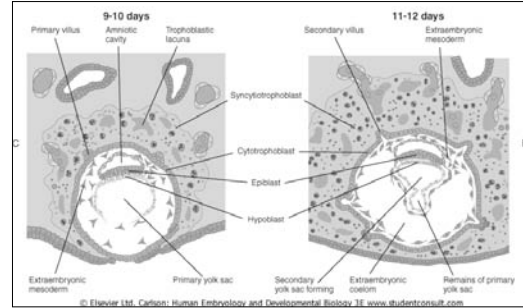


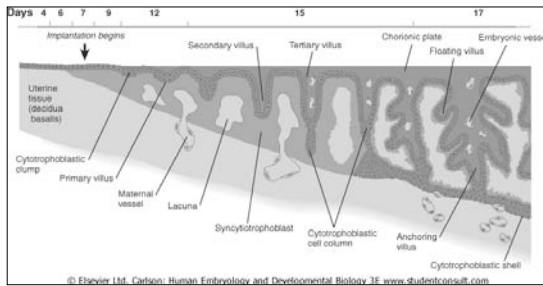
PLACENTAL PATHOPHYSIOLOGY

Harsh Thaker, MD, PhD
ht89@columbia.edu

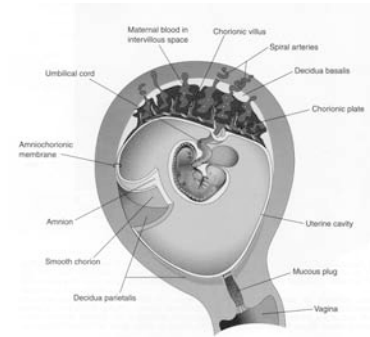
IMPLANTATION



TROPHOBLAST AND VILLI

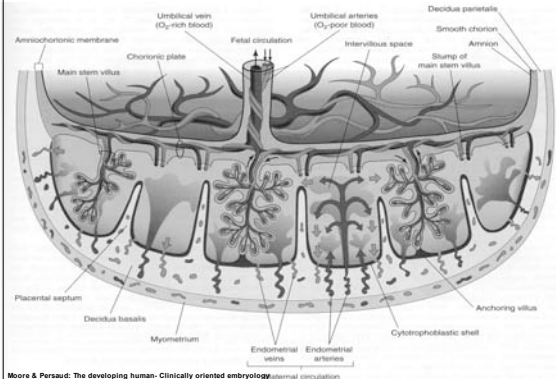


ANATOMY



Moore & Persaud: The developing human-Clinically oriented embryology

PLACENTAL CIRCULATION

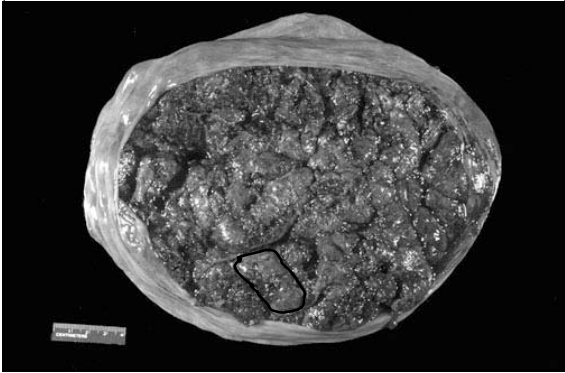


