Prehospital Emergency Obstetrics and Neonatal Care

Mercyhealth Prehospital Emergency Services Training Center

CME: November 2021

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Outline of Topics

- OB/GYN Anatomy & Physiology
- Complications during Pregnancy
- Assessment of Mother & Baby
- Normal Labor & Delivery
- Perinatal Complications
- Maternal Resuscitation
- Neonatal Resuscitation

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External Female Anatomy

- **Vagina** – flexible, muscular tube about three inches long
  - –Fetus moves from uterus through cervix into vagina & then out of mother's body
- **Perineum** – area between vaginal opening & anus
  - – It sometimes is torn during birth
- **Uterus** – pear-shaped, muscular organ, holds fetus during pregnancy
  - – Contracts to push fetus through cervix & into vagina during birth

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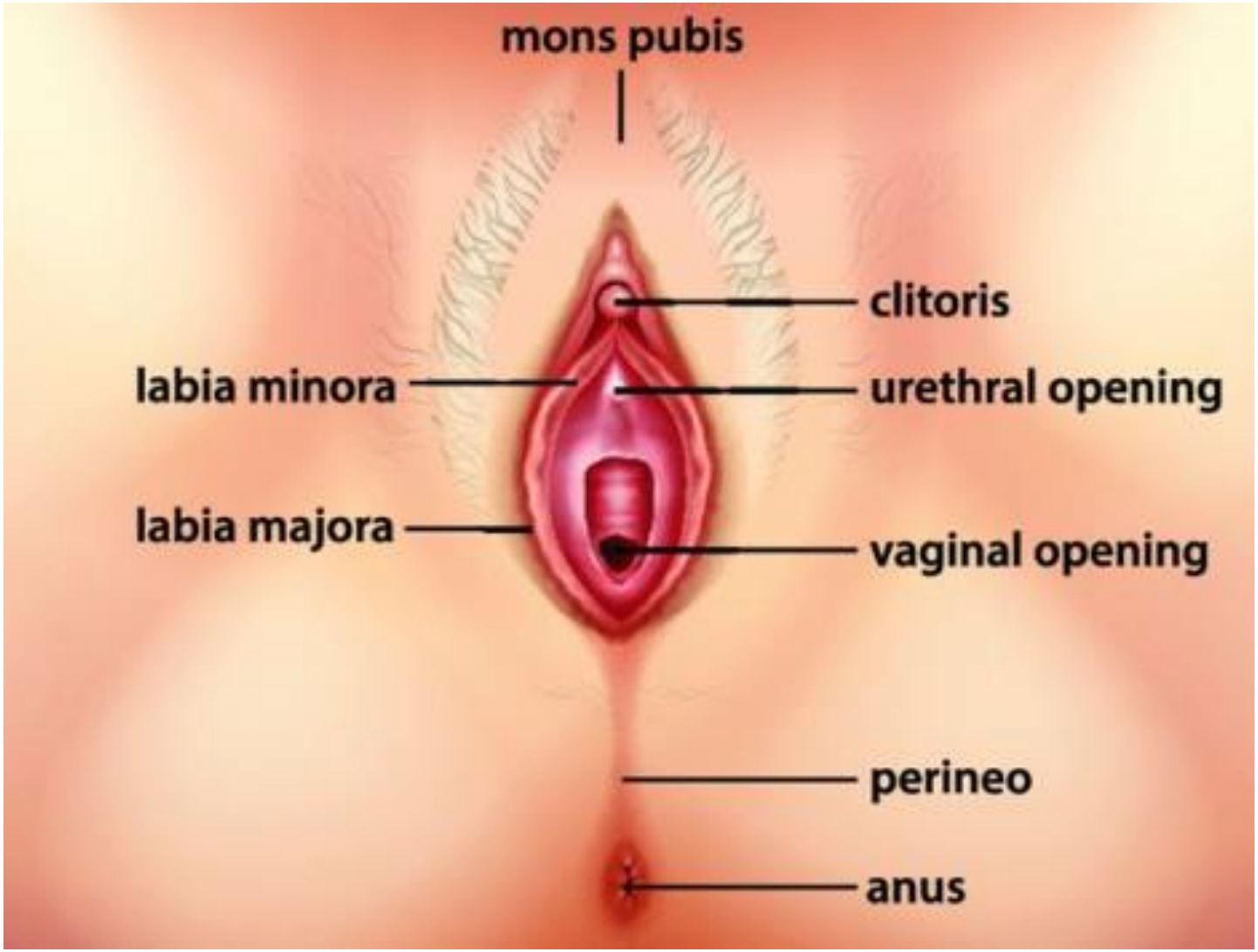

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Internal Female Anatomy

- **Cervix** – opening of the uterus
  - –During birth, cervix opens & thins-dilation
- **Endometrium** – inner lining of **uterus**
  - – Each month built up in anticipation of implantation of fertilized egg
  - – Fertilization does not occur, lining sloughs off
    - Referred to as menstrual period
- **Fallopian tubes** –passageways from uterus to ovary
- **Ovaries –** two almond-sized glands located on each side of uterus behind & below fallopian tubes
  - – Produce estrogen & progesterone in response to stimulation from pituitary gland
  - – Torsion – can occur from twisting of a large cyst

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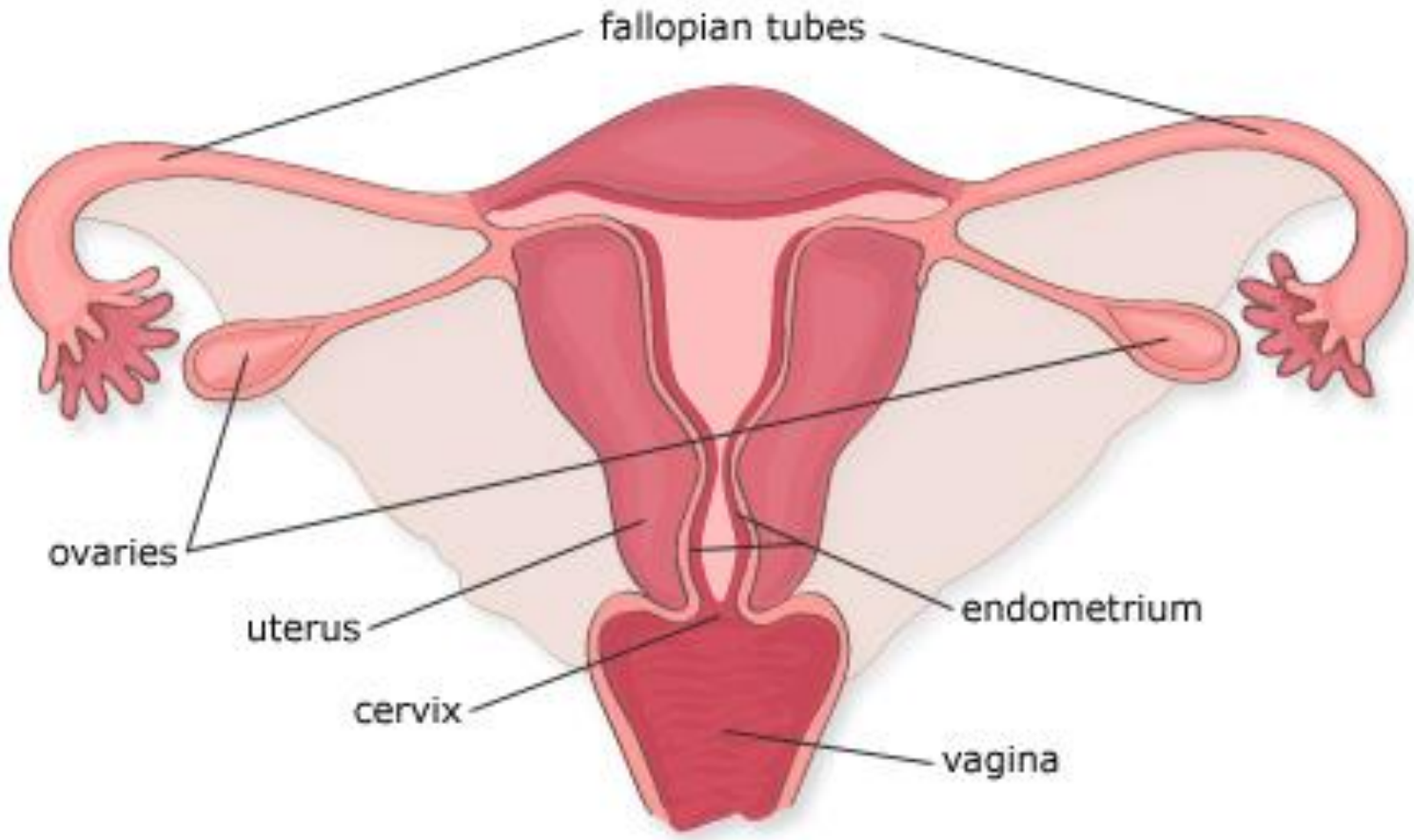
Female Reproductive Anatomy



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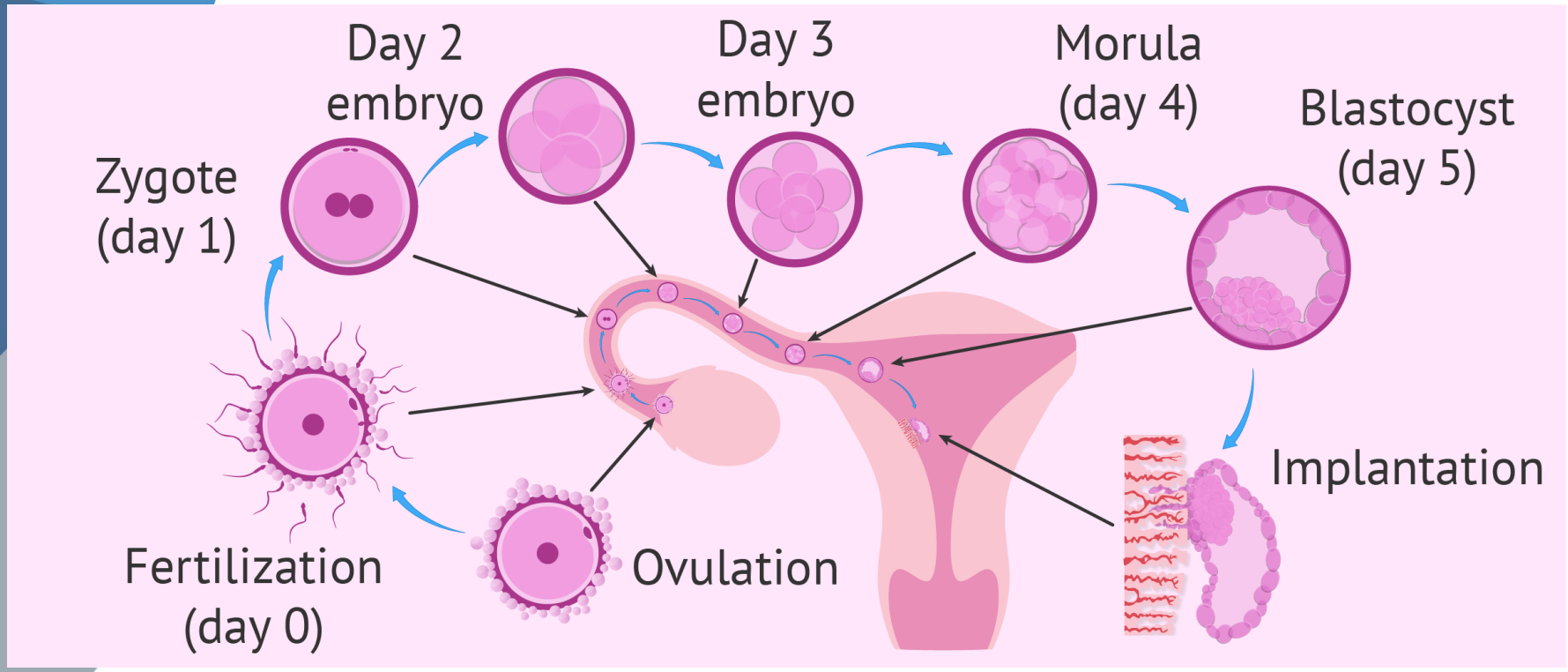
Fertilization and Implantation



