Objectives

- Discuss initial pregnancy related counseling for women with chronic conditions.
- Differentiate normal pregnancy related signs and symptoms from non-pregnancy related pathologic symptomatology.
- Review safe management of pregnant and lactating women in the primary care office including the appropriate use of pharmacologic therapies.
- Examine pregnancy related emergencies and appropriate interventions.

Maternal Mortality

- Maternal Mortality is decreasing globally, but increasing in the United States.
- Pre-existing medical conditions that increase risks for maternal mortality remain high.
- The most common chronic diseases for women of childbearing age are depression, obesity, hypertension, diabetes & substance use.

Primary Prevention?

One Key Question

“Would you like to become pregnant in the next year?”

- Yes
- Unsure/OK either way
- No
Act before you become

- Multivitamin with 400mg Folic Acid
- Exercise Daily, Good Nutrition & Food Safety
- Encourage early prenatal care
- Encourage substance cessation
- Review conditions, medications & immunizations

“Are you currently using a birth control method you are satisfied with?"

- Recommend emergency contraception as a back up method
- Provide comprehensive birth control counseling including long-acting reversible contraceptives.
- If not at risk of pregnancy – contraception not indicated.

Medical Eligibility Criteria for Contraceptives

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sub-Categories</th>
<th>US MEC</th>
<th>US SPR</th>
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<tr>
<td>Age</td>
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<td>Analytical Determinants</td>
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<td>Parenting</td>
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<th>BMI</th>
<th>Macrosomia</th>
<th>Shoulder Dystocia</th>
<th>Stillbirth</th>
<th>Newborn Death</th>
<th>Pre eclampsia</th>
<th>GDM</th>
<th>PTB</th>
<th>Cesarean</th>
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<td>30</td>
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<td>0.4</td>
<td>0.5</td>
<td>13.1</td>
<td>11.0</td>
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<tr>
<td>35</td>
<td>3.5</td>
<td>4.1</td>
<td>0.4</td>
<td>0.6</td>
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<td>13.9</td>
<td>2.8</td>
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<tr>
<td>40</td>
<td>4.3</td>
<td>4.2</td>
<td>0.5</td>
<td>0.6</td>
<td>21.4</td>
<td>16.9</td>
<td>3.4</td>
<td>53.5</td>
</tr>
</tbody>
</table>

- Recommended pregnancy weight gain
  - BMI >25 15-25 pounds
  - BMI >40 10-15 pounds

Obesity in Pregnancy

Obesity Management

- 30 minutes of physical activity 3-5 times weekly
- Nutritional & Behavioral interventions
- Avoid practices that are not sustainable
- Following Bariatric surgery
  - wait 12-18 months
  - additional supplemental iron, folic acid & B12
  - check bariatric labs & correct deficiencies

Substance Use

[Chart showing NAS/NOWS and Maternal Opioid Use Disorder on the Rise rates per 1,000 HospitalBirths]

[Graph showing Current Substance Use Among Pregnant Women Aged 15-44, by Age, 2008-2009 Combined]
Clear the Air for Baby!

Not Without Risk
- Infertility
- Ectopic pregnancy
- Miscarriage
- Preterm Rupture of membranes
- Placenta previa, abruption
- Preterm delivery
- Low birth weight / FGR
- Stillbirth
- SIDS / SUIDS
- Congenital anomalies
- Withdrawal / NAS
- Otitis media
- Asthma / Wheezing
- Bronchitis / Pneumonia
- Behavioral issues
- Attention Concerns
- Learning Disabilities

Neonatal Abstinence Syndrome
- blotchy skin coloration
- rapid breathing
- sleep problems
- irritability
- abnormal sucking reflex
- seizures
- stuffy nose and sneezing
- fever
- hyperactive reflexes
- sweating
- increased muscle tone
- trembling
- Slow weight gain
- Vomiting
- poor feeding
- diarrhea
- Excessive/high-pitched crying

Screening tools

**Illicit Substances**
- Parents
- Partner
- Past
- Pregnancy

**Alcohol Use**
- Tolerance
- Annoyed
- Cut Down
- Eye-Opener

Intervention Tools

Women want to know:
- Will this hurt my baby?
- How will it affect me?
- What will happen if I don’t take this medicine?
- Where Can I find more information?
Pregnancy Medication Databases

- **MotherToBaby.org**
  - Online fact sheets (English & Spanish)
  - Phone consultation 866-626-6847

- **Treating For Two**
  (http://www.cdc.gov/pregnancy/meds/treatingfortwo/)
  - CDC partnership with FDA

- **REPROTOX.org**
  - Resource for clinicians, scientists, government agencies.

