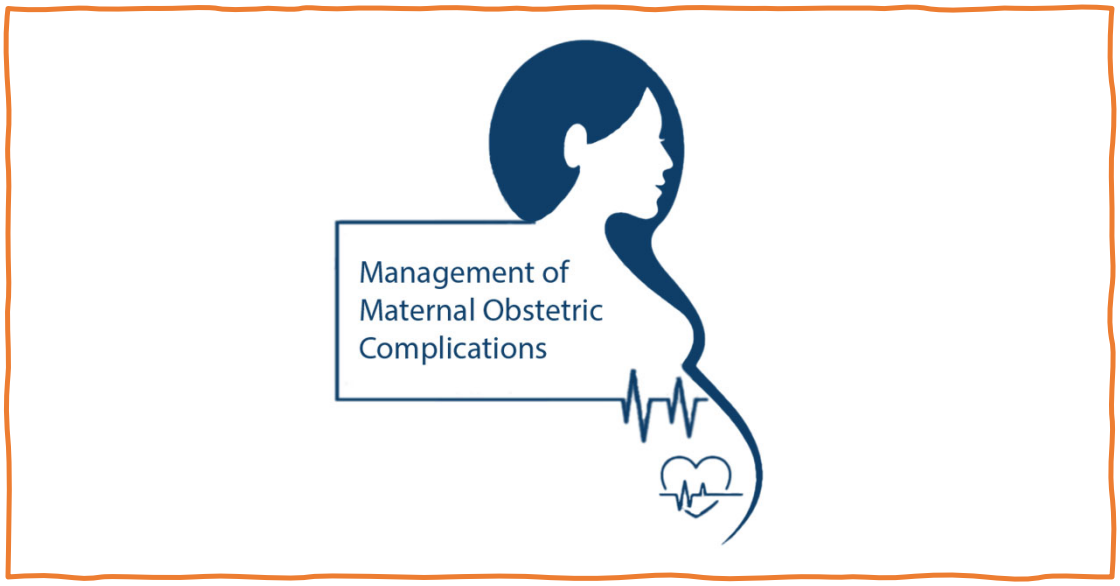

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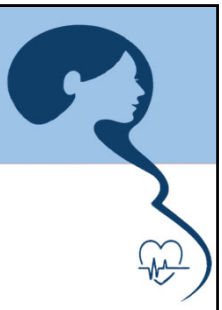
Introductions



Minnesota Perinatal Physicians

Team based approach to care for the high-risk pregnancy population

- 13 Maternal Fetal Medicine Physicians
- 2 Fetal Interventionalist Physicians
- 8 Advanced Practice Providers
- Genetic Counselors, Nurse Care Coordinators, Social Work, Registered Nurses, Sonographers, Schedulers/Front Desk Staff, Management and Administration
- We collaborate with many other specialty groups including cardiology and several pediatric specialties (surgery, neurology, cardiology, neonatal, etc)
- Heidi Sannes CNP
- Nicole Williams CNP

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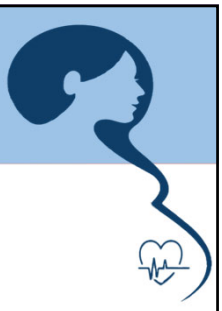
Disclosures



- We do not have any disclosures to report

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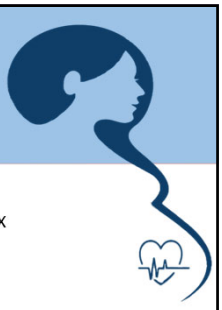
Objectives



- Understand the importance of your role as part of the team taking care of the medically complex OB patient
- Nursing/APP role in the Cardio-obstetric and/or hypertensive patient
  - Identify who is at risk for cardiovascular disease/hypertension
  - Obtain pertinent history for thorough and efficient care
  - Understand useful assessments for the detection of cardiovascular disease and hypertension
  - Recognize signs and symptoms of cardiovascular disease/hypertension
  - Formulate a plan (labs, imaging, follow-up)
- Nursing/APP role in the care of Diabetic patients
  - Gather helpful interval history for the diabetic patient
  - Identify ways to monitor blood sugar with tips on how to address common problems
  - Be aware of special considerations for specific patient populations
  - Understand how to address common specific situations (sick days, hypoglycemia, cesarean section instructions)