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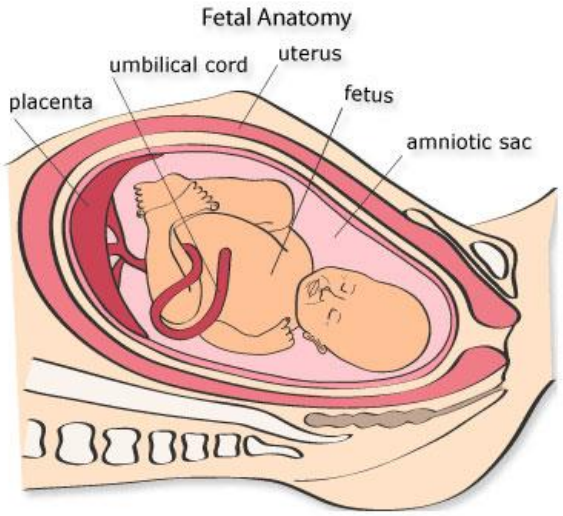
Fetal Anatomy



- **Placenta**
  - – Exchanges respiratory gases
  - – Transports nutrients from mother to fetus
  - – Excretes waste
  - –Filters some toxins
- **Amniotic sac** – develops early in pregnancy
  - – Consists of membranes surround & protect developing fetus
  - – Fills with amniotic fluid cushions fetus & provides stable environment
  - –Meconium

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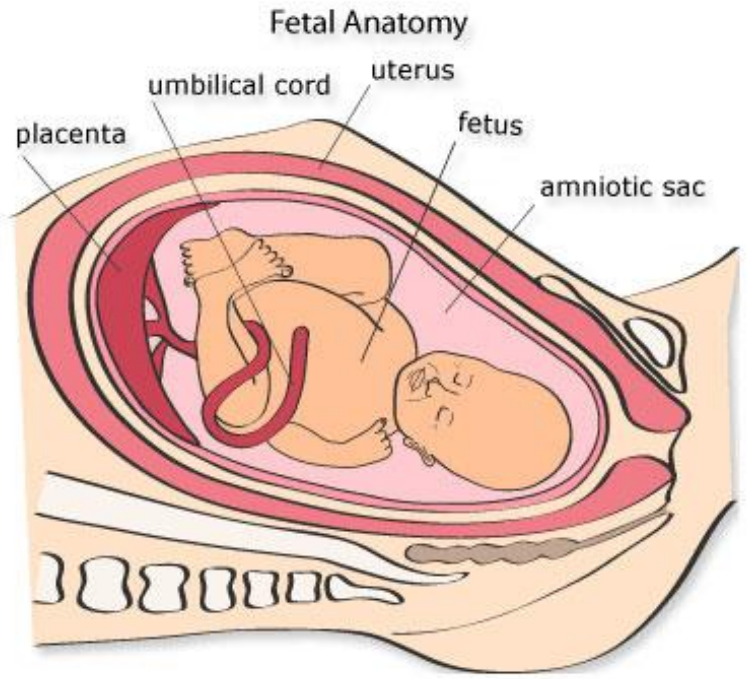
Fetal Anatomy

- **Umbilical cord** – attaches fetus to placenta
  - – Contains one vein & two arteries
  - –Newborn cord is about two feet long



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Normal Pregnancy

- Heartbeat
  - US 5-6 Weeks
  - Audible Doppler 12 weeks
  - Audible Stethoscope 24 weeks
- Viability ~23-24 weeks
  - Survival is on average:
  - >90% at 28 weeks
  - 75% at 25 weeks
  - At <25 weeks 50% have severe neurosensory disabilities
- Term is 40 (37-42) Weeks
- Premature is <37 Weeks

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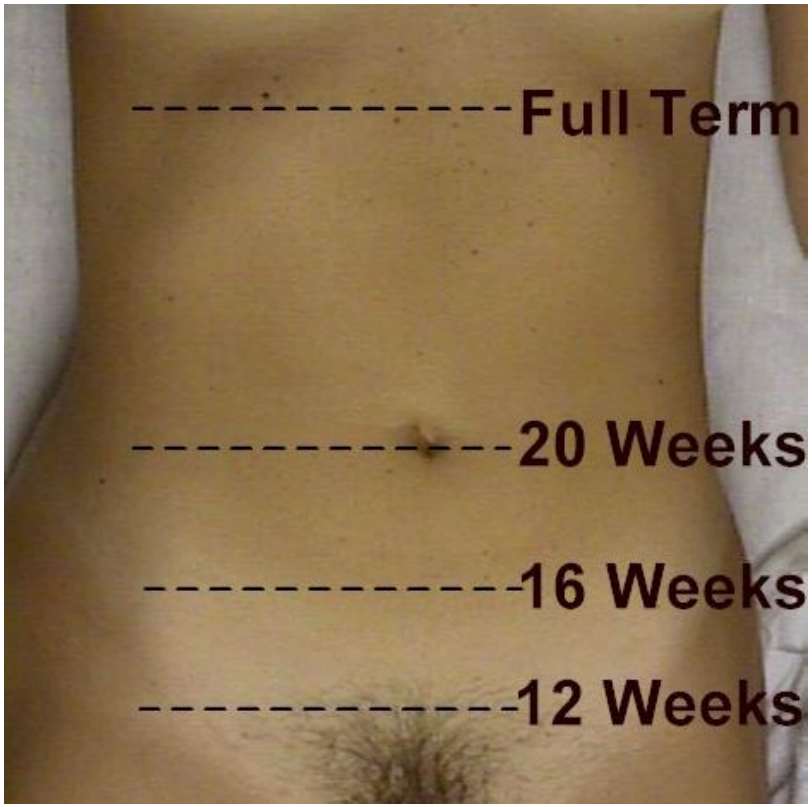
Normal Pregnancy

- EGA by exam
- Uterus Palpable
  - Above Pubic bone 12 weeks
  - At umbilicus 20 weeks



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Normal Pregnancy-Physiologic Changes

Respiratory: Progesterone increases respiratory drive, therefore increased rate, slightly lower PCO2

HEENT: Mucosal Edema

Cardiovascular: Drop in SVR, drop in BP, increase in pulse. Increased blood volume. Increased Coagulation factors. LAD. Relative hypovolemia.

GI: Progesterone relaxes sphincters, slows peristalsis: increasing GERD

Heme: Increased blood volume, leads to dilution anemia

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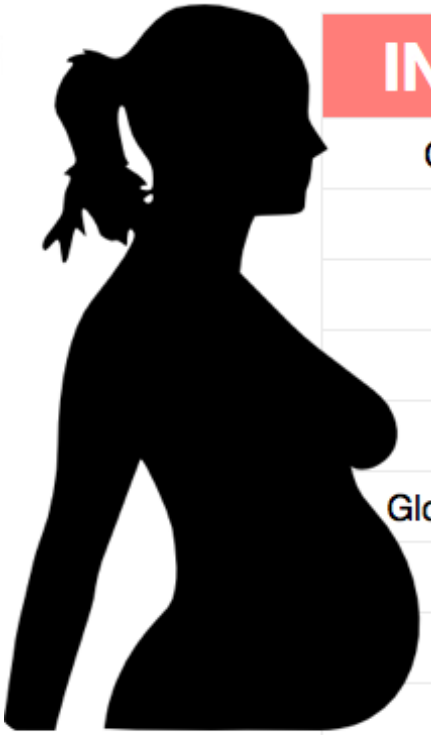
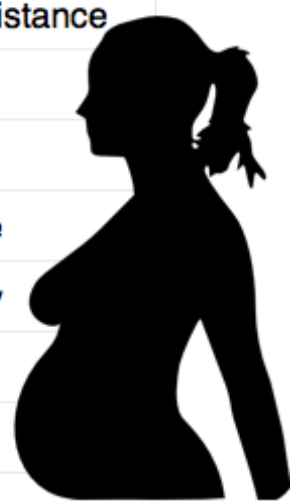
Physiology of Pregnancy

#InsidersGuideITE
OB/GYN disorders

Physiologic Changes of Pregnancy



INCREASED	DECREASED
Coagulation factors	Albumin
Fibrinogen	Antithrombin III activity
Heart rate	Systemic vascular resistance
Cardiac output	Hematocrit
Blood volume	Hemoglobin
Glomerular filtration rate	BUN/Creatinine
Proteinuria	Ureteral motility
RBC mass	Gut motility
WBC count	pCO_2 / HCO_3



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FDA Classes of Medications in Pregnancy

A	Controlled studies show no risk.
B	No evidence of risk in humans; the chance of fetal harm is remote.
C	Risk not excluded. Adequate studies lacking. Chance of fetal harm but benefits outweighs risks.
D	Positive evidence of risk. Studies in humans show fetal risk. Potential benefit in pregnant women may outweigh risk.
X	Contraindicated.