- **TERIS**
  (http://depts.washington.edu/terisweb/teris/)
  - Online database, summaries review published clinical and experimental literature
  - Risk assessment developed by advisory board

Pregnancy Registries

- Observational studies that collect data longitudinally
- Compares outcomes with internal / external control groups
- Can be voluntary or required by regulatory agencies as condition of medication approval
- Providers can help women become participants – FDA Website or MotherToBaby.org

Principles of Pregnancy Prescribing

- First line treatment with non-drug therapy
- Older drugs may have more data/safer profile
- Monotherapy is preferred
- Lowest effective dose
- Include woman in risk-benefit discussion if options exist
- Provide resources and registry information as applicable

Mental Health Concerns

- Relapse Continue (24%) vs. Discontinue (68%) Treatment
- Maternal Depression associated with poorer pregnancy outcomes.
- PPD is the most common complication of childbearing
- USPSTF : Women should be screened during pregnancy and post partum PHQ-9 or Edinburgh Postnatal Depression Scale
- CBT demonstrates best remission rates

Mental Health Medications

- Paroxetine - septal heart defects
- SSRI’s - SGA/low birth weight, preterm delivery, slight increase in some birth defects.
- Transient feeding difficulties, jitteriness & irritability
- 1% risk of persistent pulmonary hypertension of the newborn
Epilepsy

- ½ million women of childbearing age
- 3-5/1000 births to WWE
- Seizure free for 9 months before pregnancy, likely to be seizure free through pregnancy
- Folic acid (Vitamin B9) recommended
- AED’s are acceptable during pregnancy, monotherapy preferred
- Valproate in the first trimester: neural tube defects, facial clefts & hypospadias, potential for learning disabilities

Epilepsy Medications

- Lamotrigine, carbamazepine, phenytoin levels should be monitored
- Levetiracetam and oxcarbazepine may need levels monitored
- No significant newborn symptoms associated with AED’s
- Valproate, phenobarbital, phenytoin and carbamazepine preferable in breastfeeding

Thyroid Disorders

- Ideally, thyroid function should be stable
- Pregnancy may need to increase dosage 25-50%
- Back to pre-pregnancy dosage post partum
- Check thyroid function q 6-8 wks, 4 wks after dosage changes
- Separate PNV from levothyroxin by 2-3 hours

Hyperthyroidism

- Graves Disease 80-85%, 1:1500 pregnant patients
- Uncontrolled associated with fetal tachycardia, SGA, prematurity, stillbirth, cardiac & cranial malformations. ↑ TSI can cause fetal/neonatal hyperthyroidism
- Improves during the third trimester, may worsen post partum.
- PTU is the drug of choice because it is highly protein bound.
- Lower amounts of PTU cross into breast milk compared to Tapazole.
- Baby will require periodic assessment of thyroid function
- Monitor LFT’s when using PTU

Hypothyroidism

- 2-3 of 100 Pregnancies, Often Hashimotos
- pre-eclampsia, placental abnormalities, low birth weight infants, and postpartum hemorrhage (bleeding).
- Drug of choice: levothyroxine (T4) during pregnancy
- Check thyroid hormone levels q 4 - 6 weeks for the first half of your pregnancy, at least once after 30 weeks.
- May require multiple titrations

Asthma

- ~ 8% Pregnant women have asthma.
- If worsens - typically 29-36 weeks
- Asthma attacks most common 17-24 weeks
- Severity of asthma in first pregnancy typically similar in subsequent pregnancies
- Slight increased risk for gestational hypertension or preeclampsia, preterm delivery, cesarean, and LBW/IUGR baby
Asthma

