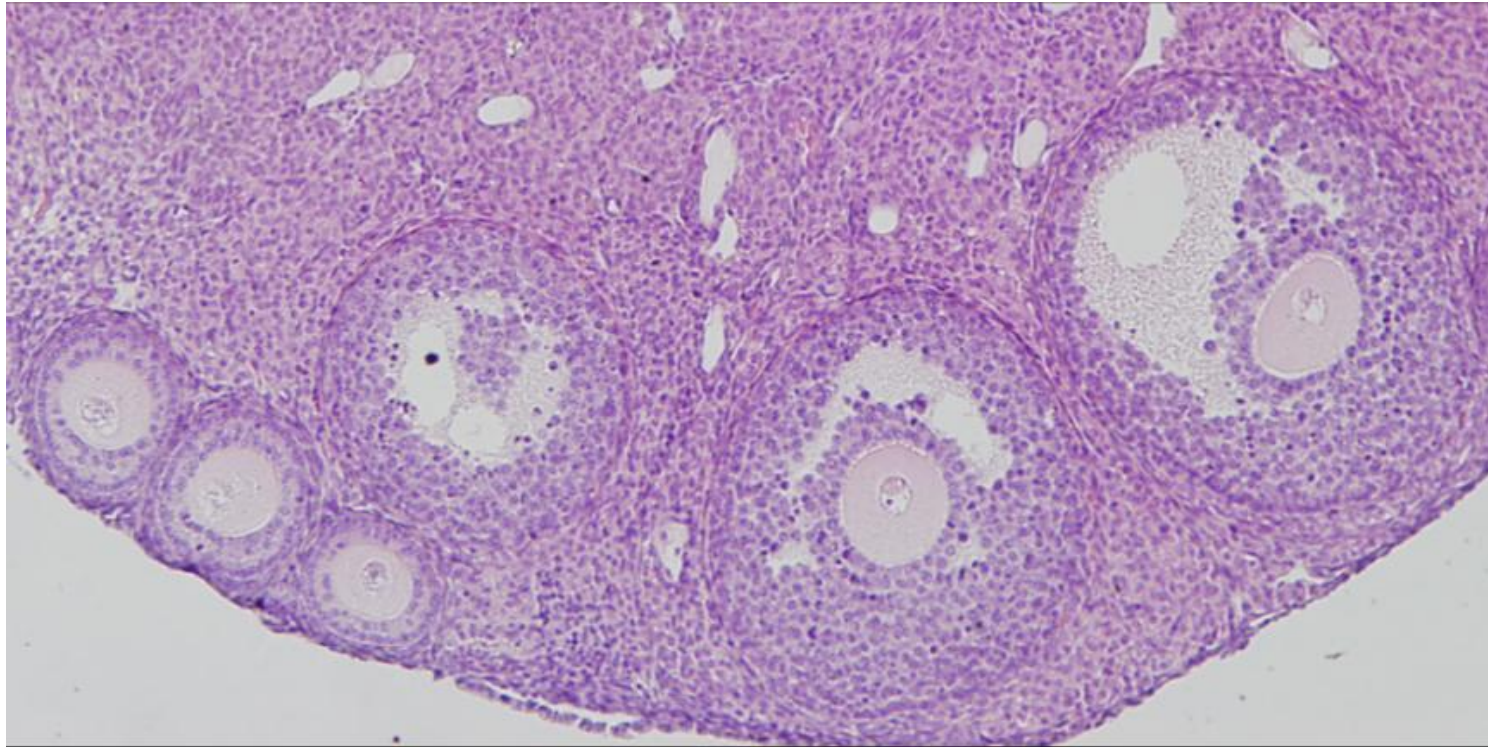


# Ovarian Tumors



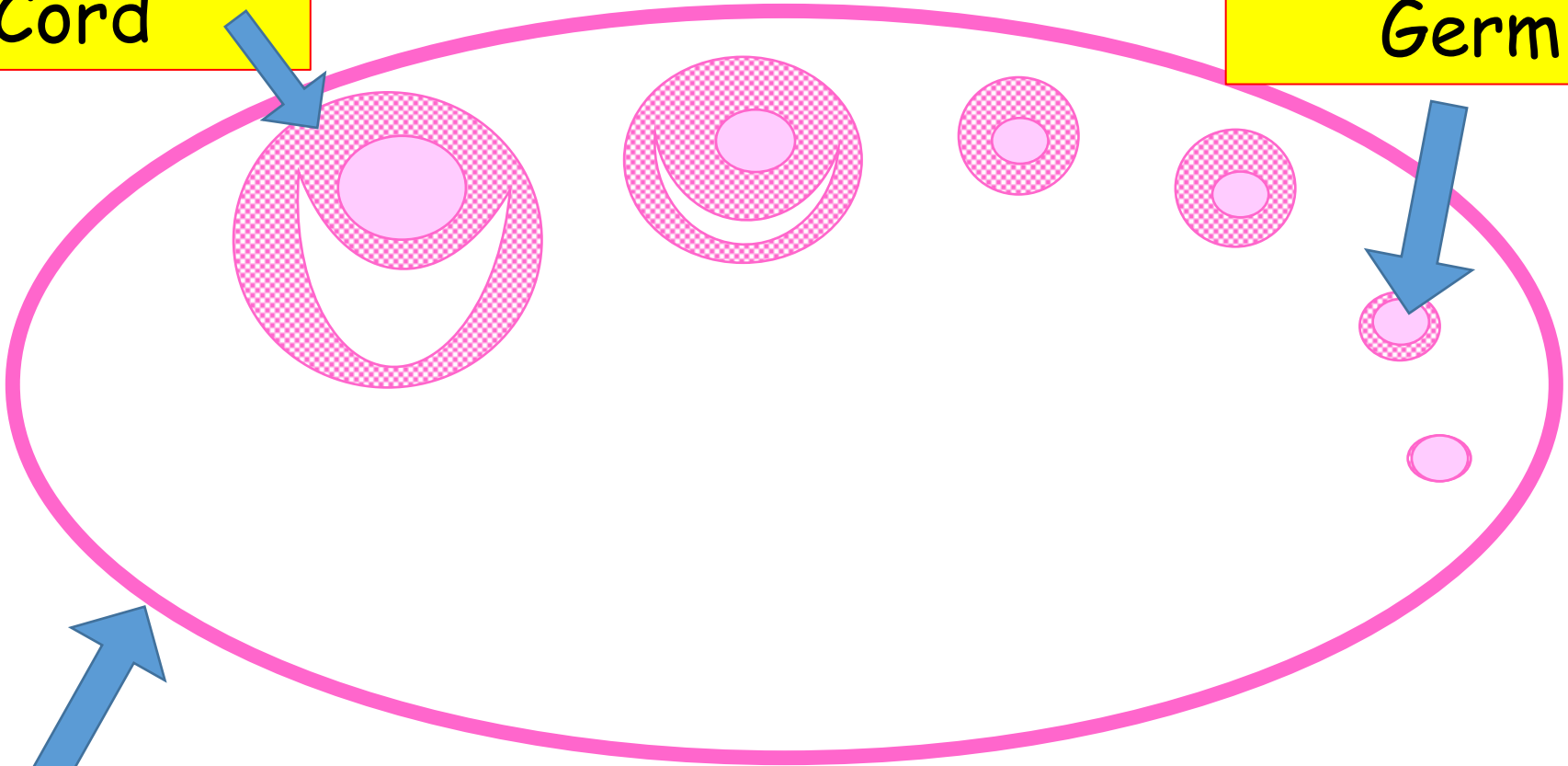
Kelsey T. Mantoni, Medical Student (Class of 2018)

[www.12daysinmarch.com](http://www.12daysinmarch.com)

# Ovarian Tumors

Sex Cord

Germ Cell



Epithelial

Metastatic

# Ovarian Tumors

## Epithelial

Serous

Mucinous

Brenner

Endometrioid

## Sex Cord

Granulosa Cell

Sertoli Leydig Cell

Who

Histology

Gross Appearance

Tumor Markers

Physiology

## Germ Cell

Dysgerminoma

Yolk Sac

Choriocarcinoma

Teratoma

Embryonal

## Metastatic

Krukenberg

AGE Female presents with blah blah blah  
found to have ADNEXAL MASS on  
histology appears PATHOLOGIC  
DESCRIPTOR.

What is the diagnosis?

