Reproductive System Part One

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UMDNJ PANCE/PANRE Review Course
(becoming Rutgers, The State University of NJ, July 1, 2013)

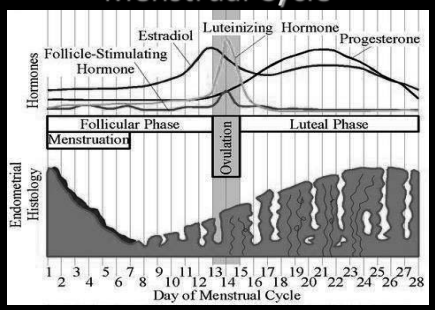
Menstrual Cycle

- Normal
  - Length: 21-35 days
  - Duration: 2-7 days
  - Regularity: generally predictable month to month

Menstrual Cycle

- Menstrual phase:
  - Day 1-7
  - FSH begins to rise
- Proliferative/Follicular Phase
  - Day 7-14
  - **Estrogen** causes proliferation of endometrium and follicular growth
  - Estrogen triggers LH surge causing ovulation at Day 14
- Secretory/progestational phase/luteal
  - High levels of **progesterone**
  - Progesterone works on thickened estrogen-primed endometrium to convert it to thickly vascularized tissue

Menstrual Cycle



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Amenorrhea

- Primary
  - No menses by 14 years and absence of secondary sex characteristics
  - No menses by 16 years with presence of secondary sex characteristics
- Secondary
  - No menses for 3 months- previous cycles normal
  - No menses for 6 months- previous cycles irregular

Primary Amenorrhea

	Karyotype	Labs	Management
Gonadal dysgenesis (Turner's syndrome)	45, **X**	High FSH	Cyclic estrogen and progestins
Hypothalamic-Pituitary insufficiency	46, XX	Low FSH, LH	Cyclic estrogens and progestins
Androgen insensitivity	46, **XY**	High testosterone	Remove testes, start estrogen
Imperforate hymen	46, XX	Dx on PE	Surgically open
Anorexia	46, XX		Tx disorder

Secondary Amenorrhea

- **Pregnancy most common cause!!**
- Also, polycystic ovaries common cause

- **Always order betaHCG, then TSH and Prolactin**

- Progesterone Challenge Test (PCT)
  - Medroxyprogesterone acetate 10mg PO x 7 days
  - If bleeding occurs= anovulatory cycles

Secondary Amenorrhea

- If bleeding does not occur after PCT:
  - Initiate estrogen-progesterone challenge test (EPCT)
    - If bleeding occurs- FSH and LH
- If bleeding does not occur after EPCT :
  - Sonogram
  - Hysterosalpingogram
  - Outflow tract obstruction (Asherman's syndrome)

Abnormal Bleeding-Terms

- **Menorrhagia**- normal frequency but heavy or ***prolonged flow***.
  - Common causes- ectopic, Von Willebrand's Disease, submucous myomas, endometrial hyperplasia, IUDs, tumors
- **Metrorrhagia**-irregular bleeding ***between*** cycles
  - Endometrial polyps, endometrial/cervical carcinoma, OCs
- **Menometrorrhagia**-irregular frequency plus heavy and prolonged
  - Molar pregnancy, malignant endometrial tumors, premenopause

Abnormal Bleeding

- Anovulatory cause (dysfunctional uterine bleeding-DUB)
  - Unpredictable, irregular bleeding
  - Most commonly caused by hormonal deficiencies or excesses
  - Usually no pathologic cause
  - Most commonly extremes of ages (under 20, over 40)
- Ovulatory cause
  - Cycles are predictable with metrorrhagia
  - Most commonly caused by endometrial polyps or submucous leiomyomas

Abnormal Bleeding-Workup

(as necessary according to hx)

- **Pregnancy test!- Most common cause of DUB in reproductive years**
- Abdominal or vaginal sonogram
- Endometrial Biopsy
  - Moderate suspicion of hyperplasia or carcinoma
  - Over 35 years with presence of obesity, HTN, DM
  - All patients after menopause
- Hysteroscopy "gold standard" to evaluate pathology in the uterine cavity

Abnormal Bleeding-Management

- Anovulatory (Dysfunctional uterine bleeding) suspected:
  - Progestin trial- If bleeding stops:
    - Prolactin level (pituitary prolactinoma)
    - TSH (hypothyroidism)

Abnormal Bleeding-Management

- If bleeding continues despite progestin trial and no endometrial lesions or other causes:
  - NSAIDS, oral contraceptives or danazol
  - Endometrial ablation
  - Hysterectomy-last resort

Primary Dysmenorrhea

- **NO PATHOLOGIC CAUSE**
- MC within 2 yrs of menarche but can be any age
- Symptoms
  - Lower abdominal-pelvic cramping/pain on 1st day of menses
  - N/V, Diarrhea
  - Headache
- Causes
  - Increased prostaglandins
  - Increased leukotriene levels
- Exam- normal
- Management
  - NSAIDS
    - Ibuprofen first
    - Cox-2 inhibitors (celecoxib-Celebrex) equally effective, less GI SE, more expensive
  - Oral contraceptives
  - Vitamin B or magnesium, acupuncture

Secondary Dysmenorrhea

- Excessive menstrual pain arising in midreproductive years, **USUALLY PATHOLOGIC**
- Causes
  - Endometriosis
  - Pelvic adhesions
  - Fibroids
  - Polyps
- Symptoms
  - pelvic pain that is dull and aching, related to menstrual cycle but timing depends on cause
  - Infertility
  - Dyspareunia

Secondary Dysmenorrhea

- Exam-depends on cause
- Diagnosis
  - Pelvic sonogram
  - Laparoscopy
- Management
  - Depends on cause

Premenstrual Syndrome (PMS)

- Physical and emotional symptoms that occur during **second half of menstrual cycle** and interfere with normal functioning
- Cause- low serotonin levels
- Symptoms
  - Absent in first half of cycle
  - Depression, irritability, mood swings
  - Breast tenderness, weight gain, bloating
  - Muscle aches, joint pain, headache
- Exam- benign
- Diagnosis- Menstrual diary- symptoms for 2 consecutive cycle

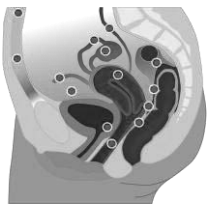
Premenstrual Syndrome (PMS)

Management

- Lifestyle modifications first
  - Stress Management
  - Exercise
  - Calcium carbonate, magnesium, vitamin B6, vit. E, St. John's wort
  - Dietary
    - Small frequent meals with increased carbohydrates
    - Decrease caffeine, alcohol, tobacco, chocolate, sodium
- Medications second
  - Selective serotonin reuptake inhibitors (SSRIs)- emotional symptoms
  - NSAIDS- muscle aches, joint pain

Endometriosis

- Endometrial tissue outside uterine cavity
- Women of reproductive age
- Location of Lesions
  - Ovary (most common)
  - Cul-de-sac
  - Broad ligaments



http://commons.wikimedia.org/wiki/File:Endometriosis_loc_en.svg

Endometriosis

- Symptoms
  - Dysmenorrhea- low sacral backache premenstrually that resolves with menses
  - Dyspareunia
  - Infertility
- Exam
  - Classic finding-retroverted uterus with uterosacral ligament nodularity
- Diagnosis
  - clinically
  - **definitive-laparoscopy**

http://commons.wikimedia.org/wiki/File:Endometriosis1.jpg

Endometriosis

- Management
  - Medical- all suppress estrogen
    - Oral contraceptives (mild symptoms)
    - Continuous progesterone (pseudopregnancy)
      - (DepoProvera IM or Provera PO)
    - Danazol-testosterone (pseudomenopause)
      - Side effects: hot flashes, acne, wt gain, deepening of voice (can be permanent)
      - Can be used up to 9 months
    - Leuprolide IM (GNRH agonist) q 3months (psuedomenopause)
      - Limited to 6 months total
  - Surgical
    - Adhesion lysis to maintain fertility

Uterine Leiomyoma (Fibroids)

- Etiology
  - Most common uterine tumor
    - Benign smooth muscle tumor
    - Estrogen and progesterone receptors
  - Multiparous women in 40s
  - African-American women

  5x more likely
- Types
  - Subserous (deforming external serosa)
  - Intramural (within uterine wall)
  - **Submucous** (deforming uterine cavity)

http://commons.wikimedia.org/wiki/File:Fibroid.jpg

Uterine Leiomyomas

- Symptoms
  - **Abnormal menstrual bleeding (most commonly menorrhagia)- from submucous myomas**
  - Pain
  - Pressure
  - Infertility
- Exam
  - Uterus is enlarged, firm, nontender, asymmetrical

Uterine Leiomyoma

- Imaging Studies
  - Sonogram
  - Hysterosalpingogram- submucous myomas
- Management
  - Conservative- most do not require treatment
  - GnRH agonists- Lupron-limited to 6 months
  - Uterine artery embolization
  - Endometrial ablation- if no desired fertility
  - Surgery

Endometrial Cancer

- MOST COMMON GYN CANCER
- Risk Factors
  - Prolonged estrogen exposure
    - Nulliparity
    - Late menopause
    - Chronic unopposed estrogen
    - Tamoxifen
  - Diabetes, HTN, obesity
  - Cancer of the breast, colon, ovaries
- Oral contraceptives have some protective effect.