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Role of APP at Minnesota Perinatal Physicians

- Clinic Role
  - Provide routine OB care for transferred patients
  - Postpartum Hypertension
  - Diabetes in Pregnancy
  - Collaborates with MPP colleagues and other specialist
- Hospital Role
  - Rounds and consults on antepartum and postpartum patients, in conjunction with the MFM and OB hospitalist
  - Provides support for inpatient nursing/care coordination

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Role of Nursing at MPP

- RNs work at all of the MPP clinics
  - Chart prep, room patients (vital signs, weight), provide nursing assessment and critical thinking, patient education (routine OB education, specific education ex. Iron supplementation), collect labs, antenatal testing, keep an updated summary of OB care (labs, consults, ultrasounds, etc), follow-up on normal labs, and triage patient calls
- RN Care Coordinators
  - Create individualized care plan, coordinate care between primary care providers and specialists, and facilitate communication with interdisciplinary team

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Cardio-Obstetric and Hypertensive Patient

History

- Cardiac (congenital and/or acquired) disease, related surgeries, and current cardiac status
- Cardiologist last visit and any upcoming follow up
- History of hypertension in previous pregnancy (timing of onset, lab abnormalities, timing of delivery)
- Chronic hypertension (diagnosis, any previous medications including doses, and duration of treatment)
- Chart prep/review
- Most recent labs and imaging (echocardiogram, MRI, CT)
- Risk factors
  - Obesity (BMI >30)
  - Advanced Maternal Age
  - Cardiovascular history, including chronic hypertension, peripartum cardiomyopathy
  - Diabetes mellitus or autoimmune disease
  - History of hypertensive disorders in pregnancy or postpartum
  - Fetal anomalies and Fetal growth restriction
  - Multifetal gestation

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Cardio-Obstetric and Hypertensive Patient

Subjective

- Physiologic changes in pregnancy most often lead to sign and symptoms that may mimic cardiac disease: Nausea, fatigue, back pain, lower extremity swelling, SOB, palpitations and chest pain
- Preeclampsia symptoms (headache, vision changes, right upper quadrant pain, edema)
- Cardiac symptoms (shortness of breath, chest pain, palpitations, activity tolerance-ADLs/stairs, orthopnea)
- Medication regimen, consistency/taking as prescribed

Objective

- Vital signs, oxygen saturation (if indicated)
  - Recognition of abnormal blood pressure in pregnancy (>140/90) vs postpartum (>130/80)
  - Consider provider notification of any abnormal values so labs can be collected early in the visit
- Weight – total weight gain and interval weight gain
- Heart and Lung Assessment
- Clonus, Reflexes, Edema

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Cardio-Obstetric and Hypertensive Patient

Maternal mortality reviews indicate most mothers who died of CVD during pregnancy or postpartum presented to a health care provider with signs and symptoms on more than one occasion that were not recognized.

Arrhythmia or Heart Failure

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Cardio-Obstetric and Hypertensive Patient

Arrhythmia

- Palpitations or "heart racing", shortness of breath during episodes
- Don't assume tachycardia is normal in pregnancy – consider other causes

Heart Failure

- High interval weight gain, shortness of breath, edema, fatigue

Importance of continuity of APP/RN to recognize changes more quickly.

