Obesity in Pregnancy

Classification:	Guideline		
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Authors Division:	Women's and Children's Health		
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Guideline to be followed by (target staff): All staff working in maternity

To be read in conjunction with the following documents:
None

Are there any eCARE implications? No

CQC Fundamental standards:
Regulation 9 – person centred care
Regulation 10 – dignity and respect
Regulation 12 – Safe care and treatment
Regulation 13 – Safeguarding service users from abuse and improper treatment
Regulation 14 – Meeting nutritional and hydration needs

Disclaimer –

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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Guideline Statement

To achieve a good outcome and experience in managing pregnant women with obesity.

Executive Summary

There is substantial evidence that obesity in pregnancy contributes to increased morbidity and mortality for both mother and baby. The CEMACH Perinatal Mortality 2005 Report found that

approximately 30% of the mothers who had a stillbirth or a neonatal death were obese. Saving Mothers' Lives: reviewing maternal deaths to make motherhood safer: 2006-2008 report (RCOG 2011) identified obesity as a risk factor for maternal mortality. 49% of the women who died (for whom a BMI had been recorded) had BMI of ≥25 and 27% had BMI ≥30.

Increased rates of obesity related morbidity and mortality are reflected in increased social and financial costs:

- Obese women spend an average of 4.83 more days in hospital and the increased levels of complications in pregnancy and interventions in labour represent a 5 fold increase in cost of antenatal care (Galtier-Dereure et al, 2000)
- The costs associated with newborns are also increased, as in babies born to obese mothers there is a 3.5 fold increase in admission to Neonatal Intensive Care Unit (NICU) (CEMACE 2009)
- Maternal obesity and diet during pregnancy creates a metabolic environment that affects fetal growth and may result in later development of metabolic syndrome and cardiovascular disease (Simiri and Goulis, 2010)

Definitions

Body Mass Index **(BMI)** is an index of weight-to-height calculated by a woman's weight in kilograms (kg) divided by the square of height in metres (kg/m2). This protocol is divided into 2 sections, clinical issues and manual handling issues.

- Obesity is defined as a BMI of ≥ 30 m^2
- BMI 30-34.9 CLASS1
- BMI 35-39.9 CLASS 2
- BMI>=40 CLASS 3 (MORBID OBESITY)

1.0 Roles and Responsibilities:

Obstetricians – decision making, discussion, planning care
Midwives – decision making, pre and post birth care
Anaesthetists – clinical assessment and decision making
Back care team – assessment and decision making
Dietitians – dietary advice

2.0 Implementation and dissemination of document

The information within this document will be disseminated throughout the maternity unit by available on the hospital intranet.

3.0 Processes and procedures

3.1 Background and Clinical Issues

- The increase prevalence of obesity in the United Kingdom has been widely publicized and the risks of maternal death among pregnant obese women has been highlighted by the Saving Mother's Lives (CEMACH 2006-2008). 27% of all direct and indirect deaths occurred in women with a BMI of ≥30 (CEMACH 2003-5).
- 34% of all direct and indirect maternal deaths (MBRRACE-UK) 2015-2017
- The key to successful maternity care of women with a raised BMI involve:
  - Multidisciplinary team approach
  - Individualised care to include all risk factors

3.2 Complications

Obesity in pregnancy is associated with an increased risk of both fetal and maternal complications. These include:

Maternal risks	Fetal risks
Death/ severe morbidity	Still birth
Cardiac disease	Neonatal death
Spontaneous miscarriage	Congenital anomalies
Recurrent miscarriage	Prematurity
Pre-eclampsia/ Gestational HTN	Macrosomia
Gestational Diabetes	Shoulder Dystocia
Thromboembolism	Difficulty in intrapartum monitoring
Wound infection	Risk of childhood obesity & metabolic disorders
Post Partum Haemorrhage (PPH)	
Low breast feeding rates	
Anaesthetic complications	
Higher rates of caesarean section	

3.3 Antenatal Care

3.3.1 Booking Assessment and BMI Recording

All women booking for maternity care will have their weight and height measured and their body mass index calculated at the antenatal booking visit. Measurements are recorded in the handheld notes and electronic patient information system

3.3.2 All Women with BMI>30

- Use BMI care pathway plan (Appendix 1) as a guidance to relevant details required to be documented on patients' electronic records (eCare).
- Women wishing to become pregnant should be advised to take 5mg folic acid supplementation daily, starting at least one month before conception and continuing during the first trimester of pregnancy.
- Women are advised to take supplementation 10 micrograms vitamin D, daily during pregnancy and while breastfeeding.