Complications of Pregnancy

- <20 Weeks
  - Ectopic
  - Spontaneous Abortions
- >20 Weeks
  - Metabolic
    - Preeclampsia/Eclampsia
    - Diabetes
      - Tx w/ Insulin
      - Complications
  - Bleeding
    - Placental Abruption
    - Placenta Previa

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First Trimester Bleeding

- Occurs is 20% of All Pregnancies
- Commonly ~ Implantation
- Other causes:
  - Trauma
  - Infections
  - Ectopic pregnancy
  - Threatened abortion

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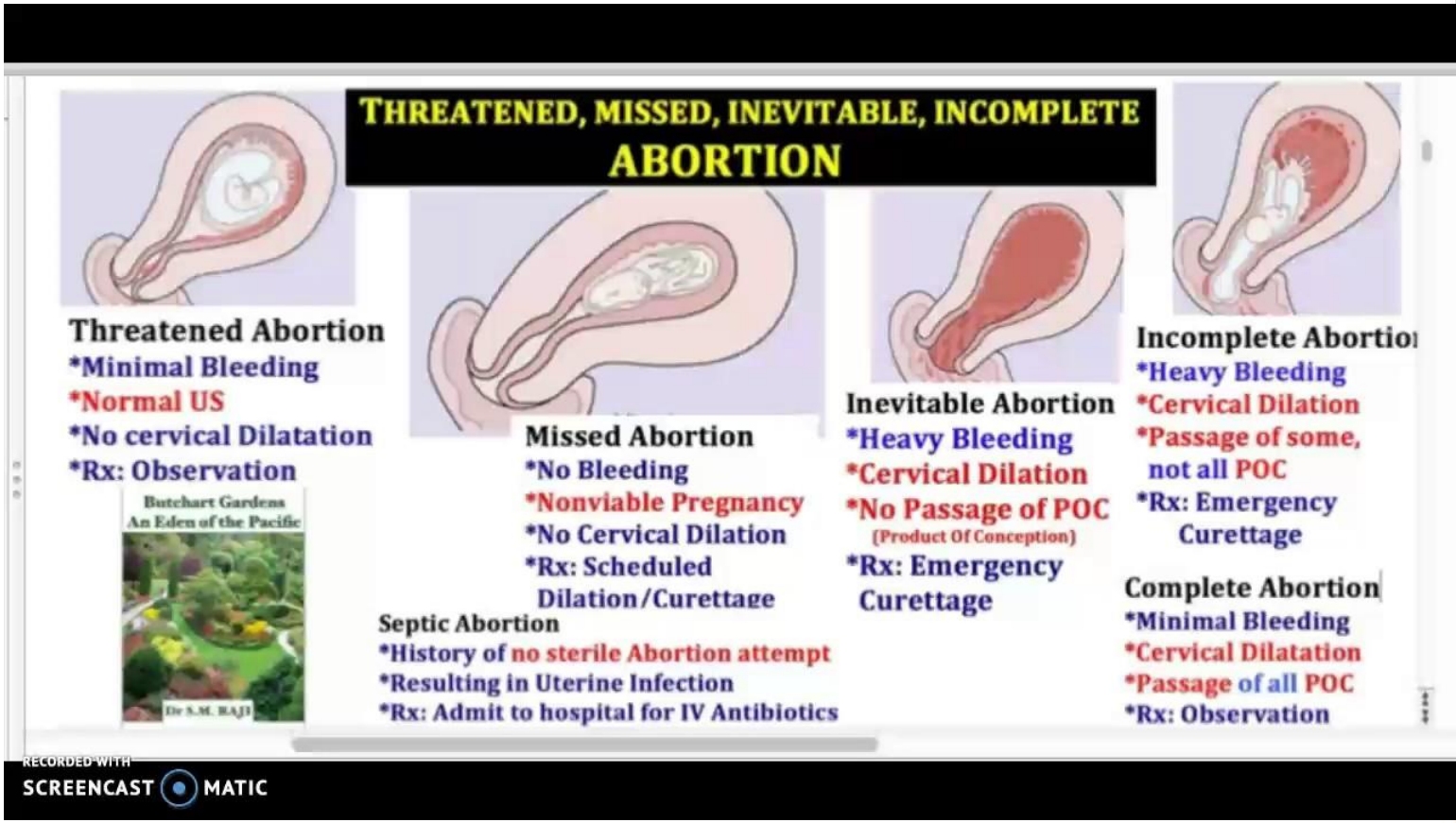
Types of Abortion



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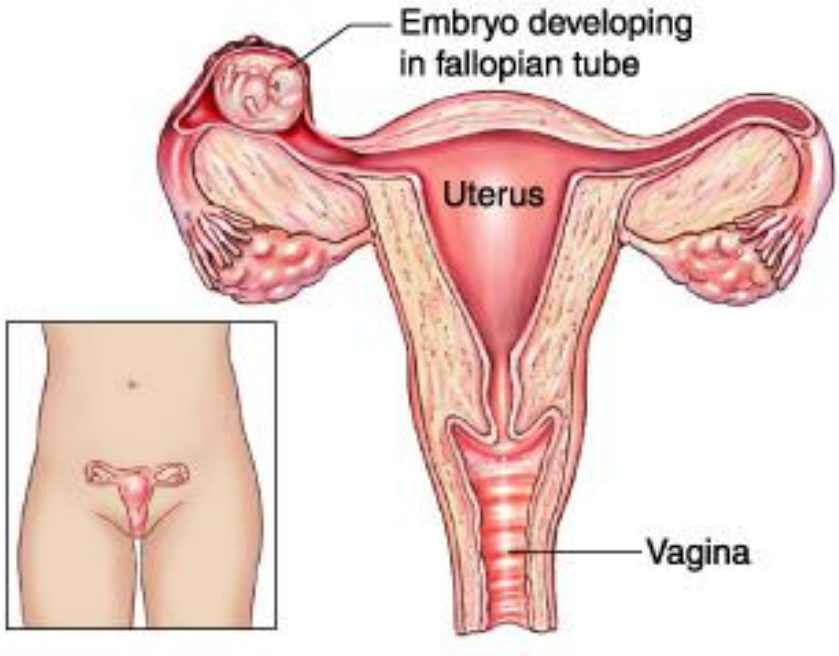
Ectopic Pregnancy

- Implantation of growing fetus in location other than endometrium
- Most common site is in one of the fallopian tubes
- May become surgical emergency
- Potential cause of shock in young female



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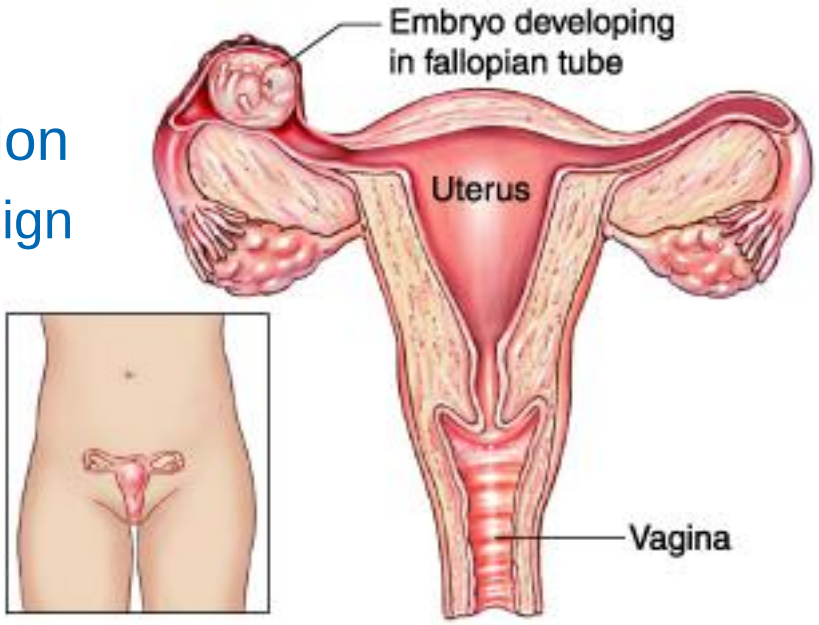
Ectopic Pregnancy

- Signs and Symptoms
  - Abdominal pain
  - Missed/Late Period
  - Vaginal Bleeding
  - Dizziness/Syncope
  - Tachycardia/Hypotension
    - Hypotension is late sign



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>20 Week Complications

- **Preeclampsia**
  - New Onset HTN and Proteinuria or end organ dysfunction >20 Weeks Gestation
  - Mild 140/90
  - Severe 160/110
  - Headache
  - RUQ abdomianl pain
  - Edema

- **Eclampsia** = Preeclampsia + Seizures/Coma

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Eclampsia Complications

- Medical emergency → ALS, MD1, OR for CSC!
  → Abruption, Stroke, Pulmonary Edema Death!
- Occurs after third trimester
  - Most common 34w until 4wks **post-partum**
- Refractory GTC Seizures
  - Treat with Versed AND **Magnesium**
  - Control severe HTN with Labetalol
- Leg/Ankle edema
- Confusion & Hyper-reflexia (clonus)
- HELLP Syndrome
  - Liver damage, tenderness RUQ, easy bleeding

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Eclampsia Treatment

- BLS
  - Check for hypoglycemia
  - Supportive care for seizure
- ALS
  - Versed 5mg IV/IO/IN 10mg IM
  - Mag Sulfate 4g in 100ml NS over 20min
  - Blood Pressure
    - Maintain SBP 140-160 and DBP 90-110
    - Labetalol 10mg initial dose

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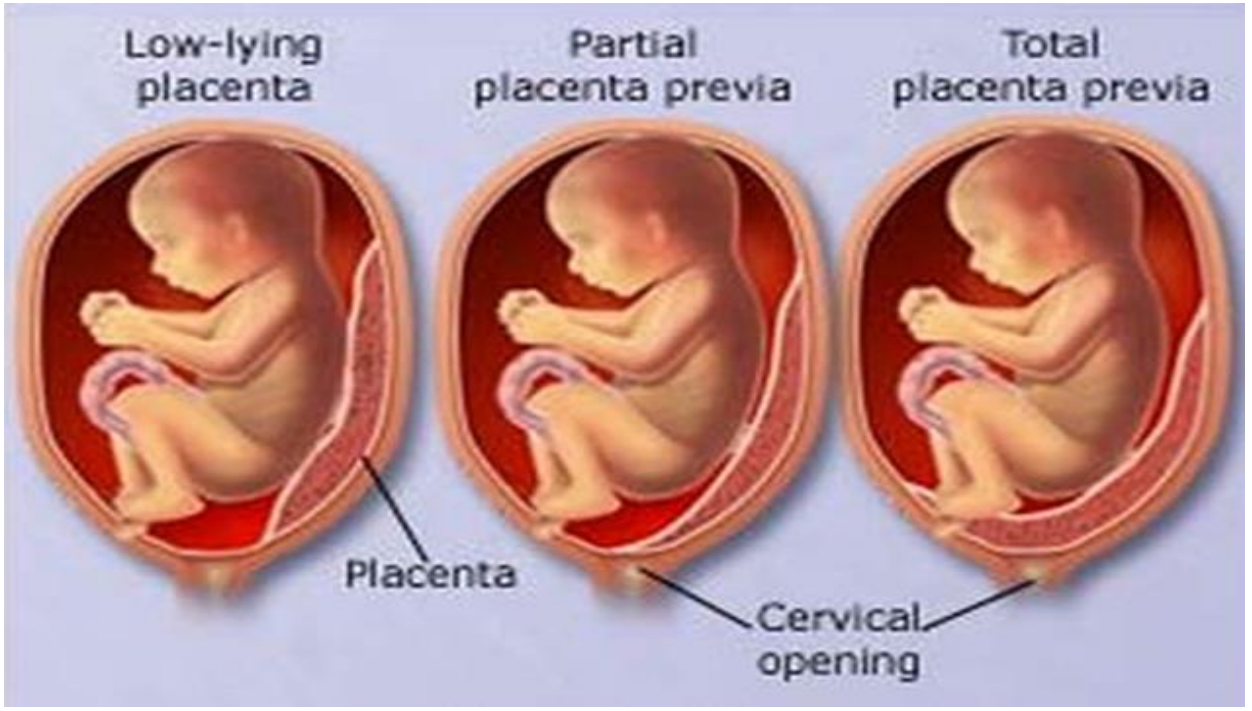
Placenta Previa



- Painless vaginal bleeding
- 3rd Trimester of pregnancy
- Will result in C-Section
- Shock Tx: IVF, O2, LLR

