Clinical Guideline

OBESITY IN PREGNANCY; INCLUDING PREGNANCY FOLLOWING BARIATRIC SURGERY

SETTING Division of Women's & Children's Services St Michael's Hospital

FOR STAFF Midwifery, Nursing & Obstetric Staff

PATIENTS Pregnant women with BMI of 30 or above and woman who have undergone bariatric surgery

CONTENTS OF GUIDELINE

1. BACKGROUND

21.3% of the antenatal population are obese. This has significant impact on maternal, fetal and neonatal outcomes. MBRRACE-UK reported that 34% of women who died between 2015-2017 were obese. Obesity is defined as a body mass index (BMI) of ≥30. The table below shows the full World Health Organisation classification of BMI.

Body Mass Index (kg/m^2)	WHO Classification
<18.5	Underweight
18.5-24.99	Normal range
≥25	Overweight
25-29.99	Pre-obese
30-34.99	Obese class I
35-39.99	Obese class II
≥40	Obese class III

2. PRE-PREGNANCY CARE

Women should be encouraged to optimise their weight before pregnancy. Advice on weight and lifestyle should be provided in primary care during preconception counselling or contraceptive consultations; weight and BMI should be measured. Women with a BMI of 30 or above should be advised of the risks of obesity in pregnancy (see below) and supported to lose weight before conception and between pregnancies. Weight loss reduces the risk of complications of pregnancy

and increases the chances of successful vaginal birth after caesarean (VBAC). Women should be advised to take folic acid 5mg daily for at least one month prior to conception and during the first trimester. Obesity is associated with a higher risk of vitamin D deficiency; supplements should be considered.

3. RISKS RELATED TO OBESITY IN PREGNANCY

Maternal risks:

- Increased risk of maternal death or severe morbidity.
- Spontaneous first trimester miscarriage.
- Cardiac disease.
- Hypertensive disorders in pregnancy.
- Gestational diabetes.
- Venous thromboembolic disease.
- Dysfunctional/prolonged labour.
- Induction of labour.
- Caesarean section.
- Post-partum haemorrhage.
- Wound infection.
- Anaesthetic complications.

Fetal/neonatal risks:

- Stillbirth and neonatal death.
- Congenital abnormality.
- Macrosomia/shoulder dystocia.
- Prematurity.
- Obesity and metabolic disorders in childhood.

Overweight women are also less likely to initiate and maintain breast-feeding.

4. ANTENATAL CARE

General Antenatal Care

The following advice applies to all women with a BMI of ≥30. Women should be treated sensitively at all times. The following should be offered in addition to the care recommended in the guideline [redacted]

- All pregnant women should have their height and weight measured and their BMI calculated at the antenatal booking visit (ideally by 10 weeks gestation). This should be documented on the electronic patient system and in the handheld maternity notes. This should be repeated in the third trimester.

- All women should be signposted to information about weight management in pregnancy. Use either the RCOG patient information leaflet [redacted] or refer to the Tommys website https://www.tommys.org/pregnancy-information/im-pregnant/weight-management

- Women should be offered referral to weight management services; options include North Somerset HEN (Health Exercise and Nutrition in Pregnancy) or referral to the UHBristol Dietetic Services via a Medway service order.

- Use a large cuff for blood pressure monitoring if arm circumference is >35cm. Document the size of cuff used in the medical notes.
- A midwife/obstetrician should discuss and document possible risks and complications in pregnancy with obesity (***see sticker appendix 1***).
- Women should be risk assessed for hypertension and offered aspirin 150mg once daily from 12 weeks gestation until 36 weeks gestation if indicated.
- Women should be screened for gestational diabetes in accordance with local guidance at 24-28 weeks. This should be repeated in third trimester if recurrent glycosuria. [redacted]
- Obese women have a pre-existing risk factor for developing VTE during pregnancy. Patients should be risk assessed and antenatal and postnatal VTE prophylaxis should be considered according to the guideline [redacted]
- There is an increased risk of mental health problems in women with a BMI ≥30 and women should be routinely screened for these in pregnancy.