- BP measurements must be taken using the appropriate sized cuff. Document the appropriate size of the cuff on patient's notes.
- Consider aspirin 150 mg once daily if any additional risk factor for pre-eclampsia, eg, Maternal age, previous pre-eclampsia, essential hypertension.
- Discussion of healthy eating and exercise during pregnancy and need to avoid excessive weight gain. While pregnancy may not the appropriate time to lose weight, however, limited weight gain during pregnancy may lower risks of complications during pregnancy and postpartum period.
- All patients need VTE risk assessment using the VTE risk assessment tool on eCare. In the presence of 3 risk factors antenatal thromboprophlaxis from 28 weeks and postnatal thromboprophylaxis for 6 weeks would be required.

- Refer for OGTT at 24-28 weeks for screening for gestational diabetes.
- Documented discussion of the possible intrapartum risks and ways to minimize these risks:
  - Difficulties with fetal monitoring and may need fetal scalp electrode
  - Increased incidence of slow progress in labour
  - Increased incidence of shoulder dystocia
  - Increased risk of emergency Caesarean section and that Caesarean may be technically more difficult, with increased risks of operative complications.
  - Less chance of successful VBAC
  - Need to prioritise the safety of the mother at all times and use a multidisciplinary approach for decision making
  - Increased incidence of primary post partum hemorrhage
  -
- Obesity is associated with low breast feeding initiation and therefore, women with a booking BMI >30 should receive appropriate specialist advice regarding the benefits of breast feeding, including advice on Colostrum harvesting at 36 weeks gestation.

3.3.3 Additional Steps for Women with BMI ≥35

Please follow all steps as for BMI > 30 and these additional steps:

- Refer the patient for Consultant-led care and plan for a delivery in hospital, combined consultant and community midwifery antenatal care may be considered following consultant review provided the appropriate BP cuff is available at the community.
- Serial growth scans to be arranged from 26-28 weeks until delivery, with estimated fetal weight plotted on growth charts.
- Given the statistically significant increased risk of severe maternal morbidity and mortality, women with BMI >35 should be seen at consultant antenatal clinic at booking and then at 32, 36 and 40 weeks after their respective scans (following SBL pathway scans)
- Symphysis fundal height measurements should not be performed, as per Saving Babies Lives (see Fetal Growth Assessment guideline).
- Women with a booking BMI >35 have an increased risk of pre-eclampsia therefore monitor urine and B/P every 3 weeks till 32 weeks.
- Monitor BP and urine every 2 weeks from 32 weeks gestation and until delivery
- Re-measure maternal weight in 3rd trimester.
- Manual handling assessment at 36 weeks to be documented in notes

3.3.4 Additional Steps for Women with BMI>40

Please follow all steps above for BMI > 30 and >35 and these additional steps:

- All women with BMI >40 and any additional co-morbidity must be referred to maternal medicine clinic.
- BMI >40 scores 2 in VTE assessment
- Consider antenatal thromboprophylaxis in all women with BMI > 40
- Postnatal thromboprophylaxis for a minimum of 10 days regardless of mode of delivery
- Referral to obstetric anaesthetic clinic at 34-36 weeks gestation. This appointment is to discuss potential issues with venous access and regional and general anaesthesia. The record should be in handheld notes and uploaded on EDM.
- Women must have a documented manual handling assessment at 36 weeks. This assessment is to look at equipment requirements in labour and potential tissue viability issues. This assessment will be done by the antenatal clinic midwife.

3.3.5 Additional Steps for Women with BMI>45

Please follow all steps above for BMI >30, >35 and 40 and this additional step:
These women must be referred to maternal medicine clinic.