Table 2. Preferred and Alternative Asthma Controller Therapy in Pregnancy

<table>
<thead>
<tr>
<th>Asthma Severity</th>
<th>Preferred</th>
<th>Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermittent</td>
<td>SABA pro (no daily medications)</td>
<td>NA</td>
</tr>
<tr>
<td>Mild persistent</td>
<td>Low-dose ICS</td>
<td>Cromolyn, LTRA, sustained-release theophylline</td>
</tr>
<tr>
<td>Moderate persistent</td>
<td>Medium-dose ICS or low-dose ICS + LABA</td>
<td>Low- or medium-dose ICS + LTRA or theophylline</td>
</tr>
<tr>
<td>Severe persistent</td>
<td>High-dose ICS + LABA; consider addition of systemic corticosteroids</td>
<td>NA</td>
</tr>
</tbody>
</table>

ICS: inhaled corticosteroid; LABA: inhaled long-acting beta agonist; LTRA: leukotriene receptor antagonist; NA: not applicable; SABA: short-acting beta agonists.

Source: Reference 1.

Chronic Hypertension

- Continued lifestyle modifications are recommended
- Maintain BP’s 120-160 / 80-105
- Up to 40% may progress to pre eclampsia
- Labetalol, nifedipine or methyldopa are preferred
- Chronic HTN, hx of preeclampsia or other risk factors – low dose ASA recommended starting end of first trimester
- ACE Inhibitors, ARB, MRAs & Statins not recommended in pregnancy
- Not recommended in women of reproductive age - unless compelling reason – proteinuric renal disease

Preeclampsia

- A pregnancy-specific hypertensive disease with multisystem involvement presenting after 20 weeks gestation
  - New onset proteinuria
  - Severe headache, visual disturbances, epigastric pain, severe swelling, nausea & vomiting, sudden weight gain, feeling ‘off’
  - Can initially present post partum (3-6 days)
  - Preeclampsia increases later in life increases CVD risk
  - Healthy weight, increased physical activity, no smoking & early evaluation for most high-risk women.
  - ? Yearly BP’s, lipids, fasting blood glucose, monitoring BMI

Risk Factors for Preeclampsia

- First baby, Obesity, Advanced Maternal Age (>40)
- Previous preeclamptic pregnancy
- Chronic hypertension, renal disease (or both)
- Hx of thrombophilia
- Multifetal pregnancy
- In Vitro fertilization
- Family history of preeclampsia
- DMI, DMII, Lupus

Diabetes

- Worsening of any existing eye, kidney, heart, or nerve problems caused by diabetes
- Labor may start too early (preterm labor)
- Bladder and other infections
- Gum disease
- Injury from delivering big baby
- Cesarean section
- High blood pressure
- Preeclampsia (high blood pressure + protein in urine)
- Birth defects
  - Some heart defects
  - Some major birth defects of the brain and spinal cord
  - Stillbirth or miscarriage
  - Born very big (more than 8 pounds)
  - If a big baby in delivered vaginally, it may have:
    - Injury to nerves in shoulder
    - Broken collarbone
    - Low blood sugar after birth
    - Yellow skin and eyes (jaundice)
    - Obesity later in life

CDC.GOV

Diabetic Guidelines

- Incorporate preconception education into routine visits for women of childbearing age.
- Average glucose 100 / A1C 6-7 before conception attempted
- Folic acid 400-600mcg daily
- Family planning: contraception at all times unless desiring pregnancy and A1C @ goal
- Discontinue ACE Inhibitors, ARB’s & statins
Inflammatory Bowel Diseases

- Crohn’s Disease
- Ulcerative Colitis
- Indeterminate Colitis

Early Pregnancy Bleeding

- About 25% of women experience bleeding in early pregnancy.
- Half of those go on to have normal pregnancies.
- Any bleeding considered ‘Threatened Abortion/Miscarriage’
- Type & Screen – RhoGAM if Rh negative

Evaluation & Differential Early Pregnancy Bleeding

- Quantification
- Pelvic Exam
- Intercourse? / Activity?
- Infection?
- Cancer?
- Non-vaginal source?