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Cardio-Obstetric and Hypertensive Patient

Labs/testing

- Arrhythmia
  - CBC, BMP, Magnesium, TSH
  - Consider EKG vs Zio/Holter
- Heart failure
  - CMP, magnesium, Pro-BNP
  - Echocardiogram if elevated pro-BNP and consult MFM
  - Chest x-ray
- Elevated Blood Pressure
  - Preeclampsia evaluation to include Hemoglobin, Platelets, Creatinine, AST, and Urine protein/creatinine

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Cardio-Obstetric and Hypertensive Patient

Assessment

- Make a diagnosis – helps for risk stratification, recognition for subsequent pregnancies, and understanding risk for future cardiovascular disease

Plan

- Supplies
  - Blood pressure cuff (check blood pressure cuff in clinic/hospital to ensure accuracy)
  - Scale
- Return visits – Consider more frequent visits to reduce risk of admission/worsening disease
- Referral if needed (Cardio-Obstetrics program, Cardiology, Social Work, Perinatal Mental Health, etc.)

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Cardio-Obstetric and Hypertensive Patient

Postpartum

- Pregnancy care doesn't end with delivery
- Heart is still pregnant. Complete normalization of cardiac output can take up to 6 months postpartum.
- Postpartum follow-up
  - 2-3 days after hospital discharge for a blood pressure and weight check, often then weekly until stabilized
  - Consider labs, if indicated
  - Discuss any risks to ongoing health given pregnancy diagnosis (preeclampsia, gestational diabetes, etc)
  - Contraception – Recommend 18-month interval between pregnancies with any hypertensive disorder

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Cardio-Obstetric and Hypertensive Patient

Cardio-Obstetrics Team-Based Management of a Pregnant Patient With Severe Bioprosthetic Aortic Valve Disease

Catherine Bigelow MD [a], Alex Campbell MD [b], Anil Poulose MD [b], Heidi Sannes CNP [a], Cassie Longtin RN [a], David Lynch-Salamon MD [a], Retu Saxena MD [b c]

https://doi.org/10.1016/j.jaccas.2023.102197

Abstract

A 38-year-old pregnant patient was managed by the cardio-obstetrics multidisciplinary team for severe degenerative bioprosthetic aortic valve failure. She was medically managed utilizing echocardiogram and brain natriuretic peptide until she demonstrated worsening heart failure. A valve and cardio-obstetrics team evaluation led to valve-in-valve transcatheter aortic valve replacement at 30 weeks' gestation.

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Cardio-Obstetric and Hypertensive Patient

Pearls

- History of cardiovascular disease or hypertension
- Vitals are Vital!
  - Know blood pressure normal values for pregnancy (<140/90) and postpartum (<130/80).
  - Weight changes (total weight gain, interval weight changes - pregnancy and postpartum).
- Assessment
  - Reflexes, clonus, edema (degree of edema and comparison to previous visit), and heart/lung assessment
- Rule out the heart before you blame the pregnancy

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Diabetic Obstetric Patient

Subjective & Objective

- Individual blood sugar numbers (fasting and 1 hour postprandial) since last visit
- Diet history (timing and typical foods), skipping meals?
- Snacks (typical snack, consistency, bedtime snack?)
- Symptoms of hyperglycemia or hypoglycemia
- Concerns from patient (supplies, insulin, dietary instructions)
- Vital signs

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Diabetic Obstetric Patient - Glucose Monitoring

Glucometer

- Fasting and 1 hour postprandial
- Order supplies (glucometer, test strips, lancets) and start testing prior to consult

Continuous Glucose Monitor

- Dexcom 7 (10 day monitor)
- Libre 3 (14 day monitor) or Libre 3 + (15 day monitor)
- Insurance may not cover if not prescribed insulin

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Diabetic Obstetric Patient

Continuous Glucose Monitor

- Sensor Application and Adhesion Guide | FreeStyle Libre Family of Personal CGMs

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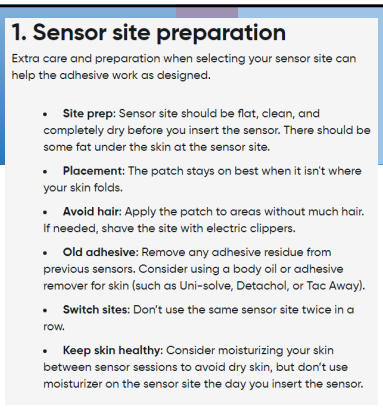
Diabetic Obstetric Patient

Continuous Glucose Monitor

- What can I do to keep the G7 adhesive patch from peeling off my body?



