THE UNIVERSITY OF NEW MEXICO
HEALTH SCIENCES CENTER

DEPARTMENT OF OB/GYN
MIDWIFERY DIVISION

CLINICAL
UPDATES

This is a collection of clinical recommendations and updates to serve as a resource
For the Midwifery Division. Please rely on consultation or additional resources as needed.

Updates Ongoing

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GESTATIONAL DIABETES SCREENING AND CNM CARE OF PATIENTS WITH GDMA1

DEFINITION of GDMA1: Abnormal glucose testing in pregnancy where euglycemia (normal blood sugar) is achieved with diet and exercise.

RISK FACTORS for GDM: Advanced age, nonwhite, multiparous, obesity, PCOS, history of delivery of large for gestational age (LGA) infant, history of GDM in first degree relative, or family history of diabetes.

- GDM is associated with gestational hypertension, pre-eclampsia and polyhydramnios.
- It is also associated with LGA infant which increases risk for macrosomia, shoulder dystocia, and cesarean delivery.
- There is up to a sevenfold increased risk of developing type 2 diabetes mellitus after a pregnancy complicated by GDM.
- History of GDM also confers increased risk of cardiovascular disease.
- Short term potential risks to babe include: poor feeding, neonatal hypoglycemia, hyperbilirubinemia, hypocalcemia, respiratory distress syndrome and polycythemia.

SCREENING AND DIAGNOSIS:

- Recommended: universal screening at NOB if < 20 weeks with **HgbA1C**.
  - Hgb A1C > 6.4 = diagnosis of overt diabetes; refer to MFM for consultation and diabetic management and MD care for remainder of pregnancy.
  - Hgb A1C 5.7-6.4 = recommendation by our MFM division is for a 3 hour GTT and results are managed as usual at the 24-28 week screening time.
    - Per our department standardized guidelines, these patients should be diagnosed as pre-diabetic and treated like GDMA1 patients with counseling about diet and exercise.
    - Consider a consult with diabetic educator.
- 24-28 week screen*:* 1 hour glucose screen (50 g OGTT) with cutoff of 130 mg/dL.
  - If $\geq$ 200 mg/dL, GDM is diagnosed
  - If $\geq$ 130 mg/dL, do a 3 hour fasting glucose tolerance test (100 g OGTT); **two** values at or above the cutoff criteria establishes the diagnosis of gestational diabetes.
    - FBS $\leq$ 95 mg/dL
    - 1 hour $\leq$ 180 mg/dL
    - 2 hour $\leq$ 155 mg/dL
    - 3 hour $\leq$ 140 mg/dL
- Alternative Screen: 2 hour 75 gram GTT
  - Must fast (8 hours prior)
  - Abnormal is **one** elevated value:
    - FBS $\leq$ 92 mg/dL
    - 1 hr $\leq$ 180 mg/dL
    - 2 hr $\leq$ 153 mg/dL

MANAGEMENT RECOMMENDATIONS:

- Diabetic Clinic/MFM:
  - It is recommended that patients diagnosed with GDM are referred to MFM for consultation and diabetic education.
  - Patients are given a glucose meter and diet and exercise recommendations.
  - Patients keep a log of fasting and postprandial blood glucose values for one week.

        - Those who are able to maintain target glucose values of < 90 mg/dL fasting and <120 mg/dL at 2 hours postprandial meet criteria for GDMA1, and may return for CNM care.
- Return to CNM Care:
    - Patients who return to CNM care from MFM with diagnosis of GDMA1 will be informed that they must bring their glucose meter to each visit by the diabetic educator.
    - The CNM will complete the record of patient glucose levels in the log provided in the clinic. The MA will put a sticker on this paper which will be scanned into the medical record after the visit.
    - The CNM will review all values and will return patient to MFM with more than 10% of unexplained elevated values, or if any concern for elevated values.
        - The ideal fasting glucose before breakfast is 60-90 mg/dL. The cutoff is $\leq$ 95 mg/dL. The 2 hour postprandial cutoff value for breakfast, lunch and dinner is $\leq$ 120 mg/dL.
- Ultrasound/Fetal Testing:
    - MFM will often schedule q 4 week US for growth.
        - Referral back to MFM for consultation is indicated if AC $\geq$75%.
    - Per ACOG, it is reasonable for clinicians to assess fetal growth by ultrasonography or by clinical examination late in the third trimester to attempt to identify macrosomia among women with GDM.
    - Per ACOG guideline, antepartum fetal testing may not be necessary in women with GDMA1 before 40 weeks but specific testing and frequency may be chosen according to local practice.
- Delivery/Induction:
    - According to ACOG, delivery of women with GDMA1 should not be before 39 weeks unless otherwise indicated and expectant management to 40 6/7 weeks with antenatal testing as indicated is appropriate.
    - If the patient needs to be induced for other reasons (for example, “postdates” or more accurately, late post term pregnancy, this should be as close to 40-41 weeks as possible (not after).

INTRAPARTUM RECOMMENDATIONS:

- It is not necessary to check blood glucose levels on L+D or immediate postpartum.
- For reference, intrapartum management of GDM is aimed at maintaining normoglycemia (plasma level 70-100 mg/dL).

POSTPARTUM RECOMMENDATIONS:

- It is not necessary to check blood glucose levels on PP unit.
- Encourage breastfeeding.
    - Breastfeeding reduces risk of type 2 diabetes in mother and baby whether delivered vaginally or by C-section.
    - Breastfeeding early (in 1st ½ hour of life) and often (10-12 times in 24 hours) can reduce risk of hypoglycemia in newborn.
- Screening postpartum:
    - At 4-12 weeks postpartum all diabetics should have a 2 hour 75 gm GTT. (This test is a more definitive test than the fasting plasma glucose in diagnosing Type 2 diabetes in women with history of GDM).
        - Fasting plasma glucose <100 mg/dL or 2 hour glucose <140 mg/dL or less = normal value

        - Fasting plasma glucose 100-125 mg/dL t2 hour glucose 140-199 mg/dL = Impaired Fasting Glucose or Impaired Glucose Tolerance
        - Fasting plasma glucose >125 mg/dL or > 199mg/DL = diagnosis of Diabetes Mellitus
    - Alternative postpartum screening:
        - FBS
            - FBS <110 = Normal
            - FBS 110-125 = Impaired Fasting Glucose
            - FBS≥ 126 = Diagnostic for Diabetes
        - Hgb A1C at 3 months postpartum.
            - 4-5.6% = Normal
            - 5.7-6.4% = Pre-diabetes
            - 6.5% or greater = Diabetes Mellitus
- Interpretation of screening results:
    - If postpartum screening is normal, repeat testing (FBS or Hgb A1C) every three years.
    - If Impaired Fasting Glucose (IFG) or Impaired Glucose Tolerance (IGT) is diagnosed, refer to primary care for management.
        - Treatments include lifestyle change (consultation with registered dietician, encouragement of activity) and metformin if combined IFG and IGT as well as increased surveillance of glycemic status.
- Preconceptual counseling (planning for future pregnancies):
    - Encourage glucose screen before conceiving again.
    - Recommended to wait 2 years for next conception after pregnancy complicated by GDM.
    - Encourage to continue to apply learned dietary changes, good exercise habits and healthy coping.
        - Depression and stress lead to cortisol release which results in insulin resistance.

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Hawkins, J. & Wing, D. (2012). Abnormal Glucose Metabolism: Diagnosis and management in the ambulatory setting. *Clin Obsete Gynaecol*, 55 (3) 731-743.

