GYNECOLOGY

Menstruation (15%) – 7

- Normal physiology
  - **Phase 1 – Follicular phase [proliferative phase]**
    - **Days 1-14**
    - ESTROGEN predominates
      - Endometrium thickens = proliferation
      - GnRH increases → increase FSH & LH
    - Ovaries
      - Increase FSH = follicle stimulating hormone → follicle & egg maturation
      - Increase LH = stimulates follicle to produce estrogen
    - ESTROGEN Causes NEGATIVE FEEDBACK to HPO system
      - Stops new follicles from maturing
    - **OVULATION**
      - Day 12-14
      - Switch from negative → positive feedback = increases estrogen, FSH & LH
      - **LH surge causes ovulation = egg release**
        - Ruptured follicle becomes corpus luteum
  - **Phase 2 – Luteal Phase [secretory phase]**
    - **Days 14-28**
    - **PROGESTERON** predominant
      - LH surge causes ruptured follicle to become corpus luteum
      - **Corpus luteum secretes progesterone & estrogen to main endometrial lining**
      - Negative feedback again
    - **EGG FERTILIZED = pregnancy**
      - **Blastocyte [maturing zygote] keeps corpus luteum functional**
        - Secreting progesterone & estrogen → keeps endometrial thick for implantation
  - **Menstruation = 1st day of follicular phase**
    - EGG NOT FERTILIZED
      - Corpus luteum deteriorates → decline in progesterone & estrogen → endometrium sloughs off LT menstruation
      - Negative feedback switched to positive feedback → increase GnRH
        - CYCLE REPEATS

- **Dysfunctional [Abnormal] Uterine Bleeding**
  - Abnormal frequency or intensity of menses due to nonorganic causes
  - Normal Cycle 24-38 days
  - Normal menstruation
    - 4.5-8 days
    - Average loss 30 ml – 80 ml
  - Terms
    - Amenorrhea = Absence of period
    - Cryptomenorrhea = light flow or spotting
    - Menorrhagia = HEAVY or PROLONGED bleeding @ normal menstrual intervals
    - Metrorrhagia = irregular bleeding BETWEEN EXPECTED CYCLES

        - Menometrorrhagia = irregular, EXCESSIVE bleeding BETWEEN cycles
        - Oligomenorrhea = infrequent periods: prolonged cycles > 35 days but less < 6 months
        - Polymenorrhagia = frequent cycle intervals < 21 days
    - Etiology
        - **<u>Chronic anovulation – 90%</u>**
            - Disruption of hypothalamus-pituitary axis
            - Seen w/ extreme ages: teenagers soon after menarche & perimenopausal
            - UNOPPOSED ESTROGEN
                - Without ovulation = no progesterone = excess estrogen = endometrial growth
                - Irregular, unpredictable shedding/bleeding

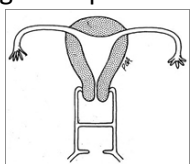
        - **<u>Ovulatory – 10%</u>**
            - Regular cyclical shedding
            - + ovulation w/ prolonged progesterone section → increase blood loss & prostaglandins → **menorrhagia**

    - **Diagnosis of Exclusion**
        - *No evidence of organic cause & negative pelvic exam*
        - **Workup**
            - Hormone levels
            - Transvaginal US
            - Endometrial biopsy
                - if endometrium >4 mm on US or women >35 yo → R/O endometrial carcinoma
    - Management
        - 1 – control bleeding
            - Acute severe bleeding
                - High dose IV estrogens or high dose OCPs
                - D&C if IV estrogen fails
        - 2 – prevent future bleeding
        - 3 – minimize endometrial cancer risk
        - <u>Anovulatory [90%] & Ovulatory [10%]</u>
            - **OCPs = 1st line** → regulates periods & reduces flow; decreases endometrial CA risk
            - Progesterone IF estrogen is contraindicated
            - GnRH agonists – leuprolide
        - Surgery →IF NOT responsive to medical tx
            - **Hysterectomy = DEFINITIVE tx for DUB**
            - Endometrial ablation – pts who DON'T want a hysterectomy

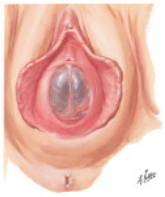
- **<u>Amenorrhea</u>**
    - Absence of menses
    - Workup
        - Pregnancy test = MCC of secondary amenorrhea
        - Serum prolactin
        - FSH & LH
        - TSH
    - <u>Primary Amenorrhea</u>
        - **Failure of menarche**

- by 15 w/ secondary sex characteristics
- by 13 w/o secondary sex characteristics

▪ Etiologies
- **Uterus Present & Breast Present**
  - ***Outflow obstruction***
    - Transvaginal septum = 2 compartment



    - Imperforated hymen = no opening into canal, blue bulge



- **Uterus Present – Breast ABSENT**
  - Ovarian Causes → elevated FSH & LH
    - Premature ovarian failure – 46XX = early menopause
    - Gonadal dysgenesis = Turner's 45XO
  - Normal/Low FSH & LH
    - Hypothalamus-Pituitary Failure
    - Puberty delays – athletes, illness, anorexia
- **Uterus ABSENT & Breast Present**
  - Mullerian agenesis – 46 XX = absence of uterus, cervix, and/or vagina
  - Androgen insensitivity – 46 XY = genetically male
- **Uterus ABSENT & Breast ABSENT**
  - RARE
  - Defect in testosterone synthesis
  - Phenotypic immature girl w/ primary amenorrhea w/ intraabdominal testes

○ <u>Secondary Amenorrhea</u>
▪ Absence of menses for >3 months w/ previous normal menstruation
▪ Absence of menses for >6 months w/ pervious oligomenorrheic
▪ Etiologies
- **Pregnancy = MCC of secondary amenorrhea**
  - Order B-hCG
- **Hypothalamus dysfunction – 35%**
  - Disruptions of GnRH = decreases FSH & LH production by pituitary
  - Diagnosis
    - **Normal or LOW FSH & LH**
    - Normal prolactin
  - Tx → stimulate GnRH – **clomiphene**

- **Pituitary dysfunction**
  - **Prolactin secreting pituitary adenoma**
  - Dx
    - Low FSH & LH
    - **HIGH PROLACTIN [inhibits GnRH]→ galactorrhea**

        - MRI of pituitary sella
    - Tx → transsphenoidal surgery = tumor removal
- **Ovarian disorders – 40%**
    - PCOS
    - **Premature ovarian failure**
    - Turners
    - **Symptoms of estrogen deficiency [similar to menopause]**
        - Hot flashes
        - Sleep & mood disturbances
        - Dyspareunia
        - Dry/thick skin
        - Vaginal dryness/atrophy
    - Dx
        - **Increased FSH & LH and Decreased estradiol**
        - **Progesterone challenge test – 10 mg medroxyprogesterone for 10 days**
            - **+ withdrawal bleeding = ovarian**
            - no withdrawal bleeding = hypoestrogenic or uterine
- **Uterine disorder**
    - **Scarring of uterine cavity**
        - **Asherman's syndrome** = acquired endometrial scarring secondary to postpartum hemorrhage
        - D&C
        - Endometrial infection
    - Dx
        - **Pelvic US = absence of uterine stripe**
        - **Hysterectomy = diagnostic & therapeutic**
    - Tx → estrogen treatment

- **Dysmenorrhea**
    - **PAINFUL menstruation** that *affects normal activities*
    - Primary Dysmenorrhea
        - **INCREASED PROSTAGLANDINS** → painful uterine wall activity
            - *Prostaglandin = stimulate uterine contraction*
        - ***NO pelvic pathology***
    - Secondary Dysmenorrhea
        - **PELVIC PATHOLOGY**
            - Endometriosis, adenomyosis, leiomyomas, adhesions, PID
    - Si/Sx
        - Diffuse pelvic pain before or with the onset of menses
            - +/- lower abdomen, suprapubic, pelvic → radiate to lower back & legs
        - May be associated w/ HA, N/V
    - Management
        - **NSAIDs – 1st line → inhibits prostaglandin-mediated uterine activity**
            - Start before onset of symptoms/menstruation
        - Ovulation suppression – **OCPs**, Depo-Provera, IUD
        - Laparoscopy – iF medications fail = R/O secondary causes

- **Premenstrual syndrome [PMS]**
    - Cluster of **physical, behavior & mood changes** w/ cyclical occurrence during luteal phase
    - 75-85% of pts

- **<u>Premenstrual dysphoric disorder [PMDD]</u> → severe PMS w/ functional impairment**
    - Tx w/ Drosperionone-containing OCPs
- Si/Sx
    - **Physical** → bloating, breast swelling/tenderness, bowel changes, fatigue, muscle/joint pain
    - **Emotional** → depression, hostility, irritability, libido changes, aggression
    - **Behavioral** → food cravings, poor concentration, noise sensitivity, loss of motor senses
- Diagnosis
    - Symptoms
        - 1-2 weeks before menses
        - relieved within 2-3 days of onset of menses
        - at least 7 symptom free days during follicular phase
- Management
    - **Lifestyle modifications** → exercise, caffeine, salt restriction
    - **NSAIDs**
    - Vitamin B6 & E
    - **SSRIs** – emotional symptoms [fluoxetine, sertraline, paroxetine, citalopram]
    - **OCPs** – induce anovulation
        - drosperinone-containing OCPs for PMDD

- **<u>Menopause</u>**
    - Cessation of menses > 1 year due to loss of ovarian function
    - Average age 50-52 yo [US]
    - Premature menopause = menopause before 40 yo
        - RF – DM, smokers, vegetarians, malnourished pts
    - Si/Sx
        - Estrogen deficiency changes
            - Vasomotor instability – **hot flashes**
            - **Mood changes**
            - Skin/nail/hair changes
            - Increased CV events– due to LOSS OF ESTROGEN
            - Hyperlipidemia– due to LOSS OF ESTROGEN
            - **Osteoporosis** – due to LOSS OF ESTROGEN
            - **Dyspareunia** – painful intercourse → due to vaginal atrophy
            - **Urinary incontinence**
            - **Atrophic vaginitis**
        - Irregular menstrual cycles but NO premenstrual symptoms
    - Physical Exam
        - Decreased bone density → order DEXA scan
        - Skin = thin, dry & decreased elasticity
        - Vaginal atrophy & thin mucosa
    - Diagnosis
        - FSH assay → more sensitive INITIAL test
            - Increase **FSH > 30**
        - **Increased serum FSH & LH w/ DECREASED ESTROGEN**
    - Management
        - Estrogen, progesterone → vasomotor insufficiency/hot flashes
        - Estrogen transdermal, intravaginal → atrophy
        - **Osteoporosis prevention**
            - Calcium + vitamin D + weight bearing exercises