Implantation spotting

- Typically only lasts 1-2 days
- Light spotting (panty liner, mostly with wiping)
- 7-10 days after ovulation / at or just prior to expecting menses
- Offer reassurance

Subchorionic Hematoma

- ~ 20% Early Pregnancy painless bleeding
- “Hypoechoic area adjacent to gestational sac”
- Watchful waiting, pelvic rest.
- Finding later in pregnancy more concerning
Miscarriage

- 15-20% of all diagnosed pregnancies
- Expectant management if hemodynamically stable
- Bedrest/pelvic rest effectiveness questionable.
- Birth Control vs. Preconception Planning
- Reassurance:
  - 1 SAB doesn’t ↑ risk in future pregnancies
  - Multiple miscarriage does

Outpatient Miscarriage Management

- Expectations (EM preferred over MM, Surgical Management)
  - EM ~ 1-3 days in 80% of women
  - Medical management ~ 2 days longer
- Precautions
  - Heavy Bleeding, Severe Pain, Fever
- Follow Up
  - HCG to 0
  - Family Planning
  - Emotional support

Miscarriage / Abortion

- Threatened: Any bleeding / cramping < 20 weeks gestation
- Inevitable: bleeding with an open cervix
- Missed: non-viable embryo (5-11 weeks) or fetus (>12 weeks)
  - Anembryonic pregnancy: >15-17 mm @ 7 wks, 21mm @ 8 wks.
  - No embryonic cardiac activity >5-7 mm CRL
- Incomplete: Products of conception retained
- Complete: Products of conception passed

Ectopic Pregnancy

- Most common cause 1st trimester maternal mortality
- Fallopian tube pregnancies ~ 95%
  - Approx. 20 per 1000 pregnancies
- Previous ectopic re-occurrence 15-20%, 32% with hx 2+
- Risk factors: PID, paragard, advanced maternal age, previous ectopic or uterine surgery / anomalies, smoking

Ectopic Pregnancy Management

- Presentation: spotting, abdominal pain, pain radiating to shoulder, syncope
- Cervical motion, abdominal tenderness, slightly enlarged uterus, leaking or ruptured ectopic - hypotension & shock
- HCG > 1500 gestational sac, no gestational sac with HCG > 6500.
- Refer to OB/GYN or Emergency Department

GI Concerns:

- Increased acuity
- Increased salivation
- Relaxed cardiac sphincter
- Motility changes
- Increased cilia
- Increased fluid absorption
Nausea & Vomiting of Pregnancy

- Mild NVP <6
- Moderate NVP 7-12
- Severe NVP >13

History:
- Abdominal pain
- Infections
- Drug History
- Thyroid

EBM for NVP
- B6 10mg up to QID &/or
- Doxylamine 10mg
  (2 at bedtime, 1 in AM, PM, up to 8 daily)
- Can add Dimenhydrinate 50mg q 4-6 hrs
- CAM:
  - Ginger 250mg q 6 hrs
  - P6 Acupressure (Sea Bands)
  - Emetterm
  - Mindfulness, CBT

Management for Hyperemesis
- >5% Pre Pregnancy Weight Loss
- Dehydration
- Electrolyte Imbalance
- At any point can consider nutrition

Heartburn
- Lifestyle & Dietary Changes
- Antacids – separate from vitamins
- Histamine 2 Blockers can be used safely in pregnancy without increased risk for SAB, PTB or SGA.
- Proton Pump Inhibitors are not associated with increased congenital malformations, SAB or PTB.
- Pro-motility agents (metoclopramide) can be considered in conjunction with previous therapies after review of risks.

Constipation
- 11-38% experience constipation
- Bulk forming agents: fiber
- Stool softeners – Docusate sodium
- Osmotic Laxatives – lactulose, polyethylene glycol
  - Poorly absorbed, minimal side effects, but may have gas, bloating
- Stimulant Laxatives: bisacodyl, Senna
  - Poor bioavailability, cramping
Cholelithiasis

- Gallstones more common during pregnancy
  - Decreased gallbladder motility
  - Increased cholesterol saturation of bile
- Supportive care usually leads to improvement of symptoms.
- First episode – supportive care vs. cholecystectomy (laparoscopic if ≥ trimesters)
- If near term – conservative management is preferable

Genitourinary Concerns

The next patient on your schedule
Says it burns when she pees, feels crampy & by the way, she’s pregnant...

Hydronephrosis

- Typically right sided flank pain, trouble voiding
- Affects ~ 80% of women, mostly G1, 2nd trimester.
- Sono imaging to rule out kidney stone, evaluate severity.
- Conservative management: Position changes (side lying, Knee chest) can help with discomfort, maintaining good hydration, sometimes IV fluids and analgesia.
- Vigilance for infection or worsening of pain, abnormal chemistry – significant may require stent placement.