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HYPERTENSION IN PREGNANCY

DEFINITIONS

Chronic Hypertension

-Systolic BP ≥140 mmHg &/or diastolic ≥90 mmHg on at least 2 different occasions 4 hrs apart, detected <20wks of pregnancy or persisting >12 weeks PP
-May be normotensive when first starts PN care due to physiologic decrease in BP

Gestational Hypertension

At least 2 increased BPs more than 4 hrs apart w/ systolic ≥140 mmHg &/or diastolic ≥90 mmHg in a previously normotensive pregnant woman who is ≥ 20w gestation & has no proteinuria (24 hr urine <0.3 g)

Pre-eclampsia w/out Severe Features (SF)

BPs	Systolic BP ≥140 mmHg or diastolic ≥90 mmHg on 2 occasions at least 4 hrs apart after 20w gestation in a previously normotensive pregnant woman.
And	
Proteinuria	≥300 mg in 24 hr urine protein or p/c ratio ≥0.3 urine dip protein 1+ (30 mg/dl; only used if other quantitative methods not available)

Preeclampsia w/ Severe Features (SF)

Same as preeclampsia, except one of following must be present (proteinuria not required):
Systolic BP ≥160 mm Hg or diastolic BP ≥110 mmHg on 2 occasions at least 15 min apart
Thrombocytopenia (platelets <100,000 uL)
Impaired liver function dx by abnormal elevated liver enzymes, severe persistent RUQ or epigastric pain unresolved by medication & not accounted for by alternative dx
Progressive renal insufficiency (serum creatinine concentration > 1.1 mg/dL or 2x serum creatinine concentration in absence of other renal disease)
Pulmonary edema
New-onset cerebral or visual disturbances

HELLP Syndrome

-Hemolysis/thrombolysis (serum bili >1.2 mg/dL LDH >600 u/L) Elevated liver enzymes (AST & ALT), Low platelets
-Occurs <1% pregnancies
-12-18% of cases are normotensive & 13% cases w/out proteinuria
-Most common complaints are RUQ pain, epigastric pain, N/V

ANTEPARTUM ASSESSMENT & MANAGEMENT

Chronic Hypertension

Management

Refer pt. to MDs for care if not stable or using antihypertensive medications

Gestational Hypertension

Morbidity

About 50% of women dx w/ GHTN between 24-35w develop preeclampsia

Assessment

Consider the following:

- Fetal movement
- PE: facial edema (not diagnostic), rapid wt gain (>5 lbs/week, 3rd trim- not diagnostic), liver enlargement &/or abdominal tenderness
- Increased BPs
- PIH panel labs
- Persistent urine dip protein ≥ 1+ (30 mg/dl), 24 hr urine protein (p/c ratio may be used, 24 hr urine preferred)
- Fetal assessment: BPP, AFI; consider assessing for IUGR

Management

Pt. education: preeclampsia S/Sx, daily fetal movement monitoring, PTL S/Sx, vaginal bleeding.

Mild range BPs outpatient management include:

- Weekly PN visit w/ BP checks & urine dip
- Weekly fetal testing w/ NST & AFI (BPP for nonreactive NST)
- Fetal growth scans q3-4w
- Repeat PIH panel labs & 24 hr urine if worsening BPs, new onset preeclampsia signs/symptoms, and/or persistent urine protein 1+ (30 mg/dl) on dip.

-Consult MD for plan of care or at CNM discretion.
-Recommend IOL ≥37w gestation when considering: severity of HTN, presence of other risk factors for adverse pregnancy outcome, past OB history, increasing BP over time.

Moderate range BPs (persistent systolic 150-159 mmHg or diastolic 100-109 mmHg): Consult MD for plan of care or at CNM discretion.

Severe range BPs (systolic ≥160 mmHg or diastolic ≥110 mmHg): transfer of care to MD.

Preeclampsia w/out SF

Risk Factors

- Personal &/or family h/o of preeclampsia (1st degree relative)
- Nulliparity
- AMA ≥ 40 y/o

- Multiple gestation
- History of preeclampsia in past pregnancy(ies)
- Chronic HTN and/or renal disease
- SLE
- Antiphospholipid syndrome
- Elevated BMI
- Preexisting diabetes mellitus.

Morbidity

Increased risk for placental abruption, IUGR, PTB, strokes, seizures, DIC, end organs involvement (kidney, liver), maternal/fetal demise.

Assessment

Consider the following:

- Personal &/or family history
- Fetal movement
- PE: facial edema (not diagnostic), rapid wt gain (>5 lbs/week, 3rd trim- not diagnostic), liver enlargement &/or abdominal tenderness
- Increased BPs
- PIH panel labs
- Persistent urine dip protein ≥ 1+ (30 mg/dl), 24 hr urine protein (p/c ratio may be used, 24 hr urine preferred)
- Fetal assessment: BPP, AFI; consider assessing for IUGR

Management

-Pt. education: preeclampsia S/Sx, daily fetal movement monitoring, PTL S/Sx, vaginal bleeding.
-Outpatient management include: biweekly BP w/ urine dip, PIH panel labs, biweekly NST, weekly AFI or BPP, growth u/s q3 weeks.
-Consult MD for plan of care or at CNM discretion.
-Recommend IOL ≥37w gestation.

Prevention

- USPSTF recommends use of daily low dose aspirin 81 mg as preventive medicine starting between 12-28wks gestation in women who are at high risk for developing preeclampsia.
- Pregnant women are at high risk for preeclampsia if they have 1 or more of the following risk factors: history of preeclampsia (including early-onset preeclampsia), especially if history of being with SF, IUGR, or PTB; multiple gestation; chronic hypertension; Type 1 or 2 diabetes; renal disease; autoimmune disease (i.e., systemic lupus erythematosus, antiphospholipid syndrome).
- No evidence found when to stop aspirin use, consult at CNM discretion.
- ASA use has not been shown to increase occurrence of abruption, PP hemorrhage, fetal intracranial bleeding & congenital anomalies.

Preeclampsia w/ SF

Morbidity

May increase risks for pulmonary edema, myocardial infarction, stroke, acute respiratory distress syndrome, coagulopathy, severe renal failure, retinal injury.

Management
-Transfer of care to MD.
-Educate pt that OBs may recommend IOL ≥34w gestation.
-OBs will recommend MgSO4 to decrease risk of seizures in women w/ preeclampsia & decreases risk of recurrent seizures. Slows neuromuscular conduction & depresses CNS irritability.

Patients with h/o pre-eclampsia w/ SF
Management
-Consider drawing baseline PIH labs (including 24 hr urine), no clear evidence in timing.
-Consider daily low dose aspirin 81 mg as preventive medicine starting between 12-28wks gestation.

Patients with h/o PTB secondary to pre-eclampsia w/ SF
Management
-Consider one time MFM consultation.
-Consider drawing baseline PIH labs (including 24 hr urine), no clear evidence in timing.
-Consider daily low dose aspirin 81 mg as preventive medicine starting between 12-28wks gestation.

INTRAPARTUM/POSTPARTUM MANAGEMENT

Inpatient Management

Consider the following:

- No clear evidence on when to repeat PIH bloodwork inpatient. Some practitioners repeat labs q6-12 hrs if continued elevated BPs, while others repeat PIH bloodwork only if patient has a severe range BP
- BP q1 hr, continuous monitoring of FHTs
- Consult at CNM discretion
- Consult or consider transfer to MD care for severe range BP x2, worsening labs, or symptomatic
- Labs: CBC, LFTs (ALT/AST), coag studies if platelets <50,000 or active bleeding (PT, PTT, and fibrinogen), UA, p/c ratio

Management of Eclamptic Seizure

-Alert OB and Anesthesia team (anesthesiologist will maintain airway)
-Protect airway, administer oxygen, suction mouth
-Position left lateral
-OBs generally order administration of 4-6 gram loading dose of magnesium sulfate, then 2 gram/hr
-OB may consider Ativan 4 mg if status epilepticus persists
-FHTs: likely bradycardic during seizure
-Pt. stabilized before C/S considered

Postpartum Management

Consider the following:

- No clear evidence on BP monitoring PP inpatient.
- Suggested monitoring BPs q8 hrs for pt. dx w/ GHTN.
- Suggested monitoring BPs q4 hrs while awake for pt. diagnosed w/ pre-eclampsia w/out SF. Can decrease to q8 hrs if all BPs are <140/90 in a 24 hr period.
- Repeat PIH labs if BP remains elevated (greater than 140 systolic or 90 diastolic) in PP period or pt. symptomatic.
- Consult MD if pt. has >1 BP >150/100 in a 24 hr period (threshold to initiate antihypertensives post-delivery), severe range BP, abnormal labs or pt. symptomatic.
- Recommend 48 to 72 hours inpatient PP BP monitoring; if patient strongly desires discharge on day 2, outpatient BP check(s) on day 3 for pre-eclampsia w/out SF. For those with GHTN consider outpatient BP check on day 3; can consider in one week instead depending on clinical situation, especially if normotensive in postpartum period
- 2w PP f/u w/ CNM appropriate for GHTN or preeclampsia w/out SF.
- 1w PP f/u w/ MD's if preeclampsia w/ SF.
- Pt. education: return to OBT for preeclampsia symptoms.

