

Nutrition, weight and exercise in pregnancy

Case Definition

Weight outside of the healthy range or a nutritionally inadequate diet during pregnancy:

Underweight in pregnancy (Body Mass Index (BMI) <18.5kg/m²) associated with an increased risk of:

- Small for gestation (SGA) age infants;
- Intrauterine growth restriction (IUGR);
- Preterm birth.

Obesity in pregnancy (BMI >30kg/m²) associated with increased:

- Rate of antenatal and intrapartum complications (e.g. pre-eclampsia, pregnancy loss, postpartum haemorrhage, gestational diabetes, caesarean section);
- Anaesthetic risks;
- Postpartum and neonatal complications (e.g. delayed wound healing, neonatal death).

Micronutrient deficiency due to restrictive or poor diets may have adverse effects on women and their babies.

Screening

Check BMI at pre-pregnancy counselling and aim to achieve a healthy BMI pre-pregnancy:

Pre-pregnancy BMI is the best predictor of nutritional intervention requirements in pregnancy. If weight loss is indicated, it is safest to lose weight before conception. Severe underweight and disordered eating is also dangerous in pregnancy and is best addressed pre-pregnancy.

Check BMI at the first antenatal visit:

First trimester BMI or pre-pregnancy BMI and should be used for nutritional counselling and birth planning (see Table 2). If first visit occurs after first trimester BMI is less useful.

Monitor weight according to need during pregnancy:

Universal weight monitoring in pregnancy is not recommended, but intermittent monitoring can help provide feedback to pregnant women about whether they are within the 'safe weight gain in pregnancy' recommendations (see Table 1).

Micronutrient screening:

Screen for vitamin D deficiency at first visit in women with risk factors (e.g. dark skin, limited sunlight exposure, pre-pregnancy BMI >30kg/m²).

Screen for vitamin B12 deficiency in women on a diet with minimal animal products (e.g. vegans, vegetarians) and in women with macrocytosis (Mean Cell Volume (MCV) >100 fL on full blood count).

Screen all women for anaemia and iron deficiency as per the "Iron and anaemia in pregnancy protocol".

Principles of Management

Management of underweight in pregnancy

Where possible, address underweight through a balanced increase in the five food groups as per the "Australian guide to healthy eating" (see RESOURCES section).

"Pantry level fortification" (e.g. mixing butter through mashed potato, adding skim milk powder to milk) may be a helpful strategy. High protein supplementation (e.g. preparations containing >30% of energy from protein) may be harmful. Commercially available preparations are likely to be safe - discussion with a dietician will be beneficial if this is being considered.

Management of obesity in pregnancy

Nutritional management:

- Dieting without professional advice can lead to adverse outcomes. Advise to eat a healthy diet as per the "Australian Guide to Healthy Eating" (see RESOURCES section) and not to restrict

dietary intake below the recommended food group requirements for pregnancy.

- Advise pregnant women about gestational weight gain recommendations (see Table 1).
- Encourage patients to continue safe levels of regular exercise (see Exercise in pregnancy section).
- After discussion with dietician/obstetrician, weight maintenance or controlled amounts of weight loss may be acceptable for individual women. Women with Obesity class 2 or 3 (see Table 1) should be encouraged to avoid any weight gain in pregnancy.

Management of restrictive diets

Women on extreme diets (e.g. vegan, paleo or high protein diets) may be at risk of micro/macro nutrient abnormalities or consuming overly high amounts of protein. Women on vegetarian or vegan diets require monitoring of vitamin B12 levels and supplementation as required.

Normal B12 range may be lower in second and third trimester of pregnancy due to haemodilution – discuss with obstetrician if unsure. Dietitian input may be helpful for these women.

Table 1: Modified from Institute of Medicine guidelines for safe weight gain in pregnancy 2009:

BMI (kg/m ²)*	Classification	Recommended total weight gain range (singleton pregnancy)
<18.5	Underweight	At least 12.5kg - up to 18kg
18.5 - 24.9	Normal	11.5 - 16kg
25 - 29.9	Overweight	Try not to exceed 7kg
30 - 34.9	Obese class 1	Try not to exceed 5kg
35 - 39.9	Obese class 2	Try to avoid any weight gain**
>40	Obese class 3	

* Based on pre-pregnancy/early pregnancy BMI

** Discuss a safe approach to weight maintenance as outlined in nutritional management

Nutrition, weight and exercise in pregnancy

Exercise in pregnancy

Aerobic (cardiovascular, heart and lungs) and strength conditioning exercise is safe and beneficial. This exercise makes it easier to carry the weight of pregnancy, decreases fatigue and oedema, helps prepare for the physical challenge of labour, and can help improve mood.