Antenatal Screening

In accordance with routine care, all women should be offered antenatal screening for chromosomal abnormalities. Obese pregnant women are at a greater risk of a range of structural abnormalities including neural tube defects, cardiovascular anomalies and clefts. Counsel that some forms of screening for chromosomal anomalies are less effective in women with a raised BMI. Screening for structural anomalies is also more limited in obese pregnant women. Consider transvaginal ultrasound scan if it is difficult to obtain nuchal translucency measurements.

Women with BMI 30-34.99

Community Midwife booking

1. Complete BMI sticker
2. Provide Weight management information
3. Offer referral to weight management services
4. Advise Folic Acid 5mg daily until 12 weeks
5. Advise pregnancy vitamins
6. Complete VTE risk assessment
7. Complete Hypertension risk assessment and advise Aspirin if indicated
8. Arrange GDM screening at 24-28 weeks

- If no additional risk factors identified can remain under midwife led care
- If additional risk factors identified refer for obstetric care

- Normal schedule of antenatal appointments with assessment of fetal growth using serial measurement of SFH from 24 weeks
- Reassess weight at 36 weeks gestation

Women with BMI of 35 or greater

Community Midwife booking

1. Complete BMI sticker
2. Provide Weight management information
3. Offer referral to weight management services
4. Advise Folic Acid 5mg daily until 12 weeks
5. Advise pregnancy vitamins
6. Complete VTE risk assessment
7. Complete Hypertension risk assessment and advise Aspirin if indicated
8. Arrange GDM screening at 24-28 weeks
9. **Refer to Consultant Clinic**

Consultant Clinic

- Discuss risks of obesity in pregnancy
- Complete BMI sticker (if not already completed by CMW)
- Reassess weight at 36 weeks gestation
- **Serial ultrasound assessment of fetal size**

If BMI 45 or greater or over 40 plus other medical issues

Antenatal Obstetric Anaesthetist review

e-mail pt. details to [redacted]

- assess difficulty with venous access, regional and general anaesthesia
- discuss & document anaesthetic plan for labour and birth

Refer women to [redacted]

Planning Labour and Birth

- The midwife should complete moving and handling risk assessment and complete tissue viability and pressure area risk assessment in 3rd trimester
- All women should have an informed discussion with their community midwife, obstetrician and anaesthetist (if indicated) antenatally with a documented plan for labour and birth.
    - Unless there are additional risk factors women with BMI 30-34.9 can opt for home birth or birth in a midwife-led unit (either Ashcombe Birth centre in Weston or St Michael's Co-located MLU)
    - In addition Multiparous women with BMI 35-39.9 and previously uncomplicated births may be suitable to give birth on the co-located midwife led unit (MLU).
    - The additional intrapartum risks from obesity should be discussed with the woman so she can make an informed choice about place of birth.
    -
- Multiparous women with a BMI <40 and no other co-morbidity can give birth on co-located MLU if fetal heart auscultation can be achieved.
    - These women can give birth in water if they have good mobility to allow swift exit from the pool and if fetal heart can be auscultated effectively.
- All women with a BMI ≥40 should deliver in a consultant led unit and should be advised that a home or water birth **is not** recommended. If the mother is keen for a water birth, individual risk assessment should be carried out.
- If BMI ≥50 inform CDS matron to request a Traxi Panniculus Retractor.

- Women with a booking BMI ≥30 should have an individualised decision for **VBAC** following informed discussion as per RCOG green top guideline 45 *Birth after Previous Caesarean Section*.
- Active management of the third stage of labour should be recommended for all women.
- Elective induction of labour at term in obesity may reduce the chance of Caesarean birth without increasing adverse outcomes (retrospective cohort studies). Therefore, induction should be discussed with women on an individual basis.
- Decision for planned Caesarean section should involve MDT discussion considering antenatal course, co-morbidities and patient wishes.
- Where macrosomia is suspected, induction of labour may be considered as per routine induction of labour guidance.