1. Sensor site preparation

Extra care and preparation when selecting your sensor site can help the adhesive work as designed.

- **Site prep:** Sensor site should be flat, clean, and completely dry before you insert the sensor. There should be some fat under the skin at the sensor site.
- **Placement:** The patch stays on best when it isn't where your skin folds.
- **Avoid hair:** Apply the patch to areas without much hair. If needed, shave the site with electric clippers.
- **Old adhesive:** Remove any adhesive residue from previous sensors. Consider using a body oil or adhesive remover for skin (such as Uni-solve, Detachol, or Tac Away).
- **Switch sites:** Don't use the same sensor site twice in a row.
- **Keep skin healthy:** Consider moisturizing your skin between sensor sessions to avoid dry skin, but don't use moisturizer on the sensor site the day you insert the sensor.

2. Adhesive patch care

- **First 12 hours:** The longer you keep it dry and sweat-free in the first 12 hours, the longer it may stick to your skin.
- **Keep dry:** When your sensor gets wet, gently pat it dry as soon as you can.
- **Maintenance:** If the sensor patch starts to peel around the edges, trim the peeled parts and put on medical tape.
- **Smooth patch:** Get some help applying your overpatch to ensure a smooth application without wrinkles.

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Diabetic Obstetric Patient – Cultural Considerations

Special Diets, Cultural/Traditional Foods

- White rice - consider switch to brown rice, reduce portion, add protein
- White bread – consider switch to whole grain bread

Ramadan

- It is the ninth month of the Islamic calendar and is the holy month of fasting. The Islamic calendar is 12 months long with each month 29-30 days, except the 12th month which is varied in order to keep the calendar in synch with the phases of the moon. This year was 3/10/24 - 4/9/24. Next 2/28/25 - 3/30/25
- Observant Muslims who choose to fast eat one meal before sunrise and another before sunset.
- Pregnancy and breastfeeding are considered exemptions to fasting.
- Asking if they plan to fast is helpful as they may not reveal that.

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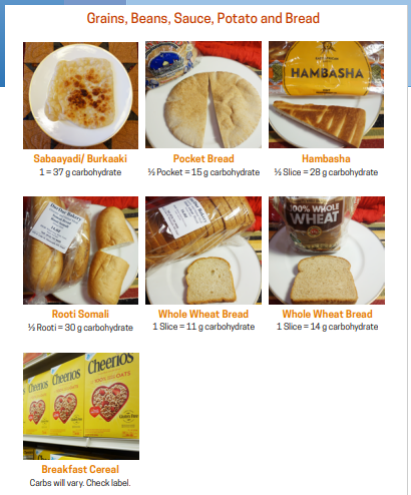
Diabetic Obstetric Patient

Somali Carbohydrate Counting Guide

Somali_carbohydrate_counting.pdf (ymaws.com)



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Diabetic Obstetric Patient

Sick days

- Blood sugars may run high, but no need to "chase" unless over 200.
- If eating, keep same insulin.
- If not eating, can decrease long-acting insulin to half and hold LOG.

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Diabetic Obstetric Patient

Hypoglycemia

- Treat if blood sugars in the 50s or if symptomatic in the 60s with 4oz juice and recheck blood sugar every 15 minutes until >60
- Avoid treating hypoglycemic symptoms with blood sugars 70 or more.
  - Explain symptoms will improve over the course of weeks as the body adjusts to a lower blood sugar.

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Diabetic Obstetric Patient

Cesarean Section Instructions

- Regular insulin the day prior to scheduled delivery.
- Day of delivery, half dose of long acting and no “log”/rapid acting insulin.