Endometrial Cancer

- Tumor Types
  - **Adenocarcinoma- most common (75%)**
  - Adenosquamous
  - Clear cell
- Symptoms
  - Post menopausal bleeding (most common)
- Exam
  - Usually normal

Endometrial Cancer

- Diagnosis
  - Endometrial biopsy
  - Endometrial curettage- definitive
  - Hysteroscopy
  - Staged I-IV

Endometrial Cancer-Management

- ALL STAGES
  - Total abdominal hysterectomy and bilateral salpingo-oophorectomy (TAH-BSO)
- Stage I and II- Radiation sometimes used postoperatively
- Stage III & IV
  - radiation
  - Progestins-if radiation fails
  - Chemotherapy-advanced or recurrent CA

Ovarian Cysts

- Cysts in any postmenopausal woman are considered malignant until proven otherwise

Benign

- Common in reproductive age group
  - Many resolve spontaneously
  - Management depends on type of cyst

Ovarian Cysts-Benign/Functional

- **Functional (most common type)- excessive response to otherwise normal function**
  - Follicular- *uni*lateral, resolve within 60 days
  - Corpus Luteum- *uni*lateral, associated with pregnancy
  - Theca Lutein- *bi*lateral, high B-hCG titers
- Diagnosis
  - Sonogram- mobile, simple, fluid filled
- Management
  - Observation 30-60 days
  - Follicular or theca lutein- surgical evaluation if present without change for greater than 60 days

Ovarian Cysts- Benign/Nonfunctional

- **Nonfunctional**
  - do not arise from normal function but are not neoplastic
  - **Endometrioma- unilateral "chocolate cysts"**
- Management
  - Surgical incision

Polycystic Ovary Syndrome

- **#1 cause of androgen excess and hirsutism**
- Bilateral
- Patients most commonly present b/c of hirsutism or infertility
- Also associated anovulation and obesity
- Normal menses followed by episodes of amenorrhea that become progressively longer
- Sonogram/Labs
  - "oyster ovaries" OR "string of pearls"- enlarged with smooth pearl-white surfaces without indentations
  - ↑androgen levels, ↑ LH:FSH ratio, lipid abnormalities, insulin resistance
- Management
  - OCPs, DepoProvera IM or Provera PO, weight loss
  - clomiphene citrate (Clomid) for fertility
  - Metformin increases ovulation and pregnancy rates

Ovarian Cysts-Neoplastic masses

- **Benign neoplastic processes**
  - Serous cystadenomas- unilocular, most common ovarian epithelial tumor
  - Mucinous cystadenomas- multilocular
  - **Benign cystic teratomas-** mobile on long pedicles
    - Most common germ cell tumors
    - Most common ovarian neoplasm-women less than 30 years old
- Management
  - Surgical excision

Benign vs. Malignant Ovarian Tumors

- Sonogram Appearance
  - Benign
    - Smooth, regular surfaces, mobile, unilateral, small, simple
  - Malignant
    - Nodular, irregular, fixed, bilateral, large, complex, or loculated

Ovarian Cancer

- Second most common gyn malignancy
- Mean age of dx- 69 years (higher than other gyn CA)
- Risk factors
  - BRCA1 gene
  - Family history
  - More lifetime ovulations (nulliparity, late menopause)
  - Caucasian or Asian ethnicity
  - Diet high in saturated fat
- Screening
  - Bimanual pelvic exam
  - Currently sonogram not done for routine screening

Ovarian Cancer

- Tumor Types
  - Epithelial- *most common* (80%)
  - Germ cell- (15%)

Ovarian Cancer- Clinical Findings

- Symptoms
  - Early-almost always asymptomatic
  - Later-abdominal distension or pain, early satiety, urinary frequency, change in bowel habits
- Exam
  - Fixed, bilateral nodular pelvic masses
  - Abdominal distension/ ascites
  - Sister Mary Joseph's nodule-metastatic implant in the umbilicus

Ovarian Cancer

- Diagnosis
  - Sonogram is suggestive
  - Definitive dx- histological examination
- Tumor Markers
  - Epithelial Tumors (most common)
    - CA-125
    - CEA

Ovarian Cancer-Management

- Most patients
  - Total hysterectomy and bilateral salpingo-oopherectomy (TAH-BSO)
  - Chemotherapy-intravenous or intraperitoneal
  - Sometimes radiation

A 30-year old woman presents complaining of pelvic pressure. On exam, there is a right 5cm cystic adnexal mass, confirmed by sonogram.

What is the recommended management?

1. CT scan
2. Exploratory laparotomy
3. Laparoscopy
4. Repeat sonogram in 6 weeks

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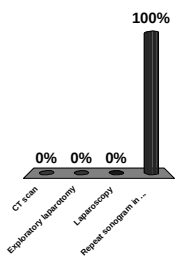


A 25-year old woman presents complaining of pelvic pressure. On exam, there is a solid right adnexal mass, confirmed by sonogram.

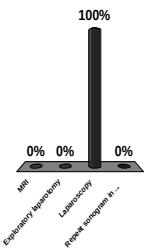
What is the most definitive way make the diagnosis?

1. MRI
2. Exploratory laparotomy
3. Laparoscopy
4. CT

A 25-year old woman presents complaining of pelvic pressure. On exam, there is a solid right adnexal mass, confirmed by sonogram.

What is the most definitive way make the diagnosis?

1. MRI
2. Exploratory laparotomy
3. ★ Laparoscopy
4. CT



Pap Smear Screening

- Indications
  - Women under 21 should not be tested
  - 21-29: every 3 years
  - 30-65: Pap plus HPV every 5 years or Pap alone every 3 years
  - Over 65: previously normal Paps- no testing
  - History pre-cancer: PAPs 20 years after that diagnosis
  - Even if vaccinated, follow same schedule
- American Cancer Society.Cancer Facts & Figures 3/14/2012

PAP-Bethesda System

- Statement of Adequacy
  - Must have endocervical cells
  - Unsatisfactory if inflammatory cells
  - If unsatisfactory, repeat in 6-12 weeks

PAP-Bethesda System-Interpretation

- **Negative for intraepithelial lesion or malignancy**
  - Can also have comments about organism or inflammation
- Squamous Epithelial cell abnormalities
  - **Atypical squamous cells**
    - **ASCUS**- atypical squamous cells of uncertain significance
    - **ASC-H-** atypical squamous cells-cannot exclude high-grade lesion
  - **Low-grade squamous intrepithelial lesion (LSIL)**
    - Associated with transient HPV infection, unlikely to proceed to cancer
  - **High-grade squamous intraepithelial lesion (HSIL)**
    - HPV viral persistence and invasive potential
  - **Cancer**

PAP –Management

- ASCUS
  - Repeat PAP 4-6 months, if second is same or worse, colposcopy
- ASC-H, LSIL, HSIL
  - Colposcopy/biopsy/ HPV testing

Grading Cervical Lesions

Cytology (from PAP)	**Histology (Biopsy from colposcopy)**
ASC	CIN 1- Mild dysplastic changes
LSIL	Same as above
HSIL	CIN2, CIN 3- moderate-severe dysplastic changes
Cancer	Invasive Cancer