Moore & Persaud: The developing human-Clinically oriented embryology

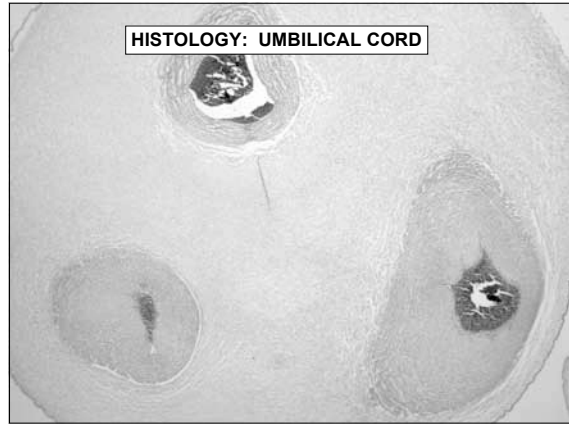
FETAL SURFACE



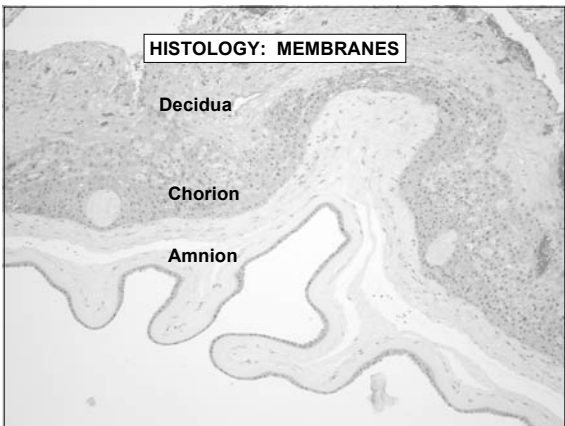
MATERNAL SURFACE



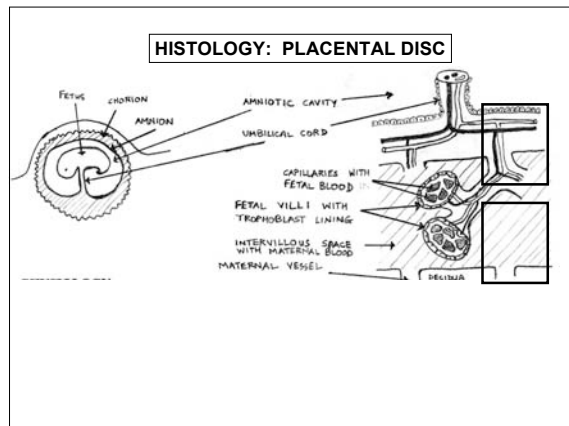
HISTOLOGY: UMBILICAL CORD



HISTOLOGY: MEMBRANES



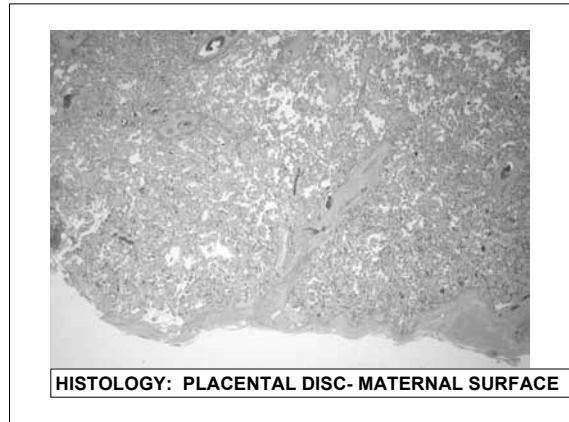
HISTOLOGY: PLACENTAL DISC

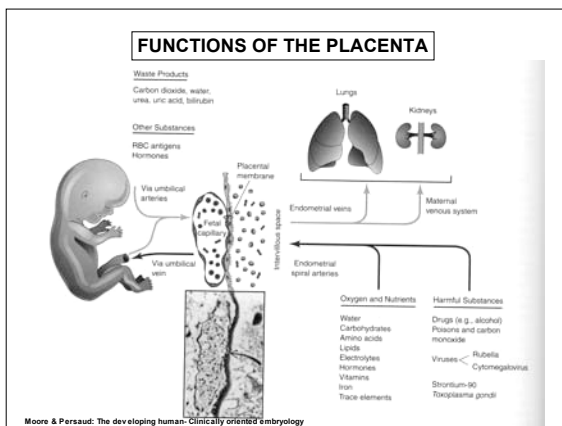
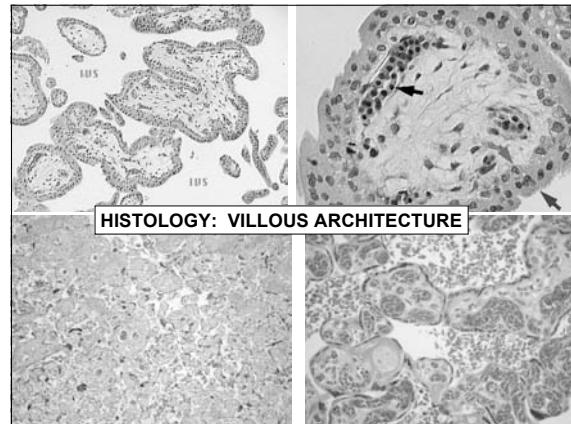
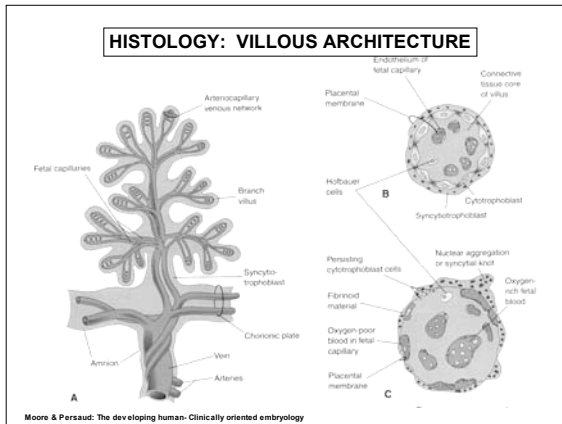