Urinary Tract Infections

- Symptomatic + nitrites strongly suggestive of UTI
  - Dip: + Nitrates, +LE’s (?), +blood (?), +protein (?)
  - Microscopy: +WBC, +RBC, +Bacteria
- Culture most reliable – treat to pathogen
- 7-10 day course of cephalexin, nitrofurantoin*, trimethoprim-sulfamethoxazole* (*caution 1st trimester & near term)
- If GBS+ (7-30% Pregnant Women), follow CDC guidelines

Pyleonephritis

- Asymptomatic bacteriuria (11%) should be treated to decrease pyelonephritis
- Risk factors: young, G1, sickle cell anemia, DM, kidney stones, drug use, urinary tract defects, hx pyelonephritis.
- Lumbar pain, fever, chills, nausea, vomiting, CVA tenderness
- 1 in 5 also have septicemia at dx of pyelonephritis
- Requires hospitalization and IV antibiotics.
- Follow up cultures recommended

Bacterial Vaginosis

- Diagnosed in up to 20% women during pregnancy
- Often with vaginal discomfort, irritation, cramping, thin, homogenous vaginal discharge,
- Vaginal pH>4.5, Positive whiff (amine odor with KOH, at least 20% clue cells
- Metronidazole 500mg BID X 7d / 5g applicatorful X5d or Clindamycin 300mg BID X7d / 2% cream applicatorful X5d or 100mg ovules X3d
Candidiasis

- Pruritus, vaginal soreness, dyspareunia and thick, curd-like vaginal discharge.
- Microscopy, KOH - reveal hyphae and / or budding
- Miconazole, Clotrimazole
- Oral fluconazole implicated as teratogen/embryotoxic during pregnancy, found in breastmilk but safe in neonatal populations.

Sexually Transmitted Infections

- Routine Prenatal Screening
  - HIV
  - Hepatitis B, C
  - Gonorrhea
  - Chlamydia
  - Syphilis
- Appropriate treatment available during pregnancy & breastfeeding

Rupture of Membranes

- Occurs in ~ 20% of pregnancies.
- Gush of fluid, feeing ‘wet’.
- Avoid digital exam
- Sterile speculum exam – pooling, fluid through cervix, ferning, nitrazine
- If < 34 weeks, IM Steroids
  - betamethasone, 12 mg IMI q 24 hourly × 2 doses or
dexamethasone, 6 mg IMI q 12 hourly × 4 doses

Dermatological Concerns

The next patient on your schedule presents with a rash & by the way, she’s pregnant...

Acne

- Gentle cleansers, washing face twice daily
- Avoid picking, popping pustules, touching face
- Oil free cosmetics
- Astringents acceptable, absorption unlikely.
- Salicylic acid, benzoyl peroxide topically are not associated with concerns.
- Topical antibiotics (Erythromycin, clindamycin)
- Avoid retinoid / vitamin A containing products

PUPPS / PEP

Pruritic Urticarial Papules and plaques of pregnancy / Polymorphic eruption of pregnancy

- Benign
- Intensely pruritic rash
- Belly, buttocks, back & down thighs.
- Resolves after birth
- Aveeno / oatmeal, cool water baths
- Low – moderate dose topical corticosteroids
- Oral antihistamines
Cholestasis of Pregnancy

- Severe pruritus, secondary skin lesions, typically 3rd trimester
- Genetically predisposed, hormonal changes
- ~1% pregnancies, 50-70% recurrence with future pregnancy
- Palms and soles, later generalized - excoriations, scratch marks and prurigo nodules
- Elevated serum bile acid levels, liver enzymes
- Treat symptoms, lower liver labs with Ursodeoxycholic acid
- REFER!

