Chronic Conditions in the Pregnant Patient

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Disclosures

- No Disclosures

Objectives

At the end of the lecture participants will be able to:

- Discuss chronic conditions in pregnant patients.
- Identify medication and management issues in patients of reproductive age.
- Explain differences in goals of care for pregnant versus non-pregnant individuals with chronic conditions.
- Identify need for early referral and management of pregnant patients.
- Utilize osteopathic principles in chronic conditions in pregnant patients.

- 1 in 5 pregnant women have a chronic disease
- Higher risk of adverse pregnancy outcome including preterm birth and higher cesarean section rates
- Ideally chronic medical conditions should be under good control prior to pregnancy to decrease maternal and fetal morbidity
  - Medications compatible with pregnancy

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Chronic Hypertension

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Risks during Pregnancy

- Maternal:
  - Severe Hypertension (HTN)
  - Superimposed preeclampsia
  - Abruption
  - Postpartum hemorrhage
  - Stroke
  - Myocardial infarction
  - Pulmonary edema
  - Death
- Fetal:
  - Fetal growth restriction
  - Preterm delivery
  - Stillbirth
  - Neonatal death

Definition in Pregnancy

- HTN present before 20 weeks of gestation
- Systolic over 140 mmHg, Diastolic over 90 mmHg
- Two measurements at least 4 hours apart
- Currently no stages of HTN however if a patient comes with the diagnosis of Stage 1 HTN should consider them HTN during pregnancy

Medications

- Avoid ACE/ARB
- Preferred Medications:
  - Labetalol
    - Starting dose 100 mg TID
    - Maximum dose of 2400 mg daily
  - Nifedipine Extended Release
    - Starting dose 30 mg daily
    - Maximum dose 130 mg daily
    - Can dose BID for improved control or if not tolerated
  - Methyldopa
    - Mostly historical
    - 250 mg TID
    - Max dose 3000 mg
  - Hydralazine
    - Starting dose 10 mg QID
    - Max dose 200 mg daily

Pre- Pregnancy Evaluation

- CMP, CBC, P/C ratio
- Evaluate for cardiovascular disease
- Encourage adjustment of modifiable risk factors
- Discontinue ACE/ARB
- Evaluate for secondary causes

Evaluate for Secondary Hypertension

Primary Hypertension	Secondary Hypertension
Gradual increase in BP, with slow rate of risk in BP	BP lability, episodic pallor, dizziness (pheochromocytoma)
Lifestyle factors that favor higher BP	Snoring or hypersomnolence (Obstructive sleep apnea)
Family history of hypertension	Muscle cramps or weakness (primary or secondary aldosteronism due to renovascular disease)
	Weight loss, palpitations, heat intolerance (hyperthyroidism)
	Edema, fatigue, frequent urination (kidney disease or failure)
	Central obesity, facial rounding, easy bruisability (Cushing syndrome)
	Medication or substance use.

Management in Pregnancy

- Low dose aspirin starting at 12 weeks
- Goal to maintain BP under 140/90
- Growth ultrasound
- Antenatal testing
- Delivery 37w0d-39 6/7 with medications
- Delivery 38 0/7-39 6/7 without medications
- Delivery 36 0/7-37 6/7 if difficult to control BPs

Note on Pre-Eclampsia

Diagnostic Criteria:

- Blood pressure:
  - Systolic of 140 mmHg or m
    mmHg or more on two occ
    apart after 20 weeks of ges
    previously normal blood pr
  - Systolic of 160 mmHG or r
    mmHg or more
- Proteinuria:
  - 300 mg or more on 24 hou
  - Protein/creatinine ratio of 0
  - Dipstick reading of 2+
- In absence of proteinuria a severe feature can also earn the diagnosis of pre-eclampsia

Severe Features:

- Platelet count less than 100,000
- AST/ALT twice normal values that are not explained by other etiology, or severe right upper quadrant pain
- Creatinine more than 1.1 mg/dL or double baseline
- Pulmonary edema
- New-onset headache unresponsive to medication
- Visual disturbances

Long Term Implications

- Patients with Pre-eclampsia in pregnancy have an increased risk for cardiovascular disease later in life

