

GUIDELINES FOR SHARED MATERNITY CARE AFFILIATES 2021



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The Royal Women's Hospital
Mercy Public Hospitals Incorporated
Western Health
Northern Health

Guidelines for Shared Maternity Care Affiliates 2021
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This publication is available on the hospital websites:

www.thewomens.org.au
www.mercyhealth.com.au
www.westernhealth.org.au
www.nh.org.au
www.nwmpnh.org.au

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ABBREVIATIONS

AFI	Amniotic Fluid Index
β-hCG	beta human chorionic gonadotropin
BGL	blood glucose level
BMI	body mass index
BP	blood pressure
CAT	Crisis Assessment and Treatment
CF	Cystic Fibrosis
CFTS	Combined first trimester test
cm	centimetre
CMV	Cytomegalovirus
CTG	cardiotocograph
CVS	chorionic villus sampling
DFM	decreased fetal movement
DjHS	Djerriwarrh Health Service
DNA	deoxyribonucleic acid
dTpa	diphtheria-tetanus-pertussis acellular (reduced antigen content formulation)
ECST	early combined screening test
EDD	estimated day of delivery
FBE	full blood examination
FBG	fasting blood glucose
FISH	fluorescent in situ hybridisation
free β-hCG	free beta human chorionic gonadotropin
FX	Fragile X syndrome
g	grams
GBS	group B streptococcus
GP	general practitioner
GTT	glucose tolerance test
Hb	haemoglobin
HCV	hepatitis C virus
HDFN	haemolytic disease of the fetus and newborn
HIV	human immunodeficiency virus
Ig	immunoglobulin
IVF	in vitro fertilisation
kg	kilogram
LFTs	liver function tests
LNMP	last normal menstrual period
LUSCS	lower uterine segment caesarean section
MAP	maternity admission appointment
M&C	microscopy and culture
MBS	Medicare Benefits Schedule

ABBREVIATIONS

mcg/day	micrograms per day
MCV/MCH	mean cell volume/mean cell haemoglobin
MHW	Mercy Hospital for Women
MSST	maternal serum screening test
mm	millimetres
mmHg	millimetres of mercury
MMR	measles, mumps and rubella
MSU	midstream urine sample
M&C&S	micro and culture and sensitivities
mU/L	milliunits per litre
NH	Northern Health
NIPT	non-invasive prenatal testing
NIPS	non-invasive prenatal screening
OTC	over the counter
PCR	polymerase chain reaction
PHN	Primary Health Network
PKU	phenylketonuria
PPMIS	Perinatal Psychotropic Medicines Information Service
PRECS	planned repeat elective caesarean section
RACGP	Royal Australian College of General Practitioners
RANZCOG	Royal Australian and New Zealand College of Obstetricians and Gynaecologists
RBG	random blood sugar
RCPA	Royal College of Pathologists of Australasia
RWH	Royal Women's Hospital
s.	section
SIDS	Sudden Infant Death Syndrome
SMA	spinal muscular atrophy
SMCA	shared maternity care affiliate
T	trisomy
TM	Trademark
ToLAC	trial of labour after caesarean
TOP	termination of pregnancy
TFTs	thyroid function tests
TSH	thyroid stimulating hormone
US	ultrasound
VBAC	vaginal birth after caesarean
VCGS	Victorian Clinical Genetics Services
VIHSP	Victorian Infant Hearing Screening Program
VMR	Victorian Maternity Record
WH	Western Health
WMH	Werribee Mercy Hospital

PREFACE

The *Guidelines for Shared Maternity Care Affiliates 2020* have been developed to support shared maternity care affiliates that are credentialed to provide shared maternity care and those that refer to The Royal Women's Hospital, Mercy Hospital for Women, Western Health and Werribee Mercy Hospital. It includes information on services, support and recommended standards for the provision of care.

Shared maternity care is a model of care whereby a woman is cared for by hospital staff and a community-based shared maternity care affiliate (a credentialed general practitioner, obstetrician or community-based midwife) throughout her pregnancy. The woman's labour, baby's birth and immediate postnatal care are managed by the hospital.

Shared maternity care provides continuity of care and a high-quality, community-based, holistic, safe and culturally appropriate model that is highly valued by women. It is an important model of care that has high-level evidence of safety¹ and very high levels of satisfaction².

The Royal Women's Hospital, Mercy Hospital for Women, Western Health and Werribee Mercy Hospital are committed to supporting shared maternity care and the involvement of shared maternity care affiliates in the ongoing development of this model of care. Led by the General Practice Liaison Units [or equivalent], these hospitals work together as the Shared Maternity Care Collaborative to support shared maternity care, providing strong support, systems and clinical governance and joint credentialing and recredentialing criteria and processes.

The Shared Maternity Care Collaborative includes the following hospitals:

- Mercy Hospital for Women (MHW)
- Werribee Mercy Hospital (WMH)
- The Royal Women's Hospital (Parkville and Sandringham)
- Western Health (WH)
- Northern Hospital (NH)

These Guidelines have been developed by the Shared Maternity Care Collaborative and endorsed by each hospital's Executive.

As Djerriwarrh Health Service is also in the region of North Western Melbourne PHN and has increasingly been working with the Shared Maternity Care Collaborative, selected information on referral pathways, support and services for Djerriwarrh is also included.

These guidelines aim to support the provision of high-quality shared maternity care by:

- Delineating the roles, responsibilities and expectations of health care providers
- Clarifying expectations and pathways for referral, care and support
- Assisting in the provision of evidence-based care and initiatives
- Providing useful and relevant information for both providers and women

During the development of these Guidelines, significant changes have been made at the hospitals to strengthen shared maternity care. These include:

- Greater alignment of antenatal care standards of care, schedules and testing
- Updated investigations during pregnancy
- Management of specific investigation findings and clinical conditions
- Clearer expectations and pathways of referral in the case of abnormal findings
- Clearer delineation of responsibilities between shared maternity care affiliates and the hospitals
- Improved clarity about the role and support provided by the shared maternity care coordinator and other hospital services
- Improved resources for SMCA and patients

It is hoped these Guidelines will also provide a useful basis for shared maternity care guideline development by other maternity services in Australia. In this case, please contact Shared Maternity Care at The Royal Women's Hospital via email: sharedcare@thewomens.org.au for approval and to ensure appropriate acknowledgment.

These Guidelines are available on each hospital website:

[The Royal Women's Hospital](#)
[Mercy Public Hospitals Incorporated](#)
[Western Health](#)
[Northern Health](#)
[North West Melbourne PHN](#)
[Djerriwarrh Health](#)

We hope these guidelines assist you in providing quality shared maternity care to women who choose this popular and important model of maternity care, and that you continue to provide shared maternity care with our hospitals for many years to come.

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1. Three Centers Consensus Guidelines on Antenatal Care, Oct 2001 Mercy Hospital for Women, Southern Health and Women's and Children's Health.
2. Shared Maternity Care Survey 2017: The Royal Women's Hospital. Unpublished anonymous survey of two months of women undertaking shared maternity care. Questions and methodology based on *Victorian Healthy Mothers Healthy Families survey, 2008*.



CHAPTER 1 MATERNITY CARE AT THE HOSPITALS

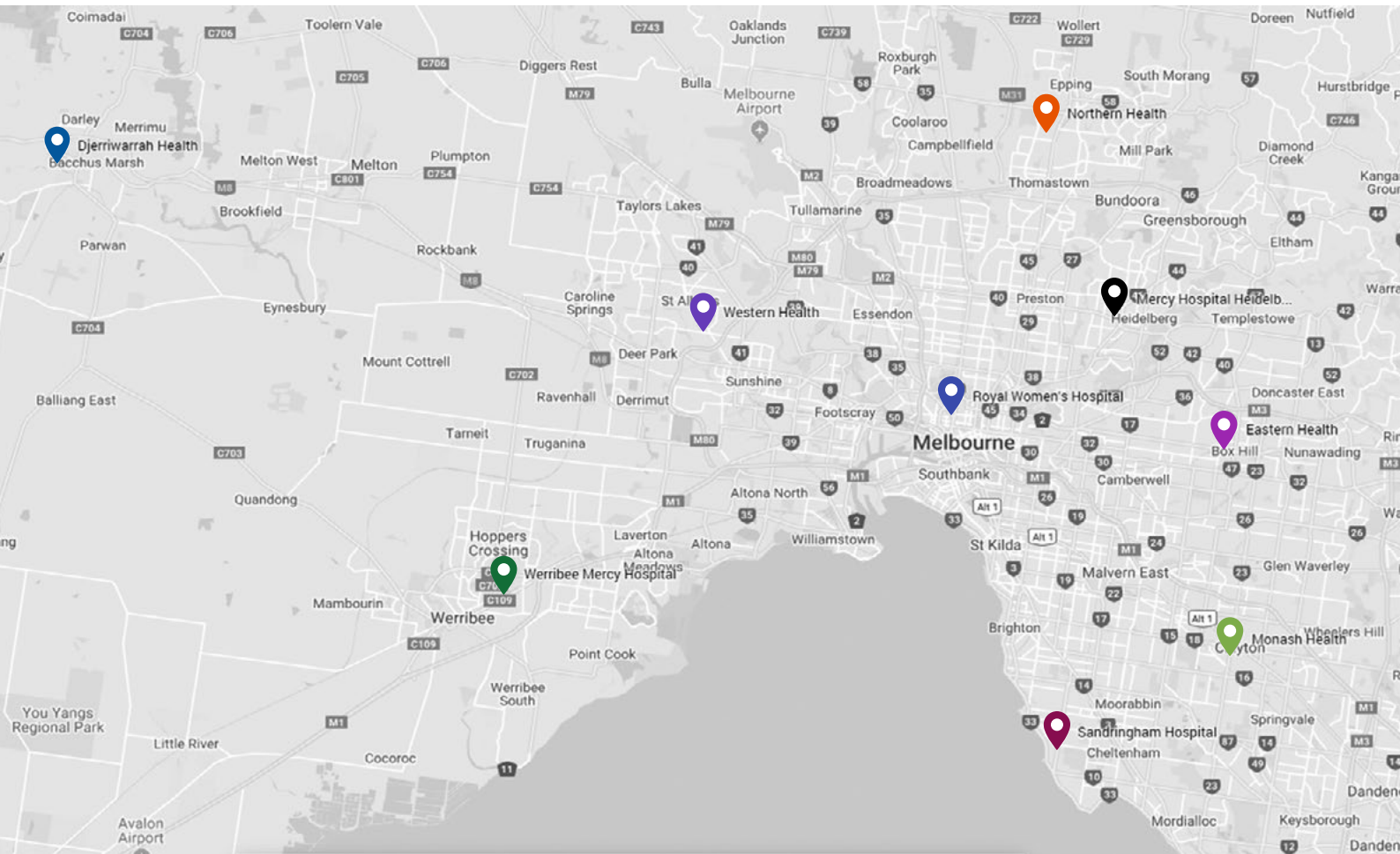
Scope of maternity care










Each hospital provides several models of maternity care. A summary of the models of maternity care and maternity care hospitals available in Victoria can be found on the 'Maternity and newborn services' page of the Department of Health website.

In Victoria, three tertiary hospitals provide state-wide maternity services for the most complex pregnancies. They are:

- Mercy Hospital for Women (MHW)
- Monash Medical Centre, Clayton
- The Royal Women's Hospital (Parkville)
- Western Health Joan Kirner Women's and Children's at Sunshine Hospital

MHW, RWH Parkville and WH are able to care for the full range of pregnancy, neonatal and newborn complexity. WMH, NH, RWH Sandringham and DjHS offer a limited range of pregnancy care services.



