Community Care
OF NORTH CAROLINA

Pregnancy Medical Home Program Care Pathway:

Management of obesity in pregnancy

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A. Background

Obesity is the most common health problem in women of reproductive age. Approximately 34% of women have a BMI > 30 and 7.5% have a BMI > 40.[1] In North Carolina, 33% of pregnant women receiving care at a Pregnancy Medical Home had a BMI>30.[2] In this care pathway we provide suggestions for the care of the obese pregnant patient. For detail behind these recommendations, please review the references included below.

This pathway focuses on two patient groups:

- Patients with BMI >30 - 40 Class I/II Obesity
- Patients with BMI >40 Class III Obesity

Guidance for the management of pregnancy in a patient of any weight with a history of bariatric surgery can be found in Appendix A of this document.

B. Preconception Care: Care of the obese patient should focus on two priorities prior to conception: identification and management of comorbid conditions and aggressive weight loss management. Pregnancy outcomes improve with control of medical comorbidities but weight loss will also reduce the risk of obesity-related complications during a subsequent pregnancy.

1. Screen for co-existent metabolic syndrome/other co-morbid conditions:
    a. Diabetes
    b. Hypothyroid
    c. Lipid abnormalities
    d. Hypertension
    e. Nonalcoholic steatohepatitis (NASH) syndrome

2. Weight loss strategies:
    a. Nutritional consultation
    b. Exercise
    c. Referral for bariatric surgery
        i. BMI > 40
        ii. BMI > 35 with 2 comorbid conditions
    d. Folic acid supplementation: 1 mg daily

C. Antepartum Care
1. First trimester
    a. Screen for comorbid conditions:
        i. HgbA1c/early gestational diabetes screening
        ii. Metabolic panel
        iii. TSH
        iv. Urine protein/creatinine ratio
        v. Consider maternal EKG in patients with BMI >40 and in those with BMI > 30 and co-morbidities
    b. Nutritional information/consultation:
        i. Recommended weight gain per Institute of Medicine is 11-20 pounds[3]
        ii. Folic acid supplementation – 1mg/daily
    c. Discuss perinatal risks:
        i. Fetal anomalies - Obesity increases risk of fetal anomalies and decreases likelihood of detecting anomalies[4]
        ii. Gestational diabetes
        iii. Preeclampsia
        iv. Macrosomia
        v. Cesarean section/wound complications
        vi. Stillbirth
    d. Ultrasound for accurate dating
    e. Suspected sleep apnea
        i. Snoring, excessive daytime sleepiness, witnessed apneas, or unexplained hypoxia
        ii. Refer to a sleep specialist if needed
    f. Consider high-risk obstetrics (HROB) or maternal-fetal medicine (MFM) consult per institutional protocol or for BMI > 50
    g. Low dose aspirin - 81 mg daily for BMI > 40 or for BMI > 30 with additional risk factor, initiated between 12-16 weeks of gestation, up to 28 weeks of gestation if delayed entry to prenatal care

2. Second trimester
    a. Monitor weight gain
    b. Detailed anatomy ultrasound – limitations should be addressed with patient
    c. Consider OB Anesthesia consult per institutional protocol or for BMI > 50

3. Third trimester
    a. Repeat gestational diabetes screening
    b. Consider serial growth ultrasound if pannus precludes accurate fundal height assessment
    c. Consider weekly NST/AFI after 36 weeks
    d. Consider referral to HROB/MFM for delivery planning based on Institutional protocol or with BMI > 50