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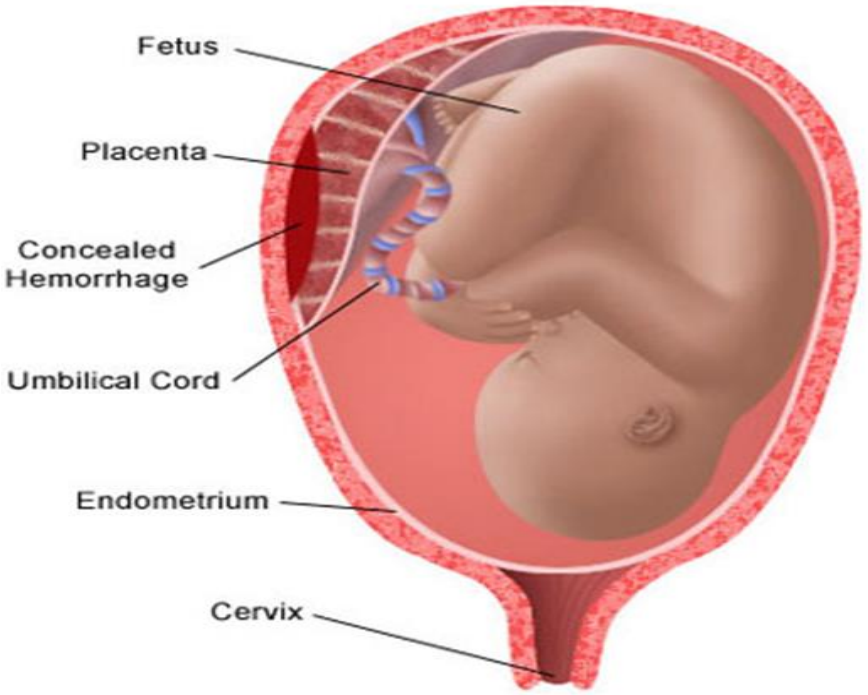
Placental Abruption



- Painful vaginal bleeding, contractions, abd tenderness
- Often a result of trauma, HTN, or drug use.
- Rapid transport to facility with OB unit if more than 30 minutes from pediatric trauma center.

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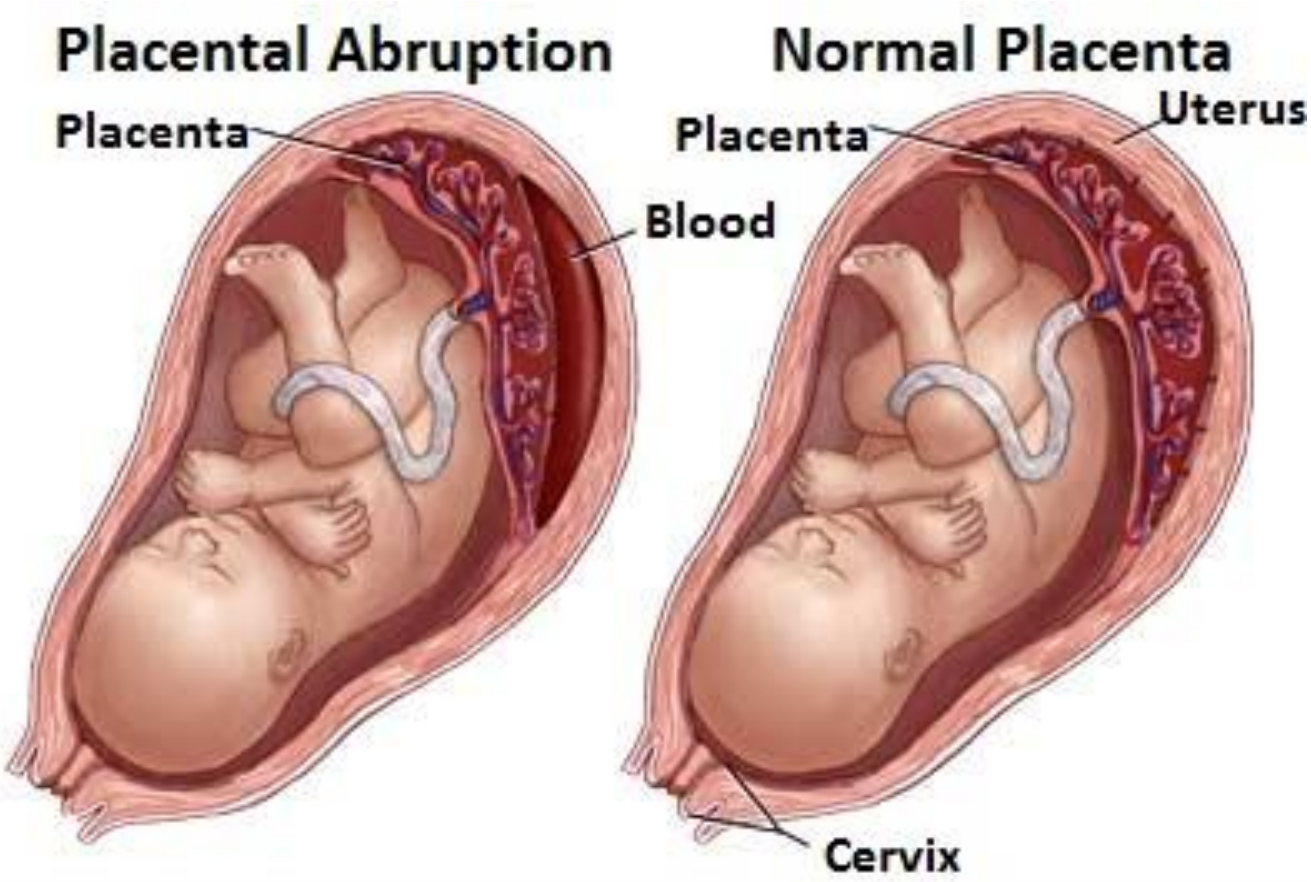
Placental Abruption



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Other Common Medical Conditions Associated with Pregnancy

- Gestational Diabetes
- Pulmonary Embolism / DVT
- Hyperemesis Gravidarium
  - Severe N/V causing distress
  - Often needs Rx Antiemetics (vitamin B12)
  - Helpful to give generous IVF
  - Check BGM & EKG - Why?

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In labor: What should you do?

- This is one of the most important prehospital decisions to make…

- load & go vs. stay & play?
  - ❖ ASSESS SITUATION FIRST!

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Important OB History

- G:_ P:_ _ _ _
  - “Florida Power and Light”
    - Full term
    - Pre-term
    - Abortions
    - Living
- Last Menstrual Period (LMP)?
- Confirmed by ultrasound? – EGA/EDC?
- Rush of fluid from vagina (clear?)?
- Degree of prenantal care (MFM?)
- Current/past pregnancy complications/concerns?

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Evaluation of a pregnant patient

- Primary survey is the same - ABC's.
- Mom is first priority, but remember that you have TWO patients.
  - *"What's good for mom is good for baby"*

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Evaluation of a pregnant patient

Physical Assessment

- Palpation of uterine fundus
- Listen for fetal heartbeat
- Vaginal bleeding or leaking fluid
- Anything protruding from vagina
  - Head → deliver where you are now
  - Anything else → emergent transport

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Trauma in Pregnancy

- Number one cause of non-obstetric maternal death
- Domestic Violence
- Treat mom first = Golden Rule
- Keep in left lateral tilt position (pillows behind LBB)
- Fetal survival drops dramatically 15 minutes after a maternal arrest, but 90% will survive if C-section done prior to 15 minutes.
- All but the most minor trauma over 24 weeks will have at least 4 hours of uterine monitoring to evaluate for abruption. (After 20 weeks [5 months] → ideal to transport all moms for evaluation)
- Unconsciousness trauma pt. female of childbearing years= palpate abdomen

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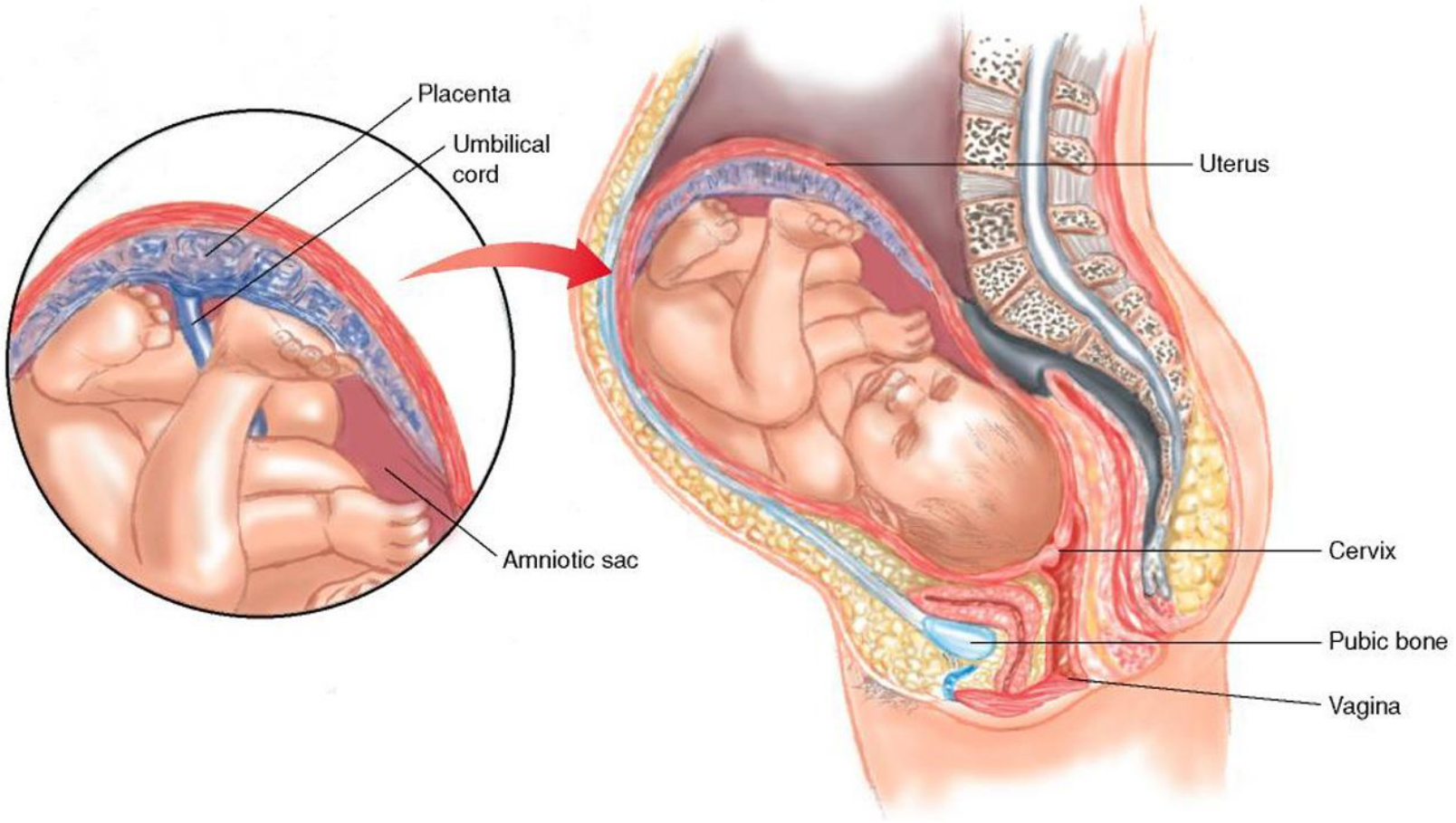
LLR Position during Transport