- | | | | | | |
|--|---------------------|---|------------------------|---|-------------------------|
|  | Djerriwarrah Health |  | Monash Health |  | Sandringham Hospital |
|  | Eastern Health |  | Northern Health |  | Western Health |
|  | Mercy Hospital |  | Royal Women's Hospital |  | Werribee Mercy Hospital |



Services and care **not provided** by Werribee Mercy, Northern Health, RWH Sandringham and DjHS are as follows:

Northern Health:

Women with:

- Weight early in pregnancy of > 180 kg
- Requirement for complex specialist non obstetric care
- Significant substance use
- Monochorionic twins
- Triplets or greater
- Fetus with significant abnormality
- History of preterm labour < 30 weeks

If Northern Health receives a referral for a woman/baby they cannot care for, they will arrange referral to another service and notify the woman and referring GP.

RWH Sandringham:

Women with:

- BMI early in pregnancy of ≥ 35
- Requirement for complex specialist non obstetric care
- Significant substance use or evere mental health problems
- Monochorionic twins
- Triplets or greater
- Fetus with significant abnormality
- History of preterm labour < 34 weeks

If a woman is too high risk at the time of referral please refer to woman's nearest tertiary service: this could be RWH Parkville (same referral number as RWH Sandringham), Monash or Peninsula Health.

Women wanting a trial of labour after caesarean will be transferred to the Parkville site for antenatal care from 36 weeks and for partum care. If women develop complications in pregnancy, they will be transferred to the Parkville site for care

Werribee Mercy:

- BMI early in pregnancy > 40 at booking
- Requirement for complex specialist non obstetric care
- Monochorionic twins
- Triplets or greater
- Fetus with significant abnormality

If women develop complications or BMI >45 in pregnancy, they will be transferred to the appropriate centre for ongoing care.

If a woman is too high-risk at the time of referral, please refer to the woman's nearest tertiary service this could be Western Health.

Djerriwarrh Health:

Women with:

- BMI early in pregnancy of ≥ 40
- Requirement for complex specialist non obstetric care
- Recent or recurrent drug use: Heroin; Methamphetamines; Methadone; Cannabis; Alcohol; Stimulants ; Volatile agents (paint, glue, petrol)
- Twins or greater
- Fetus with significant abnormality

If a woman is too high risk at the time of referral please refer to the woman's nearest tertiary service: this could be Western Health or Ballarat.

If women develop complications in pregnancy they will be transferred to care at Western Health.

Referring to Hospital

When to refer:

To refer a woman to a hospital for maternity care, a woman's general practitioner (GP) or community midwife should send a referral at around 10-12 weeks pregnant and include results of investigations performed. If a woman is high-risk, please refer her earlier in pregnancy.

To ensure all women can access the level of maternity care they require in a timely way and be contacted about their appointments, GPs should provide as much relevant information as possible.

For routine pregnancies, please refer a woman to hospital at around 10 - 12 weeks gestation with results of her initial investigations. However, if she is high risk, please refer earlier.

Which hospital to refer to:

The majority of pregnancies and births can be managed at a woman's closest maternity hospital.

To ensure all women can access the level of maternity care they require, women with low-risk pregnancies should be referred to the maternity hospital closest to their homes. If a GP thinks a woman should attend a tertiary centre and this is not the woman's closest maternity hospital, her needs must be specified on the referral to the tertiary centre (see [state-wide referral criteria](#) for to check referral criteria for tertiary level hospitals). If MHW, RWH or WH believes the woman is best served at her local hospital, the referring doctor will be contacted so a referral to her closest maternity hospital can be arranged. See [Health service map](#).

Women will generally not be able to choose a hospital that is not their closest because they had previous pregnancy care at another hospital or work closer to another hospital.

Women who are Aboriginal and Torres Strait Islander or experiencing homelessness can choose any of the hospitals.

If a woman has been accepted for care at a non-tertiary hospital and at any time her pregnancy becomes complicated or is considered to be high-risk, she will be referred by her local maternity hospital to a maternity service that meets her needs.

To ensure all women can access the level of maternity care they require, unless they are a high risk pregnancy, they should be referred to the maternity hospital closest to their homes.

Referral templates:

To assist GPs to provide high-quality information, all the hospitals have downloadable referral templates for several clinical software systems on their websites:

Royal Women's Hospital
(both Parkville and Sandringham hospitals)
Mercy Health (both Heidelberg and Werribee hospitals)
Northern Health
Western Health
Djerriwarrh Health Service

GPs are encouraged to use these referral templates and attach investigations to these. Referrals will not be accepted if crucial information is not included.

Care guidelines: *HealthPathways Melbourne*

HealthPathways are developed by PHNs and include information for health professionals about a range of health conditions, including a range of maternity care issues. They include evidence-based information care in the community and about support and referral guidelines, services and criteria. Visit North Western Melbourne PHN website for [HealthPathways](#).

Please contact HealthPathways team to [request access](#) or complete [this form](#) to request automatic login.

What to include in referrals:

Referrals should be comprehensive and contain:

Demographic:

- Name
- Address
- Date of birth
- Phone number (preferably mobile)
- Country of birth
- Aboriginal or Torres Strait Islander status
- Interpreter and language requirements
- Special needs (e.g. mobility) or additional support requirements
- GP details (practice address and provider number)

Clinical:

- Estimated day of delivery (EDD or due date)
- Body mass index (BMI)
- Blood pressure
- Relevant history, symptoms, signs, investigation results, medication and management
- Reasons that identify the patient as high risk or in need of early hospital assessment.

Investigations:

- Relevant investigations results
- Details of any tests that are to occur (e.g. 12 week ultrasound, Down syndrome test)

Hospitals may not accept the referral if initial routine investigations are not provided with the referral.

In the case of abnormal findings or results that require urgent follow – up, see Chapter 17 for support and referral pathways.

Unless it is a high risk pregnancy that requires early referral for hospital care, it is a requirement that routine antenatal blood/urine test results are included with the referral.

To ensure all women can access the level of maternity care they require in a timely way and be contacted about their appointments, please ensure referrals are comprehensive.

Please indicate on the referral if additional support or an interpreter is required.

It is not necessary for women to choose a model of maternity care prior to their first hospital visit. However, it is helpful if they have discussed their options, including Shared Maternity Care, with their GP.

Where to send referral

Health service	Referral fax numbers
Mercy Hospital for Women	8458 4205
Werribee Mercy Hospital	8754 6710
Northern Health	8405 8616 OR send eReferral
The Royal Women’s Hospital (Named referral according to RWH website)	8345 3036
Western Health - Joan Kirner Women’s and Children’s at Sunshine Hospital	9055 2125
Djerriwarrh	9746 0668

Hospital satellite clinics

In addition to the main hospital sites, some hospitals have community satellite clinics.

If it is known that a woman prefers to attend a satellite clinic, please include this request on the initial referral.

Hospital	Satellite clinics
The Royal Women's Hospital (Parkville and Sandringham)	Fawcner Footscray Strathmore (in Essendon)
Northern Health	Craigieburn Broadmeadows
Western Health	All community clinics were closed in COVID pandemic. Unclear if they will re-open and if will be in the same locations.

Childbirth education and hospital tours

Childbirth education is available at all the hospitals. As places are limited, they are generally restricted to women who are primigravida. Women are encouraged to organise childbirth education early in pregnancy. A cost is usually involved

Childbirth education includes a hospital tour, information regarding when to come to hospital, and information about labour, support, pain relief and breastfeeding. Some hospitals also provide childbirth education classes in the community, such as at maternal child health services.

Women who do not attend childbirth education are welcome to arrange a hospital tour to familiarise themselves with the facilities, including where to present when in labour, birth suites and postnatal wards. There is no cost involved for hospital tours, which generally occur weekly and take approximately one hour.

Additionally, some hospitals have online virtual tours available on their websites.

To organise childbirth education or a hospital tour:

Hospital	To arrange childbirth education (generally at a cost)	To arrange hospital tour
Mercy Hospital for Women	From 12 weeks Phone: 8458 4152	Phone: 8458 4152
The Royal Women's Hospital	From 16 weeks (primigravida only) Book online Parkville Sandringham Cost (free to women with a concession card)	Book online Parkville Hospital tour offered at the time of childbirth education at Sandringham. No separate booking required.
Werribee Mercy Hospital	From 12 weeks Phone: 8754 3412	Phone: 8754 3412
Western Health	From first hospital visit. Offered in partnership with Tweddle See website or Phone: 9689 1577 Cost (reduced to women with a concession card)	Book online Western
Northern Health	From first hospital appointment Phone: 8405 8211 (maternity ward clerk). Cost (reduced to women with a concession card)	Phone: 8405 8211 (Maternity ward clerk)
Djerriwarrh Health	Contact Associate Unit Manager Maternity Services Phone: 5367 9150 Free	Phone: 5367 9150 (Associate Unit Manager – Maternity Services). Hospital tour offered with childbirth education classes.



CHAPTER 2
PRE-PREGNANCY
CONSULTATION

Many of the most important interventions that result in improved health outcomes are best initiated prior to conception. These include lifestyle interventions, immunisation, smoking and alcohol cessation, folate and iodine supplementation, and screening of prospective parents for inherited disorders.

GPs are in a unique position to see a woman prior to pregnancy and can provide opportunistic pre-pregnancy screening and advice. The aim of the pre-pregnancy consultation is to:

- Optimise the environment for conception and pregnancy to occur in order to ensure the health of mother and child
- Undertake preventative health
- Identify and manage potential problems for the fetus and mother
- Provide education about the health care system and options available
- Develop a rapport with the woman and her partner

Pre-pregnancy care

The table below outlines a framework for a preconception consultation for a low risk woman. Issues arising from these or a woman's individual risks may raise other issues to address.

	Preconception checks	Action
Assess and advise		
Relationship and reproductive planning		
Reproductive life plan	Establish whether the woman/couple want to have children. If they do, discuss the number, spacing and timing of intended children.	Effective use of contraception to prevent unplanned pregnancy and advice on sexual health and infections.
Family planning and fecundity	Age and previous fecundity. Discuss fertility awareness and how fertility reduces with age, chance of conception and risk of infertility and fetal abnormality. For patients not planning to become pregnant, discuss contraception options	Advice on how best to achieve pregnancy and when to return. Consider referral/investigation if the couple has not become pregnant – after 12 months of trying if woman <35yo, after 6 months of trying if woman >35yo as a guide
Relationship	Assess for relationship health	If concerns about partner violence then support and refer appropriately

Preconception checks	Action
Genetic (See Chapter 6)	
<p>Genetic/family history</p> <p>Assess for:</p> <p>Assess for:</p> <ul style="list-style-type: none"> • Risk of genetic disorders from both parents • Eastern European (Ashkenazi) Jewish descent • If parents consanguineous (i.e. first cousins/close blood relatives) 	<p>All women (without a family history) should be offered:</p> <ul style="list-style-type: none"> • Basic screening for thalassaemia carrier status by a full blood examination at initial presentation. Further testing³ should be considered in high probability ethnic or population groups. <ul style="list-style-type: none"> – When requesting haemoglobinopathy or thalassaemia testing – what is performed is lab dependent, but usually includes FBE, haemoglobin electrophoresis, high performance liquid chromatography (HPLC), sickle solubility test and haemoglobin H inclusions – Haemoglobinopathy DNA testing may also be required (looking for alpha thalassaemia) • Information on carrier screening for the more common genetic conditions that affect children (e.g. cystic fibrosis [CF], spinal muscular atrophy [SMA], fragile X syndrome [FXS]) should be offered to low-risk women and couples (i.e. regardless of family history and ethnicity) • For individuals of Eastern European (Ashkenazi) Jewish descent, additional screening for Tay Sachs disease, Niemann Pick disease type A, Fanconi anaemia group C, familial dysautonomia, Bloom syndrome, Canavan disease and mucopolidosis type IV should be offered. <p>Offer referral to a genetic service if:</p> <ul style="list-style-type: none"> – A family genetic disorder that is serious – Consanguineous