Management –abnormal PAP (according to biopsy)

- **CIN1** (any of the following are appropriate)
  - Repeat PAP 6-12 months
  - Repeat PAP in 12 months and colposcopy
  - HPV DNA testing
- **CIN2 or CIN3**
  - Cryotherapy (freezing ectocervix with liquid nitrogen)
  - Cold-knife conization
    - Cone-shaped area is cut out of cervix encompassing lesion
    - May lead to incompetent cervix
  - Loop electrosurgical excision procedure (LEEP)
    - Heated wire loop excises lesions
    - Incompetent cervix less likely

Cervical Cancer

- Third most common gyn cancer
- Risk Factors
  - Early sex, multiple sex partners
  - Cigarette smoking
  - Immunosuppression (HIV)
  - HPV types **16, 18**, 31, 33- **HPV found in over 99% of cervical CA**

Cervical Cancer

- Tumor Types
  - **Squamous-most common (90%)**
  - Adenocarcinoma (less than 10%)
- Symptoms
  - Usually asymptomatic
  - Post-coital bleeding-most common

Cervical Cancer

- Exam
  - Friable, bleeding cervical lesion
- Diagnosis
  - PAP and biopsy
  - Staged I-IV
- Management
  - Hysterectomy
  - Stages III and IV- add radiation and chemo

Cystocele/Rectocele/Uterine Prolapse

Common after menopause (50%)

Cystocele-prolapse of bladder into anterior wall of vagina

Rectocele- herniation of rectum into posterior wall

Uterine Prolapse- prolapse down vaginal canal

Cystocele/Rectocele/Uterine Prolapse

- Symptoms
  - Vaginal fullness, pressure, feeling of incomplete voiding or defecation
- Treatment
  - Topical estrogen therapy (cystocele)
  - Pessary
  - Kegel exercises
  - Surgical repair

End of Part One
Please go on to Part Two

Reproductive System Part Two

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Mastitis

- Occurs mainly in breast feeding women
- Usually caused by nipple trauma
- Most commonly *S. aureus*

- Symptoms
  - Unilateral erythema, edema, tenderness
  - Usually only 1 quadrant of breast affected
  - Fever and chills

- Management
  - Dicloxacillin or erythromycin
  - alternate treatment-clindamycin
  - *Continue* breast feeding on affected side

Breast Abscess

- Progression from mastitis
- Symptoms
  - Same as mastitis with addition of:
    - Localized mass
    - Systemic signs of infection

- Management
  - Incision and drainage
  - Nafcillin/oxacillin IV **OR** cefazolin **PLUS** metronidazole
  - Alternate- Vancomycin
  - *Stop* breast feeding on affected side

Fibrocystic Breast Disease

- Most common benign condition of the breast
- 20-50 year olds

- Symptoms
  - *Painful* cyclic bilateral breast pain (usually premenstrual)
  - Size of cysts fluctuate during the menstrual cycle

- Exam
  - Bilateral cysts that vary in size

Fibrocystic Breasts

- Diagnosis
  - Sonogram shows fluid filled cysts

- Management
  - Reduce caffeine intake, increase oral vitamin E
  - Oral contraceptives
  - Severe symptoms
    - Bromocriptine, tamoxifen (not common)

Breast Fibroadenoma

- Most common *benign breast* ***tumor*** in young women, usually within 20 years of puberty
- More often in Black than White women

- Symptoms
  - *Painless* unilateral lump

- Exam
  - Mobile, firm, smooth, rubbery lump

Fibroadenoma

- Diagnosis
  - Sonogram- smooth, uniform, solid breast mass
  - Fine-needle aspiration shows solid vs. fluid
- Management
  - Small masses- clinical observation
  - Larger masses surgically removed

Breast Carcinoma

- **MC cancer in women, 2nd MC cause of cancer death**
- Risk Factors
  - BRAC1 and 2 (40-80% risk of Breast CA) (keep in mind that only 5-10% of women diagnosed have the genes)
  - Prolonged unopposed estrogen
    - Early menarche, late menopause, late first pregnancy
    - Nulliparity
    - Over 40 years old
  - Hyperplasia with fibrocystic disease
  - High fat diet
  - obesity

Mammogram Screening

- If average risk
  - Start at 40 years old
  - Ages 40-49; repeat every 1-2 years
  - At age 50; repeat every year
- Genetic Risk Factors
  - Start between 25-35 years old
  - Consider MRI

American Cancer Society facts and figures 2012

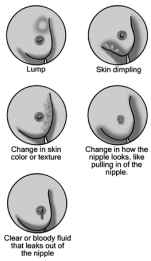
Breast Cancer

- Tumor Types
  - **Infiltrating ductal** (invasive ductal)- most common (80%)
    - ***painless*** stony hard unilateral mass. Begins as ductal carcinoma in situ (DCIS)
  - **Infiltrating lobular-** (10%)- frequently bilateral
  - **Inflammatory**- (2%) **(peau d'orange).** Poor prognosis
  - **Paget's Disease-** (1%)- pruritic, scaly rash on nipple

Breast Cancer

- Symptoms
  - Painless mass (70%)- mc in upper outer quadrant
  - Nipple discharge
  - Erosion
  - Itching of the nipple

http://commons.wikimedia.org/wiki/File:En_Breast_cancer_illustrations.gif



Breast Cancer-Diagnosis

- Exam- 90% of masses are found by patient
- Ultrasound- Differentiates solid from cystic
- Mammogram- Most common screening for non-palpable mass
- Fine-needle aspiration- Bloody fluid more likely cancer than clear fluid
- Open biopsy- **Definitive diagnosis for breast disease**

Breast Cancer-Management

- Surgery
  - Lumpectomy with sentinel lymph node biopsy vs. modified radical mastectomy
- Oncotype Dx Test
  - Sometimes used to determine need for chemo in Stage I and II hormone receptor + cancer
  - Looks at 21 genes in tumor to determine likelihood of metastasis.

Breast CA Managment

- Radiation
  - Always after lumpectomy
  - Can be used before or after surgery in advance disease
- Chemotherapy
  - Non estrogen sensitive receptor tumors and most patients with hormone therapy
  - Single agent- node-negative CA less than 1 cm
  - Multiple agents- node metastases or primary CA larger than 1cm

Breast Cancer-Management

- Hormone therapy
  - For estrogen or progesterone positive receptor tumors
  - Tamoxifen – used after chemo and/or during radiation
  - Aromatase Inhibitor- Arimidex (anastrozole) first line of hormone tx for metastatic CA-less endometrial CA, DVT than tamoxifen but more musculoskelatal disorders and fx
  - Zoledronic acid (Zometa-a bisphosphonate) given to decrease fractures, bone pain and decrease reoccurance of endocrine responsive Breast CA.

A woman presents with multiple bilateral painful breast masses that fluctuate through her menstrual cycle.

What finding would be most likely on sonogram?

1. Fluid filled cysts of varying size
2. Smooth, mobile uniform solid masses
3. Stony hard fixed solid mass
4. Smooth, large pearl-white lobulated cysts

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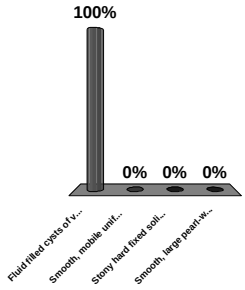

Menopause

- Mean age is 51 years old
- ***All symptoms and signs of menopause are related to estrogen deficiency***

Menopause-Symptoms

- Immediate changes
  - Cessation of menses
  - Hot flashes
  - Decreased vaginal lubrication
  - Depression/mood swings/irritability
- Late changes
  - Osteoporosis
  - Cardiovascular disease

Menopause-Signs

- Decreased size of uterus and ovaries, breasts
- Cystocele/rectocele/uterine prolapse
- FSH greater than 30mIU/mL diagnostic for menopause

Menopause- Management

- Hormone Replacement Therapy (HRT)
  - Most commonly Rx for hot flushes, vaginal dryness
  - Also helps prevent osteoporosis, dementia and colon cancer *but these are not current indications for treatment*
  - Contraindications
    - liver disease
    - thrombosis
    - CA of endometrium or breast

Menopause-Management

- Hormone Replacement Therapy
- Risks
  - Coronary heart disease , stroke, venous thromboembolism
  - Breast cancer (up to 25% increase)

