OBESITY AND WEIGHT GAIN IN PREGNANCY, LABOUR AND POSTPARTUM

This LOP is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this LOP.

1. AIM

- Optimisation of fetal and maternal and staff wellbeing to reduce morbidity and mortality related to obesity in pregnancy

2. PATIENT

- Woman with a pre-pregnancy Body Mass Index (BMI) ≥30kg/m^2 prior to current pregnancy

3. STAFF

- Medical, midwifery and nursing Staff
- Dietitian

4. EQUIPMENT

- HoverMatt ®
- Bariatric shower chair with capacity up to 175kg (normal shower chair capacity up to 110kg)
- 200kg theatre trolley
- Large theatre table up to 300kg (normal table takes up to 138kg)
- Delivery Suite bed with capacity up to 130kg
- Manual and electric inpatient beds with capacity up to 150kg
- Appropriate blood pressure cuff or thigh cuff (large cuff if upper arm circumference >33cm)
- Stand on weighing scales (Safe Work Load 200kg)

5. CLINICAL PRACTICE

- Weigh woman at booking (do not accept an estimation of the weight)
- Calculate her BMI using her preconception weight i.e. her weight when she conceived.
  BMI= $\frac{\text{weight (kg)}}{(\text{height (m}^2))}$
  e.g. For a woman 70kg and 1.70m tall, the BMI is calculated as: $70/(1.7)^2 = 24.2\text{kg/m}^2$
- Use booking weight if preconception weight uncertain. This allows for correct identification and risk stratification of maternal obesity so that correct care pathways can be followed
- Document BMI in medical record and on the antenatal card
- Discuss and give every woman the "Weight gain in pregnancy" information sheet (Appendix 1) and discuss healthy weight gain in pregnancy as per table 2 and antenatal card
- Refer every woman with BMI ≥30 kg/m^2 to Get Healthy in Pregnancy Service
- Undertake psychosocial assessment and arrange appropriate referrals as depression is a key determinant of weight gain and obesity
- Discuss with the woman the recommended physical activity guidelines for pregnancy (see educational notes). Reassure the woman that exercise in an uncomplicated pregnancy is safe

<u>Woman with BMI ≥30</u>

Antenatally

- Arrange antenatal and intrapartum care as outlined in Table 1 according to woman's BMI due to increased maternal and fetal risks (Table 2)
- Review risk factors for pre-eclampsia. Recommend low dose aspirin 150mg nocte from 12 weeks gestation until the birth of the baby for woman if one high-risk factor or two moderate-risk factors (as per educational notes)[13]. Recommend calcium supplementation if low calcium diet

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- Arrange obstetric Antenatal Clinic (ANC) appointment and ongoing shared medical and midwifery care
- Recommend weighing at each antenatal visit and encourage self-monitoring of weight gain
- Recommend woman has blood pressure (BP) check using appropriate cuff size.
- Use shared decision making, taking ino the account risk factors for stillbirth when timing of birth is decided. eg parity, age, ethnicity, smoking status (as per safer baby bundle – table 4)
- Discuss risk factors and safeguards see table 1 and 2.

Lactation

- Recommend the woman attends the antenatal breast feeding class
- Offer the woman an appointment in the Outpatient Antenatal Lactation Clinic with the Lactation Consultant (LC) for additional support

Anaesthetics

- Recommend the woman attends the antenatal anaesthetic clinic if BMI ≥40
- Arrange intrapartum consultation/review if BMI ≥30

Intrapartum

- Advise theatre of woman's current weight if booking an elective or emergency caesarean section and woman's weight is >100kg
- Recommend specialist attendance for caesarean section if BMI>40 (as per specialist obstetrician-Conditions And Procedures Requiring Attendance LOP)
- Plan timing of delivery during normal working hours where clinically appropriate
- Place a deflated HoverMatt ® under the woman if she is immobile on the bed or has an epidural inserted
- Consider continuous electronic fetal monitoring (EFM) as indicated (e.g. meconium stained liquor or signs of fetal compromise)
- Consider applying fetal scalp electrode if unable to obtain continuous external tracing when using continuous EFM (exclude positive serology such as HIV, Hepatitis B or C to minimise risk of seroconversion of the infant).
- Advise against waterbirth with BMI ≥ 35 (as per waterbirth LOP)
- Advise against homebirth with BMI ≥30
- Follow surgical bundle LOP for recommendations for antibiotic dose and dressing if a caesarean section is required