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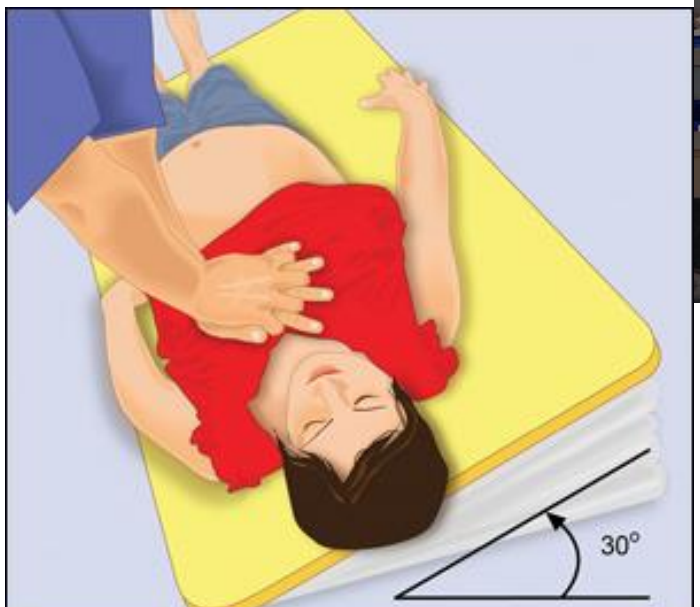
Resuscitation in Pregnancy

- Treating Mom treats Baby
- CPR Hands a little higher
- MD1 (perimortem CSC)



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Signs of Imminent Delivery

Immediately examine vagina if any of the following conditions exist:

- Regular contractions less than 2 minutes apart
- Mother feels need to push or have bowel movement
- Sensation of crowning, crying
- Multigravid with history of precipitous delivery

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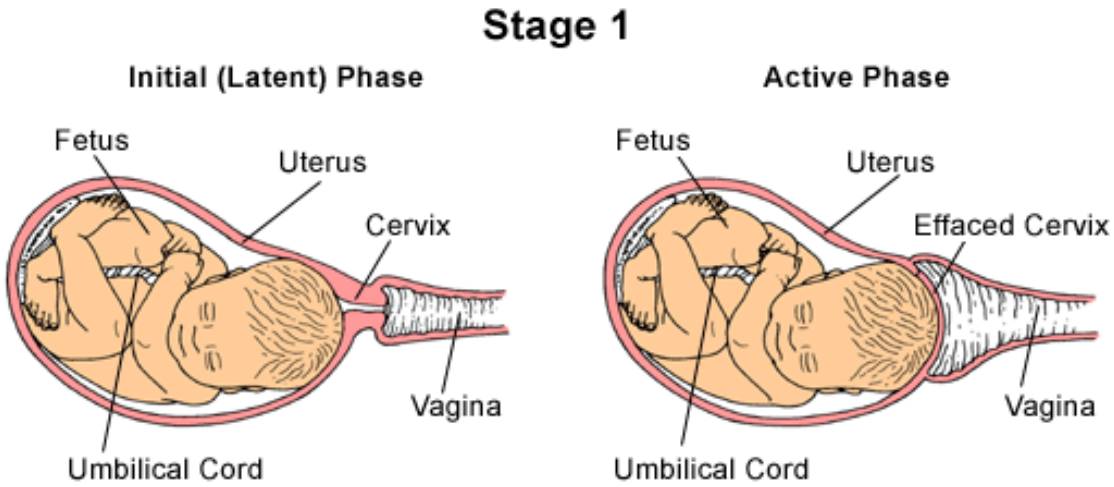
First Stage of Labor

- Irregular contractions
- Thinning, shortening, & dilating of cervix
- Ends at 10 cm (“full”) cervical dilation
  - Early/Latent — Lasts 8-12 hours
  - Active — Lasts 3-5 hours
  - Transition — Lasts 30 min - 2 hours



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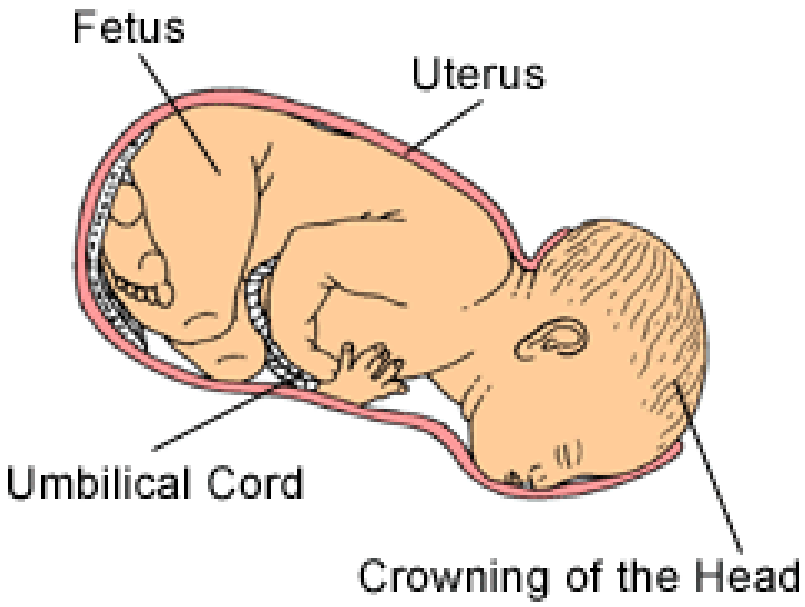
2nd Stage of Labor

- Period of full dilation to delivery of baby
- Urge to push begins
- Crowning occurs
- Burning/stinging of cervix
- Lasts 20 min - 2 hours



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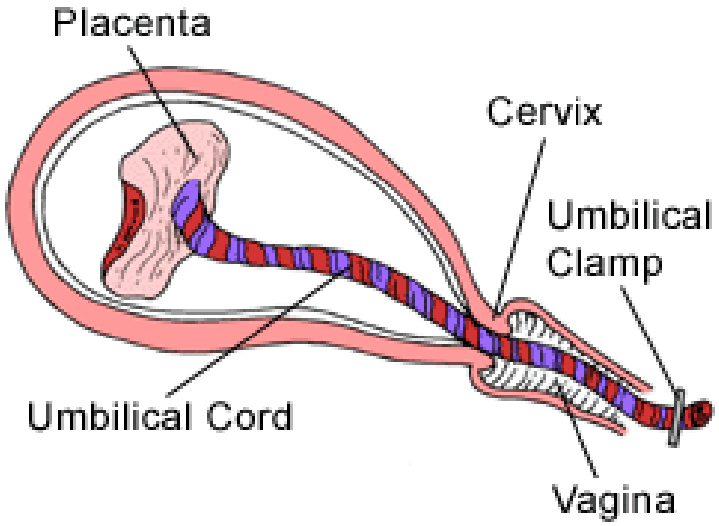
3rd Stage of Labor

- Period after birth of baby until delivery of the placenta.
- Observe for firm uterus, sudden/brief gush of blood, lengthening of cord.
- Should last 5-20 min
- **DO:** transport
- **DON'T: p**ull on cord.



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Critical Thinking Exercise!

Look at picture, then identify

- Which Stage of Labor?
- Should you transport or deliver now?

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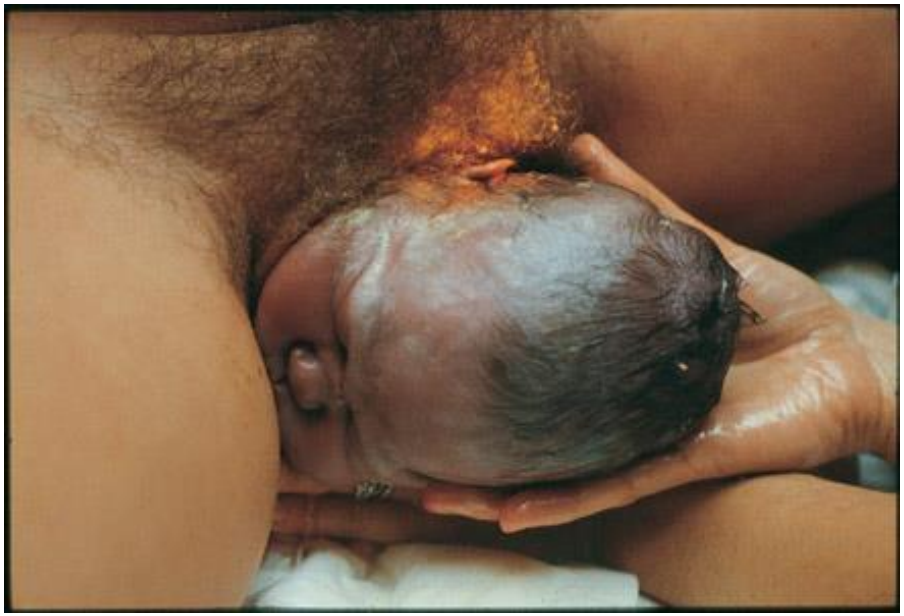
What Stage of Labor?



2nd Stage!

(baby is presenting)

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What Stage of Labor?

Likely 1st Stage,

Active Labor with Internal Focus

OK to transport?

…What symptoms should you consider?

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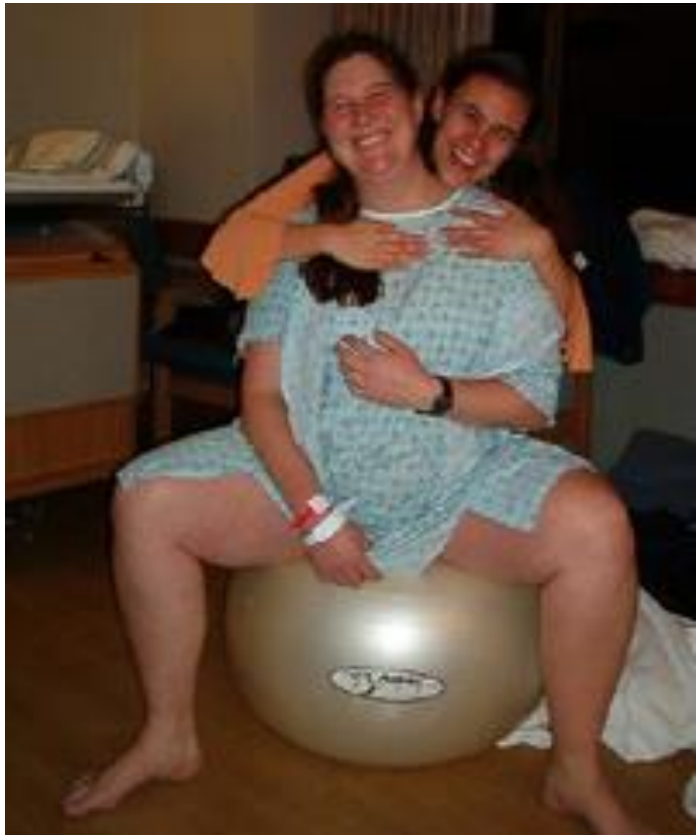
What Stage of Labor?



1st Stage,

Early Phase

(Smiling!)

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What Stage of Labor?