HISTOLOGY: PLACENTAL DISC-FETAL SURFACE



HISTOLOGY: PLACENTAL DISC-MATERNAL SURFACE



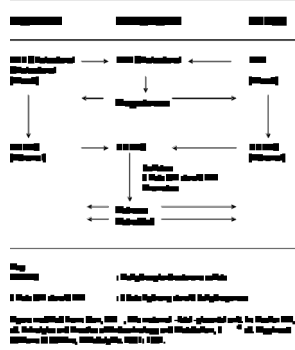


PLACENTAL HORMONES

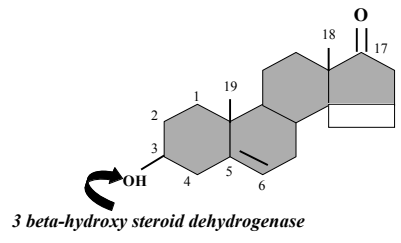
- Human Chorionic Gonadotropin (HCG)**
- Secreted by Syncytiotrophoblast Cells
 - Structurally similar to pituitary LH
 - Prolongs survival of Corpus luteum, thus maintaining steroid hormone levels in pregnancy.
 - Detectable in maternal plasma 7-10 days after implantation
 - Levels peak at 8-10 weeks' gestation

- Human Placental Lactogen (HPL)**
- A.K.A Chorionic Somatomammotropin
 - Secreted by Syncytiotrophoblast Cells
 - Structurally similar to pituitary Growth Hormone and Prolactin
 - Metabolic effects- Insulin antagonist
 - Promotes breast development

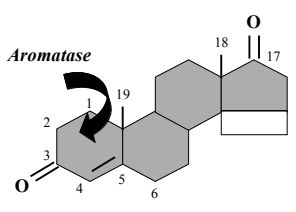
PLACENTA IN STEROID HORMONE BIOSYNTHESIS



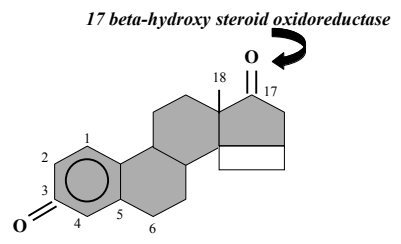
Dehydroepiandrosterone (C₁₉)



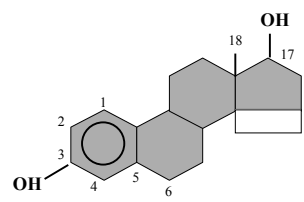
Androstenedione (C₁₉)



Estrone (C₁₈)



Estradiol (C₁₈)



OTHER PLACENTAL HORMONES

- Placental Prolactin
- Placental Thyrotropin
- Placental ACTH and CRF
- Placental growth hormone
- Other peptides- Activin, inhibin, follistatin, urocortin, leptin, IGF etc.

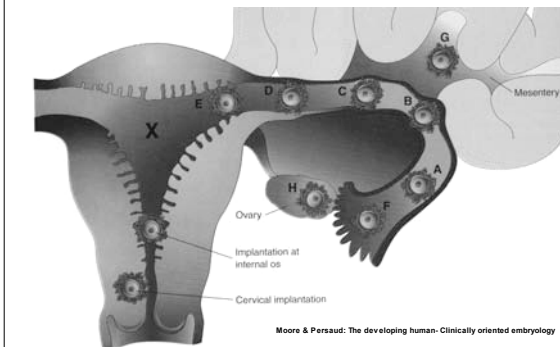
Fetoplacental hormones and peptides in prenatal screening

HCG	Elevated in Tri 21
uE3	Decreased in Tri 21
AFP	Decreased in Tri 21
Inhibin A	Elevated in Tri 21