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Diabetes

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White's Classification	Age of diagnosis	Duration of diabetes	Diabetes Sequale
A	Any	Pregnancy	None
B	>20 yrs old	<10 years	None
C	10-19 yrs old	Or 10-19 years	None
D	<10 yrs old	Or >20 years	Benign retinopathy
F	Any	Any	Nephropathy
R	Any	Any	Proliferative retinopathy
H	Any	Any	Coronary artery disease

Risks with Poor Control

- Congenital anomalies
- Preterm delivery
- Micro or Macrosomia
- HTN disorders of pregnancy
- Worsening or development of retinopathy or nephropathy

Pre-Pregnancy Management

- HbA1C less than 6%
- Baseline diabetic eye and foot exams
- Thyroid studies
- Lipid assessment
- ECG and Echo if indicated
- Increase Folic Acid

Management in Pregnancy

- Diet and carb counting is important and should continue
- Insulin requirements increase throughout pregnancy.
  - 1st trimester: 0.7-0.8 u/kg/d
  - 2nd trimester 0.8-1 u/kg/d
  - 3rd trimester: 0.9-1.2 u/kg/d
- Glycemic control goals:
  - Fasting less than 95
  - 1 hour postprandial less than 140
  - 2 hour postprandial less than 120
  - Do not want overnight glucose to decrease below 60
  - Average mean capillary glucose levels of 100
  - HbA1C less than 6 has lowest risk of LGA infants

Oral Hypoglycemic Agents

- Not well studied in pregnancy
- No increase in risk of SAB, anomalies, or stillbirth

Management in Pregnancy

- Continuous glucose monitor is a good option with recent studies showing improved neonatal o
- D
  Ic
  - Pre-gestational DM well controlled 39 0/7-39 6/7
  - Pre-gestational DM with vascular complications, poor glucose control, or prior stillbirth 36 0/7-38 6/7
  - Gestational: well controlled on diet and exercise 39 0/7-40 6/7
  - Gestational: well controlled on medications 39 0/7-39 6/7
  - Gestational: poorly controlled individualized
- ASA at 12 weeks
- Antenatal testing and growth US
- EFW over 4500g should deliver via CD
- Delivery timing:

Long Term Implications

- Increased risk for obesity and type 2 DM in children of pregnant people with pregestational DM

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Psychiatric Illness

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- 27.2% of women in the US have mental illness
- 1 in 5 women will develop mental health condition during pregnancy or postpartum
- Often undertreated or untreated during pregnancy
- For women with Bipolar disorder their highest risk for need of hospitalization is during postpartum period

General Approach to Treatment

- Psychotherapy should be recommended as first line
- Risks/benefits conversation with patient
- Use lowest effective dose
- Avoid polypharmacy if possible
- Minimize switching medications
- Remember that untreated or inadequately treated mental health disorders is a risk

Risks and Benefits Conversation

- Risks of under-treatment or no treatment for depression
  - Limited engagement in medical care and self-care
  - Substance use
  - Preterm birth
  - Low birth weight
  - Pre-eclampsia
  - Postpartum depression
  - Impaired infant attachment
  - Disrupted relationship with partner
  - Suicide
- Risks of antidepressant use during pregnancy:
  - Persistent pulmonary hypertension of the newborn
  - Transient neonatal adaptation syndrome
  - Pre-eclampsia
  - Spontaneous abortion

How to choose an antidepressant

- If they have used one before that worked, use it
- If antidepressant naïve can chose any antidepressant with regards to patient preference.
- May need to go above usual therapeutic range in pregnancy
- If patient is already on one and doing well, do not switch it!
- Do not taper antidepressants in the third trimester

Mood Stabilizers

- Do not discontinue except for Valproate during pregnancy
- Lamictal, Haldol, risperidone, etc. should be continued
- Carbamazepine, Oxcarbazepine, Valproate, and Lithium all should be transitioned prior to pregnancy if possible
- Quetiapine is the preferred anti-psychotic medication due to lowest placental passage

Postpartum Depression Options:

- Brexanolone
  - FDA-approved medication for treatment or moderate to severe postpartum depression
  - Onset of depression occurs in 3rd trimester through 4 weeks postpartum and if patient is <6 months postpartum at screening
  - Requires an IV infusion over 60 hours
  - Has a faster onset of action (1-2 days) compared to oral
  - Has been shown to maintain reduction in depression symptoms at 30days post infusion