3.3.6 Antenatal Admissions

All women with a BMI over 30 who are admitted:

- VTE risk assessment must be repeated and documented on VTE risk assessment form
- Complete waterlow assessment and consider any tissue viability issues.

3.3.7 Summary of Antenatal Care

BMI>30
• Use BMI care pathway • Folic Acid 5mgs OD until 12/40 gestation • Vitamin D 10mcg OD supplementation throughout pregnancy • Consider Aspirin 150 mgs OD if addition risk for pre-eclampsia • BP monitoring with appropriate sized cuff (upper arm circumference ≥35cm, use large cuff) • Ongoing VTE assessment • OGTT between 24-28 weeks • Documented discussion of risks intrapartum • Active management of 3rd stage
BMI >35 in addition to all the steps above
• Referral to consultant clinic • Serial growth scans from 26-28 weeks until delivery.Increase surveillance for pre-eclampsia – see every 3 weeks between 24 and 32 weeks then every 2 weeks until delivery • Re-measure maternal weight in 3rd trimester • If additional co-morbidities for referral to obstetric anaesthetic clinic • Thromboprophylaxis for a minimum of 10 days regardless of delivery mode in accordance with VTE guidelines
BMI > 40 in addition to all the steps above
• If additional co-morbidity refer to maternal medicine clinic • Referral to obstetric anaesthetic clinic at 34-36 weeks • Consider antenatal thromboprophylaxis if fulfils RCOG VTE 37a guideline • Documentation of manual handling assessment and tissue viability issues at 36 weeks
BMI >45 in addition to all the steps above
• Referral to maternal medicine clinic

DALTEPARIN DOSE: See trust VTE guideline

3.4 Intrapartum Care

- Women with BMI >30-34.9 can deliver under midwifery led care in delivery suite.
- Women with a BMI >35 should give birth on the delivery suite with consultant led care.
- All women with a BMI >30 should be aware of their increase in risk of intrapartum complications including: difficulty with fetal monitoring, risk of slow labour and shoulder dystocia, increased risk of postpartum haemorrhage, cesasrean delivery with increased operative complications.
- The decision regarding mode of delivery should be made on an individual basis by the woman and the Consultant in charge of her care.

3.4.1 Vaginal Birth After Caesarean

- Women with a booking BMI >30 should have an individualised plan
- Decision for VBAC following informed discussion and consideration of all relevant clinical factors. Obesity is a risk factor for unsuccessful VBAC. If no clear plan for VBAC on admission discuss with on call consultant. Refer to VBAC guidelines.
- All women with a BMI >30 should be recommended to have active management of the third stage of labour. This should be documented in the notes.
- Women with a BMI >30 having a caesarean section have an increased risk of wound infection and should receive prophylactic antibiotics at the time of surgery and consideration given for an additional course of oral antibiotics.

3.4.2 Admission to Labour ward

For women with a raised BMI who are admitted in labour or for induction of labour please ensure the following:

- Inform obstetric SPR (all women with BMI >35)
- Inform obstetric consultant (all women with BMI >40)
- Inform anaesthetist (all women with BMI >40 or >35 with co-morbidity)
- Consider early IV access
- Consider ultrasound to confirm presentation
- Ensure VTE risk assessment is completed in labour – stop low molecular heparin once in early labour. Consider flowtron boots.
- Advise continuous monitoring for women with BMI >40 with FSE (fetal scalp electrode).
- Inform theatre staff of any women who weighs >120kg
- A pressure sore score should be performed hourly to assess tissue viability.
- Consider Ranitidine 150mg orally every 6 hours or Omeprazole 40mg orally once daily or 20mg orally twice daily during labour

3.4.3 Delivery

- In view of the increased risk of fetal macrosomia and shoulder dystocia, the On-call Obstetric Senior Registrar or Obstetric Consultant should be notified of the impending delivery. Remember that routine manoeuvres for shoulder dystocia, such as McRoberts and suprapubic pressure, may be difficult If the patient needs an instrumental delivery for the usual indications, consider delivery in theatre.
- If delivery is by LSCS, either elective or emergency, the case must be discussed with the on-call Consultant. Consider avoiding the area directly under the panniculus because of the increased risk of infection post-operatively. Good haemostasis is essential; use of a subcuticular drain may be appropriate. Use of interrupted sutures may be considered,

however, recent data suggests slightly increased risk of skin infection and wound dehiscence with staples closure, avoid pressure dressing, stapples or non absorbable sutures should be removed on day 5 post delivery. Consider a course of broad-spectrum antibiotics. Discuss good wound care/ hygiene with patient.