5. CARE IN LABOUR

General Care in Labour

- Care for women in labour should follow NICE clinical guideline 190 – intrapartum care for healthy women and babies. There is no evidence to support continuous fetal monitoring during labour in the absence of other co-morbidities, medical or obstetric complications. Follow local guidelines [redacted] and [redacted]
- Consider re-assessment of maternal weight on admission to delivery suite to ensure accurate.
- Management of labour should be undertaken by the multi-professional team with early anaesthetic review
- Consider early siting of epidural if patient likely to require/ request an epidural, to avoid emergency anaesthetic procedures.
- Ensure continuous midwifery care in established labour.
- Routine IV access is not required unless it is predicted to be difficult (if BMI ≥40 see below).
- Fetal Scalp Electrode should be applied when the CTG is of poor quality with the abdominal transducer.
- Active management of third stage is recommended.

Additional measures if BMI 40 or above

- The on-duty anaesthetist should be informed of admission in to delivery suite and this should be documented in the notes.
- Continuous midwifery care should be provided in established labour with consideration of measures to prevent pressure sores.
- IV access should be gained when in established labour with consideration to siting of a second cannula.
- Moving and handling risk assessment should be clearly communicated between the delivery suite and theatre suites

Operative delivery

Both Obstetric Theatres can be used for Caesarean Section or Instrumental delivery.
Avoid inappropriate manual handling. Where unavoidable ensure safe manual handling at all times.
Ensure the use of appropriate operating table.
Inform Senior registrar (ST6 equivalent or above)/consultant obstetrician and senior anaesthetist. They should be available for delivery.

Caesarean section:

- Consider use of extra assistants and involvement of general surgeons if there is a large abdominal apron.
- Consider use of Alexis-O retractor for women with BMI ≥ 45.
- Consider use of Traxi Panniculus retractor for women with BMI > 50.
  - This should have been agreed with the consultant.
  - Ask Band 7 midwife/theatre co-ordinator for availability.
- There is little evidence to support one surgical approach over another. However, generally recommend:
  - Suturing of the subcutaneous tissue should be undertaken in women with > 2cms of subcutaneous fat.
  - Consider interrupted proline for closure of the skin incision.
  - Consider the PICCO dressing for women with BMI > 40

Equipment (appendix 2)

- The Hill Rom delivery bed is suitable for use in women of up to 227kg.
- Both Obstetric theatres have the Maquet theatre table which is suitable for use in women of up to 460kg.
- Following manual handling assessment in third trimester, if additional equipment is required, inform Matrons (Intrapartum and Inpatient Services) to ensure additional Bariatric equipment is available (see appendix 3 & 4).
- Large BP cuffs are available in all care settings.

6. POSTNATAL CARE

Women should be given appropriate postnatal support and specialist advice regarding the benefits, initiation and maintenance of breastfeeding as obesity is associated with low breastfeeding rates.

Postnatal VTE risk assessment should be undertaken and Thromboprophylaxis should be recommended in accordance with local guideline [redacted]

Contraceptive advice should be given considering obesity as a risk factor. Progesterone based contraceptives should be advised.

Women should be informed that weight loss between pregnancies reduces the risk of stillbirth, hypertension and fetal macrosomia; weight loss increases the chances of successful VBAC. Women with obesity should continue to be offered nutritional advice following childbirth. Women should be supported to lose weight postnatally and referred to weight management services where available.

7. CARE FOLLOWING PREVIOUS BARIATRIC SURGERY

All pregnancies should be consultant led and classified as high-risk pregnancies.

70% of women who have bariatric surgery are women of childbearing age. Resumption of menstruation is seen in 51-70% of women. Studies suggest an increased risk of NICU admission, SGA and preterm delivery if conception is within 2 years of surgery. A minimum period of 12-18 months after bariatric surgery is recommended before attempting pregnancy to allow body weight stabilisation and identification and treatment of nutritional deficiencies. Bariatric surgery includes gastric banding, sleeve gastrectomy and gastric bypass. All methods reduce oral intake and

therefore affect nutritional intake. Sleeve gastrectomy and bypass can directly affect nutritional absorption.

Nutritional Surveillance and Supplementation

Women with previous bariatric surgery should be referred to a dietician for advice regarding specific nutritional needs. Energy requirements should be individualised and dietician input is recommended. General recommendations include a diet consisting of lean protein, fruit and vegetables with low GI carbohydrates. Patients may need 5-6 small meals daily and should be advised 20p size mouthfuls, chew 20 times for 20 seconds and then wait a minute before next mouthful. Wait at least 30 minutes after eating before heaving fluids. Aim for 1.5L a day of fluid.