Postpartum Depression Options (cont):

- Zuranolone
  - FDA approved oral medication for treatment of postpartum depression
  - Consider up to 12 months postpartum for depression that has onset in third trimester or within 4 weeks postpartum
  - Taken in the evening with a fatty meals for 14 days
  - CNS depressant effects are very common
  - Can be used alone or as an adjunct to other meds
  - Should be on effective contraception during 14 day treatment course and 1 week after final dose
  - Potential suicidal thoughts or behavior, sedation, lack of efficacy beyond 42 days

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Opioid Use Disorder

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Risks with Poor Control

- Impaired maternal-infant bonding
- Maternal morbidity and mortality
- Custody issues
- Preterm delivery
- Increased risk of birth defects

- Should universally screen at beginning of pregnancy or prior to pregnancy
  - Questionnaire versus urine drug screening
- Opioid agonist pharmacotherapy is recommended over supervised withdrawal through pregnancy and postpartum period

Opioid Agonists

- Methadone
  - Not as easily accessible
  - Usually need escalation of dosage throughout pregnancy
  - Can prolong the QTc interval in dose-related fashion
- Buprenorphine
  - 100% safe and preferred to use Suboxone
  - Usually do not require as significant of dosage changes in pregnancy
  - OBGYNs can safely prescribe
- Should not transition between them during pregnancy

Postpartum

- Patients should be encouraged to breastfeed
- Infants should be monitored for signs of withdrawal
- Should continued MAT postpartum

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BREASTFEEDING MEDICINE
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ABM Protocol

Open camera or QR reader and scan code to access this article and other resources online.

Academy of Breastfeeding Medicine Clinical Protocol #21: Breastfeeding in the Setting of Substance Use and Substance Use Disorder (Revised 2023)

Miriam Harris,[1,2] Davida M. Schiff,[3,4] Kelley Saia,[2,5] Serra Muftu,[3,4] Katherine R. Standish,[6] and Elisha M. Wachman[2,7]

TABLE 5. SUMMARY OF BREASTFEEDING RECOMMENDATIONS FOR SUBSTANCE USE DISORDER TREATMENTS

SUD treatment	*Recommendations*	*Level of evidence*	*Strength of recommendation*
Methadone	Compatible with breastfeeding, regardless of dose.	2	A
Buprenorphine (SL)	Compatible with breastfeeding, regardless of dose.	2	A
Naltrexone	Compatible with breastfeeding.	3	B
Acamprosate	Likely compatible with breastfeeding.	3	C
Disulfiram	Not recommended given potential toxicity.	3	C
NRT	Compatible with breastfeeding	2	B
Varenicline	Use cautiously with a shared decision-making approach.	3	C
Bupropion	Compatible with breastfeeding.	2	B

NRT, nicotine replacement therapy; SL, sublingual.

https://pubmed.ncbi.nlm.nih.gov/37856658/#:~:text=In%20general%2C%20breastfeeding%20is%20recommended,lactation%20support%20and%20SUD%20treatment.