What does the tumor secrete?

# Epithelial

**Serous**

**Mucinous**

Brenner

Endometrioid

# Epithelial

## Serous / Mucinous

### Who

Post menopausal or BRCA 1 and Lynch Syndrome  
Protective- OCP, multiparity

### Histology

Epithelium (can form gland like structures) secreting a clear or mucinous fluid

Benign (cystadenoma) vs Malignant (adenocarcinoma) = simple vs  
papillary projections "shaggy"

Serous = Psammoma bodies

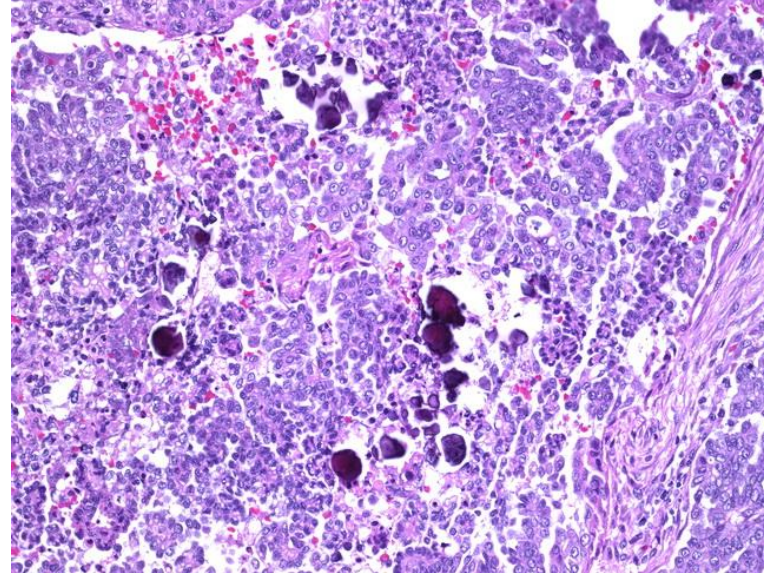
### Tumor Markers

CA-125

NOT DIAGNOSTIC -> USED TO FOLLOW TUMOR BURDEN

# Psammoma bodies

"dystrophic calcifications"  
"calcific spherules, layered"



What are the four tumors associated with psammoma bodies?