Gastric bands should be deflated in early pregnancy and as pregnancy advances if there is vomiting or inadequate oral intake.

Nutritional surveillance with screening for deficiencies in pregnancy should be performed. Common vitamin deficiencies include vitamin B12, vitamin D, folate and iron. Recommended blood tests to check at least once per trimester include:

- FBC, serum B12, folate, ferritin.
- Clotting – prothrombin time and INR
- U and Es.
- LFTs.
- Vitamin D, calcium, phosphate, PTH.
- Vitamin A & K
- Magnesium.

In addition in women who have undergone Gastric Bypass or Gastric Sleeve surgery

- Vitamin E
- Serum zinc, copper and selenium.

Screening for Gestational Diabetes should be undertaken if there is a personal history of diabetes or if other risk factors are present.

- At booking HbA1c and fasting blood glucose
    - Treat as type 2 diabetes if HbA1c > 48 mmol/ml or fasting blood glucose ≥ 7.0 mmol/l
- At 24 - 28 weeks
    - Oral Glucose Tolerance test is suitable for women who have undergone Gastric band but should be avoided in women who have undergone Gastric Bypass or Gastric Sleeve surgery as there is a risk of intestinal dumping syndrome.
    - If unsuitable for OGTT offer fasting and post meal capillary blood glucose monitoring for 1 week
    - Repeat HbA1c if there is a personal history of Diabetes

The following nutritional supplementation is recommended for all women

- A-Z vitamin supplement (forceval recommended) – One per day. **Ensure vitamin A component is B carotene (not retinol).**
- Adcal D3 - one twice daily.
- Vitamin D - 25 micrograms twice daily.
- Folic acid - 5mg once daily.

- Thiamine - 50-100mg once daily
- If gastric bypass or sleeve gastrectomy: also ferrous gluconate 300mg once daily, vitamin B12 1mg IM 3 monthly.

Additional Thiamine supplementation may be required in Hyperemesis Gravidarum.

Fetal growth surveillance should be undertaken in the third trimester as there is a greater risk of growth restriction.

Women should be weighed in each trimester to ensure adequate weight gain; weight should be maintained in the first and second trimesters with optimal weight gain of 7-9 kg in the third trimester.

Complications of Previous Bariatric Surgery

Dumping syndrome often occurs 30-60 minutes after food with rapid emptying of hyperosmolar contents into the small bowel. Patients experience vasomotor symptoms. Follow dietary advice above and avoid causative food.

Post bypass hypoglycaemia can also occur more rarely 1-3 hours after food with associated symptoms. Dietary modifications can help including regular eating, low GI foods, protein with each meal and no fluid with food. Thiamine 100mg BD can improve carbohydrate metabolism. Restrict carbohydrate to 30g each meal.

Bowel obstruction is increased due to internal small bowel hernia.

Cholelithiasis (Gallstones) is increased by pregnancy.

Delivery planning

Bariatric surgery is not an indication for caesarean section and normal intrapartum care can be given.

In the event of a Caesarean Section remember:

- Dermatomal changes may exist following abdominoplasty so regional blockade should be tested in the posterior-lateral abdomen
- Excessive abdominal skin may complicate surgery
- Risk of post-operative wound infection is greater.

Postnatal care

If the patient has had a gastric bypass or sleeve gastrectomy then increase multivitamins back up to 2 per day.
Ensure early mobilisation.
Encourage breastfeeding and ensure ongoing nutritional monitoring 3 monthly. Breastfeeding may protect against childhood obesity and complications in later life.
Contraceptive advice should be given; women should be informed that efficacy of oral hormonal contraception may be reduced due altered absorption. Long-Acting Reversible Contraceptives (LARCs) are not affected by Bariatric surgery and as such should be encouraged.

Version 3.1

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REFERENCES	Denison et al. Green Top Guideline Number 72: Care of Women with Obesity in Pregnancy. 2019. *BJOG*. **3**: e62-e106. Shawe et al. Pregnancy after bariatric surgery: Consensus recommendations for periconception, antenatal and postnatal care. 2019. *Obesity Reviews*. **20**: 1507-1522.
RELATED DOCUMENTS AND PAGES	[redacted]
AUTHORISING BODY	Joint Antenatal/ CDS Working Party
SAFETY	No unusual or unexpected safety concerns (to staff or patient)
QUERIES AND CONTACT	Contact [redacted], Consultant Obstetrician; Maternity Matrons; Senior Obstetrician or Coordinating Midwife on CDS, extension [redacted]

Appendix 1

To be completed in all cases of raised BMI (30 and above) and affixed on the antenatal clinic section of the hand held notes)

BMI 30+	*(circle Y or N or tick)*
Offered referral to Weight Management Service	Y / N
GTT arranged for 24-28/40	Y / N
Pre-eclampsia / Gestational diabetes	
Induction of labour	
LSCS/ Instrumental delivery risks	
Venous thromboembolism risks	
Shoulder dystocia/ Large Baby	
Post-Partum Haemorrhage	
Following risk assessment the advice given includes:	
Active management of 3rd stage	
Ensure has Vitamin D and Folic Acid 5mg (until 12/40)	
Hospital birth advised if BMI>35	
Increased anaesthetic risk of failed spinal/epidural & respiratory complications when having a GA	
Anaesthetic review if BMI >45 or if Consultant requests	
Increased risks discussed & explained:	
Sign & Date:	

Appendix 2

Bariatric Equipment Availability in Maternity Services

Equipment	Manufacturer/Model	Location	Weight Capacity
Delivery Beds	Birthright Hill Rom	CDS, St. Michael's Hospital	150 kg 227 kg
Ward Beds	Nesbitt Eleganza	Level E, St. Michael's Hospital	180 kg 250 kg
Chair	Bradfern	Ward 78, St. Michael's Hospital	254 kg
Operating Table	Maquet Alphamaxx ALM	Theatre 1 & 2 St. Michael's Hospital	450 kg 180 kg
Transfer Device	Air Pal Patient Transfer Device	Theatres, St. Michael's Hospital	544 kg (up to 86 stone)
Large Blood Pressure Cuff	▪ CDS (one in each delivery room and recovery ward) ▪ Level E: Two on each ward (76,74,71) ▪ Antenatal Clinic: One ▪ Day Assessment Unit: One ▪ Community (one in each of the 13 community bases		

Appendix 3

Healthy pregnancies after bariatric surgery

Contraception

- Postpone pregnancy until weight has stabilised
- Avoid oral contraception and encourage long-acting reversible contraceptive methods such as IUD

Diet

- Reduce quick-absorbing carbohydrates and opt for protein and low glycaemic index alternatives
- Avoid caffeine and alcohol
- Frequent, smaller meals

Surgical issues

- Inflate and deflate LAGB according to hyperemesis, GWG, and fetal growth
- Assess for internal herniation when abdominal pain is reported and treat promptly

Diabetes

- Avoid OGTT due to risk of dumping syndrome
- Monitor HbA1c every trimester if personal history of diabetes or risk factors
- CGM or seven point CBG between 24 and 28 weeks

Supplements

Vit D >40mcg
Vit E 15mg
Vit K 90-120µg
Thiamine >12mg
Iron 45-60mg
Copper 2mg
Selenium 50µg
Zinc 8-15mg per 1mg copper
Calcium 1200-1500mg
Vit A 5000IU (B-carotene)
Folic acid 0.4mg, 4-5mg for GDM/obesity

Mental health

- Screen for substance abuse, anxiety, or other mental health disorders
- Offer follow up during and after pregnancy

Fetal monitoring

- Monitor fetal growth every trimester
- Assess for congenital anomalies or developmental problems such as intracranial bleeds

Gestational weight gain

- Monitor GWG according to IOM guidelines and screen for associated complications if necessary

Nutrient levels

- Check serum indices (micronutrients, protein and albumin, FBC, INR) after surgery, preconception, and every trimester in pregnancy and supplement as necessary

Breastfeeding

- Breast milk is not compromised after surgery and breastfeeding is recommended
- Monitor maternal micronutrients during lactation

Pregnancy after bariatric surgery: consensus recommendations for periconception, antenatal and postnatal care (2019)
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