Postpartum

- Encourage and provide extra breastfeeding support
- Encourage early mobilisation
- Advise weight loss prior to next pregnancy to reduce obstetric risk
- Recommend high dose (5mg) folic acid supplementation starting at least one month prior to next pregnancy
- Consider maternal obesity when discussing and making the decision regarding the most appropriate form of postnatal contraception
- Recommend a minimum waiting period of 12–18 months after bariatric surgery before attempting pregnancy to allow stabilisation of body weight and to allow the correct identification and treatment of any possible nutritional deficiencies that may not be evident during the first months

6. DOCUMENTATION

- Medical Record

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7. EDUCATIONAL NOTES

- Definition of obesity according to World Health organisation:
  BMI based on pre-pregnancy or early pregnancy weight (kg/m^2)

BMI	Classification	Obstetric Risk
< 18.5	Underweight	
18.5 - 24.9	Normal range	
25.0 – 29.9	Overweight	No increased risk
30.0 – 34.9	Obese I	Mildly increased
35.5 – 39.9	Obese II	Moderately increased
≥ 40	Obese III	Significantly increased

- According to the UK and Ireland Confidential Enquiry into Maternal and Child Health's report on maternal deaths (2015-2017) 34% of mothers who died were obese, whereas there was a prevalence of obesity in the maternity population of 20% [12]
- Excessive gestational weight gain is associated with hypertensive disorders of pregnancy, large for gestational age neonates and an increase in obstetric intervention including caesarean section [3]
- It is recommended that women have two and a half to five hours of moderate intensity activity per week, OR, one and quarter to two and a half hours of vigorous exercise, OR, a combination of the two. In addition to these activities it is also recommended to have some strength training at least two days per week [15]
- Obese or previously inactive women, and women with pregnancy complications, may benefit from exercise. It is important that an individual evaluation is undertaken before commencing an exercise program. These programs should be ones that can be followed during pregnancy and beyond and should consider her baseline level of fitness and previous exercise experience [15]
- While pregnancy is not a medical condition, many women experience a deterioration in their physical and or mental health during pregnancy that may not completely recover postpartum[16]. The extent of this deterioration has been described like the poorer health and function experienced by adults with heart disease or diabetes[17, 18]. Further, the prevalence of pregnancy-specific chronic disease such as gestational diabetes mellitus, gestational hypertension, and excessive gestational weight gain, including overweight and obesity during pregnancy is increasing in Australia. An hour and twenty minutes of brisk walking each week can lead to a 25% reduction in gestational weight gain and the odds of developing gestational diabetes mellitus, pre-eclampsia and gestational hypertension[19,20,21]
- There is moderate to high quality evidence for the efficacy of exercise in pregnancy for the prevention and treatment of excessive gestational weight gain [19], gestational diabetes mellitus and gestational hypertension [20]. However, less than 30% of women in Australia complete the recommended amount of exercise during pregnancy [21].
- With overweight and obesity there are increased rates of complications including[6]:
- <u>Maternal</u>
  - diabetes: gestational and pre-gestational
  - hypertensive disorders of pregnancy
  - respiratory disorders: asthma and sleep apnoea
  - venous thromboembolism
  - difficulties with labour analgesia and general anaesthesia
  - instrumental and operative delivery
  - caesarean section
  - postpartum haemorrhage (PPH)
  - delayed wound healing and infection
  - delayed lactogenesis II and breastfeeding difficulties
  - depression

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- Fetal and neonatal
  - preterm birth
  - perinatal mortality
  - congenital abnormalities (e.g. neural tube defects and cardiac defects) and difficulties assessing fetal anatomy/ detecting fetal structural anomalies
  - abnormalities of fetal growth (i.e. growth restriction, macrosomia)
  - difficulties in assessing fetal growth, well-being, and fetal heart monitoring
  - jaundice and hypoglycaemia
  - macrosomia/shoulder dystocia [10]
  - long term neonatal consequences e.g. neonatal composition, infant weight gain, childhood obesity