3rd Stage,

Baby is delivered

(waiting on delivery of placenta)

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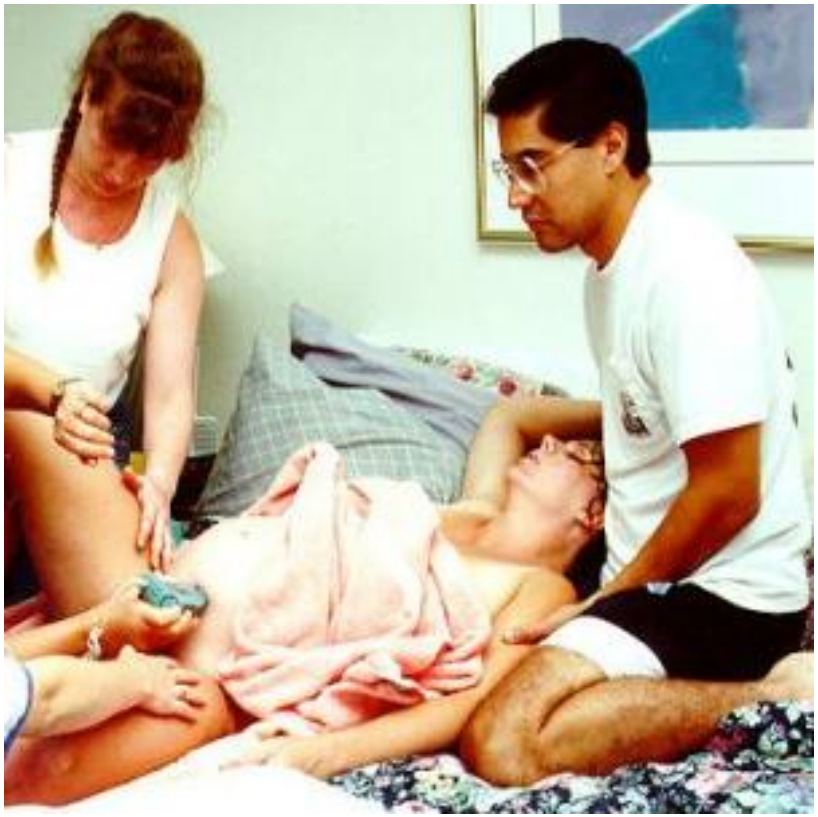
What Stage of Labor?



1st Stage,

Transition

(frustration and overwhelmed)

Could be <30 min

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What Stage of Labor?

1st Stage,

Active Labor with Internal Focus

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No time to transport: Deliver

Don’t panic…

- ✓ Control the infant head
- ✓ Have the mother push during contractions
- ✓ If amniotic sac still intact and outside the vagina, gently puncture with a finger
- ✓ Support maternal perineum
- ✓ Once head is out, sweep for nuchal cord
- ✓ Gentle downward traction, then gentle upward traction
- ✓ Support newborn’s body
- ✓ **Rub to stimulate and dry baby**
- ✓ Clamp the cord
- ✓ Place baby to mother’s bare chest

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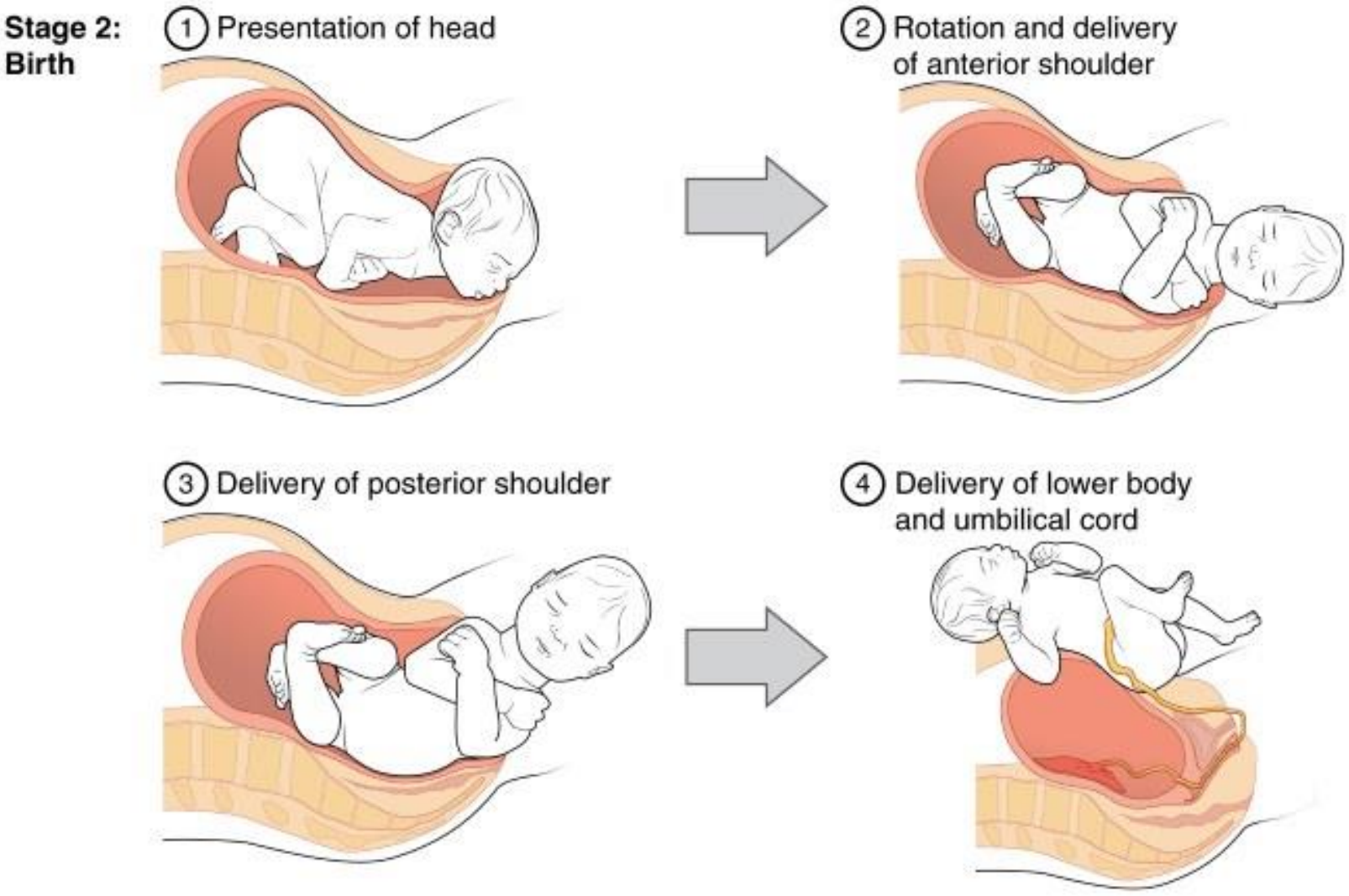
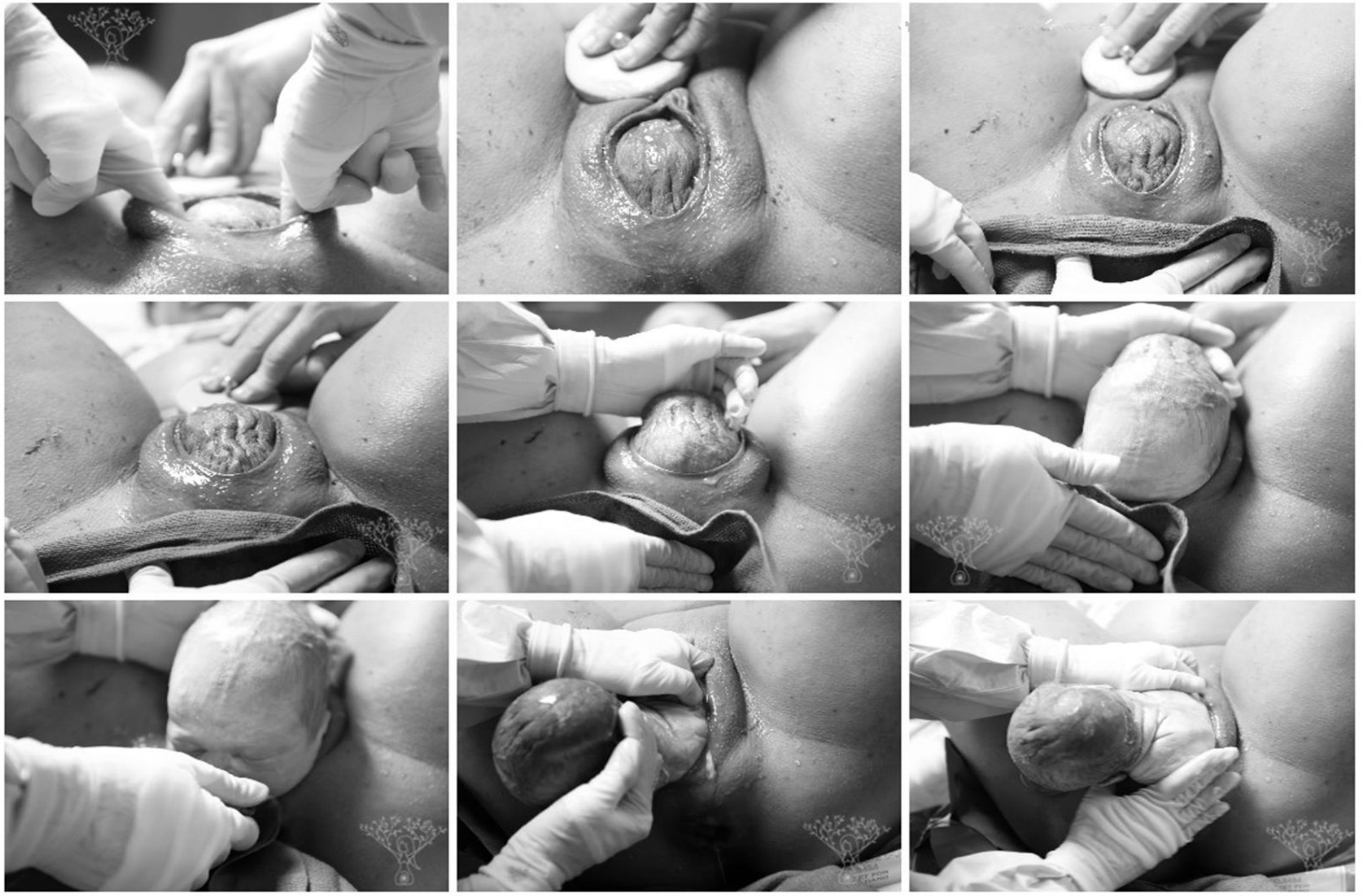
disposable
obstetrical kit
CONTENTS:
1 pair disposable sterile gloves
1 drape sheet
2 umbilical clamps, sterile
2 O.B. towelettes
1 disposable scalpel
6 gauze sponges, sterile
1 bulb syringe, sterile
4 disposable towels
2 nylon tie-offs
2 alcohol preps, medium
STERILE
ONE OBSTETRICAL PAD
EXTRA LARGE
SURGICAL SPONGES
D-948A
4"x4"; 8 PLY
Alcohol Prep Pad

Approach to Delivering of the Baby





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Normal Delivery Video

https://www.youtube.com/watch?v=J1X5FvBse_8

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What do I do now with the baby?