- Bisphosphonates
- SERM – raloxifene, tamoxifen

▪ Hormone replacement therapy
- Estrogen ONLY → **pts w/ NO UTERUS**
  - Most effective symptomatic treatment
  - RF – increased risk of endometrial cancer & thromboembolism
- Estrogen + Progesterone → **UTERUS PRESENT**
  - **Continuous dose** – no menstrual like bleeding
  - **Sequential [Cyclic] dose** – menstrual like bleeding occurs
    - BENEFITS
      - Decrease heart and stroke events
      - Decrease osteoporosis
      - Protective against endometrial cancer
    - Risks → venous thrombosis

Infections (12%) – 12

Vaginitis				
Type	Trichomoniasis	Bacterial Vaginosis [BV]	Atrophic Vaginitis	Candidiasis
Organism	Trichomonas vaginalis • Pear shaped • **Flagellated**	Gardnerella vaginalis Anaerobes		Candida albicans **overgrowth** of normal flora
Etiology	Sexually transmitted	MCC of vaginitis Decreased lactobacilli → overgrowth of normal flora	Vaginal atrophy	DM Steroid use Pregnancy
Si/Sx	Vulvar pruritus Vulvar erythema Dysuria Dyspareunia Strawberry cervix	Vaginal **odor worse AFTER SEX** >50% asymptomatic	Vaginal discharge Pruritus	Vaginal & vulvar erythema, swelling, burning, pruritus Dysuria Dyspareunia
Discharge	Copious FROTHY YELLOW/GREEN	Copious Thin – watery GREY-WHITE "Rotten Fish" smell	Thin Yellow	THICK Curd-like / cottage cheese
pH	>5	>5	> 5.5	Normal [3.8 – 4.2]
Whiff Test	+/-	++ Fishy odor w/ **10% KOH prep**		Negative
Dx	Microscope – mobile protozoa [wet mount] WBCs	Microscope – clue cells Few WBCs		Microscope – hyphae, yeast on **KOH**
Tx	Metronidazole [**PO preferred**] Tinidazole	Metronidazole x 7 days Clindamycin [both gel or PO]	Topical Estrogen	Fluconazole PO 1x Intravaginal antifungal • Clotrimazole, nystatin • Butoconazole • Miconazole
	Metronidazole is SAFE during pregnancy			
Prevention	Spermicidal agents	Avoid douching		Keep vagina dry

	Treat partner!			100% cotton undies Avoid tight fitting clothes, feminine deodorants, bubble bath
Complication		Pregnant Female • PROM • Preterm labor • Chorioaminoitis		

Cervicitis			
Infection	Presentation	Diagnosis	Treatment
Chlaymdia [STI] *Chlaymdia trachomatic* *Gram -*	• MC si/sx = ASYMPTOMATIC • **Mucopurulent cervicitis** • Abnormal vaginal discharge • **Post coital bleeding**	• **Nucleic acid amplification [NAATs]** → PCR = most sensitive/specific • Cultures • DNA probe	• Azithromycin 1g PO **single dose** **OR** • Doxycyclin 100mg PO **2x for 7 days** • AVOID intercourse for 7 days after tx *ALWAYS treat for the other infection* • Ceftriaxone 125 mg **IM** **AND** • Cefixime 400mg **PO single dose** OR azithromycin 2 g
Gonorrhea [STI] *N. gonorrhoeae* *Gram -*	• Asymptomatic • 3-5 days post infection • Cervicitis		
Chlaymdia + Gonorrhea COMPLICATION • PID , Infertility, Ectopic pregnancy • **Reactive arthritis** = Reiter's syndrome **[+HLA-B27]** → *can't pee, can't see, can't climb a tree*			
Herpes Simplex Virus [HSV] *HSV 1 – oral* *HSV 2- genital*	• MULTIPLE, small vesicles • Erythematous base • PainFUL • Prodromal symptoms 24 hrs – burning, paresthesias, tingling → painful grouped vesicles	• Viral culture [poor specificity] • PCR – most sens&spec • Tzanck smear – multinucleated giant cells & inclusion bodies **HSV = MCC of encephalitis**	• Acyclovir → **MC** ○ @ 36 weeks to prevent active GENITAL infection during delivery • Famciclovir • Valcyclovir
HPV	Etiology • Oncogenic 16&18, 31, 33, 35 • Genital warts 6 & 11 • ***Complication*** → cervical dysplasia, cervical cancer Si/Sx • Flat, pedunculated or papular flesh-colored growth • "Cauliflower" lesion	• 4% acetic acid → **Lesion whitening** • Clinical • +/- Colposcopy biopsy	Office • Trichloroacetic acid • Podophylin – wash after 4 hrs • Cryotherapy • Surgical removal Outpatient • Podofilox • Imiquinmod

PID *MC – N.gon & Chlamydia*	Etiology • Ascending infection of upper reproductive tract • RF – multiple sex partners, unprotected sex, PID Hx, 15-19, nulliparous, IUD Si/Sx + PE • Pelvic pain • Vaginal discharge • N/V • Fever • Lower abdominal tenderness • Dysuria • Purulent cervical discharge • Dyspareunia • + Chandelier sign • Cervical motion tenderness	• **Obtain B-hCG RO preg** Physical Exam • Abdominal tenderness **AND** • CMT **AND** • Adnexal tenderness • Pelvic US • Laparoscopy	**Outpatient** • Doxycycline [100mg bid x14] **AND** • Ceftriaxone [250 mg IM] • +/- metronidazole **Inpatient** • IV doxycycline + 2nd gen cephalosporin [cefoxitin or cefotetant] Complications • Fitz-Hugh Curtis syndrome – hepatic fibrosis → Si/Sx – RUQ pain due to perihepaititis, "violin string" adhesions • Infertility, tubo-ovarian abscess, ectopic,

OTHER			
Issue	Syphilis	Chancroid	Lymphogranuloma Venereum
Organism	Treponema pallidum	Haemophilus ducreyi [gram – bacillus]	Chlamydia trachomatis
Etiology	The "great imitator" Direct contact of infected lesion = intercourse, mucous membrane CROSSES PLACENTA!	Uncommon in US IP 3-5 days	Caused by long term infection
Si/Sx	3 day – 3 months incubation Primary • **PainLESS ulcer (Chancre)** • Papule → LT ulceration • Nontender regional LD Secondary: few weeks – 6 mon • **Maculopapular rash** – diffuse & bilateral • **Soles & palms** involved • Condyloma lata – wart like moist lesion = highly contagious Tertiary [Late]: 1 to >20 yrs • GUMMA – noncancerous granulomas • Neurospyhilis – tabes dorsalis • Arygyll Robertson pupil –does not react to light	PAINFUL genital ulcer – soft, shallow, **foul discharge** **Bubo formation** PAINFUL inguinal LAD	**PAINLESS genital ulcer → LT PAINFUL inguinal LAD** Genital/rectal lesion w/ softening Suppuration Lymphadenopathy
Dx	Darkfield Microscopy • Spirochete • Pts w/ chancre or condyloma lata	Clinical Culture	

	Screening Tests • RPR – rapid plasma reagent • VCRL – venereal disease research lab **Confirmatory** • **Treponemal tests – FTA-ABS** = fluorescent treponemal antibody absorption		
Tx	Penicillin G **IM*** - for ALL stages MUST TREAT IN PREGNANCY BECAUSE INFECTION CROSSES PLACENTA & CAN CAUSE FETAL HARM – PCN = SAFE	Azithromycin* Ceftriaxone Erythromycin Ciprofloxacin	
complication	Congenital Syphilis • **Hutchinson teeth** = notches • Sensorineural HL • CNS abnormalities • **Saddle-nose deformity** • ToRCH syndrome (T= toxoplasmosis, R= Rubella, C- CMV, H- HSV)	Secondary infections Scarring	

Neoplasms (10%) – 6

- **Ovarian neoplasms**
  - **Ovarian Cancer**
    - **2nd MC gynecological cancer [after endometrial]**
    - *Highest mortality of all gynecological cancers*
    - Risk Factors
      - **+ FHx**
      - **Increase # of ovulatory cycles** [infertility, nulliparity, >50yo, late menopause]
      - BRCA1/BRCA2
    - Protective Factors
      - **OCPs protective** * [decreases # of ovulatory cycles]
      - High parity
      - TSH
    - Si/Sx
      - RARELY symptomatic until late in disease [extensive METS]
      - 40-60 yo
      - Abnormal fullness/distention, back or abdominal pain, early satiety, urinary frequency
      - Irregular menses, menorrhagia, postmenopausal bleeding, constipation
    - Physical Exam
      - **Palpable abdominal or ovarian mass**
        - *Solid*
        - *Fixed*
        - *Irregular*
      - **Ascites**
      - Sister MaryJ oseph's node – METS to umbilical lymph nodes
    - Dx

- **Biopsy** – 90% epithelial [esp postmenopausal], 30% germ cells [< 30 yo]
- **Transvaginal US – screening**
- Mammogram – look for primary in breast

- Management
  - **Early stage: TAH-BSO + selective lymphadenectomy**
  - **Surgery**: tumor dublking
    - ***Serum CA-125 – levels used to monitor treatment progress***
  - Chemo: paclitaxel + Cisplatin or Carboplatin

- **Benign Ovarian Neoplasms**
  - Reproductive age – 90% of ovarian neoplasms are BENIGN
  - Risk of malignancy increased w/ age
  - **<u>Dermoid cystic teratomas</u>**
    - MC benign ovarian neoplasm
  - Management
    - Removal – potential risk of torsion or malignant transformation