Menopause-Management

- Alternate therapies of HRT:
- Hot Flashes
  - Depo-medroxyprogesteone acetate IM
  - SSRIs (Paxil most common)
  - Soy, black cohosh, ginseng
- Osteoporosis
  - Calcium with Vitamin D
- Vaginal Dryness
  - Topical estrogen

Vaginitis

	Risk Factors	**Symptoms**	**Discharge**	**PH**	**Microscopic finding**	**Treatment**
Candida	HIV Diabetes antibiotics	Pruritus Erythema Odorless	Thick white "cottage cheese"	4.0-5.0	In 10% KOH pseudohyphe	Fluconazole PO single dose **OR** "azole" creams 3-7 d
Bacterial vaginosis		Malodorous Discharge, worse after menses	**Fishy** grey scant, thin, sticky, non-irritating	4.0-5.0	Clue Cells	Metronidazole 500mg BID or 750 qD PO x 7d **OR** metronidazole gel intervaginally x5d **OR** Clindamycin cream invag x 7 days
Trichomonas	Sexual activity	Copious malodorous discharge	Green/yellow "frothy" "strawberry cervix"	5.0-6.5	Motile flagellated protozoa	Metronidazole 2g po x 1 dose **OR** Tinidazole 2g x1

- Metronidazole (Flagyl) warning:
  - Avoid ETOH and sun exposure

A woman presents with vaginal discharge. Fluconazole PO x 1 successfully treated the infection.

Which of the following would most likely describe the discharge found on physical exam?

1. Fishy, thin grey
2. Copious, green, frothy
3. Thick, white, curdy
4. Maloderous, thin, yellow

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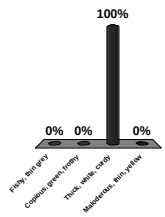

A woman presents with “frothy” malodorous green discharge. On exam, cervix is erythematous with a strawberry appearance.

What is most likely to be found on wet mount?

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2. Motile flagellated protozoa
3. Pseudohyphe
4. Spermatozoas

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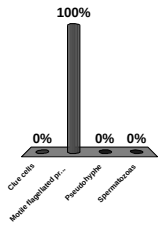


Cervicitis

- Chlamydia
- Gonorrhea
- Human Papillomavirus (HPV)

Chlamydia

- Most common cause of mucopurulent cervicitis and most common *bacterial* STI in women
- Chlamydia trachomatis
- Risk Factors
  - Sex less 20 years old
  - Multiple sex partners
- Presentation
  - Most often asymptomatic
  - Mucopurulent cervical discharge
  - Cervical motion tenderness

Chlamydia

- Labs
  - Nucleic acid amplification test **"expanded gold standard"**
  - Direct fluorescent antibody test
  - Enzyme-linked immunoassay
- Management
  - Azithromycin 1gm single dose **OR** Doxycyline BID x 7 days
  - In pregnancy- azithromycin 1 gm x 1 dose **OR** amoxicillin TID x 7 days
  - Treat sexual partners

Gonorrhea

- Neisseria gonorrhoeae
- Often co-infection with Chlamydia
- Presentation
  - Often asymptomatic
  - Vaginal itching and burning with dysuria or rectal discomfort
  - Purulent cervical discharge
  - Cervical motion tenderness
- Disseminated infection
- **#1 cause of septic arthritis in young, sexually active adults**
  - Maculopapular lesions on hand/feet, tenosynovitis, endocarditis, meningitis

Gonorrhea

- Labs
  - Thayer-Martin media culture (gold standard)
  - Gonazyme (enzyme immunoassay)
- Management
  - Treat for both gonorrhea and chlamydia
  - Cefixime PO single dose or ceftriaxone IM single dose
  - **No fluoroquinolones-due to resistance**
  - Treat partners

Human Papillomavirus (HPV)

- Most common *viral* STI in women
- HPV results in genital warts (condylomata acuminata)
- Subtypes 6 and 11-more common and benign
- **Subtypes 16, 18, 31, 33 associated with cervical and penile cancer**
- Incubation can be 3 months or longer
- Presentation
  - cauliflower-like warts on external genitalia, anus, cervix or perineum
- Diagnosis-
- HPV DNA testing(13 high risk types including 16, 18, 31, 33)
- direct visualization or PAP

HPV

- Management
  - Small lesions
    - Podophyllin
    - Trichloroacetic acid
    - Imiquimod
  - Large lesions
    - Cryosurgery
    - Laser ablation
    - Surgical incision

HPV-Prevention

- Gardasil vaccine
  - Girls and boys 9-26, recommended at 11-12 yrs.
  - Protects against 6, 11, 16, 18
  - 3 doses (1st, 2nd 2 months later, 3rd 6 months after 1st)

Pelvic Inflammatory Disease (PID)

- Most commonly presents as acute salpingo-oophoritis
- Pathogens ascend to upper GU tract, most often at menses
- Pathogens
  - Chlamydia-most common
  - Gonorrhea
  - E. Coli
- Risk factors
  - Age less than 20
  - Multiple partners
  - Prior PID
  - Vaginal douching

PID

- Symptoms
  - **BILATERAL** abdominal-pelvic pain-onset can be gradual or sudden
  - Pelvic pressure, back pain that radiates down legs
- Exam
  - Mucopurulent cervical discharge
  - Cervical motion tenderness and bilateral adnexal tenderness
  - +/- fever
  - Rebound tenderness on abdominal exam

PID

- Diagnosis
  - Cervical cultures
  - Elevated WBC and ESR, C-reactive protein
  - WBCs on wet prep
  - Transvaginal sonogram-thickened fluid filled tubes
- DDx
  - Ectopic
  - Appendicits
  - Pyelonephritis

PID

- Management
  - Inpatient (indications for hospitalization)
    - Pelvic abscess
    - Fever above 102.2
    - Pregnancy
    - Outpatient treatment failure
    - Unreliable patient
      - Parenterally 48 hours then switch to PO tx (see outpt meds)
      - Cefotetan **OR** Cefoxitin IV **PLUS** doxycycline IV or PO
  - Outpatient
    - Ceftriaxone IM single dose **PLUS** doxycycline PO x 14 days with or without metronidazole bid x 14 days **OR**

Contraception

- Natural Family Planning
- Barrier
  - Condom
  - Diaphragm
  - Cervical cap
  - Spermicide
- Hormonal
  - Oral contraceptives (combined and progestin only)
  - Patch
  - Vaginal ring
  - Injectable (Depo-Provera)
  - Implantable
- Intrauterine device (IUD)
- Sterilization
  - Male
  - Female
- Emergency contraception

Natural Family Planning

- Identify time of ovulation and avoid intercourse 48 hours before and after this time
- Ovulation predicted by:
  - Past menstrual cycles
  - Rise in basal body temperature
  - Cervical mucus from watery to sticky/stringy
- Failure rate: 25%

Barrier Methods

- Condom
  - Only contraception effective in protecting against STIs
- Diaphragm
  - Can be inserted 1-2 hours before intercourse/used with spermicide
  - Can cause bladder irritation

Barrier Methods

- Cervical cap
  - Small cup-like diaphragm fitted by gynecologist
  - Placed on cervix up to 2 days before intercourse
- Spermicides-Nonoxynol-9
  - Foams/vaginal suppositories/jellies that kill sperm
  - Inserted up to 30 minutes before intercourse
  - Irritation to genital membranes

Barrier Methods-ALL

- Advantages
  - Lack systemic side effects
  - Low cost
- Disadvantages
  - Loss of spontaneity

Hormonal Methods
Estrogen and Progestin Combination

- Oral Contraceptive Pills
  - Combination estrogen/progestin pills most common
  - 3 weeks on-1 week off for menses
  - Monophasic- fixed dose every day of cycle
  - Mulitphasic- fixed estrogen but progesterone increases each week

Hormonal-Estrogen and Progestin

- Patch (OrthoEvra)
  - Patch changed once a week x 3 weeks, one week off
  - Failure rate 1% but increases if weight is more than 200 lbs.
- Vaginal Ring (NuvaRing)
  - Transvaginal vinyl ring placed in vaginal fornices x 3 weeks
  - Failure rate less than 1%