3. RCPA, Haemoglobinopathy/thalassaemia screen. [View online](#)

	Preconception checks	Action
Obstetric and Medical (See Chapter 13)		
Obstetric/Reproductive history	<p>Determine ongoing risks that could lead to a recurrence in a future pregnancy e.g. history of:</p> <ul style="list-style-type: none"> • Fetal/infant problems such as infant death, fetal loss, birth defects, low birth weight, pre-term birth • Pregnancy problems such as gestational diabetes, high blood pressure • Maternal history of cone biopsy/loop excision of cervix 	<p>May require:</p> <ul style="list-style-type: none"> • Interventions depending on the issue (e.g. high dose folate pre-pregnancy and 1st trimester, aspirin early in pregnancy) • Early referral to hospital care when pregnant • Pre-pregnancy referral to hospital or specialist care
Medical history	<p>Medical conditions that potentially affect future pregnancy such as diabetes, blood pressure, thyroid disease etc.</p>	<p>Optimise the management of health and medication</p>
Medication	<p>Review current medications including over the counter medicines, vitamins and supplements.</p>	<p>Ensure that medication is appropriate for pregnancy and the risks. Counsel against non-evidence based over the counter medication and supplements.</p>
Vaccination (See Chapter 9)	<p>Assess need for vaccination, particularly for rubella, varicella and hepatitis B</p>	<p>May be required depending on history and results of investigations. Live vaccines (e.g. varicella, rubella, and measles) are contraindicated in pregnancy and women should be advised against becoming pregnant within 28 days of vaccination. Measles: Adolescents and non-pregnant adults who have been incompletely vaccinated or do not have evidence of immunity to measles are recommended to receive measles-containing vaccine</p>

Preconception checks		Action
Lifestyle and risks (See chapter 14)		
Healthy weight, nutrition and exercise	Assess risk of nutritional deficiencies (vegetarian, vegan diet, etc.)	Discuss weight management and caution against being overweight or underweight. Recommend daily physical activity.
Substance use	Tobacco, alcohol and illicit drug use	Offer counselling and referral for specialised assistance as appropriate
Toxins, infective agents (Home, work and environment)	Consider pets, environment, work and hobbies.	Identify risks and mitigate and counsel accordingly
	Assess risks from work and hobbies e.g. does a woman work with oncological drugs, animals or children	<p>Good hand washing should be encouraged</p> <p>Repeated exposure to hazardous toxins can increase the risk of miscarriage and birth defects. Discuss the avoidance of TORCH infections: Toxoplasmosis, Other – such as syphilis, varicella, mumps, parvovirus and human immunodeficiency virus (HIV) – Rubella, Cytomegalovirus, Herpes simplex.</p> <ul style="list-style-type: none"> • Toxoplasmosis: avoid cat litter, garden soil, raw/undercooked meat and unpasteurised milk products, and wash all fruit and vegetables • Cytomegalovirus, parvovirus B19 (fifth disease): Provide information about CMV and discuss importance of frequent hand washing, and child and healthcare workers further reducing risk by using gloves when changing nappies
Toxins, infective agents (food and water)	Consider both infectious agents (e.g. listeriosis and toxoplasmosis) and toxins (e.g. mercury in fish, lead in water)	<p>Provide advice on good food hygiene, minimising risks of infectious agents and toxins.</p> <p>Listeriosis:</p> <ul style="list-style-type: none"> • Avoid paté, soft cheeses (feta, brie, and blue vein), pre-packaged salads, deli meats and chilled/smoked seafood. • Wash all fruit and vegetables before eating. Refer to Australian food standards at regarding folate, listeria and mercury <p>Mercury:</p> <ul style="list-style-type: none"> • Limit fish containing high levels of mercury. Refer the Australian food standards for types of fish containing mercury <p>Lead:</p> <ul style="list-style-type: none"> • Use cold water for drinking and food preparation • Run water taps before drinking • Wash hands after exposure to soil • Avoid handling older paints and lead products

	Preconception checks	Action
Dental/oral care	Ask about bleeding gums, swellings, sensitive teeth, loose teeth, holes in teeth, broken teeth, toothache, or any other problems in the mouth	Good oral care important for all women, although current evidence does not suggest any special focus in pregnancy. Refer to dentist if any issues. Increased access to Dental Health Services when pregnant. Educate on need for good oral and dental care.
Examine		
BP, BMI		
Investigations (See chapter 5)		
	<ul style="list-style-type: none"> FBE 	If abnormal, consider ferritin, thalassaemia testing and partner testing for haemoglobinopathy
	<ul style="list-style-type: none"> Rubella antibodies 	Check for antibodies. Provide advice regarding vaccination if no or low immunity
Others if indicated e.g.:		
	<ul style="list-style-type: none"> Varicella antibodies 	If vaccination or immunity status unknown
	<ul style="list-style-type: none"> Ferritin, Haemoglobin electrophoresis 	If part of at-risk population or abnormal FBE and not previously performed
	<ul style="list-style-type: none"> Chlamydia urine PCR 	If ≤ 29 years or at risk
	<ul style="list-style-type: none"> HIV, syphilis serology, Hepatitis B/C, TSH, Vitamin B12 	As indicated by risk
	<ul style="list-style-type: none"> Cervical screening 	If due
Offer: Reproductive carrier screening		

	Preconception checks	Action
Supplements (See Chapter 14)		
<p>Folic acid supplementation</p>	<p>The most robust data for the efficacy of higher dose folic acid supplementation are for women with a previously affected offspring or where <u>either parent</u> has a personal history of NTD.</p> <p>More limited data support recommendations for higher dose folic acid supplementation in the specific other high-risk groups discussed below.</p> <p>Generally recommended the following women take high dose folate (5mg per day):</p> <ul style="list-style-type: none"> • Family history of neural tube defects in a first or second degree relative • With pre-existing diabetes • On medication for epilepsy • Women with epilepsy • On medications other than antiepileptic drugs that have been associated with reductions in available folic acid (e.g. triamterene, trimethoprim, sulfasalazine) • Women with conditions associated with malabsorption (e.g. celiac disease, inflammatory bowel disease, major intestinal resection, some bariatric surgery, advanced liver disease, renal failure) • Women with BMI ≥ 35 (<i>lacks strong evidence– expert opinion only</i>) <p>Women should not attempt to achieve high-dose supplementation by taking multiple multivitamins because of the possibility of ingesting harmful levels of other vitamins, such as vitamin A.</p> <p>See Chapter 4</p>	<p>Folic acid 0.4 mg/day supplementation in most women.</p> <p>Dose increased to 5 mg/day in high risk women. Begin at least one month prior to conception until the end of the first trimester.</p>
<p>Iodine supplementation</p>		<p>Iodine supplement 150 μg daily and continue in pregnancy and while breastfeeding</p>

Pre-pregnancy consultation services at hospitals

RWH, MHW, WH, NH and DjHS provide pre-pregnancy consultation services that include pre-pregnancy review and advice. GPs can refer women to the hospital if there are particular risks to future pregnancy due to a particular medical condition or obstetric history. DjHS does not have a specific pre-pregnancy consultation service, however SMCAs can refer women to the gynaecology service for pre-pregnancy counselling.

Pre-pregnancy checklist

Reproductive planning	<input type="checkbox"/>
Check plan for children Fecundity and age Contraception and sexual health advice for those not desiring pregnancy	
Diet	<input type="checkbox"/>
Nutritional requirements Advice on a healthy diet	
Weight	<input type="checkbox"/>
Maintaining healthy weight	
Physical activity	<input type="checkbox"/>
Advise 150 minutes of exercise per week or 30 minutes on most days	
Obstetric and Medical history	<input type="checkbox"/>
Screen for modifiable risk factors	
Medical conditions	<input type="checkbox"/>
Review current disease status and medications Refer as required	
Genetic screening	<input type="checkbox"/>
If indicated from personal/family history or ethnic background or consanguineous	
Smoking/alcohol/illicit drugs	<input type="checkbox"/>
Assess intake and provide appropriate advice	
Relationship/Psychosocial aspects	<input type="checkbox"/>
Assess for violence Assess mental health	
Supplements	<input type="checkbox"/>
Folic acid Iodine	
Check all medications	<input type="checkbox"/>
Environmental toxins and infectious agents	<input type="checkbox"/>
Advice on home, work and recreational environments	
Dental/oral health advice	<input type="checkbox"/>
Examine	<input type="checkbox"/>
BMI and BP	
Test for:	<input type="checkbox"/>
FBE and Rubella Consider if indicated e.g. varicella, ferritin, Hb electrophoresis, chlamydia, HIV, syphilis serology, hepatitis B/C, TSH, B12, cervical screening Offer population carrier screening for cystic fibrosis, fragile X syndrome and spinal muscular atrophy for couples without a family history	

Resources

Resources	Action
American Congress of Obstetricians and Gynaecologists	Marijuana use during pregnancy and lactation
California Dental Association	Oral health during pregnancy
Dental Health Services Victoria	Oral health during pregnancy and referral in pregnancy
Department of Health, Victoria	Low vitamin D in Victoria Information on healthy eating during pregnancy & breastfeeding, with multiple links
National Health and Medical Research Council	Iodine supplementation for pregnant and breastfeeding women Australian Guidelines to Reduce Health Risks from Drinking Alcohol (2009)
RACGP	RACGP guidelines for preventative activities in General Practice (<i>The Red Book</i>). A General Practice perspective for managing opioid dependence
RCPA	Information on haemoglobinopathy/thalassaemia screening
RANZCOG	Pre-pregnancy counselling (C Obs 3A)
The Royal Women's Hospital	Comprehensive web-based pregnancy and breastfeeding medicines guide developed by RWH and available by annual subscription Food safety in pregnancy Clinical Guidelines for the use of buprenorphine in pregnancy (2018) Clinical guidelines for the use of cannabis in pregnancy (2018)
Therapeutic Goods Administration	Comprehensive guide with multiple resources, including Australian categorisation of risk of drug use in pregnancy and links to State-based Obstetric Drug Administration Services



CHAPTER 3
SHARED MATERNITY CARE

Shared maternity care is a model of care in which the majority of antenatal care takes place in the community with a hospital-credentialed GP, obstetrician or midwife (a shared maternity care affiliate [SMCA]). Visits also take place at key times at the hospital (the main hospital site or community satellite clinic). The woman attends the hospital for the labour, baby's birth and immediate postnatal care.

The provision of care and support to a woman while she is in labour is undertaken by the hospital. It is not the role of a SMCA to provide care and support once the woman is in labour, during the baby's birth or in the immediate postnatal period while she is in hospital. This is not covered under the credentialing, roles or responsibilities of a shared maternity care provider.

Therefore, the community-based SMCA and hospital-based care providers act as a team in the provision of a woman's care.

The provision of care and support to a woman while she is in labour is undertaken by the hospital. It is not the role of a Shared Maternity Care Affiliate and is not covered under the credentialing, roles or responsibilities of a shared maternity care provider.

It is important that both hospital and community providers:

- Support the shared maternity care model
 - Are respectful and supportive in their approach to a woman's decision to undertake shared care
 - Do not attempt to divert a woman into another model of care unless this is medically indicated
-

Shared maternity care is available to all women who have been assessed as being low-risk by the hospital.

Women who are not low-risk may be eligible to undertake a modified form of shared maternity care (called *modified shared maternity care*). In this case, an individualised care plan will be documented in the woman's record and communicated to the SMCA in the pregnancy record. The care plan provides information on additional reviews, care and investigations that are required, including whose responsibility this is.

Credentialing

Any GP, obstetrician or midwife who is credentialed at The Royal Women's Hospital, Mercy Hospital for Women, Western Health, Northern Health or Werribee Mercy Hospital as a SMCA can provide shared maternity care to women who have been registered by the hospital to undertake shared maternity care.

Underpinned by hospital policies and a joint agreement, the hospitals have joint credentialing criteria and a single application process for GPs and obstetricians who wish to become SMCAs at any of the hospitals. Each hospital site has documented policies for credentialing as a SMCA and registration protocols for shared maternity care that comply with these guidelines. SMCAs can request these by contacting the shared maternity care coordinator at the appropriate hospital.