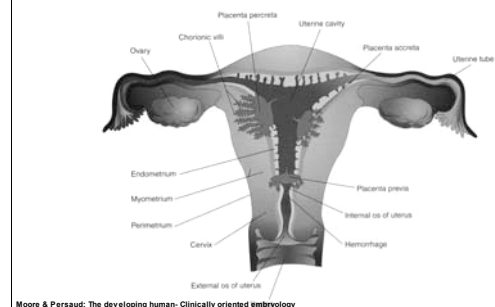
AFP is elevated in Neural Tube Defects

DEVELOPMENTAL PATHOPHYSIOLOGY

ECTOPIC IMPLANTATION

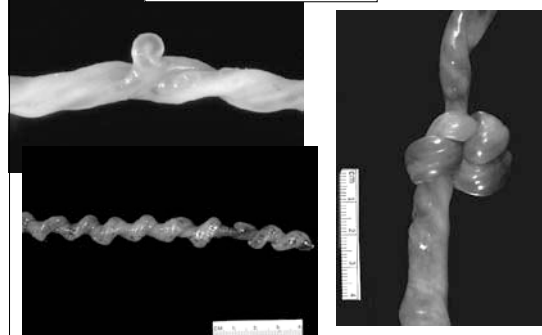


PLACENTA PREVIA & PLACENTA ACCRETA



MECHANICAL PATHOPHYSIOLOGY

CORD KNOTS & TWISTS

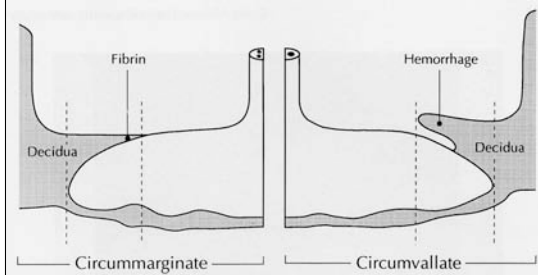


CORD: VELAMENTOUS INSERTION



Kaplan: Color atlas of gross placental pathology.