  - **<u>PCOS – polycystic ovarian syndrome</u>**
    - *Endocrine syndrome – due to insulin resistance*
      - Abnormal hypothalamus-pituitary → increase insulin & LH → increases androgen production
      - **TRIAD**
        - **Amenorrhea** [chronic anovulation]
        - **Obesity**
        - **Hirsutism** [androgen excess]
    - Si/Sx
      - **Menstrual irregularity**
        - Secondary amenorrhea
        - Oligomenorrhea
      - Increased Androgen
        - **Hirsutism** – coarse hair growth on midline structures [face, neck, abdomen]
        - Acne
      - **Insulin resistance**
        - **Type II DM**
        - **Obesity**
    - Physical Exam
      - **Bilateral enlarged, smooth, mobile ovaries on bimanual exam**
      - **Acanthosis nigricans ****
    - Dx
      - Exclude other disorders – TSH, pituitary adenoma [prolactin], ovarian tumors, Cushing's
      - Labs
        - **Increased testosterone**
        - **LH:FSH ratio >3:1**
        - GnRH agonist stimulation test
        - Lipid panel
        - **Pelvic US**
          - **Bilateral enlarged ovaries w/ peripheral cysts**
          - **"String of pearls"**

- Management
  - Combination OCPs – mainstay
    - Normalize bleeding
    - Suppress androgen
  - Anti-androgenic agents for hirsutism – **Spirolactone**
  - **Infertility – clomiphene**
    - **Metformin in pts w/ abnormal LH:FSH**
  - Lifestyle changes
  - Surgical
- Complications
  - Chronic anovulation
    - Increase risk for infertility
    - Increase endometrial hyperplasia & endometrial carcinoma

- **Cervical carcinoma**
  - HPV – 99.7%
    - **16, 18, 31, 33**, 45, 52, 58
  - **3rd MC gynecologic cancer** [#1 = endometrial, #2 = ovarian cancer]
  - Average age of diagnosis 45
  - MC METS locally – vagina, parametrium, pelvic lymph nodes
  - Risk Factors
    - **HPV**, early onset of sexual activity, increase # of partners, smoking, CIN
    - **DES exposure**, immunosuppression, STIs
  - Two types
    - Squamous 90%
    - Adenocarcinoma 10% [**clear cell carcinoma linked with DES exposure**]
  - Si/Sx
    - **Post coital bleeding/spotting – MC symptom**
    - Metrorrhagia
    - Pelvic pain
    - +/- watery discharge
  - Dx
    - Colposcopy w/ biopsy
    - Pap smear w/ cytology – screening
  - Management
    - **Stage 0 – carcinoma in situ**
      - **Excision**** – LEEP, cold knife conization
      - **Ablation** – cryotherapy or laser
      - TAH-BSO [total abdominal hysterectomy w/ bilateral salpingo-oophorectomy]
    - **Stage Ia1 – microvasion**
      - **Surgery** – conization, TAH-BSO, XRT
    - **Stage I, IIA**
      - TAH-BSO; XRT + chem tx [cisplatin]
    - **Stage IIb-Iva – locally advanced**
      - **Locally Advanced**
        - II - Extends locally beyond cervix
        - III – lower 1/3 of vagina
        - Iva – local METS [bladder, rectum]
      - Radiation [XRT] + chemo [cisplatin +/- 5FU]
    - Stage IBb or recurrent – Ivb: distance METS

- Palliative radiation therapy
- Chemotherapy

- **Cervical dysplasia**
  - Pap Smear *Cytology* Results
    - **Negative for intraepithelial lesions or malignancy [no neoplasia]**
      - NORMAL PAP or reactive cellular changes w/ inflammation
      - Management
        - **NO HPV – Follow routine PAP screening guidelines**
        - **>25 + HPV positive**
          - Cytology & HPV testing in 12 months
            OR
          - Genotype for HPV 16 & 18

    - **Squamous Cell Abnormalities**
      - ASC-US – atypical squamous cells of Undetermined significance
        - Goal – see if HPV related
        - Management
          - > 25
            - HPV testing
              - Negative → repeat PAP & HPV every 3 yrs
              - Positive → colposcopy w/ biopsy
            - Repeat PAP in 1 year
              - Negative – continue regular PAP screening
              - Positive – colposcopy

      - ASC-H – atypical squamous cells can't HSIL
        - Higher chance for cancer than ASCUS
        - Management
          - Colposcopy – apply acetic acid for accentuation of lesions

      - LSIL – low grade squamous intraepithelial lesion
        - MC associated w/ cellular changes seen w/ transient HPV infection
        - Includes CIN I
        - Management
          - 25-29 yo → colposcopy w/ biopsy
          - >30
            - HPV negative → repeat cytology in 1 year
            - HPV positive → colposcopy w/ biopsy

      - HSIL – high grade squamous intraepithelial lesion
        - CIN II, CIN III & carcinoma in situ
        - Management
          - Colposcopy w/ biopsy – ALL AGES

    - **Glandular Cell Abnormalities**
      - Atypical glandular
      - Endocervical carcinoma in situ, adenocarcinoma, endometrial cells
      - Management
        - Colposcopy for ALL GLANDULAR CELL ABNORMALITIES

- MAY be indicative of endometrial neoplasia

- *Cervical Biopsy Histology* Results
  - **LSIL – low grade squamous intraepithelial lesion**
    - *Usually result of transient HPV infections* [esp young women]
    - May progress to cancer in 7 years
    - CIN 1
      - **MILD DYSPLASIA contained to basal 1/3 of epithelium**
      - Management
        - Observation – 75% resolve within 1 year
        - Excision
          - LEEP – loop electrical excision procedure
          - Cold knife cervical conization
        - +/- Ablation

  - **HSIL – high grade squamous intraepithelial lesion**
    - Includes CIN II, CIN III & Carcinoma in Situ
    - *Usually from persistent HPV infections*
      - Often p-16 positive
    - CIN 2
      - **MODERATE DYSPLASIA** including **2/3 thickness of basal epithelium**
    - CIN 3
      - **SEVERE DYSPLASIA**: **>2/3 – up to full thickness of basal epithelium**
      - Full thickness = carcinoma in situ
    - Management
      - CIN 2 & CIN 3
        - Excision
          - LEEP – loop electrical excision procedure
          - Cold knife conization
        - Ablation
          - Cyrocautery
          - Laser cautery
          - Electrocautery

- **Breast cancer**
  - Malignancy primarily of the milk ducts (ductal) or the lobules
    - MC non skin malignancy in women
    - 2nd MCC of death (after lung)
  - Risk factors
    - BRCA 1 & BRCA 2
      - Genetic mutation --> assoc. Breast & ovarian CA
    - 1st degree relative w/ breast CA
    - Age > 65 y
    - **Hormonal: Increase # of menstrual cycles**
      - Nulliparity, 1st full term preg. > 35 y, early onset of menarche, late menopause, prolonged unopposed estrogen, never breast fed
    - Increased estrogen
    - 75% have no risk factors
  - Types
    - Ductal carcinoma

- Infiltrated ductal carcinoma --> MC (75%)
    - Associate w/ lymphatic METS, esp. axillary
- Ductal carcinoma in situ (DCIS)
    - DOES NOT penetrate basement membrane

- Lobular carcinoma
  - Infiltrative lobular carcinoma
  - Lobular carcinoma in situ (may not process but ass. W/ increased risk of invasive breast CA in either breast
- Medullary, mucinoid, tubular, papillary, metastatic, mammary paget's dz of the breast

- Si/sx
  - Breast mass
    - Usually painless, hard, fixed (non-mobile) lump
    - May be mobile early on
    - 80% present w/ mass--> 90% found by pt
    - Pain rare
    - +/- axillary lymphadenopathy
    - MC is upper outer quadrant
  - Unilateral nipple d/c
    - +/- bloody, purulent or green
    - METS to lung, liver, bone, brain
- Physical Exam
  - Skin changes
    - Asymmetric redness, discoloration, ulceration, skin retraction (dimpling if cooper's ligament involvement), changes in breast size & contour, nipple inversion, skin thickening
  - Paget's dz of the nipple
    - Chronic eczematous itchy, scaling rash on the nipples & areola
    - A lump is often present
  - Inflammatory breast CA
    - Red, swollen, warm, itchy breast
    - Often w/ nipple retraction
    - Usually not ass. W/ lump
    - **Peau d'orange**
      - Skin looks like the peel of an orange d/t lymphatic obstruction
      - Ass. W/ poor prognosis
- Dx
  - Mammogram
    - Microcalcifications & spiculated masses highly suspicious for malignancy
  - US
    - Recommended initial modality to evaluate breast masses in women <40y
      - D/t high density of breast tissue
    - May be used to guide FNA w/ biopsy
  - Biopsy
    - Fine needle w/ biopsy, large needle core biopsy, open (excisional biopsy)
- Staging--> Based on T (size), N= nodes (axillary lymph nodes), M= Metastasis
  - Stage 0
    - Precancerous, DCIS or LCIS
  - Stage I-III
    - Within breast/regional lymph nodes
  - Stage IV

- Metastatic breast cancer

- Management
  - Lumpectomy
    - **Followed by radiation therapy**
    - Allows for breast conservation
  - Mastectomy
    - Entire breast removed
    - Indications: Diffuse, large tumor, prior XRT to breast etc
  - Removal or regional (axillary lymph nodes)
    - To determine if METS present
- Adjunctive
  - Radiation therapy / chemotherapy
    - Radiation
      - Done after lumpectomy and may be done post mastectomy to destroy residual microscopic tumor cells
      - External beam radiation or brachytherapy (internal)
    - Chemotherapy
      - Used in breast cancers stage II-IV and inoperable dz
        - Especially ER negative dz
      - Ex: Doxorubicin, Cyclophosphamide, Fluorouracil, Docetaxol
  - Neoadjuvant endocrine therapy (Hormone therapy
    - Breast CA tumors may be
      - Estrogen receptor (ER) positive
      - Progesterone receptor (PR) positive
      - HER 2 positive
    - Anti estrogen (Tamoxifen)
      - Useful in tumors that are ER + (dependent on estrogen for growth)
      - MOA: binds & blocks estrogen receptor in breast tissue
    - Aromatase inhibitors
      - Useful in postmenopausal ER + pts w/ breast CA
      - MOA: reduces the production of estrogen
      - Ex: **Letrozole, Anastrozole**
    - Monoclonal Ab treatment
      - Useful in pt w/ HER2 positivity
      - Her 2 receptors stimulate cancer growth and are associated w/ more aggressive tumors
- Breast cancer screening
  - Mammogram
    - Best screening test
  - Clinical Breast Exam
    - At least q 3y in women age 20-39 (annually after age 40y)
  - Breast Self examination
    - Immediately after menstruation or on days 5-7 of menstrual cycle
- Breast cancer prevention in high risk pt
  - SERM:
    - Tamoxifen or Raloxifene can be used in postmenopausal or women >35 w/ high risk