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Updated: July 2017

PRELABOR RUPTURE OF MEMBRANES AT TERM

Background:

- When membranes rupture at term before the onset of labor, approximately 77–79% of women will go into labor spontaneously within 12 hours, and 95% will start labor within 24–28 hours.
- Studies (TERMPROM etc.) have shown that the risks of expectant management include higher rates of NICU admissions, and higher diagnosis of intra-amniotic infection and/or inflammation (Triple I).
  - These results have been called into question because women in these studies received serial vaginal exams including an admit exam, expectant management was done for up to 4 days, GBS status was unknown and hence not treated, and the criteria for the diagnosis of Triple I was variable and often not in line with today's standards.
  - In these same studies, although the rates of diagnosed Triple I were higher, the rates of neonatal infection were the same for induction vs. expectantly managed patients.

Recommendations:

- Women should receive counseling and informed consent about the benefits and risks of expectant management vs. induction of labor in the case of prelabor rupture of membranes at term. Both are reasonable options since they result in similar rates of neonatal infection and cesarean birth.
- **GBS positive:** Administration of GBS antibiotic prophylaxis should not be delayed while awaiting labor. In such cases, many providers prefer induction although expectant management is an option for informed women.
- **Meconium:** Lightly stained meconium fluid is not a strong contraindications for expectant management if FHTs are reassuring. Meconium is associated with increased risk of Triple I, meconium aspiration syndrome, and non-reassuring FHR patterns, but there is no evidence that immediate induction reduces the risk of these complications.
- **Induction agents:** Studies have not demonstrated a benefit to cervical ripening agents with PROM, but only a few small trials involved women with unfavorable cervixes. It is possible that women with PROM will receive some benefit from miso for cervical ripening as it does benefit women being induced without PROM. One large randomized trial found an increased rate of Triple I with the use of Foley catheters for cervical ripening. Pitocin is the most widely used induction agent in the setting of PROM.

Education:

Expectant management

Benefits:

- Labor may start on its own
- Spontaneous labor, once it starts, tends to be shorter than induced labor
- Intermittent monitoring is an option if FHTs are reassuring at less than 41 wks

Risks/Drawbacks:

- Risk of uterine infection may increase with time
- If mother is diagnosed with Triple I, her baby will get a blood draw, may receive antibiotics, and will likely stay 48 hours or longer in the hospital

Induction of labor

Benefits:

- Durations from rupture of membranes to birth will be shorter
- No increase in cesarean rates

Risks/Drawbacks:

- Continuous monitoring is required with use of Pitocin
- Tachysystole can occur with induction agents

References:

ACNM Position Statement 2012: Premature Rupture of Membranes at Term

ACOG Committee Opinion: Approaches to Limit Intervention during Labor & Birth. Feb 2017

Cochrane Database: Planned Early Birth vs Expectant Management for prelabor rupture of membranes at term. Jan 2017

Morzurkewich (2009) "Systematic review of indications for induction of labor, a best evidence review"

Scorza W, Lockwood C, Barss V. "Management of premature rupture of the fetal membranes at term", UpToDate, Literature review current through: Jan 2018.

Recommended Management
Prelabor Rupture of Membranes at Term (≥ 37 weeks)

Data Collection

- ❑ Confirm rupture of membranes (with speculum SROM exam assessing nitrazine, ferning, and pooling) unless gross rupture is evident
- ❑ Time of rupture
- ❑ Color of amniotic fluid
- ❑ EDD
- ❑ Presentation/engagement with ultrasound
- ❑ Assess for signs of Triple I (fever, tender abdomen, foul smelling fluid, fetal or maternal tachycardia)
- ❑ GBS status
- ❑ HIV, HBsAg, HCAb status (if done)

Considerations for Expectant Management vs. Induction

- ❑ No signs of infection
- ❑ Fetal status reassuring
- ❑ Maternal status reassuring
- ❑ Hepatitis B, Hepatitis C, and HIV all negative (if done)

If above 4 criteria are all satisfied, then counsel the patient on the benefits and risks of expectant management vs. induction to assist her in choosing. If criteria are not satisfied, then proceed with induction.

Expectant Management at home or in the hospital

Some patients who are candidates for and choose expectant management may prefer to wait for labor at home. **If these patients meet the following additional criteria they have the option to go home:**

- ❑ GBS negative this pregnancy and no history of invasive neonatal GBS disease in past pregnancies
- ❑ Patient understands and has been given the PROM info handout
- ❑ Patient has had regular prenatal care
- ❑ No barriers to communication
- ❑ Patient has a place to go that is safe and comfortable, and patient has a working telephone
- ❑ There is someone who will be with the patient and transportation is available
- ❑ Patient has a thermometer and knows how to use it
- ❑ Patient agrees to return to the hospital at the agreed upon time
- ❑ Patient evidences understanding of risks, danger signs, and her responsibilities

(Thank you to the USCF midwives for allowing us to modify their handouts.)

After Your Bag of Water is Leaking

Sometimes, the bag of water that surrounds the baby will break or open, and water will leak out of your vagina. Most women go into labor within 24 hours of the bag of water opening.

You and your midwife have decided that it is safe to wait for labor to start at home. There may be a higher chance of infection in your uterus if your bag of water is leaking for more than 24 hours and you have not gone into labor.

It is very important that you return to the hospital at or before the time noted below, and follow these instructions carefully:

- Do not put anything in your vagina, (no fingers, toilet paper, or tampons)
- Do not have intercourse (sex)
- Take your temperature every four hours
- If you feel chills or feverish or your temperature is over 100^{O} F or 37.6C, you must come to the hospital **IMMEDIATELY**

Also come to the hospital if:

• Your baby moves less than 10 times in two hours

• You have vaginal bleeding like a period; bloody mucous is normal

• The water coming from your vagina turns green or yellow

• You have *strong* contractions every 3-5 minutes for an hour

Drink water and juice!
Your body needs energy.
Eat if you are hungry.

Call UNM OB Triage at 272-2460 if you have any questions.

You must return to the hospital at or before _____

Updated: June 2018

THYROID DISORDERS

Overt hypothyroidism (Elevated TSH, reduced Free T4)

- Prevalence in pregnancy: 0.3 to 0.5 %
- These women have a higher rate of infertility and 1st trimester SAB
- Other risks of untreated overt hypothyroidism in continuing pregnancies: preeclampsia and gestational HTN, Placental abruption, non-reassuring FHT, PPH, PTD, low birth weight, increased rate of cesarean section, fetal cognitive impairment

Subclinical hypothyroidism (Elevated TSH, normal Free T4)

- Prevalence in pregnancy: 2-5%
- Lower risk than with overt hypothyroidism, but still associated with GHTN, PTD, or pregnancy loss; questionable fetal cognitive impairment
- Obtain Thyroid Peroxidase (TPO) antibody (31% have positive TPO) – useful in making treatment decisions in women with borderline TSH (>2.5-4) and in predicting PP thyroid dysfunction
  - If TPO positive, consider MD consult for plan of care
  - If TPO negative, recommendations mixed (Endocrine Society recommends treatment, ATA does not)

Clinical Manifestations: fatigue, cold intolerance, constipation, and weight gain. Many patients are asymptomatic.

Diagnosis: is based on the finding of an elevated TSH concentration, using **trimester-specific** reference ranges for pregnant women:

SERUM	1st Trimester	2nd	3rd
TSH (mU/L)	0.1-2.5	0.2-3.0	0.3-3.0
FT4 (ng/dl)	0.86-1.77	0.63-1.29	0.66-1.12

Screening:

There is insufficient evidence to support universal screening in pregnancy. The ATA recommends measurement of serum TSH in pregnant women in the following cases:

- Age >30 years
- Family history of thyroid disease
- Women with a goiter, known TPO antibody, or currently on thyroxine replacement
- Women with clinical signs or symptoms of thyroid dysfunction
- Women with Type 1 DM, or other autoimmune disorders
- Women with infertility
- Women with prior history of miscarriage or preterm delivery
- Women with prior thyroid surgery or head/neck irradiation
- BMI>40
- Women from an area with an iodine insufficiency

Treatment:

- Per CNM Guidelines, women newly diagnosed with overt hypothyroidism should have an MD visit for consultation and initiation of plan of care
- Synthetic T4 (Levothyroxine) is the treatment of choice

- Recommended dosage to start: 50 mcg/day, check TSH after 4 weeks of treatment
- Goal of treatment is to get TSH into trimester-specific range as rapidly as possible; once in treatment range, check TSH once per trimester
- If the TSH remains above the normal trimester-specific reference range, the dose can be increased by 12 to 25 mcg/day.