- Individualised counselling is recommended for women planning mode of birth following a caesarean section. Consideration needs to be given to a woman's individualised risks and benefits (E.g. previous vaginal births). The chance of successful vaginal birth after caesarean section (VBAC) is as follows [4]:
  - Normal weight – 77%
  - Overweight – 66%
  - Obese I – 78%
  - Obese II – 71%
  - Obese III – 59%
- Elevated BMI increases the risk of perinatal death[12,14]
- The mechanisms to explain this are not clear. The increased risk may be related to increased incidence or missed gestational diabetes or gestation hypertension, difficulties in diagnosing growth restriction and fetal anomalies or difficulties in perceiving changes in fetal movements. Other risk factors for stillbirth include[10]: maternal age over 35 years; maternal smoking in late pregnancy; nulliparity; assisted reproductive technologies (ART), alcohol and other drug use, previous history of stillbirth; social disadvantage; Aboriginal and Torres Strait Islander ethnicity; Pacific ethnicity,African ethnicity, and South Asian ethnicity (India, Pakistan, Sri Lanka, Afghanistan and Bangladesh and others), and gestation at birth beyond 39 weeks
- Women at high risk of pre-eclampsia are those with any of the following[13]:
  - hypertensive disease during a previous pregnancy, chronic kidney disease, autoimmune disease such as systemic lupus erythematosus or antiphospholipid syndrome, type 1 or type 2 diabetes, chronic hypertension
- Factors indicating moderate risk of pre-eclampsia are[13]:
  - first pregnancy, age 40 years or older, pregnancy interval of more than 10 years, body mass index (BMI) of 35 kg/m^2 or more at first visit, family history of pre-eclampsia, multifetal pregnancy
- Epidural insertion may be difficult and likely to require senior anaesthetic input therefore timely referral should be made when a woman is planning to have an epidural
- Exclusive breastfeeding will reduce the likelihood of childhood obesity in the infant
- High pre-pregnancy BMI has been positively and significantly associated with later onset of lactogenesis 2 and decreased duration of breastfeeding [5,7]
- Lactogenesis 2 occurs at placental separation with the decline in progesterone levels acting in the presence of the lactogenic hormones (prolactin and glucocorticoids) to achieve the full lactogenic effect. This process takes between 30-72 hours. The delay in obese women is caused by elevated amounts of progesterone in excess adipose tissue [5,7]
- Obese women are more likely to have large breasts and non-protractile nipples leading to poor breastfeeding technique that reduces breast stimulation and increases the risk of interventions [5,7]

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- If a woman has had bariatric surgery pre-pregnancy, referral to a dietitian should be instituted, particularly if the woman has had malabsorptive surgery, since she may require additional supplementation during pregnancy including vitamin B12, iron, folate, vitamin D and calcium
- If a woman has had bariatric surgery pre-pregnancy she should avoid pregnancy immediately post-surgery (to avoid pregnancy during complications e.g. band displacement) and during the initial weight loss phase, usually 12-24 months after surgery[6,14]
- Maternal morbidity is increased with H1N1 influenza in pregnancy, particularly among obese women. All women should be recommended influenza vaccine; however this is particularly important for obese women [8]
- Women may start or continue exercise programs during pregnancy in line with national guidelines, and this may aid their weight maintenance and avoidance of excess gestational weight gain [8]
- Postpartum depression – this has been reported to correlate positively with BMI and can be as high as 40% in women with class III obesity[6,9]

…./Tables

Table 1. Antenatal and intra-partum consultation management for obese women by BMI category

	Body mass index (BMI) category		
Antenatal, intrapartum consultation and management	**BMI ≥30-34.9**	**BMI ≥35-39.9**	**BMI ≥40**
Arrange obstetrician and midwifery shared antenatal care with hospital birth (not homebirth)	Yes	Yes	Yes
High dose folic acid (5mg) until 12 weeks gestation	Yes	Yes	Yes
Review risk factors for pre-eclampsia*	Yes	Yes	Yes
Recommend aspirin 150mg nocte from 12 weeks if high risk for pre-eclampsia plus calcium if low dietary intake*	No	Yes	Yes
Antenatal visits scheduled at least two 2 weekly from 28 weeks and weekly from 36 regardless of parity	Yes	Yes	Yes
Offer weighing at each visit	Yes	Yes	Yes
Influenza vaccination	Yes	Yes	Yes
Get Health in Pregnancy Service	Recommend	Recommend	Recommend
Dietician review	Recommend	Recommend	Recommend
Glucose Tolerance Test (GTT) at:			
- 12-14 weeks gestation	Yes	Yes	Yes
- 24-28 weeks gestation	Yes	Yes	Yes
Ultrasound at 34 weeks gestation	Yes	Yes	Yes
Ultrasound at 38 weeks gestation	No	No	Yes
Lactation- antenatal breastfeeding class	Recommend	Recommend	Recommend
Lactation consultant antenatal review	Offer	Offer	Offer
Induction of labour at 40 weeks	Shared decision making	Offered (Recommend if other risk factors)	Recommend
Anaesthetic review antenatal	No	No	Yes
Anaesthetic review intrapartum and consider early epidural if woman requests one	No	Yes	Yes
Specialist obstetrician attendance for caesarean section	No	No	Yes
Place of birth	Delivery suite or birth centre	Delivery suite**	Delivery suite
Waterbirth option	Yes	No	No
Cannula and group and hold in labour	Yes	Yes	Yes
Active management of third stage of labour	Yes	Yes	Yes
Antibiotic prophylaxis for caesarean section according to weight as per surgical bundle LOP. Give single dose of cephazolin (if no allergy) intravenously (IV) 30 - 60 minutes prior to surgical incision, in the following doses:	51-120kg 2g	> 120kg 3g	
Thromboprophylaxis- antenatal (if inpatient) and postpartum according to VTE LOP	Yes	Yes	Yes
Recommend weight loss prior to next pregnancy and folic acid 5mg	Yes	Yes	Yes