- **Endometrial cancer**
  - **Endometrial hyperplasia** = endometrial gland proliferation → **precursor to endometrial carcinoma**
    - Hyperplasia due to continuous increased unopposed estrogen [chronic anovulation, PCOS, perimenopause, obesity]
      - MC = post menopausal
    - Si/Sx
      - Bleeding – **menorrhagia**, metrorrhagia, **post-menopausal bleeding**
    - Dx
      - **Transvaginal US [TVUS] → screening test**
        - *Endometrial stripe > 4mm*
      - **Endometrial biopsy – DEFINITIVE dx**
        - > 35 yo
        - Increased endometrial stripe on TVUS
        - Pts on unopposed estrogen therapy
        - Tamoxifen
        - AGS on PAP smear
        - Persistent bleeding w/ endometrial stripe > 4mm
    - Management
      - Endometrial hyperplasia **WITHOUT ATYPIA**
        - **Progestin** – PO or IUS
        - Repeat biopsy in 3-6 months
      - Endometrial hyperplasia **WITH ATYPIA**
        - **Hysterectomy** [TAH +/- BSO]
  - MC gynecologic malignancy in the US [2x that of cervical cancer]
  - 4th MC malignancy incidence in women overall
  - MC postmenopausal
    - 50-60 yo peak
  - **Estrogen-dependent cancer – associated w/ endometrial hyperplasia**
  - Risk Factors
    - **Increased estrogen exposure**
    - Nulliparity, chronic anovulation, PCOS, obesity, late menopause, Tamoxifen, HTN, DM
    - **Estrogen replacement therapy**
  - Si/Sx
    - **Abnormal uterine bleeding**
      - Postmenopausal bleeding ***
      - Pre or perimenopsual → menorrhagia
  - Dx
    - Endometrial biopsy
      - **Adenocarcinoma = MC type**
      - Sarcoma
    - Ultrasound – endometrial stripe >4mm
  - Management
    - Stage I → hysterectomy [TAH-BSO] +/- post-op radiation therapy
      - **One of the most curable of the gynecological cancers**
    - **Stage II-III → TAH-BSO + node excision** +/- post-op radiation
    - Stage IV [advanced] → systemic chemo

- **Vaginal Cancer**
  - RARE – 1% gynecological malignancies [usually secondary to another cancer]

- Peak incidence 60-65 yo
- **Squamous cell 95%**
- **Clear cell – DES exposure in utero**
- Si/Sx
  - Asymptomatic
  - Changes in menstrual period
  - Abdominal vaginal bleeding
  - Vaginal discharge
- Management → radiation therapy

- **<u>Vulvular Cancer</u>**
  - 90% - squamous cell
    - Increase risk w/ HPV 16, 18, 31
  - Linked to DES exposure
  - Si/Sx
    - **Pruritus – MC presenting sign**
    - Irritation
    - Asymptomatic
    - Post-coital bleeding
    - Vaginal discharge
  - Dx
    - Red/white ulcerative, crusted lesions – BIOPSY
  - Tx
    - Surgical excision
    - Radiation therapy
    - Chemotherapy

Disorders of the breast (8%)

- **<u>Mastitis and Breast abscess</u>**
  - **Mastitis** = *inflammation of the breast*
    - Types
      - <u>Infection</u>
        - MC in lactating women secondary to nipple trauma [esp primagravida]
        - Organisms
          - MCC = S.aureus
          - Strep
          - Candida
        - Si/Sx
          - **UNILATERAL** breast pain [esp 1 quadrant] w/ tenderness
          - Warmth
          - Swelling
          - Nipple discharge
        - Tx
          - **Supportive** – warm compress, breast pump
            - CONTINUE BREAST FEEDING
          - **Anti-staphylococcal antibiotics** – dicloxacillin, nafcillin, cephalosporin

      - <u>Congestive</u> – BILATERAL breast enlargement 2-3 days postpartum
        - Si/Sx
          - **BILATERAL** breast pain & swelling

        - May have low grade fever & axillary adenopathy
    - Tx
        - If woman doesn't want to breast feed DO
            - Ice packs, tight fitting bras, analgesics, avoid breasts stimulation
        - Want to breast feed → completely empty breast after feeding
- **Abscess**
    - Si/Sx
        - Induration w/ FLUCTUANCE – due to pus
        - RARE
    - Tx
        - I & D – incision & drainage
        - DISCONTINUE BREAST FEEDING – from affected breast

- **Fibrocystic disease**
    - Fluid filled **breast cyst** due to exaggerated response to hormones
    - MC breast diagnosis [esp 30-50]
    - Si/Sx
        - Multiple, mobile, well demarcated lumps in breast tissue
        - **TENDER**
        - BILATERAL
        - No axillary involvement or nipple discharge
        - **Cyst MAY increase or decrease in size w/ menstrual hormonal changes**
    - Dx
        - US
        - **FNA – fine needle aspiration → straw-colored fluid [no blood]**
    - Tx
        - Most spontaneously resolve +/- FNA of fluid if symptomatic

- **Breast Fibroadenoma**
    - 2nd MC benign breast disorder
    - MC in late teens to early 20s
    - Composed of glandular & fibrous tissue [collagen arranged in "swirls"]
    - Si/Sx
        - Smooth, mobile. Well-circumscribed
        - **NON-tender**
        - **RUBBERY**
        - **NO waxing & waning w/ menstruation**
        - Gradually grows over time & may increase w/ pregnancy
        - No axillary involvement or nipple discharge
    - Tx
        - **Observation** – most small tumors resorb w/ time
        - +/- excision [not usually done]

Structural abnormalities (5%) – 4

- Pelvic Organ Prolapse
    - **Uterine prolapse** → **Uterine** herniation into the vagina
        - Risk Factors
            - Weakness of pelvic support structures
            - **MC after childbirth [esp traumatic]**

- Increased pelvic floor pressure
- Multiple vaginal births
- Obesity
- Repeated heavy lifting

- **Cystocele** → posterior **bladder** herniating into the anterior vagina
- **Rectocele** → distal sigmoid colon [**rectum**] herniates into the posterior distal vagina

- Grades
  - I → descent into upper 2/3 of the vagina
  - II → cervix approaches introitus
  - III → outside introitus
  - IV → entire uterus outside of the vagina – complete prolapse
- Si/Sx
  - **Pelvic or vaginal fullness, heaviness "falling out" sensation**
  - Lower back pain
  - Vaginal bleeding, puruln discharge
  - Urinary frequency, urgency, stress incontinence
- PE
  - **Bulging mass esp w/ increased intraabdominal pressure [Valsalva]**
- Tx
  - Prophylactic → **kegal exercises**, weight control
  - Nonsurgical – pessaries [symptomatic relief], estrogen tx [improves atrophy]
  - Surgical – hysterectomy, uterosacral or sacrospinous ligament fixation

- **Ovarian torsion/Adnexal Torsion**
  - Rotation of the ovary at its pedicle to such a degree as to occlude the ovarian artery and/or vein
  - EMERGENCY
  - RF
    - Large ovarian cysts > 5cm
  - Si/Sx
    - Acute LOWER abdominal/pelvic pain
      - Rebound & guarding
    - Adnexal pain
    - Bleeding
  - Tx
    - Surgery → laparoscopy

Other (5%)

- Contraceptive methods
  - PANCE 287-289
- Endometriosis
  - Presence of endometrial tissue (stroma and glad) out of the endometrial cavity
    - Ectopic endometrial tissue responds to cyclical hormonal changes
    - Ovaries MC site
  - Risk Factors
    - Nulliparity
    - Family hx
    - Early menarche
    - Onset usually <35 y

- Si/sx
  - Classic triad
    - Cyclic premenstrual pelvic pain +/- low back pain
    - Dysmenorrhea
    - Dyspareunia
  - Dyschezia
  - +/- pre post menstrual spotting
  - Infertility
    - >25% of all causes of female infertility
- Dx
  - Physical Exam
    - Usually normal
    - +/- fixed tender adnexal masses
  - **Laparoscopy with biopsy--> Definitive dx***
    - Visualize structures for presence of tissue
    - Rised, patches of thickened, discolored, scarred, or "powder burn" appearing implants of tissue
    - Endometrioma:
      - Endometriosis involving ovaries large enough to be considered tumor
      - Usually filled w/ old blood appearing chocolate colored --> chocolate cyst
- Tx
  - Medical (Conservative) ovulation suppression
    - Premenstrual pain
      - **Combined OCPs** + NSAIDS
    - Progesterone
      - Suppresses GnRH
      - Causes endometrial tissue atrophy
      - Suppresses ovulation
    - Leuprolide
      - GnRH analog
      - Causes pituitary FSH/LH suppression
    - Danazol
      - Testosterone
      - Induces postmenopause--> suppresses FSH & LH mid cycle surge
- Surgical
  - Conservative--> Laparoscopy w/ ablation
    - If fertility desired
    - Preserves uterus & ovaries
  - Total abdominal Hysterectomy with Salpingo-oophorectomy (TAH-BSO)
    - If not desire to conceive

- Ovarian cyst
  - **Follicular cysts**
    - Occur when follicles failure to rupture & continue to grow
  - **Corpus luteal cysts**
    - Fail to degenerate after ovulation
    - Theca lutein:
      - Excess beta-hCG causes hyperplasia of theca interna cells
  - Si/sx
    - Most are asymptomatic until they
      - Rupture