Viral Infections

- Condyloma
  - Destructive therapy with liquid nitrogen is preferred
  - Topical TCA acceptable
  - Avoid Salicylic acid
  - Podophyllin (X)
  - Cantharidin, imiquimod, podophlox – very little data, avoid

- HSV – untreated - risk of TORCH complex
  - Acyclovir ®, safe in lactation
  - Valacyclovir, famcyclovir (B)

Infestations

Pediculosis

- Permethrin (B)
- Occlusive therapy – coconut oil, moisturizer
- Lindane © (caution, potentially neurotoxic), pyrethrin ©
- Malathion & Lindane need to be avoided in lactation

Scabies

- Permethrin (B)
- 6-10% sulfur in white petrolatum, crotamiton, benzyl benzoate and topical aloe vera gel.
- Malathion & Lindane need to be avoided in lactation

Infestations

- Tinea Corporis (ringworm)
  - Topical clotrimazole or topical miconazole
  - Sertaconazole ©, ketoconazole®, naftifine, ciclopirox alamine (B)
  - Avoid terbinafine in first & second trimesters
  - Oral azoles & griseofulvin contraindicated in pregnancy
  - Terbinafine & oral azoles excreted in breastmilk with long half life **
    - Weigh risk of disease progression vs. exposure to medication

Respiratory: Pregnancy Physiology

- Air hunger common
- Mild respiratory alkalosis
- Less buffering capacity for acidic insult
- Prone to acute pulmonary edema
- Prone to aspiration pneumonia
- Weight gain
- Increased estrogen causes mucous membrane edema

The next patient on your schedule presents with a cough & by the way, she's pregnant...

Sleep

- Melatonin
- Diphenhydramine & Doxylamine -- risk for CNS/Respiratory depression noted in newborns, some withdrawal noted.
- Zolpidem – CNS depression, abnormal thinking/behavior changes, neonatal respiratory depression and withdrawal when used at end of pregnancy.
- Sedating tricyclic antidepressants --Amtriptyline or nortriptyline
- Use of lorazepam, clobazam seen, but controversial
**Allergic Rhinitis**

- Remove allergens, control exposures
- Nasal saline irrigation
- An intranasal corticosteroid alone should be the initial treatment for allergic rhinitis with symptoms affecting quality of life. Budesonide most studied, considered safe with pregnancy and breastfeeding.
- Loratadine, cetirizine have the safest profiles for pregnancy, also compatible with breastfeeding
- Diphenhydramine -- risk for CNS/Respiratory depression noted in newborns, some withdrawal noted.

**Common Cold**

- Immune support measures
- Symptom Management
  - Dextromethorphan (DM), Guaifenesin, cough drops, vicks.
  - Ipratropium bromide, cromolyn sodium
  - Pseudoephedrine and phenylephrine,
  - Diphenhydramine and chlorpheniramine,
- Reassurance!

Rakel et. al. (2008), "Clinician empathy as perceived by patients with the common cold, significantly predicts decreased duration and severity of illness.

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**Flu**

**Safe with Pregnancy & Breastfeeding**

- Flu Vaccine
- Oseltamivir
- Zanamivir

---

**MS: Pregnancy Physiology**

- Weight gain
- Center of gravity shifts
- Abdominal muscles relax
- Pelvic joints relax
- Ligament support strain
- Increased curvature of lumbar spine

---

**Headache**

- Acetaminophen 1000mg, +/- metoclopramide 10mg, Acetaminophen + Caffeine + Butalbital (4-5 days/month), Acetaminophen + Codine (9 days/month)
- Referral For:
  - Sudden onset, severe, not responsive to pain medications.
  - Headaches associated with fever, exertion, hypertension, proteinuria, vision changes or neurological signs / symptoms

---

**NSAIDs in Pregnancy & Lactation**

- Not teratogenic but avoid while trying to get pregnant.
- Low / intermittent doses, D/C 6-8 weeks before term
- Low dose ASA safe for pregnancy and breastfeeding,
- Potential Concerns
  - Maternal: prolonged gestation, labor, PPH, anemia
  - Neonatal: risk for intracranial hemorrhage, premature closure of the ductus arteriosus, pulmonary hypertension, impaired renal function, reduced urine output, reduced amniotic fluid volume.
- Compatible with breastfeeding, caution with jaundice
**Back Pain**

- 50-90%, #1 cause for early pregnancy / sick leave
- Lumbar Pain
  - Worse with prolonged sitting, standing
  - Tender muscles
- Posterior Pelvic Pain
  - Worse with movement, may radiate
  - Deep Sacroiliac or pubic symphysis pain
- Referral for
  - Sensory, motor or reflex changes,
  - Bowel or bladder dysfunction