*Advise pregnant women with more than 1 moderate risk factor for pre-eclampsia to take 150 mg of aspirin daily from 12 weeks until the birth of the baby. Factors indicating moderate risk are: first pregnancy, age 40 years or older, pregnancy interval of more than 10 years, body mass index (BMI) of 35 kg/m2 or more at first visit, family history of pre-eclampsia, multifetal pregnancy

** Women who are otherwise low risk can be offered shared decision making with choice of setting for planning their birth in collaboration with an obstetrician. A clear referral pathway for early recourse to delivery suite if complications arise

Table 2. Risks of obesity and pregnancy and safeguard to reduce risk of adverse outcomes

Risk	Safeguard
Deep Vein Thrombosis (DVT)	Recommend antenatal thromboprophylaxis during inpatient stays and after operative birth
Decreased chance of success of vaginal birth after caesarean (if applicable)	Positive encouragement , spontaneous labour, continuity of midwifery care (refer to Next Birth After Caesarean (NBAC) LOP)
Difficulties monitoring fetal heart in labour	Fetal scalp electrode
Increased risk of PPH	Active management of third stage and Intravenous (IV) cannula in labour
Higher rates of delivery intervention including emergency caesarean section	Appropriate attention to and management of labour progress
Difficult caesarean section, with an associated increase in morbidity and mortality including wound infection and delayed wound healing	Appropriate attention to management of labour and progress. Ensure timing of intervention at an appropriate hour- minimising urgent procedures out of hours. Follow surgical bundle for abdominal surgery LOP
Sub-optimal lactation outcomes	Lactation consult and support
Increased risk of postpartum depression	Midwifery continuity of care model, mental health support

Table 3. Gestational weight guidelines for singleton pregnancies[2]:

Underweight women BMI <18.5 (kg/m^2)	12.5-18kg
Normal weight women BMI 18.5-24.9 (kg/m^2)	11.5-16kg
Overweight women BMI 25-29.9 (kg/m^2)	6.8-11.5kg
Obese women BMI >30 (kg/m^2)	5-9kg

Table 4. Safer baby bundle risk factors for stillbirth

Stillbirth Risk Factors

- Maternal age >35yrs
- Maternal smoker
- Obesity/overweight (≥ 30)
- Nulliparity
- Assisted reproductive technology
- Aboriginal or Torres Strait islander, pacific, African, South Asian
- Previous stillbirth
- Pre-existing diabetes, hypertension
- Pre-eclampsia
- Low socioeconomic status/ education
- Small for gestational age (<10%)
- > 41weeks
- Alcohol and other drug use

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8. RELATED POLICIES/ PROCEDURES/GUIDELINES

- Thromboembolism prophylaxis and treatment
- Assisted vaginal birth guideline – SESLHDPD/050
- Shoulder Dystocia
- Diabetes in Pregnancy – Gestational - Management SESLHDPD/282
- Induction of labour guideline for women with a post-dates low risk pregnancy
- Hypertension – management in pregnancy
- Next birth after caesarean section (NBAC)
- Surgical bundle for abdominal surgery
- Specialist Obstetrician – Conditions And Procedures Requiring Attendance
- Antenatal Lactation Clinic – Referral Assessment And Preparation
- Water Immersion For Birth
- Anaesthetic Role In Birthing Services

9. NATIONAL STANDARD

- Partnering with Consumers – Standard 2
- Comprehensive Care - Standard 5

10. RISK RATING

- Low

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FOR REVIEW : SEPTEMBER 2025

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Appendix 1.

Weight gain in pregnancy - Information Sheet

What is a healthy weight gain?
How much weight you gain can affect the outcome of your pregnancy. We know that women who gain an excess amount of weight are more likely to develop problems with blood pressure and diabetes in the pregnancy as well as making the birth more difficult (you are more likely to need induction of labour or other interventions such as caesarean section). If you gain too much weight you are also less likely to lose the weight before another pregnancy. This can increase the risks in that next pregnancy as well as your risk of diseases such as diabetes, cancer and heart disease. On the other hand if you are underweight or of normal weight at the start of pregnancy, you should not restrict weight gain through insufficient diet since this can result in your baby not growing enough.