                - Undergo torsion
                - Become hemorrhagic
                    - Unilateral RLQ or LL pain
            - Menstrual changes (abnormal uterine bleeding)
            - Dyspareunia
    - Physical Examination
        - Unilateral pelvic pain/tenderness
        - May have a mobile palpable cystic adnexal mass
    - Dx
        - Pelvic US
            - **Follicular**
                - Smooth
                - Thin walled unilocular
            - **Luteal**
                - Complex
                - Thicker walled w/ peripheral vascularity
                - Order beta-hCG to r/o pregnancy
    - Tx
        - Supportive
            - Most cysts <8cm are functional & usually spontaneously resolve
                - Rest, NSAIDS
                - Repeat US after 6 weeks
                - +/- OCP --> prevent recurrence *but doesn't treat existing ones*
            - > 8cm /persistent or cysts found post menopause
                - +/- laparoscopy or laparotomy
- Leiomyoma (uterine fibroids)
    - **Leiomyoma**: benign uterus smooth muscle tumor
        - MC benign gynecologic lesion
        - Growth related to ***estrogen production*** --> regresses after menopause
            - If it grows after menopause, think other causes
            - +/- increase w/ pregnancy or change in size w/ menstrual cycle
        - MC in 30 (esp. > 35)
        - 5x more common in African Americans
        - Types:
            - Intramural
            - Submucosal
            - Subserosal
            - Parasitic
    - Si/sx
        - Most are asymptomatic
        - **Bleeding (menorrhagia)** -->MC presentation
        - Dysmenorrhea
        - Abd pressure/pain
            - Related to size of tumor and location
        - Bladder:
            - Frequency
            - Urgency
    - Physical Examination
        - Large, irregular hard palpable mass in abd or pelvis
    - Dx

        - Pelvic US
            - Focal heterogenic mass w/ shadowing
            - Also used to observe growth
    - Tx
        - Observation
            - **Majority of tx**
            - Decision to treat determined by
                - Symptoms
                - Size/rate of tumor growth
                - Desire for fertility
        - Medical--> Inhibition of estrogen (decreases endometrial growth)
            - Leuprolide
                - GnRH agonist that causes GnRH inhibition when given continuously
                    - Shrinks uterus temporarily until natural menopause
                - Most effective medical tx
                    - Can shrink as much as 50% but will return to normal size once therapy is stopped
                    - Not long term therapy
                    - Usually used if near menopause or preoperatively (prior to hysterectomy)
            - Progestins
                - Causes endometrial atrophy--> decreases bleeding
                - Ex: Medroxyprogesterone
        - Surgical
            - **Hysterectomy**
                - **Definitive tx**
                - Fibroids are MCC for hysterectomy
            - **Myomectomy**
                - Used especially to preserve fertility
            - Endometrial ablation, artery embolization--> Both may affect ability to conceive
- <u>Spouse of partner neglect/violence</u>
    - Domestic violence
        - Relationship in which an individual is victimized by a current or past intimate partner
            - Physically
            - Psychologically
            - Emotionally
        - Every woman should be screened b/c it can occur w/ any woman, in any situation
        - Any injury **during pregnancy**
            - especially to the abd or breast--> suspicious for abuse
    - Recognition of domestic violence
        - Bilateral or multiple injuries
        - Delay in sought treatment
        - Inconsistencies between explanation of injury and clinical findings
        - History of repeated trauma
        - Patient calls or visits frequently for general somatic complaints
        - The perpetrator may exhibit:
            - Signs of control over health care team
            - Refusal to leave pt side for private convo
            - Control of vicitm
        - **Pregnant women**

- Late entry into prenatal care
- Missed appts
- Multiple repeated complaints
- Pregnant women are at highest risk to experience domestic violence, during the pregnancy
- All pregnant women should be questioned about abuse during EACH trimester

  - Dx
    - Use screening questionnaire
  - Medical obligation to victims
    - Listen and assure pt it is not her fault
    - Assess safety of pt and children
    - If pt ready to leave
      - Connect w/ resources (shelters, police, public agencies, and counselors)
    - If pt not ready to leave
      - Discuss a safety or exit plan
      - Provide pt w/ domestic violence info
    - Carefully document--> can be used in legal case

- <u>Sexual assault</u>
  - Sexual Assault:
    - Occurs when any sexual act is performed by one person on another w/o that person's consent
  - Rape
    - Sexual intercourse w/o consent of one party, whether from force, threat of force, or incapacity to consent d/t physical or mental condition
  - Tx:
    - Infection prophylaxis
    - Offer hepatitis B vaccine
    - Offer antivirals for HIV prophylaxis
    - Administer Td toxoid when indicaited
    - **Postcoital regimen:**
      - Plan B (levonorgestrel)
      - Combined estrogen-progestin pill
- <u>Urinary incontinence</u>
  - Chart on PANCE pg 368
  - Etiologies
    - **Pelvic floor prolapse** → stress incontinence [increased intraabdominal pressure causes LEAKAGE]
      - MC after VAGINAL child birth
    - **Menopause**
  - Tx
    - Kegals

- <u>Infertility</u>
  - Failure to conceive after 1 year of regular unprotected sexual intercourse
  - 60% of couples achieve pregnancy in 1st 3 years in the absence of a cause for infertility
  - Etiologies
    - Male
      - 40% of cause (ex abnormal spermatogenesis)
    - Female
      - Anovulatory cycles or ovarian dysfunction --> 30%

        - Congenital
        - Acquired disorders
    - Dx
        - **Hysterosalpingography**
            - Helps evaluate tubal patency or abnormalities
    - Management
        - Clomiphene
        - Intrauterine insemination
        - In vitro fertilization --> esp. If fallopian tube defect is present

Obstetrics

Prenatal care/Normal pregnancy (16%) – 6

- Prenatal diagnosis/care
    - Office Visits
        - 6 – 24 weeks → every 4 weeks
        - 28 – 36 weeks → every 2 weeks
        - >36 weeks → every week
    - Physical Exam
        - Uterus Changes
            - Ladin's sign – uterus softening after 6 weeks
            - Hegar's sign – uterine isthmus softening: 6-8 weeks
            - Piskacek's sign – palpable lateral bulge or softening of cornus: 7-8 weeks
        - Cervix Changes
            - Goodell's sign – cervical softening [increased vascularization]: 4-5 weels
            - Chadwick's sign – bluish colorization of cervix & vulva: 8-12 weeks
    - **1st Trimester: 1-12 weeks gestation**
        - 1st Prenatal Visit
            - BP
            - Type & cross
            - CBC, US [glucose & protein]
            - HBsAG
            - HIV
            - Syphilis
            - Rubella titer
            - Screening for sickle cell & CF
            - Pap smear
        - Maternal blood screen test
            - **Down syndrome screen** – 3 markers
                - Free BhCG
                    - Abnormally high or low = ABNORMAL
                - PAPP-A
                    - LOW
                - Nuchal translucency
                    - Increase THICKNESS → US 10-13 weeks
        - Ultrasound
            - Location of placenta

- # of pregnancies
- Fetal development
- Amino fluid levels
- Gestation age
- Due date
- Abnormalities

- Chorionic villus sampling = placenta tissue biopsy
  - 10-13 weeks
  - WHO
    - FHx of inherited diseases [CF, sickle cell, tasakes] or chromosomal disorders
    - AMA
    - Prior child w/ chromosomal disorder
    - Abnormal 1st or 2nd trimester US, blood screen
    - Prior pregnancy loses
  - INVASIVE
  - Advantage → EARLY answers = early termination option
  - RISK → spontaneous abortion

- **2nd Trimester: 13-27 weeks gestation**
  - QUAD Screen: 15-18 weeks

a-FP	B-hCG	Estradiol	Inhibin A	Diagnosis
Low	HIGH	Low	HIGH	Trisomy 21
Low	Low	Low		Trisomy 18
HIGH				Spina bifida

  - Ultrasound → check fetal viability, growth & development
  - Amniocentesis
    - 15-18 weeks
    - WHO
      - FHx of inherited diseases [CF, sickle cell, tasakes] or chromosomal disorders
      - AMA
      - Prior child w/ chromosomal disorder
      - Abnormal 1st or 2nd trimester US, blood screen
      - Prior pregnancy loses

  - Gestation Diabetes
    - 24-28 weeks
    - Oral glucose challenge
      - **50 g glucose PO**
        - Hold down glucose for 1 hour
        - Test Levels
          - **< 140 = NORMAL**
      - **100 g glucose PO**
        - IF initial test levels were > 140
        - **Diagnostic test**
        - Fasting glucose should be <100
        - AFTER

- 1 hr should be < 180
- 2 hrs should be < 155
- 3 hrs should be < 140
- **ANY OVER = GESTATIONAL DIABETES**

- **Tx**
  - Metformin*
  - Insulin
- Complications
  - Macrosomic infant
  - Development of type 2 DM in the future

- **3rd Trimester: 28 weeks – birth**
  - <u>Gestational Diabetes</u> – see about
    - 24-28 weeks
  - <u>Rh NEGATIVE mothers</u>
    - Repeat antibody titers
    - RhoGAM @ 28 weeks & within 72 hours of delivery
  - <u>Group B beta hemolytic strep culture</u>
    - 32-37 weeks
    - vaginal & rectal culture
  - <u>Ultrasound</u>
    - Biophysical Profile
      - Breathing – 1+ episodes of trying to take a breath
      - Heart rate – 2+ accelerations w/in 20 mins
      - Movement – 2+ movements of the limbs
      - Muscle tone – 1+ extension/flexion of the body
      - Amino fluid – 1+ pockets of fluid
  - <u>Stress Test → GO BACK & LEARN THIS</u>
    - Non-Stress Test
    - Contraction Stress Test

<table>
<tr><td colspan="10">WEEKS GESTATION</td></tr>
<tr><td colspan="3">1st Trimester</td><td colspan="4">2nd Trimester</td><td colspan="3">3rd Trimester</td></tr>
<tr><td>5-6</td><td>10-12</td><td>12</td><td>15-18</td><td>16</td><td>16-20</td><td>20</td><td>28</td><td>35</td><td>38</td></tr>
<tr><td rowspan="2">Fetus Detected</td><td rowspan="2">Fetal Heart Tones</td><td rowspan="3">Fundus above pubic symph</td><td>Quad Screen</td><td rowspan="3">Fundus b/t symphysis & umbilicus</td><td rowspan="3">Quickening 1st time moms ~20 weeks