- Use Negative Pressure Wound Therapy System, (for example PICO dressing Smith & Nephew) in all women with BMI >45, consider using it also in women with BMI > 35-40 with other risk factors for poor wound healing. Negative pressure wound dressing has been recognised by NICE guidelines as well.
- Consider giving IM syntometrine into arm- deltoid, as there may be difficulties in injecting in leg muscles which can affect absorption.

3.4.4 After Delivery

Postnatal Care

- Ensure adequate breast feeding advice and support. Women with a booking BMI >30 should receive appropriate specialist advice and support postnatally regarding the benefits, initiation and maintenance of breastfeeding.
- If the woman (BMI>40) has not been antenatally referred to the Dietetics service, this should be considered postnatally.
- VTE prophylaxis in accordance to RCOG 37a and trust guidelines.
- Encourage women to modify life style and lose weight to reduce life long risks of obesity

3.5 Manual Handling Issues and Specialist Equipment

- Standard delivery beds take a weight up to 180kg
- Soft beds on ward 9 or 10 take weight up to 220kg
- Toilets on wards take a weight up to 178kg

4.0 Statement of evidence/references

References:

MBRRACE-UK 2015-2017: Knight M, Bunch K, Tuffnell D, Shakespeare J, Kotnis R, Kenyon S, Kurinczuk JJ (Eds.) on behalf of MBRRACE-UK. Saving Lives, Improving Mothers' Care - Lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2015-17. Oxford: National Perinatal Epidemiology Unit, University of Oxford 2019.

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Hignett S. et al (2007) Risk assessment and Process planning for bariatric patient handling pathways http://www.hse.gov.uk/research/rrpdf/rr573.pdf

National Obesity Forum (2001) The guidelines on the management of adult obesity and overweight in primary care.www.nationalobesityforum.org.uk

National Institute for Health and Clinical Excellence(NICE). Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children. December 2006 CG43

National Institute for Health and Clinical Excellence(NICE). Antenatal care: Routine care for the healthy pregnant woman. October 2003 CG6

Royal College of Obstetricians and Gynaecologists. Care of Women with Obesity in Pregnancy. Green-top Guideline No. 72. BJOG 2018

Royal College of Obstetricians and Gynaecologists(RCOG). Thromboprophylaxis during pregnancy, labour and after normal vaginal delivery. Green top guideline no.37a 2015

Royal College of Obstetricians and Gynaecologists(RCOG). Thromboembolic disease in pregnancy and the puerperium: acute management. Green top guideline no.28 2001

Institute of Medicine (US) and National Research Council (US) Committee to Reexamine IOM Pregnancy Weight Guidelines; Rasmussen KM, Yaktine AL, editors.
Washington (DC): National Academies Press (US); 2009.

Routine prophylactic drugs in normal labour for reducing gastric aspiration and its effects. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD005298. DOI: 10.1002/14651858.CD005298.pub2.

Ranitidine supply disruption alert (SDA/2019/005) issued on 15 October 2019.

NICE Medical technologies guidance [MTG43]: PICO negative pressure wound dressings for closed surgical incisions Published date: 09 May 2019 Last updated: 06 August 2019.

External weblinks: Please note that although Milton Keynes University Hospital NHS Foundation Trust may include links to external websites, the Trust is not responsible for the accuracy or content therein.

