

Coming to Terms: The Vocabulary of Reproductive Policy

United Women in Faith

Texas Legislative Conference

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Statement of Conflicts of Interest

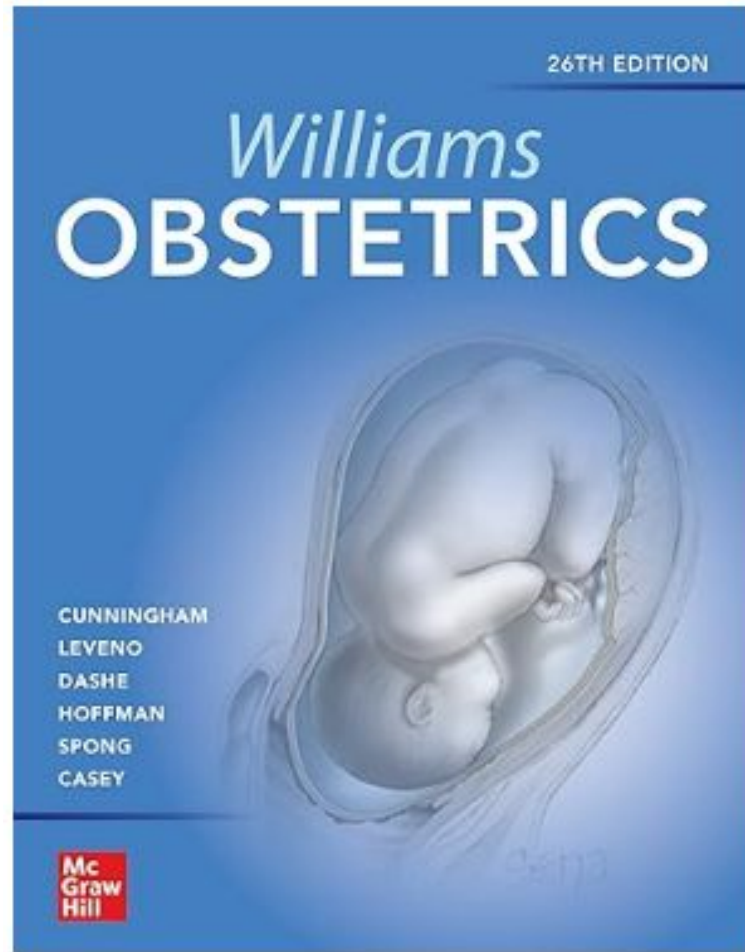
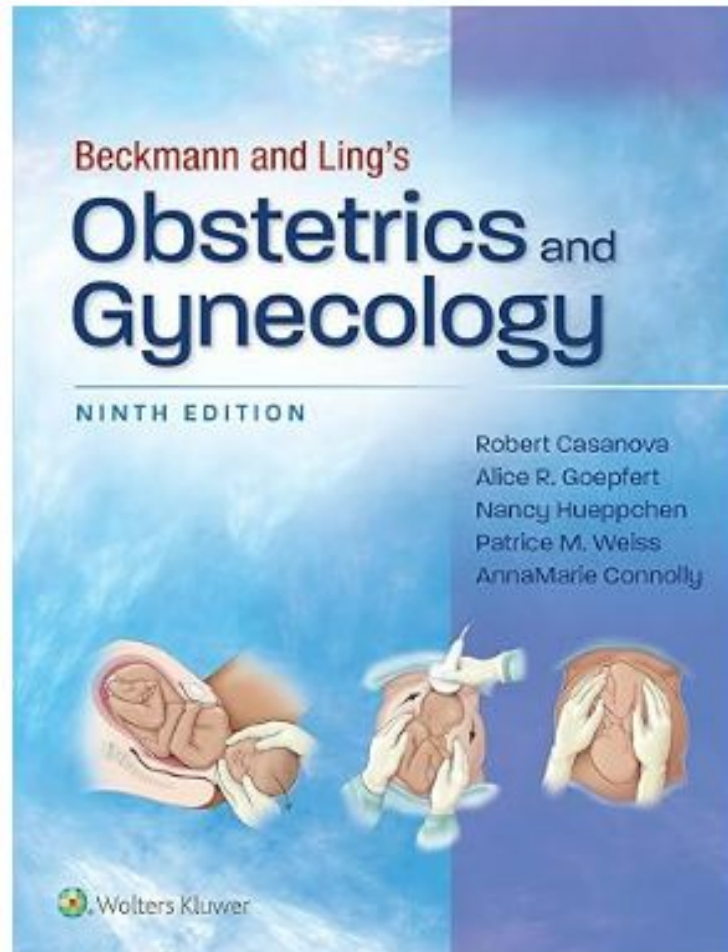
I have no conflicts of interest to disclose

Disclaimer

- This presentation only addresses pregnancy matters
- There are many other “Reproductive Policy” presentations one might need
- This is a lot of material; we will have some time for questions
- The purpose of this presentation is medical education -- not policy or legal discussions

Learning Objectives

- Review basic human reproduction biology
- Describe how to make the diagnosis of pregnancy
- Describe molar pregnancy and gestational trophoblastic disease
- Describe terminology used for complications of early pregnancy and ectopic pregnancy
- Discuss therapeutic options for ectopic pregnancy and spontaneous abortion
- Be aware of ethical and legal issues



Suggested textbooks



Patient information page

<https://www.acog.org/womens-health>

ACOG Guide to Language and Abortion

<https://www.acog.org/-/media/project/acog/acogorg/files/pdfs/publications/abortion-language-guide.pdf>

