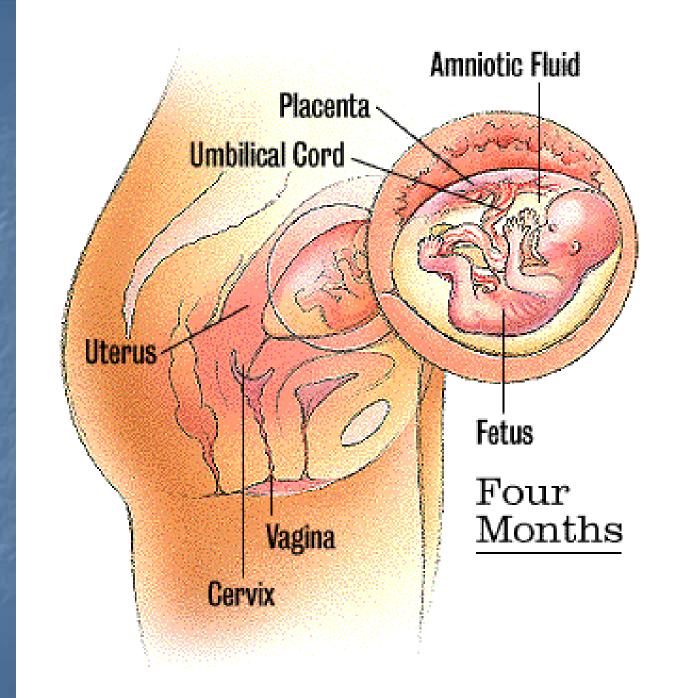
3 Stages of Pregnancy 40 week Gestation ■ 1<sup>st</sup> Trimester ■ 1<sup>st</sup> 12 - 14 weeks Organs forming Most critical time