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Diabetic Obstetric Patient

Pearls

- Social Support
- Team approach for success
- Frequent touch points for questions

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Case Presentation

G4P1021

BMI 66

Chronic vs Gestational hypertension in first pregnancy

- Required 6 weeks of antihypertensives postpartum, not currently on antihypertensives
- Occasionally had systolic blood pressures >140 between pregnancies
- Taking aspirin 81mg daily

Asthma

History of postpartum anxiety

OB history: Vacuum assisted vaginal delivery

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Case Presentation

Transfer of Care with APP 16w6d

- Blood pressure 142/95, Pulse 107
- EKG – Normal sinus rhythm
- TSH 0.83
- Early 1 hour glucose 121
- Prescribed labetalol 200mg twice daily
- Sleep study ordered and Weight management referral
- Home blood pressure monitoring (Home cuff compared to clinic cuff for accuracy)

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Case Presentation

Pregnancy Course

- Blood pressures rising and occasionally >140/90
  - Labetalol 200mg every 8 hours at 23w4d
  - Elevated blood pressure in clinic at 33w5d, preeclampsia labs and increased labetalol
  - Mild range blood pressure at 34w1d, repeat labs and increased labetalol; home cuff rechecked to ensure accuracy
    - Ongoing blood pressure rise at 36w5d and asked to return to the clinic in 3 days
  - Weight rising 32-33w (+6lb in 2 weeks; Total weight gain 18lb)
- Elevated 1 hour glucose 152 at 23w4d & 3-hour GTT (97, 197, 188, 109)
  - Start checking blood sugars (fasting and 1 hour postprandial)
  - Discussed diet, insulin and supplies ordered at 27w6d.
  - MPP Diabetes Program consult at 28w5d - insulin started and continuous glucose monitor placed
  - Diabetes management with each OB visit for titration of insulin/diet education
- New diagnosis of obstructive sleep apnea at 27w3d
  - Qualified for PAP therapy
- Large for gestational age fetus 27w6d
  - No longer LGA by 31w6d, no polyhydramnios
- Asthma
  - Using albuterol inhaler more frequently at the county fair, discussed long-acting inhaler if ongoing issues
- Lower Extremity Abrasion at 33w5d
  - Started on bactroban, concern for poor perfusion/wound healing

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Case Presentation

Pregnancy Course

- Worsening symptoms – Admission at 37w1d for chronic hypertension with superimposed preeclampsia
  - Headache, feels "not well", taking cyclobenzaprine with no relief, vision changes
  - Mild range blood pressures 156/80 with severe range blood pressures at home
  - +4 lower extremity edema, +4lb in 3 days
  - Patient discussed with inpatient MFM. Admission indicated for induction of labor and labs.
  - Labs: Platelets 244, Creatinine 0.47, AST 18, Urine PCR 0.1
- Delivery via primary low segment transverse cesarean section after fetal heart rate decelerations, failed forceps (difficulty articulating forceps due to soft tissue anatomy) & vacuum three pop offs, thus cesarean section was pursued. True knot noted at time of delivery.
  - Postpartum Hemorrhage QBL 1236mL

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Case Presentation

Postpartum Course

- Antihypertensives titrated, furosemide started
- Magnesium sulfate x 24 hours postpartum
- Continuous glucose monitor – Fasting blood sugars mostly <95
- Discharged on POD #5
  - -3lb with furosemide
  - Enalapril 10mg twice daily, Labetalol 800mg every 8 hours, Furosemide 20mg twice daily x 2 additional days
- Clinic visits
  - POD #10: Blood pressures still elevated (>130/80), -4lb in 5 days, reported shortness of breath in the hospital (none currently), +3 lower extremity edema, incision appropriate and inter-dry placed
    - Prescribed furosemide 20mg twice daily x 3 additional days, add Nifedipine XL 30mg daily
    - Labs: Hemoglobin 8.6 (previous 8.1), Platelets 441, Potassium 5.0, Magnesium 2.0, Creatinine 0.80 (previous 0.58), AST 29, pro-BNP 358
  - Phone call POD #11
    - Review labs, order echocardiogram
    - Increased Nifedipine XL to 30mg twice daily
    - Follow-up 1 week

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Maternal Complications

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MPP APP Team

Questions?

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