Serous cystadenocarcinoma  
Mesothelioma  
Meningioma  
Papillary carcinoma of the Thyroid

# Epithelial

## Serous

## Mucinous

### Who

Post menopausal or BRCA 1 and Lynch Syndrome  
Protective- OCP, multiparity

### Histology

Columnar "fallopian tube" epithelium

"mucous secreting"

Benign (cystadenoma) vs Malignant (adenocarcinoma) =  
simple vs **papillary projections** "shaggy"

**Serous = Psammoma bodies**

### Tumor Markers

**CA-125**

NOT DIAGNOSTIC -> USED TO FOLLOW TUMOR BURDEN



# Epithelial

## Histology

**Brenner**

Transitional epithelium like seen in bladder

**Endometrioid**

Appears like endometrial like tissue  
Will be lesions in the uterus!

# Epithelial

## Serous

An epithelial lined cyst of clear fluid with psammoma bodies

## Mucinous

An epithelial lined cyst of mucous

Post menopausal female with...

## Brenner

An cyst lined with bladder epithelium

## Endometrioid

Endometrial like tissue in the ovary with additional tumor in the uterus

# Ovarian Tumors

## Epithelial

**Serous**  
**Mucinous**  
Brenner  
Endometrioid

Shaggy Appearance  
Psammoma bodies  
Marker: CA-125

## Germ Cell

Dysgerminoma  
Yolk Sac  
Choriocarcinoma  
Teratoma  
Embryonal

## Sex Cord

Granulosa Cell  
Sertoli Leydig Cell

## Metastatic

Krukenberg

# Germ Cell

Dysgerminoma

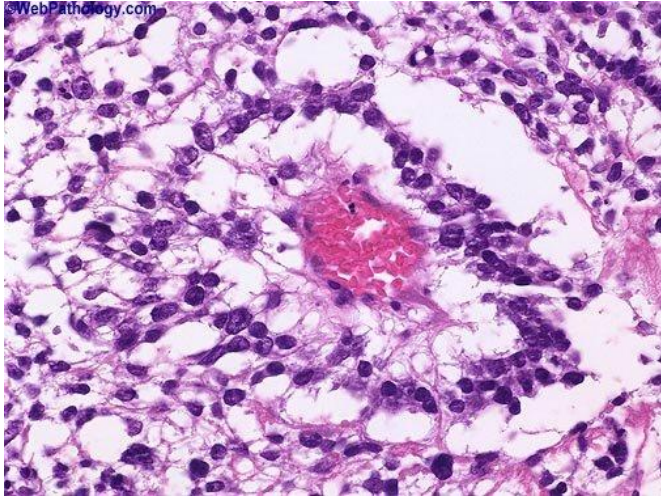
Yolk Sac

Choriocarcinoma

Teratoma

Embryonal

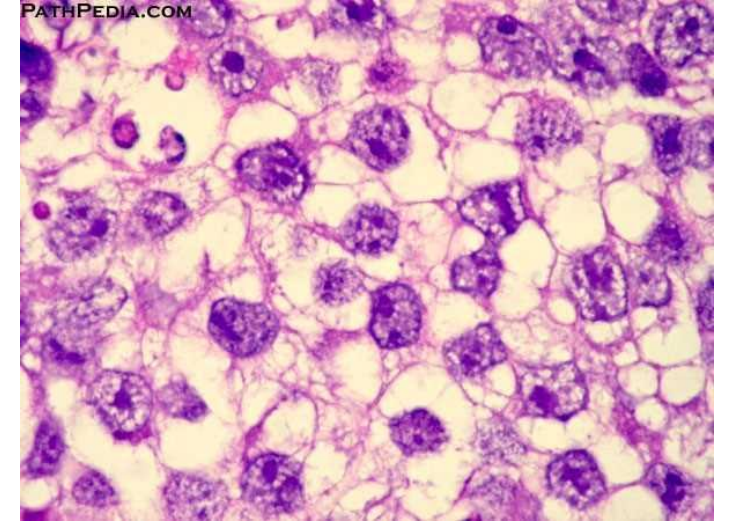
# Yolk Sac



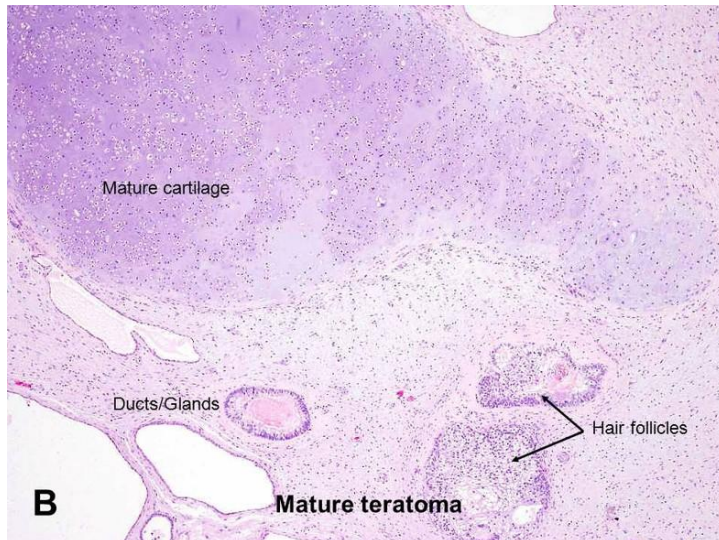
# Germ Cell

# Histology

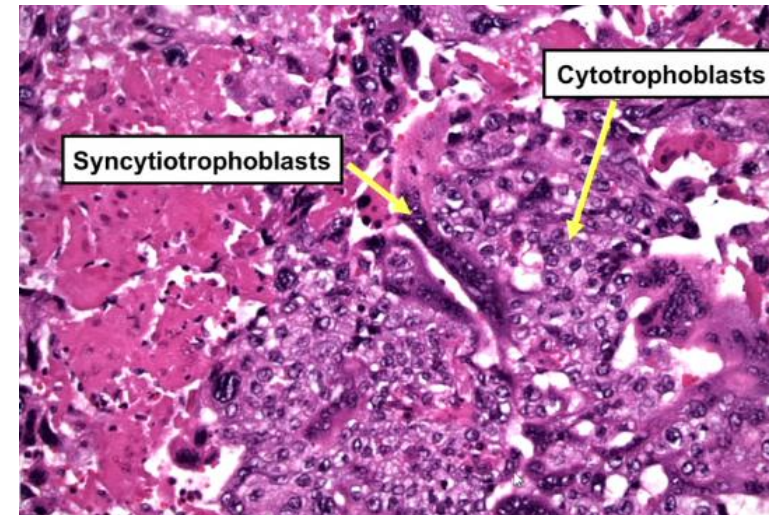
# Dysgerminoma



# Teratoma



# Choriocarcinoma





# Germ Cell

## Dysgerminoma

### Who

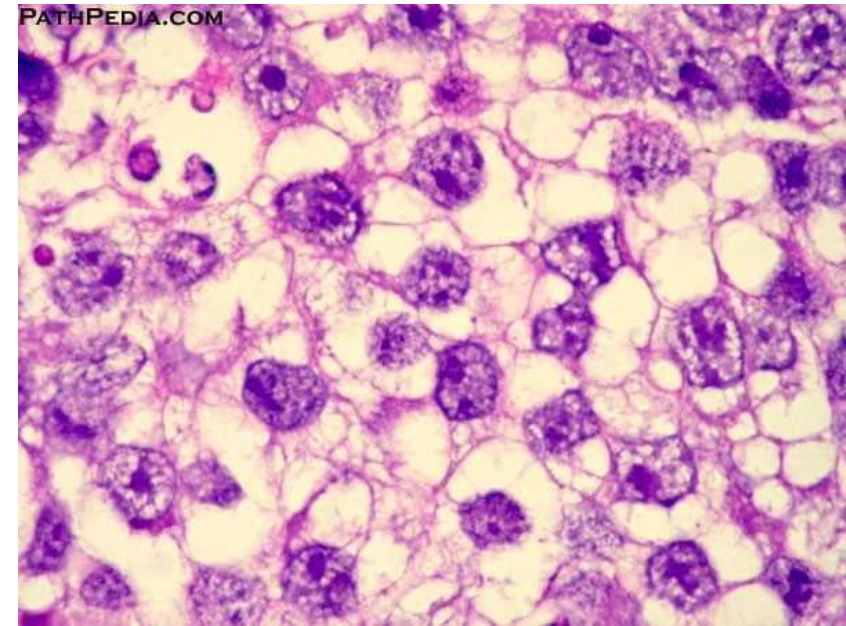
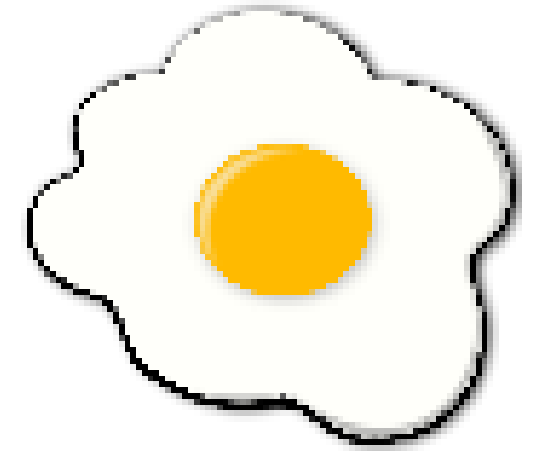
Peak in premenopausal women

### Histology

"Fried eggs" = large cells with clear cytoplasm and large nuclei

### Tumor Markers

PLAP, bhCG, LDH



# Germ Cell

## Yolk Sac (Endodermal Sinus)

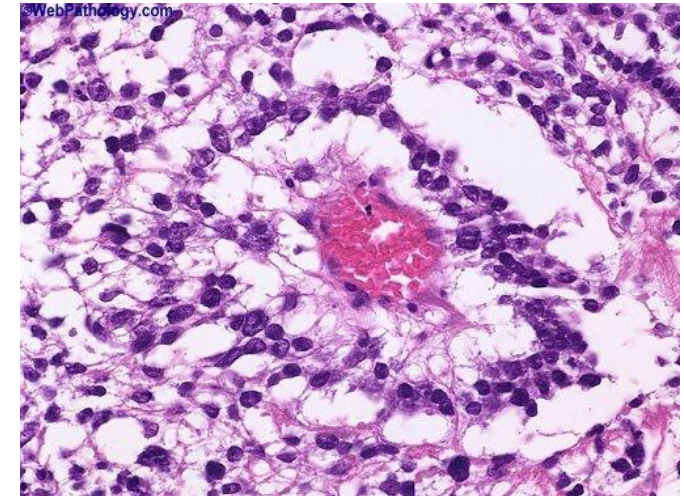
Who

Peak in premenopausal women but will commonly be children in question stems!