2nd time moms ~16 weeks</td><td rowspan="3">Fundus @ umbilicus</td><td rowspan="2">RhoGAM for Rh – mothers</td><td rowspan="2">Culture beta hemo strep</td><td rowspan="3">Fundus 2-3cm below xiphoid process</td></tr>
<tr><td>Amnio</td></tr>
<tr><td rowspan="2">Fetal HB 120-160</td><td>10-13</td><td>Rubella titer</td><td rowspan="2">Gestational Diabetes test</td><td rowspan="2">Hb & Hct</td></tr>
<tr><td>Nuchal Chorionic</td></tr>
</table>

- <u>Normal labor and delivery</u>
  - **Intrapartum**
    - Braxton Hicks contractions

- Spontaneous uterine contractions – LATE IN PREGNANCY
- NOT associated w/ cervical dilation
- NOT regular

- Lightening
  - Fetal head descending into the pelvis causing a change in abdomen's shape & sensation
- Ruptured Membranes
  - Sudden gush of liquid or constant leakage of fluid
  - Premature rupture – NOT accompanied by contractions
- Bloody show
  - Passage of blood tinged cervical mucus late in pregnancy
  - Occurs when effacement occurs = cervix thinning
- True labor
  - Contractions of the uterine fundus w/ radiation to lower back & abdomen
  - Characteristics
    - REGULAR
    - Each last about 60 seconds
    - Painful
      - Increases as labor proceeds
    - Become closer together as labor proceeds
  - Contractions CAUSE cervical dilation & fetus expulsion

- Stages
  - Stage 1
    - Onset of labor & until FULL dilation [10 cm] & effacement of the cervix
    - *DURATION*
      - *10-12 hrs in a nulliparous pt*
      - *6-8 hrs in multiparous pt*
    - **Latent phase → onset of labor until 3-4 cm of dilation**
      - Slow cervical change
    - **Active phase** → rapid cervical dilation

  - Stage 2
    - Full dilation to delivery of the infant
    - Passive phase → compete cervical dilation to active maternal expulsion efforts
    - Active phase → active maternal expulsion efforts to delivery to fetus

  - Stage 3
    - Postpartum until delivery of the placenta
    - *DURATION: 0-30 mins*
      - *Average ~5 mins*
    - Signs of Placental Separation
      - 3 signs → **NO delivery until these signs are present!**
        - Cord lengthening
        - A gush of blood
        - Uterine fundal rebound = anterior-cephalad movement

  - Stage 4 → 1-2 hrs after delivery
    - Mother is assessed for complications

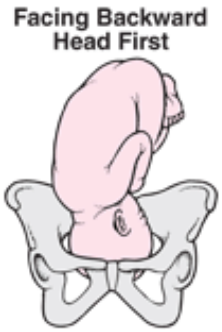
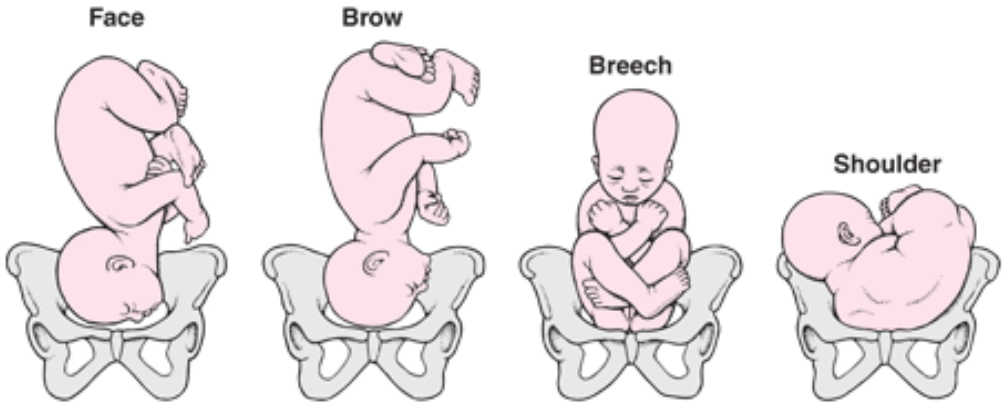
- **Mechanism of delivery / Cardinal Movements of Labor**

- Engagement – fetal presenting part enters the pelvic inlet
- Flexion – flexion of the head to allow the smallest diameter to present to the pelvis
- Descent – passage of head into pelvis = lightening
- Internal rotation – fetal vertex moves from occiput transverse position to a position where the sagittal suture is parallel to the anteroposterior diameter of the pelvis
- Extension – vertex extends as it passes veneath the pubic symphysis
- External rotation – fetus externally rotates after the head is delivered to allow shoulders to pass

- Physiology of pregnancy?
  - First AID OBGYN Chapter 3 (Pg 31-39)

- Fetal position
  - **Station → relation of the fetal head to the ischial spines of the female pelvis during delivery**
    - 0 Station → most descended aspect pr presenting part is @ the level of ischial spines
    - -5 to -1 → above spines
    - +1 to +5 → below spines

<table>
<tr><td>Normal</td><td colspan="4">Abnormal</td></tr>
<tr><td rowspan="2">Head first facing backwards

 
</td><td>Cephalic</td><td>Brow</td><td>Breech</td><td>Shoulder</td></tr>
<tr><td>Fetus in longitudinal lie & head first
MC = vertex → occiput leading</td><td>Crown of head & coming out sideways</td><td>Bottom first/feet first</td><td></td></tr>
<tr><td colspan="4"> 
</td></tr>
</table>

- Multiple gestation
  - **Dizygotic = fraternal**
    - Fertilization of 2 ova by 2 different sperm cells
  - **Monozyotic = identical**
    - Fertilization of 1 ovum
    - Increased risk of transfusion syndrome & discordant fetal growth
  - **Maternal complications**
    - **Preterm labor**
    - **Spontaneous abortion**
    - **Preeclampsia**
    - **Anemia**
  - Fetal Complications

        - Intrauterine growth restrictions
        - Placental abnormalities
        - Breech presentation
        - Umbilical cord prolapse
    - HIGH RISK PREGNANCY

- Apgar score
    - Done at 1 & 5 minutes after birth
    - Repeated ! 10 mins IF abnormal
    - **Score 1-10**
        - > 7 = normal
        - 4-6 = fairly low
        - < 3 = critically low

Apgar Scoring System			
APGAR	**0**	**1**	**2**
Appearance	Blue or pale 	Pink – trunk/body Blue – extremities 	Pink all over 
Pulse [Heart Rate]	No pulse	Slow <100	>100 bpm
Grimace [nostril cath reaction]	No response	Grimace or cry	Sneeze, cough, pull way
Activity [Muscle Tone]	Flaccid/Limp	Some flexion	Active motion
Respiratory Effort	No response	Slow – irregular	Vigorous Cry

Pregnancy complications (15%)

- Abortion

Type	**Definition**	**Products of Conception**	**Cervical Os**	**Presentation**	**Management**
Inevitable	NOT salvageable	NO POC expelled	OPEN **Progressive dilation > 3cm**	Moderate bleeding >7 days Cramps	D&C – 1st tri D&E – 2nd tri
Incomplete		SOME POC expelled Some POC retained	OPEN **DILATED**	***HEAVY bleeding*** Retained tissue **Boggy uterus**	May finish naturally D&C – 1st tri D&E – 2nd tri Oxytocin [Pitocin] = induced contraction

Threatened	May be viable MCC of 1st trimester bleeding	NO POC expelled	Closed	Bloody vaginal discharge Spotting → profuse	Supportive – bed rest ER – si/sx progress B-hCG – see if doubling
Missed	Fetal demise	Retained POC	Closed	Brown discharge Loss of pregnancy	D&C – 1st tri D&E – 2nd+ tri Misoprostol – induce abortion
Complete	Complete passage	ALL POC expelled	Closed	Pain, cramps, bleeding	
Septic	Retained POC becomes infected Infection of uterus & organs	Some POC retained	Closed	FOUL brownish discharge Fever, chills Uterine tenderness	D&E – remove POC Broad spectrum of ABX

- Elective Abortion
  - **Medical**
    - Mifepristone = anti-progestin
    - Misoprostol = prostaglandin that causes uterine contractions
    - Methotrexate = antimetabolite [folic antagonist]
    - Sequences
      - **Mifepristone → misoprostol 24-72 hrs after**
        - Safe *up to 9 weeks*
      - **Methotrexate → misoprostol 3-7 days later**
        - Safe *up to 7 weeks*
  - **Surgical**
    - Can be performed up to 24 weeks from LMP
    - **D&C = dilation & curettage** [including suction curettage]
      - *4-12 weeks gestation*
    - **D&E = dilation & evacuation**
      - *>12 weeks gestation*

- Placenta abruption vs. Placenta Previa

Disorder	Placenta Previa	Placenta Abruption

Definition	• Implantation of the placenta on or close to the cervical os = covering the passage way
	• Types
	  ○ Partial – covering ahead of fetal presenting part
	  ○ Complete – total converge of cervical os
	  ○ Marginal – within 2-3 cm of cervical os
		• Premature separation of the placenta from uterine wall AFTER 20 weeks
		• Types – based on bloody discharge
		  ○ I – mild, slight bleeding
		  ○ II – moderate/partial
		  ○ III – complete = increase risk to fetus & mother

Risk Factors	• Multiparity • AMA • Smoking	• Maternal HTN = MCC • Smoking, alcohol, cocaine • Folate deficiency • High parity • AMA • Trauma • Chorioaminonitis

Presentation	• 3rd trimester bleeding
	  ○ Sudden
	  ○ **Bright red**
	• PAINLESS
	• Uterine soft & NONTENDER
		• 3rd trimester bleeding
		  ○ Continuous
		  ○ **DARK red**
		• PAINFUL – severe abdominal pain
		  ○ Rigid uterus
		  ○ Painful uterine contractions
		  ○ Tender uterus
		
		Placental separation results in intravascular and retroplacental coagulation. This excessive coagulation depletes platelets, fibrinogen and other clotting factors, leading to **thrombocytopenia** and **hypofibrinogenemia**

Fetal HR	• NORMAL – no fetal distress	• Fetal bradycardia – fetal distress
Diagnosis	Pelvic ultrasound – localize placenta DO NOT DO VAGINAL/PELVIC EXAM!	