ABNORMAL MEMBRANE ATTACHMENT

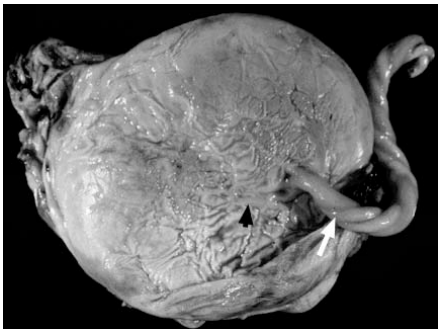


MEMBRANE RUPTURE: AMPUTATIONS

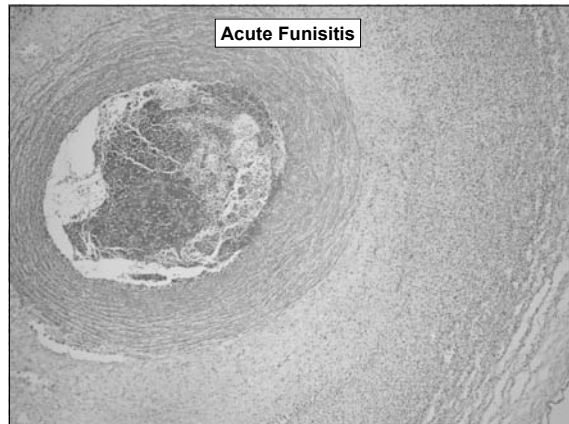


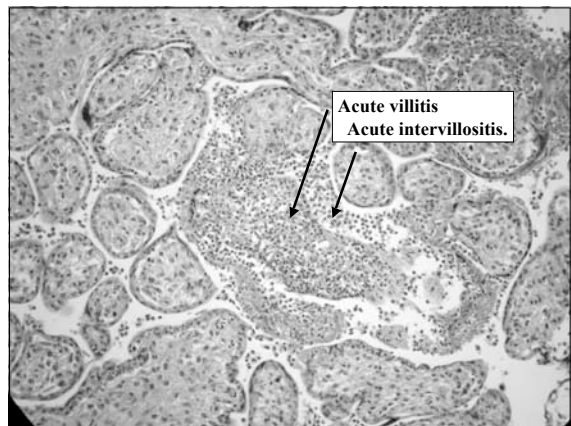
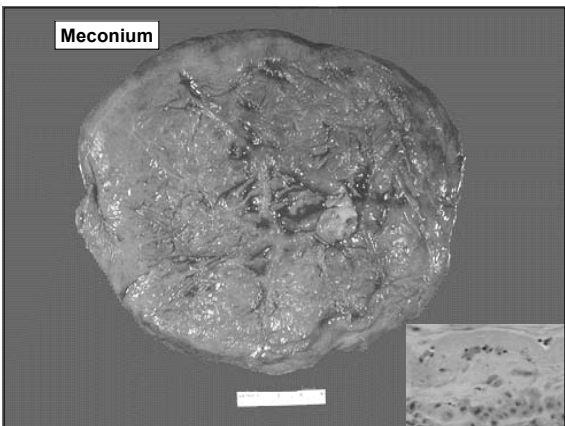
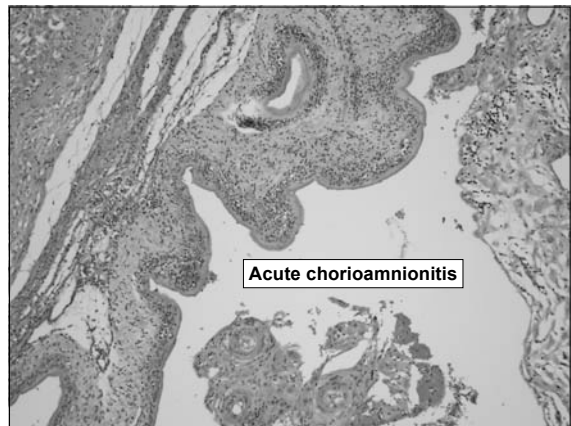
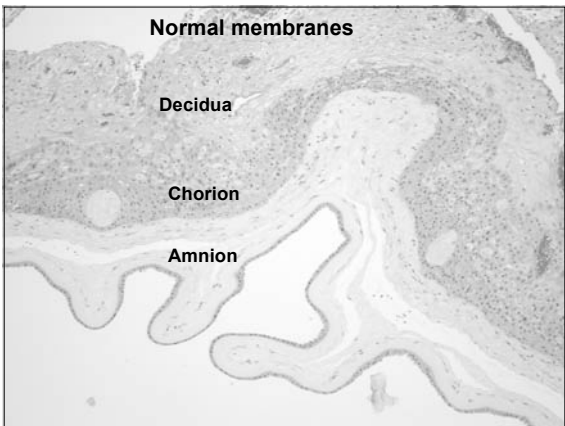
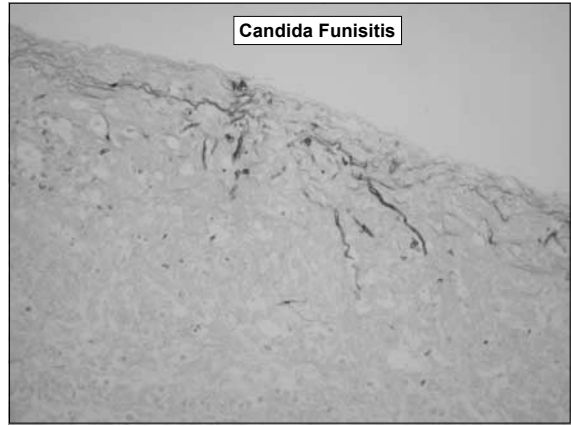
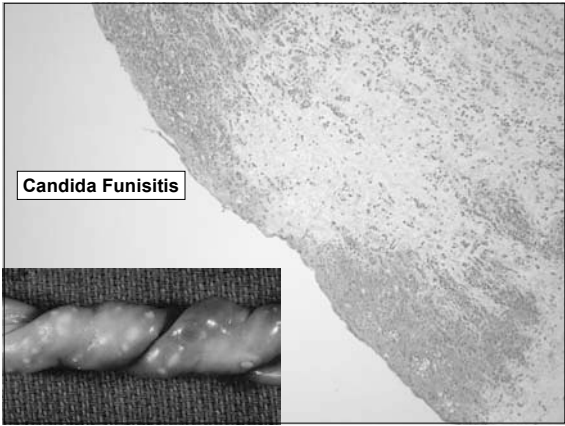
INFLAMMATORY PATHOPHYSIOLOGY