Histology

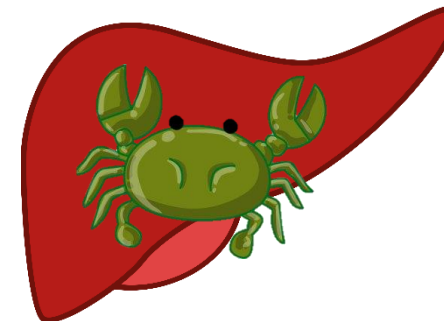
Endodermal Sinuses = Schiller Duval bodies  
Resemble primitive glomeruli

Eosinophilic cytoplasmic globules



Tumor Markers

Alpha fetoprotein



# Ovarian Tumors

## Epithelial

Serous  
Mucinous  
Brenner  
Endometrioid

## Sex Cord

Granulosa Cell  
Sertoli Leydig Cell

Fried Egg Appearance  
Markers: PLAP, HCG, LDH

Schiller-Duval Bodies  
(Primitive Glomeruli)  
Marker: AFP

Trophoblastic Tissue  
Marker: HCG  
Early Hematologic Mets

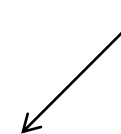
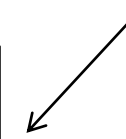
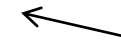
Multiple Germ Cell Layers

## Germ Cell

Dysgerminoma  
Yolk Sac  
Choriocarcinoma  
Teratoma  
Embryonal

## Metastatic

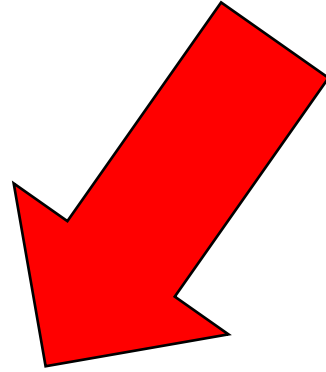
Krukenberg



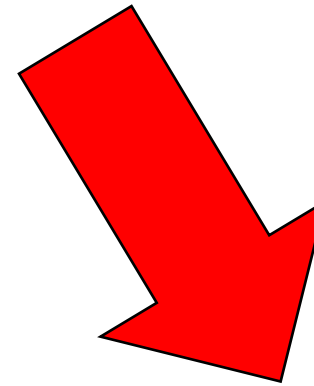


Germ Cell

Teratoma



Mature



Immature

# Mature

# Immature

Elements from >1 germ layers that is well differentiated

Elements from >1 germ layers that is poorly differentiated

Benign

Malignant

Who

Histology

Gross Appearance

Tumor Markers

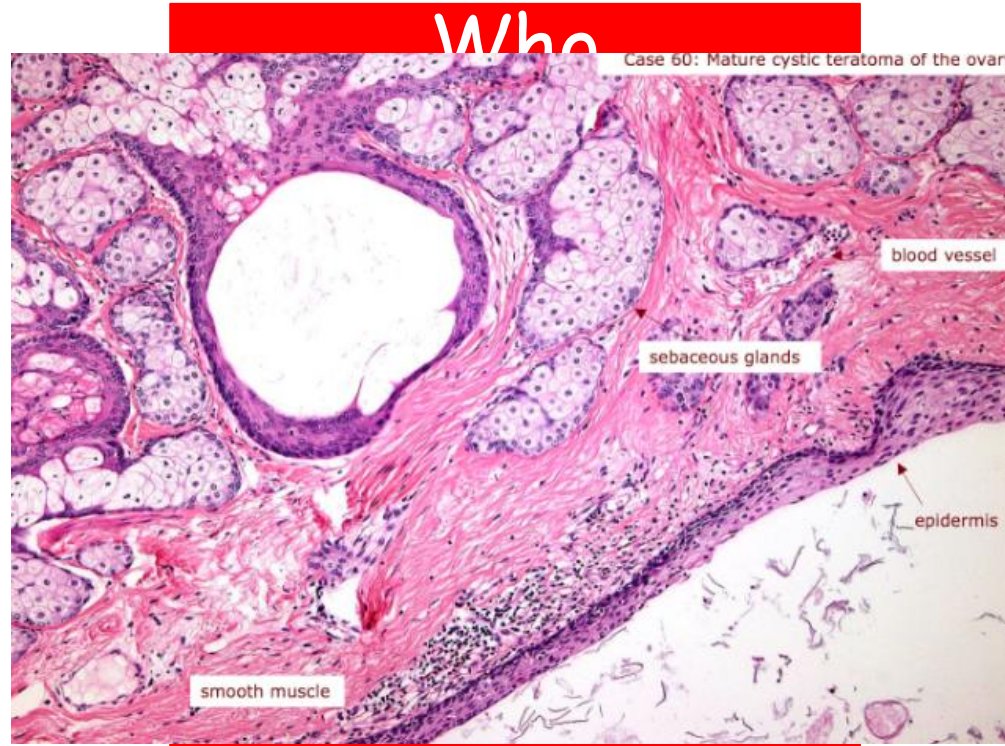
Physiology

# Mature

# Immature

Elements from >1 germ layers that is well differentiated

Elements from >1 germ layers that is poorly differentiated



# Benign

# Physiology

# Malignant

## Germ Cell

# Teratoma

- Malignant transformation can occur in mature teratomas- most commonly squamous cell carcinoma
- Struma ovarii - presents with signs of hyperthyroidism