Hormonal
Estrogen and Progestin Combination

- Mechanism of Action for ALL:
  - Estrogen suppresses FSH so no follicle/ovulation
  - Progesterone suppresses the LH surge so no ovulation
  - Thicker cervical mucus-hostile to sperm
  - Endometrial atrophy-unfavorable to implantation

Estrogen Containing Hormonal Methods-Benefits

- Decreases risk of:
  - Endometrial and ovarian cancer
  - Ovarian cysts
  - endometriosis
  - Dysmenorrhea
  - Fibrocystic breasts
- Regulates menses

Estrogen Containing Contraception

- Absolute contraindications
  - Pregnancy
  - Hx of
    - Venous thrombosis or pulmonary embolism
    - CVA, CHD
    - Breast/Endometrial Cancer
    - Melanoma
    - Abnormal liver function tests or liver tumor
- Relative contraindications
  - Diabetes
  - Sickle cell disease
  - Chronic hypertension
  - Hyperlipidemia
  - Vascular headache
  - Depression
  - Smoker over 35 years

Hormonal Method
Progestin only

- Progestin-only pills ("mini-pills")
  - Taken everyday (no week off like combo pills)
  - High incidence of breakthrough bleeding
  - Failure rate is 3%
- Indications
  - Breast feeding
  - over 40 years
  - Women who can not take estrogen

Hormonal-Progestin Only

- Intramuscular injection (Depo-Provera)
  - Depo-medroxyprogesterone acetate
  - Every 3 months, Failure rate 0.3%
  - **Return of ovulation can take up to 18 months**
  - Common side effects
    - Break through bleeding
    - 5 lb/year weight gain
    - Mood changes
  - **BLACK BOX WARNING**
    - calcium loss, bone weakness, maybe osteroporosis
    - Use for 2 years or less

Hormonal-Progestin only

- Subcutaneous rod insertion under upper arm skin
  - **(think Norplant but Norplant is off the market)**
  - Jadelle-2 levonorgestrel rods replaced every 5 years
  - Implanon-1 etonorgestrel rod replaced every 3 years
- Ovulation prompt after removal
- Side Effects
  - Scaring at insertion site
  - Break through bleeding

Hormonal
Progestin Only

- Mechanism of Action- of ALL of them:
  - Same as combination methods except:
    - Mature Follicle is formed but not released
      - Suppresses LH surge
      - No effect on FSH
- Progestin Only-contraindications
  - Breast carcinoma
  - Liver tumors

IUD

- Types
  - Levonorgestrel (Mirena)
    - Replace every 5 years
    - Decreases menstrual cramping and bleeding
  - Copper-banded (ParaGuard)
    - Replace every 10 years
    - May increase cramping and bleeding
- Mechanisms of action
  - Implantation altered- hostile endometrial environment
  - Ovum transport altered- changed tubal ciliary action

IUD

- Indications
  - **Multiparous**
  - Oral contraceptives contraindicated/intolerated
  - Smokers over 35 years
  - Monogamous relationship
- Contraindications
  - Absolute
    - Pregnancy
    - Undiagnosed uterine bleeding
    - Acute gyn infection
    - Suspected gyn malignancy
  - Relative
    - Nulliparity
    - Previous ectopic pregnancy
    - Hx of multiple sex partners or STIs
    - Heavy menses

IUD

- Complications (most commonly occurs at time of insertion)
  - Uterine perforation
  - Salpingitis
  - Ectopic pregnancy
  - Menorrhagia and metrorrhagia

Sterilization

- Tubal sterilization-most common
  - Failure rate 0.5%
- Vasectomy
  - Failure rate 0.2%

Emergency Contraception

- Indications
  - Rape
  - Barrier contraceptive failure
  - Any other unprotected intercourse
- Plan B-levonorgestrel (progesterone)
- 1st dose within 72 hours up unprotected sex (some now say 120 hours) 2nd dose 12 hours later
- Efficacy greater than 95%

Infertility

- Inability to conceive within 12 months of unprotected sex
- Primary-absence of previous pregnancy
- Secondary-after previous pregnancy

- Causes
  - **Anovulation- most common**
  - Tubal Disease
  - Male factor
  - Unexplained/ multifactorial

Infertility-Anovulation

- Etiology
  - Polycystic Ovaries
  - High prolactin levels
  - hypothalamic-pituitary dysfunction
  - Hypothyroidism

- Diagnosis
  - Menstrual diary
  - Luteal-phase (day 21) progesterone level less than 3ng/ml
  - No mid-cycle basal body temperature increase

- Management
  - Bromocriptine to tx hyperprolactinemia
  - Clomiphene citrate to hyperstimulate ovulation
  - Metformin increases ovulation and pregnancy rates when PCOS is cause

Infertility-Tubal Disease

- Etiology
  - **Think scarring/ adhesions**
  - PID, endometriosis, hx of ruptured appendix, previous ectopic pregnancy

- Diagnosis
  - Hysterosalpingogram
  - Laparoscopy

- Management
  - Surgery/lysis of adhesions

Infertility-Male factor

- Abnormal semen analysis-most common male factor
- Etiology
  - Increased scrotal temperature
  - Smoking
  - Excessive ETOH ingestion
  - Epididymitis
  - Varicocele
  - Endocrine disorders
- Diagnosis- Semen analysis
- Management
  - Treat if etiology is identified
  - Intrauterine insemination (IUI)
  - Intracytoplasmic sperm injection (ICSI)
  - Donor insemination

Infertility-General Approach

- Phase I (inexpensive/noninvasive)
  - Detailed history and type of coitus
  - Ovulation tracking
  - Semen analysis
  - TSH, prolactin, LH
  - FSH in women over 35 years
- Phase II (more expensive/more invasive)
  - hysterosalpingogram
  - Laparoscopy
  - IVF if no cause is found by this point

Fetus/ Infant Nomenclature

- **Abortion**: < 20 wks gestation **or** weight < 500 grams
- **Premature Infant**: 20-36 weeks gestation **or** 1000- 2500g
- **Full Term Infant**: After 37-42 wks gestation **or** > 2500g
- **Postmature infant**: > 42 wks gestation

Abbreviation of Obstetrical Hx

G_ P T P A L

T- Total number of **full term** pregnancies (37-42 wks)

P- Total number of **preterm** pregnancies (20-36 wks)

A- Total number of **abortions** (elective or spontaneous) occurring before 20 wks

L- Total number of **living** children

** Twins count as ONE pregnancy, TWO live children

Manifestations of Pregnancy

- **Presumptive Manifestations**
- **Probable Manifestations**
- **Positive Manifestations**

Presumptive Manifestations

- Symptoms
  - Amenorrhea
  - Nausea/ vomiting
  - Quickening (fetal movement)
    - Nulliparas- 18-20 weeks
    - Multiparas- 14-16 weeks
  - Urinary frequency, nocturia, infection

Presumptive Manifestations

- Signs
  - Chadwick's sign
    - bluish discoloration of vagina and cervix
  - Increased basal body temperature
  - Skin changes:
    - Melasma/Chloasma (dark patches on face)
    - Linea nigra

Probable Manifestations

- Positive Pregnancy Test
- Hagar's sign-softening between fundus and cervix
- Uterine Growth
  - 12 weeks- at symphysis pubis
  - 20 weeks-at umbilicus
  - After 20 weeks- 1cm for every week gestation

Positive Manifestations

- Fetal Heart Tones
- Ultrasound Examination of Fetus

Normal Lab Changes in Pregnancy

System	Increase	Decrease	Unchanged
Hepatic	**Cholesterol**		ALT, AST, LDH
Renal		BUN Creatinine Uric acid	
Hematologic	WBC Fibrinogen Clotting factors	hemoglobin hematocrit	Platelet count PT, PTT
Thyroid	Total T3, T4	TSH	Free T3, T4
Pancreas (until 24-28 wks)	Plasma insulin	Fasting glucose	

First Prenatal Visit-Labs

- **Blood:**
  - CBC
  - blood type, Rh factor, antibodies to blood group antigens
  - Random glucose
  - VDRL (RPR)
  - Hepatitis B
  - Rubella
  - As indicated
    - Sickle cell trait
    - Cystic fibrosis
    - Tay-Sachs
- Urine
- Pap smear (if less than 1 yr. since last)
- Group B Streptococcus