1. Dry and stimulate gently
2. **Keep warm!!**
3. Check APGAR at 1 & 5 minutes:
   - Assess activity (crying, flailing, limp, silent)
   - Assess breathing (rate, meconium, WOB)
   - Assess circulation (HR, skin color)

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APGAR SCORING SYSTEM

	0 Points	1 Point	2 Points	Points totaled
Activity (muscle tone)	Absent	Arms and legs flexed	Active movement	
Pulse	Absent	Below 100 bpm	Over 100 bpm	
Grimace (reflex irritability)	Flaccid	Some flexion of Extremities	Active motion (sneeze, cough, pull away)	
Appearance (skin color)	Blue, pale	Body pink, Extremities blue	Completely pink	
Respiration	Absent	Slow, irregular	Vigorous cry	

Severely depressed	0-3
Moderately depressed	4-6
Excellent condition	7-10

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Neonatal Resuscitation - BLS

- **If baby is not crying and flailing…**
  - RUB TO STIMULATE!
- **If baby is blue and not breathing normally…**
  - BVM ventilation 40-60bpm on O2 100% for 30 seconds
  - Check UMBILICAL PULSE…
  - If HR less than 60, BEGIN CPR
    - Neonatal CPR: 3:1 ratio, 90v + 30bpm
  - If HR is 60-100...
    - Continue adequate ventilations/O2 for another 30 seconds…
    - Recheck HR, if remains < 100 BEGIN CPR
  - CHECK GLUCOSE – treat if less than 40

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Neonatal Resuscitation - ALS

- **If signs of poor circulation…**
  - NS IVF bolus 10cc/Kg
  - Consider epi IVP/gtt
- **If neonate is seizing…**
  - Check glucose
  - Treat with versed (0.2mg/Kg IM)
- **If severe shortness of breath…**
  - Check for meconium aspiration
  - Albuterol neb for wheezing
  - Intubation as needed

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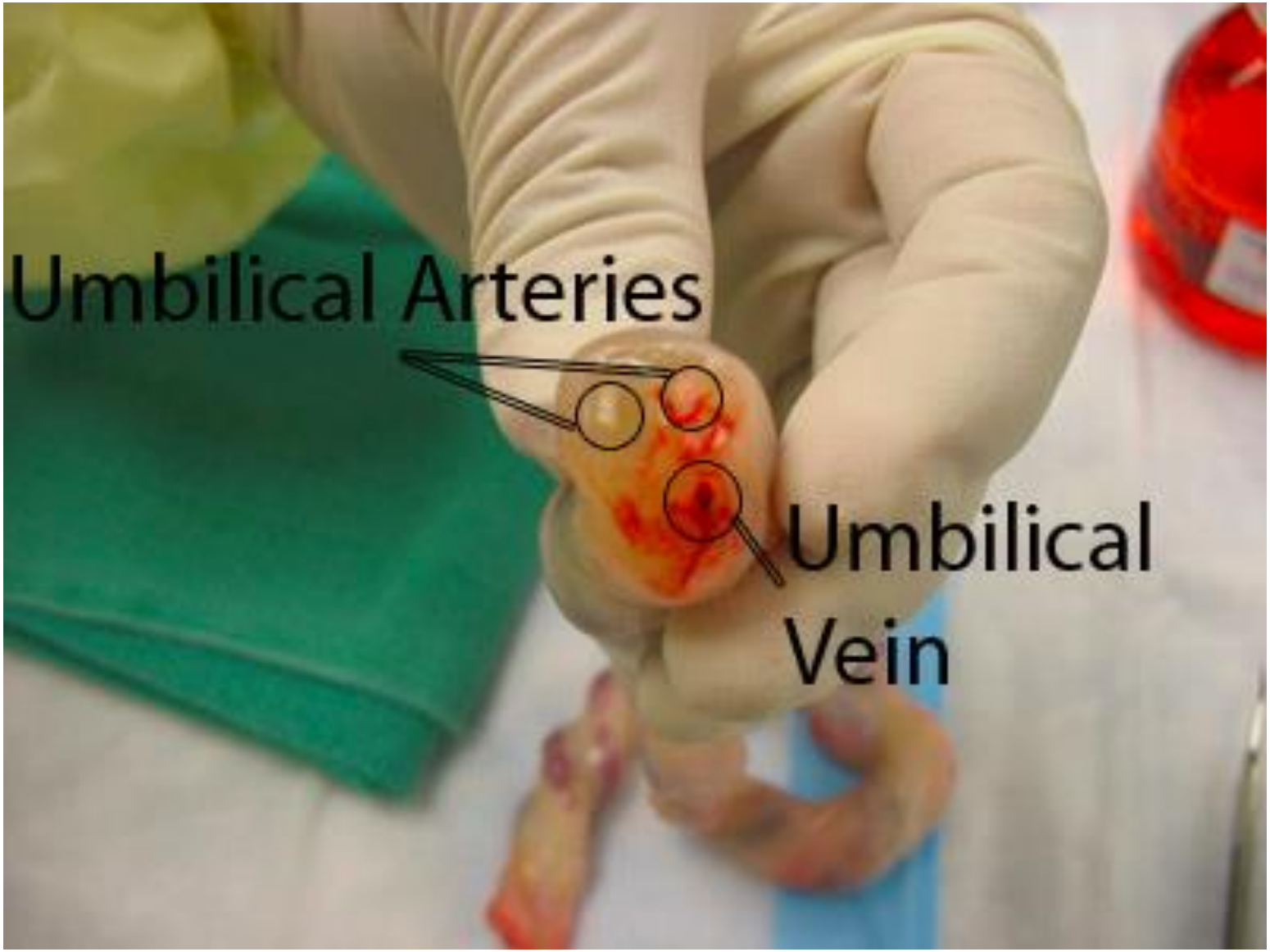
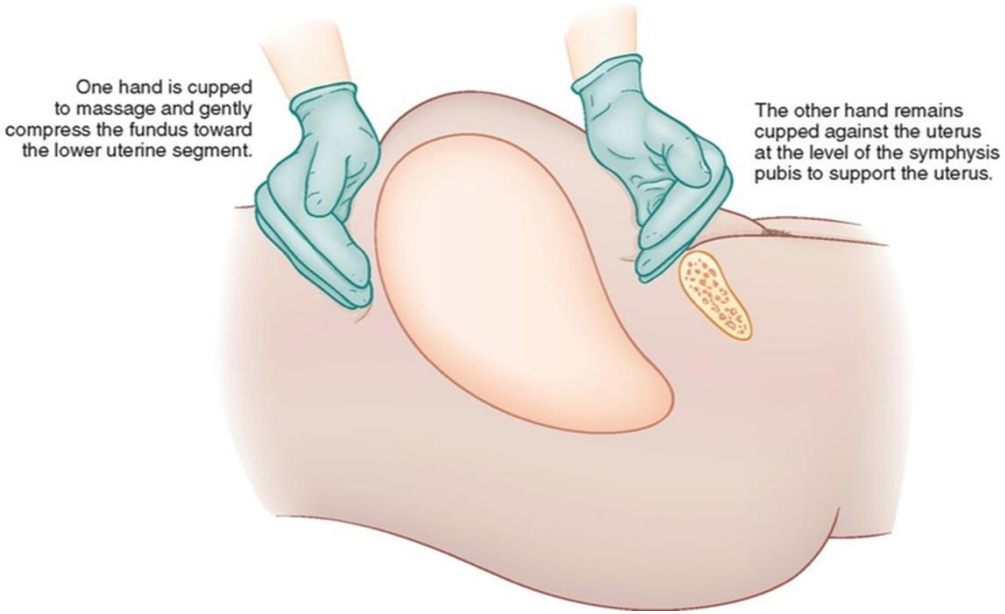

Umbilical Arteries
Umbilical Vein

What do I do with Mom?

- Watch for excessive bleeding
  - Always massage fundus, allow breastfeeding
    - Assess/treat lacerations
  - Check for large lacerations or excessive bleeding
  - BLS can give oxygen and IVF
  - ALS can also give TXA for shock
  - MD1 carries Pitocin IV (uterine contraction)



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Potential Complications during Labor

- Prolapsed cord
- Nuchal cord
- Abnormal presentation (limb, breech)
- Hemorrhage

Quick Review: How do we treat these conditions?

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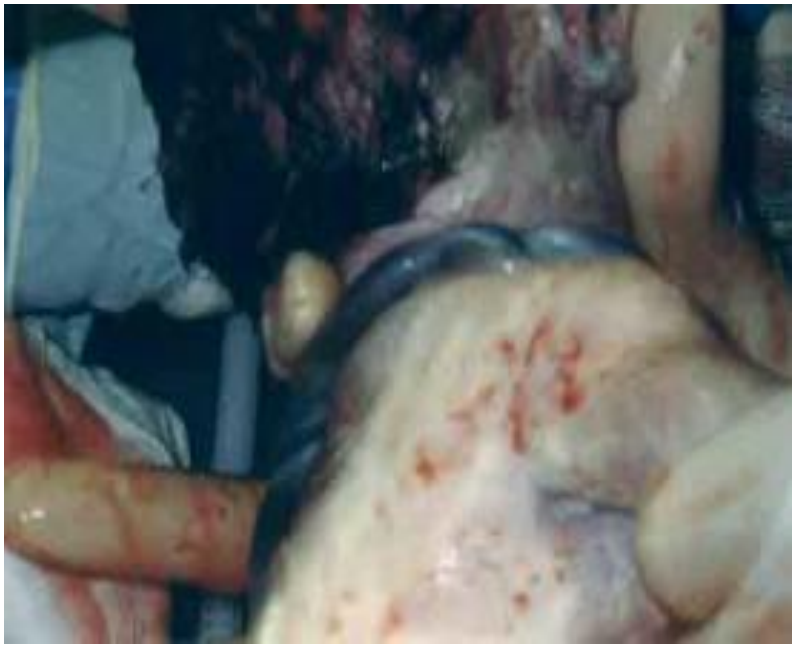
Nuchal Cord

- Check as head emerges
- 25% of deliveries
- Loose= Slip over Head
- Tight= may need to cut
- May be more than 1



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Prolapsed Cord

- OB emergency: essentially cuts off all oxygen to fetus
- Give O2 NRB
- Wrap cord in moist WARM towel.
- IMMEDIATELY: place EMT **hand in vagina**, elevate fetal head off the cord to allow circulation to fetus.
- Elevate mother's hips: knee to chest or Trendelenburg
- Rapid transport to closest OB hospital - requires emergent cesarean delivery