# Germ Cell

## Choriocarcinoma

Who

Premenopausal women

Histology

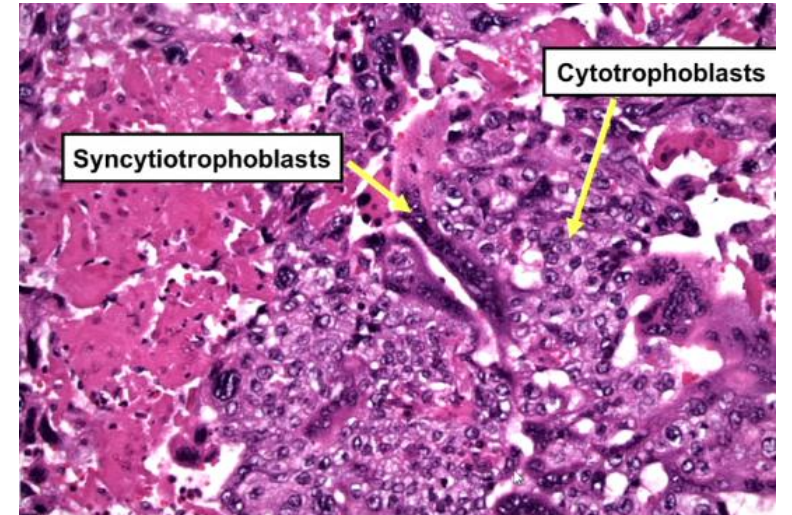
Cytotrophoblasts and syncytiotrophoblasts- they will say this in the question

Gross Appearance

Very small primary tumors

Tumor Markers

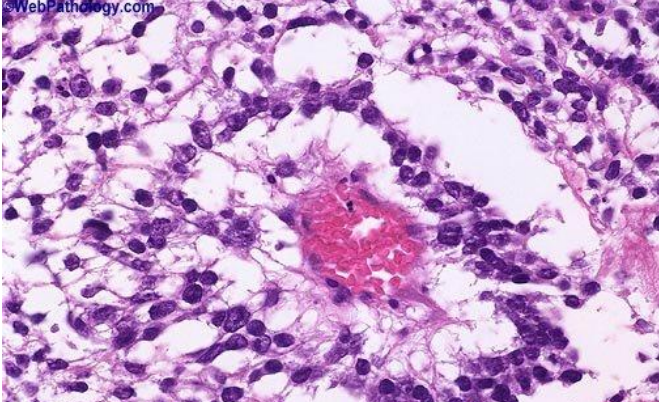
hCG



**Metastasizes early through the blood!**



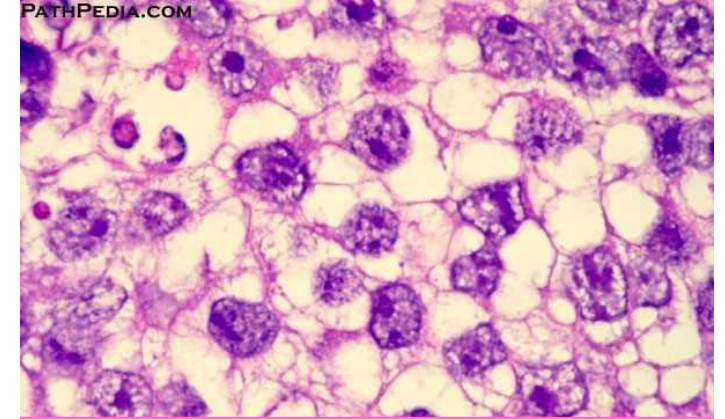
# Yolk Sac



Primitive glomeruli  
(Schiller-Duval)