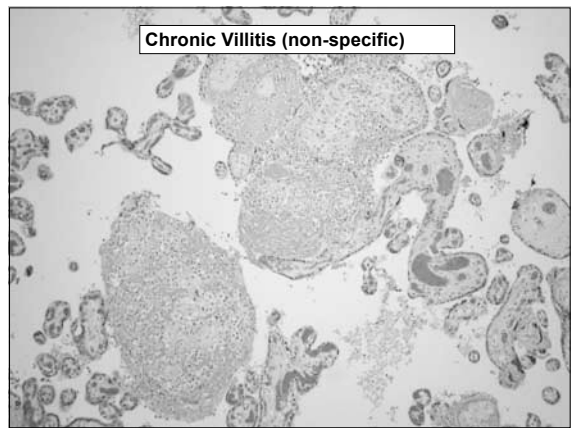
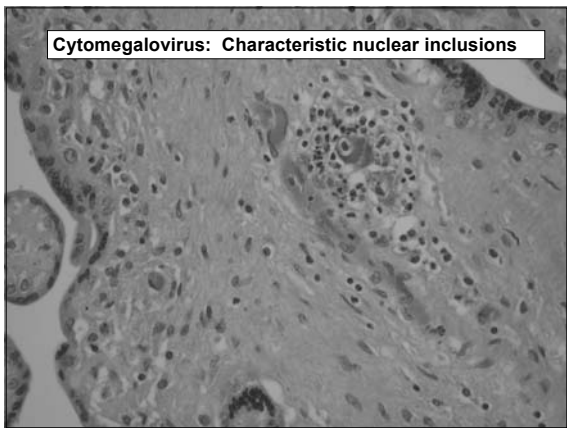
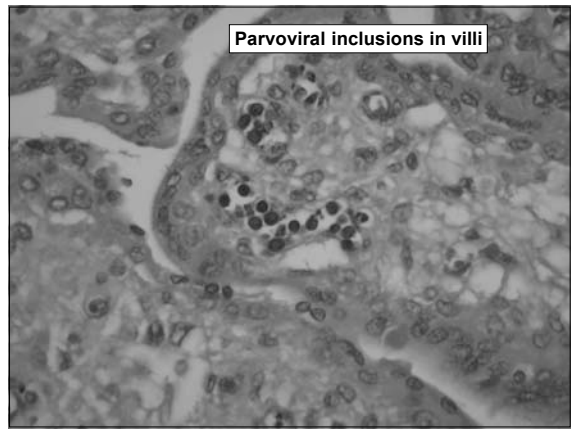
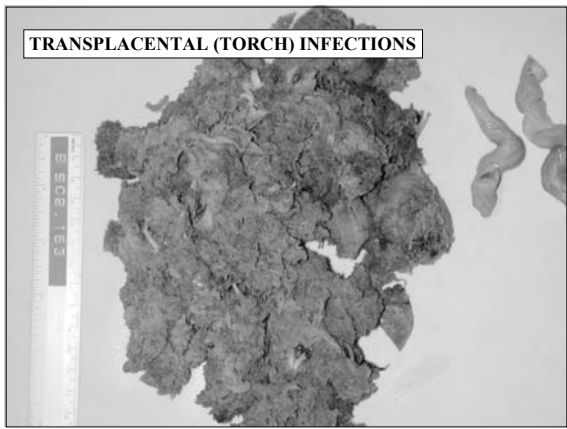
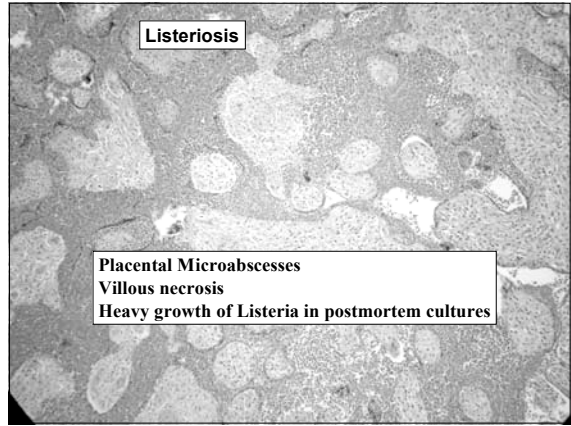
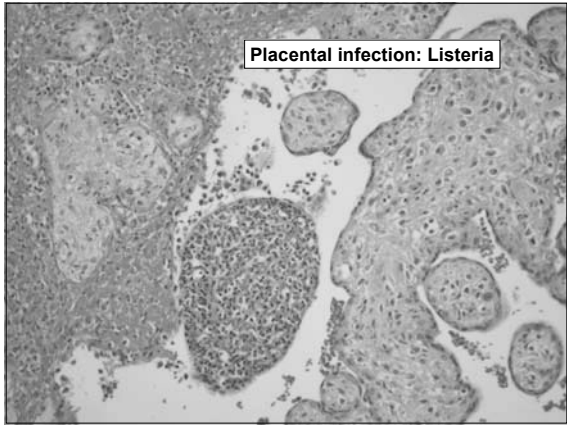
INFLAMMATION: CHORIOAMNIONITIS