Most women gain between 11 and 16 kg in weight during pregnancy. All women are different and you may gain a little more or little less than average. The amount of weight you gain is affected by factors like your height, and whether you are pregnant with more than one baby.

Where does the weight go?
Pregnancy is a unique time in which your body changes to meet the needs of your growing baby. Your body must store nutrients, and increase the amount of blood and other fluids it makes. Here is how much weight an average woman will gain in different parts of her body during pregnancy:

Component	**Weight (kg)**
Baby	3.4 - 3.8
Blood	1.8
Uterus	0.9
Breasts	0.45
Placenta and umbilical cord	0.68
Fat and protein stores	3.4
Tissue fluids	1.22
Amniotic fluid	0.8
Approximate total weight gain	**13.0**

How much weight should I gain?
To find out a healthy target for weight gain in pregnancy, you will need to know your Body Mass Index (BMI) calculated on your pre-pregnancy weight. Work out your BMI and then use the table below: Calculate the BMI as: Weight in kg/ (height in metres) ^{2} e.g. A woman is 60kg and 1.60m tall the BMI is calculated: 60/1.6/1.6 = 23.4kg/m^2 (healthy weight range). Having a BMI from 20 to 24.9 is classified as normal. A BMI of 25 to 29.9 is classified as overweight. A person with a BMI of 30 or greater is classified as obese.

Pre-pregnancy BMI (kg/m^2)	**Weight gain (total) kg**
<18.5	12-18
18.5-24.9	11-16
25.0-29.9	7-11
>30.0	0-9

Is it safe to exercise in pregnancy?
It is safe during pregnancy to continue exercise and activity as you did prior to pregnancy and this will help you to maintain a healthy weight. There is no evidence that regular exercise during an uncomplicated pregnancy is unsafe for you or your baby.
Exercise is not only safe but it is important for a healthy pregnancy, helping reduce the risk of excessive weight gain, diabetes and high blood pressure. The current physical activity guidelines from The Royal Australian and New Zealand College of Obstetricians and Gynaecologist states that women should aim to accumulate:

- 2 ½ to 5 hours of moderate intensity physical activity each week OR
- 1 ¼ to 2 ½ hours of vigorous exercise OR
- A combination of the two
- Also, include muscle strengthening exercises 2 days a week

How can I gain a healthy amount of weight?
You do need to eat extra when you are pregnant, but the amount of energy (kilojoules/calories) extra each day is quite small i.e. equivalent to a couple of slices of bread and a glass of low-fat milk only! What you do need more of are nutrients- more B vitamins, folate, vitamin C, iron, protein among others, so it can take some planning to make sure that almost everything you choose to eat is giving you something worthwhile.

What are the best foods to eat?
One of the simplest ways of achieving a healthy diet is by thinking about your diet in terms of food groups. Our food groups exist because the foods within each group provide similar nutrients i.e. milk, cheese and yoghurt are all good providers of protein and calcium. There are guidelines to help you to choose the right number of serves from these groups each day. The benefit of this approach is also that it lets you keep track of your total intake as well as the balance in your diet. It also can help draw your attention to the frequency of those 'extra' foods in your diet- the ones that do not really fit into any of the groups very well. It's these 'extras' that can cause trouble! High energy, low nutrition = not great for you or your baby.

How do I manage my weight?
Portion size is a vital part of weight management. If you are hungrier and are already eating the recommended amounts of protein/starch already then the best way you can bulk out a meal is by adding vegetables- while the other meal components may be nutritious, if you're overdoing it you're more likely to put on too much weight. A quick way to think about it is by using the 'plate' model. Half your plate should be salad or cooked vegetables then a quarter protein (meat/chicken/fish/tofu/eggs) and a quarter starch (bread/rice/pasta/quinoa/noodles).

Our dietitian's five top tips:
1. Choose high fibre breads and cereals
2. Choose low fat dairy products
3. Choose lean meats
4. Eat more vegetables
5. Choose your snacks wisely

How do I manage all this?
It is all in the planning. If you are feeling sick often the last thing you feel like doing is thinking or talking about food. Spending a short time focusing on your shopping list and planning will help a lot in managing your diet. Ensuring you have nutritious snacks on hand, a list of options for work lunches and a plan for quick but healthy dinners will save you from the trap of banana bread, giant sandwiches and late night laksas!

Talk with your doctor or midwife about any questions you might have about eating right during pregnancy or you may choose or be asked to see a dietitian