---

**Carpel Tunnel Syndrome**

- Most symptoms peak in third trimester, may continue during breastfeeding but most resolve within a year of birth.
- Activity modification – avoid activities that force wrists into flexed position, splinting, edema control, ultrasound guided steroid injections
- Referral if symptoms are constant or severe

---

**Leg Cramps**

- Weight gain, fluid, blood flow and pressure changes during pregnancy contribute to Leg Cramps
- Stretch out before bed, massage, stay active, supportive footwear, take PNV, Evaluate for Magnesium, Calcium, and iron supplementation, Adequate fluid intake
- Review blood clot warning signs

---

**Restless Leg Syndrome**

- URGE: Urge to move legs with dysesthesias, Rest-induced, Gets better with activity, Evening or night worsening.
- Depression-Anxiety, sleep hygiene, exercise, stretching before bed, massage, Folate supplementation, if deficient: Ferrous sulfate/gluconate, Vitamin C
- Avoiding caffeine, dopamine antagonists
- Codeine – short term, CNS depression, opioid dependence/neonate withdrawal
- Gabapentin – limited pregnancy data

---

**Braxton Hicks vs. Preterm Labor**

<table>
<thead>
<tr>
<th></th>
<th>Timing</th>
<th>Intensity</th>
<th>Where noticed</th>
<th>Change in activity</th>
<th>Cervix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braxton Hicks</td>
<td>Sporadic, stop-start</td>
<td>Variable</td>
<td>Usually just in abdomen</td>
<td>Can change contractions</td>
<td>No change</td>
</tr>
<tr>
<td>(Progressing)</td>
<td>Regular, steadily closer</td>
<td>Steadily stronger</td>
<td>Starts in back, wraps around to front</td>
<td>Continue despite change</td>
<td>Change</td>
</tr>
</tbody>
</table>

- Contractions that are 5 or more in an hour, have persisted despite rest and fluids, are getting stronger, longer and closer or notice bloody show or leaking of fluid – refer for OB Care.

---

**Rural Health Care**

- 54% of rural counties are without hospital based OB services
- 2004 – 2014
  - 200 Maternity wards closed
Post Partum Mood Disorders

- Discuss Risks & Benefits with patient
- Do Not Discourage Breastfeeding
- Try non-pharmacological interventions
  - Psychotherapy, Support
- Medications
  - Monotherapy Preferred
  - Single dose before infant’s longest sleep period

Effective Communication

S - Situation: Concise statement of the problem
B - Background: Pertinent and brief information related to the situation.
A - Assessment: Analysis and considerations of options.
R - Recommendation: Request / recommend action

Rapid Response

- All team members have authority to activate rapid response Multi-disciplinary Education on criteria that defines emergency
  - Trigger signs: agitation, new onset of difficulty with movement, fetal bradycardia, hypotension, bradycardia, trouble breathing, hypertension, severe headache.
  - Standardize process for Rapid Response.
    - Periodic Drills, protocols for emergencies, activation criteria, critical interventions
    - Pocket cards, posters, charting guides on emergency carts
Maternal Early Warning Trigger (MEWT)  
Maternal Early Warning Observation Record (MEWOR)  
Modified Obstetric Early Warning Score (MOEWS)  

Immediate Action Required

Maternal Early Warning Signs Protocol

- Systolic BP <90 or >160, Diastolic BP >100
- Heart Rate < 50 or >120
- Respiratory rate <10 or > 30
- Oxygen saturation <95%
- Oliguria <35ml/hour X2hours
- Maternal agitation, confusion or unresponsiveness
- Hypertension, severe headache or SOA

Delayed / Secondary PPH Presentation

- >1 pad/hour > than an hour
- Clot larger than egg
- Sub involution
- Increase uterine, perineal, incisional pain
- Fever, flu-like, uterine tenderness, lochia odor
- Medical, Birth history
- Post partum & Breastfeeding course

Bleeding (Delayed post partum hemorrhage)

- Fundal massage to assess uterine tone
- Evaluation for infection
- Trauma
  - Perineal – vaginal inspection for hematoma, dehiscence
  - Uterine – incision dehiscence, pseudoaneurysm
  - Ultrasound to observe for retained placental fragments

Bleeding:
(Delayed Post Partum Hemorrhage)