Applications for credentialing as a SMCA are currently processed at The Royal Women's Hospital (Parkville), Mercy Hospital for Women, Northern Health and Western Health. An application form can be downloaded from the hospitals' websites.

To maintain credentialing, affiliates are invited to apply for recredentialing every three years. Recredentialing criteria differ from initial credentialing criteria.

To maintain credentialing as a SMCA, recredentialing is undertaken every 3 years. Requirements are available on the hospitals' websites.

Responsibilities

A team approach between the community and hospital providers is required for the provision of quality shared maternity care. Responsibility for a woman's care is shared, including ordering investigations, the communication and management of investigations, results and abnormal findings. These should be documented in the patient-held pregnancy record.

The following obligations form the basis of responsibilities and communication between the SMCA and hospital staff.

Hospital	SMCA	Both hospital and SMCA	Women
Notify the referring doctor of the receipt of referral for pregnancy care	Notify the shared maternity care coordinator if a woman does not attend her first SMCA visit	Record test results, visits, findings and management in the patient-held pregnancy record	Book appointments with the SMCA
Notify the woman of the first hospital appointment details and location	Contact the woman if she does not attend her first scheduled SMCA appointment (if she is known to the practice)	Review investigations they have ordered in a timely way	Attend their appointments
Notify the referring doctor if the woman does not attend her first hospital appointment	Notify the shared maternity care coordinator if a woman has a poor attendance record for her antenatal visits	Follow-up abnormal investigations and findings	Bring their patient-held pregnancy record to all appointments
Establish suitability for shared maternity care	Ensure the shared maternity care coordinator has up-to-date details for the SMCA		
Register the woman with a credentialed SMCA	Abide by these guidelines, including when to refer to hospital		
Notify the SMCA that the woman has registered for shared maternity care	Comply with credentialing /recredentialing requirements		
Notify the referring doctor of the outcome of the first hospital visit			
Ensure the woman has a pregnancy record			
Ensure that the woman receives information about her required schedule of visits and tests (for both hospital and the SMCA)			
Ensure the anticipated hospital appointments are organised and notify the woman of these			
Organise and review the woman's routine 28 week and 36 week tests			
Notify the woman's SMCA if shared maternity care ceases			

Shared maternity care coordinators

The hospital shared maternity care coordinator is the key person for non-urgent contact for both SMCAs and women. The shared maternity care coordinator's qualifications and role vary between health services.

In general, the shared maternity care coordinator responds to issues that may arise and ensures that non-urgent queries and requests from SMCAs are dealt with in a timely and appropriate manner.

At all sites, the shared maternity care coordinator is the point of contact for:

- Updating a woman's contact details
- Organising and notifying women of routine hospital appointments
- Organising appointments for additional non-urgent clinical consultations at the request of the SMCA or hospital staff; for example, with obstetric doctors, dietetics, physiotherapy, social workers, physicians, psychiatry or genetics
- Organising hospital follow-up for women who have been diagnosed with gestational diabetes
- Obtaining non-urgent information about hospital care (e.g. discharge summaries, investigation results, whether a woman is registered for shared care)
- Changing shared maternity care providers (if requested by the woman)
- Notifying the SMCA of cessation of shared maternity care

The shared maternity care coordinator may also be able to assist with:

- Non-urgent reassessment and review of community ultrasound results and other pathology results by the relevant department

For any abnormal results, see [Chapter 5](#), [Chapter 6](#).

Both the SMCA and hospital providers must record each visit's findings, test results and management in the patient-held pregnancy record.

A woman is required to make her own appointments with her SMCA.

The hospital shared maternity care coordinator is the key person for non-urgent contact for both SMCAs and women.

Shared maternity care coordinator contact details

Health service	Shared maternity care coordinator contact details	Contact in absence of shared care coordinator
Mercy Health Heidelberg	Phone: 8458 4120 (Mon to Fri 8.30am - 4.30pm) Fax: 8458 4205 Email: sharedcare@mercy.com.au	Switchboard: 8458 4444 to contact obstetric registrar on call or 8458 4000 for Emergency Department
Northern Health	Phone: 8405 8772 Antenatal Clinic Manager (Mon to Fri 8.30am - 4.30pm) Email: maternitysharedcare@nh.org.au	Phone: 8405 8000 and request on-call obstetrician / registrar
The Royal Women's Hospital (Parkville)	Phone: 8345 2129 (Mon to Fri 8.30am - 4.30pm) Fax: 8345 2130 Email: sharedcare@thewomens.org.au	Switchboard: 8345 2000 to contact obstetric registrar or Emergency Department
The Royal Women's Hospital (Sandringham)	Phone: 9076 1233 (Wed 8.00am - 3.00pm) For clinical inquiries phone: 9076 1232 Email: sharedcare.sandringham@thewomens.org.au	Switchboard: 9076 1232 to contact midwife in charge. Phone: 9076 1232 for clinical inquiries
Western Health	Phone: 9055 3012 (Tue and Wed 8.00am - 4.00pm) Fax: 9055 2125 Email: maternitysharedcare@wh.org.au	Associate Midwife Unit Managers: Orange - 9055 3016 Blue - 9055 3015 Yellow - 9055 3014 Purple - 9055 3017 Maternity Assessment Centre is open 24 hrs: 9055 2300
Werribee Mercy	Phone: 8754 3393 (Mon to Fri – office hours) Fax: 8754 6710 Email: werribeesharedcare@mercy.com	Routine outpatients' queries: 8754 3390 Phone: 8754 3448 to contact registrar for urgent clinical concern
Djerriwarrh Health	Phone: 5367 9871 (Mon to Fri - office hours) Fax: 9746 0668 Email: patriciar@djhs.org.au	ANUM Antenatal clinic Phone: 5367 9871 Fax: 5367 0300

Suitability for shared maternity care

At the hospitals, shared maternity care is an option for all women who have been assessed by the hospital as low-risk.

It is the hospital's responsibility to establish a woman's suitability for shared maternity care. However, it is valuable if shared maternity care has been discussed prior to any referral and a woman's preference indicated on the referral to the hospital.

Women are only registered for shared maternity care after their first hospital appointment.

It is the hospital's responsibility to establish a woman's suitability for and register her shared maternity care.

However, it is valuable if shared maternity care has been discussed prior to referral and a woman's preference indicated on the referral to the hospital.

Exclusion criteria

Medical and social history	Previous obstetric history	Current pregnancy
≥40 years of age at the time of booking (modified shared care frequent until about 43 years)	A stillbirth or neonatal death (unexplained or recurrent reason)	Multiple pregnancy
Early pregnancy BMI is ≥35 or ≤ 18.5 (modified shared care frequent from BMI ≥35-≤40)	Recurrent (3 or more) miscarriage	Some congenital abnormalities
Cardiac disease, including hypertension	Fetal growth restriction w(birth weight <2800 g at term)	Pregnancy associated plasma protein-A (PAPP-A) ⁴ Multiples of Median (MoM) <0.4 on first trimester early combined screening test
Renal disease	Pre-term birth (≤32 weeks)	
Diabetes and some endocrine disorders (treated hypothyroidism not an exclusion)	Severe pre-eclampsia	
Major psychiatric disorders	Rhesus isoimmunisation or significant blood group antibodies	
Haematological disorders, including thromboembolic disease		
History of obstetric cholestasis	Placental abruption	
Epilepsy requiring anticonvulsant drugs	Cervical insufficiency	
Malignant disease	Congenital abnormalities	
Severe asthma	Uterine rupture	
Human immunodeficiency virus (HIV) positive		
Hepatitis B or C with abnormal liver function		
Significant auto-immune disorders		
A cone biopsy or ≥2 loop excisions of the transformation zone (LETZ)		
Drug abuse		

Note that many of the above are not exclusions for women undertaking shared maternity care with SMCA who are obstetricians.

Note the following common issues do not preclude shared maternity care:

- Previous lower uterine segment caesarean section (LUSCS)
- In vitro fertilisation (IVF) and other assisted conception
- Treated thyroid disease and subclinical hypothyroidism
- Previous gestational diabetes
- Depression and anxiety
- Well controlled coeliac disease

4. PAPP-A is a blood marker utilised in the first trimester early combined screening test that is combined with other markers to generate an aneuploidy risk; however, a low level in itself may predict poorer obstetric outcomes.

Modified shared maternity care

Some women who are not suitable for (routine) shared maternity care because they are not low-risk, may be assessed by the hospital doctor as appropriate for modified shared maternity care. In this situation, additional visits, surveillance and investigations may be required with the community and/or hospital provider. In these cases, an individual care plan will be developed by the hospital doctor and documented in the patient-held pregnancy record. Some common schedules for modified shared maternity care are outlined below, including the responsibilities of the SMCA and hospital.

In some cases, shared maternity care will continue in a modified form. This decision will be made by the hospital and documented in the patient-held pregnancy record.

The following women are frequently eligible for modified shared maternity care:

- Advanced maternal age: Age ≥ 40 - ≤ 43 years at time of booking
- Early pregnancy BMI ≥ 35 - ≤ 40
- Gestational diabetes diagnosed after 24 weeks that is well controlled on diet
- Woman has had ≥ 5 births above the gestational age of 28 weeks

This section will discuss additional investigations required and management.

Advanced Maternal Age (≥ 40 - ≤ 43 years at time of booking)

A woman with a maternal age ≥ 40 - ≤ 43 years at time of booking requires increased surveillance and additional tests due to an increased risk of age-related fetal abnormalities, gestational diabetes, pregnancy-induced hypertension, growth restriction and late fetal death in utero.

In addition to the routine requirements, extra investigations required include:

- **Consider early test for diabetes** with fasting blood glucose and HbA1C at initial tests, especially in the context of other risk factors
- **Growth and wellbeing ultrasound/s** (hospital responsibility): Growth and wellbeing ultrasound in third trimester should be offered to a woman age 40 or older:
 - At WMH, WH and NH this is routinely done twice: at 28-32 weeks and at 36 weeks
 - At RWH, MHW this is routinely done once at about 34-35 weeks

Action

- **Consider Aspirin:** start before 16 weeks (SMCA responsibility) Take aspirin 100-150 mg at night start before 16 weeks until 36 weeks – recommend for women with one strong indication or consider if woman has two or more moderate indications for pre-eclampsia.

Strong indications (recommend if any of):

- Past history pre-eclampsia, especially if associated with preterm delivery and/or fetal growth restriction
- Multiple pregnancy
- Renal disease
- Chronic hypertension
- Autoimmune diseases such as SLE and antiphospholipid syndrome
- Diabetes (type 1 or 2)

Moderate indications (consider if two or more of):

- Primigravida or interpregnancy interval of ≥ 10 years
- Advanced maternal age (≥ 40 years)
- First-degree family history of pre-eclampsia
- High BMI (≥ 35)
- Donor sperm +/- donor egg pregnancies
- If an early pre-eclampsia screening result shows an increased risk of 1:180 or higher (note this is not a routinely recommended test)
- **More frequent visits:** e.g. four-weekly until 28 weeks, two-weekly until 36 weeks, weekly until 40 weeks (SMCA responsibility, with hospital providing the recommended schedule)
 - The 39-week visit is a hospital visit rather than SMCA visit (hospital responsibility)
- **Consider induction of labour at about 40 weeks** (hospital responsibility)

Pre-pregnancy BMI ≥ 35 - ≤ 40

A woman with a maternal pre-pregnancy BMI ≥ 35 has an increased risk of folate deficiency, gestational diabetes, pregnancy-induced hypertension, intrauterine growth restriction (IUGR) and stillbirth, malpresentation, caesarean section, thromboembolism, increased difficulty with anaesthesia and increased difficulty in breastfeeding.