- Women under treatment for **preexisting hypothyroidism** should be counseled to contact a provider upon positive pregnancy test to check TSH level
  - Counsel to contact provider upon positive pregnancy test
  - May need to increase T4 dose up to 30% due to extra metabolic demands as soon as 4-6 weeks in pregnancy
  - May choose to take 9 tablets per week instead of 7 tablets per week until get their TSH checked
  - Alternatively, may check TSH as soon as they confirm pregnancy, check TSH 4 weeks later, and 4 weeks after any dose change

Postpartum care:

- Overt hypothyroidism: D/C treatment may lead to breast milk reduction
- Subclinical hypothyroidism: not always necessary to continue treatment unless another pregnancy imminent (75% normal function at 5 yrs PP)
- Pre-existing hypothyroidism: may decrease to pre-pregnant dose after delivery and check TSH 4-6 weeks PP

Postpartum thyroiditis:

- Postpartum thyroiditis is a destructive thyroiditis induced by an autoimmune mechanism within one year after parturition.
- It may also occur after pregnancy loss or abortion.
- It usually presents in one of three ways:
  - Transient hyperthyroidism alone
  - Transient hypothyroidism alone
  - Transient hyperthyroidism followed by hypothyroidism and then recovery
- Risk factors: Type 1 DM, Prior history of PPT, +TPO Ab with normal thyroid function during pregnancy
- Women at high risk for developing PPT should have a TSH measurement at 6 to 12 weeks postpartum
- The majority of women either in the hypothyroid phase or hyperthyroid phase need no treatment. However, TSH, FT4, (FT3 if hyperthyroid) should be monitored q 4-8 wks to confirm resolution

References:

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Updated: October 2017

TRIAL OF LABOR AFTER CESAREAN (TOLAC)

CANDIDATES:

- Low transverse uterine scar
- Low vertical uterine incision (with MD evaluation and consult)
- No gross pelvic abnormalities
- No other uterine scars or previous rupture
- Undocumented uterine scar and C/S did not involve:
  - Transverse lie at term
  - <30 week gestation
  - Previa
  - Pt told she should never attempt vaginal birth
- A woman with 2 previous C/Ss may be a candidate for TOLAC
  - Studies in women with more than one cesarean delivery have reported a risk of uterine rupture between 0.9% and 3.7%, but have not reached consistent conclusions regarding how this risk compares with women with only one prior uterine incision
    - 4-year observational NICHHD MFM study (19 centers with N=45,988)
      - 0.9% rupture rate if multiple cesareans (n=975) and 0.7% if 1 prior cesarean (*P*=0.37)
      - 66% successful VBAC with multiple prior vs. 74% with single prior
      - Maternal morbidity greater with multiple prior: transfusions (3.2% vs. 1.6%) and hysterectomy (0.6% vs. 0.2%)
  - The chance of achieving VBAC appears to be similar for women with one or more than one cesarean delivery.

CONTRAINDICTIONS:

- Previous classical uterine incision
- Vertical extension of a uterine incision into the contractile segment of the uterus
- High transverse incision into the contractile segment of the uterus
- Myomectomy that enters the uterine cavity
- 3 or more previous C/Ss

CONSIDERATIONS:

- If patient declines blood products TOLAC may not be recommended
- If patient desires repeat C/S, plan to schedule
- If C/S <6 months ago (*birth to conception time frame*) risk of rupture with VBAC increases (as well as maternal morbidity)
  - Rupture rate:
    <=12mos: 0.6%
    13-18mos: 0.5%
    19-24mos: 0.3%
    >=25mos: 0.2%

CLINICAL FACTORS ASSOCIATED WITH TOLAC SUCCESS

- Increased Probability of Success (Strong predictors)
  - Prior vaginal birth
  - Spontaneous labor

- Decreased Probability of Success (Other predictors)
  - Recurrent indication for initial cesarean delivery (labor dystocia)
  - Increased maternal age
  - Non-white ethnicity
  - Gestational age greater than 40 weeks
  - Maternal obesity
  - Preeclampsia
  - Short interpregnancy interval
  - Increased neonatal birth weight

AP MANAGEMENT:

- Obtain ultrasound before 20 weeks for dating and placental location if considering repeat C/S. If placenta is low anterior, needs repeat ultrasound to rule out accreta
- Try to obtain operative report to confirm indication for C/S and uterine scar
- Counseling should include risks and benefits including success rate and risk of rupture – use of TOLAC calculator can guide counseling, but realize there are limitations to these tools
  - Overall, for women with one low transverse C/S, the TOLAC success rate is 60 to 80 percent, with an estimated uterine rupture rate of 0.4 to 0.7 percent
  - Success rates are higher in patients with additional characteristics, such as a prior vaginal delivery, non-recurrent indication for C/S, and spontaneous labor
- Counsel patient and write TOLAC note (TOLAC note template available in PCO)
  - Predicted success rate
    - Overall 60-80% of women have successful VBAC
    - 80% with prior vaginal birth and/or with non-recurring indications (breech, fetal distress, etc.)
    - 70% prior to complete dilatation
    - 13% after complete dilatation
  - Risk of rupture (0.5% or 1/2000)
- Have patient read and sign TOLAC consent form
- If patient has had a history of 2 C/S *or* complex issues with 1 C/S, pt is required to have TOLAC counseling done by MD with C/S privileges (okay to be done with upper level resident) – preferably counseling to be done before or in early third trimester

IP MANAGEMENT:

- Reconfirm desire for TOLAC and document TOLAC counseling note. Reassess new developments that may influence the likelihood of success, i.e., induction with Bishops of 0 at 42 weeks or 4500 gm infant. Re-counsel and document in note.
- Consider IV on admission (saline lock okay)
- Identify TOLAC status on labor board and notify attending physician
  - For women with 2 prior C/S, note that documents co-management plan of pt must be written at admission by OB attending or upper level resident
- Continuous electronic monitoring in active labor.
  - Consider FSE if unacceptable FHR tracing.
  - Consider IUPC if Pitocin used.
- Induction/Augmentation

- Use slow pit per protocol, if indicated, but remember that VBAC more often successful with spontaneous labor (10% less likelihood of VBAC with Pitocin)
  - Rupture rate comparison for IOL vs spontaneous labor:
    - Spontaneous labor: 0.5-0.7%
    - IOL (any GA): 1%
    - IOL (at term): 1.5%
- Cook catheter or Foley are generally regarded as safe methods for induction
- Misoprostol/prostaglandins are contraindicated
- Lack of data on IOL for women who have history of 2 prior C/S attempting TOLAC

- All forms of pain relief (NCB, IV meds, nitrous, epidural) are acceptable
- Non-reassuring FHR with decels and bradycardia may indicate uterine rupture. Other possible signs are abdominal/uterine pain, loss of station, vaginal bleeding, signs of hypovolemia

References:

ACNM. Care for Women Desiring Vaginal Birth After Cesarean. Journal of Midwifery and Women's Health. Volume 56, Issue 5, September/October 2011, Pages: 517–525.

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Metz TD, Berghella V, Barss VA. Use of calculators and models for predicting vaginal birth after a previous cesarean delivery. UpToDate. Updated: Aug 26, 2016.

Wells CE, Cunningham FG, Berghella V, Barss VA. Choosing the route of delivery after cesarean birth. UpToDate. Updated Aug 04, 2017.