D. Delivery
1. Induction per institutional protocol
    a. Timing and method per local preference
    b. Consider pneumatic compression devices for those with prolonged bed rest with induction
2. Cesarean delivery:
    a. In patients with BMI >60, there are instances where inability to perform emergent cesarean may preclude attempt at vaginal delivery and primary cesarean is recommended
    b. Consider 3 grams cefazolin with cesarean delivery
    c. Consider Hibiclens® shower/wipe prior to cesarean
    d. Operative prep per local protocol
    e. Pneumatic compression devices for all cesarean patients
    f. Consider a negative pressure wound dressing in high risk patients (BMI > 40, chorioamnionitis in labor, prolonged labor, preeclampsia with significant edema)
    g. Occupational/physical therapy consult post-delivery if difficulties with wound care and or daily living are anticipated
3. Consider low molecular weight heparin prophylaxis in highest risk patients (BMI > 50, chorioamnionitis in labor, prolonged labor, preeclampsia)[7]
    a. Initiate at 12-24 hours post delivery
        i. 40 mg BID BMI 40-60
        ii. 60 mg BID BMI >60

E. Postpartum

See the Pregnancy Medical Home Care Pathway on Postpartum Care and the Transition to Well Woman Care for detailed guidance about timing of postpartum care and the content of the comprehensive postpartum visit.

1. Incisional check at 5-7 days with external wound vacuum removal, if utilized
2. Comprehensive postpartum visit:
    a. Depression screen at comprehensive postpartum visit
    b. Review contraceptive options: IUD or implant are preferred methods
    c. Encourage breastfeeding
    d. Nutritional counseling
    e. Exercise
3. Ensure transition to primary care provider
4. Consider bariatric surgery referral
    a. BMI > 40
    b. BMI > 35 with 2 co-morbid conditions

F. References

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Note: Pregnancy Medical Home Care Pathways are intended to assist providers of obstetrical care in the clinical management of problems that can occur during pregnancy. They are intended to support the safest maternal and fetal outcomes for patients receiving care at North Carolina Pregnancy Medical Home practices. This pathway was developed after reviewing ACOG resources such as practice bulletins, committee opinions, and Guidelines for Perinatal Care as well as current obstetrical literature. PMH Care Pathways offer a framework for the provision of obstetrical care, rather than an inflexible set of mandates. Clinicians should use their professional knowledge and judgment when applying pathway recommendations to their management of individual patients.

Appendix A. Management of pregnancy in patients with a history of bariatric surgery

1. Preconception

A. 80% of patients undergoing bariatric surgery are women of reproductive age

B. NIH bariatric surgery indications:
- ≥ 100 lb excess weight
- BMI ≥ 40 kg/m^2 without obesity-associated co-morbidities (DM, CV disease, sleep apnea)
- BMI 35-39.9 kg/m^2 with 1 or more associated medical problems
- Previous weight loss attempts

Pregnancy Outcomes After Bariatric Surgery		
	Absolute risk	Relative risk
BENEFITS		
Macrosomia (>4000 g) (4)	1.1 vs 0.6%	OR .4 (0.2-0.8)
HTN disorder (4)	7.8 vs 2.2%	0.4 (0.3-0.6)
DM (total) (4)	5.7 vs 2.2%	0.6 (0.4-0.9)
Gestational DM (6)		0.4 (0.3-0.8)
Perineal laceration (5)	23.0 vs 12.5%	0.4 (0.3-0.8)
RISKS		
Cesarean section (6)		1.34 (1.1-1.7)
Small for gestational age (6)		2.7 (2.0-2.7)
Preterm birth (6)		1.4 (1.01 – 2.03)
PPROM (1)		1.9 (1.3-2)
NO CHANGE		
Miscarriage (7)	21.6 vs 26.0%	
Congenital anomaly (8)	4.1 vs 3.4%	

C. Three primary bariatric approaches:

i. Gastric lap band (restrictive)
- Less effective long term
- 50% complication rate

ii. Vertical sleeve gastrectomy (restrictive)

iii. Roux-en Y (restrictive and malabsorptive)

D. Future Pregnancy
   i. Recommend reviewing risks and benefit of pregnancy outcomes after bariatric surgery (see table)
   ii. No difference in pregnancy outcomes between malabsorptive and restrictive procedures. (1)
   iii. Recommend delaying pregnancy 18-24 months post-surgery.

E. Contraceptive counseling
   i. Recommend contraceptive counseling prior to bariatric surgery. Adolescents are the fastest growing group undergoing bariatric surgery and are twice as likely to become pregnant compared to general adolescent population.
   ii. Oral contraceptive pill absorption decreased in Roux en Y; consider non-oral contraceptives.