In addition to the routine requirements, extra investigations required include:

- **Early test for diabetes** with fasting blood glucose and HbA1C at initial tests
- **Consider baseline investigations of renal and liver function** in early pregnancy, such as serum electrolytes, creatinine and urea and liver function, and urine proteinuria. (This assists in differentiating pre-existing dysfunction from pregnancy-induced disorders later in pregnancy)
- **Growth and wellbeing ultrasound/s** in third trimester (hospital responsibility, with the protocol varying amongst services)

Action

• **Supplementation:**

- Generally, recommend **high dose folate** (5mg/day) until 12 weeks (SMCA responsibility)
- If previous bariatric surgery, consider B12, folate and iron supplements⁵ (SMCA and hospital responsibility)

• **Consider Aspirin:** start before 16 weeks (SMCA responsibility)

Due to the increased risks of pre-eclampsia, recommend that women with more than one moderate risk factor for pre-eclampsia should take aspirin 100-150mg at night starting from 8-16 weeks of gestation until 36 weeks.

Factors indicating moderate risk are:

- First pregnancy
 - Age 40 years or older
 - Pregnancy interval for more than 10 years
 - Pre-pregnancy BMI ≥ 35
 - Family history of pre-eclampsia
 - Multiple pregnancy
- **More frequent visits:** e.g. four-weekly until 28 weeks, two-weekly until 36 weeks, weekly until 40 weeks (SMCA responsibility, with hospital providing the recommended schedule)
 - Consider referral to a **dietitian, physiotherapist and lactation consultant** (hospital responsibility)
 - Consider referral for **anaesthetic review** (hospital responsibility)

Women with BMI ≥ 40 generally require hospital care including consideration for thromboprophylaxis, anaesthetic and cardiac risk assessment.

5. Shawe J, Ceulemans D, Akhter Z et al. Pregnancy after bariatric surgery: Consensus recommendations for preconception, antenatal and postnatal care, Obesity Review 2019. <https://doi.org/10.1111/obr.12927>

Diet controlled gestational diabetes

During pregnancy, women with suboptimally managed gestational diabetes (GDM) are at potentially increased risk of pre-eclampsia, hypertension, preterm delivery, macrosomia, induction of labour and caesarean section.

Women with GDM well-controlled by diet do not face these increased risks and may be eligible for modified shared care after hospital assessment.

All women with GDM need to be seen by the hospital's diabetes educator where this decision will be made in accordance with the hospital's protocol.

Diagnosis of GDM⁶

Gestational diabetes mellitus is diagnosed if one or more of the following criteria are met following a 75g oral glucose load:

- Fasting glucose \geq 5.1mmol/L
- 1-hr glucose \geq 10.0mmol/L
- 2-hr glucose \geq 8.5mmol/L

or

- A random blood glucose $>$ 11.1 in the presence of symptoms

Action

• Referral to hospital diabetes team

- If a SMCA confirms a diagnosis of gestational diabetes, contact the shared maternity care coordinator as soon as possible. The shared maternity care coordinator will inform the diabetes team
- The woman will be seen by a hospital diabetes educator, dietitian and/or a physiotherapist.

She will be:

- Provided with education on GDM and symptoms
- Provided with advice on diet and physical activity
- Taught to take her blood sugar (BGLs) levels QID (fasting in the morning and after each main meal) with the aim of keeping levels in a defined range.

The timing of testing and range will be part of the woman's education and documented by the health service

The time for testing and the levels vary according to the service:

- Morning fasting BGL $<$ 5.0 mmol/L - $<$ 5.5 nmol/L depending on the health service
- Post prandial BGL $<$ 6-5 - $<$ 6.7 mmol/L depending on the health service
- Provided with a book, machine and strips to take and record BGLs
- Registered with the National Diabetes Service Scheme (NDSS)
- Asked to contact the diabetes educator if BGLs above the recommended level

• Hospital to decide if able to continue with shared care or not

Eligibility for the continuance is:

- Diagnosis was made \geq 24 weeks gestation
- If HbA1C performed, it is in the normal range (ordered by hospital)
- GDM is well controlled by diet and exercise
- Woman does not require insulin or other oral hypoglycaemic
- Woman adheres to monitoring and recording her BGLs
- There are no concerns about fetal growth and wellbeing

In the case of continuation of shared care; this will be recorded on the woman's hand held pregnancy record by the hospital team.

6. For ease, GDM in these guidelines incorporates both GDM and Diabetes in pregnancy. Diabetes in pregnancy is diagnosed at higher levels than GDM.

If shared maternity care continues the following is required:

- **More frequent visits:**
 - These will be more frequent as determined by the hospital, generally:
 - With SMCA every two weeks until 36 weeks and then every week until 40 weeks
 - At hospital at 28 weeks, 36 weeks and 40 weeks onwards
 - Review book of BGLs at each visit
 - Discuss and encourage appropriate diet and physical activity at every visit (see Chapter 14)
 - SMCA to refer woman to the Diabetic Educator if BGL above target level
 - SMCA to refer to hospital if concern about fetal growth or compromise

BGL target is:

- Morning fasting BGL $\leq 5.0 - 5.5$ mmol/L and
 - Post prandial BGL $< 6.5 - 6.7$ mmol/L
-

If BGL target is exceeded on two or more occasions in the previous seven days, refer woman to diabetes educator. Shared care may also be ceased.

Modified shared care can only continue if:

- Diagnosis was made after 24 weeks
 - HbA1C is in normal range
 - GDM is diet and exercise controlled (i.e. no insulin or oral hypoglycaemic) required
 - There is no concern about fetal growth or compromise
 - BGLs stay within ideal range
 - The hospital has made the decision that shared care can continue and communicated with the SMCA
-

Grand multiparity

The definition of “grand multiparity” varies, however a reasonable definition of “grand multiparity” is a woman who has had ≥ 5 births (live or stillborn) at ≥ 20 weeks of gestation. As such it is associated with advanced maternity age which is a risk factor for pregnancy and outcomes and also for risk factors of GDM and obesity.

Grand multiparity as an independent risk factor probably increases the risk of the following complications, although findings are inconsistent across studies⁷:

- Placental abnormalities, such as placenta praevia and abruption
- Postpartum haemorrhage
- Macrosomia
- Umbilical cord prolapse

Data are not adequate to clearly support or refute an independent association between grand multiparity⁷ and:

- Caesarean delivery
- Venous thromboembolic events
- Gestational hypertension/preeclampsia
- Pregestational/gestational diabetes
- Malpresentation/operative delivery
- Dysfunctional labour/prolonged labour
- Preterm birth/low birth weight
- Neonatal intensive care unit admission
- Perinatal death
- Amniotic fluid disorders (oligohydramnios, polyhydramnios)

Action

- Additional investigation: Presentation/Growth and wellbeing ultrasound (hospital responsibility) at about 35 weeks
- The 39-week visit is a hospital visit rather than a SMCA visit (hospital responsibility)

Cessation of shared care

In the course of pregnancy, a woman may develop issues that mean she is no longer low-risk and therefore requires a change in the model of maternity care and the cessation of shared maternity care.

In some cases, modified shared maternity care may still be appropriate, but this decision will be made and documented after assessment by the hospital doctor.

Shared maternity care is ceased in the following cases:

- Fetal abnormalities
- Fetal growth restriction
- Gestational diabetes
- Placental problems such as placenta praevia, vasa praevia and placenta accreta
- Antepartum haemorrhage
- Cholestasis
- Gestational hypertension or evidence of pre-eclampsia
- Woman requests cessation
- Development of exclusion criteria (see above)

If these are noted by SMCAs, appropriate and timely referral to a hospital must be undertaken.

It is the hospital's responsibility to notify SMCAs of the cessation of shared maternity care or changes to modified shared maternity care and the reasons.

If a woman becomes unsuitable for shared maternity care and this is noted by a SMCA, the SMCA is required to ensure appropriate and timely referral to the hospital.

7. UpToDate® Grand Multiparity. Authors: Sara Ellis Simonsen and Michael W Varner Feb 2019

Patient-held pregnancy record

This is a patient-held pregnancy record used at the hospitals. Each woman enrolled in shared maternity care requires a patient-held pregnancy record. It is essential that a record of each consultation is added to this at each visit by providers at all SMCA and hospital visits.

All providers need to document their care in the patient-held pregnancy record (including any tests ordered and test results). These need to be dated and signed. The following must be recorded by all health care providers in the patient-held pregnancy record:

- Date and gestation
- Blood pressure reading
- Measurement of fundal height in centimetres
- Presence of fetal movements from 20 weeks
- Fetal auscultation with a Doppler from 20 weeks
- Check of fetal presentation from 30 weeks
- Note oedema if present
- Consider a urine dipstick test for proteinuria
- Tests ordered and results
- Management
- Follow-up appointment

If required, GPs can print consultation notes from their clinical software and attach these to the record. If a woman attends a SMCA or hospital visit without her patient-held pregnancy record, the SMCA or hospital should ensure that she leaves with written correspondence that she can attach to her pregnancy record. To expedite the follow-up of results, it is useful if the SMCA includes in the patient-held pregnancy record the contact details of community ultrasound and pathology providers utilised.

It is essential that a record of the consultation is added to a woman's handheld pregnancy record at each visit by all providers.

All health care providers must record examination findings and investigations.

Resources

Resources	Action
Australasian Diabetes in Pregnancy Society	Clinical Guidelines: <i>ADIPS Consensus Guidelines for the Testing and Diagnosis of Diabetes Mellitus in Australia (2013)</i>
Diabetes Australia	Comprehensive guide for health professionals and consumers: Multiple diabetes resources, including free booklet and DVD resources
National Institute for Health and Clinical Excellence (UK)	Clinical guideline: <ul style="list-style-type: none"> • Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period (2015) • Algorithms on diabetes in pregnancy with links to various aspects of care from gestational diabetes to postnatal diabetic care
RANZCOG	Clinical Guidelines: Management of Obesity in Pregnancy (2017)
RCOG United Kingdom	Clinical Guideline: <i>Care of women with obesity in pregnancy (Green top Guideline No. 72)</i>
Shared maternity care program at each health service	Mercy Health The Royal Women's Hospital Western Health Northern Health Werribee Mercy Hospital



CHAPTER 4 ANTENATAL VISITS

Standard antenatal consultation and examination

All visits provide opportunities for the identification of problems, advice and education – to maximise patient activation and develop a trusting relationship between the woman and care provider.

The focus of each trimester's visits tends to vary. First trimester visits primarily focus on assessing problems and risks to the mother and fetus, including screening and assessing maternal and fetal problems and wellbeing and providing opportunities to maximise health.

First trimester tasks include taking a comprehensive history, examination, undertaking investigations (initial tests, aneuploidy tests, 12-week ultrasound, and advice and education. Any required interventions are primarily to:

- Identify problems
- Identify and mitigate risks for both mother and fetus
- Confirm the expected date of birth
- Organise ongoing care

Second-trimester visits are primarily to:

- Check for fetal and placental problems (20-22 week ultrasound)
- Monitor fetal growth and maternal wellbeing
- Identify pre-eclampsia/high blood pressure, diabetes, anaemia, etc.

Third-trimester visits are primarily to:

- Monitor fetal growth, maternal wellbeing and signs of pre-eclampsia/high blood pressure
- Assess and prepare women for admission, labour and going home

A standard antenatal consultation and examination is performed at EACH SMCA and hospital appointment. This includes:

History (each visit)

- General wellbeing check-up
- Enquire about fetal movements from 20 weeks

Examination:

- Blood pressure check
- Measure fundal height in centimetres (see next page)
- Auscultate fetal heart with Doppler from 20 weeks
- Check fetal presentation from 30 weeks
- Inspect legs for oedema (a sign of pre-eclampsia and thromboembolic disease – also check for other signs of thromboembolic disease)
- Consider urine testing with a dipstick
- Consider weighing

Investigations and documentation

- Ensure investigations are arranged/results checked and followed up if required
- Document findings, results and management in the patient-held pregnancy record

Each visit must be documented in the patient-held pregnancy record along with copies of all results of investigations.

A normal fetal heart rate (FHR) in the in-utero period usually ranges from 120 to 160 beats per minute.