Check on Every Visit

- Maternal weight
- Blood pressure
- fundal height
- fetal size and presenting part
- urine dipstick for protein, glucose, ketones

Time Table for Screening Tests

- **First visit:** dating sonogram-discuss optional screening tests
- **10-13 weeks:** PAPP-A, nuchal translucency
- **15-18 weeks**: Alpha- fetoprotein (AFP) /quadruple screen
- **18-22 weeks**: Official anatomical sonogram
- **24-28 weeks**: Glucose challenge test (GCT)
- **28 weeks**: Rhogam if woman is Rh -
- **32 weeks**: Repeat CBC, VDRL, chlamydia, gonorrhea, Grp. B strep

Screening Blood Tests Trisomy 21

- 1st trimester
  - Pregnancy-associated plasma protein A (PAPP-A)-**low**
  - Free beta-human chorionic gonadatropin (free b-hCG)-**high**
- 2nd trimester
  - Unconjugated estriol- l**ow**
  - Maternal alpha-fetoprotein-l**ow**
  - inhibinA- **high**

Optional Screening Test

- Nuchal translucency screening test
  (aka nuchal fold scan)
  - 10 weeks-13 weeks
  - Screen for Trisomy 21, 13, 18 and Turner's Syndrome

Optional Diagnostic Tests

- **10-13 weeks**: Chorionic villus sampling (CVS)
- **15-20 weeks**: Amniocentesis

Recommended Weight Gain During Pregnancy

- 20-35 lbs. average weight women
- 40-45 lbs. under weight women
- 10-15 lbs. overweight women

Nutrition During Pregnancy

- Pregnant intake= increase 300 kcal/ day
- Prenatal Vitamins
  - folic acid (0.4 mg/day)
  - Iron (30 mg/day)

Things to Avoid

	Reason
Smoking, ETOH, drugs	teratogens
Unpasturized food (apple cider, soft cheeses)	listeria
Raw meat, seafood	listeria
Deli meat	listeria
King mackerel, shark, swordfish, tuna, tilefish	mercury
Farm salmon	PCBs

Stages of Labor

- First Stage- Onset of labor to fully dilated (10 cm)
- Second Stage- fully dilated to birth of infant
- Third Stage- Delivery of infant to delivery of placenta

Signs of Placental Separation

- Fresh show of blood
- Cord lengthening
- Fundus rises
- Uterus firm and globular

Causes of Dystocia in Labor

- **Pelvic Factors**
  - Inadequate pelvis
  - Cephalopelvic disporportion (CPD)
  - Failure to descend
- **Contraction Factors**
  - Inadequate contractions and subsequent failure to dilate
  - Treatment-Pitocin

Aids in Delivery

- **Episiotomy**
  - Incision to widen the vulvar orifice, permitting easier passage of the fetus
- **Forceps**
  - instruments used to "pull" the baby out
- **Vacuum**
  - round suction placed on head to apply traction while mom pushes

Induction of Labor

- Induction of labor by medical or surgical means
- considered when prolongation of pregnancy might expose mother or fetus to complications and vaginal delivery <u>is not</u> contraindicated

Indications for Induction (most common)

- Prolonged pregnancy
- Diabetes mellitus
- Pre eclampsia
- Suspected intrauterine growth retardation

Induction-Absolute Contraindications

- Cephalopelvic disproportion
- Placenta previa
- Uterine scar from previous classical C-section
- Transverse lie

Methods of Induction of Labor

- **Pharmacologic**
  - Early (minimal dilation or effacement)
    - Prostaglandin Gel (cervidil): given vaginally. Helps to "ripen" the cervix
  - Some dilation and effacement
    - Oxytocin (Pitocin): causes uterine contractions. Given intravenously

Induction of Labor (cont)

- **"Surgical"**
  - Amniotomy: Rupturing of membranes, usually with a hook

Fetal Monitoring
ANTEPARTUM TESTING

- Nonstress test (NST)
- Contraction Stress test (CST)
- Vibroacoustic stimulation
- Biophysical Profile

Antepartum Fetal Monitoring

- **Non stress test (NST)**
- Most common antepartum technique)
  - Reactive test
    - 2 accelerations in 20 minutes, up 15 beats from baseline for 15 seconds
    - **Positive test is a GOOD thing**
- Some of the Indications:
  - preeclampsia
  - IUGR
  - gestational diabetes
  - decreased fetal movement

Antepartum Fetal Monitoring

- **Contraction Stress Test (CST)**
  - Also called an oxytocin challenge test
  - Done to observe HR response to contractions
  - Pitocin is given to cause contractions
  - late decelerations with each contraction constitutes a positive test
  - **Positive test is a bad thing**

Antepartum Monitoring

- Vibroacoustic Stimulation (VAS)
  - Auditory source (often artificial larynx) placed on maternal abdomen
  - Short burst of sound delivered to fetus to "wake up" fetus
  - Used when NST is non-reactive

Antepartum Testing

- **Biophysical profile (five components):**
- Most often done after a non-reactive NST and heart rate stays non-reactive after VAS
- Each component worth 2 points
  - NST reactivity
  - Fetal breathing
  - Gross Body movements
  - Fetal tone
  - Amniotic Fluid Index

Monitoring During Labor

- Heart rate and pattern is indicator of infant well-being
- Normal heart rate in newborn 120-160 bpm
- Consistent decelerations after a contraction can indicate fetal distress

Monitoring During labor

- **External Fetal Monitor**- On maternal abdomen. Most common
- **Internal Fetal Monitor**- Electrode attached to infant's head

Intrapartum Fetal Monitoring

FHR change	Appearance	Etiology	Significance
Accelerations	Increase of baseline 15 bpm for 15 sec.	Response to fetal movement	Reassuring
Early decelerations	Mirror images of cxns	Fetal head compression	benign
Variable decelerations	Rapid FHR drop with return to baseline with variable shape	Cord compression	Benign if mild or moderate Worrisome if severe
Late decelerations	FHR drop at end of cxn	Uteroplacental insufficiency	Always worrisome

Non-reassuring FHR

- Management
  - Stop Pitocin
  - Change maternal position
  - Oxygen
  - Fetal Scalp PH
    - Reassuring- greater than 7.20
    - Nonreassuring- less than 7.20

Induced Abortion

- **Mifepristone and Misoprostol:** a medical abortion procedure up to the first 7-9 wks LMP
- **Suction Curettage: (safest and most effective for 12 wks or less)** surgical procedure 3 -12 wk LMP. Local anesthesia being used on the cervix.
- **Surgical Curettage (D&C): Aspiration:** a surgical abortion up to 16 wks LMP. It can also be referred
- **Dilation and Evacuation (D&E):** up to 18 wks outpt.
- **Induction of Labor** with Intra Amniotic Instillation after 16 weeks
- **Induction of labor** with vaginal prostaglandins after 16 weeks

Spontaneous Abortion

- any pregnancy which ends before 20 weeks gestation and/or a fetus that less than 500 grams
- More than 80 percent of abortions occur in first 12 weeks
- **Risk increases with:**
  - parity
  - increased maternal and paternal age
  - women who conceive within 3 months of a term birth

Spontaneous Abortion

- About 60 percent of abortions are due to chromosomal abnormalities
- Next largest category of cause is "unknown"

- **Factors include:**
  - infection
  - anatomic
  - endocrine

- **Environmental factors:**
  - tobacco
  - ETOH
  - caffeine

Classification of Spontaneous Abortion

Type	Vaginal Bleeding	Cervix Open	POC passed
Threatened	Yes	No	No
Inevitable	Yes	Yes	No
Incomplete	Yes	Yes	Partial
Complete	Yes	Yes	Yes
Missed	No	No	No

One more Spontaneous Abortion

- Habitual abortion- 2-3 or more consecutive spontaneous abortions
  - Genetic testing of parents
  - Thyroid (hypo and hyper)
  - Autoimmune (SLE and anticardiolipin antibodies)

Incompetent Cervix

- Cervical weakness causing passive, painless cervical dilation
- Results in first or second trimester abortion or preterm labor
- Management
  - Cerclage-cervical suture in 1st trimester to provide support to weak cervix

Normal B-hCG Levels

- Serum positive 8-9 days after ovulation
- level doubles every 48 hours during first trimester of normal intrauterine pregnancy