ULTRASOUND AND DATING

Error Factor for Menstrual Age Dating: The 8% Factor
Example: 19wks 4days: 19x7 = 133+4 = 137 --> 137x0.08 = +/-10.96 days

1 wk	+/-	0.56 days
2 wks	+/-	1.12 days
3 wks	+/-	1.68 days
4 wks	+/-	2.24 days
5 wks	+/-	2.80 days
6 wks	+/-	3.36 days
7 wks	+/-	4.41 days
8 wks	+/-	4.48 days
9 wks	+/-	5.04 days
10 wks	+/-	5.60 days
11 wks	+/-	6.16 days
12 wks	+/-	6.70 days
13 wks	+/-	7.28 days
14 wks	+/-	7.48 days
15 wks	+/-	8.40 days
16 wks	+/-	8.96 days
17 wks	+/-	9.52 days
18 wks	+/-	10.08 days
19 wks	+/-	10.64 days
20 wks	+/-	11.20 days
21 wks	+/-	11.76 days
22 wks	+/-	12.32 days
23 wks	+/-	12.88 days
24 wks	+/-	13.44 days
25 wks	+/-	14.00 days
26 wks	+/-	14.56 days
27 wks	+/-	15.12 days
28 wks	+/-	15.60 days
29 wks	+/-	16.24 days
30 wks	+/-	16.80 days
31 wks	+/-	17.36 days
32 wks	+/-	17.92 days
33 wks	+/-	18.48 days
34 wks	+/-	19.04 days
35 wks	+/-	19.60 days
36 wks	+/-	20.16 days
37 wks	+/-	20.72 days
38 wks	+/-	21.28 days
39 wks	+/-	21.84 days
40 wks	+/-	22.40 days

Updated: September 2017

UPPER RESPIRATORY INFECTIONS, ETC

Common Cold

- Rhinitis, nasal congestion, sore throat, cough, sneezing, headache, and malaise
- Fever uncommon
- Lungs clear
- Usually lasts 3-10 days (sometimes longer in pregnant women ~14d)
- <2% go on to have secondary sinus infection

Treatment:

1) Herbal:
- Increase intake of Vitamin C, elderberry, fruits, juices, EmergenC, Vicks, Humidifier

2) OTC
- Cough Drops (Cepacol okay)
- Tylenol 650-1,000mg PO q6 hours PRN (not to exceed 4,000mg/24hrs)
- Dextromethorphan
- Guaifenesin
- Nasal Cromolyn Sodium (NasalCrom) 1 spray each nostril 3-4x day up to 2 weeks

3) RX:
- Atrovent (Nasal Ipratropium) 0.06% solution 2 sprays each nostril TID, not to exceed 4 days

Bronchitis:

- Cough w/ sputum production (50% have purulent sputum)
  - Sputum discoloration and purulence does not always mean bacterial infection
- Consider as diagnosis if persistent cough >5 days
- 90% caused by Virus
- Consider Pertussis if prolonged cough (>2 weeks), vomiting after cough, coughing spells, inspiratory whoop

Treatment:
- Same as common cold; antibiotic therapy not beneficial
- Tesslon Perles (Benzonatate) 100-200mg TID PRN for cough (Pregnancy Cat C, animal studies have not been conducted, info limited in pregnancy)
- Guaifenesin 100mg/Codeine 6.33mg per 5ml -> 10-15mL q4-6hrs

Sinusitis:

- Persistent symptoms of acute runny nose, stuffy nose, and nasal inflammation lasting >10 days
- Fever >39 C, purulent nasal discharge, facial pain lasting 3-4 days

Treatment:
- Amoxicillin 500mg PO TID or 875mg PO BID 5-7 days
- Amoxicillin-Clavulanate 500mg/125mg PO TID or 875mg/125mg PO BID 5-7 days
- PCN allergy: Cefixime 400mg PO daily 5-7 days

Influenza:

- Recommend seasonal flu vaccine in any trimester of pregnancy
- Fever (>37.8 C), cough, running nose, sore throat, headache, SOB, body aches, fatigue, diarrhea, vomiting
- If no fever but ***abrupt*** onset of symptoms -> test for flu
- Pregnant women more likely to have severe clinical course; increases risk of SAB, PRB, LBW or SGA infant, and fetal demise

Treatment:

- Treating within 48 hours of symptoms is ideal
  - Oseltamivir (Tamiflu) 75mg PO once daily up to 10 days
  - Zanamivir 10mg (2 inhalations) daily x 5 days
  - Peramivir 600mg IV over 15-30mins single dose
- **If patient has had close contact with individual with confirmed +flu, then post-exposure chemoprophylaxis for all pregnant women ***and*** postpartum women (up to 2 weeks after delivery) is recommended

Pneumonia:

- Incidence 0.2 to 8.5 per 1,000 deliveries
- Risk factors; anemia, smoking, asthma, substance use disorder, immunosuppressive conditions/therapy
- Subjective: shivering/shaking, chest pain, SOB, cough w/ productive purulent sputum
- Objective: tachypnea, tachycardia, decreased O2 saturation, fever, rales, decreased lung sounds

Treatment:

- Transfer to OB for treatment

Strep Throat

- Most commonly caused by Group A Streptococcus (GAS)
- Sore throat worsens with swallowing, neck pain or swelling, fever, edema, white patchy tonsil exudates, tender lymphadenopathy; may see strawberry tongue
- Test with rapid Strep, follow-up culture is not needed
- Use Centor Criteria:

Centor criteria:
Tonsillar exudates
Tender anterior cervical lymphadenopathy
Fever
Absence of cough

One point is given for each criterion. The likelihood of GAS pharyngitis increases as total points rise. Patients with <3 points are unlikely to have GAS pharyngitis and generally do not require testing or treatment. Patients with a score ≥3 may benefit from testing.

Treatment:

- Penicillin V 500mg BID x 10 days
- PCN allergic: Cephalexin 500 mg orally twice daily for 10 days OR Azithromycin 500mg PO qday x 3 days

<u>Conjunctivitis</u>
Noninfectious Allergic:

Treatment:

- Antihistamines safe in pregnancy (Claritin, Benadryl, Zrytec)

If symptoms do not resolve may try:

- Cromolyn Sodium eye drops 1 to 2 drops per eye up to 4x daily for 1-2 weeks. May take the 1-2 week duration to be effective.

Infectious Bacteria:

- Usually caused by *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis*. *S. aureus* infection
- There is also Chlamydial and Gonorrhea conjunctivitis

Treatment:

- Erythromycin ophthalmic ointment 0.5 inch (1.25 cm) of ointment deposited inside the lower lid for 5-7 days
- Trimethoprim-polymyxin B drops 1 to 2 drops instilled 4x daily for 5-7 days

<u>Otitis Media (Ear Infection)</u>

- Classified as a middle ear fluid and inflammation of the middle ear space, fluid retention, erythema, purulent appearing ear drum and/or a ruptured tympanic membrane

Treatment:

- Amoxicillin-clavulanate 875 mg/125 mg orally twice daily for 5-7 days

References:

ACOG Committee Opinion No. 732: Influenza Vaccination During Pregnancy. Obstet Gynecol 2018; 131:e109.

ACOG Committee Opinion No. 753: Assessment and Treatment of Pregnant Women With Suspected or Confirmed Influenza. Obstet Gynecol 2018; 132:e169.

Charles J Limb, MD Lawrence, R Lustig, MD, Marlene L Durand, MD. Otitis Media in Adults. In: UpToDate, Post, TW (Ed), UpToDate, Waltham, MA, 2018.