Measuring fundal height

- Palpate using the physical landmarks of the xiphisternum, umbilicus and symphysis pubis
- Consider macrosomia, multiple pregnancy and small for gestational age
- Measure the fundal height with a disposable paper (or non-stretchable) tape measure with the centimetres side facing down (to avoid bias)
- Gently palpate from the lower end of the sternum and continue to palpate down the abdomen until the fundus is reached. Palpate the fundus and determine the highest point. Secure the end of the tape measure at that point with fingers
 - If the uterus is rotated away from the midline, the highest point of the uterus will not be in the midline but will be to the left or right of the midline. Therefore, also palpate away from the midline to make sure that the highest point at which the fundus can be palpated is noted (see figure 1)
 - Do not move the fundus into the midline before marking the highest point

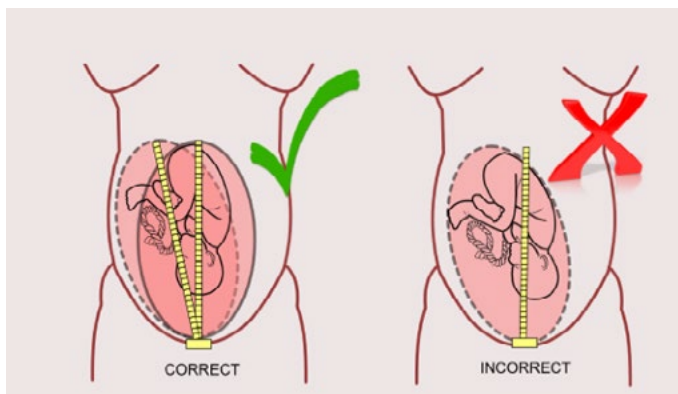


Figure 1: Measuring fundal height

Consultation discussion points

Throughout pregnancy:

- Smoking/alcohol/drug use and cessation, if relevant (See Chapter 14)
- Mental health and wellbeing (See Chapter 15)
- Relationships and support networks
- Intimate partner violence
- Breastfeeding (See Chapter 16)

Early in pregnancy:

- Folate and iodine supplementation (See Chapter 13)
- Medicines and supplements (prescription, over-the-counter, vitamins and vitamin A derivatives)
- Influenza vaccination (See Chapter 9)
- Food and environmental safety; avoiding infection and toxins (e.g. Listeria, toxoplasmosis, CMV, mercury and lead prevention) (See Chapter 14)
- Diet, nutrition and weight gain (See Chapter 14)
- Oral health care
- Common discomforts in pregnancy
- Anti-D, if relevant (See Chapter 10)
- Expectations for pregnancy/birth
- Models of care

Later in pregnancy:

- Fetal movements (See Chapter 8)
- Advice on sleeping on either side after 28 weeks to reduce chance of stillbirth
- Pertussis immunisation
- Breastfeeding (See Chapter 16)
- Symptoms/signs of premature labour
- Labour, birth and discharge, including expectations (discussed at hospital visit) (See Chapter 11)
- Vaginal birth after caesarean, if relevant (discussed at hospital visit) (See Chapter 11)

In the final weeks:

- Newborn care
- Baby products and safety
- Baby immunisations
- Maternal, partner and other children care
- Partner and family support
- Postnatal GP check for mother and baby and community maternal and child health services

Weight gain

Recommendations for maternal weight gain during pregnancy:

Pre-pregnancy weight category	Body mass index	Recommended range of total weight gain (kg)	Recommended rate of weight gain in 2 nd & 3 rd trimesters (kg/week)
Underweight	Less than 18.5	12.7–18.1	0.45
Normal weight	18.5–24.9	11.3–15.9	0.45
Overweight	25–29.9	6.8–11.3	0.27
Obese (includes all classes)	30 and greater	5–9	0.22

Table: The Institute of Medicine (US) recommendations for weight gain for singleton pregnancy⁸.

Excess weight gain during pregnancy can increase the risks of several health problems in mother and baby.

“Expectant mothers and their care providers need to balance the benefits of pregnancy weight gain for the fetus with the risks of too much or too little increase, which can result in consequences for both mothers and children. For mothers, the ramifications of excess weight gain include increased chances of retaining extra kilos after birth or needing a Caesarean section; for children, the risks include being born preterm or larger than normal with extra fat. Each of these consequences increases the chances for subsequent health problems – such as heart disease and diabetes in the case of extra weight, and impaired development in the case of premature birth. At the same time, adding too few kilos during pregnancy increases risks for stunted fetal growth and preterm delivery.

... To minimize the risks, women should aim to conceive while at a normal BMI and gain within the guidelines during pregnancy, the committee concluded.

... Helping women achieve these goals will require health care providers to increase the counselling they give their patients on weight, diet, and exercise. This counselling should occur not just during pregnancy, but well before women plan to conceive, given that many should lose weight to begin pregnancy closer to or at a normal BMI... Prenatal care providers and expectant mothers should work together to set pregnancy weight gain goals based on the guidelines and other factors relevant to each patient’s individual needs.”^{9,10}

To minimise the risks, women should be advised to conceive while at a normal body mass index (BMI) and gain within the guidelines during pregnancy (see table above). Health care providers should provide information on weight, diet and exercise before women plan to conceive and consider discussing weight gain in pregnancy with women.

All pregnant women should have an initial weight and BMI recorded in their hand-held record.

- Institute of Medicine (US). *Weight gain during pregnancy: re-examining the guidelines*. Washington, DC: National Academies Press; 2009
- Office of News and Public Information. Report Updates Guidelines on How Much Weight Women Should Gain During Pregnancy; Calls on Health Care Providers to Help Women Achieve a Healthy Weight before and during Pregnancy, News from the National Academies, news item, 28 May 2009. Accessed 12 June 2015 <www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12584>
- IOM (2009). *Nutrition During Pregnancy*. National Academy of Sciences, Institute of Medicine, Food and Nutrition Board, Committee on Nutritional Status During Pregnancy and Lactation, Subcommittee on Dietary Intake and Nutrient Supplements During Pregnancy, Subcommittee on Nutritional Status and Weight Gain During Pregnancy. Washington DC: National Academy Press, 1990.

Common first trimester interventions: aspirin and high dose folate

As women will frequently not be seen at the hospital until the second trimester, some interventions should be commenced before hospital review.

Aspirin

Low-dose aspirin is most commonly used during pregnancy to prevent or delay the onset of pre-eclampsia (and its associated complications including stillbirth, fetal growth restriction and preterm delivery).

Indications:

For women with a high risk of pre-eclampsia including:

- **Strong indications (recommended if any one of the following):**
 - Past history pre-eclampsia, especially if associated with preterm delivery and/or fetal growth restriction (start aspirin prior to 16 weeks of gestation)
 - Multiple pregnancy
 - Renal disease
 - Chronic hypertension
 - Autoimmune diseases such as SLE and antiphospholipid syndrome
 - Diabetes (type 1 or 2)
- **Moderate indications (consider if two or more of the following):**
 - Primigravida or interpregnancy interval of ≥ 10 years
 - Advanced maternal age (≥ 40 years)
 - First-degree family history of pre-eclampsia
 - High BMI (≥ 35)
 - Donor sperm +/- donor egg pregnancies
 - If an early pre-eclampsia screening result shows an increased risk of 1:180 or higher (note this is not a routinely recommended test)

Timing

- **Consider aspirin: start before 16 weeks** (SMCA responsibility)
Recommend that women with one strong indication (or consider if two or more moderate indications for pre-eclampsia) take aspirin 100-150 mg at night, starting before 16 weeks until 36 weeks.

High-dose folate

The most robust data for the efficacy of higher dose folic acid supplementation are for women with a previously affected offspring or where either parent has a personal history of NTD. More limited data support recommendations for higher dose folic acid supplementation in the specific other high-risk groups discussed below.

It is generally recommended that the following women take high dose folate (5mg per day):

- Family history of neural tube defects in a first or second degree relative
- With pre-existing diabetes
- On medication for epilepsy
- Women with epilepsy
- On medications other than antiepileptic drugs that have been associated with reductions in available folic acid (e.g. triamterene, trimethoprim, sulfasalazine)
- Women with conditions associated with malabsorption (e.g. celiac disease, inflammatory bowel disease, major intestinal resection, some bariatric surgery, advanced liver disease, renal failure)
- Women with BMI ≥ 35 (no evidence – expert opinion only)

Women should not attempt to achieve high-dose supplementation by taking multiple multivitamins because of the possibility of ingesting harmful levels of other vitamins, such as vitamin A. (See Chapter 14)

Schedule of visits: timing and place

The following table provides a summary of the minimum routine antenatal visits for shared maternity care. Although there is considerable alignment between the hospitals, the recommended antenatal schedule and routine investigations vary slightly.

- Shared Care providers should use their clinical judgement in determining reviews, with the following recommended as a minimum schedule.

Place	Timing	Notes
Hospital	12–20 weeks	At each visit an antenatal consultation and examination occurs plus
SMCA	16 weeks	<ul style="list-style-type: none"> Discuss result of Aneuploidy test or offer second trimester maternal serum screening if Down syndrome test already undertaken Confirm fetal morphology ultrasound appointment arranged
SMCA (hospital visit for NH)	22 weeks	<ul style="list-style-type: none"> Check fetal morphology ultrasound result. (At NH, women with a previous caesarean will also have a discussion about mode of birth)

Site of the routine 28-week visit varies amongst the hospitals:

- At MHW, this occurs at the hospital for all women
- At RWH, this occurs at the hospital for women who are Rh -ve or who have had a previous caesarean (otherwise is with SMCA)
- At WMH, WH and DjHS occurs at the hospital for women who have had a previous caesarean (otherwise is with SMCA)
- At NH, all women see their SMCA for this visit

In all cases, the hospital orders the routine 28 week investigations (GTT/FBE /antibodies) and administers Rh immunoglobulin (Anti-D) if required (See Chapter 10)

SMCA	32 weeks	
SMCA	34 weeks	
Hospital	36 weeks	Rh immunoglobulin (Anti-D) administered at hospital if required
SMCA	38 weeks	
SMCA	39 weeks	
SMCA	40 weeks	Depending on the timing of the hospital appointment, this appointment may not be required
Hospital	40 weeks to 40 weeks + 7 days	
Hospital	41 weeks+	Monitoring/arrange induction if applicable

Hospital visits schedule and care

If undertaking routine shared maternity care, women are generally booked in for key hospital visits at:

- 12–20 weeks
- (22 weeks at NH only)
- +/- 28 weeks (if past history of caesarean. At MHW this is routine)
- 36 weeks
- After 40 weeks

These are organised by the shared maternity care coordinator and communicated to the woman at or soon after her first hospital visit.

In addition, the shared maternity care coordinator can organise appointments for additional non-urgent clinical consultations and communicate these to the woman. This includes consultations with obstetric doctors, dietitians, physiotherapists, social workers, physicians, mental health teams or genetics. This may be at the request of the SMCA or hospital staff.

First hospital visit: 12–20 weeks

Each woman has a detailed health and social assessment undertaken at the first hospital visit ("the booking in visit"). This provides the opportunity to explore many aspects of maternity care and for women to discuss models of care.

A woman may be provided with written material covering care and hospital contacts. Depending on the hospital, the first hospital visit may consist of a doctor or midwife appointment or both. If there are two components to the first hospital visit, these may occur on different days or on the same day, and can take up to three hours. It is at this first hospital visit that a woman is officially 'booked in' for the birth of her baby at the hospital.

Women who are assessed as eligible by the hospital and choose shared maternity care are then registered for shared maternity care. This involves:

- The woman receiving a schedule of visits and tests
- Ensuring the woman has been provided with a patient-held pregnancy record
- Ensuring that hospital appointments are made (except at WH and WMH, where women are notified of hospital appointment details closer to the date by mail)
- A letter of registration, which is sent to the SMCA to inform the SMCA of the woman's enrolment into shared care (within 72 hours)

The woman needs to make her own appointments with the SMCA.

If they do not attend their first SMCA visit, the SMCA must notify the shared maternity care coordinator.

The following is a summary of what occurs at the first hospital visit (12–20 weeks).

Responsibility	Clinical consultation	Investigations
<p>Hospital doctor and/or midwife</p> <p>Depending on the hospital, the first hospital visit may consist of a doctor or midwife appointment or both. If both, these may occur on different days or the same day.</p>	<ul style="list-style-type: none"> • Comprehensive medical, obstetric and social history taken • Antenatal consultation and examination • BMI taken and documented • EDD decided and documented • Investigation results checked and documented, and order other investigations as required • Aneuploidy test result discussed, or second trimester maternal serum screening offered if not already performed (note some Down syndrome tests that are routinely available in the community cannot be performed at the hospital) • Fetal morphology ultrasound (20-22 weeks) appointment confirmed. If not organised, organise at the hospital if eligible or ask woman to present to SMCA to have this undertaken in community • If Rh-ve, discuss Rh D immunoglobulin (anti-D) • Ensure woman has a patient-held pregnancy record and findings are entered into the patient-held pregnancy record • Internal hospital referrals made as required • If past caesarean section: eligibility for trial of labour after caesarean (ToLAC) established and information provided • Education/discussion of lifestyle and wellbeing: <ul style="list-style-type: none"> – Optimal weight gain – Changes in pregnancy – Smoking, alcohol and other drug cessation – Medicines (prescriptions, over the-counter, vitamins) – Diet and nutrition – Physical activity – Listeria and toxoplasmosis prevention – Hospital and community support (when/how to seek help) – Breastfeeding – Influenza and pertussis vaccination – Arrange childbirth education • Confirm and record eligibility for shared maternity care • Register for shared maternity care: <ul style="list-style-type: none"> – Woman receives a schedule of visits and tests – Routine hospital appointments are made (except at WH or WMH where women are notified of hospital appointments by mail closer to the date) – Provide woman with slips for 26-28 week tests – Provide woman with a Pregnancy Handheld Record – Letter of registration sent to SMCA 	<p>(See Chapter 5)</p> <p>Antenatal Investigations recommended and to consider.</p> <p>It is preferable that initial investigations are ordered by the GP with copies of results given to the woman to bring to the first hospital visit.</p> <p>Many hospitals will not accept referral if initial routine investigations are not provided with the referral.</p>

28 weeks: +/-Hospital visit: varies amongst sites

- At MHW, this occurs at the hospital for all women
- At RWH, this occurs at the hospital for women who are Rh -ve or who have had a previous caesarean (with rest at SMCA)
- At WMH, WH and DjHS, this occurs at the hospital for women who have had a previous caesarean (with rest at SMCA)
- At NH, all women see their SMCA for this visit

For women with past caesarean section, discussion with the hospital doctor will be undertaken regarding mode of birth (at NH this occurs at the 22-week hospital visit)

At MHW, this is routinely a hospital appointment.

Women have a midwife antenatal check and Maternity Admission Appointment. Review by a hospital doctor will also occur if a history of caesarean section and if required or requested by the SMCA if indicated (via the shared maternity care coordinator).

At RWH, WH, WMH, NH and DjHS, this is routinely a SMCA visit.

However, at RWH, WMH, WH and DjHS, this is a hospital visit for women with past caesarean section (and for women who are Rh -ve at RWH).

This enables discussion and planning with the hospital doctor regarding trial of labour after caesarean (ToLAC) or repeat planned elective caesarean section. At NH, this discussion has taken place at 22 weeks. At MHW, this takes place at 28 weeks with a hospital doctor.

At all sites, if Rh immunoglobulin (anti-D) is required it is:

- Organised by the hospital staff at the woman's first hospital visit
- Administered at the hospital
- Documented in the patient-held pregnancy record.

The following is a summary of what occurs at the 28-week visit (may be SMCA or hospital).

Responsibility	Clinical consultation	Investigations (routine)
<p>SMCA visit (no hospital visit)</p> <p>Except for MHW where this is a hospital review (with a midwife and also a doctor if required or requested by SMCA via shared maternity care coordinator)</p>	<ul style="list-style-type: none"> • Antenatal consultation and examination • Order/check investigations • Review and complete patient-held pregnancy record entries 	<p>Ordered by hospital:</p> <ul style="list-style-type: none"> • GTT • FBE • Antibody screen <p>Consider Ferritin Anti-D prophylaxis for Rh-ve women with no Rh antibodies (See Chapter 10)</p>

Maternity Admission Information

During their pregnancy, women are provided with information about admission, birth and the postnatal period. This may be via video, written information, a face-to-face meeting or a telehealth appointment with a hospital midwife. This occurs by 36 weeks.

Information includes:

- Admission and discharge
- Childbirth education
- Previous birth experience
- Signs of labour, when to come to hospital, where to present and what to bring
- Birth plan, pain relief, monitoring, episiotomy, labour support
- Infant feeding (breastfeeding support)
- Neonatal screening tests (Newborn Screening Test and hearing screen), vitamin K, hepatitis B vaccination
- Postnatal contraception and child safety/car restraints
- GP postnatal check and community support services
- Pertussis vaccination

If Rh immunoglobulin (anti-D) is required (at 28 and 36¹¹ weeks), it is:

- Organised by the hospital staff at the woman's first hospital visit (all sites)
- Administered at the hospital
- Documented in the patient-held pregnancy record

(Note: only at MHW will this routinely be accompanied by an antenatal check at 28 weeks). SMCAs should check women have had or are having their anti-D.

Hospital visit at approximately 36 weeks

The following is a summary of what occurs at the hospital visit at 36 weeks.

Responsibility	Clinical consultation	Investigations (routine)
Hospital doctor (RWH, MHW, NH, WMH, DjHS)	<ul style="list-style-type: none"> • Antenatal consultation and examination • Review and complete patient-held pregnancy record entries • For women with past history of caesarean section, finalise and record decision on VBAC or elective caesarean with the hospital doctor 	<p>GBS swab Consider FBE/ferritin</p> <p>Rh D immunoglobulin for Rh -ve women with no Rh antibodies: at 34 weeks. (See Chapter 10)</p>

11. When required, second prophylactic Rh D immunoglobulin is usually provided around 34 weeks. However, to align with hospital visit and GBS swab this is undertaken at 36 weeks for women undertaking shared maternity care.

Hospital visit at approximately 40 weeks to 40 weeks + 7 days

The following is a summary of what occurs at the hospital visit at 40 weeks to 40 weeks + 7 days.

Responsibility	Clinical consultation	Investigations (routine)
Hospital doctor or midwife	<ul style="list-style-type: none"> Antenatal consultation and examination Review and complete patient hand-held pregnancy record entries Monitoring/arrange induction if applicable (This hospital visit is moved to 39-40 weeks in cases where routine induction of labour is considered at term e.g. maternal age \geq 40 years) 	If applicable: Cardiocograph (CTG) Amniotic Fluid Index (AFI)

Hospital care from 41 weeks onwards

After 40 weeks + 7 days, a woman has hospital visits with close surveillance.

Shared maternity care women’s pregnancy interventions checklist

Responsibility	1st Trimester	2nd Trimester	3rd Trimester
Assess, advice, educate			
Initial testing organised			
Aneuploidy test offered			
Aspirin therapy started for women at risk of pre-eclampsia			
Refer to hospital			
EDD established		FV	
Investigations results checked and order other investigations as required		FV	
Domestic violence screen		FV	
Tobacco, alcohol, illicit drugs, and non-prescribed use of medication screen		FV	
Eligibility for shared care determined		FV	
Register for shared care		FV	
Aneuploidy result checked			
Fetal morphology ultrasound ordered/checked		FV	
Examination			
GTT, FBE and antibodies order		FV	
GTT, FBE and antibodies review			
Discussion about admission, birth and postnatal period			
Pertussis immunisation (20-32 weeks), Influenza immunisation (anytime)			
Administer Rh D immunoglobulin if Rh -ve (28 week)			
Administer Rh D immunoglobulin if Rh -ve (36 weeks)			
GBS Screen (36 weeks)			
Discuss and document delivery choice with women have previous LUCS			
Monitor post term			
Postpartum check and baby immunisation (6 weeks postpartum)			

*FV - First visit

- Hospital doctor/midwife
- Hospital and SMCA
- Shared Maternity Care Coordinator
- Shared Maternity Care Affiliate



CHAPTER 5
MATERNAL ANTENATAL
INVESTIGATIONS

This section provides information on routine and commonly considered antenatal investigations. Although there is considerable alignment between the four hospitals, recommended routine antenatal investigations vary. Common fetal investigations are discussed in [Chapter 6](#). Also see [Chapter 17](#) for Hospital Support Services and for management of abnormal findings.

Initial routine investigations in first trimester

Recommended	Consider according to risk/if due
Blood group and antibody screen	HbA1C and Fasting Blood Glucose for diabetes
FBE (including MCV/MCH)	Haemoglobin electrophoresis (routine at WH, unless a previous test result is available)
Ferritin	Chlamydia urine PCR
Hepatitis B screening for carrier status	Vitamin B12
Hepatitis C serology	Thyroid stimulating hormone (TSH)
Syphilis serology	Cervical screening
Rubella antibodies	
HIV serology	
Urinalysis for bacteriuria	
Varicella antibodies unless known immunity or immunisation	
Offer to all: Reproductive Population carrier screening for CF, SMA, Fragile X (if no family history and not previously performed)	

The hospitals require that routine initial investigations are performed by a woman's GP prior to her first hospital visit and included with the hospital referral. This is to enable appropriate triage, ensure timely intervention for some conditions and maximise the utility of the first hospital visit.

It is the primary responsibility of the provider ordering a test or noting any abnormal finding to ensure appropriate follow-up, communication and management. However, all providers should check any abnormal investigation has been followed up. Once registered for shared care, results and management need to be documented in the patient-held pregnancy record.

Blood group and antibody screening

The objectives of routine blood group and antibody testing in pregnancy are to:

- Identify Rh D -ve women who would then require Rh D immunoglobulin (anti-D) prophylaxis
- Detect and identify red blood cell antibodies
- Identify pregnancies at risk of fetal and neonatal haemolytic disease resulting from clinically significant maternal antibodies crossing the placenta and entering the fetal circulation
- Identify antibodies which may be relevant to the safe provision of blood should it be required for transfusion

An antibody screen is recommended for every woman early in every pregnancy and again at 28 weeks, regardless of their Rh D status, even if Rh +ve, as other antibodies may develop over time. Also see [Chapter 10](#).

FBE

The objectives of routine FBE are to:

- Identify, assess and treat moderate or severe anaemia that is associated with adverse maternal and fetal outcomes
- Identify and correct incidental findings such as early iron deficiency anaemia and thrombocytopenia
- Screen for haemoglobinopathies and Fe deficiency (low Hb or MCV or MCH should prompt consideration of cause of either or both of thalassaemia or iron deficiency)

A microcytosis may indicate an iron deficiency, a haemoglobinopathy or a combination of both.

A previous normal haemoglobin and MCV and MCH excludes thalassaemia.

Low MCV/MCH should prompt investigation for thalassaemia and iron deficiency.

Assessment for haemoglobinopathies is indicated if low Hb/MCV/MCH and there is no previous record of normal Hb/MCV/MCH, even if ferritin is low.

See section on [haemoglobinopathies](#). Also see RCPA guideline on [haemoglobinopathy](#).

Ferritin

All women should have a test for ferritin in early pregnancy.

Iron deficiency starts with a low ferritin then proceeds to a microcytosis, lower red cell distribution width (RDW) and then to a microcytic anaemia.

Hepatitis B screening for chronic status

All women should have a screening test for hepatitis B virus early in pregnancy because at-risk screening misses approximately half of women with chronic hepatitis B.