5.0 Governance

5.1 Record of changes to document

Version number: 4		**Date:** 05/2020		
Section Number	**Amendment**	**Deletion**	**Addition**	**Reason**
Full document	Reviewed and updated			Update

5.2 Consultation History

Stakeholders Name/Board	**Area of Expertise**	**Date Sent**	**Date Received**	**Comments**	**Endorsed Yes/No**
Erum Khan	O&G Conulstant			Incorporated	Yes
Nandini Gupta	O&G Conulstant		24/04/2020	Suggested amendments to clinic appointments for women with BMI 35-40	Yes
Michelle Fynes	O&G Conulstant		24/04/2020	No suggestions	N/A
Nidhi Singh	O&G Conulstant		24/04/2020	No suggestions	N/A
Omar Mulki	O&G Conulstant		24/04/2020	No suggestions	N/A
Mary Plummer	Matron		27/04/2020	Incorporated	Yes
Julie Cooper	Head of Midwifery		24/04/2020	Incorporated	Yes
Guidelines group discussion	Obstetricians and Midwife		24/06/2020	Include antacid indormation – 150mg ranitidine, omeprazole 20mg twice daily or 40mg Once a day	

5.3 Audit and monitoring

This Guideline outlines the process for document development will be monitored on an ongoing basis. The centralisation of the process for development of documents will enable the Trust to audit more effectively. The centralisation in recording documents onto a Quality Management database will ensure the process is robust.

Audit/Monitoring Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee/Board
a) Percentage of women presenting to service with ≥30 b) Audit of outcome for women with BMI≥40 c) Post birth complications in women with BMI ≥ 40 d) Equipment matches specifications above	Audit and statistics	Obstetricians and Midwives	Annually	Maternity CIG

5.4 Equality Impact Assessment

As part of its development, this Guideline and its impact on equality has been reviewed. The purpose of the assessment is to minimise and if possible remove any disproportionate impact on the grounds of race, gender, disability, age, sexual orientation, religion or belief, pregnancy and maternity, gender reassignment or marriage and civil partnership. No detriment was identified. Equality Impact assessments will show any future actions required to overcome any identified barriers or discriminatory practice.

Equality Impact Assessment			
Division	Women's and Children's Health	Department	Maternity
Person completing the EqIA		Contact No.	
Others involved:		Date of assessment:	04/2020
Existing policy/service	Yes	New policy/service	No

Will patients, carers, the public or staff be affected by the policy/service?	Yes
If staff, how many/which groups will be affected?	*All staff working in maternity*

Protected characteristic	Any impact?	Comments
Age	NO	Positive impact as the policy aims to recognise diversity, promote inclusion and fair treatment for patients and staff
Disability	NO	
Gender reassignment	NO	
Marriage and civil partnership	NO	
Pregnancy and maternity	NO	

Race	NO	
Religion or belief	NO	
Sex	NO	
Sexual orientation	NO	

What consultation method(s) have you carried out?
Circulation via email, discussion at guidelines meeting and WH CIG
How are the changes/amendments to the policies/services communicated?
Circulation via email, discussion at guidelines meeting and WH CIG
What future actions need to be taken to overcome any barriers or discrimination?

What?	Who will lead this?	Date of completion	Resources needed
Review date of EqIA			

Appendix 1: Raised BMI Care Pathway

Document BMI at booking and consider the following:

Pregnancy and labour care pathway for women with BMI ≥30 or above			
Action required	**Notes**		
Advised to take increased dose of folic acid – 5mg – in first trimester	Folic Acid available from GP's/ pharmacy		
Advised to take 10mcg vitamin D throughout pregnant and whilst breastfeeding	Vitamin D available from GP's/ pharmacy		
Screening for gestational diabetes between 24-28 weeks gestation			
Increased risk of pre-eclampsia. See every 3 weeks at 24-32 weeks, every 2 weeks from 32 weeks -Delivery	For additional team midwifery follow up. Do not send to DAU unless indicated		
Place of birth discussed in antenatal period and recorded in notes by 36/40 (Home, Delivery Suite) and **discussion of associated risk**	Mothers may want a home birth or to use pool. Need to consider this in discussion. **See points over page**	Home Delivery Suite	
Overall obstetric management plan for intrapartum and postnatal care documented in notes			
Active management of 3rd stage discussed	Discuss increased risk of bleeding		
Additional pregnancy care for all women with BMI ≥35			
Referral for consultant led care, shared with maternity team.	As per guideline		
Additional fetal ultrasound for growth and liquor volume at 36 weeks gestation.	As per guideline		
Assessment for specialist equipment requirement after 36 weeks.	See **manual handling guideline**		
Additional pregnancy care for all women with BMI ≥40			
Consultation in joint Obstetric/anaesthetic clinic after 32 weeks.	Ensure appointment made to see Anaesthetist		
Consider tissue viability and manual handling requirements from 36 weeks gestation. *See Trust Guideline*	Look at PUP guideline.		