ECTOPIC PREGNANCY

- Implantation of the blastocyst anywhere outside of the uterine cavity
- Most common location-tube (95%)

Etiology of Ectopic Pregnancy

Most common cause:

hx of salpingitis

Others

- abnormalities of the tube (adhesions, tumors)
- previous ectopic pregnancy
- failed contraception (IUD)

Diagnosis of Ectopic Pregnancy

- **Symptoms:**
  - Pain (99%)
  - Vaginal bleeding (75%)
  - Amenorrhea (68%)

Signs of Ectopic Pregnancy

***Un*ruptured**	**Ruptured**
Cervical tenderness	Hypotension
*Uni*lateral adnexal tenderness	Tachycardia
Adnexal mass	Abdominal guarding

Ectopic Labs/Studies

- Lab:
  - B-hCG-urine or serum positive
- Sonogram
  - Absence of intrauterine gestational sac
- Presumptive Diagnosis
  - B-hCG titer greater than 1500mIU/ml with no intrauterine gestational sac

Ectopic Pregnancy-Treatment

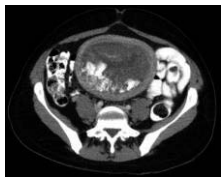
- **Medical:**
  - **Methotrexate (folic acid inhibitor)**
  - Criteria:
    - Serum B-hCG titer less than 5,000mIU
    - Ectopic less than 3.5 cm
    - hemodynamically stable
    - No pulmonary, renal or hepatic disease
    - compliant patient

Ectopic Pregnancy-Treatment

- **Surgical**
  - Used if patient does not meet criteria for medical treatment
  - Salpingostomy- if unruptured
  - Salpingectomy- if ruptured and tube destroyed

GESTATIONAL TROPHOBLASTIC DISEASE

- Neoplasms from an abnormal proliferation of the placenta or trophoblast
- Benign
  - Hydatidiform mole
- Malignant
  - choriocarcinoma



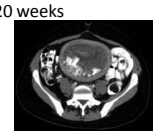
http://commons.wikimedia.org/wiki/File:Blasenmole_Computertomographie_axial.jpg

Hydatidiform Mole

Complete (most common)	Incomplete
Grape-like vesicles	No vesicles; **fetus present**
Empty egg	Normal egg
Paternal X's only 46, XX	Maternal & paternal X's 69, XXY
Fetus absent	Fetus non-viable
20% progress to malignancy	10% progress to malig

Hydatidiform Mole

- History/Physical
  - Vaginal bleeding (***most common***)
  - Pre-eclampsia- like symptoms before 20 weeks
  - Severe hyperemesis
  - New onset hyperthyroidism
  - Uterus larger than gestational age
  - No fetal heart tones



- Studies
  - B-hCG titer (excessively high for pregnancy dating)
  - Sonogram (**sack of grapes or snowstorm pattern**)
  - http://commons.wikimedia.org/wiki/File:Blasenmole_Computertomographie_axial.jpg
- Treatment- D&C, serial bHCG, OCs x 1 yr

PRETERM LABOR

- Labor occurring after 20 weeks but before 37 weeks gestation

Preterm Labor-Triad

- Gestation less than 37 weeks
- Uterine contractions
  - greater/equal to 3 in 20 min
- Dilatation and effacement
  - greater/equal to 2cm on single exam or 1cm change on serial exams

Preterm Labor-Risk Factors

- Infection- bacteria from vaginal or cervical canal
  - **Group B Step**
- Premature rupture of membranes (PROM)
- Previous preterm birth
- cocaine
- heavy cigarette smoking

Preterm Labor-Diagnosis

- **Symptoms/ Signs:**
  - contractions
  - dilatation and effacement
  - premature rupture of membranes (PROM)
  - vaginal bleeding/ pressure

Preterm Labor Diagnosis

- **Fetal fibronectin testing**
  - Cervical swab
  - Negative test result means low risk of delivery w/i 2 weeks
- Cervical length
  - 4 cm is normal
  - 2cm @ 24 weeks indicated increased risk of prematurity
- Cervical length and fibronectin together
  - Both abnormal: 50% chance of delivery before 34 wks
  - Both normal: only 11% chance of delivery

Preterm Labor-Management

- Observation
  - 30-60 minutes
  - Hydration
- Antibiotics
  - treat subclinical infection
- Glucocorticoids (betamethasone)
  - enhance fetal lung maturity
  - increase levels of surfactant
- Tocolytics- decrease contractions/slow labor
- NO CLEAR 1ST LINE THERAPY

Preterm Labor-Tocolysis Magnesium Sulfate

Mechanism
- inhibits myometrial contractility mediated by calcium

– Therapeutic Level- 5.5-7.0 mg/dL

– Side effects:
- nausea, fatigue, generalized muscle wkness
- Decreased reflexes
- respiratory depression

Pearl
- Antidote- calcium gluconate

Preterm Labor-Tocolysis Beta-mimetic adrenergic agents

- Ex. Ridodrine, **terbutaline (black box warning)**
  - Mechanism
    - stimulate beta-receptors to relax smooth muscle, therefore decrease cxns
  - Side effects
    - pulmonary edema
    - Maternal and/or fetal tachycardia
    - emesis, headaches

Preterm Labor-Tocolysis Calcium Channel Blockers

- Nifedipine often used
- Mechanism
  - inhibit smooth muscle contractility by decreasing intracellular Ca2+ ions, therefore relax uterine muscle
- Side effects:
  - Hypotension, tachycardia myocardial depression

PREMATURE RUPTURE OF MEMBRANES (PROM)

- Rupture of membranes before labor begins
- Most common diagnosis leading to NICU admission in United States

PROM-Risk Factors

- Exact cause unknown
  - vaginal/cervical infection (Grp. B strep, STI)
  - cervical incompetence
  - multiple pregnancy
  - cigarette smoking

PROM-Diagnosis

- **Symptoms:**
  - gush of fluid from vagina
  - persistent leakage of fluid from vagina
  - reduced size of uterus
- **Signs:**
- Sterile Speculum Exam
  - pooling
  - nitrazine paper
  - ferning test
  - visual leakage of fluid from os

PROM-Treatment

- Risk of infection vs. prolonging gestation
- **After 35wks**- induction
- **34 wks**- controversial
  - some give betamethasone, wait 24 hours, then induce
  - may attempt to check for lung maturity by the lecithin/sphingomyelin (L/S) ratio

PROM-Treatment

- **Before 34 wks**
- Goal is prolong pregnancy to 35 weeks, as long as mom and baby are stable
  - bedrest (trendelenberg position), pelvic rest
  - VS q 4 hrs
  - WBC daily
  - NST daily
  - biophysical profile, if NST non-reassuring
  - steroids
  - antibiotics

MATERNAL Rh ISOIMMUNIZATION

- Mom produces antibodies against foreign red blood cell antigens in maternal circulation
- *Most common* isoimmunization antigen is D
- Risk is present only if Mom is Rh - and Dad is Rh +, and baby is subsequently Rh +

- Most commonly occurs during birth, therefore does not affect current child
  - Problem in subsequent kids
- But if there is concern fetal blood has gotten into maternal blood at anytime, treatment is given

Rh Isoimmunization-Treatment

- RhoGAM
  - Mechanism
    - Binds to and hemolyzes any D-positive RBC in maternal circulation
  - Most commonly given at 28 weeks
  - Other high risk times
    - After delivery of Rh+ infant
    - Ectopic
    - Amnio
    - D&C
    - Trauma

MULTIPLE GESTATION

- All the same symptoms of pregnancy, but usually more severe
- prenatal office visits more often

Multiple Gestation-Complications

- **Maternal- increased risk of**:
  - spontaneous abortion
  - premature labor and delivery
  - preeclampsia

- **Fetal- increased risk of:**
  - death
  - abnormal or breech presentation
  - prolapse of the cord
  - premature separation of the placenta before delivery

Gestational Diabetes
Incidence and Etiology

- Carbohydrate intolerance of variable severity which is present only during pregnancy

- Risk Factors of Developing GDM:
  - obesity
  - age over 25 years
  - Ethnicity (AA, Asian, Hispanic, Indian)

Gestational Diabetes

- **Maternal risk of:**
  - Pre-eclampsia
  - Traumatic birth

Fetal Risk of:
- macrosomia
- prematurity
- still birth
- delayed fetal lung maturity