ACOG Advocacy

<https://www.acog.org/advocacy/abortion-is-essential>

Resources for further study

Beckmann and Ling's Obstetrics and Gynecology 9e

Chapter 19 – Ectopic Pregnancy and Pregnancy Loss

Chapter 26 – Family Planning

Chapter 45 – Gestational Trophoblastic Disease

Williams Obstetrics 26e

Chapter 7 – Embryogenesis and Fetal Development

Chapter 10 – Prenatal Care

Chapter 11 – First- and Second-Trimester Pregnancy Loss

Chapter 12 – Ectopic Pregnancy

Chapter 13 – Gestational Trophoblastic Disease

The challenges of obstetrics and gynecology

Not every pregnancy will become an
infant

A healthy infant for a healthy mother
every time

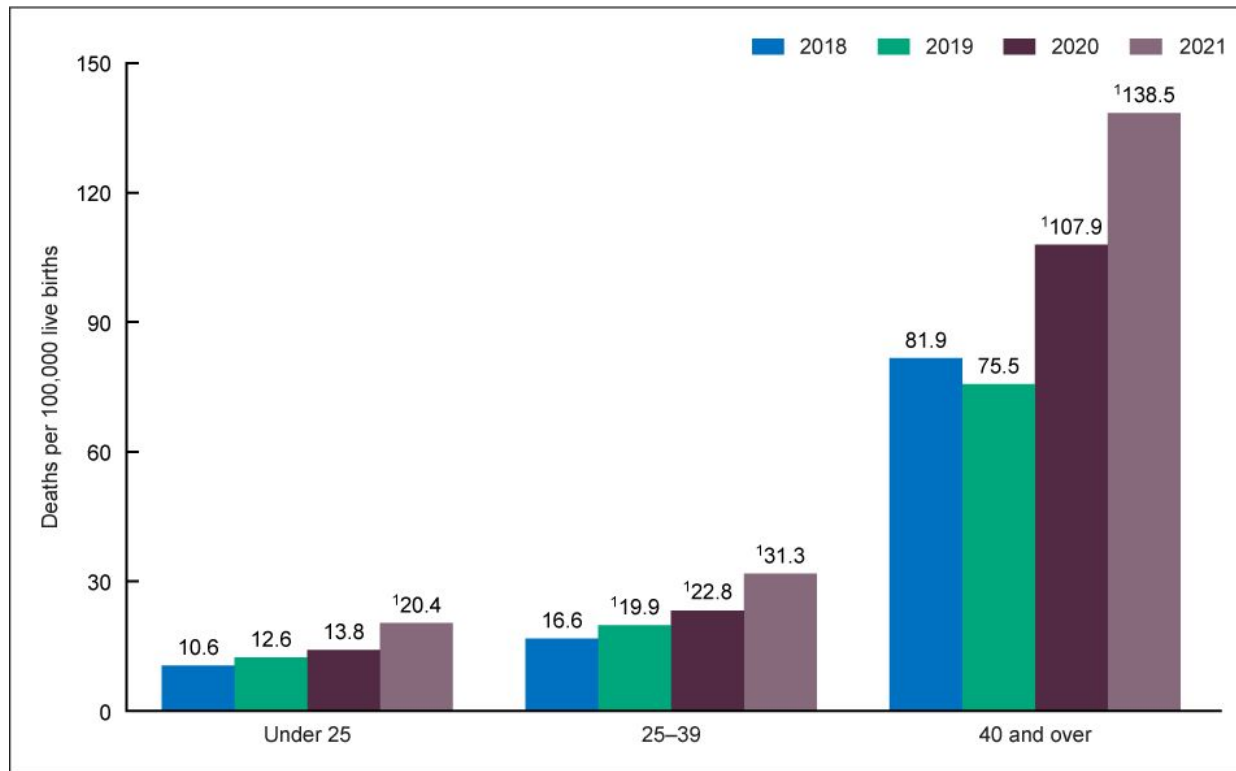
FACTS

Women risk their life with every pregnancy

Risk of death age for a woman aged 25-35 is **9.7/100,000** (CDC for 2020)

Risk of maternal mortality is **22.8/100,000** live births in 2020, and **increasing** (CDC)*

*not directly comparable due to definitions



¹Statistically significant increase from previous year ($p < 0.05$).

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Abortion is safer than delivery

MORBIDITY AND MORTALITY RATES FOR ABORTION VS LIVE BIRTH

	Morbidity	Mortality Rate
<i>Live birth</i>	1.3%-26% more common in live birth vs abortion patients	8.8/100 K
<i>Abortion</i>		0.6/100 K

Overall risk of death from childbirth is 14× higher than from abortion.

Where do “persons” typically come from?

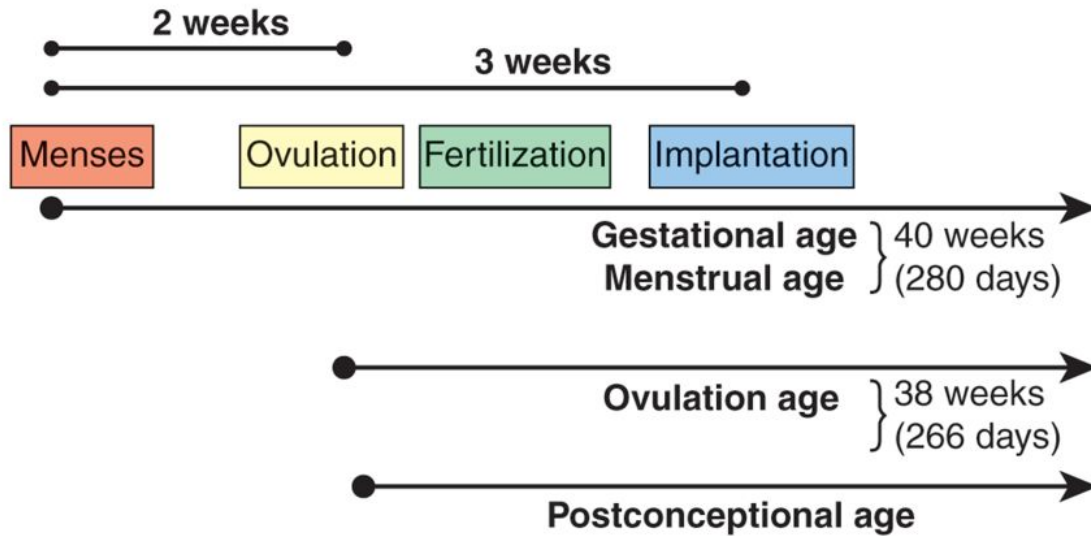
A **mother's** body:

(**abdomen**) ovum gets fertilized => zygote =>
(**fallopian tube**) => various bunches of cells =>
(**uterus**) gestational sac => embryo => fetus =>
(**out of maternal body**) neonate => infant => child => ...

Embryogenesis and Fetal Development

Williams Obstetrics 26e

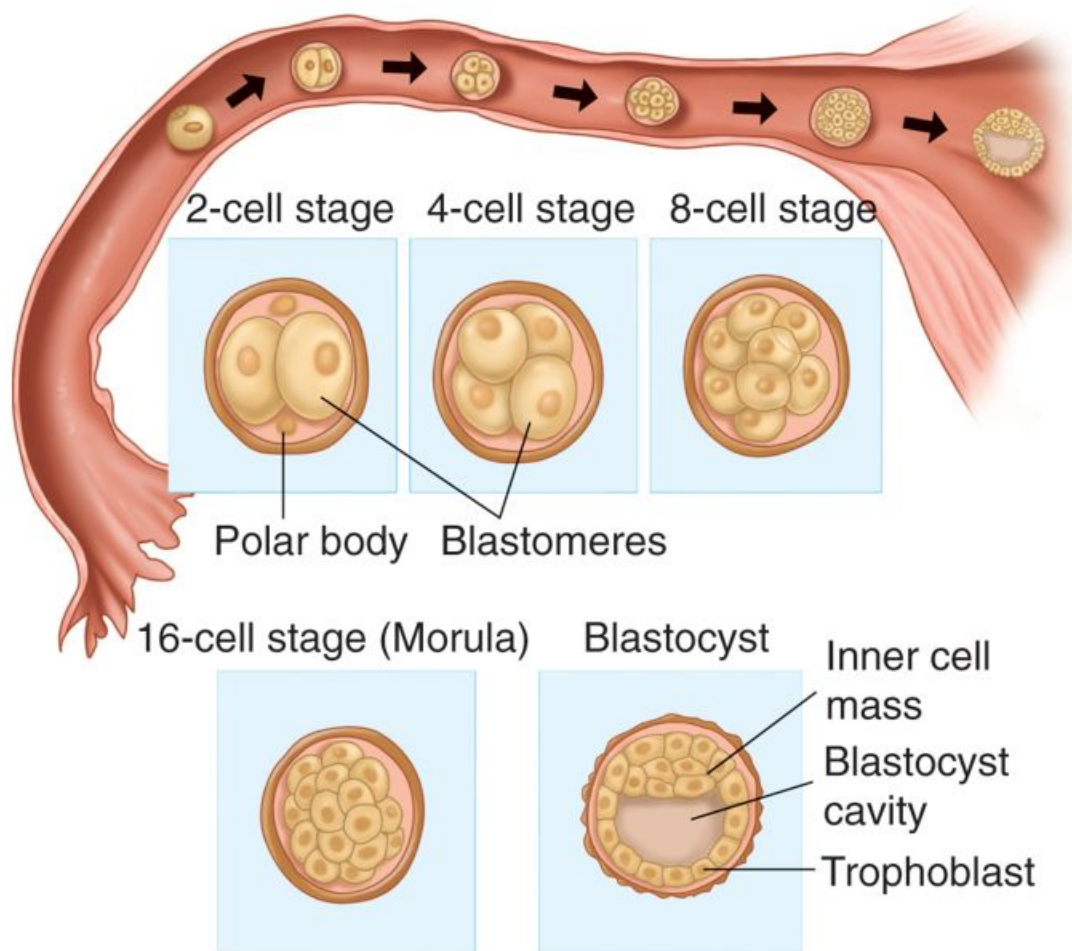
Chapter 7 – Embryogenesis and Fetal Development



Source: F. Gary Cunningham, Kenneth J. Leveno, Jodi S. Dashe, Barbara L. Hoffman, Catherine Y. Spong, Brian M. Casey: *Williams Obstetrics*, 26th Edition
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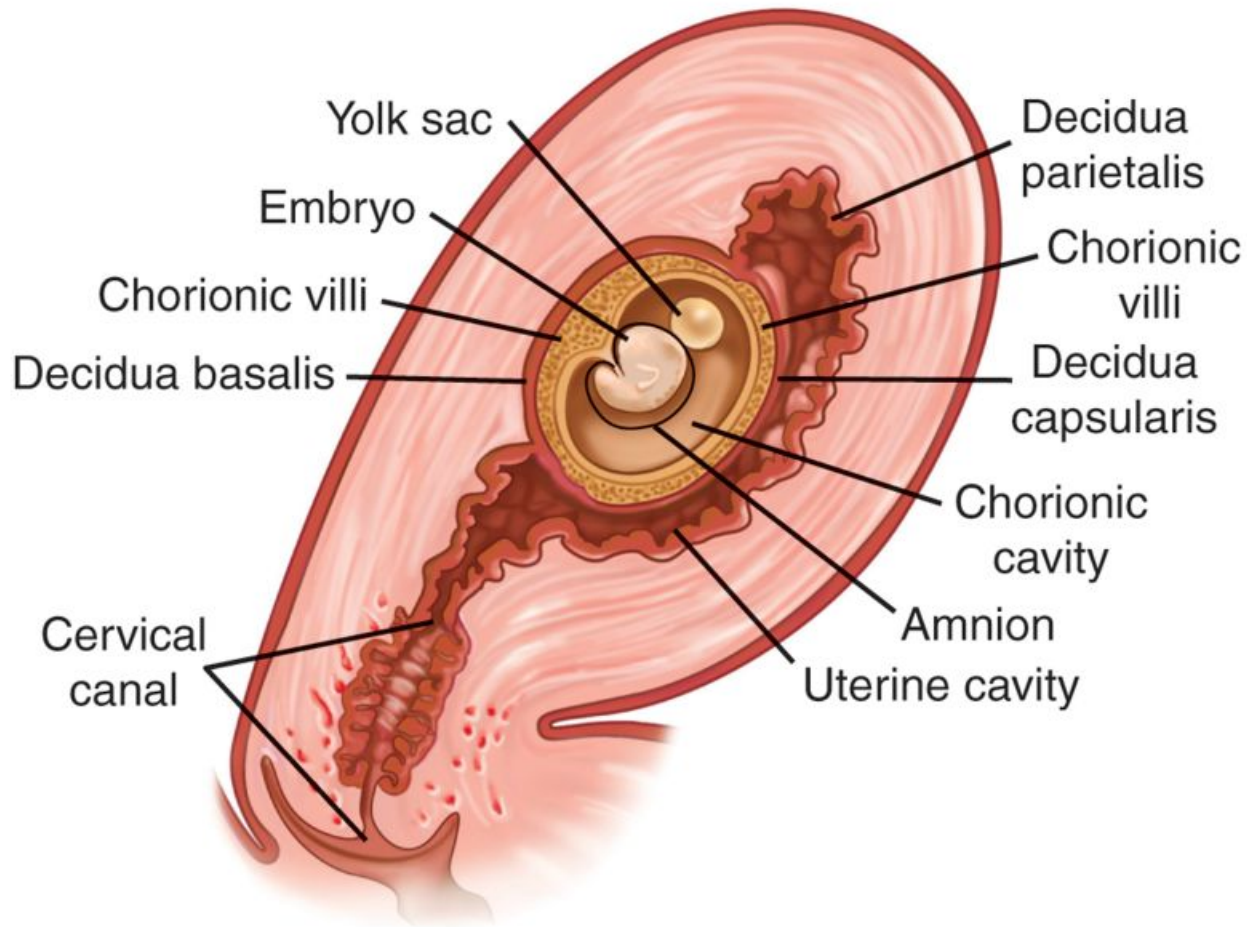
Terminology used to describe pregnancy duration.





Source: F. Gary Cunningham, Kenneth J. Leveno, Jodi S. Dashe, Barbara L. Hoffman, Catherine Y. Spong, Brian M. Casey: *Williams Obstetrics*, 26th Edition
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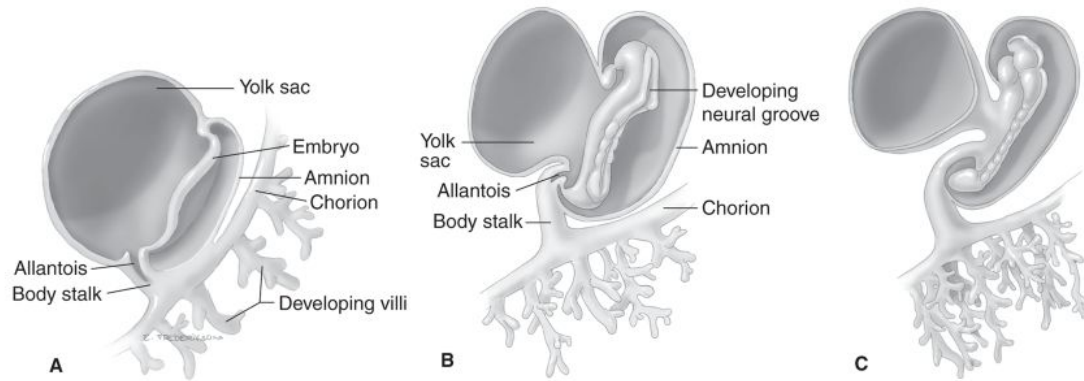
Zygote cleavage and blastocyst formation. The morula period begins at the 12- to 16-cell stage and ends when the blastocyst forms, which occurs when there are 50 to 60 blastomeres present. The polar bodies, shown in the 2-cell stage, are small nonfunctional cells that degenerate.



Source: F. Gary Cunningham, Kenneth J. Leveno, Jodi S. Dashe, Barbara L. Hoffman, Catherine Y. Spong, Brian M. Casey: *Williams Obstetrics*, 26th Edition
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Three portions of the decidua—the basalis, capsularis, and parietalis—are illustrated.

A day or two can make a big difference in early pregnancy



Source: F. Gary Cunningham, Kenneth J. Leveno, Joel S. Dashe, Barbara L. Hoffman, Catherine Y. Spong, Brian M. Casey. *Williams Obstetrics*, 26th Edition. Copyright © McGraw Hill. All rights reserved.

Early human embryos. Ovulation ages: A. 19 days (presomite). B. 21 days (7 somites). C. 22 days (17 somites). (After drawings and models in the Carnegie Institute.)



Embryo versus Fetus:

embryo **before** 8 weeks

> most organs, including the heart are not formed

fetus **after** 8 weeks

> most organs formed, but many continue to develop

Period:	Implantation		Embryonic Period (Organogenesis)						Fetal Period (Growth)											
Weeks	1	2	3	4	5	6	7	8	9	12	16	20	24	28	32	36	38			
Crown-rump length (cm)									6-7	12	16	21	25	28	32					
Weight (g)									110	320	630	1100	1700	2500						
Brain			Neural tube		Hemispheres, cerebellum, ventricles, choroid plexus				Temporal lobe, sulci, gyri, cellular migration, myelination											
Face			Lips, tongue, palate, cavitation, fusion																	
Eyes			Optic cups, lens, optic nerves, eyelids						Brows				Eyes open							
Ears			Canals, cochlea, inner ears, ossicles																	
Pinnae													Pinnae							
Diaphragm			Transverse septum, diaphragm																	
Lungs			Tracheoesophageal septum, bronchi, lobes				Canaliculi				Terminal sacs									
Heart			Primitive tube, great vessels, valves, chambers																	
Intestines			Foregut, liver, pancreas, midgut				Abdominal wall, gut rotation													
Urinary tract			Mesonephric duct		Metanephric duct collecting system				Glomeruli											
Genitalia			Genital folds, phallus, labioscrotal swelling						♂ Penis, urethra, scrotum				♀ Clitoris, labia							
Axial skeleton			Vertebral cartilage, ossification centers																	
Limbs			Buds, rays, webs, separate digits																	
Skin									Fingernails		Vernix		Lanugo hair							

Source: F. Gary Cunningham, Kenneth J. Leveno, Juli S. Dashe, Barbara L. Hoffman, Catherine Y. Spong, Brian M. Casey. *Williams Obstetrics*, 26th Edition. Copyright © McGraw Hill. All rights reserved.

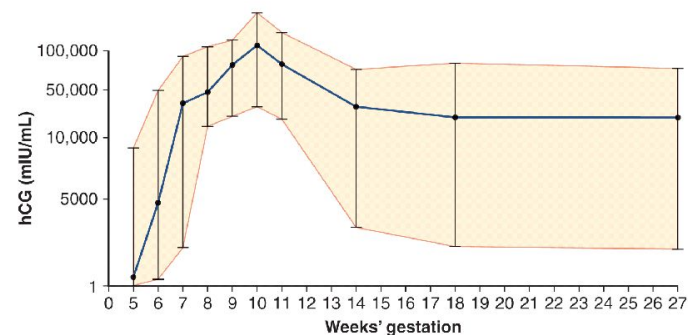
Embryofetal development according to gestational age determined by the first day of the last menses. Times are approximate.



Review Diagnosis of Pregnancy

- Symptoms (history)
 - **Amenorrhea** (missed period)
 - ? reliability ?
 - Perception of movement -- varies
 - Breasts
- Signs (physical exam)
 - Lower reproductive tract
 - Breasts
 - Uterus
- Laboratory tests
 - **Human chorionic gonadotropin (hCG)** is the pregnancy test
 - From syncytiotrophoblasts
 - 8-9 days after ovulation
 - Peak at 60-70 days
 - Home test sensitivities vary
- Imaging (**sonography/ultrasound**)
 - Gestational sac @ 4-5 weeks
 - Yolk sac mid 5th week
 - Embryo \geq 6 weeks

hCG and weeks' gestation



Source: 1. Case (1998), 2. Case (1998), 3. Case (1998), 4. Case (1998), 5. Case (1998), 6. Case (1998), 7. Case (1998), 8. Case (1998), 9. Case (1998), 10. Case (1998), 11. Case (1998), 12. Case (1998), 13. Case (1998), 14. Case (1998), 15. Case (1998), 16. Case (1998), 17. Case (1998), 18. Case (1998), 19. Case (1998), 20. Case (1998), 21. Case (1998), 22. Case (1998), 23. Case (1998), 24. Case (1998), 25. Case (1998), 26. Case (1998), 27. Case (1998)

Review Gravity/Parity (Gs & Ps)

- G/T P A L

G = Number of times pregnant

P = Parity (number of deliveries)

- T= Term (>37 weeks)

- P= Preterm (20-37 weeks)

- A= Abortions (<20 weeks)+ectopic

- L= Living children (**not** live births)

Gravidity/Parity -- Examples

- **G** pregnancies / **T**erm delivery **P**reterm delivery **A**bortion **L**iving children
 - G0P0 = never pregnant
 - G1P0 = first pregnancy
 - G1P1001=currently not pregnant, term delivery, living child
 - G1P1000=currently not pregnant, stillbirth at term
 - G2P1001 = second pregnancy, one prior term delivery
 - G3P0030 = not pregnant with 3 abortions prior to 20 weeks (could be spontaneous, elective, or ectopic)

What is a pregnancy?

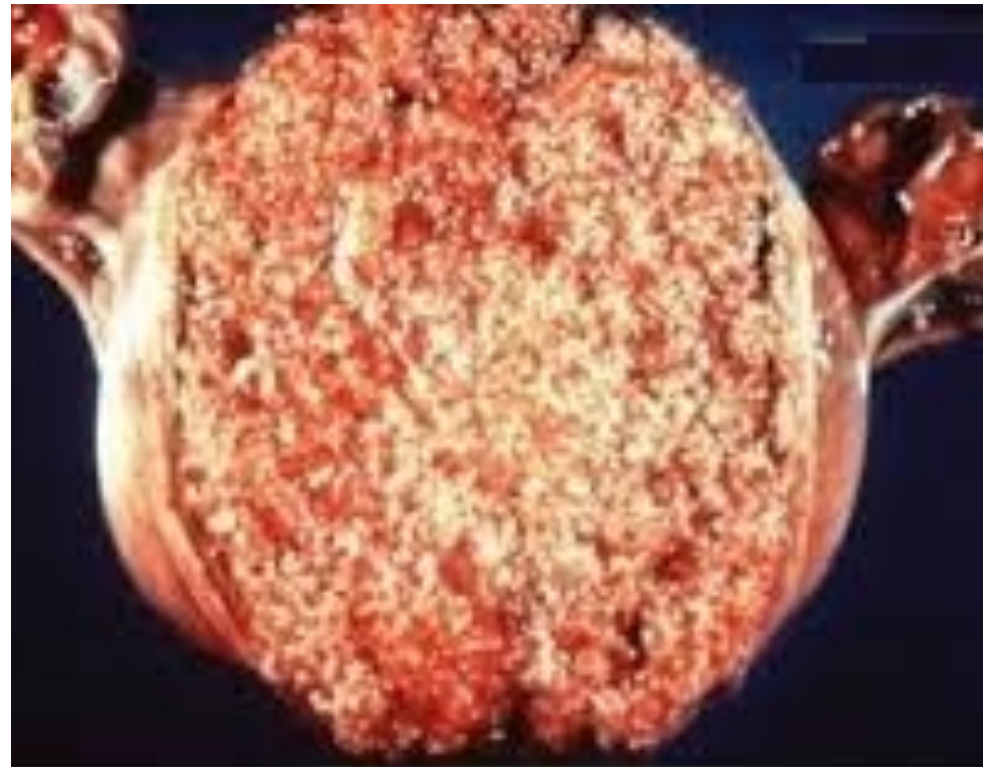
A fertilized ovum with normal development into embryo=> fetus=> neonate/infant

Pregnancy test is part of the diagnosis



Both are pregnancies

One is a baby



complete Molar Pregnancy

Gestational Trophoblastic Disease (GTD)

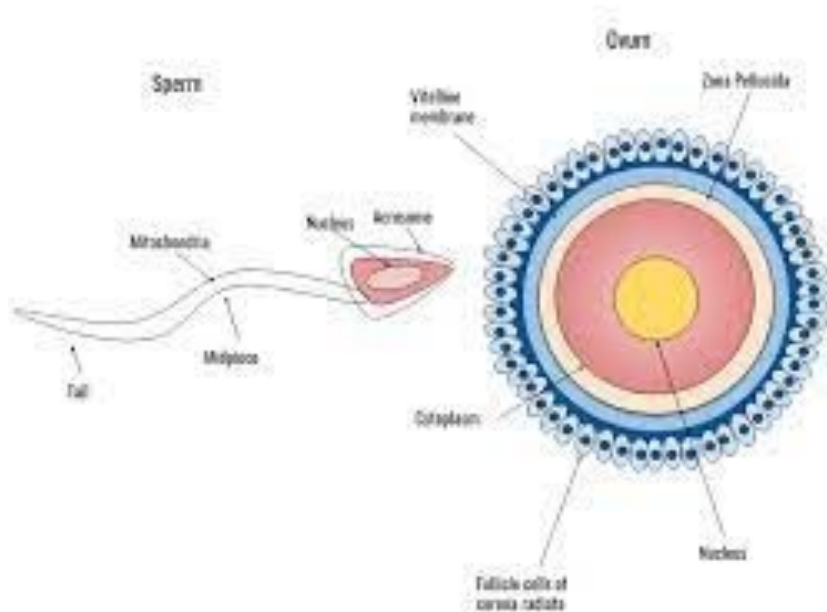
Resource:

Beckmann and Ling's Obstetrics and Gynecology 9e,
Chapter 45 – Gestational Trophoblastic Disease