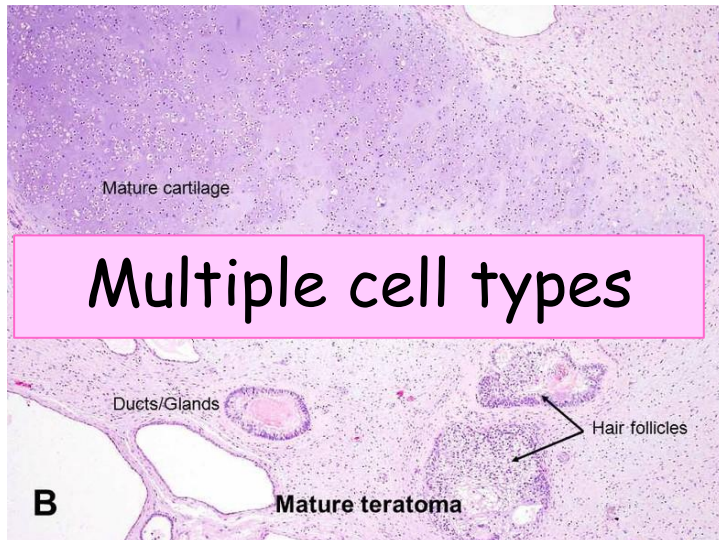
# Germ Cell

# Dysgerminoma



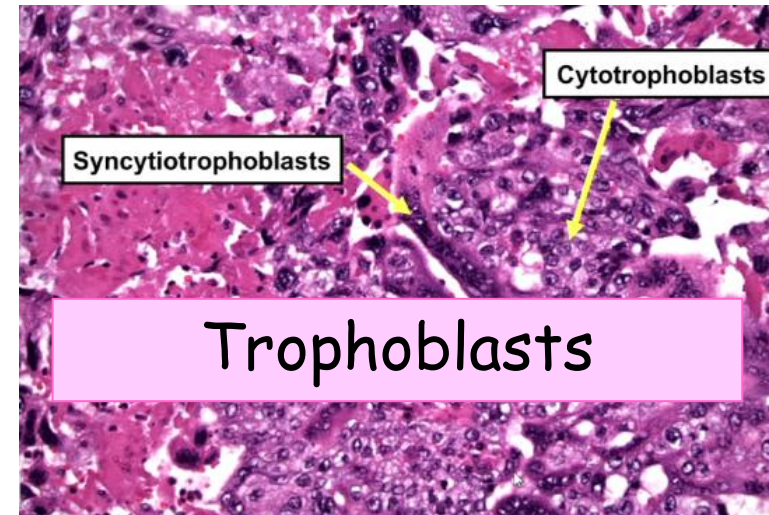
Fried Egg

# Teratoma



Multiple cell types

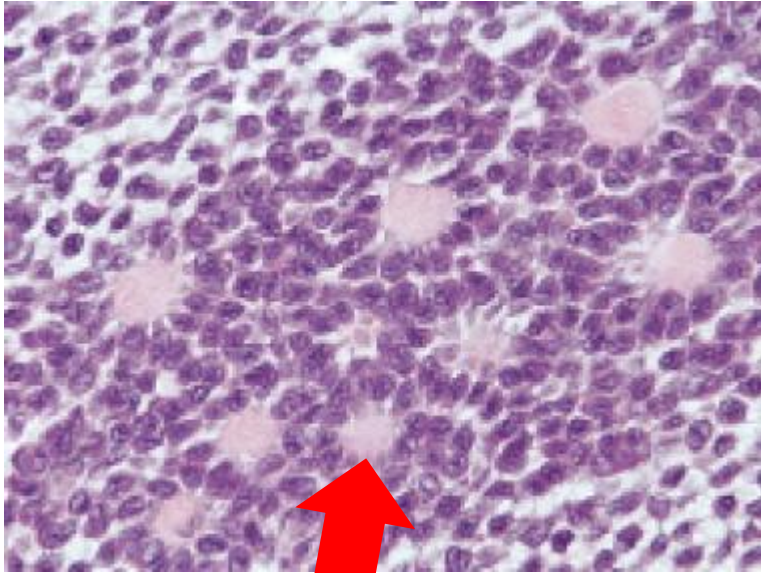
# Choriocarcinoma



Trophoblasts

# Sex Cord

## Granulosa Cell



Call Exner bodies

Who

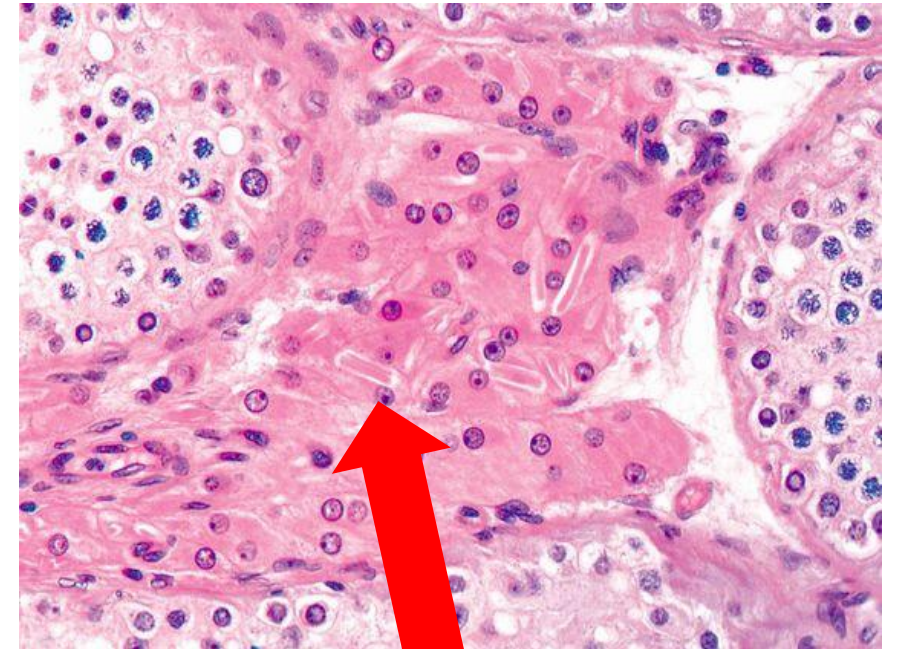
Histology

Gross Appearance

Tumor Markers

Physiology

## Sertoli Leydig Cell



Reinke Crystals



# Sex Cord

## Granulosa Cell

### Who

Mostly perimenopausal but on Step 1 - ANYBODY

### Histology

Call Exner bodies = cuboidal cells in a multifollicular pattern around eosinophilic material