Information mothers need to know

Most pregnancies in women with raised BMI will result in a healthy baby. However, adverse pregnancy outcomes also rise with BMI.

Women are at a higher risk of:

1. Increased risk of Gestational diabetes
2. Hypertension
3. Thromboembolism
4. preterm labour
5. Increased risk of induced labour
6. Increased risk of instrumental delivery
7. Increased risk of operative delivery
8. Increased risk of maternal death

For further information please refer to the NICE guidance for 'Dietary interventions and physical activity interventions for weight management before during, and after pregnancy'

http://www.nice.org.uk/guidance/PH27

Other considerations

1. BMI > 30 poses greatest risk to mother and baby.
2. Advice needs to be given regarding healthy diet and being physically active
3. Making changes during pregnancy will make it easier to move towards a healthy weight after giving birth
4. Manual handling considerations apply to mothers with any reduced mobility, but should also be considered for labour
5. Tissue viability – see Trust guideline. (is there one?)

Appendix 2: Patients with morbid obesity - practical aspects

Equipment

- Table: Maternity theatre 1 table X 350KG: Table 2 x450kg.
- Lithotomy poles: The current Lithotomy poles are sufficient to support Women with raised BMI.
- Slide sheets: 115cms wide kept in all clinical areas.
- Wide BP cuffs: All clinical areas.
- Arterial line: Consider for most patients the need to use the forearm.
- Epidural / spinal: Consider using two foot stool without wheels as foot rests whilst patient undergoes siting of regional block.
- Nasal cannulae: For overnight oxygenation.
- Electric bed: Post operative management.

Anaesthetic kit

- Tuohy needles: 80mm, 110mm and 150mm 18g or 16g.
- CSE kits: (Pjunck) 90mm Tuohy kits 18g or 16g, or use 110mm Tuohy with Vygon 25g x 145mm whitacre (pencil point) spinal needle.

Pre Delivery

- Early anaesthetic review
- Check airway and intubation parameters.
- Check supine Sp02 >96% on room air.

Delivery

- Get extra experienced hands.
- Consultant Obstetric Anaesthetist and Consultant Obstetrician to be informed of admission and impending delivery.
- Make a strong attempt to avoid a general anaesthetic.
- Regional anaesthesia using standard doses. The epidural space is full of fat so there can be more rather than less spread of a conventional dose.
- Antacid prophylaxis use rigorously.
- Pre-oxygenate in head up position.
- Use the ramp position for intubation i.e. External auditory meatus and the sternal notch horizontal, use a pillow or blankets under the upper chest to achieve this position.
- Polio blade is useful to overcome large breasts.
- Awake intubation may be needed.
- Panniculus will need to be retracted, aim for a vertical pull using sponge forceps and bandages over the top of a weighted drip stand and attach to a firm object.

Post Delivery

Thromboprophylaxis - use the larger doses of low weight molecular heparin, consider discussion with haematologist/ Mat med Cons Miss Khan

- Electric bed.
- HDU may be required.
- CPAP may be needed if sats pre – op reduced.

Appendix 3: Anaesthetic Assessment for Obstetric Patients with BMI>40

Management plan
High Risk Obstetric Anaesthetic Clinic,

Name _____

DOB _____ **Hosp. No** _____
BMI _____ **BP** _____
Obstetric status _____ **EDD** _____
Co-Morbidities

_____
_____

Allergies

_____

Airway Assessment

Mal I II III IV

Neck _____ **TMD** _____

Jaw Protrusion A B C

Spine

Spaces felt yes no

Anatomic abnormalities

_____
_____
_____

Problems with anaesthesia anticipated?

_____
_____

Anaesthetic management plan _____

_____
_____

Specialist bariatric equipment requirements

Bed
Theatre bed
Chair
Wheelchair
Hoist
Ex large BP cuff
Ex large TEDS

Assessed by **Date**

Sign:

Print: