3 Pregnancy

Introduction

Antenatal care must respect the woman's cultural beliefs and social situation. It needs to be flexible, friendly, non-threatening, and accessible to all women, including young women. Antenatal care aims to improve the health of the pregnant woman and her baby by monitoring progress, detecting and managing problems, and providing education about pregnancy and birth. The earlier antenatal care starts, the better the outcome. Antenatal care in remote areas may also include supporting women who have additional life stressors.

Problems that can adversely affect pregnancy outcomes include

- Medical issues — UTI, STI, anaemia
- Chronic diseases — diabetes, kidney disease, RHD
- Social and emotional issues — history of depression, anxiety or other mental health concerns, poor family or social support
- Environmental and social issues — crowded housing, mobile lifestyle, poor nutrition, access to affordable nutritious food, domestic/family violence
- Substance use — smoking, alcohol, kava, other drugs
- Pregnancies in young women
- Late presentation to health services.

Remote area health services can have trouble accessing skilled women's health providers. Providing antenatal information, education and care can be shared between a variety of providers including midwives, doctors, nurses, ATSIHPs, ACWs, and community-based workers such as Strong Women, Strong Babies, Strong Culture (SWSBSC) program workers. Use an interpreter if needed, and if available, written materials in language.

Traditionally, Aboriginal women acknowledged a pregnancy when the baby's movements were felt at around 16–20 weeks pregnant. They believed that at this time a spirit child entered the woman. This spirit may have come from a deceased relative, from certain places in the country, or from eating certain food.

Traditionally, women didn't talk much about pregnancy until it was obvious, although close family members often knew. Secrecy and privacy are still important to some women, so they may give another reason for seeking medical care when they really want confirmation of a pregnancy. Practitioners need to be sensitive to non-verbal cues, and offer a urine pregnancy test in these circumstances.

Women now tend to present for antenatal care earlier than in the past, and many come in the first trimester. However, some women still don't present until they feel the baby moving. Young women may present late, as they may not understand what is happening, or they may feel frightened, embarrassed or shamed about being pregnant. A small number of women don't come for antenatal care at all.

Reasons for not presenting may include feelings of shame or guilt due to social circumstances around the pregnancy (eg sexual assault, 'wrong way' marriage), because they believe things are going fine, or due to previous bad experience with the service. Other health staff may hear a woman is pregnant from an ATSIHP, ACW, or SWSBSC worker, or from another culturally appropriate woman in the community. Respect the woman's privacy, and her reasons for not presenting. Talk with the ATSIHP or ACW about the best way to approach her to offer confirmation of the pregnancy and antenatal care.

Pre-pregnancy counselling

Health check for women planning pregnancy.

- Aims to
  - Find and treat problems that might put woman or baby at risk
  - Make sure woman's medical problems well managed
  - Give education on health, nutrition, fertility
  - Investigate any problems — trouble getting pregnant (fertility problems), recurrent miscarriages
- Best done **at least** 3 months before woman tries to become pregnant
- Offer before stopping contraception or removing LARC (eg ENG-implant)
- Can offer opportunistically to any woman of childbearing age
- Important to be discreet and private — woman may not want others from community knowing she is trying to get pregnant

Check

- History, examination, tests as for first antenatal visit (*p89*)
- Adult Health Check (*CPM p123*) — include STI check (*p238*), cervical screening if due (*p272*)
- Urine pregnancy test (*p279*)
- Immunisation status, see *Australian Immunisation Handbook*
- Was follow-up of problems (*p209*) from last pregnancy completed
  - If woman had GDM and 75g OGTT not done after last pregnancy — do now

Do

Medical consult if

- High risk of baby with abnormality — previous baby with congenital abnormality, family history of inherited disorder
  - May need genetic counselling
- Obstetric issues that could affect future pregnancy or birth — baby with neural tube defect, multiple pregnancy, several miscarriages
- More than 35 years old, especially if first baby
- Chronic medical or mental health condition
- Taking any prescription medicine
- History of substance use

Talk with woman about

- General health issues, especially if first pregnancy or woman has medical, mental health, substance use issues
- Optimising control of chronic conditions — high BP, diabetes, asthma, epilepsy, depression
- Encourage healthy weight (BMI 20–25) before getting pregnant
- **Immunisations**
  - If rubella serology non-immune or unclear — offer MMR
    - Advise not to get pregnant for 28 days after MMR

    - If not immune to varicella — **medical consult** about immunisation
        - If woman already pregnant — avoid giving
    - If influenza immunisation due — offer
        - Pregnant women are at high risk of complications from flu
    - Offer any other immunisations due
- **Menstrual cycle** and best times to try for baby (have sex)
    - Ovulation usually 2 weeks before period
    - Give advice about stopping contraception
- **Signs and symptoms of pregnancy**
    - Good opportunity to talk with woman about why antenatal care is important
    - Tell her to come to clinic as soon as she thinks she might be pregnant
- **Family and social circumstances**
    - Talk with woman about family help and support, any domestic/family violence issues
    - Financial capacity to look after baby, cost of essential baby items, Centrelink payments
- Arrange to see woman again and talk about test results, any other worries she is having in relation to trying to get pregnant

Education

- See *Antenatal education* (*p109*)

Antenatal checklist

Routine antenatal check

— every visit

Ask

- How she is feeling
  - Physical problems — urine symptoms, STI symptoms, vaginal loss, bleeding, pain, DVT or PE symptoms (*p138*)
  - Social or emotional issues
- Baby's movements — 18–20 weeks first baby, 15–16+ weeks next babies

Check

- How many weeks pregnant (gestation)
- Weight
- BP
- U/A — mid-stream urine
- Oedema — face, fingers, feet, ankles
- After 12 weeks
  - Fundal height (*p98*)
  - Baby's heart rate (*p101*)
- After 36 weeks — baby's position (*p99*)
- EPDS (*p224*) at least twice in pregnancy

Do

- Talk with woman about
  - Baby's growth and development
  - Any problems found
  - Plans for baby's birth
  - Ongoing care needed
  - Smoking, alcohol, substance use — brief interventions (*CPM p138*)
  - Antenatal education topics (*p109*)
- See Table 3.2 (*p94*) for managing results

First visit — ALSO

Ask or check file notes

- *Estimated date of birth (p89)*
- *Detailed history (p89)*

Check

- *Head-to-toe check (p90)*
- *Risk factors for pre-eclampsia (p128)*
- *Offer full STI check (p238)*
- *Take blood for*
  - *FBC, iron studies, POC test for Hb*
  - *Blood group, antibody screen*
  - *Test/s for diabetes (p119) — OGTT (preferred) OR HbA1c and venous blood glucose*
  - *Rubella serology*
  - *Hepatitis B serology, hepatitis C serology*
  - *HIV serology*
  - *Syphilis serology*
  - *If known diabetes, high BP or kidney disease — UEC, LFT*
- *Other tests*
  - *Mid-stream urine — U/A, send for MC&S*
  - *Cervical screening if due (p272). Best done before 24 weeks pregnant*
    - *If speculum exam not done — cervical screen by self-collected HPV test if eligible (p264) AND visual check of vulva and vagina*
  - *If known chronic high BP or kidney disease — urine ACR*
  - *If history of preterm birth — MC&S for BV*

Things to offer at specific times

11–13^{+6} weeks

- If woman unsure of last period — dating scan
- First trimester screen for abnormalities (*p103*)

14–20 weeks

- If first trimester screen not done — offer second trimester screen (*p103*)

18–22 weeks

- Morphology ultrasound (*p105*) + cervical length measure
  - If risk of preterm birth (*p107*) — request transvaginal ultrasound for cervical length – 'Preterm birth risk'
- Antenatal review at regional service

26–28 weeks

- If no known diabetes — 75g fasting OGTT. See *Screening for diabetes in pregnancy* (*p119*)
- If HBsAg positive (hepatitis B) — check viral load (HBV DNA)

28 weeks

- POC test for Hb, take blood for FBC, iron studies
- If RhD negative with no Anti-D antibodies — repeat antibody screen, then give prophylactic RhD-Ig IM – 625 international units
- If other antibodies detected earlier — repeat antibody screen
- Pregnancy STI check (*p241*)

34 weeks

- If RhD negative with no Anti-D antibodies — give second prophylactic RhD-Ig IM – 625 international units

36 weeks

- POC test for Hb, take blood for FBC
- Combined vaginal and anal swab (*p266*) for GBS (*p147*)
- Pregnancy STI check (*p241*)

38 weeks

- Transfer to regional centre to wait for birth

40^{+} weeks if still in community

- **Medical/midwife consult**

Antenatal education

Try to talk about each of these topics during pregnancy.

See *Antenatal education and birth planning* (*p109*)

- Access to healthy food, nutrition and healthy diet, supplements
- Exercise
- Working
- Sex
- Common discomforts of pregnancy
- Mental health
- Domestic/family violence
- Prescribed and over the counter medicines
- Smoking, alcohol, other substances
- Warning signs
- Birth plan, travel to a regional centre for birth
- Signs of labour, process of birth
- After the birth — breastfeeding, family supports, looking after baby
- Contraception

Antenatal care

Maintain or improve health of pregnant woman, monitor progress of pregnancy, detect and manage problems, provide information and education.

Antenatal care schedule

- Planned schedule of visits should consider individual woman's needs
- If high risk pregnancy (Table 3.1), or other problems — may need more visits
- Minimum of 7–10 visits recommended
  - Monthly until 28 weeks
  - *THEN* every 2 weeks until 36 weeks
  - *THEN* weekly until leaves for regional centre, or birth
- Key visits
  - First visit in first 10 weeks of pregnancy
  - 18–20 weeks — timed with morphology ultrasound if possible
  - 26–28 weeks — timed for blood tests
  - 30–32 weeks
  - 34 weeks
  - 36 weeks — time to collect pathology and organise travel to regional centre for birth
  - 38 weeks — depends on when woman transfers to regional centre
  - Weekly to 40 weeks — medical/midwife review

Providing antenatal care

Pregnancies must not be managed in isolation. Shared care is essential.

- Within 1 week of woman's first antenatal visit
  - **Doctor/midwife/obstetrician consult** about risks and developing shared care plan
  - Consult as per plan, or at least once a trimester to monitor and update plan
  - Women at high risk need more frequent review
  - Share woman's antenatal care with female ATSIHP if appropriate
  - If woman travelling — talk with staff in other clinics about shared antenatal care

- Record antenatal care, progress, results, education in antenatal file notes *AND* in woman's hand-held pregnancy record if she has one
  - Encourage women to participate in MeHR/PCEHR
- Encourage woman to be involved in her pregnancy care
- If difficult to see woman as often as recommended — use any opportunity to provide antenatal care

Give information and education about pregnancy (*p109*) from first antenatal visit.

Antenatal checks

Routine antenatal check

- See *Antenatal checklist* (*p86*)

First antenatal visit

- Every woman should be seen by doctor and/or midwife early in pregnancy
- Spend time getting to know woman, explaining what needs to be done
  - Talk about tests available, why recommended, see *Antenatal screening tests for baby* (*p103*)
  - Be patient, give her time to think about everything
- Long visit. May need to ask her to come back the next day to finish
- Do routine antenatal check (*p86*) *AND* the following

Ask about and check file notes

This pregnancy

- Try to work out **estimated date of birth** (EDB)
  - Use date of last normal menstrual period (LNMP) and obstetric wheel
    - If unsure of calendar date — was it at the same time as recent community or other event
  - If LNMP unknown or unsure — **refer for dating ultrasound**
    - Best done before 14 weeks
    - Consider combining with first trimester nuchal translucency measurement (*p103*)
- Clinical assessment to check for current problems (eg cough, pain on passing urine, STI)
  - If increased shortness of breath or needs to sleep with 2 pillows — consider RHD

Detailed history

Best way to find women who will need extra care during pregnancy (Table 3.1), labour, after birth. Consider need for interpreter, using information in woman's own language if available.

Obstetric history

History of each pregnancy including stillbirths, miscarriages, ectopic pregnancies, terminations. Record relevant history.

- Pregnancy — high BP, diabetes, anaemia, infections, GBS, bleeding, blood clots (DVT, thromboembolism), premature rupture of membranes
- Birth — date, place, gestation, type, length of labour, fetal distress, episiotomy, tear including degree, retained placenta, heavy bleeding
  - Birth type — spontaneous vaginal birth, induction, forceps, vacuum, Caesarean section
- Baby — weight, APGAR scores, birth abnormalities, problems in first 6 weeks, Group B Streptococcus infection, breastfeeding

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- After birth — infection, breast problems, blood clots (DVT, PE), depression
- If history of preterm birth — see *Preventing preterm birth* (*p107*)

Medical and surgical history

- High BP, diabetes, heart disease, kidney disease, recurrent UTIs, fits, lung disease, asthma, blood clots, bleeding problems, other serious problems
- Mental health problems including previous perinatal depression
- Operations, problems with anaesthetics, blood transfusions
- Allergies, medicines, immunisation history

Gynaecological history

- Usual periods — how often, how long
- Recent contraception
- Any trouble getting pregnant, assisted reproduction
- Date of last cervical screening, results, any treatment for previous abnormality
- STIs, PID, operations

Family history

- Medical problems in close relatives, especially diabetes, hypertension, mental health problems
- Multiple pregnancy, preterm labour or birth (*p107*)
- Genetic/family problems

Social history

- Regular partner, family support, housing, money
- Domestic/family violence (*p324*)
  - May increase or be triggered by pregnancy
  - Explain that asking about it is routine part of antenatal care
  - Use screening tool if available
  - Be aware of mandatory reporting requirements for your state/territory
- Substance use — pregnancy is an ideal time to talk with women about substance use, many women motivated to change at this time
  - Alcohol and other substances
  - Smoking, second hand smoke

Check

- Do head-to-toe check
  - Weight, height, BMI (*CPM p108*)
  - BP — take when seated and rested. Use manual sphygmomanometer, correct size cuff, same arm each time
  - Teeth — check for gum disease, tooth decay
  - Thyroid — feel for obvious enlargement
  - Chest and heart — note heart rate, check for wheeze or crackles
    - Check for heart murmurs. Done by doctor if possible
    - If suspect heart murmur or RHD (*p136*) — refer for echocardiogram
  - Breasts and nipples — abnormalities, concerns

  - Abdomen — look for scars, masses, tenderness, size of uterus
    - If uterus felt — measure fundal height (*p98*), baby's heart rate (*p101*)
    - If abdomen tender — **medical/midwife consult**
  - Legs — for calf tenderness, note any varicose veins
  - Skin — sores or infections needing treatment
- If more than 36 weeks pregnant — palpate position of baby and try to identify presenting part (*p99*)
- Edinburgh Postnatal Depression Scale (EPDS) (*p224*)
  - Do again at least once more during pregnancy, usually in third trimester
  - *OR* as needed
- **Pathology tests**
  - See *Antenatal checklist* (*p86*)
  - If medical problems — may need other blood tests. See individual protocols
  - Record on pathology forms — woman pregnant, how many weeks, any medicines, current medical conditions
  - Request copy of results sent to antenatal clinic at hospital where birth planned

Table 3.1: Conditions that suggest woman may need extra antenatal care

Medical problems	Current or previous obstetric problems
• Heart disease • History of rheumatic fever • RHD • Asthma • Kidney disease • High BP • Epilepsy • Diabetes, thyroid, or other endocrine disease • Clots in legs (DVT) • Mental health problems including perinatal depression, anxiety	• Caesarean section • Recurrent miscarriages • Preterm labour or birth • 5 or more previous births • Pre-eclampsia • RhD antibodies (Anti-D) or other significant blood group antibodies • Uterine surgery, cone biopsy, fibroids removed • Bleeding during previous pregnancy • Excessive bleeding after birth of previous baby (postpartum haemorrhage) • Underweight — BMI less than 18.5 • Obese — BMI more than 30 • Birth of small baby (less than 2.5kg) or large baby (more than 4.5kg) • Stillborn baby or baby died soon after birth • Baby born with abnormalities (*p103*)

Do

- **Medical/midwife consult** about immediate management and to plan shared antenatal care. Talk about findings from history and examination including
  - Prescribed or other medicines that may need to be stopped or changed
  - Medical problems needing treatment — abnormal U/A, STI, dental disease

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  - Any conditions needing extra care (Table 3.1)
    - May increase pregnancy risk
    - May change plan for antenatal care
    - May need additional investigations or specialist referrals
- If known conditions — see individual protocols
  - *Rheumatic heart disease in pregnancy (p136)*
  - *Diabetes in pregnancy (p118)*
  - *Kidney disease in pregnancy (p143)*
  - *High BP (hypertension) in pregnancy (p127)*
  - *Epilepsy in pregnancy* (p140)
- See Table 3.2 for management of investigation results
- Give **iodine** oral once a day through pregnancy – 150microgram. Can be in multivitamin designed for pregnancy and breastfeeding
  - If woman has thyroid condition — **medical consult**
- If early in pregnancy — give **folic acid** oral once a day until 12 weeks pregnant – 0.5mg *OR* at least 0.4mg in multivitamin designed for pregnancy and breastfeeding
  - *OR* if woman has diabetes, epilepsy, BMI over 30, or had baby with neural tube defect — **folic acid** oral once a day until 12 weeks pregnant – 5mg
- Give **iron** if needed — see *Anaemia (weak blood) in pregnancy* (p132)
- Offer **influenza immunisations** to all pregnant women — they are at high risk of complications from flu

Talk with woman about

- How pregnant they are (estimated gestation), approximate date of birth
- Common discomforts (p115) — morning sickness, heartburn
- Plan for managing ongoing problems
- Antenatal screening tests for baby (p103)
- Plan for future visits, including review in 2 weeks for results

Follow-up

- Check results — see Table 3.2 to help with ongoing care
- Medical review
- May need referral to obstetrician or other specialist if
  - Chronic medical problems
  - Twin/multiple pregnancy (p96)
  - Complicated obstetric history
- Refer to services or identify community support for social issues, if needed

Following antenatal visits

- Do routine antenatal check at each visit (p86)
  - Include relevant antenatal education (p109)
- Ask **all** pregnant women about substance use at **every** clinic visit in sensitive, non-judgemental way. Check file notes for earlier discussions

- Ask about
  - Prescribed medicines, alcohol, smoking and chewing tobacco, other drugs, herbal/natural medicines
  - Pattern of use — duration, frequency, amount, whether partner or other family members use
  - Previous use, quitting, relapses
- Assess whether dependency an issue

- Offer special tests at times indicated in antenatal checklist (*p86*)
- Offer **whooping cough (pertussis) booster** after 28 weeks for woman, partner, other adults in house
- See Table 3.2 (*p94*) to help manage abnormal results
- **Midwife/doctor consult** about findings

At 36 weeks

- Check pregnancy record, make sure it is complete
- Talk again about plan for birth (*p112*)
  - If high levels of substance use — always plan for hospital birth
- Arrange for transfer to regional centre at 38 weeks to wait for birth. Advise all women to give birth in hospital or birth centre

Things to watch for in later pregnancy

Medical/midwife consult if any concerns or you find any abnormalities.

- **Pre-eclampsia**
  - If high BP after 20 weeks — could be pre-eclampsia (*p21*)
    - BP 140mmHg or more systolic and/or 90mmHg or more diastolic
- **Shortness of breath**
  - If increased shortness of breath — consider RHD, asthma, pulmonary embolus, heart failure
- **Growth of baby**
  - Estimate baby's growth by measuring fundal height (*p98*) at each visit
- **Position of baby**
  - After 36 weeks pregnant, check position of baby (*p99*)
  - If breech position (bottom coming first) or transverse lie (across uterus) — arrange obstetric ultrasound, antenatal review
- **Baby's movements** — feel and ask woman
  - Movements felt from around 18–20 weeks pregnant, sometimes at 15–16 weeks if woman had baby before
    - Regular movements are one sign that baby is well
    - Tell woman to come to clinic for a check if she notices decreased or no movements
  - If movements reduced —
    - Check woman's temp, pulse, RR, BP, O_2 sats — work out REWS (*p8*)
    - Check baby's heart rate (*p101*)

  - Ask about symptoms of illness or infection
  - **Medical/midwife consult**
- **Baby's heart rate** (*p101*) — usual to check for this, reassuring for woman

Table 3.2: Management of results at first and subsequent visits

Investigation	Result	Management
BP	• 140mmHg or more systolic and/or 90mmHg or more diastolic	• See ◦ *High BP (hypertension) in pregnancy (p127)* ◦ *Severe pre-eclampsia* (*p21*)
Hb — FBC or POC test	• Hb — less than 110g/L	• See *Anaemia (weak blood) in pregnancy* (*p132*)
FBC	• MCV — 80fL or less	• See *Anaemia (weak blood) in pregnancy* (*p132*)
	• Low platelets	• **Medical consult**
OGTT, BGL, HbA1c	• See *Screening for diabetes in pregnancy* (*p119*)	
Blood group and antibody screen	• RhD negative, no Anti-D antibodies	• Repeat antibody screen at 28 weeks ◦ If RhD-Ig already given for sensitising event — note on form • Give routine RhD-Ig IM prophylaxis at 28 and 34 weeks ◦ 625 international units
	• RhD negative, with Anti-D antibodies	• Refer to obstetrician
	• Other antibodies present	• **Medical consult**
Rubella serology	• Positive and protective	• Normal
	• Non-immune or unclear	• Record need for immunisation in file notes • Offer **MMR immunisation** after birth
Hepatitis B serology	• HBsAg positive	• See *Hepatitis in pregnancy — Hepatitis B* (*p144*) • Record in antenatal file notes ◦ Baby needs hepatitis B immunoglobulin at birth ◦ If mother needs immunisation
Hepatitis C serology	• Positive • Negative but risk factors identified	• See *Hepatitis in pregnancy — Hepatitis C* (*p146*)
Syphilis serology	• Positive	• Could be active syphilis • **Medical/sexual health consult** straight away. Manage as directed

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Investigation	Result	Management
HIV serology	• Positive	• See *HIV — Pregnancy considerations* (*p250*)
NAAT	• Positive STI result	• See *STI management for women* (*p245*)
Vaginal swab MC&S	• Positive STI result	• See *STI management for women* (*p245*)
	• Positive non-STI result	• See *Bacterial vaginosis* (*p255*) • See *Thrush (candidiasis)* (*p254*)
Combined vaginal and anal swab	• GBS positive	• See *Group B Streptococcus* (*p147*)
U/A	• Leucocytes, blood, protein, or nitrites	• See *Urine problems in pregnancy* (*p149*)
	• Glucose	• **Medical consult**
Urine MC&S	• Culture positive	• See *Urine problems in pregnancy* (*p149*)
	• GBS positive	• See *Group B Streptococcus* (*p147*)
Cervical screening	• Any abnormalities	• See cervical screening — *Follow-up* (*p291*)
Obstetric ultrasound	• Abnormalities relating to ◦ Amount of fluid ◦ Location of placenta ◦ Morphology of baby ◦ Estimated body weight less than 10th or more than 90th centile • Number of babies	• **Medical consult**
	• Cervical length less than 35mm	• Refer for transvaginal ultrasound
Transvaginal ultrasound	• Cervical length less than 25mm	• See *Preventing preterm birth* (*p107*)
First or second trimester screening	• Any abnormal results	• **Medical consult** straight away
Dental exam	• Tooth decay or gum disease	• Call oral health service for advice, or refer to dentist

Antenatal care in twin pregnancy

Multiple pregnancies often need extra professional and emotional support for woman and family.

- Physical demands of multiple pregnancy can be very tiring for woman
- Common discomforts of pregnancy may be increased (*p115*)
  - More nausea and vomiting in first 3 months (first trimester)
  - More heartburn, backache, groin pain, varicose veins
- Greater risk of complications
  - High BP, pre-eclampsia
  - Gestational diabetes
  - Preterm birth
  - Anaemia
- Babies more likely to have
  - Poor growth
  - Preterm birth
  - Congenital abnormalities
- Birth of twins often complicated — **always** plan for hospital birth

Do

Talk with woman about

- Antenatal care schedule, referral to obstetrician
- Possible trips to regional centre for extra ultrasounds
- Problems she needs to look out for, including
  - Preterm labour (*p26*)
  - Premature rupture of membranes (*p29*)
  - Reduced baby movements
- Antenatal education and birth planning (*p109*)
- Seeing midwife or doctor any time she is worried
- Any available support services for twin pregnancies

Antenatal care schedule

- Multiple pregnancies should be closely monitored at all times
- Refer to obstetrician as soon as multiple pregnancy identified
- **Obstetrician/medical/midwife consult** any time you are concerned

- Explain schedule to woman so she can understand and help with her care
  - Extra visits can be arranged if needed
- See *Antenatal care* (*p88*) for what to do at visits
- Obstetrician will
  - Help plan antenatal care
    - Take over care when woman goes to regional centre
    - May ask for earlier repeat OGTT to screen for GDM (*p119*)

- Plan follow-up obstetric ultrasounds
  - Ultrasound at 16–18 weeks *THEN*
  - If 2 placentas — ultrasound every 4–5 weeks
  - If 1 placenta — ultrasound every 2 weeks. High risk of twin-to-twin transfusion syndrome (TTTS)
- Make plans for woman to birth in hospital. Talk with woman about options for birthing
- Decide when woman should go to regional centre for birth, usually around 34 weeks

Remember: With twins, fundal height will be about 4 weeks ahead of gestational age.

- I placenta — monochorionic diamniotic (MoDi) or monochorionic monoamniotic (MoMo) twins
- 2 placenta — dichorionic diamniotic (DiDi) twins

Checking baby's growth and development

Positioning pregnant woman

- In later pregnancy the uterus is heavy. When woman lies on her back, the weight of the uterus presses down on big abdominal blood vessels, she may feel faint
  - Usual to put wedge/pillow under right hip to tilt woman slightly to left
  - If she feels faint — roll onto left side straight away, check baby's heart rate
- Lay woman as flat as possible for these procedures, but for as short a time as possible

Measuring fundal height

Measurement from top of uterus (fundus) to top edge of pubic bone in pregnant woman.

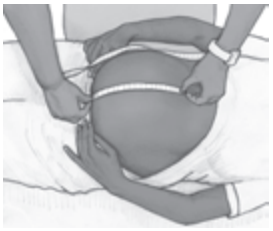
- Measure at each antenatal visit after uterus out of pelvis — after 12–14 weeks pregnant
- Tells how many weeks pregnant woman is, if baby growing properly
- **Measure the same way at each visit** so measurements consistent

Do

- Ask woman to empty bladder, collect urine sample if needed (*CPM p393*)
- Position pregnant woman as above
- **If you notice a contraction** — **stop** until it is over
- Find top of uterus by gently pressing side of your hand down where you think it is — F 3.1. Move hand up and down until it lies right against top of uterus. Feels like a smooth rounded muscle

3.1

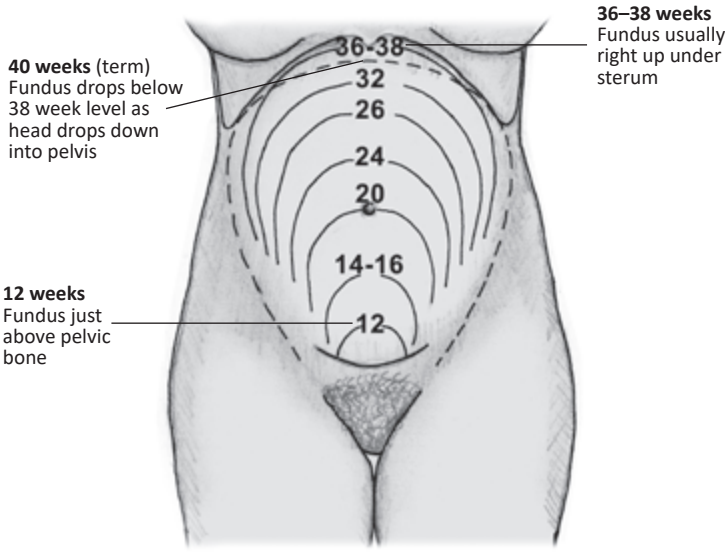
- Measure with disposable paper tape. Have tape facing downward so previous readings or expected length of pregnancy don't influence result
- Put end of tape measure at top of uterus, hold with 1 hand
- With other hand, stretch tape from top of uterus down midline to top of pubic bone — F 3.2
  - Often easier to ask woman to find pubic bone herself



3.2

- If fold of skin or fat at lower abdomen — stretch tape across fold straight to pubic bone. **Do not** run tape under fold of skin or fat
- Compare your measurement with expected measurement for woman's dates — F 3.3 and/or ultrasound
  - 12 weeks — top of uterus just above pubic bone
  - 20–36 weeks — measurement in centimetres about the same as number of weeks pregnant

- 36–38 weeks — top of uterus at or under sternum
- 40 weeks (term) — fundal height less than 38 weeks measurement as presenting part (eg head) drops down into pelvis
  - May not happen with first baby
- Twins — fundal height will be about 4 weeks ahead of pregnancy dates



3.3

You can use your fingers to estimate growth — 1 finger = 1 week's growth. From top of pubic bone (12 weeks) to umbilicus, usually room for 8 fingers (8 weeks) — 12 + 8 = approximately 20 weeks growth

Medical consult if

- Too much growth of baby (fundal height 3cm more than expected)
- Too little growth of baby (fundal height 3cm less than expected)

May need another obstetric ultrasound and review at antenatal clinic.

Palpating the baby

- Helps identify part of baby furthest down in pelvis (presenting part)
  - Head (cephalic) — most common
  - Bottom (breech) — sometimes
  - Other parts of body (eg shoulder) — rarely
- Most babies lie with their back to front of uterus (anterior lie) but some babies lie with their back to back of uterus and against woman's spine (posterior lie)
- If a lot of backs, limbs and/or movement — suspect twin pregnancy

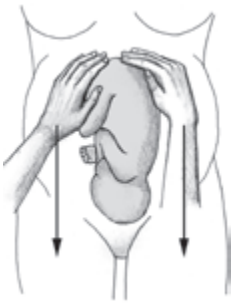
Do

- Maintain position of woman (*p98*) if she is comfortable
- Look at woman's abdomen for clues about which way the baby is lying
  - If centre of abdomen looks empty — baby's back may lie against woman's spine
  - If one side of abdomen looks fuller or firmer — baby may have back to this side and limbs to other
  - Ask where the baby kicks
- Gently feel (palpate) with flat of your hands and finger pads
- Try to get a picture of the baby inside. Imagine what is underneath

Top of uterus

- Face toward woman's head, put your hands palm down on either side of top of uterus — F 3.4
- Move hands down a little, feeling as you go. Feel for
  - Head — hard and even (well defined) and can be gently 'bounced' (balloted) between your hands
  - Bottom — uneven, with soft lines (poorly defined)
  - Other parts (eg shoulder) will be almost impossible to work out
- If unsure — **midwife/doctor consult**

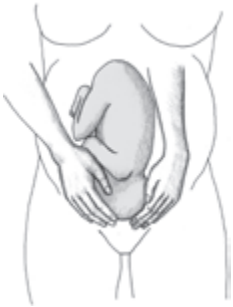
Sides of uterus — to feel for limbs and back



3.4

- Stay facing woman, keeping your hands on either side of uterus
- Feel all the way down uterus — F 3.4
  - Move one hand down at a time
  - Use opposite hand to support uterus while you explore baby's outline
- Feel for
  - **Limbs** — feel uneven, 'knobbly', may move away or even give you a kick. If baby in posterior lie — all you will feel is limbs
  - **Back** — feels firm all the way down side of uterus and won't move much if baby kicks
  - When you find the back, imagine where baby's anterior shoulder will be
    - This is position for listening to fetal heart rate

'Presenting' part



3.5

- Face toward woman's feet, put your hands either side of lower uterus — F 3.5
- Feel for presenting part
  - Head for cephalic presentation
  - Bottom for breech presentation

Note: If head or bottom has already dropped down into pelvis ready for birth (engaged) — you won't be able to feel presenting part. Check what is at top of uterus instead.

- Document in woman's hand held record and clinical notes

Listening to baby's heart rate

- Fetal heart beat may first be heard from 12–14 weeks pregnant
- **3 sounds in pregnant abdomen**
  - Sound of blood in woman's large abdominal artery (aorta). Swishing sound at same rate and rhythm as woman's pulse — **about 70–100 beats/min**
  - Sound of blood passing through placenta. Swishing sound at same rate as baby's heartbeat — **about 110–160 beats/min**
  - Sound of baby's heartbeat. Sound like galloping horse's hooves on hard ground, 'clipperty clop' — **about 110–160 beats/min**

Remember: May be more than 1 baby's heartbeat.

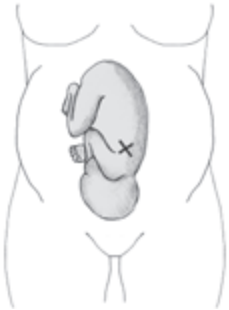
If heartbeat under 110 beats/min or over 160 beats/min — baby may be distressed. Roll woman onto left side, **midwife/medical/obstetrician consult**.

Do

- Maintain position of woman (*p98*) if she is comfortable

Finding the heartbeat

- **If you know baby's position from palpation** (*p99*) —
  - Put device on woman's abdomen over area where you think baby's anterior shoulder is — F 3.6
- **If unsure of baby's position** —
  - Put device in centre of abdomen midway between umbilicus and top of pubic bone
  - *OR* in early pregnancy before top of uterus reaches umbilicus (12–20 weeks), put probe 3 fingers above pubic bone
  - If baby bottom down (breech presentation) — heartbeat may be higher in abdomen
  - During labour (if head coming first), heartbeat will be heard lower down toward pelvis
  - If you can't hear heartbeat in any of these positions — move across abdomen in grid pattern until you have covered whole area
    - If distressing for mother — stop and do **midwifery/medical consult**



3.6

Remember: Take woman's pulse to be sure you are not listening to her heartbeat.

Using fetal heart doppler machine

- All machines are different — read manufacturer's instructions before use
- Probe/head of doppler delicate, be careful not to drop or bang against furniture
- Check batteries are working before starting

Do

- Put conductive gel over surface of probe/head, switch on machine. Have volume turned down
- Position probe/head. See *Finding the heartbeat* (*p101*)
- Turn up volume
- When you find heartbeat, count for 1 full minute

Using pinard stethoscope

- Position pinard. See *Finding the heartbeat* (*p101*)
  - Put widest end of pinard ('bell trumpet') on abdomen, press just firmly enough to seal rim against skin
  - Put your ear over smaller end of pinard (diaphragm)
  - Take your hand off shaft, balance pinard between your ear and woman's abdomen, listen for 'clipperty clop' of baby's heart beat
- When you find heartbeat, count for 1 full minute

Listening during labour

- Count heart rate for 1 full minute during and straight after contraction
- During first stage — check every 15 minutes, note if getting faster or slower
- During second stage (when woman pushing) — check during and after each contraction. Usually slows down during contraction but should increase again at end of contraction

Listening to twins' heartbeats

- To tell if twins (without experienced practitioner or ultrasound scan) you need helper with another doppler
- See if you can find a heartbeat in 2 separate places (eg one low and on right, other high and on left)
- Each of you should use doppler over separate heartbeat and start counting at exactly the same time
- Heart rates of twins that are not distressed will differ by up to 10 beats/min
  - If one twin is distressed — heart rates may be very different

Antenatal screening tests for baby

Small chance in every pregnancy that baby may have an abnormality. Some women won't want to know, other women are very anxious about possible problems. Screening for and diagnosis of abnormalities gives woman the option to prepare for a baby with a disability, or termination.

Increased likelihood of fetal abnormality if

- Inherited conditions in woman's or partner's family
- Mother has medical problems — diabetes, epilepsy, prescribed medicines, substance misuse
- Previous baby with an abnormality
- Increasing age of mother increases chance of some abnormalities (eg Down syndrome)

- **Abnormalities detected by routine screening before the baby is born include**
  - Chromosomal — Down syndrome (trisomy 21), trisomy 18
  - Structural abnormalities of musculoskeletal system, internal organs, nervous system

Screening tests

- Estimate chance that baby may have an abnormality
- Done at specific times during pregnancy (gestation specific), so accurate dating of pregnancy needed
  - If woman unsure of dates — dating scan

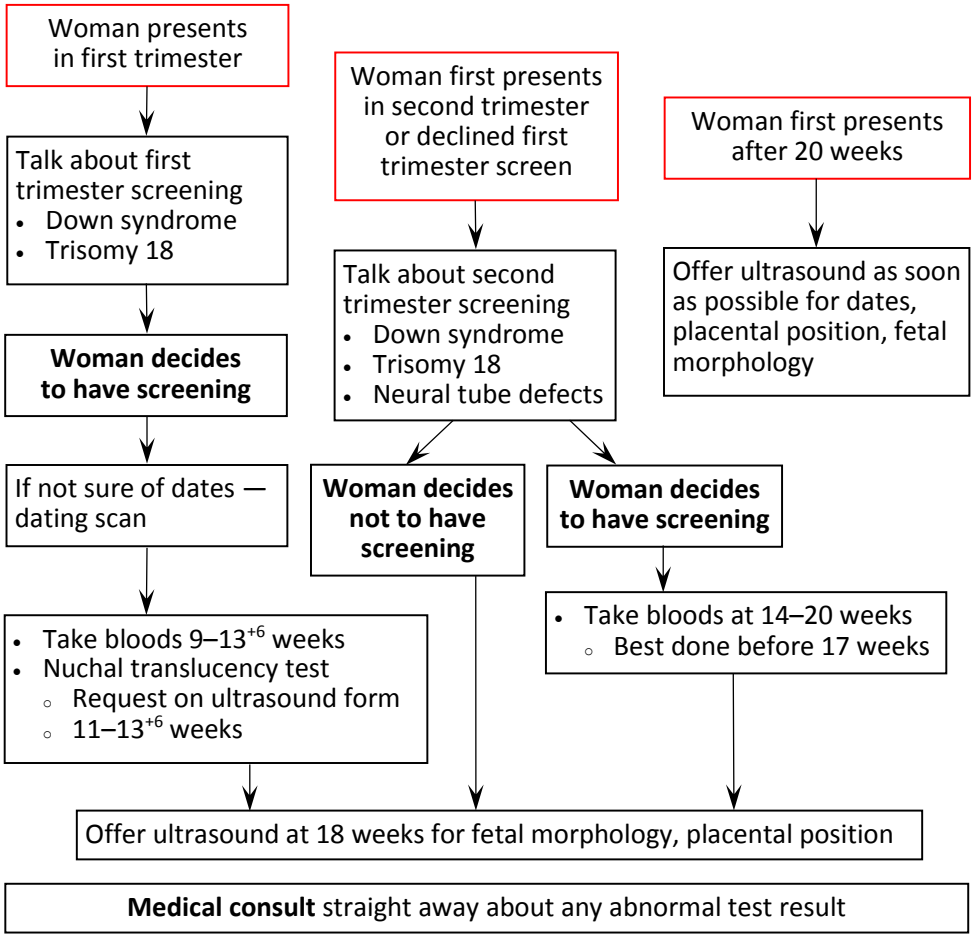
First trimester screen

- **Maternal serum screen and nuchal translucency measurement**
  - Screens for
    - Down syndrome — detects 80–90% of affected babies
    - Trisomy 18
  - Take blood from woman between 9 and 13^{+6} weeks pregnant
  - Measurement at back of baby's neck taken on ultrasound between 11 and 13^{+6} weeks pregnant

Second trimester screen

- **Maternal serum screen**
  - Screens for
    - Down syndrome — detects 70–80% of affected babies
    - Trisomy 18
    - Neural tube defect — anencephaly, spina bifida
  - Take blood from woman after 14 weeks and up to 20 weeks pregnant
    - Best done before 17 weeks to allow time for diagnostic testing if needed

Flowchart 3.1: Testing for fetal abnormalities



Diagnostic tests

Tests for chromosomal abnormalities

- Full results from diagnostic testing can take 2–3 weeks
- Preliminary result may be available in 48–72 hours, but must talk with obstetrician about results
- Small increase in risk of miscarriage
- If result abnormal — woman may choose termination of pregnancy
- **Amniocentesis** — needle passed through wall of uterus into amniotic fluid. Cells from aspirated fluid tested
  - Done after 15 weeks pregnant
  - Can be done at smaller centres

- **Chorionic villus sampling** (CVS) — needle passed through wall of uterus into placenta to collect cell sample
  - Done after 11 weeks pregnant
  - Only done in larger hospitals (eg Adelaide)

Tests for fetal growth and anatomical abnormalities

- **First trimester/dating scan**
  - Most accurate for dating between 8 and 13^{+6} weeks pregnant
  - Reliably diagnoses multiple pregnancy
  - Detects some severe structural abnormalities (eg anencephaly)
  - Confirms pregnancy intrauterine, and helps exclude ectopic pregnancy
  - Confirms pregnancy viable — fetal heart activity can be seen on transvaginal ultrasound at 6–7 weeks in normal pregnancy
  - Can diagnose miscarriage
- **Obstetric morphology ultrasound**
  - Usually done at 18–20 weeks pregnant
  - Reliably detects some major anatomical abnormalities (eg open neural tube defects), but less sensitivity for others (eg heart abnormalities)
  - Detects other anomalies that may not have functional significance, but can be associated with chromosomal problems
  - Provides information about location of placenta, amount of amniotic fluid, growth of baby
  - If any abnormality — **medical consult**. Obstetric consult usually needed
- **Late second trimester and third trimester ultrasound**
  - If morphology scan not done at 18–20 weeks pregnant — still worth doing ultrasound later
    - Not as accurate for dating and detecting anatomical abnormalities
    - Can provide valuable information
  - If woman had morphology ultrasound — further ultrasounds only needed if clinically indicated

Do

- Assess if increased chance of fetal abnormality (*p103*)
- If specific concerns based on family history, personal history, age — **medical consult**
- Offer antenatal screening, see Flowchart 3.1
  - Talk with woman about how knowing her baby has an abnormality would affect her attitude to continuing or terminating the pregnancy
  - Use written material or decision aids (available online)
    - 'Screening for fetal abnormalities and diagnosis' poster *www.menzies.edu.au/icms_docs/161977_Screening_Poster.pdf*
    - 'Checking for problems with the baby in early pregnancy' flipchart *www.menzies.edu.au/icms_docs/161962_Checking_for_problems_with_the_baby_in_early_pregnancy_2010_Flipchart.pdf*

- If result indicates increased chance of Down syndrome — explain
  - Most babies with result indicating increased chance of Down syndrome are not actually affected
  - Further invasive diagnostic testing is needed to identify babies that are affected
- If result indicates increased chance of trisomy 18 — obstetric review with counselling about diagnostic testing
- If result indicates increased chance of neural tube defect — detailed ultrasound and obstetric review
- If any concerns — **medical consult**, consider referral to obstetrician

Preventing preterm birth

Babies born before 37 weeks (preterm) have greater risk of illness and death. Important to assess and manage risk of preterm birth. Women at risk always need shared care with midwife, doctor, obstetrician.

Risk factors for preterm birth

- History of preterm labour and birth
- Previous second trimester miscarriage
- Previous surgery on cervix
- Short cervical length
- Multiple pregnancy (eg twins)
- Abnormally shaped uterus
- Smoking

Ask

- History of preterm labour and birth
- Previous late miscarriage
- Date of most recent previous pregnancy
- Any vaginal bleeding during current pregnancy (*p14*) — more than spotting
- Previous surgery on cervix
- Smoking

Check

- Are pregnancy STI checks up to date (*p241*) — do if needed
- Confirm expected date of birth (current gestation)
  - If dating scan not done — request one
- Request transvaginal ultrasound for cervical length at same time as morphological ultrasound. Note on form 'Preterm birth risk'

Do

- If history of previous preterm birth at less than 34 weeks —
  - **Obstetric consult** at 12–13 weeks about starting **progesterone vaginal pessaries** 200mg every night from 14–36 weeks pregnant
  - If less than 28 weeks pregnant — refer for transvaginal ultrasound to measure cervical length, if not already done
- If cervical length less than 35mm on morphological ultrasound and transvaginal ultrasound not done — refer for transvaginal scan for accurate measure of cervical length
- If cervix length less than 10mm on transvaginal scan — **urgent obstetrician consult**
- If cervical length less than 25mm on transvaginal scan — **obstetrician consult** for management plan. Plan may include
  - Progesterone vaginal pessaries

  - Possible surgery to put suture or tape around cervix (cervical cerclage)
- Encourage not to smoke while pregnant, talk about ways to stop smoking. See *Brief interventions* (*CPM p138*), *Antenatal education and birth planning* (*p109*)

Follow-up — if suture or tape around cervix

- Encourage woman to stay in or close to regional centre, if possible
  - Refer to a local health service or antenatal clinic at hospital where birth planned
- If staying in community —
  - Review every 2 weeks
  - Check for infection once a month
    - Swabs for STI, BV
    - Urine MC&S
    - **Medical consult** about any positive results
  - **Always** plan for hospital birth
    - Encourage woman to go to regional centre to wait for birth earlier than usual
  - If still in community at 36 weeks — hospital review
- If woman with suture or tape around cervix has **PROM** or **preterm labour** in community —
  - **Urgent medical/obstetrician consult** about sending to hospital and immediate management
  - **Do not** remove suture or tape unless advised to by doctor
    - Only needed if woman in established labour and will give birth before she can be sent to hospital
    - If doctor not in community — they need to stay on phone and talk you through the procedure. See *Emergency equipment* (*p157*)
  - See *Premature rupture of membranes* (*p29*) or *Preterm labour* (*p26*)

Antenatal education and birth planning

To promote healthy pregnancy and build woman's confidence in her ability to give birth and care for her baby.

- Document antenatal education in antenatal file notes and hand-held record
- First antenatal visit — **talk with woman about**
  - Pregnancy care options, who will provide care, support person
  - Lifestyle considerations — access to healthy food, nutrition, exercise, substance use
  - Screening tests in pregnancy (*p103*)
- Following antenatal visits
  - Cover as much information as possible during the pregnancy

Warning signs

Tell woman to come to clinic if she is unwell, injured, has any of

- Vaginal bleeding, other fluid loss
- Abdominal pain
- Contractions/baby pains
- Urine problems (eg burning, frequency)
- Headaches, blurred vision, spots in front of eyes
- Fever, chills, feeling hot then cold
- Reduction in baby movements

Education

Nutrition

- Healthy diet is important before, during and after pregnancy
- Include plenty of fruits, vegetables, breads, cereals, foods high in absorbable iron (*below*)

Talk with woman about

- Access to healthy food and fluid options (*CPM p143*) — consider foods available in local store, woman's income, bush tucker
- Current diet
- Eating regular high fibre meals, drinking plenty of water
- Local recommendations about how much and what types of fish to eat
- Increasing intake of calcium, folate, iron
  - Iron supplements often needed, not easy to achieve body's need for iron in pregnancy even with a 'good diet'
  - Amount of iron absorbed from food depends on make-up of diet
    - Foods rich in vitamin C increase iron absorption
    - Tea and coffee contain phytates, reduce absorption of iron from food
    - Red meats have highly absorbable iron, help promote absorption of iron from other food

Foods to avoid

- Foods that may lead to listeriosis
  - Use only pasteurised or long life milk and milk products
  - Avoid soft/mouldy cheeses, uncooked or undercooked pre-prepared meats/sliced meats
  - Thoroughly wash raw vegetables including pre-packaged salads
- Foods that may lead to salmonellosis
  - Avoid raw or partially cooked eggs or meats, or food containing them (eg mayonnaise)

Supplements

- **Offer all women**
  - **Iodine** oral once a day – 150microgram. Can be in multivitamin designed for pregnancy and breastfeeding
    - Start when planning pregnancy, or as soon as pregnancy confirmed
    - If woman has pre-existing thyroid condition — **medical consult**
    - Important for normal development of fetal brain and nervous system
  - **Folic acid** oral once a day – 0.5mg *OR* at least 0.4mg in multivitamin designed for pregnancy and breastfeeding
    - *OR* if woman has diabetes, epilepsy, BMI more than 30, or had previous baby with neural tube defect — **folic acid** oral once a day – 5mg
    - Start when planning pregnancy, continue until 12 weeks pregnant
    - Reduces risk of baby having neural tube defect — anencephaly, spina bifida
- If has anaemia or at risk of anaemia (*p132*) — **iron** tablets
- Consider **vitamin C** for women at risk of anaemia, exposed to tobacco smoke

Exercise

Talk with woman about

- 30 minutes of moderate physical activity every day
  - Walking, swimming, non-contact sports
- Avoid strenuous activity, especially if not used to it
- Exercise in cool part of day — avoid becoming overtired or hot
- Pelvic floor exercises (*p283*) — important for woman's long-term health

Sex in pregnancy

- Having sex during pregnancy is usually safe for woman and baby
  - If any concerns — **medical/midwife consult**

Working during pregnancy

- For most women in most jobs, it is safe to continue working during pregnancy

Talk with woman about

- Pregnant employee entitlements. See Fair Work Ombudsman website *www.fairwork.gov.au*

- Avoiding heavy physical work or standing for long periods
- Personal concerns about her job (eg working with chemicals)

Common discomforts of pregnancy

- Talk about common discomforts of pregnancy and how to deal with them (*p115*)

Mental health

- Significant emotional changes can occur during and after pregnancy — see *Perinatal depression and anxiety* (*p221*)
- Pregnancy can sometimes worsen pre-existing mental health conditions
  - Make sure mental health team knows about pregnancy early

Talk with woman about

- Medicine already prescribed for mental health problems — **medical consult**
- Support services
- Coming to clinic for check if she feels unwell
- Warning signs, spiritual, emotional and physical symptoms of depression during pregnancy and after baby is born (*p221*)

Domestic/family violence

- Be aware of signs of domestic/family violence (*p324*)
- May increase or be triggered by pregnancy
- Explain that asking about it is routine part of antenatal care
- Be aware of mandatory reporting requirements in your state/territory
- Refer to support services

Prescribed and over the counter medicines

- Many medicines and drugs can harm baby if taken in pregnancy or while breastfeeding
- Usual medicines may need to be changed or adjusted during pregnancy — medical review
- If not sure whether medicine safe in pregnancy or breastfeeding — **medical/ pharmacist consult**
  - May need to balance benefits and risks of using medicine
- Tell woman to make sure anyone who prescribes medicines for her knows she is pregnant or breastfeeding

Substance use in pregnancy

- Smoking
  - No safe level of smoking in pregnancy
  - Cigarettes can cause low birthweight or preterm baby
  - Best to stop smoking before becoming pregnant or early in pregnancy. But stopping at any time is good

  - No evidence that 'cutting down' number or strength of cigarettes protects fetus. **Do not** recommend as only strategy
  - For medicines to stop smoking — see *Tobacco — Pregnant or breastfeeding women* (*CARPA STM p225*)
- Alcohol
  - No safe level of alcohol in pregnancy — important to avoid alcohol as soon as planning pregnancy
  - Drinking alcohol in pregnancy can lead to fetal alcohol spectrum disorder (FASD) (*CARPA STM p152*)
  - Binge and heavy drinking put baby at most risk
- Chewing tobacco (mingkulpa, pituri)
  - Commercial or native tobacco mixed with wood ash, rolled into ball
  - Chewed or absorbed through skin, behind ear or on lip
  - Increases baby's heart rate
  - Safety of chewing tobacco in pregnancy not known, but risks thought to be similar to smoking
- Cannabis (gunja, marijuana) (*CARPA STM p218*)
  - Can cause preterm or low birthweight babies
  - Best to stop use before getting pregnant
- Volatile substance misuse (*CARPA STM p226*)
  - No safe level of petrol, glue, solvent sniffing in pregnancy
- Kava (*CARPA STM p220*)
  - Effect of drinking kava before or during pregnancy not known
  - Advise to stop drinking kava

Birth planning

Women living in remote and rural areas without birthing services are strongly encouraged to give birth in regional hospital. Usually transfer at 38 weeks unless medical or obstetric complications, but also depends on individual health service policy.

Give information during antenatal period to prepare woman for this.

Talk with woman about

Warning signs for urgent hospital review

- Unusual headaches
- Vaginal bleeding
- Any sign of infection including fever
- Reduced baby movements

Planning for hospital birth

- Accommodation in regional centre
  - Hostel accommodation may be available — provides meals, bedding, public phone, washing machine, transport to and from hospital and appointments

- Organise appropriate escort, preferably female, who can support her through experience. Find out if patient travel scheme will cover support person costs
- What to bring for herself and her baby — clothes, pads, baby clothes, nappies
- What to organise at home
  - If other children — childcare arrangements in community
  - Financial situation in advance

Try to arrange for woman and support person to tour hospital before the birth. When she goes to regional hospital for routine ultrasound usually a good time.

Ongoing antenatal care in regional centre, labour and birthing

- What happens in regional centre
  - Hospital midwife assessment in first 24 hours — same as clinic check, possible cardiotocograph (CTG)
  - Weekly appointments with doctor/midwife until she comes into labour
  - Admission to labour ward. Postnatal ward for about 2 days
  - Return to hostel on discharge until transport back to community
- Signs of labour starting include
  - 'Show' — small amount of blood and mucus
  - Irregular abdominal pains 'coming and going'
  - Low back pain
- When to go to hospital labour ward
  - Painful regular contractions
  - Persistent low back pain
  - Rupture of membranes
- Mechanism of normal labour and positions for pushing during birth
- Pain relief in labour
  - Walking, position, mental coping strategies
  - Breathing techniques
  - Bath/shower
  - Opioid injection
  - Nitrous oxide gas (eg *Entonox*)
  - Epidural
- Variations in labour leading to instrument assisted birth or Caesarean section
  - Long labour and woman too tired to push effectively
  - Baby becoming stressed, needing help to birth more quickly
  - Baby too big to fit through birth canal
- Procedures woman might experience during birth
  - Digital vaginal exam with or without artificial rupture of membranes
  - Cardiotocograph, fetal heart monitoring with doppler, fetal scalp monitoring
  - Portable ultrasound

After the birth

- How long she will stay in hospital
- Who will visit, provide food, stay with her, do washing, look after children
- Breastfeeding (*p199*)
  - Benefits of breastfeeding for baby and mother, supports available
- Looking after baby
  - Bathing/hygiene and care of baby in hospital and at home
  - How to reduce risk of SIDS by sleeping baby safely (*p196*)
  - Birth payment, Medicare and family allowance options
  - Community support options
- Personal health issues
  - Importance of postnatal check for herself and baby
  - Choices for contraception (*p335*), especially during breastfeeding

Common discomforts of pregnancy

Hormone levels and physical changes may cause unpleasant symptoms. Reassure woman that discomforts are a normal part of pregnancy and usually resolve after birth. Can be worse in multiple pregnancies. Often improve with simple measures.

- **Medical/midwife consult** if
  - Not sure if symptom caused by serious problem
  - Not sure about management of symptom
  - Problem not resolving despite simple lifestyle changes

Nausea and vomiting

Nausea with/out vomiting common in first 15 weeks.

- Called 'morning sickness', but can happen at any time of day
- Severe vomiting (hyperemesis gravidarum) can cause dehydration, unbalanced body salts (electrolytes), poor nutrition

Medical consult if

- Nausea and vomiting with fever, headache, diarrhoea, dizziness or abdominal swelling — consider causes other than pregnancy (eg UTI)
- Nausea and vomiting with dehydration, weight loss, ketones in urine
- Vomiting continues past first 15 weeks of pregnancy

Check

- Weight
- Temp, pulse, RR, BP
- Hydration — look at skin, mouth
- Urine — U/A, note any ketones, send for MC&S
- Baby's heart rate
- Baby movements (after 18 weeks)

Do not

- **Do not** give iron tablets unless woman has anaemia or at risk of anaemia (*p132*)

Do

- Encourage woman to talk with grandmothers about traditional foods to avoid or to help prevent nausea
- Suggest changes in diet and habits
  - Small, easily digested meals more often
  - Fluids — teas like lemongrass or ginger tea, plenty of water between meals
  - Dry crackers or toast before getting up
  - Avoid fatty foods, spicy or hot foods, foods with strong smell
  - Don't lie down after eating

- Give **pyridoxine** (vitamin B6) oral 3 times a day (tds) – adult 25mg
  - Can take up to 3 days to work, need to keep taking to prevent nausea
- Review in 1 week to see if changes have helped
- **Medical consult**
  - May suggest — metoclopramide oral 3 times a day (tds) – 60+kg 10mg, 40–59kg 5mg. First dose may need to be given IV/IM (same dose)
- May need to go to hospital for IV fluids and tests (eg obstetric ultrasound) to look for problems or other causes (eg multiple pregnancy)

Heartburn

Burning feeling in chest, may be bitter taste in mouth. Caused by hormones and later in pregnancy by growing baby pressing on oesophagus and stomach.

Do

- Suggest
  - Small meals more often
  - Avoid fatty or spicy foods
  - Drink plenty of water
  - Try ginger tea
  - Avoid smoking, alcohol, coffee, chocolate
  - Sleep in semi-upright position
  - Try antacids
  - Try H_2 antagonist (eg ranitidine)

Constipation

Hormones can slow down muscles in bowel — causes constipation, leads to haemorrhoids. Can also be caused by iron tablets.

Do

- Suggest
  - Increase fibre in diet — prunes, dried fruits, fresh fruits and vegetables, wholegrain breads and cereals
  - Eat more bush foods — bush sultana, tomato, orange, seed damper, yams
  - Drink more water — at least 8 glasses a day
  - Walk for at least 30 minutes every day
- Try changes for 1 week before adding 'bulking agent' (eg *Metamucil*)
- If these things don't work — **medical consult**

Preventing constipation will reduce occurrence and severity of haemorrhoids.

- If haemorrhoids do occur
  - Rest and elevating legs can help
  - Ice packs and mild local anaesthetic creams to anal area help pain

Leg cramps

Cramps in lower legs mainly happen at night after 28 weeks of pregnancy.

Do

- Suggest
  - Sitting up and pulling toes up toward shins to stretch calf muscle
  - Getting up and walking around when cramps come
  - Gentle massage — with rubbing medicine or heat
  - Drinking plenty of water

Other common problems that may occur

Include backache, ligament pain, varicose veins, faintness, tiredness and poor sleeping, carpal tunnel syndrome, headache, swollen ankles, urinary frequency, vaginal thrush (*p254*).

- **Medical/midwife consult** if concerned

Diabetes in pregnancy

Number of related medical conditions with high blood glucose levels.

- **Gestational diabetes mellitus** (GDM)
  - Impaired glucose tolerance that starts in second half of pregnancy
- **Pre-existing Type 2 or Type 1 diabetes mellitus** (PDM)
  - Type 2 or Type 1 diabetes diagnosed before pregnancy
- **High BGL in early pregnancy** in women not already known to have diabetes — likely to be Type 2 diabetes
  - High risk of complications for woman and baby — treat as PDM

Diagnosis and management of diabetes in pregnancy is important

- Diabetes in pregnancy is common and increasing in all age groups
  - Present in 10–20% of pregnant Aboriginal women
- Aim to keep BGL at normal levels to reduce complications
- Complications in PDM
  - Woman — pre-eclampsia, worsening of kidney disease, birth trauma
  - Baby — congenital malformations, miscarriage, stillbirth, prematurity, small baby (IUGR), large baby (macrosomia), birth trauma, low BGL as newborn, increased risk of early onset Type 2 diabetes
- Complications in GDM
  - Woman — pre-eclampsia, higher risk of Type 2 diabetes in next 5 years
  - Baby — large baby (macrosomia), birth trauma, low BGL as newborn, increased risk of Type 2 diabetes as adult

Pre-pregnancy counselling for women with known diabetes

- Talk with women with known PDM before they get pregnant about
  - Need for excellent blood glucose and metabolic control before getting pregnant (eg BP control, weight loss, improved nutrition, exercise)
  - Addressing other health problems (eg heart, kidney, eye problems)
- If woman likely to become pregnant soon after stopping contraception — review medicines. See *Do — medical consult* (*p120*)
- Monitor woman for pregnancy at routine visits, advise to notify clinic as soon as she thinks she is pregnant
- If planning pregnancy or as soon as pregnancy confirmed — start
  - **Folic acid** oral once a day – 5mg
  - **Iodine** oral once a day – 150microgram. Can be in multivitamin designed for pregnancy and breastfeeding
    - If woman has thyroid condition — **medical consult**
- For topics to cover — see *Education* (*p123*)

Risk factors for diabetes in pregnancy

- Ethnicity — Aboriginal or Torres Strait Islander, Asian, Indian, Pacific Islander, Maori, Middle Eastern, non-white African
- Past history of GDM or high BGL with/without pregnancy
- Family history of diabetes (parents, sister, brother)
- Previous large for gestational age baby
- Obesity — pre-pregnancy BMI more than 30
- Age — over 35 years
- Polycystic ovary syndrome (*p307*)
- Previous adverse pregnancy outcome — unexplained perinatal loss, congenital malformation
- Medicines — antipsychotics, corticosteroids

Screening for diabetes in pregnancy

- First antenatal visit — screen all pregnant women not already known to have diabetes who have risk factors (*above*). Best before 13 weeks pregnant
  - All Indigenous women at high risk, need to test at first antenatal visit
- 24–28 weeks pregnant — screen or re-screen all pregnant women not already known to have diabetes

First antenatal visit (or within next 2 weeks)

Women not already known to have diabetes *AND* with risk factors.

- Fasting 75g OGTT (0, 1 and 2 hour blood glucose tests) (*CPM p376*)
- *OR* if fasting OGTT not possible — random venous BGL and HbA1c. Use POC test if available
- If result normal — do OGTT at 24–28 weeks pregnant to test for GDM
- See Table 3.3 to interpret results
- If abnormal result confirmed (treat as GDM or PDM) — **medical consult**

At 24–28 weeks pregnant

ALL women not already known to have diabetes.

- HbA1c can't be used to screen for GDM. Cut off points unknown
- Do fasting 75g OGTT (0, 1 and 2 hour blood glucose tests)
- Diagnosis of GDM if any **one** result is
  - 0 hour plasma glucose 5.1mmol/L or more
  - 1 hour plasma glucose 10mmol/L or more
  - 2 hour plasma glucose 8.5mmol/L or more
- If diagnosis of GDM — **medical consult**

Table 3.3: Interpreting blood glucose test results

Result for fasting OGTT (mmol/L)	Result for HbA1c	Result for random venous blood glucose	What it means
• 0 hour glucose less than 5.1 • *AND* 1 hour glucose less than 10 • *AND* 2 hour glucose less than 8.5	Less than 39mmol/mol (5.7%)	Less than 5.1 mmol/L	• Normal • Do OGTT at 24–28 weeks pregnant
• 0 hour glucose 5.1–6.9 • *OR* 1 hour glucose 10 or more • *OR* 2 hour glucose 8.5–11	39–47 mmol/mol (5.7–6.4%)	5.1–11mmol/L	• Do second test to confirm – do OGTT if not already done • If confirmed — treat as **GDM**
• 0 hour glucose 7 or more • *OR* 2 hour glucose 11.1 or more	48mmol/mol (6.5%) or more	11.1mmol/L or more	• Do second test to confirm – do OGTT if not already done • If confirmed — treat as **PDM**

Antenatal care for PDM

At first antenatal visit after diagnosis

Check

- Add to routine antenatal check
  - Take blood for HbA1c, TSH, UEC *AND* if taking metformin — serum B12
  - Urine ACR
- Vision (*CPM p148*) — baseline check to monitor for retinopathy
  - If retinopathy present – eye check each trimester

Do

- Give **folic acid** oral once a day until 12 weeks pregnant – 5mg
- Give **iodine** oral once a day – 150microgram. Can be in multivitamin designed for pregnancy and breastfeeding
  - If woman has thyroid condition — **medical consult**
- **Medical consult** — include urgent medicines review
  - Stop all oral blood glucose control medicines except metformin
  - Start **insulin** if needed
  - Stop ACE inhibitor or ARB — contraindicated in pregnancy
    - If used for BP control — consider safer medicine (eg methyldopa, labetalol)

  - Stop statins and other lipid lowering medicines — contraindicated in pregnancy
- All women with PDM need medicines for good blood glucose control
- If not already doing — start blood glucose monitoring (*p123*)
  - Teach woman how to self-monitor (*CPM p381*) and keep BGL diary
  - Review BGL diary and meter every week — see *Blood glucose control* (*p123*)
- **Diabetes educator consult**. Can use telehealth
- Give advice on diet and physical activity (*CPM p143*) to help control blood glucose
- Arrange as soon as possible
  - Ultrasound scan to date pregnancy, if not already done
  - Obstetric review
  - Endocrinologist/physician review
  - Retinal eye exam — fundal camera or optometrist/ophthalmologist
  - If in NT or north QLD — refer to Diabetes in Pregnancy Clinical Register
- Develop joint management plan with doctor, obstetrician, midwife, diabetes educator, endocrinologist, nutritionist
  - Early specialist advice can be by telehealth
- Make sure woman on recall system to be followed up after birth — see *Follow-up of medical problems in pregnancy* (*p209*)

Additional antenatal care

Additional care needed due to increased risk of complications (*p118*).

Check

- Extra ultrasounds as ordered by obstetrician — could include
  - 24 weeks for heart assessment
  - 28–30 and 34–36 weeks for fetal growth assessment
- At 28 and 36 weeks
  - Take blood for UEC, LFT, HbA1c
  - Urine ACR

Do

- Antenatal check every 2 weeks until 28 weeks pregnant
  - *THEN* every 1 week from 28–36 weeks
- Arrange for transfer to regional centre at 36 weeks to wait for birth — hospital birth
- Medical review every 4 weeks to assess BGL control
- Strongly encourage testing for fetal abnormalities (*p103*)
- Education about diabetes in pregnancy (*p123*)

Antenatal care for GDM

At first antenatal visit after diagnosis

Check

- Add to routine antenatal check (*p89*)
  - Take blood for HbA1c, TSH, UEC
  - Urine ACR

Do

- Start blood glucose monitoring (*p123*)
  - Teach woman how to self-monitor (*CPM p381*) and keep BGL diary
  - Review BGL diary and meter weekly — see *Blood glucose control* (*p123*)
- **Medical consult**
- **Diabetes educator consult**. Can use telehealth
- Most women can control blood glucose with diet and physical activity (*CPM p143*)
- Arrange as soon as possible
  - Obstetric review
  - If in NT or north QLD — refer to Diabetes in Pregnancy Clinical Register
- Develop joint management plan with doctor, obstetrician, midwife, diabetes educator, nutritionist
  - Early specialist advice can be by telehealth
- Make sure woman on recall system to be followed up after birth — see *Follow-up of medical problems in pregnancy* (*p209*)

Additional antenatal care

Additional care needed due to increased risk of complications (*p118*).

Check

- Extra ultrasounds as ordered by obstetrician. Could include
  - 28–30 and 34–36 weeks for fetal growth assessment
- At 28 and 36 weeks
  - Take blood for UEC, LFT, HbA1c
  - Urine ACR

Do

- Antenatal check every 2–4 weeks until 36 weeks pregnant
  - *THEN* every week from 36 weeks pregnant, if in community
  - If on insulin — see every week from 28 weeks
- Medical review every 4 weeks to assess BGL control
- Arrange for transfer to regional centre at 38 weeks to wait for birth — hospital birth
- Education about diabetes in pregnancy (*p123*)

Education

- Importance of healthy diet, physical activity, limiting weight gain
- Complications (*p118*) for mother and baby due to PDM and GDM
- Need for excellent blood glucose and metabolic control
  - Need to monitor and record own BGL in pregnancy
  - Possible need for medicines including insulin
- Need for extra checks in pregnancy
- Hospital birth recommended
  - Baby may also need special care straight after birth

Blood glucose control for PDM and GDM

- Woman should measure and record 4 BGL a day at different times
  - If not able to do 4 — do at least 2, one fasting and one 2 hours after starting main meal of day
- If BGL high — may need to take more measurements

BGL monitoring

- Best times to monitor BGL
  - Before breakfast — morning fasting
  - 2 hours after starting breakfast
  - 2 hours after starting midday meal
  - 2 hours after starting evening meal
- If taking more than 1 dose of insulin a day — check before and 2 hours after starting main meal

- Review BGL diary and meter in clinic at least once a week
  - Send BGL diary results to diabetes educator for review
  - If BGL within target range — no change in diabetes management
  - If BGL outside target range 2 or more times in 1 week — **diabetes educator consult**

BGL targets

- Before breakfast — 5.0mmol/L or less
- 2 hours after starting meal — 6.7mmol/L or less

- **Diabetes educator consult** at least once a week, more often if BGL high
  - Advice on blood glucose management and adjusting insulin doses can be given over telephone
  - If problems getting good blood glucose control — diabetes educator will talk with specialist
- Some women need to be sent to hospital to stabilise diabetes
- Need BGL and HbA1c to monitor blood glucose control in pregnancy
  - HbA1c lower in pregnancy due to increased red blood cell turnover

Medicines for PDM and GDM

- Oral agents not part of standard guidelines but often used
  - Need to decide if benefits of oral medicines outweigh risks to baby
  - Doctor will talk with woman on individual basis

Metformin

- Can be used
  - With diet and exercise for mild GDM
  - For woman who can't or won't take insulin
  - With insulin if woman with PDM obese and insulin dose will be very high
- If woman on metformin before pregnancy — continue
- Use standard doses as for non-pregnant woman (*CARPA STM p258*)

Insulin

- 'Gold standard' for blood glucose control in pregnancy
  - See Table 3.4 for suggested regimes
- Recommended if blood glucose not controlled by diet and exercise, or metformin
- Must initially be prescribed by doctor or nurse practitioner
  - Dose changes are made by person identified in management plan as responsible for advising on blood glucose control (eg doctor, diabetes educator)

Starting insulin treatment

- Type of insulin depends on pattern of BGL and woman's ability to manage insulin. **Medical/diabetes educator consult** about best insulin regime
- Start and adjust treatment using Table 3.5 as guide
  - For glargine see *Glargine insulin treatment in Type 2 diabetes* (*CARPA STM p261*)
- 0Approximate total dose to start with
  - 0.3 units/kg/day for PDM
  - 0.1–0.2 units/kg/day for GDM
- After each change in insulin dose, monitor BGL for 2 days before making another change

Table 3.4: Recommended insulin regimes

Insulin routine	Comments
Basal bolus regime • **Short-acting insulin** (eg *NovoRapid* or *Humalog*) — before meals • *AND* **intermediate-acting insulin** (eg isophane) or **long-acting insulin** (eg glargine) — in evening before bed (nocte)	• Most widely used, likely to give best results • Complex treatment routine ◦ Insulin injections usually 4 times a day ◦ **Short-acting insulin** only used with food ◦ Some women need fewer doses of **short-acting insulin** ◦ Woman needs to be motivated ◦ Need experienced doctor or diabetes educator to advise on insulin dose adjustment • Use when BGL stays very high before or after meals
NovoMix30 (30% short-acting, 70% intermediate-acting insulin) twice a day — with breakfast and evening meal	• Simple treatment routine • Not recommended as first line during pregnancy — only start or continue on specialist advice • Use when BGL high through 24 hour period *AND* basal bolus regime not practical • If not eating regular meals — premixed dose can increase risk of low BGL (hypo)
Isophane (intermediate-acting insulin) — in evening before bed (nocte)	• Simple treatment routine • Use when only morning fasting BGL high
Glargine (long-acting insulin)	• Simple treatment routine • Appears safe in pregnancy • Useful for women with established PDM • Not yet part of standard guidelines

Table 3.5: Guide to starting and adjusting insulin doses

Insulin regime	Starting doses	Dose adjustment
Basal bolus regime • **Short-acting insulin** (eg *NovoRapid* or *Humalog)* • *AND* **intermediate-acting insulin** (eg isophane) *OR* **long-acting insulin** (eg glargine)	• Breakfast ◦ **Short-acting insulin** — 20% of total daily dose • Lunch ◦ **Short-acting insulin** — 10–20% of total daily insulin dose • Evening meal ◦ **Short-acting insulin** — 20% of total daily insulin dose • Before bed ◦ **Intermediate or long-acting insulin** — 40–50% of total daily insulin dose	• If before breakfast BGL high as a pattern — increase **intermediate or long-acting insulin** dose by 2–4 units • If after meal BGL high as a pattern — increase **short-acting insulin** dose by 2–4 units
NovoMix 30	• Twice a day ◦ ⅔ before breakfast ◦ ⅓ before evening meal	• If before breakfast BGL high as a pattern — increase evening dose by 2–4 units • If daytime BGL high as a pattern — increase breakfast dose by 2–4 units
Isophane	• Give total dose in evening before bed	• If before breakfast BGL high as a pattern — increase dose by 2–4 units

Follow-up of PDM and GDM

- Postnatal follow-up of woman with diabetes in pregnancy (*p210*)

High BP (hypertension) in pregnancy

- Systolic BP 140mmHg or more and/or diastolic BP 90mmHg or more
  - Confirm by repeated readings over several hours
  - Re-check with manual sphygmomanometer if available

Due to

- Chronic high BP
  - Known to have high BP before pregnancy
  - *OR* high BP recorded in first 20 weeks of pregnancy
- Pregnancy-induced (gestational) high BP
  - High BP first recorded when more than 20 weeks pregnant
- Pre-eclampsia
  - More than 20 weeks pregnant
  - High BP *AND* one or more other signs or symptoms — see Table 3.6
  - If systolic BP 170mmHg or more **or** diastolic BP 110mmHg or more — severe pre-eclampsia
    - **Medical emergency** — see *Severe pre-eclampsia* (*p21*) straight away

High BP can cause

- Poor growth of baby
- Death of baby in the uterus
- Placental abruption (part or all of placenta comes away from wall of uterus)
- Preterm labour, preterm delivery
- If worsening of chronic high BP — 'end-organ' damage for mother (eg to kidneys, liver, brain)
- If severe high BP — mother to fit (eclampsia)

Check

- Assess risk factors for pre-eclampsia (*p128*) at first antenatal visit
  - If risk factors — **medical consult**
    - May need to see obstetrician early in pregnancy
    - May suggest low dose aspirin or calcium supplements to reduce risk
- BP at every antenatal visit

Do — if BP high at antenatal visit

- Take BP again after woman has rested for 10 minutes
- Finish routine antenatal check (*p86*) — note if protein on U/A
- Check file notes for
  - Risk factors for pre-eclampsia
  - How many weeks pregnant (gestation)
  - U/A or 24 hour urine results earlier in pregnancy — any protein
  - Last urine MC&S
- Ask about symptoms of pre-eclampsia — see Table 3.6
- Check for signs of pre-eclampsia — see Table 3.6

Medical consult about findings and management.

- If managing as pre-eclampsia — see *Severe pre-eclampsia* straight away (*p21*)
- If managing as high BP — see *Pregnancy-induced high BP* (*p129*) or *Chronic high BP* (*p130*)

Risk factors for pre-eclampsia

- Medical
  - High BP
  - Kidney disease, diabetes
  - Overweight or obese
  - Autoimmune disease (eg SLE)
- This pregnancy
  - 40 years or over
  - First pregnancy or more than 10 years since last pregnancy
  - Twin/multiple pregnancy
- History
  - Previous pregnancy with high BP or pre-eclampsia
  - Family history of pre-eclampsia

Table 3.6: Signs and symptoms of pre-eclampsia and eclampsia

Body organ or system	Signs	Symptoms
Cardiovascular	• High BP • Platelet count less than 100,000/microL • Bleeding from venipuncture	• Swollen ankles
Lungs	• Pulmonary oedema	• Breathlessness
Kidneys	• More than 2+ protein on U/A • Creatinine more than 90micromol/L	• Low urine output
Liver	• Tender abdomen — right upper quadrant	• Severe epigastric or right upper abdomen pain • Nausea and vomiting
Neurological	• Fits • Brisk reflexes, muscle spasms • Stroke	• New headache that doesn't go away • Visual changes (eg shooting stars, spots)

Pregnancy-induced high BP

- Need to send to hospital to
  - Check for pre-eclampsia
  - Work out management plan

Check

- Take blood for FBC, UEC, LFT
- If signs or symptoms of pre-eclampsia — urine for U/A and MC&S

Do

- **Medical consult** about sending to hospital — straight away or non-urgent referral
- If sending to hospital straight away —
  - **Medical consult** about whether to start medicine to reduce BP
  - Check BP every hour until transfer
    - **Medical consult** if more than systolic 160mmHg or diastolic 100mmHg
- If non-urgent referral —
  - See **every day** while waiting for hospital appointment
    - Do routine antenatal check (*p86*)
    - Ask about symptoms of pre-eclampsia — see Table 3.6
    - **Medical consult** every day about findings

If ongoing management in community

- After review in hospital — may be managed in community
- Management plan should include
  - More frequent antenatal checks
    - Ask about symptoms of pre-eclampsia at each visit — see Table 3.6
    - **Medical consult** about findings from each visit
  - BP target — usually less than 140/90mmHg
  - Using medicine to control BP
    - Often methyldopa or labetalol
    - **Do not** use ACE inhibitor or ARB — contraindicated in pregnancy
    - Always use if systolic BP 160mmHg or more, or diastolic BP 100mmHg or more
    - May be used if systolic BP 140–160mmHg, or diastolic BP 90–100mmHg
  - Pathology
    - Take blood for FBC, UEC, LFT once a week, or twice a week if pre-eclampsia
    - Take blood on day transport available, so it gets to lab in time for platelet count
    - If low platelet count or falling Hb — take blood for clotting studies, blood film, LDH, fibrinogen
  - Collecting urine for U/A once or twice a week
  - Regular hospital checks, obstetric ultrasounds, cardiotocogram (CTG)

►

- Plan to send to hospital if pre-eclampsia or severe high BP develop
- Plan for birth in hospital — may need epidural or Caesarean section

Follow-up

- See *Postnatal follow-up* of women with high BP in pregnancy (*p209*)

Chronic high BP

If planning pregnancy — see *Pre-pregnancy counselling* (*p84*)

Check

- First antenatal visit
  - Check file notes — history of kidney disease, BP management plan
  - Also take blood for UEC, LFT, uric acid
  - Urine ACR (*CARPA STM p237*)
- After 20 weeks
  - Signs or symptoms of pre-eclampsia — see Table 3.6

Do

- First antenatal visit
  - **Medical consult**
  - Stop ACE inhibitor or ARB — both contraindicated in pregnancy
    - Use a safer BP lowering medicine, often methyldopa or labetalol
  - **Medical consult** about stopping beta blocker or diuretic
  - Arrange renal ultrasound (if not already done) to look for causes of high BP. Do at same time as obstetric ultrasound
  - Arrange medical review, refer to specialist and obstetrician if needed
- Follow management plan
  - Routine antenatal care (*p86*)
  - Additional monitoring and treatment as advised by specialist
  - BP target
  - Plan for birth in hospital — may need epidural or Caesarean section
- **Medical consult** straight away if
  - Systolic BP more than 140mmHg or diastolic BP more than 90mmHg
  - Protein in urine for first time or it gets worse
  - Other signs and symptoms of pre-eclampsia — see Table 3.6

Follow-up

- See *Follow up of medical problems in pregnancy — High BP* (*p209*)

Unplanned birth in community

Woman with high BP goes into labour in community.

- **Medical consult** straight away about
  - Sending to hospital
  - Stopping labour with medicines
  - Management plan if birthing in community
- If labour proceeds
  - See *Labour and birth* (*p158*)
  - Give good pain relief as directed by doctor or midwife
  - Get ready for a sick baby — see *Newborn resuscitation* (*p70*)
  - Be ready in case woman has a fit (*p19*)
  - Send mother and baby to hospital after birth — still at risk of complications

- **Do not** give nifedipine to stop labour unless instructed by obstetrician. May be asked to give nifedipine to control BP
- **Do not** use ergometrine alone or in combination. Only use plain oxytocin

Anaemia (weak blood) in pregnancy

Small drop in Hb level is usual in pregnancy. Hb should be 110g/L or more in women up to 20 weeks pregnant and 105g/L or more after 20 weeks.

Causes

- **Most common** — iron deficiency anaemia
  - Can be due to
    - Diet low in 'absorbable iron' (*p109*) — doesn't meet high iron needs in pregnancy
    - Less than 2 years between pregnancies
    - Chronic disease, chronic bleeding, parasitic disease (eg hookworm)
- **Less common but important**
  - Vitamin B12 deficiency, folate deficiency (megaloblastic anaemia)
  - Genetic abnormalities resulting in microcytic anaemia (low MCV)

Risk factors for low iron stores at start of pregnancy

- Diet low in 'absorbable iron' — significant problem in remote communities
- Already given birth 5 or more times (grand multiparity)
- Adolescent pregnancy — iron also needed for mother's own development
- Twin or multiple pregnancy
- Recent or current breastfeeding of another child
- Chronic conditions or infections — diabetes, kidney disease, tuberculosis

Problems

- **For pregnant woman**
  - Tiredness
  - Increased risk of infection during pregnancy, postpartum haemorrhage, severe anaemia after birth due to poor iron reserve
  - Very severe anaemia can cause heart failure (*CARPA STM p264*)
- **For baby**
  - Low iron stores cause anaemia. See *Anaemia (weak blood) in children* (*CARPA STM p116*)
  - Low birth weight, preterm birth, perinatal mortality
  - Long-term effects on child's development

Ask

- Recent bleeding — vaginal (*p14*), rectal, gums, nose (*CARPA STM p110*)
- Periods before pregnancy — long or heavy
- Iron in diet

Check

- Routine antenatal care includes
  - First antenatal visit — take blood for FBC, iron studies *AND* POC test for Hb
  - 28 weeks — take blood for FBC, iron studies *AND* POC test for Hb
  - 36 weeks — take blood for FBC *AND* POC test for Hb

- A fall in MCV is the earliest sign of iron deficiency

Other causes of anaemia

- If no known iron deficiency anaemia *BUT* Hb less than 110g/L up to 20 weeks pregnant or less than 105g/L after 20 weeks — consider other causes
  - Take blood for CRP, serum B12, folate, TSH, LFT
  - Take blood for UEC if not done in previous 12 months

Do

- If POC test for Hb less than 80g/L — **medical consult** straight away
- If POC test for Hb less than 110g/L up to 20 weeks pregnant or less than 105g/L after 20 weeks — treat as iron deficiency anaemia (*below*), start iron replacement (*below*)
- **Medical consult** if
  - Unclear if iron deficiency or other cause of anaemia
  - Hb does not increase as expected (8–10g/L/week) over first 2 weeks of iron replacement
  - Hb still less than 100g/L after 4 weeks of oral iron

Do — iron deficiency anaemia

- Talk about access to healthy food, healthy diet (*CPM p143*)
  - Getting enough iron and folic acid — red meat, iron fortified cereals and drinks
  - Foods rich in vitamin C (eg citrus fruit, tomatoes, berries, juice)
- Give iron replacement (*below*)
  - Take blood for FBC 2 weeks after starting treatment and again 2 weeks after that
    - Should see 8–10g/L increase in Hb each week
- Give **vitamin C** oral once a day – 500mg to improve absorption of dietary iron
- If from area where hookworm is/has been common *OR* if MCV low and eosinophil count raised — give **pyrantel** oral once a day for 3 days – adult 1g
  - **Do not** give ivermectin or albendazole in pregnancy

Iron replacement

Do not give iron supplement if Hb and iron studies normal.