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Thomas M. File Jr. MD. Acute Bronchitis. In: UpToDate, Post, TW (Ed), UpToDate, Waltham, MA, 2018

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URINARY TRACT INFECTION

Infection	Signs/Symptoms	Risks	Screening	Treatment (May individualize)	Follow-up
Asymptomatic bacteriuria (ASB)	Usually asymptomatic +Bacteriuria ($\geq 10^5$ colony forming units/mL)	4-7% Increased risk UTI/Pyelo if untreated	Early pregnancy recommended	ABX 3-7d	TOC >1 wk after treatment complete
Acute cystitis or Symptomatic bacteriuria	Dysuria Urgency Frequency Pubic pain Hematuria	Varies	Collect PRN or based on HX	ABX 5-7d May initiate treatment based on symptoms before culture back	Periodic screening suggested-optimal timing unclear Consider prophylaxis if 2 UTI or worrisome HX and rescreen in 3rd trimester
Pyelonephritis	May have UTI symptoms and: • Fever (> 38°C) • CVAT/ flank pain • Nausea • Vomiting	1-2% Maternal sepsis PTD LBW ARDS	Consider regular screening throughout PG if +HX	Consult with OB Team May require admission IV ABX	Strongly consider prophylaxis Preventing recurrence options include: • Nitrofurantoin 50-100mg q HS Or • Cephalexin 250-500 mg q HS
Recurrent UTI			Assess history		May consider post-coital prophylaxis or prophylaxis described above or close monitoring
GBS		2-7%		Can consider treatment for 3-7/d if symptomatic or high colony count. Amoxicillin or PCN Cephalexin (avoid in severe PCN allergy)	Counsel Pt of +GBS and treat IP

Prevention Strategies:

- Educate
- Counsel about risk factors:
  - Avoid spermicides
  - consider post-coital prophylaxis in women with recurrent UTI appear r/t intercourse

Treatment options:

Individualize as necessary (consider symptoms, colony count, allergies, cost, etc.…)

ASB	**Acute Cystitis**	**Comments**
Amoxicillin 500mg q 8-12/hr x 3-7 d	***Amoxicillin*** 500mg q 8-12/hr x 7 d	Cat B Resistance not uncommon
Cephalexin 500mg q 12/6hr x 3-7d	***Cephalexin*** 500mg q 12/6hr x 7d	Cat B Some resistance
Nitrofurantoin 100mg q 12/hr x 5-7/d	***Nitrofurantoin*** 100mg q 12/hr x 5-7/d	Cat B Avoid 1st/3rd tri -Unless no other options (?teratogenic risk/ risk hemolytic anemia if G6PD deficiency) Avoid if suspect pyelo
Amoxicillin-clavulanate 500 mg q 8 hr 3-7/d 875 mg q 12 hr	***Amoxicillin-clavulanate*** 500 mg q 8 hr 3-7/d 875 mg orally every 12 hours	Cat B
Trimethoprim-sulfamethoxazole 800/160 mg bid x 3d	***Trimethoprim-sulfamethoxazole*** 800/160 mg bid x 3d	Cat C Avoid 1st tri and term (Folic acid antagonist, ?risk birth defects, ?risk kernicterus)
Fosfomycin 3 g orally as single dose	***Fosfomycin*** 3 g orally as single dose	Cat B Avoid if suspect pyelo Well tolerated

References:

https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/asymptomatic-bacteriuria-in-adults-screening

Prevention of Perinatal Group B Streptococcal Disease Revised Guidelines from CDC, 2010. (2010). MMWR Recommendations & Reports, 59(RR-10), 1-31.

Schneeberger C, Geerlings SE, Middleton P, Crowther CA. Interventions for preventing recurrent urinary tract infection during pregnancy. Cochrane Database of Systematic Reviews 2015, Issue 7. Art. No.: CD009279.

Jepson RG, Williams G, Craig JC. Cranberries for preventing urinary tract infections. Cochrane Database of Systematic Reviews 2012, Issue 10.

Matuszkiewicz-Rowińska, J., Małyszko, J., & Wieliczko, M. (2015). Urinary tract infections in pregnancy: old and new unresolved diagnostic and therapeutic problems. Archives of Medical Science : AMS, 11(1), 67–77

American College of Obstetricians and Gynecologists. (2008). ACOG Practice Bulletin No. 91: Treatment of urinary tract infections in nonpregnant women. Obstetrics and Gynecology, 111(3), 785-94.

FETAL HEART RATE PATTERN CLASSIFICATION AND INTERPRETATION

Category	Interpretation	Features
I **Normal**	Tracings in this category are strongly predictive of normal acid-base status at the time of observation.	• Baseline rate 110 to 160 beats per minute • Baseline variability moderate • Late or variable decelerations absent • Early decelerations present or absent
II **Indeterminate**	Tracings in this category are not predictive of abnormal acid-base status, however there are insufficient data to classify them as either category I or category III.	All tracings not categorized as category I or III; may represent many tracings encountered in everyday clinical practice. Examples: • Minimal variability • Absent variability without recurrent decelerations • Marked variability • Absence of induced accelerations after fetal stimulation • Recurrent variable decelerations with minimal or moderate variability • Prolonged deceleration • Recurrent late decelerations with moderate variability • Variable decelerations with “slow return to baseline”, “overshoots” or “shoulders”
III **Abnormal**	Tracings in this category are predictive of abnormal acid-base status at the time of observation.	• Absent variability *and* any of the following: - Recurrent late decelerations - Recurrent variable decelerations - Bradycardia • Sinusoidal pattern

References:

Macones, G. A., Hankins, G. D. V., Spong, C. Y., Hauth, J., & Moore, T. (2008). The 2008, National Institute of Child Health and Human Development workshop report on electronic fetal monitoring.Obstetrics and Gynecology, 112(3), 661-666.;
NICHD Definitions and Classifications - National Certification, www.nccwebsite.org/.../docs/final_ncc_monograph_web-4-29-10.pd.

Updated: August 2017

NICHD definitions for EFM Terminology

TERM	DEFINITION
Baseline	Bradycardia = below 110 bpm Normal = 110 to 160 bpm Tachycardia = over 160 bpm The baseline rate is the mean bpm (rounded to 0 or 5) over a 10-minute interval, excluding periodic changes, periods of marked variability, and segments that differ by more than 25 bpm. The baseline must be identifiable for two minutes during the interval (but not necessarily a contiguous two minutes); otherwise, it is considered indeterminate.
Variability	Fluctuations in baseline that are irregular in amplitude and frequency Absent = amplitude undetectable Minimal = amplitude 0 to 5 bpm Moderate = amplitude 6 to 25 bpm Marked = amplitude over 25 bpm Measured in a 10-minute window. The amplitude is measured peak to trough. There is no distinction between short-term and long-term variability.
Acceleration	An abrupt* increase in the FHR. Before 32 wks of gestation, accelerations should last ≥10 sec and peak ≥10 bpm above baseline. As of 32 wks gestation, accelerations should last ≥15 sec and peak ≥15 bpm above baseline. A prolonged acceleration is ≥2 minutes but less than 10 minutes. An acceleration of 10 minutes or more is considered a change in baseline.
Early deceleration	A gradual decrease and return to baseline of the FHR associated with a uterine contraction. The nadir of the FHR and the peak of the contraction occur at the same time. The deceleration's onset, nadir, and termination are usually coincident with the onset, peak, and termination of the contraction.
Late deceleration	A gradual decrease and return to baseline of the FHR associated with a uterine contraction. The deceleration is delayed in timing, with the nadir of the deceleration occurring after the peak of the contraction. The onset, nadir, and recovery usually occur after the onset, peak, and termination of a contraction.
Variable deceleration	An abrupt decrease in FHR below the baseline. The decrease is ≥15 bpm, lasting ≥15 secs and <2 minutes from onset to return to baseline. The onset, depth, and duration of variable decelerations commonly vary with successive uterine contractions.
Prolonged deceleration	A decrease in FHR below the baseline of 15 bpm or more, lasting at least 2 minutes but <10 minutes from onset to return to baseline. A prolonged deceleration of 10 minutes or more is considered a change in baseline.
Sinusoidal pattern	Visually apparent, smooth, sine wave-like undulating pattern in FHR baseline with a cycle frequency of 3–5 per minute which persists for 20 minutes or more.