Williams Obstetrics 26e,

Chapter 13 – Gestational Trophoblastic Disease

Normal fertilization

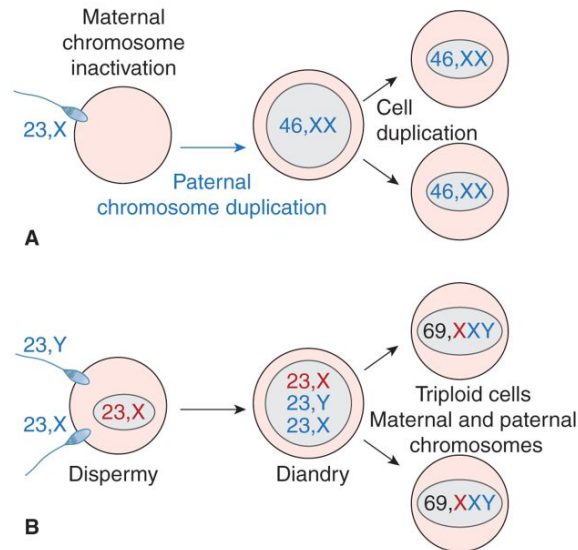


- One sperm with chromosomes
 - 23 **single set** ($\frac{1}{2}$ total after meiosis – can be X **or** Y)
- One ovum with chromosomes
 - 23 **single set** ($\frac{1}{2}$ total after meiosis – **all** are X)
- Total = 23 **pairs** of chromosomes (male is 46,XY; female is 46,XX)
 - $\frac{1}{2}$ of all genetic material from mother
 - $\frac{1}{2}$ genetic material from father

Gestational Trophoblastic Disease

NOT normal fertilization

Pregnancy test => **tumor** marker

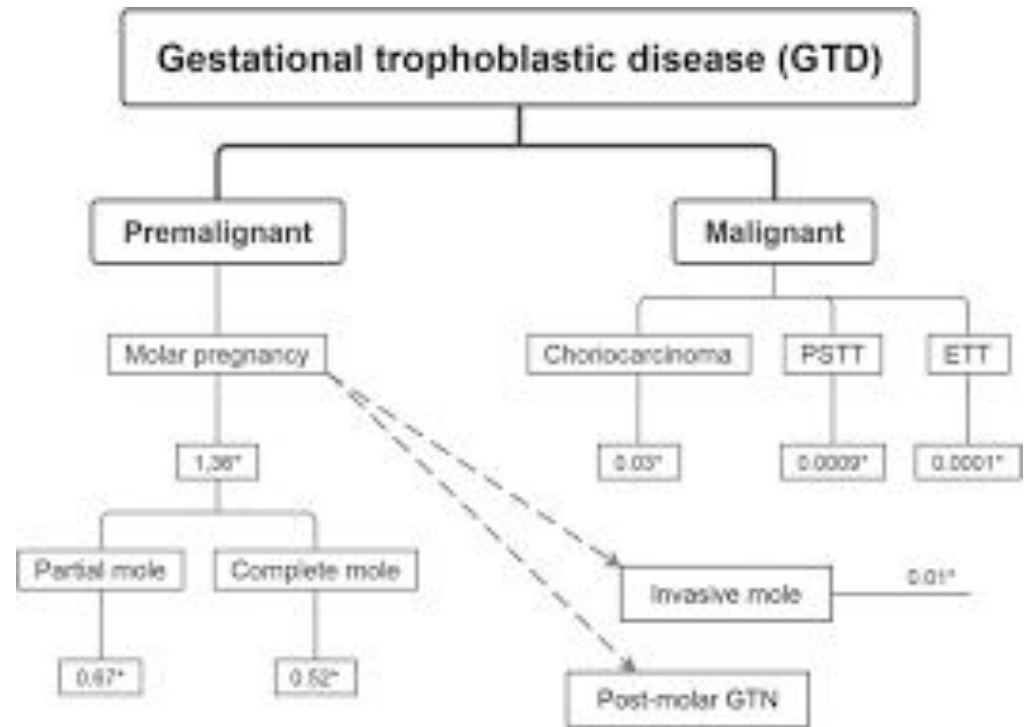


Source: F. Gary Cunningham, Kenneth J. Leveno, Joel S. Dashe, Barbara L. Hoffman, Catherine Y. Spong, Brian M. Casey, William Obermiller, 25th Edition
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Typical pathogenesis of complete and partial moles. A. A 46,XX complete mole may be formed if a 23,X-bearing haploid sperm penetrates a 23,X-containing haploid egg whose genes have been "inactivated." Paternal chromosomes then duplicate to create a 46,XX diploid complement solely of paternal origin. B. A partial mole may be formed if two sperm—either 23,X- or 23,Y-bearing—both fertilize (dispermy) a 23,X-containing haploid egg whose genes have not been inactivated. The resulting fertilized egg is triploid with two chromosome sets being donated by the father (diandry).

GTD

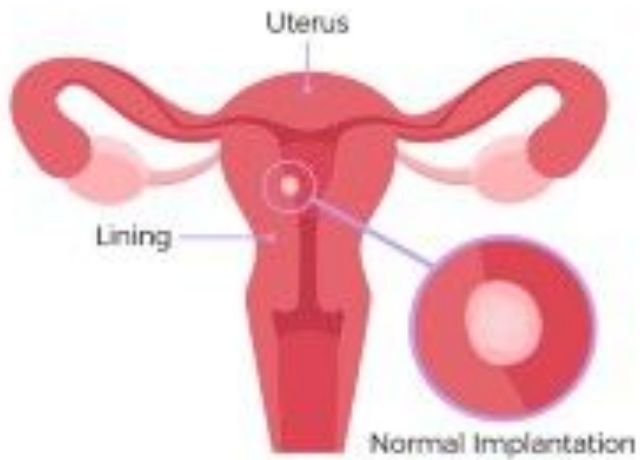
- **Complex** disease; can be **MALIGNANT CANCER**
- **Potentially fatal for the mother**, even if it is not **MALIGNANT**
- **Early correct diagnosis** is important
- **Difficult** to differentiate from early pregnancy complications
- **Tissue needed**, followed by genetic studies, close follow up



Early pregnancy

About 6-8 weeks

Normal Pregnancy



Molar Pregnancy

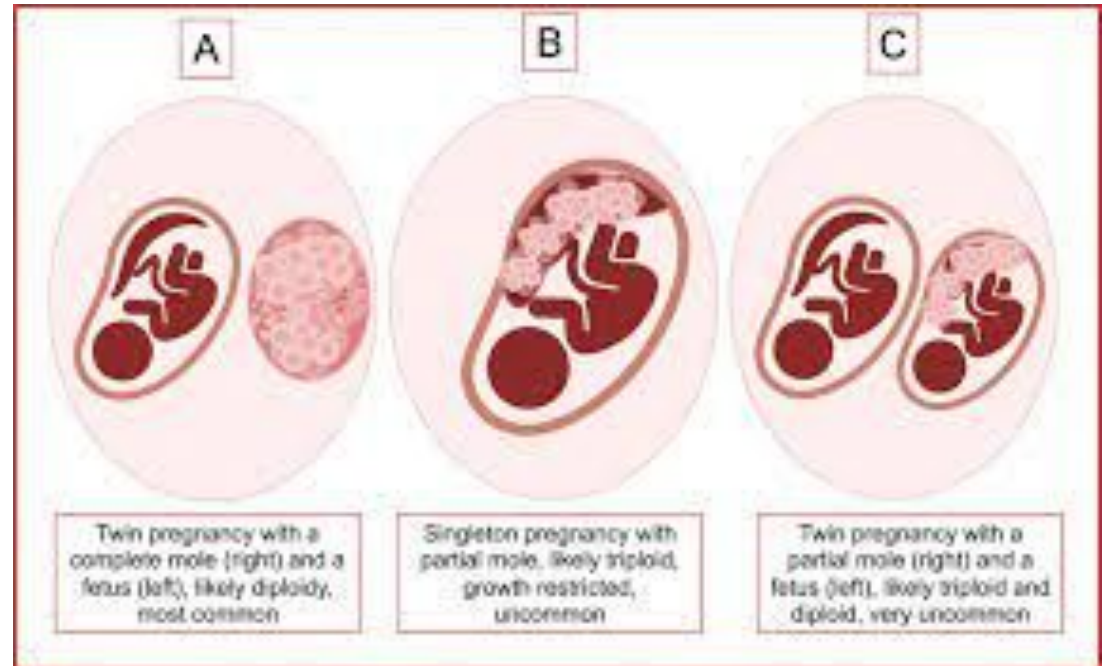
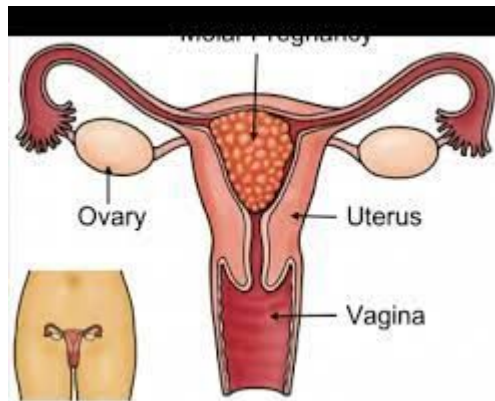