Treatment	• Hospitalization
	  ○ Bed rest
	  ○ Stabilize fetus
	  ▪ Tocolytics – magnesium sulfate = inhibits uterine contractions
	  ▪ **Amniocentesis – access fetal lung development**
	  ◊ Steroids b/t 24-34 weeks
	• **Delivery – definitive**
	  ○ Vaginal – partial or marginal
	  ○ C-section – complete
		• Hospitalization – hemodynamic stabilization
		• IMMEDIATE delivery – C-section

- Ectopic pregnancy
  - **Implantation of fertilized ovum outside of the uterine cavity**
    - **MC site = fallopian tube [especially ampulla]**
  - Risk factors
    - HIGH RISK
      - **Previous abdominal or tubal surgery – adhesions**

        - PID, previous ectopic, endometriosis, IUD
        - Hx of tubal ligation
    - Intermediate
        - Infertility, multiple partners, Hx of genital infections
- Si/Sx
    - *CLASSIC TRIAD*
        - **Unilateral pelvic/abdominal pain**
        - **Vaginal bleeding**
        - **Amenorrhea [pregnancy]**
    - Ruptured/rupturing ectopic
        - Severe abdominal pain
        - Dizziness
        - N/V
        - Shock [from hemorrhage] – syncope, tachycardia, hypotension
- Physical Exam
    - **Cervical motion tenderness**
    - **Adnexal mass**
    - Mild uterine enlargement
- Diagnosis
    - Serial quantitative B-hCG
        - Should double q24-48 hrs
        - IN ECTOPIC → serial B-hCG FAILS to double
    - Transvaginal US
        - Absence of gestational sac w/ B-hCG levels >2,000 → ectopic or nonviable intrauterine pregnancy [IUP]
    - Culdocentesis
    - Laparoscopy
- Management
    - Un-ruptured + Stable
        - **Methotrexate** = destroys trophoblastic tissue
            - WHO
                - **Hemodynamically stable**
                - **Early gestation**
                - **< 4 cm**
                - **B-hCG < 5,000**
                - **NO fetal tones**
            - CI – ruptured, h/o TB, non-compliant
        - **Laparoscopic salpinigostomy or salpingectomy** – IF pt prefers surgical procedure
    - Ruptured + Unstable
        - **Laparoscopic salpingostomy – 1st choice**
        - Laparotomy – severe cases
    - **RhoGAM** – IF mother is Rh NEGATIVE → ALWAYS

- Gestational diabetes
    - **Glucose intolerance or DM only present during pregnancy – subsides post partum**
    - Risk factors
        - FHx or prior Hx of gestational DM
        - Spontaneous abortion

        - Hx of infant > 4,000g at birth
        - Multiple gestations
        - Obesity
        - African American, Hispanic, Asian/pacific islander, native American
    - Diagnosis
        - **Screening @ 24-28 weeks**
            - 50g oral glucose challenge test [non-fasting]
                - IF >140 mg/dL after 1 hr → preform 3hr 100g OGTT
        - Confirmatory test
            - **100 g oral GTT → GOLD STANDARD**
                - + IF
                    - Fasting > 95
                    - 1 hr > 180
                    - 2 hr > 155
                    - 3 hr > 140
    - Management
        - Daily fingerpicks – overnight & after each meal
        - Diet & exercise
        - **Insulin – treatment of choice**
            - Indications
                - Fasting > 105
                - Post prandial > 120
            - **NPH/Regular insulin 1/3 AM & 1/3 PM**
                - *1st trimester → 0.8*
                - *2nd trimester → 1.0*
                - *3rd trimester → 1.2*
        - **Metformin or glyburide = PO**
        - **Labor induction @ 38 weeks IF uncontrolled/macrosomia**
    - Fetal complications
        - Fetal demise, malformation, premature labor, hypoglycemia, macrosomia, birth trauma, hypocalcemia, hyperbilirubinemia
    - Maternal complications
        - Preeclampsia, placenta abruption, >50% chance of developing type 2 later in life
        - Screen 6 weeks postpartum for DM & yearly

- <u>Incompetent cervix</u>
    - Inability to maintain pregnancy secondary to **premature cervical dilation**
        - Especially in <u>2nd trimester</u>
    - Risk factors
        - Previous cervical trauma or procedure (ex. Tx for CIN)
        - Uterus defects
        - DES exposure in utero
        - Multiple gestations
    - Si/sx
        - Bleeding , vaginal d/c--> especially in 2nd trimester
    - Physical exam
        - **Painless dilation and effacement of cervix**
    - Management
        - **Cerclage** (suturing of cervical os) and bed rest
            - Can also be performed for women with short cervix (<25mm) before 24 weeks
        - +/- weekly injection of **17 alpha-hydroxyprogesterone** in women w/ preterm birth hx

- Pregnancy induced HTN
  - Also known as gestational HTN or Transitional HTN
  - Definition
    - HTN no proteinuria *AFTER 20 weeks gestation*
    - Resolves 12 weeks post partum
  - Si/sx
    - Asymptomatic
  - Diagnosis
    - **Increased BP + NO proteinuria**
    - HTN thought to be d/t arteriolar vasoconstriction
  - Management
    - May withhold meds
    - +/- Hydralazine or Labetalol

- Preeclampsia/eclampsia
  - **HTN + Proteinuria +/- edema**
    - *After 20 weeks gestation*
  - Si/sx
    - Sx of HTN
      - Headache
      - Visual sx
    - Fetal growth restriction
    - Edema caused by proteinuria --> decreased oncotic pressure
  - Diagnosis
    - Mild --> BP ≥ 140/90
      - 2 separate occasions @ least 6 hours apart
      - But no greater than 1 week apart
      - **Proteinuria**
        - > 300 mg/24 hr (or > + 1 dipstick)
    - Severe --> BP ≥ 160/110
      - Proteinuria
        - > 5 g/24 h
        - > + 3 on dipstick
      - Oliguria
        - <500 ml/24 hr
      - Thrombocytopenia +/- DIC
      - **HELLP Syndrome****
        - Hemolytic anemia
        - Elevated liver enzymes
        - Low platelets
        - Sx of HTN: headache, visual sx
  - Management
    - Mild
      - **Delivery at 37 weeks gestation**
      - Conservative if < 34 weeks
        - Daily weight, BP and dipstick weekly
        - Bedrest
        - Steroids to mature lungs if <34 weeks
        - Elective delivery as planned

        - Severe
            - PROMP DELIVERY ONLY CURE!
            - Hospitalization
                - Magnesium sulfate--> prevent eclampsia/seizures
            - BP meds
                - In acute severe HTN (may be lower in some cases)
        - **Hydralazine, Lebatalol**, Nifedipine

- <u>Gestational trophoblastic disease</u>
    - Array of disorder associated w/ abnormal placental trophoblastic tissue
    - 4 types:
        - Molar pregnancy → benign
        - Invasive mole
        - Choriocarcinoma
        - Placental site trophoblastic tumor
    - **Hydatidiform mole**: Neoplasm d/t abnormal placental development w/ trophoblastic tissue proliferation arising from gestation tissue (not maternal in origin). *MC type. 80% benign*
        - COMPLETE molar pregnancy
            - Egg w/ NO DNA fertilized by 1 or 2 sperm
            - 46XX **all paternal chromosome**
            - Associated with **higher risk of development into choriocarcinoma (20%)**
        - PARTIAL molar pregnancy
            - Egg fertilized by 2 sperm (or 1 sperm that duplicates its chromosomes)
            - May be development of the fetus
                - ALWAYS malformed
                - NEVER viable
            - 2 MC risk factors
                - Prior molar pregnancy
                - Extremes of maternal age <20 yrs or >35 yrs
                - Asian
        - Pathophysiology
            - Abnormal pregnancy in which a nonviable fertalized egg implants in the uterus w/ a nonviable pregnancy which will fail to come to term --> **abnormal placental development**
        - Si/sx
            - **Painless vaginal bleeding**
                - +/- benign at 6 weeks- 4th/5th months MC
                - +/- brownish d/c
            - **Uterine size/date discrepancies**
                - Larger than expected
                - Preeclampsia before 20 weeks
            - **Hyperemesis gravidarum**
                - d/t significant hormonal changes (occurs earlier than usual)
            - Choriocarcinoma
                - METS to lungs MC, lower genital tract (purple black nodules), pelvic mass
        - Diagnosis
            - Beta- hCG markedly elevated
                - Ex > 100,000 mIU/mL
                - Very low maternal serum alpha fetoprotein
            - Ultrasound

        - **Snowstorm or Cluster of grapes appearance**
            - Cluster of grapes= enlarged cystic chorionic villi
        - COMPLETE molar pregnancy
            - NO products of conception seen
            - Absence of fetal part and heart sounds
        - PARTIAL molar pregnancy
            - Gestational sac may be seen
    - Management
        - Surgical uterine evacuation--> **suction curettage mainstay***
            - As soon as possible to avoid risk of choriocarcinoma
            - Pt followed weekly until beta-hCG levels fall to an undetectable level
            - Hysterectomy also an option
            - Rhogam administered to Rh- mothers
            - Pregnancy should be avoided 1 year after
        - METS: chemotherapy (methotrexate)
            - Destroys trophoblastic tissue and/or hysterectomy
            - Suspect if beta-hCG rises or plateaus after tx, continued hemorrhage after tx, vaginal tumor or pelvic mass