Oral iron

- **Iron–folic acid** oral once a day – 1 tablet (up to 100mg elemental iron)
  - If woman has side effects — give lower dose
  - Iron dose in pregnancy multivitamins may be lower than recommended
- Take iron tablets with water
  - Best taken on an empty stomach (1 hour before meal)
  - If upset stomach a problem — take with food or at night

- To encourage woman to take iron+folic acid tablets regularly, explain
  - Why tablets are important
  - Normal that faeces can become dark in colour
- Encourage woman to tell you if she has side effects
  - Oral iron alone (without folic acid) can make discomforts of pregnancy worse (eg constipation, heart burn, nausea)
- Continue until 6–8 week postnatal check, reassess

- **Iron** medicine is dangerous in overdose
- Need to keep in childproof container, in a safe place

Iron IV infusion

- Use if oral iron doesn't work or can't be used. **Medical consult**
- Dates must be checked with dating scan before giving
- **Do not** use
  - In first trimester
  - If signs of infection
- **Ferric (iron) carboxymaltose** (eg *Ferinject*) IV infusion can be given in second and third trimester if
  - Prescribed by doctor
    - In consult with obstetrician in second trimester
  - Anaphylaxis kit and resuscitation equipment available
  - Clinician trained in life support stays with person during infusion
  - Infusion pump used
- See *Giving iron by IV infusion* (*CPM p353*)
- **Do not** restart oral iron until at least 5 days after infusion given

Table 3.7: Ferric carboxymaltose (eg Ferinject) IV infusion by weight and Hb level

Weight		Ferric carboxymaltose dose (50mg/mL strength)			Mix with normal saline	Infusion time
		Hb 70–89g/L	Hb 90–99g/L	Hb 100–110g/L		
36–69kg	Week 1*	20mL	20mL	20mL	250mL	15 min
	Week 2*	10mL	10mL	–	250mL	15 min
70kg and over	Week 1*	20mL	20mL	20mL	250mL	15 min
	Week 2*	20mL	10mL	10mL	250mL	15 min

* **Do not** give more than 20mL (1000mg) in a single dose. Give second dose at least 1 week after first.

Do — Hb normal but iron studies show ferritin less than 30microgram/L

- Give oral iron replacement as above
- Check iron studies and Hb after 4 weeks

Do — folate deficiency (megaloblastic) anaemia

Anaemic with high MCV and low red blood cell folate.

- **Medical consult**
  - Before starting treatment
    - If vitamin B12 also low — get advice
  - If no improvement after 4 weeks of treatment
- Give **iron–folic acid** oral once a day – 1 tablet (up to 100mg elemental iron)
- *AND* **folic acid** oral once a day – 5mg
- Take blood for FBC 2 weeks after starting treatment and again 2 weeks after that

Do — anaemia from other causes

- Anaemia due to vitamin B12 deficiency — can have serious short-term and long-term neurological consequences for baby
  - **Medical consult** — doctor may advise vitamin B12 supplement, usually IM
  - Talk with woman about foods rich in vitamin B12 — fortified cereals, seafood, liver, meat, cheese, eggs
- If anaemia due to parasitic disease, genetic causes, kidney disease, any other cause — **medical consult**

Rheumatic heart disease in pregnancy

Acute rheumatic fever (ARF) and rheumatic heart disease (RHD) common and under-diagnosed in remote Australia.

- If planning pregnancy — see *Pre-pregnancy counselling* (*p84*)

Problems

- Severe heart disease in pregnancy puts woman and fetus at risk
- Heart failure may occur in late pregnancy
- May be infection of heart valve (endocarditis). Risk higher with artificial valve

Do

- Ask about ARF/RDH, check file notes and contact Rheumatic Heart Disease Register for more information
- **Medical consult** as soon as possible for pregnant woman with RHD or suspected RHD
  - Arrange early obstetric ultrasound, ECG, ECHO
- Urgent referral to obstetrician and physician/cardiologist as soon as possible
- If moderate to severe RHD —
  - Need closely-managed pregnancy with medical and obstetric specialist involvement
  - Delivery in hospital ICU

Talk with woman about

- Looking after herself and continuing her medicine
- More frequent antenatal checks and hospital visits to watch for problems
- Seeing midwife or doctor any time she is concerned
- Support services that can help her

Antenatal care

- Follow joint management plan from physician/cardiologist and obstetrician
- Woman with an artificial heart valve takes anticoagulant to stop clots — usually warfarin. In pregnancy warfarin may be stopped by physician or obstetrician and replaced with another medicine — usually low molecular weight heparin (eg enoxaparin) given by daily injections
- Continue routine antibiotic prophylaxis during pregnancy (*CARPA STM p295*)
- At each visit — ask about physical activity, sleeping and shortness of breath (dyspnoea)
- If signs or symptoms of heart failure (*CARPA STM p264*) or problem that could cause heart failure (eg anaemia, infection, high BP) — **medical consult** straight away
- Always plan for birth in hospital

Prevention of endocarditis

- Highest risk of endocarditis (infection inside heart) in women with
  - Rheumatic heart disease

  - Artificial heart valve
  - Heart transplant
  - History of bacterial endocarditis
  - Certain congenital heart problems
- May need preventive antibiotics before invasive, surgical or dental procedures (*CARPA STM p298*)
  - Always do **medical/dental consult**
- If miscarriage —
  - Give **amoxicillin** oral single dose 1 hour before D&C – adult 2g
  - *OR* **amoxi/ampicillin** IV single dose just before D&C – adult 2g
  - Max rate 100mg/mL/min
  - If anaphylaxis to penicillin — give **vancomycin** IV single dose – adult 15mg/kg/dose (doses *p378*)
    - Slow infusion (at least 1 hour) that ends just before procedure
- If premature rupture of membranes (*p29*), prolonged labour —
  - Give **amoxi/ampicillin** IV single dose – adult 2g
    - Max rate 100mg/mL/min
  - If anaphylaxis to penicillin — **medical consult** about **vancomycin** IV single dose – adult 15mg/kg/dose (doses *p378*)
    - Slow infusion — at least 1 hour

Unplanned labour or birth in community

- **Medical consult**, send to hospital
- Put in IV cannula (*CPM p84*). **Medical consult** before giving IV fluids — too much can cause heart failure
- Record fluid balance during labour, after birth
- See *Labour and birth* (*p158*)
- Watch woman closely. If severe heart disease — can become unwell quickly
- **Do not** give ergometrine alone or in combination after birth. Only use plain oxytocin

- If woman becomes short of breath —
  - Sit upright
  - Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD 88–92%
    - Nasal cannula 2–4L/min *OR* mask 5–10L/min
  - **Medical consult**

Thromboembolism (blood clots) in pregnancy and postnatal

- Deep vein thrombosis (DVT) is a clot in deep veins of legs or pelvis. Usually with leg swelling and pain, sometimes redness and warmth
- In pregnant women DVT most often in left leg
- Parts of DVT may break off (embolise) and travel through blood vessels to lungs. Clot in lung is a pulmonary embolus (PE)

Risk factors include

- Pregnancy — can happen before, during or after birth
- Previous DVT or PE
- Known condition with increased tendency to clot (thrombophilia) or family history of clots at a young age
- Obesity (BMI more than 30)
- Age more than 35 years
- Recent surgical procedure — Caesarean section, postpartum tubal ligation
- Poor mobility — lower limb injury, long distance travel
- Pre-eclampsia (*p21*)
- Current infection (eg UTI)
- Smoking

Ask

- Ask all pregnant women and check file notes for history of DVT, PE, clotting disorder (eg thrombophilia)

Check

- If woman has multiple risk factors (*above*) or single strong risk factor (previous DVT or PE, thrombophilia) — **medical consult**
  - May need referral to obstetrician and physician as soon as possible
  - May need treatment to prevent clots (prophylaxis) in this pregnancy
- For all pregnant women, look for symptoms of DVT or PE at every antenatal and postnatal visit — see Table 3.8

Table 3.8: Symptoms of thromboembolism (DVT or PE)

Deep vein thrombosis (DVT)	Pulmonary embolus (PE)
• Usually swelling in 1 leg, but can be in both • May have pain in calf, lower abdomen, groin • Affected leg may be warm, red or tender	• Breathlessness • May be low grade fever • Fast pulse, fast breathing • Feeling faint, fainting • May have sudden onset of chest pain, coughing, coughing up blood, collapse

Do

- If you suspect DVT or PE — **medical consult** straight away
  - Need to send to hospital to confirm diagnosis and start treatment
  - Incorrect blood thinning treatment (anticoagulation) can lead to bleeding complications
- Treatment during pregnancy
  - Usually low molecular weight heparin (eg enoxaparin) subcut injections
  - *OR* warfarin tablets
- Treatment needs to continue for 3–6 months after birth
  - May need to encourage woman to continue treatment for whole time
- All women with DVT or PE in current or previous pregnancies must plan to have baby in hospital

While waiting for evacuation

- Continue regular observations
- **Do not** lie woman flat on her back. Sitting upright may be best
- Give **oxygen** to target O_2 sats 94–98% *OR* if moderate/severe COPD 88–92%
  - Nasal cannula 2–4L/min *OR* mask 5–10L/min
- Put in IV cannula (*CPM p84*)
  - Flush with **normal saline** 5mL every 4 hours
- Give other treatment as directed by doctor (eg pain relief, medicine to stop clots)
- Reassure woman, keep her calm. Have someone stay with her if possible

Follow-up after birth

- Emphasise importance of continuing treatment for whole time advised by doctor
- Reassure her that breastfeeding is not affected by anticoagulation medicines
- **Do not** give combined oral contraceptive pill to woman with history of DVT or PE
  - Other hormonal contraception may be suitable but **medical consult** first

Epilepsy in pregnancy

If woman fitting now —
- If more than 20 weeks pregnant — see *Fits in the second half of pregnancy* (*p19*) straight away
- If less than 20 weeks pregnant — see *Fits — seizures* (*CARPA STM p57*)

- Epilepsy is the most common neurological problem in pregnancy

Remember: Always consider eclampsia as a cause of fitting in pregnancy — even if woman has history of epilepsy.

Risks during pregnancy for women using antiepileptic medicines

- Woman may be concerned about risk to their baby of using antiepileptic medicines during pregnancy
- Risks need to be balanced against the effects of uncontrolled fits on both mother and baby

- Adverse effects of antiepileptic medicines
  - Valproate associated with highest risk of congenital malformation and long-term developmental problems
  - Phenytoin, carbamazepine, phenobarbital associated with specific congenital abnormalities
  - Newer antiepileptics (eg lamotrigine, levetiracetam, gabapentin) have not yet been associated with significant harmful effects on the fetus
- Change in seizure frequency
  - About ⅓ of women with epilepsy have more fits while pregnant
  - Women who had fits in the year before getting pregnant at highest risk of increased number of seizures
  - Women who haven't had a fit for at least 9 months before getting pregnant have a 90% chance of staying seizure free during pregnancy
- If epilepsy not controlled — higher risk of illness and death for woman

Do

Woman not yet pregnant

- Talk about importance of reliable contraception
  - If taking enzyme-inducing antiepileptics (*p141*) —
    - IUDs or Depo injection best methods
    - ENG-implant and progestogen-only pill not recommended
    - If emergency contraception needed — give double dose of ECP *OR* use copper IUD
  - If not taking enzyme-inducing antiepileptics — all methods effective
  - If woman using lamotrigine and oral contraceptives — specialist advice

Woman planning pregnancy

- Arrange health check
- Pre-pregnancy planning important
- Best to change to safest antiepileptic at lowest dose needed for seizure control before getting pregnant
- **Medical consult** — arrange physician/neurologist review (can use telehealth) to decide on best antiepileptic and dose
- Give **folic acid** oral once a day – 5mg

Woman already pregnant

- **Medical consult** as soon as you know woman with epilepsy is pregnant
- Give **folic acid** oral once a day
  - In first 12 weeks of pregnancy – 5mg
  - More than 12 weeks pregnant – 0.5mg *OR* at least 0.4mg in multivitamin designed for pregnancy and breastfeeding
- Arrange dating ultrasound (*p105*)
- Refer to physician and neurologist for joint management plan. May need
  - Monthly monitoring of medicine levels
  - Serial ultrasounds for fetal growth
- Talk with woman about antenatal screening tests for baby (*p103*). Recommend she has tests, especially
  - Second trimester maternal serum screen, which detects neural tube defect. Best done at 14–17 weeks, but can be done up to 20 weeks
  - 18 week morphology ultrasound
    - Note type of antiepileptic being used on request form
- **Plan for hospital birth** — risk of fit in labour and in first 24 hours after birth
- If taking enzyme-inducing antiepileptics (*below*) — give **vitamin K** oral once a day for last 4 weeks of pregnancy (from 36 weeks) – 20mg
- Talk with woman about any known triggers for her fits (eg when she is very tired) and strategies to try to avoid these triggers during pregnancy
- Tell woman to let clinic know any time she has a fit — needs **medical consult**

Enzyme-inducing antiepileptics — phenobarbital, phenytoin, carbamazepine, primidone, topiramate, oxcarbazepine, felbamate.

Unplanned birth in community

- **Medical consult**, send mother and baby to hospital with escort
- Put in IV cannula (*CPM p84*), largest possible
- Continue oral antiepileptic during labour
  - If can't tolerate oral medicine — **medical consult** about alternatives
- Have equipment and medicines ready in case woman has fit. See *Fits — seizures* (*CARPA STM p57*)
- If woman taking enzyme-inducing antiepileptics has not been taking oral vitamin K — give **vitamin K** IM/subcut – 10mg

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- See *Labour and birth* (*p158*)
- Watch baby closely for breathing problems — especially if mother taking phenobarbital or primidone, they are sedating
- Give baby **vitamin K** IM at birth
  - If baby 1.5kg or more — 1mg (0.1mL)
  - If baby less than 1.5kg — 0.5mg (0.05mL)

Breastfeeding

- Encourage breastfeeding
  - Antiepileptics pass into breast milk, but benefits of breastfeeding outweigh small risk to baby
- If any concerns — get specialist advice (eg lactation consultant)

Postnatal care

- If antiepileptic dose adjusted during pregnancy —
  - Need to monitor antiepileptic blood levels
    - Especially important if using lamotrigine
  - Plan to return to pre-pregnancy dose over first 1–2 weeks after birth
- **Medical consult** to plan monitoring of levels and dose adjustment

- If woman with CKD planning pregnancy
  - See *Chronic kidney disease* (*CARPA STM p244*)
  - **Medical consult** about
    - Stopping ACE inhibitor or ARB — both contraindicated in pregnancy
    - Starting safer medicine (eg methyldopa, labetalol)
  - CKD lowers fertility, makes it harder to get pregnant. See *Infertility* (*p309*)
- If woman with CKD pregnant
  - Increased risk of perinatal death, preterm birth, poor growth of baby
    - Risks get higher as kidney disease and high BP get worse
  - Increased risk of pre-eclampsia (*p21*)
  - CKD often gets worse during pregnancy

Check

- Add to routine antenatal tests (*p86*)
  - Take bloods for UEC, LFT
  - Urine ACR
- May need extra tests to check baby (eg more obstetric ultrasounds)
- If renal ultrasound needed — arrange at same time as 18–20 week obstetric morphology ultrasound. Fill out separate request form

Do

- Stop ACE inhibitor or ARB straight away — both contraindicated in pregnancy
  - **Medical consult** about starting safer medicine (eg methyldopa, labetalol)
- Refer to kidney specialist

Antenatal care

Plan care with kidney specialist and obstetrician.