Acute Funisitis

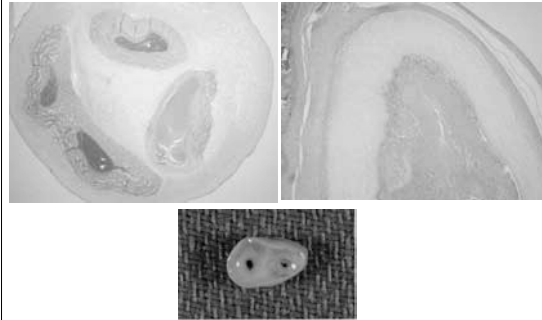






VASCULAR PATHOPHYSIOLOGY

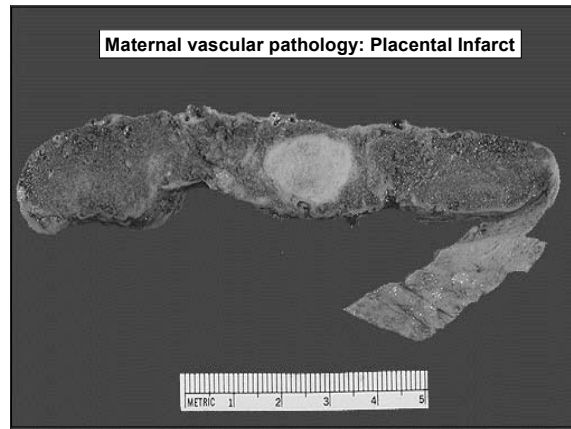
FETAL VASCULAR PATHOLOGY



Maternal Vascular Pathology: Pre-eclampsia



Maternal vascular pathology: Placental Infarct

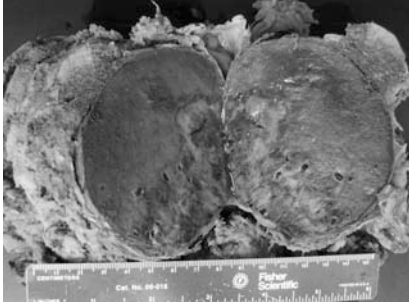


Maternal vascular pathology: Placental Abruption

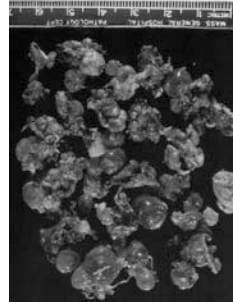


NEOPLASTIC PATHOPHYSIOLOGY

VASCULAR TUMOR- CHORANGIOMA



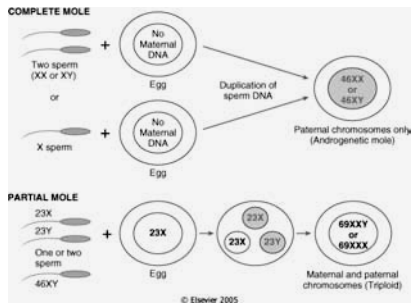
TROPHOBLASTIC TUMORS HYDATIDIFORM MOLES



**COMPLETE = Diploid
2 Pat, 0 Mat.**

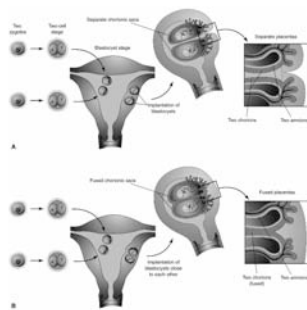
**PARTIAL = Triploid
2 Pat, 1 Mat**

HYDATIDIFORM MOLES- GENETICS