Sometimes there is an embryo/fetus

A > fetus + mole

B > partial mole
(abnormal fetus)

C > twin with normal fetus
+ partial mole



GTD: Treatment

- Diagnosis
 - hCG elevated (due to excessive placental tissue)
 - Sonography has a specific pattern MOST of the time; very confusing in early pregnancy and twins
 - Difficult to differentiate from bleeding seen with spontaneous abortion
- **D&C (dilation and curettage)**
 - removal
 - tissue for accurate diagnosis
- **Methotrexate** (prevents/interrupts trophoblasts)=> first line chemotherapy agent

Ectopic Pregnancy

Resource:

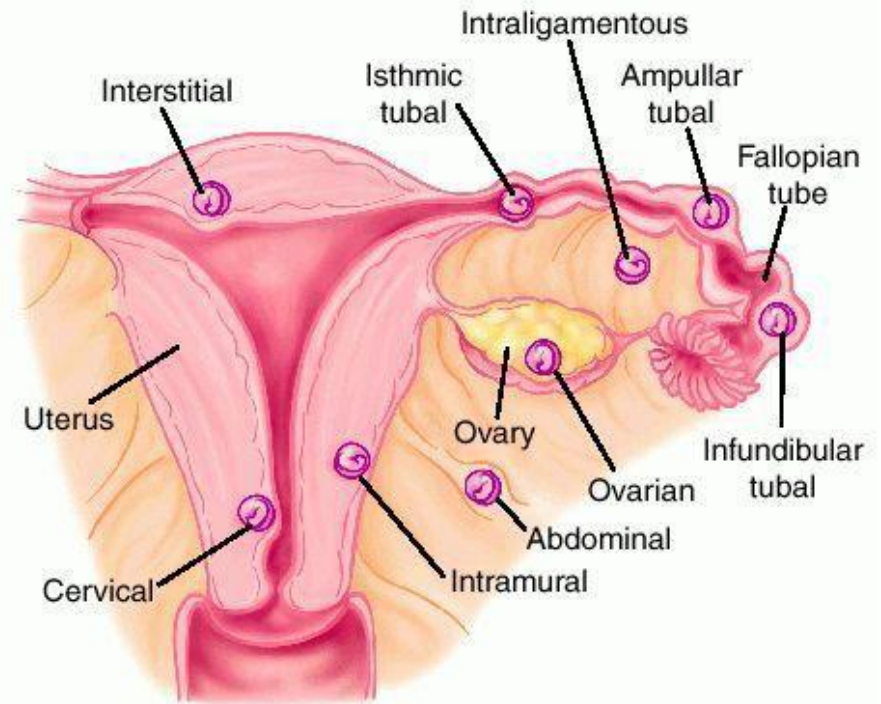
Beckmann and Ling's Obstetrics and Gynecology 9e,
Chapter 19 – Ectopic Pregnancy and Pregnancy Loss
Williams Obstetrics 26e,
Chapter 12 – Ectopic Pregnancy

Ectopic: definitions

- Extrauterine pregnancy, make up 2% of pregnancies

- Location

- Fallopian Tube (95%):
 - **Ampullary (70%)**
 - Fimbria (11%)
 - Isthmus (12%)
 - Interstitial/cornual (2.4%)
- Ovarian (3.4%)
- Abdominal (1.3%)
- Cervical (<1%)



- Risk Factors: Pelvic inflammatory disease, hx tubal surgery, prior ectopic, ART, smoking, history of abdominal/pelvic surgery

Ectopic: diagnosis (labs)

Normal Serum hCG:

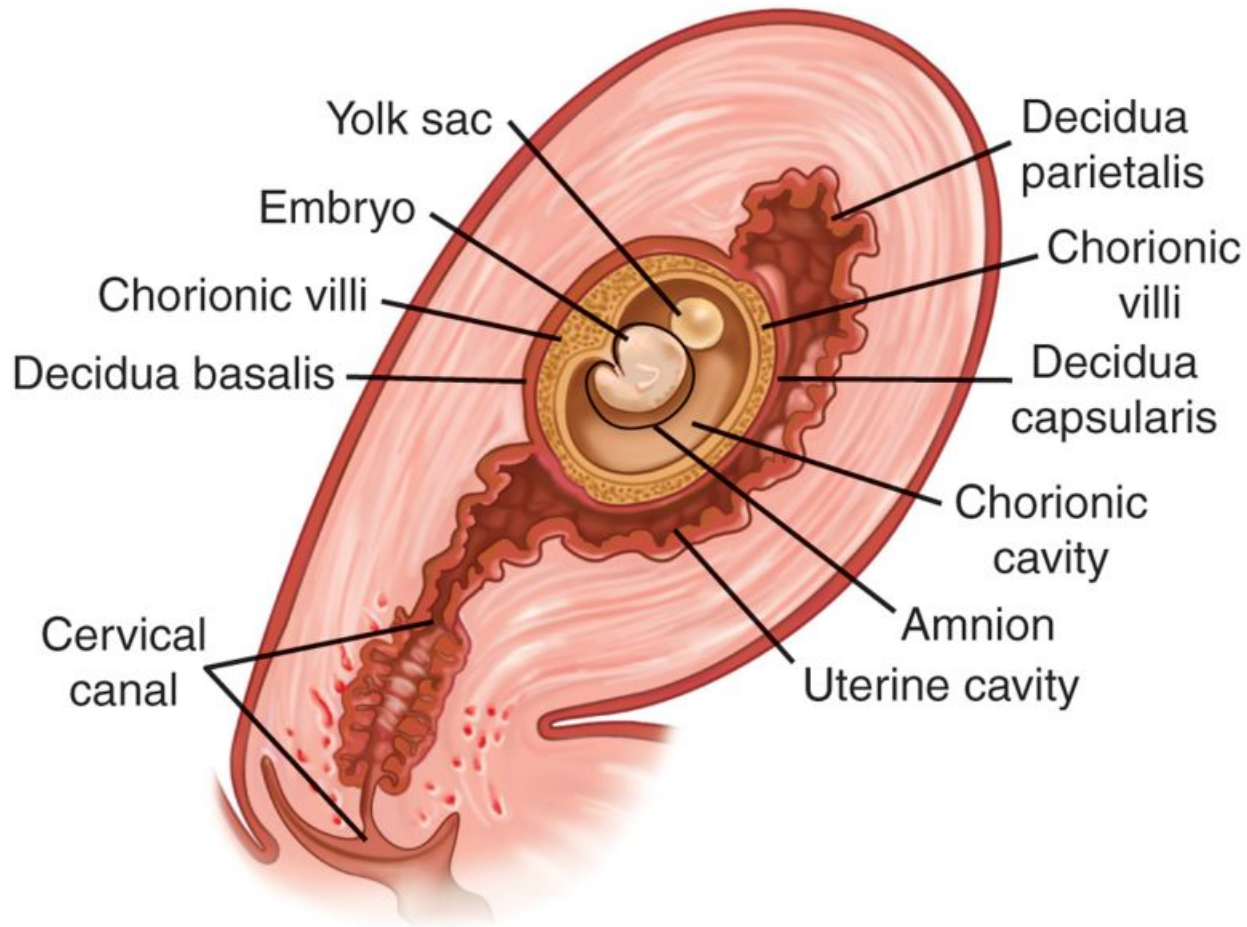
- Detected as early as 8d after LH surge
- Plateaus 60-80d; \uparrow by 53-66% q48 hrs (think about it as doubling every 2d)