- Management plan must include guidelines for
  - BP. If not controlled — **medical consult**
  - UTIs (*p149*)
  - Anaemia (*p132*)
  - How often to do blood and urine tests
- Watch closely for signs or symptoms of pre-eclampsia (*p21*)
  - Increased protein in urine
  - Poor BP control (*p127*)
- If concerns at any time — **medical consult**

- Mothers with hepatitis B or hepatitis C can breastfeed their babies
  - If cracked or bleeding nipples — advise to express and discard milk until bleeding areas healed
  - Get advice from someone experienced — CDC/PHU, lactation consultant

Hepatitis B

Testing for hepatitis B

- Test all pregnant women regardless of recorded status
  - Take blood for HBsAg, anti-HBc, anti-HBs
- **Review result** — see *Classification of hepatitis B status* (*CARPA STM p368*)
  - Interpreting hepatitis B serology results can be hard — get help if needed
- **Medical consult** about need for further testing or immunisation
  - Immunisation recommended during pregnancy if benefits outweigh risks

If woman HBsAg positive

- Risk of transmission to baby can be reduced — see Table 3.9

Table 3.9: Risk of transmission of hepatitis B to baby

Mother's viral load	Intervention	Risk of transmission
High more than 10^7 (10 million) international units/mL	• None	90%
	• Baby has hepatitis B immunoglobulin and hepatitis B immunisation at birth	8–10%
	• Mother given antiviral treatment • *AND* baby has hepatitis B immunoglobulin and hepatitis B immunisation at birth	Less than 2%
Low	• Baby has hepatitis B immunoglobulin and hepatitis B immunisation at birth	Less than 2%

Check

- Take blood for
  - LFT, UEC
  - Hepatitis A — HAV IgG
  - Hepatitis B — HBeAg, anti-HBe
  - Hepatitis B viral load — HBV DNA
    - Best at 24–26 weeks, but can do any time between 20 and 28 weeks
  - Hepatitis C — anti-HCV
  - HIV serology
- Make sure other blood tests from antenatal checklist are done (*p86*)

Do

- **Urgent specialist consult** (doctor should phone specialist for advice) if
  - Hepatitis B viral load more than 10^7 (10 million) international units/mL
  - *OR* raised LFT
- If hepatitis B viral load very high — antiviral medicine in third trimester may reduce risk of transmission to baby. Safe in pregnancy
- Otherwise manage as hepatitis B in non-pregnant women (*CARPA STM p363*)
  - Talk with woman about not infecting others — use of condoms with new or non-immune partners, not sharing needles, razors or toothbrushes
- Offer testing for hepatitis B to sexual partners and household contacts
  - Household contacts may be eligible for free hepatitis B immunisation
- Advise staff involved in birth of hepatitis B status
  - Need to avoid invasive procedures before and during birth
    - Particularly important for woman with high viral load
- Caesarean section doesn't reduce risk of baby being infected any more than giving immunoglobulin and immunisation to baby at birth

Babies of HBsAg positive mothers

- Babies infected with hepatitis B at birth have 90% chance of long-term infection, high risk of severe complications
- Give **hepatitis B immunoglobulin** and **hepatitis B immunisation** at birth to prevent infection
- Carefully wash injection site with warm water and dry thoroughly before giving baby IM injection
- Test at 9–18 months to check if infected during birth
  - Take blood for HBsAg, anti-HBc, anti-HBs

If woman HBsAg, anti-HBc and anti-HBs negative

- If high risk — give woman immunisation during pregnancy
  - High risk if
    - Household member with hepatitis B
    - Sexual behaviours that increase risk of contracting hepatitis B
    - Intravenous drug use
- If not high risk — give woman immunisation after birth of baby (postpartum)
- Check HAV IgG. If non-immune — can give combined HAV/HBV immunisation

Hepatitis C

Testing for hepatitis C

- Offer testing for hepatitis C (anti-HCV) at first antenatal visit
  - If anti-HCV positive — HCV PCR needed
- Hepatitis C test can take up to 3 months to become positive after infection — known as 'window' period. Consider re-testing at 3 months if woman experienced risk factors during that period

Risk factors for hepatitis C

- Intravenous drug use, needle sharing
- Tattooing or body piercing
- Has been in prison

If woman hepatitis C RNA positive

Check

- Check hepatitis A and hepatitis B status. If not immune — offer immunisation
- Take blood for LFT, FBC, INR, UEC
- At beginning of pregnancy take blood for HCV viral load, genotype testing

Do

- If signs of advanced liver disease (*CARPA STM p367*) — **medical consult**, urgent referral to liver clinic
- If **no** signs of advanced liver disease — **medical consult** about hepatitis treatment after baby is born

Babies of hepatitis C positive mothers

- About 5% of babies born to mothers with hepatitis C infected during birth
- Advise staff involved in birth of hepatitis C status — can modify practices to protect baby
  - Fetal scalp monitoring contraindicated during birth
  - Avoid delivery methods that may damage baby's skin
- Caesarean section doesn't reduce risk of baby becoming infected
- Carefully wash injection site with warm water and dry thoroughly before giving baby IM injection
- Test baby at 12–18 months of age. Take blood for anti-HCV
  - Before this age, tests may be positive due to antibodies transferred from mother to baby, even if baby not infected
  - Can test after 12–18 months if missed

Group B Streptococcus

Group B Streptococcus (GBS) bacteria found in rectum, vagina, urinary tract of healthy women. Asymptomatic, only detected by screening tests.

Problems

- If GBS present in vagina during labour and birth — baby at risk of infection
  - Infection in babies serious, can cause pneumonia, meningitis, sepsis
  - Leading cause of sickness and death in newborn babies
  - Preterm babies most at risk

Do

At first antenatal visit

- Check file notes, ask woman if previous baby infected with GBS

All women with history of GBS infected baby are given antibiotics in labour for all future births, even if negative swab results.

GBS swab

- Take combined vaginal and anal swab at 35–37 weeks pregnant
  - Can be self-collected by woman (*p266*)
- If swab GBS positive —
  - Record in file notes
  - **No** antenatal treatment needed
  - Explain meaning of positive result — will need antibiotics in labour
  - Advise woman to report signs of labour or rupture of membranes early so antibiotics can be started before baby is born

GBS positive urine

- If GBS positive urine — must treat
  - Give **amoxicillin** oral 3 times a day (tds) for 3 days – adult 250mg
  - See *Urine problems in pregnancy (p149)* for follow-up
- If GBS positive at any point in pregnancy — will need antibiotics in labour

In labour

- If woman GBS positive at any time during pregnancy —
  - Plan for birth in hospital
  - If not possible to send to hospital before birth —
    - Transfer mother and baby after birth
    - See *Newborn needing special care* (*p76*)
- Treat for GBS
  - Woman with GBS positive swab or urine in this pregnancy
  - Woman with previous baby infected with GBS
  - If GBS status unknown or no GBS swab in last 5 weeks — give antibiotics if
    - Preterm labour
    - Premature rupture of membranes

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        - Prolonged rupture of membranes — more than 18 hours or unknown time since membranes ruptured
    - Give **benzylpenicillin** IV single dose straight away – adult 3g
    - *THEN* **benzylpenicillin** IV every 4 hours until birth – adult 1.2g
        - If allergic to penicillin — **medical consult**
    - Stop treatment immediately after birth
- **If unwell** — see *Intrauterine infection (chorioamnionitis)* (*p31*)
    - T above 38°C
    - Pulse more than 100 beats/min
        - Check woman's pulse with pulse oximeter at same time as baby's heart rate using doppler to tell the difference between the two
    - Baby's heart rate more than 160 beats/min
    - Tender uterus
    - Smelly vaginal discharge or pus

Urine problems in pregnancy

- Urine problems include
  - Bladder infection — lower UTI
    - Asymptomatic bacteriuria — no symptoms. Diagnosed by testing urine
    - Cystitis with symptoms
  - Kidney infection (pyelonephritis) — upper UTI
  - Also consider STI as cause of pain on passing urine, especially if 15–35 years. See *STI checks for women* (p238)

Problems

- Increased risk of preterm labour, low birth weight baby, perinatal death

Ask — at every antenatal visit

- About upper and lower UTI symptoms (*below*). Can have both at same time
- If lower abdominal pain — can be UTI, also see *Pelvic inflammatory disease* (p260)

Upper UTI symptoms

- Flank/loin pain — pain in back or side between ribs and pelvis
- Fever, shakes (rigors)
- Nausea, vomiting

Lower UTI symptoms

- Burning, discomfort, pain when passing urine (dysuria)
- Passing urine more often than usual (frequency)
- Lower abdominal pain
- Blood in urine (haematuria) (*CARPA STM p415*)

Check

First antenatal visit

- U/A — mid-stream urine
- Send urine for MC&S even if U/A normal

All other antenatal visits

- U/A — mid-stream urine
- Send urine for MC&S if
  - Previous UTI in this pregnancy
  - Nitrites or leukocytes on U/A
  - UTI symptoms
- If symptoms — also see *Abnormal vaginal discharge* (p253) or *STI checks for women* (p238)

Abnormal U/A can have other causes

- If blood or protein and no infection on MC&S — **medical consult**
- If protein —
  - See *Testing for kidney disease* (*CARPA STM p237*)
  - *OR* if second half of pregnancy — see *Severe pre-eclampsia* (*p21*). **Medical consult**

Do

- **Always** treat UTIs in pregnancy, including asymptomatic bacteriuria
- Repeat urine MC&S to confirm successful treatment

- If upper UTI symptoms — see *Kidney infections in pregnancy* (*p151*)
- If GBS positive on urine culture — always treat straight away
  - Give **amoxicillin** oral 3 times a day (tds) for 3 days – adult 250mg
  - If GBS positive at any point in pregnancy — will need antibiotics in labour (*p147*). Plan for hospital birth
- If lower UTI symptoms *OR* nitrites on U/A — give antibiotics straight away, **do not** wait for MC&S result
  - Give **cefalexin** oral twice a day (bd) for 5 days – adult 500mg
  - *OR* **nitrofurantoin** (**not** if eGFR less than 45) oral twice a day (bd) for 5 days – adult 100mg
- Encourage oral fluids

Note: Urinary alkalinisers may help relieve symptoms but don't treat infection.

Follow-up

- Check MC&S result and antibiotic sensitivities. Change antibiotic if needed
  - Make sure suggested antibiotic is safe in pregnancy
- 1 week after antibiotics finished — do U/A and send urine for MC&S
  - If still infection — repeat antibiotics, **medical consult**
  - If frequency or pain on passing urine *OR* nitrites on U/A but no infection on MC&S — STI check (*p238*), **medical consult**
- After first UTI
  - U/A at every antenatal visit
  - MC&S every month until baby born, even if U/A normal
- If woman has second or persistent UTI in pregnancy — **medical consult** about preventive antibiotics or further tests
  - If renal ultrasound needed — can be done at same time as obstetric ultrasound, use separate request form

Preventive antibiotics

Medicine taken every day for rest of pregnancy to prevent UTIs.

- Give **cefalexin** oral once a day at night – adult 250mg

- If symptoms *OR* UTI diagnosed by screening test —
  - Stop preventive antibiotics, treat as acute infection
  - Restart preventive antibiotics as soon as acute treatment finished
  - Follow-up in usual way

Kidney infections (pyelonephritis) in pregnancy

Usually only one kidney at a time, but can affect both. More common in second and third trimester.

Pyelonephritis in pregnancy needs to be treated in hospital with IV antibiotics.

Ask

- Fever — feeling hot then cold, may be shivering
- Nausea or vomiting
- One sided (flank/loin) pain
- Abdominal pain, contractions
- History of pyelonephritis, repeated UTIs
- Abnormality of urinary tract

Check file notes

- How many weeks pregnant, when baby due to be born
- Urine or kidney problems in the past, MC&S results in current pregnancy
- Allergies
- Current medicines

Check

- Temp, pulse, RR, BP, O_2 sats — work out REWS (*p8*)
- Baby's heart rate
- U/A — mid-stream urine
  - Usually but not always abnormal
  - Send urine for MC&S
- Abdomen — feel for
  - Tenderness, rebound, guarding. See *Abdominal assessment* (*CARPA STM p18*)
  - Loin (renal angle) tenderness
  - Contractions. If you feel contractions — see *First check in labour* (*p158*)

Do

- If you suspect pyelonephritis — **medical consult**, send to hospital
- Put in IV cannula (*CPM p84*)
  - Take blood for FBC, UEC, blood cultures. Send in with woman
  - Start **normal saline** – 1L at 125mL/hr, or as directed by doctor

- If pain relief needed — give
  - **Paracetamol** up to 4 times a day (qid) – adult 1g (*CARPA STM p380*)
  - *OR* **paracetamol-codeine** oral up to 4 times a day (qid) – adult 500+30mg (*CARPA STM p381*)
- **Medical consult** about starting antibiotics
  - Usually **ceftriaxone** IV single dose – adult 1g
  - If unable to give IV — give IM mixed with 3.6mL **lidocaine (lignocaine) 1%**
- Continue observations until evacuation
  - Every 30 minutes — pulse, RR, BP
  - Every hour — temp, baby's heart rate

Follow-up

- Antibiotic treatment for total of 10–14 days. Completed in community after discharge from hospital
  - Usually oral — monitor to make sure all taken
  - *OR* may be IV as outpatient
  - If not sure — **medical consult**
- Urine MC&S at least 48 hours after antibiotic treatment finished
  - If still positive — **medical consult**
- MC&S every month (even if U/A normal) until baby born
- **Medical consult** about need for preventive antibiotics for rest of pregnancy (*p150*)