Advise patients to:

- Warm up and cool down to prevent muscle and joint injury (joints are looser when pregnant).
- Consider a pelvic support belt or core stability work to counter the effects of joint laxity.
- Start slowly, build up gradually and learn to check own pulse to prevent overexertion. Effective aerobic exercise should result in a rise in heart rate.
- In pregnancy aim for 60 - 70% maximum heart rate if sedentary before pregnancy, or 60 - 90% if previously exercised regularly (exercise at a level where they can carry on a conversation, but not sing).

Advise patients to take extra care with:

- Contact sports where there is a risk of being hit in the abdomen (e.g. martial arts).
- Exercise where there is a risk of losing your balance or falling (e.g. horse riding, cycling) or which involves lying flat on your back, especially after 16 weeks.
- Exercising in very hot and humid environments (drink plenty of water, exercise at the cooler times of the day).

Most women with uncomplicated births can start with easy exercise soon after birth (e.g. walking, stretching within days).

Women who have pre-existing or pregnancy related musculoskeletal problems (e.g. pubic symphysis dysfunction, low back pain), or a high BMI may benefit from physiotherapy input. Physiotherapy may have additional benefits for women with complicated pregnancies or births, or pelvic floor problems.)

Contact your local hospital for guidelines on referring to the physiotherapy department.

Food safety in pregnancy

Pregnant women should be specifically advised on foods to avoid and on general food safety tips.

Some foods should not be consumed in pregnancy as they can pose additional risks for the baby. Infections such as listeria and salmonella can result in miscarriage or stillbirth.

Foods that must be avoided include:

- Cold processed meats (e.g. ham, salami, chicken)
- Raw/smoked meat, raw/smoked fish, raw eggs (including homemade mayonnaise, hollandaise sauce)
- Avoid the liver and kidneys from turtle and dugong (the lean meat however is OK)
- Raw bean sprouts
- Cold chicken or turkey (e.g. from deli or sandwich bars), and packaged creamy salads (e.g. potato salad, pasta salad)
- Refrigerated pate or meat spreads
- Store bought or restaurant prepared sushi
- Uncooked soft and semi-soft cheese (e.g. brie, camembert, ricotta, feta, blue)
- Unpasteurised dairy, soft serve and fried ice cream
- Stuffing from chicken or poultry

Drinks to limit or avoid include:

- No alcohol in pregnancy is the safest choice. Drinking alcohol during pregnancy can lead to miscarriage, stillbirth, premature birth or foetal alcohol syndrome (see Alcohol and other drugs in pregnancy protocol).
- Small amounts of caffeine are safe during pregnancy but excessive volumes may increase the risk of miscarriage and premature birth. Pregnant women should limit their intake to 200mg of caffeine daily (e.g. 4 cups of tea, 4 cans of cola, 3 cups of instant coffee, or 2 cups of espresso coffee). Avoid sports or energy drinks that contain caffeine.

General food safety tips include:

- Shop with a cooler bag to keep food cold when carrying home. Don't leave food out of the fridge.
- Keep hands, benches, knives and chopping surfaces clean (use different chopping surface for raw meat).
- Cook meat thoroughly and eat within the hour, or refrigerate immediately.
- Check use-by dates and don't eat expired food.
- Avoid take-away food that is not freshly cooked or prepared.
- Eat leftovers within one day providing they have been refrigerated below 5°C. Reheat to high temperature for at least two minutes.

Eating oily fish 2-3 times a week is recommended and provides many important nutrients. Eating certain fish (e.g. shark (flake), billfish (broadbill, swordfish and marlin), catfish or orange roughy (deep sea perch)) greater than once a week can increase your exposure to mercury and may affect the baby's developing nervous system.

See "Food safety during pregnancy" in RESOURCES section for more detail on food safety.

Therapeutic Protocols

Additional antenatal care requirements for women with obesity

Consult with obstetric trained GPs and regional obstetrician as needed.

- Schedule early gestation diabetes screening.
- Liaise with birthing hospital for early anaesthetic assessment and decision regarding place of birth.
- Schedule foetal morphological assessment at 20 - 22 weeks (later than usual).
- Schedule an additional ultrasound for foetal weight, amniotic fluid index (AFI), umbilical Doppler studies in the third trimester (28 - 34 weeks).
- Consider discussing with regional obstetrician about

Nutrition, weight and exercise in pregnancy

thromboembolic prophylaxis if additional risk factors for venous thromboembolism (VTE) (e.g. smoker, previous VTE, family history VTE, gestational diabetes, multiparity).