Serum progesterone (**not often used clinically**):

- <5 ng/ml \rightarrow dying pregnancy (Sp 100% that it is abnormal)
- >20 ng/ml \rightarrow healthy pregnancy, yet it is commonly 10-20 ng/ml

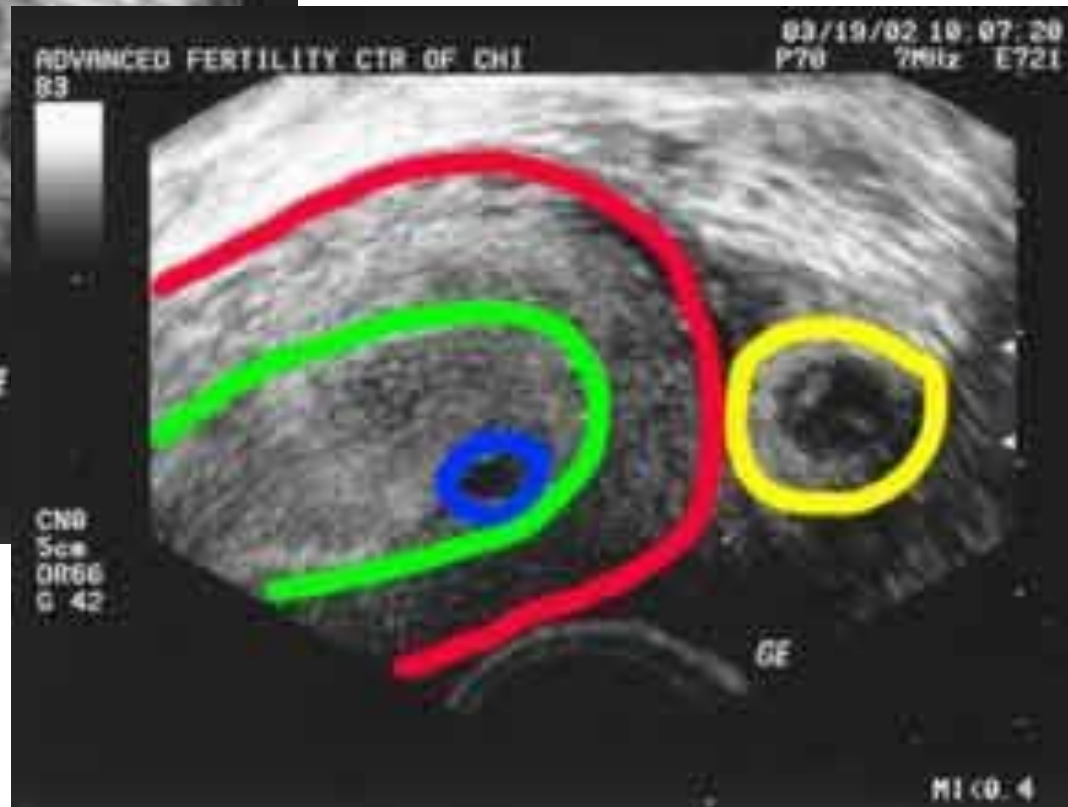
Ectopic: Diagnosis (imaging)

- Discriminatory value: lowest hCG able to see IUP (~1500-2000 IU/L)
- Normal IUP:
 - Gestational sac at 4.5-5 wks (double echogenic rings)
 - Yolk sac at 5-6 wks, hCG 7,200 IU/L
 - Fetal pole at 5.5-6 wks, hCG >10,800 IU/L
 - Cardiac activity at 5.5-6 wks, hCG >5,000 IU/L
- Identifiable IUP essentially rules out ectopic
 - Yet ... don't forget about a **heterotopic!**



Source: F. Gary Cunningham, Kenneth J. Leveno, Jodi S. Dashe, Barbara L. Hoffman, Catherine Y. Spong, Brian M. Casey: *Williams Obstetrics*, 26th Edition
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Three portions of the decidua—the basalis, capsularis, and parietalis—are illustrated.



Uterus outlined red
Uterine lining green
Tubal ectopic pregnancy yellow
Fluid in uterus at blue circle is a "pseudosac"
Looks like early pregnancy sac, but is not



Tubal ectopic pregnancy sac circled in red



4.5 mm fetal pole (between cursors) in green

Pregnancy yolk sac blue

Ectopic: Medical Treatment=>

methotrexate

- Who is a candidate (success rate)?
 - hCG <5k (92%), ectopic sac <3.5cm (93%), no FHR
 - Patient reliability and access to ER
- Absolute contraindications
 - Breastfeeding, immuno-deficient, liver or renal disease, blood dyscrasia (BM disease, leukopenia, low platelets, severe anemia), allergy to MTX, active pulmonary disease, peptic ulcer disease
- Relative contraindications
 - Ectopic sac >3.5cm, cardiac activity

Ectopic: Medical

Treatment

- **Methotrexate (MTX)**, 50mg/m² IV
 - Folic acid antagonist: inhibits DNA synthesis, irreversibly binds to DHFR, renally cleared
 - SE: n/v, stomatitis, diarrhea, gastritis, elevated LFT
- Regimen
 - IM is day 1, **check hCG on day 4 & 7**
 - Should see 15% decrease by day 7, if not, re-dose
 - Weekly hCG until hCG < 15