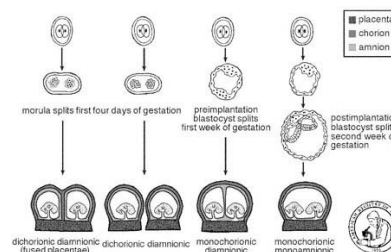
MULTIPLE GESTATIONS

TWINS- Dizygotic



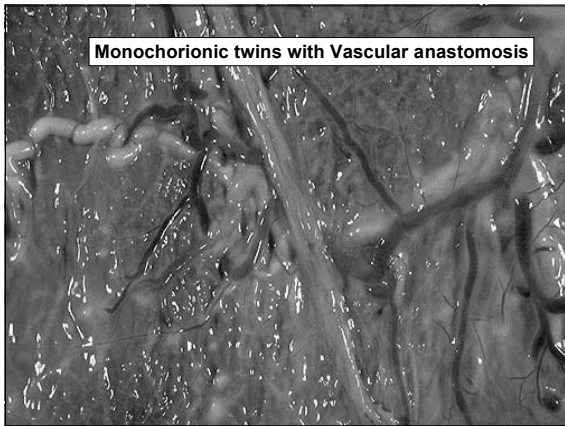
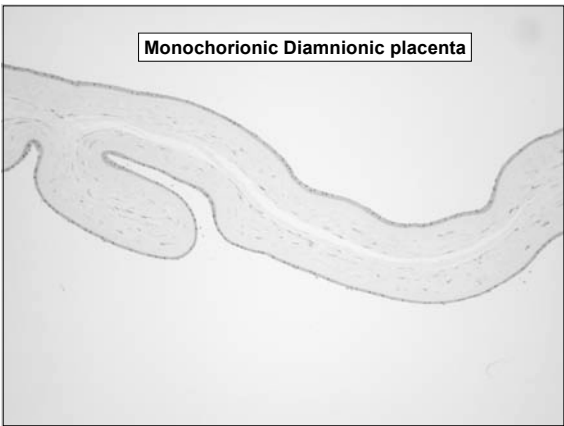
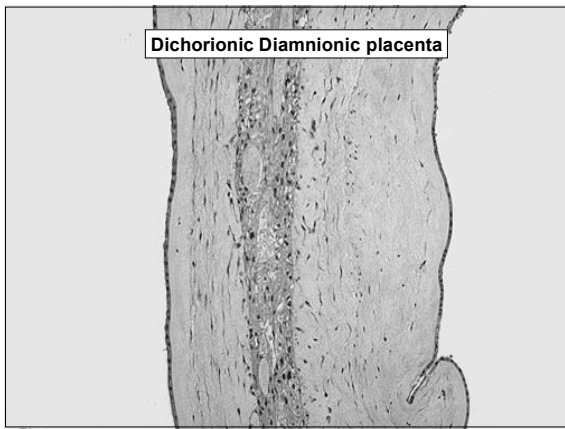
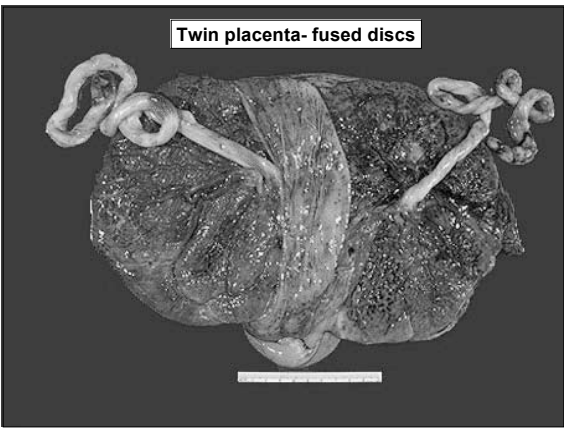
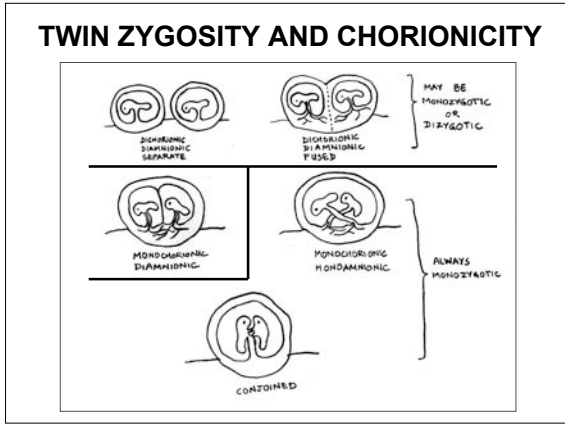
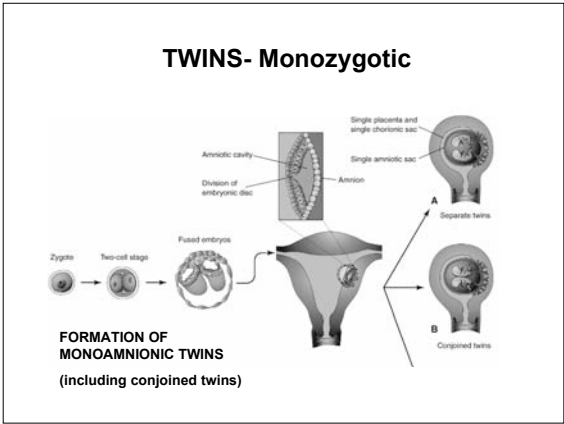
**TWO AMNIONS
TWO CHORIONS
(fused or separate)**

TWINS- Monozygotic



**TWO AMNIONS
TWO CHORIONS
(fused or separate)**

**ONE CHORION
ONE OR TWO AMNIONS**



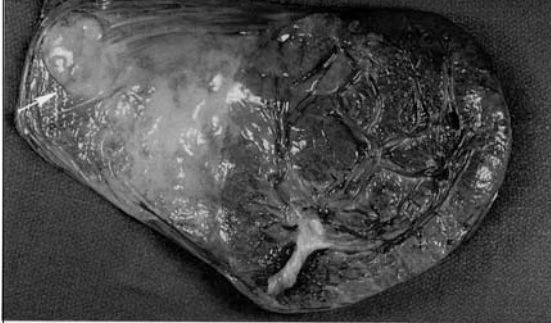
Twin-Twin transfusion syndrome



Twin placenta- Monoamnionic, with entangled cords



Twin placenta- fetus papyraceus



ENJOY THE LAB!