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Headaches

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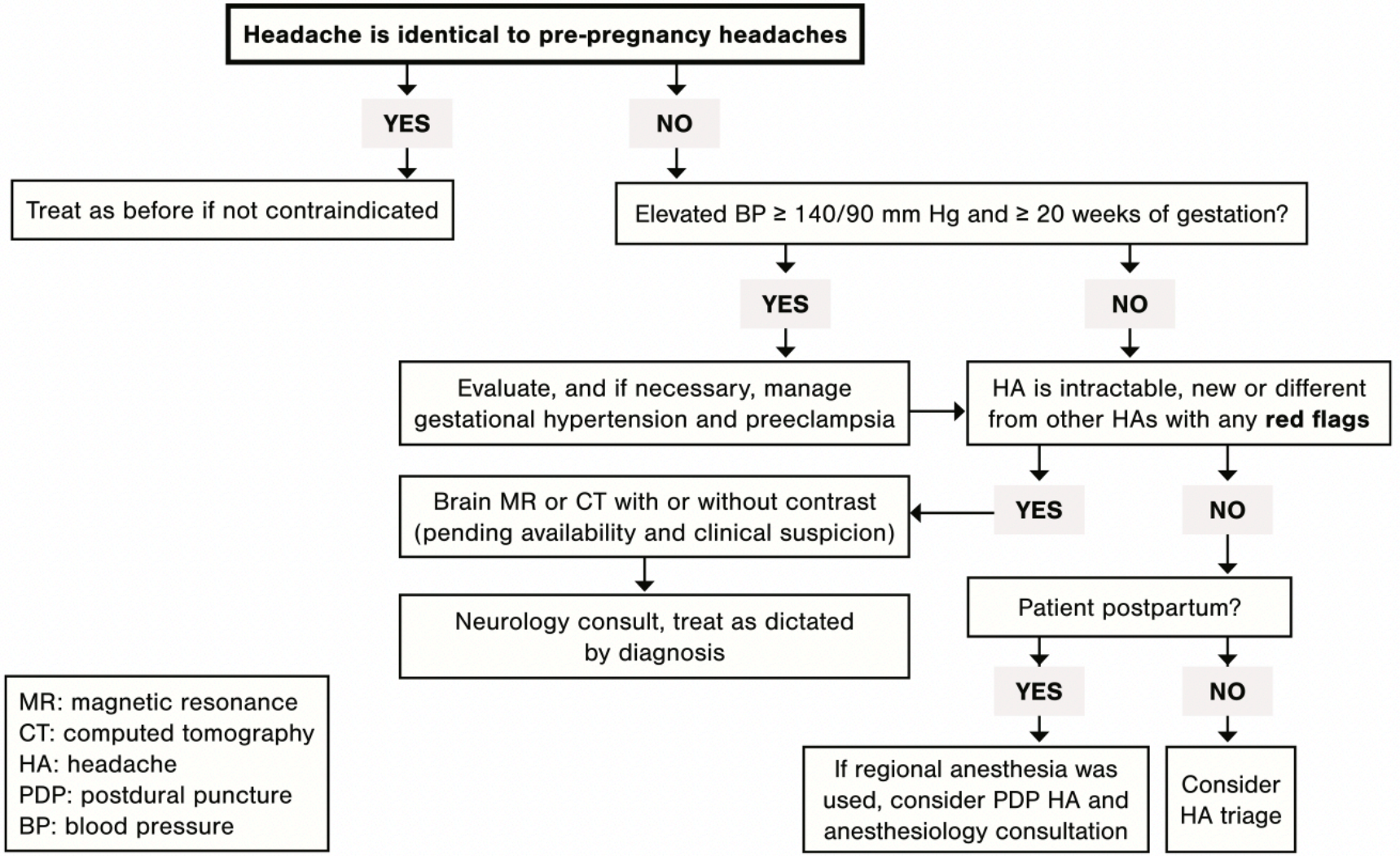
- Migraine HA affect 1 in 5 women with peak prevalence during reproductive age
- Most pregnant individuals have a decrease in primary HA in pregnancy, increase in secondary
- Secondary HA can often be overlooked in pregnant women

Comparison of HA Types

	Migraine	Tension	Cluster
Duration	4-72 hours	30 minutes- 7 days	15-180 minutes
Location	Typically unilateral	Bilateral	Unilateral, orbital, supraorbital, temporal, or any combo
Description of pain	Pulsating	Pressing or tightening	Stabbing, non-pulsating
Pain intensity	Moderate to severe	Mild to moderate	Severe to excruciating
Nausea or Vomiting	Yes	No	No
Photophobia or Phonophobia	One or both	None or one	None but may have ipsilateral conjunctival injection, lacrimation, nasal congestion, eyelid edema, or facial sweating
Effect of Routine activity	Aggravated by	None	None, may be restless or agitated



igure 1. Evaluation and management of secondary headache.

https://www.uptodate.com/contents/headache-during-pregnancy-and-postpartum#subscribeMessage

- Not as many good options for maintenance medications in pregnancy
- MagOxide can be helpful
- Osteopathic techniques