Ectopic: Surgical Treatment

- * Salpingectomy
- * Salpingostomy

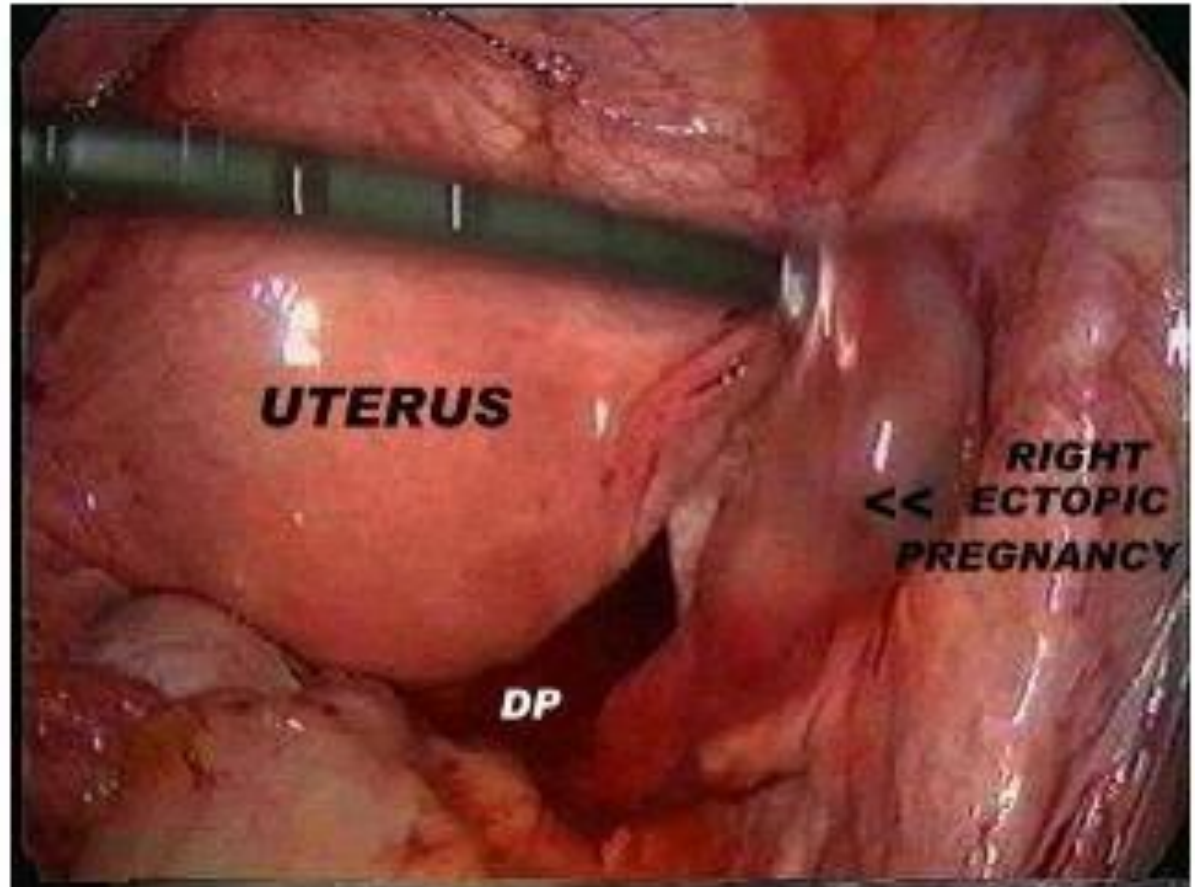


Figure 12:
Right Ectopic Pregnancy

Ectopic Pregnancy

Ethical and Legal implications

- Definitions vary from state to state
- As of September, 2017 management of ectopic pregnancy is allowed under **Texas law** (i.e. explicitly NOT an elective abortion), but the definition is “**outside of the uterus**”
- As of September, 2023 diagnosis of ectopic pregnancy at any location is an **affirmative defense** in a court case (**might still be sued or charged with a felony**)
- Texas has some very specific statutes regarding the use of **methotrexate** in pregnancy

Abortion

Resources: *Beckmann and Ling's Obstetrics and Gynecology 9e*,
Chapter 19 – Ectopic Pregnancy and Pregnancy Loss
Chapter 26 – Family Planning

Williams Obstetrics 26e,
Chapter 11 – First- and Second-Trimester Pregnancy Loss

Abortion: definitions

1. Spontaneous (sometimes called miscarriage)
5 subtypes – **some have “heartbeats”**

2. Induced (caused by medical intervention) – As of 2022, **NOT ALLOWED, UNLAWFUL IN TEXAS, with SOME exceptions**

Abortion: definitions

Spontaneous (sometimes called miscarriage)

- Threatened: closed os, vaginal spotting/bleeding
 - VB seen in 20-25% of early gestation, 50% of these will abort
- Inevitable: cervical dilation, gross ROM, bleeding
- Incomplete: os open, POC not all expelled
- Missed: demised fetus, POC retained, closed os
- Septic: infection present; +/- embryonic or fetal death

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- Missed
- Septic: infection present; +/- embryonic or fetal death

Medical intervention is indicated in these cases, but new Texas laws call into question if they are legal exceptions

Abortion: Facts

- Pregnancy termination is a reproductive option
- Indications
 - Fetal anomalies
 - Maternal disease or illness
- Safe abortions are associated with lower maternal morbidity and mortality
- Risk of death from childbirth is 14 times greater than from abortion
 - Maternal mortality ratio:
 - Live birth => 8.8/100,000
 - Abortion => 0.6/100,000

Spontaneous AB: Facts

- Incidence ranges from 15-25%; higher (80%) in earlier weeks
- Approximately 20% of pregnancies fail very early – *biochemical pregnancy losses* are clinically silent
- About 50% are due to chromosomal abnormalities, but there are other causes
- **MUST** know patients blood type, Rh status – **Rho(D) immune globulin** (RhoGam, etc.) may be indicated, depending on GA at a “mini” dose (50 mcg vs. 300 mcg)

Early Spontaneous AB: Sonography/Ultrasound (US)

Facts

- US to view fetus – due to abortion laws in Texas, strict guidelines need to be followed
 - hCG levels correlating to US findings
 - hCG 1,500 → should see a gestational sac
 - hCG 2,500 → should see a fetal pole
 - hCG 10,000 → should see a heartbeat
 - 5-10-20 Rule
 - Crown rump length >5mm → should see a heartbeat
 - Gestational sac >10mm → should see a yolk sac
 - Gestational sac >20mm → should see an embryonic pole

Early Spontaneous AB: Practices

- US imaging combined with hCG levels...many practices have a deliberately higher “discriminatory value” of 3,500 IU/L to avoid disrupting a potentially normal pregnancy
 - hCG levels correlating to US findings
 - hCG 1,500 → should see a gestational sac
 - hCG 2,500 → should see a fetal pole
 - hCG 10,000 → should see a heartbeat
 - 5-10-20 Rule
 - Crown rump length >5mm → should see a heartbeat
 - Gestational sac >10mm → should see a yolk sac
 - Gestational sac >20mm → should see an embryonic pole

Incomplete/Inevitable/Missed AB: Management

- Surgical*
 - Definitive treatment
 - Dilation and curettage (suction)
 - Medical*
 - Avoid surgery yet not wait for passage
 - **mifepristone+misoprostol**; 70-90% expulsion rate (superior to misoprostol alone)
 - Methergine (rarely used for early loss)
 - Expectant*
 - Not desire treatment, often expel within 1-2wk
- * Remember to check Rh status

Induced abortion: Medical vs Surgical

Not legal in Texas

Feature	Medical	Surgical
Invasive	No	Yes
Sedation	No	Yes
Time to complete	Days to weeks	Predictable period
Success rate	95%	99%
Heavy bleeding	No	Yes
Requires follow up	Yes	No
Multi-step	Yes	No

Induced abortion: Medical Treatment

Not legal in Texas

Regimen	Success Rate (%)	+/-	GA, up to
Mifepristone 600mg po + Misoprostol 400mcg po	92	-Stay in office 4hr after given	70d*
Mifepristone 200mg po + Misoprostol 800mcg pv	95-99	-Vaginal administration +Less time to expulsion +Less SE +More effective	63d*
MTX 50mg/m ² IM + Misoprostol 800mcg pv 3-7d later			49d*
Misoprostol 800mcg pv, repeat up to 3 doses	88	-Complicated dosing -Higher SE +Cheap	56d*

*FDA approved regimen; SE: side effects; Mifepristone aka RU486

Abortion

Ethical and Legal implications

- Abortion is a complex ethical matter
- Induced abortion is procedure that is regulated at both the State level, and medical abortion is also regulated at the Federal level (FDA)
- There are many situations where induced abortion might be recommended for maternal reasons
- Definitions and regulations vary from state to state – this has ethical **and legal** implications

Abortion

Ethical and Legal implications – cont.

- Texas has statutes that mandate reporting of complications of abortion – these apply to ANY physician/facility who/which sees the patient
- In the State of Texas participation in induced abortion, both medical and surgical, has both civil and criminal liabilities – it is a felony (punishable up to life in prison)
- There are some exceptions

Abortion

Ethical and Legal implications – cont.

- Texas also has multiple statutes regarding this matter, **this has implications for the management of spontaneous abortion, ectopic pregnancy, and possibly other disorders**
- There are specific laws in Texas regulating the use of **mifepristone, misoprostol, and methotrexate** in pregnancy – thus, make **certain** you know if a woman is pregnant when you give any of these drugs at any clinic or hospital

Abortion

Your role as a student on clinical rotations

- You will see women with early pregnancy in many clinical settings
- As with all medical matters, privacy is expected; **do not discuss these matters with anyone else**
- In Texas, these issues are challenging, ongoing and, changing rapidly
- Please discuss **ALL** women with a positive pregnancy test with your assigned **FACULTY**
- **If you have further questions about the care of the patient, or your role as a student, ask your Regional Dean for assistance**

Learning Objectives

- Review **basic** human reproduction **biology**
- Describe how to make the **diagnosis** of **pregnancy**
- Describe molar pregnancy and gestational trophoblastic disease (**GTD**)
- Describe terminology used for **complications** of **early pregnancy** and **ectopic pregnancy**
- Discuss **therapeutic options** for **ectopic pregnancy** and spontaneous **abortion**
- Be aware of **ethical and legal issues**

Thank you