Screening/ Diagnosis

- 24-28 weeks: Glucose Challenge Test (GCT)
  - non fasting 50g glucose load
  - Check maternal glucose after 1 hour
  - if > 140 mg/dl (some say >130mg/dl), move to Glucose Tolerance Test (GTT)

GDM-Diagnosis

- Glucose Tolerance Test (GTT):
  - 100g oral glucose load
  - in morning after overnight fast
  - venous plasma glucose is measured at fasting, 1 hr, 2hr, and 3 hr
  - 2 or more abnormal values = gestational diabetes
  - (Some say only 1 abnormal value but this is NOT standard at this time)

GDM-Diagnosis
Plasma Glucose Levels(mg/dL)

- Carpenter and Coustan
  - Fasting 95
  - 1hr 180
  - 2hr 155
  - 3hr 140

hA1C not generally used in diagnosing gestational diabetes

White Classification of GDM

- A1:diet controlled
- A2:Insulin required

GDM-Treatment

- Diet and exercise
- Fingersticks (4 times daily)
  - Fasting < 90mg/dl
  - 2-hr post-meal < 120 mg/dl
- Insulin no glucose control in a week of dietary control
- (oral hypoglycemics-glyburide or metformin- have similar outcomes but are not standard of care)
- weekly check-ups and NSTs at 32-34 weeks
- Induction of labor
  - good control- at 40 wks
  - bad control or signs of macrosomia - at 38 wks

Prognosis of GDM

- If diagnosed during pregnancy, increased risk of DM in future
- If required insulin, 50% risk of diabetes within 5 years

Hypertension in Pregnancy

- Chronic Hypertension
  - HTN present prior to 20 weeks gestation
  - Good prognosis
    - Bp 140/90-179/109
    - No end-organ damage
  - Poor prognosis
    - Bp > 180/110
    - Renal disease
    - Retinopathy

Chronic Hypertension

- Monthly sonogram to check for IUGR
  - If IUGR suspected
    - Weekly NSTs and/or BPP
- Serial BP and urine protein
- Patient should not go past due date
- Medication (only when bp is 150/100)
  - Methyldopa (most common)
  - Labetalol

PREECLAMSIA/ ECLAMSIA

- Preeclampsia
  - Classic triad of hypertension, proteinuria, edema (but edema not really in criteria anymore)
- Eclampsia
  - the above plus seizures
- after 20 weeks gestation and *most commonly* near term
- Can occur postpartum, up to 2 weeks after delivery
- No increased risk of HTN later in life

Preeclampsia
Predisposing factors

- **Nulliparity *(most common)***
- extremes of age (under 20, over 35)
- multiple gestation
- diabetes
- chronic hypertension

Preeclampsia-Complications

- progression to eclampsia
- renal failure
- pulmonary edema
- HELLP syndrome
- DIC

- Prevention—1gm calcium daily during pregnancy

HELLP Syndrome

- Severe preeclampsia with:
  - **H**emolysis
  - **E**levated **L**iver enzymes
  - **L**ow **P**latlets

Classification

- **Mild (Most common)**
  - Bp: 140/90 on 2 occasions at least 6 hrs. apart
  - Proteinuria: >300mg/24hrs but less than 5g/24hr
  - absence of symptoms
- **Severe**
  - Bp: 160-180/110 on 2 occasions 6 hrs. apart
  - Proteinuria:>5g in 24hrs, **or** 3+ or more on 2 random urine dips, 4 hrs. apart
  - headaches, visual disturbances
  - RUQ pain, low urine output
  - elevated creatinine
  - elevated liver enzymes

Preeclampsia- Diagnosis

- Signs
  - hypertension
  - proteinuria
  - hyperreflexia

Preeclampsia-Diagnosis

- Labs:
  - sterile U/A
  - CBC
  - fibrinogen
  - PT/ PTT
  - Chem panel
    - creatinine
    - uric acid
    - Liver function studies

Preeclampsia- Management

- "Cure"- Delivery of the fetus
- Mild preeclampsia
  - Before 37 weeks
    - If patient reliable- follow as outpatient
      - Bedrest, antepartum testing 2x/week, betamethasone if less than 34wks.
    - If non-reliable- follow as inpatient
  - After 37 weeks
    - Delivery through induction

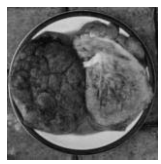
Preeclampsia-Management

- Severe:
  - Hospitalize
  - Under 34 weeks
    - Monitor within ICU setting
    - Betamethasone for fetal lung maturity
  - Over 34 weeks
    - Deliver vaginal vs. cesarean
    - watch for HELLP
  - Medication
    - MgSo4- seizure prophylaxis
    - hydralazine or labetolol for bp management

Placental Abruption

- Separation of the placenta from the site of uterine implantation before delivery of the fetus
- *Most common* cause of 3rd trimester bleeding
- *Most common* obstetric cause of DIC

http://commons.wikimedia.org/wiki/File:PlacentaPair.jpg



Placental Abruption-Risk Factors:

- Hypertension
- cigarette smoking
- cocaine abuse
- trauma
- advanced maternal age
- PROM

Placental Abruption-Classifications:

- External form- blood drains through the cervix
  - More common, less serious
- Concealed form- hemorrhage in confined within uterine cavity
  - Less common, more serious

Placental Abruption-Diagnosis

- Symptoms:
  - vaginal bleeding (80%)
  - **abdominal *pain* (66%)**
  - moderate to severe ***back pain*** (66%)
  - tender hypertonic uterus (30 %)
- Signs:
  - fetal distress

Placental Abruption

- Labs/Tests
  - sonogram
  - Hgb/ Hct
  - PT/PTT
  - Fibrinogen
- BUT: Diagnosis is mainly a clinical one

Placental Abruption-Treatment

- Depends on:
  - size of abruption
  - amount of bleeding
  - fetal well being
  - gestational age
- Emergency vs. expectant therapy
- Vaginal vs. cesarean delivery

Placental Abruption- Complications

- Fetal demise
- Maternal Hemorrhage
- Maternal DIC and death

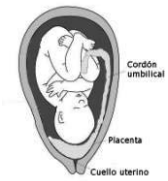
PLACENTA PREVIA

- Placenta is implanted over the os
- Can be partial or complete
- cause of 20% of 3rd trimester bleeding

- Risk Factors
  - advance maternal age
  - multiple gestation
  - previous placenta previa
  - scarred endometrium (previous C/S)
  - multiparity

Placenta Previa-Diagnosis

- Symptoms:
  - **pain*less*,** bright red vaginal bleeding
  - maybe cramping or contractions
- Signs:
  - sonogram
  - NO VAGINAL EXAM



http://commons.wikimedia.org/wiki/File:Placta_prv.jpg

Placenta Previa-Treatment

- Depends on:
  - amount of bleeding
  - gestational age
  - degree of previa
  - whether or not labor has begun

- Delivery by cesarean section

Placenta Previa- Complications

- Maternal
  - hemorrhage, shock, and death
  - infection
  - embolism
- Fetal
  - prematurity
  - hypoxia

POST PARTUM HEMORRHAGE

Condition	**Uterine Atony** *most common* (50%)	**Genital laceration** (20%)	**Retained Placenta** (10%)
Risk Factors	Excessively short or long labor Infected uterus	Uncontrolled vaginal delivery	Noncontracted uterus
Findings	Soft uterus	Visual laceration	Missing cotyledon on placenta
Management	Uterine massage oxytocin	suture	Manual exploration

Endometritis

- Increased risk with:
  - Cesarean section
  - Ruptured membranes over 24hrs
- S/S
  - Most commonly present on 2-3 post partum day
  - Post partum fever (over 38 or 100.4)
  - Uterine tenderness

Endometritis

- Labs
  - WBC over 20,000
  - U/A
  - Bacteria (vary widely from hospital to hospital)
    - Anaerobic streptococci (most common)
    - Gram-negative coliforms
    - Aerobic streptococci
- Treatment
  - Clindamycin plus gentamicin (first line therapy)
  - Ampicillin added if no response in 24-48 hrs.
  - Metronidazole added if sepsis is present
  - Ceftriaxone is alternate therapy

Thank you and good luck!

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