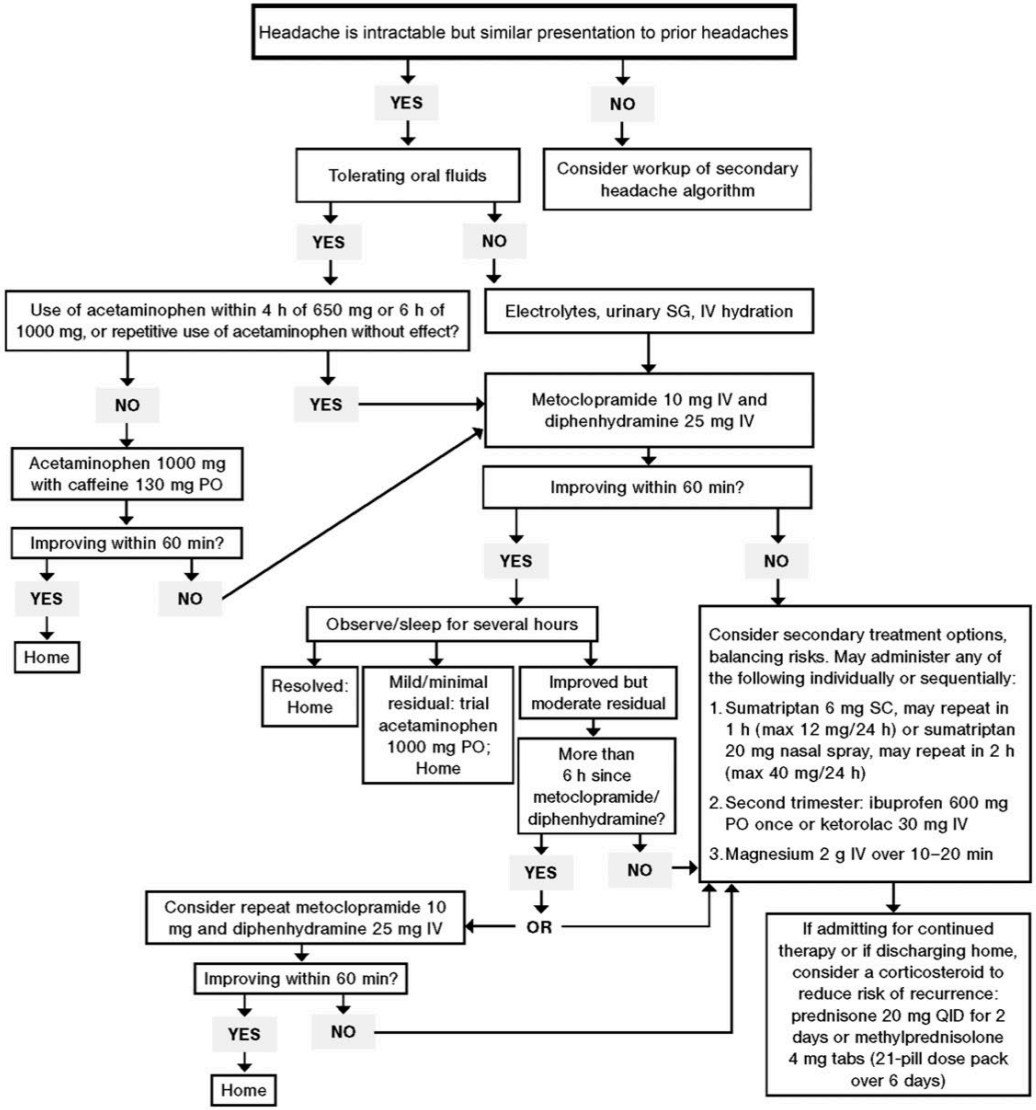


Figure 2. Headache triage algorithm. HA, headache; BP, blood pressure; SG, specific gravity; PO, per oral; IV, intravenous; NV, nausea and vomiting; UA, urinary analysis; QID, four times per day; SC, subcutaneous.