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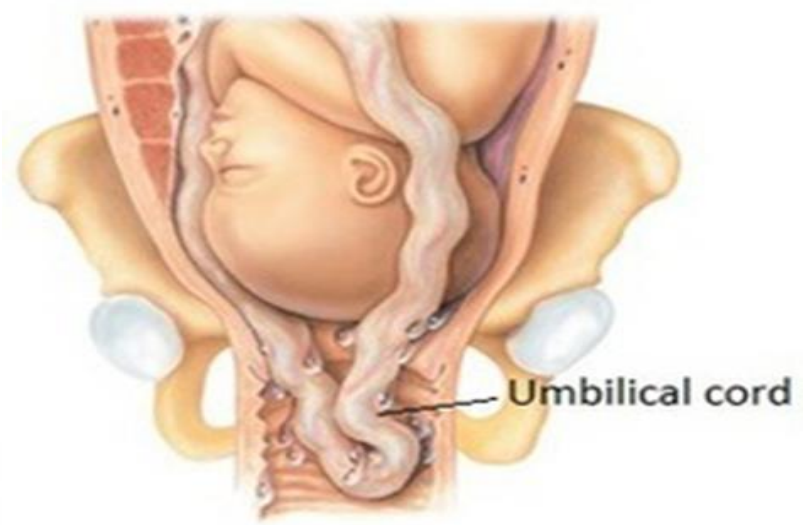
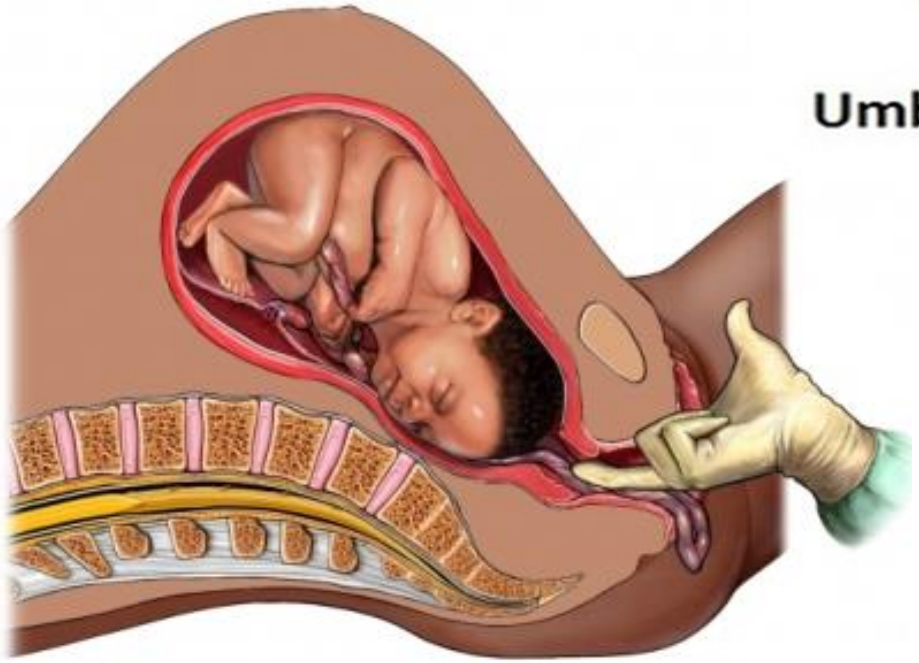
Prolapsed Cord



Umbilical Cord Prolapse



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Shoulder Dystocia

- Diagnosis:
  - **After** delivery of head, further expulsion is prevented by impaction of fetal shoulders within maternal pelvis (“turtle head”)
- Risk Factors:
  - Diabetes, Obese, Post Date
- Complications:
  - Nerve Injury, Asphyxia Fetal/Maternal Death, hemorrhage

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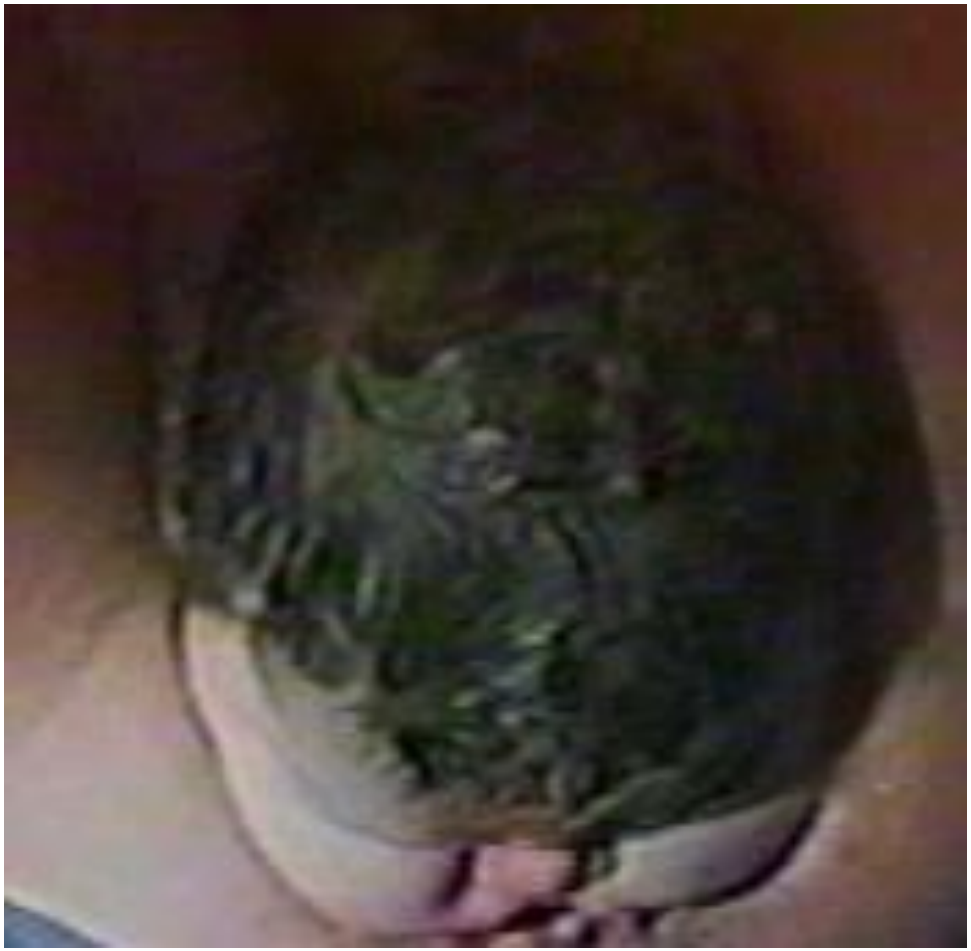
Shoulder Dystocia



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Shoulder Dystocia- Management

Order of maneuvers:

- Mom's knees to chest while applying firm suprapubic pressure (McRoberts)
- Gentle/steady inferior/posterior pressure on baby's head (but do not pull outward)
- Attempt delivery of posterior shoulder
- If this does not work, place mother on all 4's (Gaskin) on stretcher and immediate emergent transport to closest ED.

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Shoulder Dystocia- Management

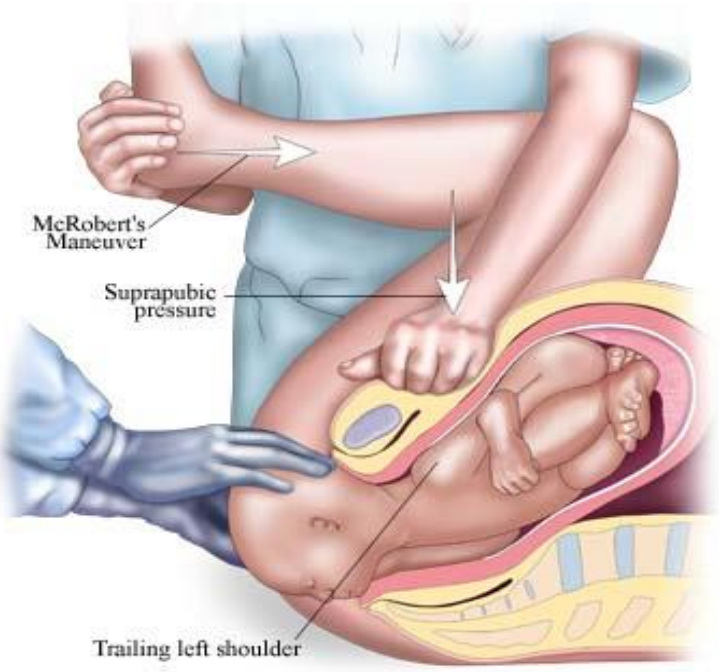


Fig. 18.8: Gaskin maneuver or all-fours position

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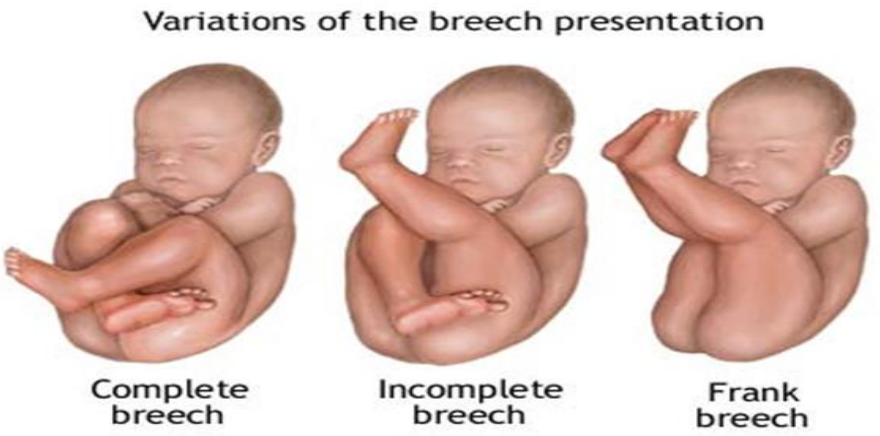
Abnormal presentation (Breech)

Types:

- Footling
- Limb presentation
- Buttocks



- ✓ Do not attempt pre-hospital delivery
- ✓ No aggressive traction
- ✓ Rapid transport to closest OB hospital, notify them immediately

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Breech Presentation Video

https://www.youtube.com/watch?v=EPklRwlMV1Y

(Stop at 3:00}

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Post-partum Hemorrhage

#**1 cause of Maternal death**

- Defined as >500cc after vaginal delivery
- Causes:
  - Retained placenta
  - Failure to progress during the second stage of labor
  - Lacerations
  - Hypertensive disorders
  - Uterine Atony

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Post-partum Hemorrhage

Treatment

- Large IV for fluid and blood transfusion (use blood tubing)
  - Infant IO: Manual insertion 25mm needle < 1y/o
- Provide Supplemental O2
- Perform Fundal Massage
- TXA IV
- Oxytocin IV (MD-1)

…Do NOT pack vagina

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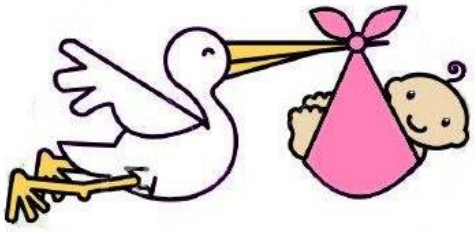
Quick Take Home Point Review

- Crucial to obtain a good OB history
- Don’t forget the Golden Rule
- Assess for imminent delivery
- Lay 3rd trimester patients on their left side
- Close vitals monitoring, IVFs
- Do NOT pull on anything!!
- Be prepared to care for two patients
- Stay calm, it’s natural & usually goes just fine
- Call medical control / MD1 if needed



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Now Go Practice Hands-on Skills!

- Look through your OB Kit (All)
- Review your Broselow Tape (All)
- Review bulb suctioning (All)
- Neonatal CPR (All)
- Neonate BVM ventilation (EMT & Above)
- Manual IO insertion/sites (AEMT & above)
- Emergency Childbirth Simulation (All)
- Infant Intubation (Paramedics)
  - DL with Miller 0-1

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