- Identify cause ASAP
- Large bore IV, fluid resuscitation with isotonic crystalloids
- Oxygen
- Evaluate labs, type & crossmatch
- Vaginal swabs, blood culture if febrile
- Balloon tamponade
- Referral

Blood Pressure

- "I just don't feel right", headache, abdominal pain, SOA, generalized edema
- Treatment of BP >160 / 110 (and/or) (within the first hour)
- Prevention of eclamptic seizures
- Caution with history of drug use
- Close postpartum follow-up
- Magnesium sulfate (IV), labetalol, hydralazine and calcium gluconate.
Blood Clots VTE = DVT + PE

- Complicates 0.5 to 3.0 per 1,000 pregnancies
- Pregnancy increases risk 5-10 fold compared to non pregnant woman of same age.
- Post partum risk 15 – 35 fold (first 3-6 weeks).
- Risk factors >35, obesity, grand multiparity, personal or family hx of VTE or thrombophilia, immobility, hyperemesis, dehydration, pre eclampsia, severe varicose veins, surgery, trauma. ~ 2-6% recurrence rate.
- 64 % of postpartum VTEs occur after cesarean delivery.

Blood Clots Presentation

- PE mostly postpartum period
- Mild dyspnea, panic and tachypnea to dramatic cardiopulmonary collapse.
- PE: Multidetector-row (spiral) computed tomography is the test of choice
- DVT : unilateral leg pain, swelling, +Homans’ sign, may be subtle
- 78 – 90 % DVT’s occur in left leg, 72 % ilio-femoral vein.
- DVT: Venous Compression Doppler Ultrasound

Blood Clots Treatment

- Therapeutic anticoagulation : LMWHs, UFH, post partum – warfarin may be started with heparin. (neither contraindicated with breastfeeding
- Continue medications remainder of pregnancy, at least 6 (up to 12) weeks post partum
- Discontinue anticoagulation therapy 24 hours prior to labor.
- >24hrs between last dose and epidural or spinal preferred.
- Total of at least 3 months total treatment, longer with APA or thrombophilias
- Compression stockings X 1 year (mixed data)

The next patient on your schedule
Is having breast pain & she’s got the cutest little baby.

<table>
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<th>Exclusive @ 6 months</th>
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* CDC Breastfeeding Report Card 2014

Breastfeeding Considerations

- Breastfeeding is a vital sign
- Consider physiology
- “Medications that are safe for use directly in an infant are generally safe for the breast-feeding mother.”
- Give resources

Breastfeeding Recommendations

- Experts agree that mother’s milk is the best food for all babies.
- Exclusive breastfeeding for 6 months & continue through introduction of solids.
- Babies should have breast milk for the first year & longer as mutually desired by mother and infant.
Safe Prescribing for Breastfeeding

Choose medication...
- shortest half-life and highest protein-binding ability.
- poorest oral absorption.
- lowest lipid solubility.
- Has been studied in infants / could be therapeutically used for infant.
- If not absorbed through the GUT, what is transferred in breastmilk is typically not bioavailable.

Medications Contraindicated with Breastfeeding

Antineoplastic agents
- Ergotamine tartrate (Ergomar)
- Bromocriptine (Parlodel)
- Lithium
- Cyclophosphamide (Cytoxan)
- Methotrexate (Rheumatrex)
- Cyclosporine (Sandimmune)
- Radiopharmaceuticals*

Engorgement

- Significant, continual breast fullness/edema
- Breast pain, flattened nipple, difficulty with latch
- No fever, body aches or redness
- Breastfeed early & often
- Pump for comfort
- Cold packs, cabbage leaves
- Reverse nipple softening
- NSAIDs

Sore Nipples vs. Candida

- Burning pain, shiny, red, friable tissue
- Not relieved with latch or positioning
- Baby may / may not have symptoms
- Treat both mother and baby
- Nystatin, Gentian Violet, APNO, or Prolonged course Fluconazole

In the absence of infection or unsure of problem - coordinate care with a lactation specialist

Plugged Ducts vs. Mastitis

- Localized breast pain
- Tender, red, unilateral
- Afebrile
- Can progress to abscess or mastitis

- Localized breast pain
- Tender, red, unilateral
- Febrile
- Chills, flu-like aching

Mastitis : Amoxicillin-clavulanic acid, cephalaxin, erythromycin.
10-14 day treatment to prevent relapse