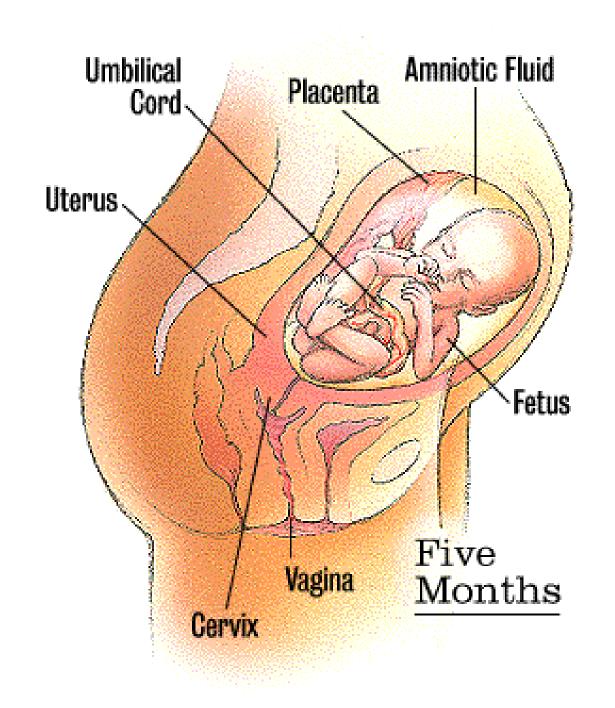


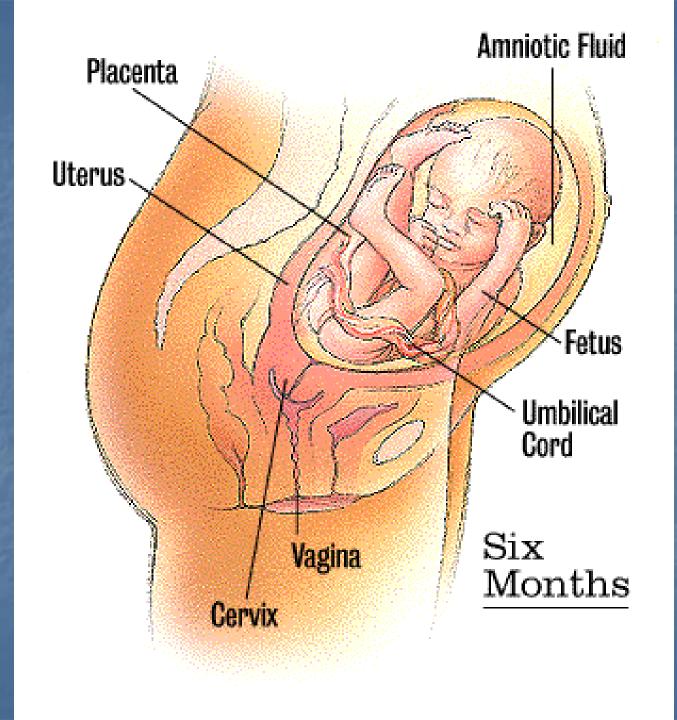


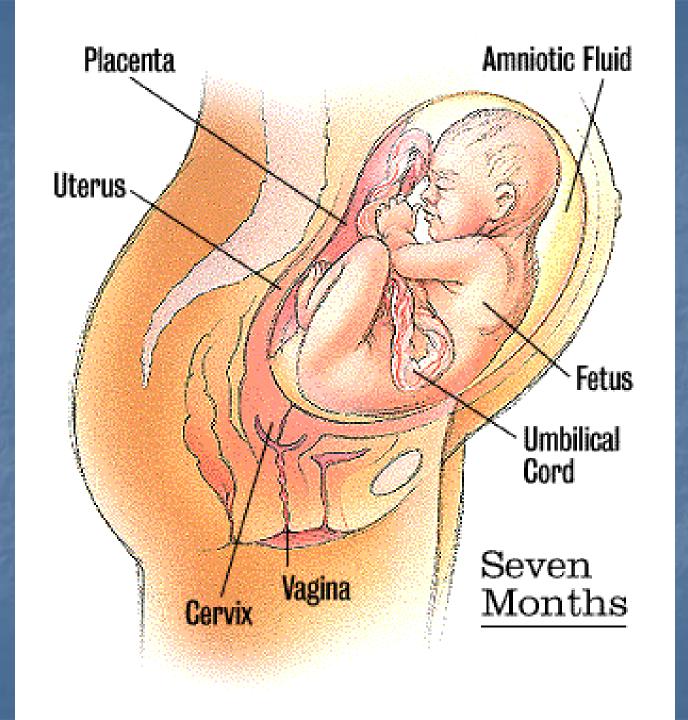


3 Stages of Pregnancy (cont.) 2<sup>nd</sup> Trimester ■ Til end of 7<sup>th</sup> month Organ systems formed & maturing





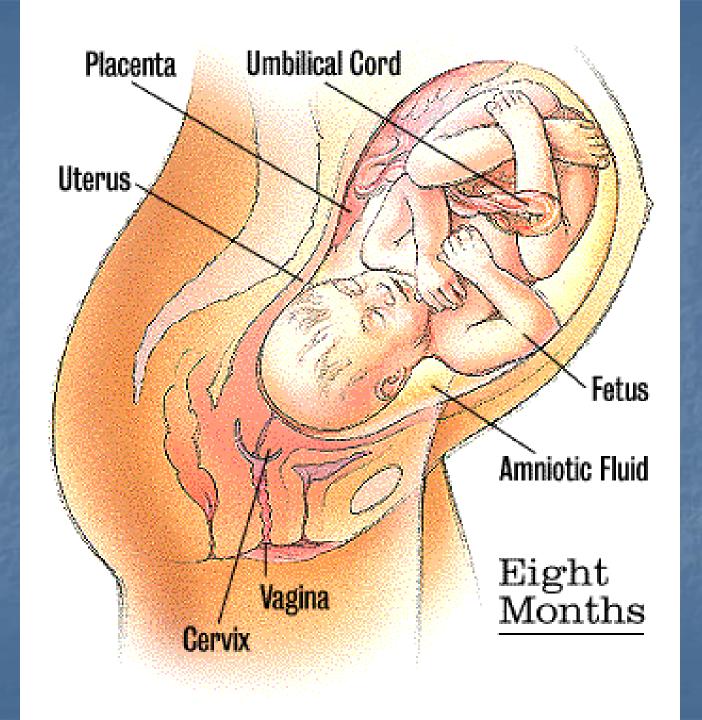


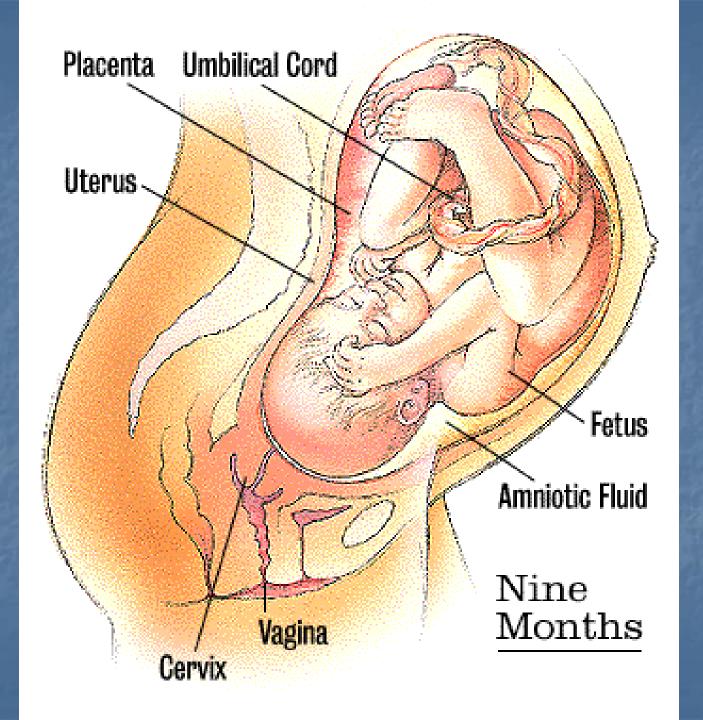


### 3 Stages of Pregnancy (cont.)

 3<sup>rd</sup> Trimester
 Final weeks
 Rapid growth and weight gain of fetus







### Ready?

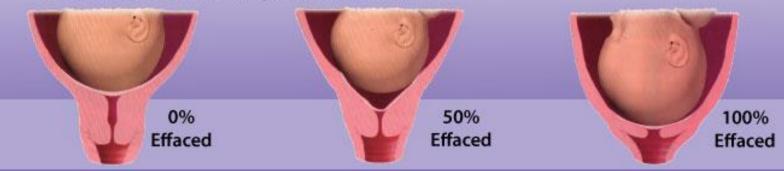
 Between 38 & 42 weeks, all systems mature
 Baby's size puts pressure on cervix & amniotic sac



### **Cervical Effacement & Dilation** (Borramiento y Dilatación Cervical)

*Effacement* -the gradual thinning, shortening and drawing up of the cervix measured in percentages from 0 to 100%. *Borramiento* - el adelgazamiento, acortamiento y encogimiento gradual del

Borramiento - el adelgazamiento, acortamiento y encogimiento gradual de cervix medido en porcentajes del 0 al 100 %.



**Dilation** - the gradual opening of the cervix measured in centimeters from 0 to 10 cms.

**Dilatación** - La apertura gradual del cérvix medida en centímetros de 0 a 10 cms.



1cm



7cm

8cm

9cm

10cm

### Stages of Childbirth

cervix dilates, uterus

contracts

 \_\_\_\_\_\_ – baby pushed out through vagina (aka birth canal)
 Afterbirth – Placenta is delivered
 Caesarean Section (\_\_\_\_\_) – baby is removed surgically from abdomen

### **Other Pregnancy Terms**



Siblings – brothers and sisters
Fraternal Twins – 2 eggs and 2 sperm
Identical Twins – zygote splits

### Infancy

 1<sup>st</sup> two years
 Rapid learning, growth, and development



## Toddlers

### Continued growth and independence





## Childhood

Growth slows but continues, more coordinated in activities

### Adolescence

 "Awkward" stage between childhood and adulthood
 Puberty – sexual development



### Adulthood

Body peaks at 22 and by 27 body and brain starts its slow decline, which varies depending on individual.



## Aging

 skin wrinkles, muscles decrease, sense organs decline
 Slow aging process by diet & exercise