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Asthma

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"Safer for women with asthma to be treated with asthma medications than it is for them to have asthma symptoms and exacerbations"

- National Asthma Education and Prevention Program

- Mild and well controlled asthma at beginning of pregnancy has excellent outcomes
- Severe and poorly controlled:
  - Increase preterm delivery
  - Need for CD
  - Growth restriction
  - Preeclampsia

Table 1. Classification of Asthma Severity and Control in Pregnant Patients

Asthma Severity* (Control†)	Symptom Frequency	Nighttime Awakening	Interference With Normal Activity	FEV_1 or Peak Flow (Predicted Percentage of Personal Best)
Intermittent (well controlled)	2 days per week or less	Twice per month or less	None	More than 80%
Mild persistent (not well controlled)	More than 2 days per week, but not daily	More than twice per month	Minor limitation	More than 80%
Moderate persistent (not well controlled)	Daily symptoms	More than once per week	Some limitation	60–80%
Severe persistent (very poorly controlled)	Throughout the day	Four times per week or more	Extremely limited	Less than 60%

Abbreviation: FEV_1, forced expiratory volume in the first second of expiration

*Assess severity for patients who are not taking long-term-control medications.

†Assess control in patients taking long-term-control medications to determine whether step-up therapy, step-down therapy, or no change in therapy is indicated.

- Exacerbation rate in pregnancy: 12.6%
- 23% improves in pregnancy
- 30% gets worse in pregnancy

https://www.acog.org/clinical/clinical-guidance/practice-bulletin/articles/2008/02/asthma-in-pregnancy

Step Therapy for Treatment

- Mild Intermittent Asthma
  - No daily meds, albuterol as needed
- Mild Persistent Asthma
  - Preferred: low-dose inhaled corticosteroid
  - Alternative: Cromolyn, leukotriene receptor antagonist, or theophylline
- Moderate Persistent Asthma
  - Preferred: low-dose inhaled corticosteroid and salmeterol or medium-dose inhaled corticosteroid and salmeterol
  - Alternative: low-dose or medium-dose inhaled corticosteroid and either leukotriene receptor antagonist or theophylline
- Severe Persistent Asthma
  - Preferred: high-dose inhaled corticosteroid and salmeterol and oral corticosteroid
  - Alternative: high-dose inhaled corticosteroid and theophylline and oral corticosteroid

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Thyroid Disease

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Risks with Poor Control

- Spontaneous abortion
- Pre-eclampsia
- Preterm birth
- Placental abruption

- TSH and T4 ranges change depending on the trimester.
  - Look at free T4 and free T3 for most reliable
- Fetal thyroid gland starts working at 12 weeks gestation
- Maternal T4 is transferred to fetus entire pregnancy
  - Very important for normal fetal brain development
- Do not recommend universal screening

Hyperthyroidism

- Best case is to be well maintained going in to pregnancy
- Rare during pregnancy (0.1-0.4%)
- Graves disease and HCG mediated
- Fetal thyrotoxicosis is a risk with maternal graves disease due to thyroid antibodies passed to fetus

Hyperthyroidism Treatment

- Methimazole is avoided in first trimester
  - Rare embryopathy with esophageal or choanal atresia and aplasia cutis
- Propylthiouracil is usually used in first trimester however significant hepatotoxicity can occur
- Consider transitioning to Methimazole after first trimester
- Can result in poor control
- Must weigh risks and benefits.
- Beta-blockers for palpitations are safe

Hypothyroidism

- More common in pregnancy 2-10 per 1000
- Rare for it to affect neonate

Hypothyroidism Treatment

- Levothyroxine
- Guided by TSH level
  - Goal lower level of reference range and 2.5 mu/L

Management in Pregnancy

- Only requires antenatal testing and growth scans if poorly controlled
- No indication for early delivery

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Obesity, Bariatric Surgery

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- Optimization of health and BMI prior to pregnancy
- If undergoing Bariatric surgery effective birth control should be used until weight loss is achieved
- Optimize nutritional deficits prior to conceiving

Table 1. World Health Organization Body Mass Index Categories

Category	BMI*
Underweight	Less than 18.5
Normal weight	18.5–24.9
Overweight	25.0–29.9
Obesity class I	30.0–34.9
Obesity class II	35.0–39.9
Obesity class III	40 or greater

BMI, body mass index.