***"Gradual" and "abrupt" changes are defined as taking ≥30 seconds or ≤30 seconds, respectively, from the onset of the deceleration/acceleration to its nadir/peak.**

References:

Julian T JT Parer. The 2008 National Institute of Child Health and Human Development report on fetal heart rate monitoring. Obstetrics and Gynecology 114(1) Lippincott Williams & Wilkins, Inc. 2009 Updated: August 2017

INDUCTION OF LABOR

CONTRAINDICATIONS

- Placenta or vasa previa
- Non-cephalic presentation
- Prolapsed cord
- Active genital herpes
- Prior classical uterine incision

MEDICAL INDICATIONS

Include, but are not limited to:

- Late term IUP up to 41 weeks 6 days
- Non-reassuring fetal testing and / or oligohydramnios
- PROM
- Pre-eclampsia without severe features
- At CNM discretion, after consultation with OB service for any clinical indication for which the benefits of delivery outweigh the risks of induction, while remaining within the CNM scope of practice

ELECTIVE INDUCTION REQUIREMENTS

- At least 39 weeks gestation by reliable dating
- Bishop score: ≥ 5 for a multip / ≥7 for a nullip
- Adequate L&D staffing and CNM availability
- Note in Powerchart with a copy to the patient documenting counseling, including:
    - Reason for induction
    - Increased risk of cesarean (double the risk for nullips)
    - Review of determination of EDD
    - Bishop score

METHODS

- Nipple stimulation
- Amniotomy
- Cervical ripening balloon
- Oxytocin administration (see guidelines)
- Misoprostol administration (see guidelines)

Parameter/ Score	0	1	2	3
Position	Posterior	Mid	Anterior	-
Consistency	Firm	Mid	Soft	-
Effacement	0-30%	31-50%	51-80%	>80%
Dilation	0 cm	1-2 cm	3-4 cm	>5 cm
Fetal station	-3	-2	-1, 0	+1, +2

References:

ACOG Practice Bulletin #107, "Induction of Labor" 8/2009

Share with Women, "Induction of Labor." JMWH, vol. 53, No.4, July/August 2008

Updated: February 2017

INTERMITTENT AUSCULTATION

DEFINITION:

- Intermittent auscultation (IA) is a method of fetal surveillance that utilizes listening and counting fetal heart rate (FHR) for a specific amount of time at specified intervals in relation to uterine contractions.
- IA may be done with a fetoscope or hand-held Doppler.
- Use of an external fetal monitor (EFM) for IA is not recommended.
- If a strip is recorded for less than 20 minutes it is inadequate to interpret and may actually present a liability.

INDICATIONS:

- According to ACOG, the use of EFM, compared with IA, is associated with an increased rate of both vacuum and forceps operative vaginal delivery and cesarean delivery. It does not reduce risk for cerebral palsy of perinatal mortality.
- ACOG recommendations for monitoring women in labor state that IA is "acceptable in patients without complications."
- According to ACNM, "IA is the preferred method for monitoring the FHR during labor for women at term who present a low risk for developing fetal acidemia at the onset of labor."

IA Candidates:

- 36 wks or greater
- Vertex presentation
- Singleton pregnancy
- Recent 20 min Cat 1 FHR tracing done in either OBT or L&D (does not need to be repeated on admission to L&D)

Maternal Contraindications:

- Preeclampsia or chronic HTN
- GDM A2 or Type 1 DM
- Cholestasis
- TOLAC
- HX of IUFD

Fetal Contraindications:

- IUGR
- Polyhydramnios
- Multiples
- Preterm or PROM <36wks
- Postdates > 41 completed weeks
- Major anomalies or fetal complications

Intrapartum Contraindications:

- Epidural anesthesia
- Pitocin administration
- Misoprostol administration within two hours

- Moderate to thick meconium
- Chorioamnionitis
- Vaginal bleeding, other than bloody show

IA Assessment Recommendations:

- Obtain 20 min FHR strip with EFM. May convert to IA if Cat 1 FHT., i.e. normal baseline, moderate variability and absence of persistent variable decelerations and late decelerations.
- Perform Leopold's maneuvers to identify fetal presentation and position.
- Assess uterine contractions (UCs) by palpations.
- Place Doppler over fetal thorax or back.
- Determine the FHR baseline by listening for 60 sec. between UCs. Verify maternal pulse
- Subsequently count the FHR during a UC and 60 sec. after.

IA Frequency:

- Per ACOG, ACNM, & AWHONN
  - Latent phase: q 1 hr
  - Active phase: q 15-30 min
  - Second stage: q 15 min (q 5 min while pushing)
- Perform IA before:
  - AROM
  - Administration of analgesia
  - Transfer of D/C of patient (continuous EFM may be used)
- Perform IA after:
  - Vaginal examination
  - AROM of SROM
  - Administration of analgesia (continuous EFM x 30 min.)
- Discontinue IA if:
  - FHR baseline <110 bpm or >160 bpm
  - Persistent audible decelerations
  - Abnormal rhythm
  - Presence of contraindications
  - Difficulty distinguishing between maternal HR and FHR

IA Document Recommendations:

- Fetal baseline heart rate
- Presence of absence of audible accelerations
- Presence of absence of audible decelerations
- Maternal HR
- Uterine contraction frequency, duration and intensity (mild, moderate or strong)
- Palpable fetal movement

References:

American College of Nurse Midwives. Clinical Bulletin Number 11. Intermittent Auscultation for Intrapartum Fetal Heart Rate Surveillance. (2010). Journal of Midwifery & Women's Health, 55: 397–403.

American College of Obstetricians and Gynecologists. Practice Bulletin No. 106: Intrapartum Fetal Heart Rate Monitoring: Nomenclature, Interpretation, and General Management Principles. (2009). Obstetrics & Gynecology, 114(1), 192-202.

Association of Women's Health, Obstetric and Neonatal Nurses. Fetal heart monitoring principles and practices. Washington (DC): Association of Women's Health, Obstetric and Neonatal Nurses, 2000.
Denver Health. Intermittent Auscultation of the Fetal Heart Rate Clinical Practice Guideline NO. CPG-19.000. Reviewed 12/13/2011

MISOPROSTOL INDUCTION GUIDELINES

Indications:
Cervical ripening and/or induction of labor

Contraindications:
- Previous cesarean delivery or other uterine surgery
- Non-vertex presentation
- Positive or suspicious Oxytocin Challenge Test (OCT)
- Any contraindication to vaginal delivery or induction (i.e. placenta previa, prior uterine rupture, active genital herpes, etc.)
- Painful uterine contractions less than 5 minutes apart

Initiation:
- Counseling of patient regarding:
  - Indication for induction
  - Options / recommendations for cervical ripening
  - Possible side effects, including: diarrhea, nausea, vomiting, abdominal pain, chills, fever, and tachysystole with or without Fetal Heart Rate (FHR) changes
  - Potential for FHR abnormalities requiring intervention
- Place saline lock or start IV fluids as indicated
- Confirm vertex presentation and appropriate Bishop score
- Obtain reactive NST or negative OCT (consider OCT with IUGR or non-reassuring fetal surveillance)

Administration options:
- 25 micrograms placed in the posterior vaginal fornix every 4 hours
- 25 micrograms PO every 2 hours **(PENDING APPROVAL)**
- 50 micrograms PO every 4 hours
- Consider re-dosing per above dosing schedule if contractions are $\geq$ 5 minutes apart, and fetal status is reassuring (Category I)
- Recommended maximum dose is 300 mcg regardless of route of administration, but may consult if maximum is reached and additional doses desired.

Fetal Monitoring:
- Continuous EFM is indicated for at least 1-2 hours after each dose administration.
  - In the case of vaginal dosing, the patient should remain supine for 30 minutes with lateral tilt or side-lying in order to promote cervical absorption of the medication.
- Intermittent monitoring of FHT may be considered after a 1-2 hour monitoring interval if there is no active labor pattern and FHT remains Category I.
- If significant uterine activity with cervical change persists 4 hours after dose (2 hours after 25 mcg PO dosing), then re-dosing is not indicated. Intermittent monitoring of FHT may then be considered in the absence of further pharmacologic stimulation of labor and in the presence of Category I FHT.

Management of Complications:

In the case of tachysystole with FHR decelerations consider the following:

- Maternal position change
- IV Fluid bolus
- Oxygen by mask (10L per min by non-rebreather)
- Remove remnants of vaginal misoprostol tablet if possible
- Administer terbutaline per standing order if no response to other measures
- Consult MDs if there is an inadequate response or at CNM discretion

Oxytocin:

May initiate oxytocin 4 hours after final dose of misoprostol in the absence of an active labor pattern, and with reassuring FHT.