2. Initial Prenatal Visit and First Trimester

A. Recommend maternal fetal medicine consultation; consider transfer of care
B. Consider proton pump inhibitor given increased risk of ulcers and reflux
C. Consider 81 mg aspirin daily for preeclampsia prevention
D. Nutritional considerations:
   i. Review Institute of Medicine weight gain goals based on pre-gravid BMI.
   ii. Recommend nutrition consultation
   iii. Recommend protein 60-80 g/day
   iv. Recommend prenatal PNV (with 400 mcg folic acid) <u>and</u> MVI containing vitamin B1 1.2 mg, vitamin K 90 mcg, biotin 30 mcg, zinc 8 mg, folate 400 mcg, iron 18 mg
   v. Ensure vitamin A supplementation ≤ 5000 international units (IU)/day: vitamins with beta-carotene, the pre-form vitamin A, which is not teratogenic, are preferred. Retinyl acetate and retinyl palmitate in doses of > 5000 IU/day may be teratogenic.
   vi. After malabsorptive surgery (Roux en Y):
      - Vitamin B12 500-1000 mcg oral or sublingual daily
      - Calcium citrate 1200-2000 mg with Vitamin D 400-800 IU daily
   ii. After restrictive surgery (Lap band):
      - No consensus regarding nutritional supplementation
      - Consider early consultation with bariatric surgeon to adjust band for nausea/vomiting in first trimester

E. Labs:
   - CBC
   - Ferritin
   - Iron
   - Vitamin B12
   - RBC folate (not serum folate which reflects recent oral intake)
   - Vitamin D

- Calcium
- Oral intake absorption of medications may be decreased. If therapeutic drug levels are critical, test drug levels

3. Second Trimester
   A. DM screening:
      i. 50% cannot tolerate glucola due to dumping syndrome (abdominal cramping, bloating, nausea, vomiting from fluid shifts post hyperosmolar fluid intake causing small bowel distension).
      ii. If able to drink a 12 oz soda, likely able to tolerate one hour 50 g glucose tolerance test
      iii. Alternative DM screening:
         1. Fasting and post-breakfast glucose checks x 1 week between 24-28 weeks
         2. IV glucose tolerance test (9)
         3. HgA1C > 6.5%: test screens for type 2 diabetes but NOT gestational diabetes mellitus

   B. Labs:
      - CBC
      - Iron
      - Ferritin
      - Calcium
      - Vitamin D
      - Drug levels as needed
      - Diabetes screen at 24-28 wks +/- early screen based on BMI

4. Third Trimester
   A. Most women remain obese after surgery and may require labor induction, more oxytocin and have longer labor than non-obese women. (1)
   B. History of bariatric surgery is not an indication for cesarean delivery
   C. Consider prelabor consultation with bariatric surgeon if extensive abdominal surgery
   D. Use caution with NSAIDs to avoid gastric ulceration.
   E. Contraceptive counseling particularly if desiring OCPs and s/p Roux-en-Y as absorption may be compromised
   F. If breastfeeding, encourage calcium citrate supplementation 1500 mg, vitamin D 400-800 IU & vitamin B12 500-1500 mcg daily
   G. Drug levels as needed

5. Postpartum
   A. Use caution with NSAIDs to avoid gastric ulceration.
   B. Contraceptive counseling particularly if desiring OCPs and s/p Roux-en-Y as absorption may be compromised
   C. Recommend lactation consult if breastfeeding

D. If breastfeeding, encourage calcium citrate supplementation 1500 mg, vitamin D 400-800 IU & vitamin B12 500-1500 mcg daily

6. Special Considerations
   A. Avoid extended release medication preparations; oral solutions and rapid releasing preparations are preferred.
   B. Recommend high suspicion for gastro-intestinal complications in pregnant women with significant abdominal symptoms. Consider surgery consultation if patient presents with abdominal pain, nausea, vomiting or other abdominal symptoms.

7. References

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