- <u>Rh Incompatibility</u>
    - Maternal ab that bind to fetal RBCs--> neonate hemolytic dz
    - If mother of fetus is Rh - & father of fetus is Rh +
        - 50% chance baby will be +
    - Pathophysiology
        - When Rh- mother carries an Rh + fetus
        - Fetal blood mixing causes maternal immunization --> maternal anti Rh IgG ab
        - During subsequent pregnancies if she carries another Rh + fetus
            - Ab may cross the placenta and attack the fetal RBCs --> hemolysis of fetal RBC
        - At risk pregnancy:
            - Rh – mother with Rh+/unknown father
    - Si/sx
        - If subsequent newborn is RH +
            - Hemolytic anemia
            - Jaundice
            - Kernicterus
            - Hepatosplenomegaly
            - Fetal hydrops
            - Congestive heart failure
    - Diagnosis
        - Pregnant women
            - ABO blood group, RH-D type
            - Indirect erythrocyte ab screen
                - 1:8 – 1:32 associated w/ fetal hemolysis
            - Indirect Coombs
        - Fetus monitoring in 2nd trimester
            - If present --> amniotic fluid (increased bilirubin)
            - US of middle cerebral artery
                - Increased flow secondary to decreased viscosity of blood in anemia
            - Percutaneous umbilical blood sampling
                - Decreased hematocrit

- Management
  - Preventative in mother
    - 300 ug **RhoGAM** given if Rh negative, Ab negative in 3 indications:
      - 1. Given at 28 weeks
      - 2. Within 72 hrs of delivery of an Rh + baby
      - 3. After any potential mixing of blood
  - Tx of erythoblastosis fetalis
    - Moderate to severe anemia treated w/ antigen – RBCs through US guided umbilical vein transfusion

Labor and delivery complications (8%)

- **Dystocia**
  - **Abnormal labor progression**
  - 3 categories:
    - **P**ower
      - Uterine contraction
    - **P**assenger
      - Presentation size or position of fetus
      - Ex: **shoulder dystocia:** one or both shoulders lodged at pubic symphysis after delivery of head +/- Erb's palsy (brachial plexus injury) especially in macrosomic children, multiparity, gestational DM
    - **P**assage
      - Uterus or soft tissue abnormalities
  - Management
    - Nonmanipulative
      - 1st line--> **McRoberts maneuver**
        - Increase pelvic opening w/ hip hyperflexion
    - Manipulative
      - Wood "corkscrew" maneuver
        - 180 shoulder rotation +/- cesarean section

- **Fetal distress**
  - Nothing on PANCE or OBGYN first aid

- **Premature rupture of membranes (PROM)**
  - Risk factors
    - STDs
    - Smoking
    - Prior preterm delivery
    - Multiple gestation
  - Diagnosis
    - Sterile speculum exam: Visual inspection- pooling of secretions; assess for infx
      - Nitrazine paper test
        - **Turns blue if pH >6.5= PROM is likely**
        - Normal amniotic fluid pH (7.0-7.3). Vaginal pH usually 3.8-4.2
      - Fern test
        - Amniotic fluid- fern pattern (crystallization of estrogen and amniotic fluid)
    - Ultrasound
      - Avoid digital exam in most cases
  - Treatment

        - Await for spontaneous labor
        - Monitor for infx (chorioamnionitis or endometritis)

- **Prolapsed umbilical cord**
    - Nothing on PANCE or First AID

- **Preterm labor**
    - Labor
        - Regular uterine contractions (>4-6 hr) with progressive cervical changes (effacement and dilation) **BEFORE 37 weeks gestation**
            - *MCC of perinatal mortality (70)*
    - Si/sx
        - Cramps
        - Uterine contractions
        - Back pain
        - Pelvic pressure
        - Vaginal d/c
    - Diagnosis
        - Nitrazine pH paper test
            - If pH > 6.5 (amniotic fluid)
            - Normal vaginal pH 3.8-4.2
        - Fern test
            - Estrogen + amniotic fluid causes delicate crystallization seen with a microscope
        - Presence of fetal fibronectin
            - b/w 20-34 weeks strongly suggests preterm labor
        - Rule out infx
            - UTI
            - Group B strep
            - L:S ratio <2.1 , < 34 weeks). **Betamethasone**
    - Management
        - Antenatal steroids
            - Enhance fetal lung maturity
            - Betamethasone
        - Tocolytics--> suppresses uterine contraction; *May be given for 48 hr to delay delivery so steroids can take full effect on the fetus*
            - Indomethacin
            - Nifedipine
            - Magnesium sulfate
            - Beta 2 agonists: Terbutaline
        - Antibiotics prophylaxis
            - Includes group B strep
            - Example:
                - Ampicillin followed by PO amoxicillin and azithromycin

- **Breech presentation**
    - The presenting fetal part is the **buttocks**
    - Incidence
        - 3.5% @ or near term but much greater in early pregnancy (14%)
        - Those found in early pregnancy will often spontaneously convert to vertex as term approaches

- Risk factors
  - Low birth weight (20-30% of breeches)
  - Congenital anomalies such as hydrocephalus or anecephaly
  - Uterine anomalies
  - Multiple gestation
  - Placenta previa
  - Hydramnios, oligohydramnios
  - Multiparity
- Diagnosis
  - Leopold maneuvers
  - Ultrasound
  - Vaginal exam
- Types of breech
  - **Frank breech (65%)**
    - Thighs are flexed (bent forward) and knees are extended (straight) over the anterior surfaces of the body (Feet are in front of the head or face)
  - **Complete breech (25%)**
    - Thighs are flexed (bent) on the abd and the knees are flexed (folded) as well
  - **Incomplete (footling) breech (10%)**
    - One or both of the hips are not flexed so that foot lies below the buttox
- Management
  - Delivery via C-section --> Most common
  - Frank breech w/ other ideal conditions may delivery vaginally
  - Complete and incomplete breeches are not delivered vaginally d/t risk of umbilical cord prolapse
  - External cephalic version
    - Procedure that maneuvers the infant to a cephalic position by applying pressure through the maternal abd
    - Can be done only if
      - Breech is dx before onset of labor and
      - Gestational age is 35-37 weeks
    - Success rate: 50 %
    - Risks
      - Placental abruption
      - Fetal heart rate abnormalities
      - Reversion

Postpartum Care (6%)

- **<u>Postpartum hemorrhage</u>**
  - Definition
    - Bleeding > 500 ml if vaginal delivery is preformed or >1000 ml if C-section is performed
    - Common cause of maternal death with 24 hrs of delivery
    - Early: 24 hrs postpartum
    - Delayed: >24 hr up to 8 weeks postpartum
  - Etiologies
    - **Uterine atony --> MCC**
    - Uterine rupture, congestion, bleeding disorder, DIC
  - Risk factors
    - Rapid or prolonged labor
    - Overdistended uterus
    - C section

- Si/sx
  - Hypovolemic shock
    - Hypotension
    - Tachycardia
    - Pale/Clammy skin
    - Decreased capillary refill
  - Uterine atony
    - Soft boggy uterus with dilated cervix
- Workup
  - CBC to evaluate hemoglobin and hematocrit
  - US may detect the bleeding source
- Management
  - Bimanual uterine massage, treat underlying cause, and IV access
  - Utertonic agents--> enhance uterine contraction & *only used if uterus is soft and boggy*
    - Oxytocin IV, Methylergonovine
    - Prostaglandin analogs:
      - IM carboprost tromethamin
      - Misoprostol
  - Suction & curettage
    - May be needed if there are retained products
    - Antibiotics in some cases

- **<u>Endometritis</u>**
  - Infection of the uterine endometrium; Chorioamnionitis (fetal membrane infx)
  - Usually polymicrobial
    - Often vaginal flora, aerobic & anaerobic bacteria
  - Risk factors
    - Postpartum or postabortal uterine infx
    - C- section biggest risk factor
    - Prolonged rupture of membranes > 24 hours
    - Vaginal delivery
    - Dilation and curettage (or evacuation)
  - Diagnosis
    - Fever, tachycardia, abd pain and uterine tenderness after C-section
      - 2-3 days postpartum or postabortal (may present later)
    - Mainly a clinical dx
    - May have vaginal bleeding/ discharge (may have foul smelling lochia)
  - Management
    - Infx post C-section
      - Clindamycin + Gentamicin
      - May add ampicillin for additional group B strep coverage
      - Ampicillin/sulbactam is an alternative
    - Infx after vaginal delivery or chorioamnionitis
      - Ampicillin + Gentamicin
      - ***Prophylaxis w/ 1st generation cephalosporin x 1 dose during C-section to reduce the incidence***

- **<u>Perineal laceration/episiotomy care</u>**
  - **Episiotomy**
    - Incision of the perineum and/or labia to aid delivery by creating more room
    - Types

        - Midline--> MC
            - Incision made midline from the posterior fourchette
            - Increased risk of 4th degree laceration
        - Mediolateral
            - Incision is oblique starting from 5 l'clock or 7 o'clock postion of the vaginal
            - Causes more bleeding and pain
    - **Perineal laceration**
        - Perineum and anus become stretched and thin--> results in increased risk of spontaneous laceration to
            - Vagina
            - Labia
            - Perineum
            - Rectum
    - Classifications *(same for episiotomy and perineal lacerations)*
        - 1st degree
            - Involve the fourchette, perineal skin, and vaginal mucosa
            - DOES NOT involve the underlying fascia and muscle (skid mark)
        - 2nd degree
            - 1st degree PLUS the fascia and muscle of the perineal body
            - NOT the anal sphincter
        - 3rd degree
            - 2nd degree PLUS involvement of anal sphincter
        - 4th degree
            - Extend through the rectal mucosa to expose the lumen of the rectum
            - Proper repair of this laceration is essential to prevent:
                - Future fecal incontinence
                - Rectovaginal fistula

- **<u>Normal physiology changes of puerperium</u>** (6 week period after surgery)
    - **Uterus**
        - At level of umbilics after surgery
        - Involution (shrinks) after 2 days
            - Descends into the pelvic cavity @ approx. 2 weeks
        - Normal size around 6 weeks postpartum
    - **Lochia serosa** (vaginal d/c after giving birth)
        - Pinkish/brown vaginal bleeding--> from the decidual tissue
            - Especially postpartum days 4-10
            - Resolves by 3-4 weeks postpartum
    - **Breasts/Menstruation**
        - Breast milk in postpartum days 3-5 (bluish-white)
        - If lactating
            - Mothers may remain anovulatory during that time
        - If not breastfeeding
            - Menses may return 6-8 weeks postpartum