*Weight in kilograms divided by height in meters squared (kg/m^2)

Obesity: preventing and managing the global epidemic. Report of a WHO consultation. World Health Organ Tech Rep Ser 2000;894:i-xii, 1–253.

https://www.acog.org/clinical/clinical-guidance/practice-bulletin/articles/2021/06/obesity-in-pregnancy

Risks with Obesity

- Increased risk of spontaneous abortion and recurrent miscarriage, stillbirth
- Increased risk of neural tube defects, hydrocephaly, cardiovascular, orofacial, and limb reduction anomalies
  - Protective against gastroschisis
- Maternal cardiac dysfunction, proteinuria, sleep apnea, NAFLD, GDM, preeclampsia

Management in Pregnancy

- 11-20 pound weight gain recommended
- Screen for OSA and GDM at early prenatal visits
- Need targeted ultrasound to reliably diagnose anomalies
- Growth US and Antepartum fetal surveillance:
  - BMI 35-39.9 screen at 37 0/7
  - BMI 40+ screen at 34 0/7
- Should refer after delivery to weight management to achieve healthier weight before next pregnancy

Summary

- All medical conditions should be optimized if possible prior to pregnancy.
- There are very few medications that should not be used in pregnancy and treatment should never be withheld from a pregnant patient.
- Gestational Diabetes and Hypertensive disorders of pregnancy have long term implications for pregnant individuals and their offspring.
- The risk of treatment of mental health and substance use disorders in pregnancy is far less than not treating.

Questions?

References

- Kersten I, Lange AE, Haas JP, Fusch C, Lode H, Hoffmann W, Thyrian JR. Chronic diseases in pregnant women: prevalence and birth outcomes based on the SNiP-study. BMC Pregnancy Childbirth. 2014 Feb 19;14:75. doi: 10.1186/1471-2393-14-75. PMID: 24552439; PMCID: PMC3943445.
- American College of Obstetricians and Gynecologists' Committee on Practice Bulletins—Obstetrics. ACOG Practice Bulletin No. 203: Chronic Hypertension in Pregnancy. Obstet Gynecol 2019; 133:e26. Reaffirmed 2024.
- Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Hypertension 2018; 71:1269.
- Deputy NP, Kim SY, Conrey EJ, Bullard KM. Prevalence and Changes in Preexisting Diabetes and Gestational Diabetes Among Women Who Had a Live Birth - United States, 2012-2016. MMWR Morb Mortal Wkly Rep 2018; 67:1201.
- Tennant PW, Glinianaia SV, Bilous RW, et al. Pre-existing diabetes, maternal glycated haemoglobin, and the risks of fetal and infant death: a population-based study. Diabetologia 2014; 57:285.
- Screening and diagnosis of mental health conditions during pregnancy and postpartum. Clinical Practice Guideline No. 4. American College of Obstetricians and Gynecologists. Obstet Gynecol 2023; 141: 1232– 61. doi: 10.1097/AOG.0000000000005200
- Finnegan LP, Hagan T, Kaltenbach KA. Scientific foundation of clinical practice: opiate use in pregnant women. Bull N Y Acad Med 1991; 67:223.
- Ballabio M, Poshychinda M, Ekins RP. Pregnancy-induced changes in thyroid function: role of human chorionic gonadotropin as putative regulator of maternal thyroid. J Clin Endocrinol Metab 1991; 73:824.
- Steiner TJ, Stovner LJ, Jensen R, Uluduz D, Katsarava Z; Lifting The Burden: the Global Campaign against Headache. Migraine remains second among the world's causes of disability, and first among young women: findings from GBD2019. J Headache Pain 2020; 21: 137– 0. doi: 10.1186/s10194-020-01208-0
- Lashen H , Fear K , Sturdee DW . Obesity is associated with increased risk of first trimester and recurrent miscarriage: matched case-control study . Hum Reprod 2004 ; 19 : 1644 – 6 . (Level II-3)
- Stothard KJ , Tennant PW , Bell R , Rankin J . Maternal overweight and obesity and the risk of congenital anomalies: a systematic review and meta-analysis . JAMA 2009 ; 301 : 636 – 50 . (Meta-analysis)
- Catalano PM . Management of obesity in pregnancy . Obstet Gynecol 2007 ; 109 : 419 – 33 . (Level III)