Grooved nuclei - "coffee bean"

### Gross Appearance

Gross yellow appearance because granulosa and theca cells are full of lipids

### Tumor Markers

Estrogen and inhibin

### Physiology

Signs of excess estrogen!  
Post menopausal bleeding or precocious puberty



# Sex Cord

## Sertoli Leydig Cell

Who

Mostly perimenopausal but on Step 1 - ANYBODY

Histology

Hollow or solid tubes surrounded by sertoli cells

Gross Appearance

Gross yellow appearance because leydig cells are full of lipids

Tumor Markers

Androgens

Physiology

Signs of excess androgens!  
Virilization - hair growth, voice deepening

# Ovarian Tumors

## Epithelial

Serous  
Mucinous  
Brenner  
Endometrioid

## Germ Cell

Dysgerminoma  
Yolk Sac  
Choriocarcinoma  
Teratoma  
Embryonal

## Sex Cord

Granulosa Cell  
Sertoli Leydig Cell

Call Exner Bodies (cuboidal cells in a multifollicular pattern), Grooved Nuclei  
Markers: Estrogen, Inhibin  
Physiology: Hyperestrogenism (bleeding, precocious puberty)

Reinke Crystals  
Physiology: ↑ Androgens (virilization, masculinization)

## Metastatic

Krukenberg

# Metastatic

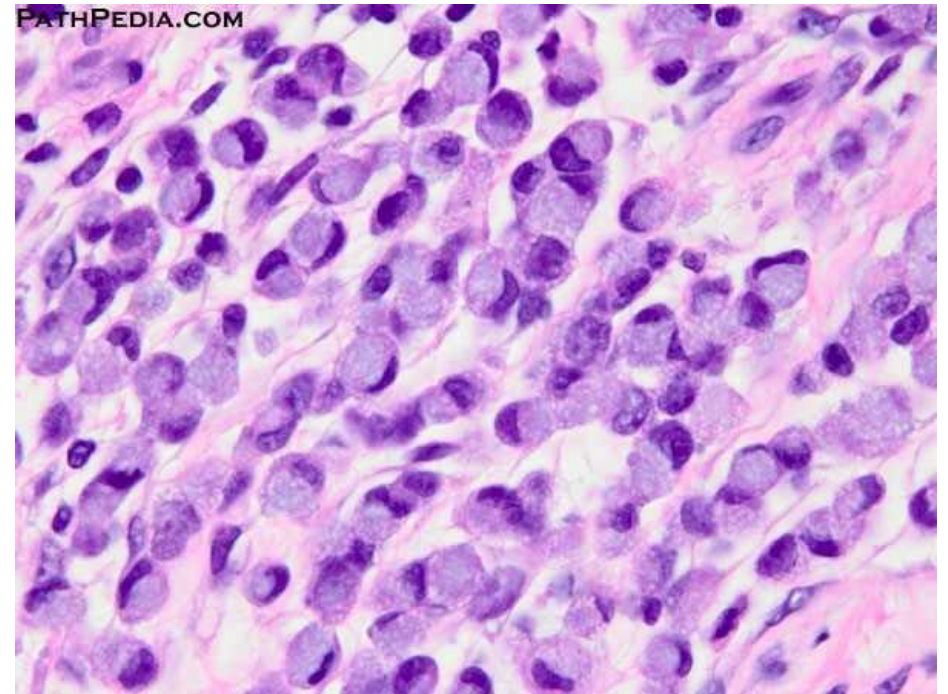
## Krukenberg Tumor

GI adenocarcinoma most commonly **diffuse gastric** that metastasizes to the ovaries

Going back to GI diffuse thickening and leathery stomach wall

### Histology

Signet ring cells = **mucin droplets displacing the nucleus**



# Ovarian Tumors

## Epithelial

Serous

Mucinous

Brenner

Endometrioid

## Sex Cord

Granulosa Cell

Sertoli Leydig Cell

Who

Histology

Gross Appearance

Tumor Markers

Physiology

## Germ Cell

Dysgerminoma

Yolk Sac

Choriocarcinoma

Teratoma

Embryonal

## Metastatic

Krukenberg

# Ovarian Tumors, Summary

## Epithelial

Serous/Mucinous Cystadenocarcinoma:  
Shaggy Appearance  
Psammoma bodies  
Marker: CA-125

## Sex Cord

Granulosa Cell:  
Call Exner Bodies (cuboidal cells in a multifollicular pattern), Grooved Nuclei  
Physiology: Hyperestrogenism  
(bleeding, precocious puberty)

Sertoli Leydig Cell:  
Reinke Crystals  
Physiology: ↑ Androgens  
(virilization, masculinization)

## Germ Cell

Dysgerminoma:  
Fried Egg Appearance  
Markers: PLAP, HCG, LDH

Yolk Sac:  
Schiller-Duval Bodies  
(Primitive Glomeruli)  
Marker: AFP

Choriocarcinoma:  
Trophoblastic Tissue  
Marker: HCG  
Early Hematologic Mets

Teratoma:  
Multiple Germ Cell Layers