References:

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PROTRACTED ACTIVE LABOR AND ARREST OF SECOND STAGE

DEFINITIONS OF FAILED INDUCTION AND ARREST DISORDERS

FAILED INDUCTION OF LABOR: FAILURE TO GENERATE REGULAR (E.G. EVERY 3 MINUTES) CONTRACTIONS AND CERVICAL CHANGE AFTER AT LEAST 24 HOURS OF OXYTOCIN ADMINISTRATION, WITH ARTIFICIAL MEMBRANE RUPTURE IF FEASIBLE

FIRST-STAGE ARREST

SPONTANEOUS LABOR: ≥ 6CM DILATION WITH MEMBRANE RUPTURE AND

- ≥ 4 HOURS OF ADEQUATE CONTRACTIONS (EG >200 MONTEVIDEO UNITS) OR
- ≥ 6 HOURS IF CONTRACTIONS INADEQUATE WITH NO CERVICAL CHANGE

INDUCED LABOR: ≥ 6CM DILATION WITH MEMBRANE RUPTURE OR ≥ 5CM WITHOUT MEMBRANE RUPTURE AND

- ≥ 4 HOURS OF ADEQUATE CONTRACTIONS (EG >200 MONTEVIDEO UNITS), OR
- ≥ 6 HOURS IF CONTRACTIONS INADEQUATE WITH NO CERVICAL CHANGE

SECOND-STAGE ARREST: NO PROGRESS (DESCENT OR ROTATION) FOR

- 4 HOURS OR MORE IN NULLIPAROUS WOMEN WITH AN EPIDURAL
- 3 HOURS OR MORE IN NULLIPAROUS WOMEN WITHOUT AN EPIDURAL
- 3 HOURS OR MORE IN MULTIPAROUS WOMEN WITH AN EPIDURAL
- 2 HOURS OR MORE IN MULTIPAROUS WOMEN WITHOUT AN EPIDURAL

*****See Dept OB/GYN SOP on Management of Labor Progress*****

References:

Spong, C. Y., Berghella, V., Wenstrom, K. D., Mercer, B. M., & Saade, G. R. (2012). Preventing the First Cesarean Delivery: Summary of a Joint *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, Society for Maternal-Fetal Medicine, and American College of Obstetricians and Gynecologists Workshop. *Obstetrics and Gynecology*, *120*(5), 1181–1193.

CANDIDIASIS OF THE BREAST/NIPPLE IN LACTATION

- Mammary candidiasis is a poorly understood/defined and studies on diagnosis/treatment are limited.

Diagnosis

- Presumed candida infection is based on symptoms/history:
  - Breast pain out of proportion to physical findings including severe deep shooting or stabbing pain, soreness of areola/nipple, burning
  - Physical finding of shiny or flaky skin of the affected nipple
  - History of infant with oral or diaper candidial infection or maternal vaginal candidial infection

Differential Diagnosis of Nipple and Breast Pain

- Nipple injury including trauma from breast pumps
- Nipple vasoconstriction (Raynaud phenomenon)
- Engorgement
- Plugged ducts
- Infection
- Excessive milk supply
- Nipple dermatitis/psoriasis

Treatment

- There are **no** clinical trials on the treatment of presumed candida infection in lactating mothers.
- Initial treatment:
  - Maternal topical care with miconazole or clotrimazole.
  - Combination antifungal and anti-inflammatory agent (Mycolog) may also be effective
  - If fissures are present, consider adding mupirocin or bacitracin.
  - APNO can be used but limited studies do not show improved outcomes with this medication which may not be covered by insurance.
    - Apply sparingly after each feeding
    - Do not wash or wipe it off and continue until pain free for a few days and then decrease frequency over a few days until stopped
    - 30 gm compounded from the following ingredients:
      - Mupirocin 2% ointment (15 grams)
      - Betamethasone 0.1% ointment (15 grams)
      - Miconazole powder so that the final concentration is 2% miconazole.
  - Gentian Violet 1% applied to nipples and infants mouth with a Q-tip once daily for 3-4 days
    - Risks include mouth sores in infant and nipple/areolar irritation
    - Gentian violet is inexpensive and effective but messy to use.
- If symptoms do not resolve with the above treatment or if the diagnosis is intraductal candidiasis
  - Use oral fluconazole dosed at 400mg the first day followed by 200mg per day for 14 days
    - May be used longer if symptoms are improved but not resolved
    - This dosing is safe for infants but will not provide treatment for infant with thrush.
- Infant care
  - Although there is a lack of supportive data, the infant is typically treated for oral candidal infection with the same regimen used to treat oral mucocutaneous candidiasis

- This is administered as an oral suspension of nystatin (100,000 units/mL) at a dose of 0.5 mL to each side of the mouth, given four times a day

Other Considerations/Recommendations may be helpful:

- Collaborate with lactation clinic and pediatric team
- Stress good hand washing technique
- Keep breasts dry by using disposable breast pads and change as soon as they become wet.
- Expose nipples to air as much as possible
- Use microwave steam bags for pacifiers, bottle nipples, breast pump supplies, teething rings, baby's tooth brush, and medication droppers once a day
- Launder all of mother's and baby's clothes in hot water with white vinegar in the rinse cycle
- Wear a clean bra every day
- Suggest cut down on sugars and dairy in diet
- Consider a probiotic
- Raynaud's recommendations:
  - Advised to avoid exposure to cold temperature
  - Keep the breasts and nipples warm
  - Avoid vasoconstrictive substances including; caffeine and nicotine
  - Consider Nifedipine (approved by AAP)

References:

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INADEQUATE MILK SUPPLY – GALACTAGOGUES

Inadequate milk Supply

- Primary management should be to increase milk production and milk transfer through intensive evaluation and lactation support.
- There is minimal data to support the use of galactagogues. If recommended, patients should be counseled carefully.

Herbs as galactagogues

- Few studies conducted, mixed results so evidence is inadequate to guide clinical recommendations. However, many women are interested in trying herbs to support lactation.
- Herbs recommended:
  - Fenugreek: 3 Capsules 3 times per day
  - Blessed Thistle: 3 capsules 3 times per day
- Some experts (Jack Newman, MD) recommend taking Fenugreek and Blessed Thistle together
- Other herbs that my increase breast milk production are:
  - Shatavari root extract
  - Mulunggay leaves
  - Milk thistle: 1 heaping teaspoon freshly chopped seeds in 5 oz. boiling water, steep 20-30 minutes. Drink 5-6 times per day.
  - Goat's rue: ½ to 1 teaspoon dried flower tops with 5 oz. boiling water for 2-3 minutes, cool and drink 4-5 times per day.

Medications as galactagogues

- Few studies with mixed results so evidence is inadequate to guide clinical recommendations.
- Medications recommended:
  - Domperidone: 30 mg three times per day for 3-4 weeks (can be used longer). When ready to wean off the Domperidone, decrease by 10mg per week. If milk supply decreases, may go back up on dose.
    - Some women will see improved milk supply within 24 hours while others may not see an improvement for weeks. A 4 to 6 week trial is reasonable.
    - Careful counseling re: minimal data available about this medication's impact on breast milk supply so it is not possible to provide evidence-based recommendation. However, most studies that have been done indicate that there is improvement in milk supply and many breastfeeding experts experienced with use of Domperidone (mostly in Canada) are of the opinion that it is quite effective and has minimal risk.
    - This medication is not FDA approved in the U.S. because of concerns about it causing ventricular arrhythmia and sudden cardiac death in high doses when given IV to ill patients. This concern is not likely applicable to healthy women of childbearing age. Screen women for any significant personal of family history of cardiac arrhythmia as well as for use of other medications that may impact cardiac rhythm.
  - Metoclopramide: 10 mg 3 times per day for 2-3 weeks then decrease by 10 mg per week until weaned off.
    - Some women will notice a decrease in supply with weaning and they may continue with 10mg three times per day for an additional 1-2 weeks before attempting the wean again.

- Metoclopramide crosses the blood-brain barrier. Depression may be a side effect. Use with caution in women with current or history of depression.

References:

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MASTITIS

- Clinical symptoms
  - Firm, red, tender area of one breast with maternal fever
  - A tender fluctuant area indicates an abscess
  - Women may also experience myalgia, chills, malaise and flu-like symptoms
- Diagnosis is made based on clinical presentation.
- Differential diagnosis
  - Severe engorgement
  - Breast abscess
  - Plugged ducts
  - Galactoceles
  - Inflammatory breast cancer
- Management
  - Pain management with ibuprofen, cold compresses
  - Continue breastfeeding favoring infected breast with focus on complete emptying
  - Empiric Antibiotic therapy:
    - Dicloxacillin 500mg QID x 10-14 days OR cephalexin 500mg QID x 10-14 days
    - If PCN allergy then use clindamycin 300mg QID x 10-14 days
    - If infection is severe or not responsive to normal treatment inpatient treatment with vancomycin is indicated. Transfer to MD care may be most appropriate in this case.

References:

Spencer J., Abrams S., Drutz J. Common problems of breastfeeding and weaning. www.uptodate.com, October 20, 2016.

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