- Obese patients are at increased risk of pre-eclampsia – ensure BP is checked every 3 weeks from 24 - 32 weeks, then every 2 weeks until birth.

Table 2: BMI cut-offs for birthing in Kimberley hospitals

HOSPITAL	FIRST TRIMESTER BMI (kg/m ²)*	
	Refer to anaesthetic/obstetric DMO	Usual cut-offs for birth**
Broome	>35	40
Derby	>35	35 - 40
Kununurra	>30	34

* Check at first visit, do not use subsequent BMI. Women who have a borderline BMI at the first visit and who gain greater than 15kg may need to be re-evaluated.
 ** The specific BMI at which women will be unable to birth in Kimberley hospitals is decided on an individual basis on the basis of their anaesthetic assessment.

Micronutrients in pregnancy

Vitamin D:

Vitamin D deficiency may result in hypocalcaemia, rickets and defective tooth enamel in newborns, and an increased risk of SGA.

Women with vitamin D levels <50 nmol/L require treatment:

- Levels 30-50 nmol/L: 1000 IU (one tablet) daily
- Levels <30 nmol/L: 2000 IU (two tablets) daily
- Recheck levels in women with deficiency at 28 weeks

Women who have had vitamin D deficiency in pregnancy should have their levels rechecked at six weeks and continue on at least 1000 IU cholecalciferol (one tablet) daily until they have finished breastfeeding. Breastfed babies of vitamin D deficient mothers require additional supplementation (see “Neonatal Medication Protocols: Cholecalciferol” in RESOURCES section).

Calcium:

The recommended dietary intake of calcium per day for pregnant women is 1300mg (14 - 18 years) and 1000mg (19 - 50 years). If the woman avoids dairy (or has poor access to dairy) in her usual diet and does not consume alternative high calcium foods, she should take a calcium supplement of at least 1000mg daily. Calcium requirements are similarly increased whilst breastfeeding and ongoing supplementation may be required.

Calcium supplementation may be prescribed for women at high risk of pre-eclampsia to reduce the risk of adverse outcomes.

Note: Calcium reduces iron absorption and should not be administered concurrently with iron supplements.

Iodine:

Australia is classified as a mildly iodine deficient country. Iodine deficiency in pregnancy may impair neurological development of the foetus. Supplementation of 150mcg daily is universally recommended in Australia during pregnancy.

Folic acid:

Folic acid supplementation is universally recommended in pregnancy to reduce the risk of neural tube defects, commencing if possible 12 weeks prior to conception and continuing through the first trimester. The usual dose is 0.5mg daily. Women with the following risk factors should be prescribed the higher dose (5mg):

- Taking medicines that are folate antagonists (e.g. carbamazepine, lamotrigine, sodium valproate)
- Diabetes (type 1 and type 2)
- Risk of malabsorption (e.g. coeliac disease)
- Family or personal history of neural tube defects
- BMI >30kg/m²

Iron:

For further information on dietary recommendations for iron consumption in pregnancy and management of iron deficiency see “Iron and anaemia in pregnancy” protocol.

Table 3: Oral micronutrient supplementations available on the Kimberley Standard Drug List

Name	Components
Folic acid	0.5mg or 5mg of folic acid
I-Folic	0.5mg folic acid and 150mcg iodine
Cholecalciferol	25mcg cholecalciferol (equal to 1000 IU)

Note: Over the counter vitamin supplementations that are intended for use in pregnancy (e.g. Elevit) will usually contain adequate amounts of iodine and folate.

Advise women that the use of multivitamins that are not specifically designed for pregnancy may contain harmful levels of certain components (e.g. vitamin A) and should not be taken.

Refer/ Discuss

- Underweight women with poor weight gain during pregnancy.
- Obese women with additional risk factors for VTE and pre-eclampsia or other indicators of high risk pregnancy.
- Women on extreme or restrictive diets for dietitian input, or who may require vitamin B12 supplementation.

Resources

Australian Guide to Healthy Eating: <https://www.eatforhealth.gov.au/guidelines/australian-guide-healthy-eating>

Food safety during pregnancy: http://www.foodauthority.nsw.gov.au/_Documents/consumer_pdf/pregnancy-brochure.pdf

Neonatal Medication Protocols: Cholecalciferol: http://www.kemh.health.wa.gov.au/development/manuals/O&G_guidelines/sectionp/alpha/p_cholecalciferol.pdf

Vitamin and Mineral Supplementation in Pregnancy: <https://www.ranzcog.edu.au/doc/vitamin-and-mineral-supplementation-in-pregnancy.html>