Women found to be chronic carriers of hepatitis B, should have:

- Assessment of their viral
- Liver function tests
- Ensure close contacts are immunised
- Education, including into Hep B Ig and immunisation of baby after birth
- Ensure hepatitis B surveillance organised post birth

A specialist consultation is generally undertaken at the hospital if a woman has abnormal liver function tests (LFTs), a high viral load or is newly diagnosed. Contact the shared maternity care coordinator to arrange a specialist consultation if required. Also see Sections on [Infectious Diseases](#) and [Intrahepatic cholestasis](#) for further information on women with chronic hepatitis B.

Hepatitis C serology

Hepatitis C serology is performed to determine carrier status. Women who are known to be hepatitis C antibody positive should have:

- Assessment of their Hep C viral load
- Liver function tests

A specialist consultation is generally undertaken at the hospital if a woman has abnormal LFTs, a high viral load or is newly diagnosed. Contact the shared maternity care coordinator to arrange a specialist consultation if required.

Syphilis serology

All women should be offered a screening test for syphilis early in pregnancy. Maternal syphilis infection results in congenital infection in at least two-thirds of cases, which can occur at any stage of pregnancy. Although unusual, there has been an increase in cases of syphilis in Victoria.

Women identified at increased risk of acquiring syphilis require additional screening during their pregnancy (usually at around 28 weeks). If a woman tests positive or results are inconclusive, a semi-urgent specialist consultation is required. Contact the shared maternity care coordinator or registrar on call to arrange this.

In 2019, for the first time since 2004, congenital syphilis has re-emerged in Victoria.

Rubella antibodies

In 2019, WHO verified that Australia has eliminated ongoing local transmission of rubella, although a woman may still have contracted rubella overseas. All women should have their rubella antibody titre measured for each pregnancy.

Rubella vaccination is a live vaccine, so it cannot be given in pregnancy. Women who are non-immune should be offered immunisation at the hospital post-delivery.

HIV serology

High-level evidence indicates that all women should be offered a screening test for HIV early in pregnancy.

Urinalysis (MSU M/C)

It is recommended that routine testing for asymptomatic bacteriuria and chronic renal disease be done in early pregnancy.

If, at any visit, a woman reports symptoms of a urinary tract infection or screening for bacteriuria is indicated, then a MSU for MC&S should be undertaken.

When asymptomatic bacteriuria is detected, it should be treated with a full course of an appropriate and safe antibiotic to improve outcomes with respect to pyelonephritis, preterm birth and low birth weight.

A repeat MSU micro and culture should be performed after treatment.

Varicella

Consideration should be given to checking varicella antibodies at the first visit where there is no known immunity or immunisation.

Of note, testing for seroconversion after varicella vaccination is not recommended. Antibody levels after vaccination may be up to 10-fold lower than levels induced by natural infection with tests are not usually sensitive enough to detect these levels.

Varicella vaccination is a live vaccine, so it cannot be given in pregnancy. Women who are non-immune should be immunised in general practice post-delivery.

Population carrier screening (for cystic fibrosis, spinal muscular atrophy, fragile X)

Unless a woman has already had testing, information on carrier screening for the more common genetic conditions of cystic fibrosis, spinal muscular atrophy, and fragile X syndrome should be offered to all women planning a pregnancy (ideally) or in the first trimester of pregnancy.

This is referred to as “Reproductive genetic carrier screening” and is available for couples with no personal or family history of genetic disease at a cost to the patient. This can be undertaken by mouth swab or blood test.

Various extended carrier screening options are also available. These can include the Ashkenazi panel or other conditions a couple may be interested in.

Reproductive carrier screening tests are for couples with no family history: if there is a family history, the couple should be offered a referral for genetic counselling.

Screening tests are not available at the hospitals and are not funded; however, counselling is available at the hospitals.

It is usual to undertake “two step screening” i.e. test the female first and then only test the male partner if the female is found to be a carrier of the specific autosomal recessive condition(s) being screened for. However, the turnaround time of screening tests and the anticipated gestational age at final diagnosis are important factors to consider when deciding between one - or two-step carrier screening. For fragile X, the partner is not tested (as the condition is X linked).

If both parents are identified as carriers, immediate follow-up is required, especially if the woman is pregnant. Refer directly to the Genetics Services of the hospital the woman is booked into care with.

If there is a family history of any of these, then population testing is not appropriate, and the woman should be referred to a genetic counsellor to assess what testing is required.

Also see [Chapter 6](#).

Other initial investigations to consider

Early Diabetes Testing: Fasting blood glucose and HbA1C

Women, not known to have pre-existing glucose abnormalities, but with risk factors for hyperglycaemia in pregnancy should be tested in early pregnancy for diabetes with a glycosylated haemoglobin (HbA1c), and fasting venous plasma glucose (FBG). This can be undertaken with the initial screening bloods.

If the result is normal, a GTT is still required at 24–28 weeks (also see later in this section).

For results in the first trimester, the hospitals vary in the threshold where referral is required to the hospital team. Please refer in a timely manner to shared maternity care coordinator or diabetes team if:

- RWH/WH/: FBG ≥ 6 mol/L
- MHW/WMH/DjHS: FBG ≥ 5.1 mol/L

or for all sites: HbA1C $\geq 5.9\%$ or RBG ≥ 7.8 mmol/L

Risk factors for hyperglycaemia in pregnancy are previous GDM, impaired fasting glycaemia, impaired glucose tolerance or any two or more of the following:

- Previously elevated blood glucose level
- Maternal age ≥ 40 years
- Ethnicity: Asian, Indian subcontinent, Aboriginal, Torres Strait Islander, Pacific Islander, Maori, Middle Eastern, non-white African
- Family history DM (first degree relative with diabetes or a sister with hyperglycaemia in pregnancy)
- Pre-pregnancy BMI > 30 kg/m²
- Previous macrosomia (baby with birth weight > 4500 g or > 90 th centile)
- Polycystic ovarian syndrome
- Multiple pregnancy
- Medications: corticosteroids, antipsychotics

Tests for haemoglobinopathies: haemoglobin electrophoresis and DNA analysis and partner testing

Haemoglobinopathy screening (Thalassaemia screen)

At WH, unless a previous test result is available, a haemoglobin electrophoresis is routine.

The aim of haemoglobinopathy testing is to identify couples at risk of having a fetus with a major haemoglobinopathy. This includes B thalassaemia major (both parents with B thalassaemia minor or with B/E haemoglobin), Barts hydrops (4 gene alpha haemoglobin deletion – parents have alpha thalassaemia minor with 2 gene deletion), Haemoglobin H disease and sickle cell disease (parents heterozygous S and Beta, D or C).

As such, determine if the woman has an abnormality and, if so or if this is a concern, proceed to partner screening to identify couples at risk of having a baby with a severe thalassaemia.

If not done prior e.g. in a previous pregnancy, offer Hb electrophoresis and DNA analysis globin genes if required to women with:

- Low MCV (<83 fL) or MCH (<28.1 pg) in the absence of iron deficiency
- Family history of thalassaemia or haemoglobinopathy
- Partner has thalassaemia or haemoglobinopathy
- An ethnic background with increased rates of aemoglobinopathy (e.g. Mediterranean, Middle East, Africa, Asia, India, Sri Lanka, Pakistan, Bangladesh, Pacific Islands, South America, New Zealand Maori).

Of note: haemoglobin electrophoresis can yield a false negative for B thalassaemia if a woman is iron deficient.

Partner screening for haemoglobinopathy

Urgent partner screening for haemoglobinopathy is essential if a woman has an abnormal haemoglobin electrophoresis or a thalassaemia/haemoglobinopathy cannot be excluded.

As there can be long delays, clearly indicate the woman is pregnant and her details for partner testing.

Therefore, in the case where a woman has a low ferritin, if a low haemoglobin/MCV/MCH is found and there is no previous normal haemoglobin/MCV/MCH, please order urgent partner testing (indicating the woman is pregnant and her details for partner testing).

Partner testing for haemoglobinopathy consists of:

- FBE
- Ferritin
- Hb electrophoresis
- +/- DNA analysis of the alpha globin genes (a request for blood to be kept for a DNA analysis if later required is valuable)

If the partner testing is normal, no further investigation is required.

If partner testing is also abnormal, contact the shared maternity care coordinator as soon as possible and provide results in order to ensure appropriate referral to the correct hospital department. At this stage it is useful to request an urgent DNA analysis on the woman and her partner's blood specimen.

Link the partner and woman so the laboratory can review the results of both and identify couples at risk of having a child with a serious thalassaemia/haemoglobinopathy syndrome.

Indicate urgency and pregnancy status so testing can be prioritised.

Chlamydia

A urine test should be conducted if the woman has symptoms of chlamydia infection, previous infection or if she is <29 years old.

Vitamin D

Testing of Vitamin D levels in pregnancy is not recommended as part of routine pregnancy screening, regardless of maternal risk factors.¹²

If Vitamin D testing is undertaken then, under MBS criteria, in pregnancy it is generally limited to women with:

- Deeply pigmented skin
- Chronic and severe lack of sun exposure for cultural, medical, occupational or residential reasons
- Taking medication known to decrease 25OH-D levels (e.g. anticonvulsants)
- Malabsorption: conditions that impair fat absorption are associated with inadequate Vitamin D absorption from the gut (e.g. inflammatory bowel disease, untreated coeliac disease, cystic fibrosis, bariatric surgery)
- Chronic renal failure or renal transplant recipient, hyperparathyroidism, hypo or hypercalcaemia, or hypophosphataemia

See section on Vitamin D (Chapter 13 and 14)

Vitamin B12

Vitamin B12 (also called cobalamin) testing should be undertaken in vegans and considered in vegetarians with low dairy and egg intake.

Vitamin B12 is present in many animal products, including meats, dairy products, and eggs. Many breakfast cereals are fortified with vitamin B12.

Vitamin B12 is not present in foods derived from plants, with the exception of those that contain animal products or added vitamin B12. Seaweed is not a source of vitamin B12, although certain edible algae used in Japanese soups may contain some vitamin B12.

Vitamin B12 testing is indicated if:

- Increased MCV (> 100 fL but may be of the order of 120 fL)
 - Vegan diet – also consider in vegetarian
Except in vegans, true vitamin B12 deficiency is unlikely despite the increased requirements of pregnancy due to the extent of vitamin B12 stores
 - Young mum (<19 years)
 - History of bariatric surgery, gastric banding / bypass
 - GIT pathology (e.g. coeliac disease, Crohn's disease)
 - Family history of vitamin B12 deficiency or pernicious anaemia
 - Low platelet count (< 100 x 10⁹ / L)
- If low or indeterminate total serum B12 is detected (<260 pmol/L), holotranscobalamin (active B12) will be routinely tested under MBS rules.

Thyroid stimulating hormone (TSH)

Universal screening of pregnant women for thyroid disease is not recommended.

There is wide variation in screening practices with little evidence base, with the following a reasonable approach. Screen with a TSH if woman has:

- Symptoms of hypothyroidism or hyperthyroidism
- Personal history of thyroid disease
- Personal history of:
 - Head and neck irradiation or prior thyroid surgery
 - Type 1 diabetes or other autoimmune condition
 - Recurrent miscarriage
 - Use of amiodarone, lithium, or recent administration of high iodine load e.g. iodinated radiocontrast agent

If TSH is elevated, order FT4.

If no TSH pregnancy range provided by pathology service, use TSH > 4.0 as elevated.

- TSH ≥ 10, treat as overt hypothyroidism
- FT4 is low, treat as overt hypothyroidism
- FT4 normal and TSH ≤ 10, then subclinical hypothyroidism.

(Ordering anti- thyroid antibodies and TSH receptor antibodies is not generally recommended)¹³

Also see section on [hypothyroidism](#).

Cervical Screening

If due, screening for cervical cancer can be performed at any time, although it is generally undertaken during at less than 28 weeks gestation due to maternal discomfort.

12. RANZCOG, Vitamin and mineral supplementation during pregnancy. View [online](#).

13. RANZCOG guidelines November 2019

**Second trimester investigations:
26-28 weeks**

Test
Glucose Tolerance test
FBE (consider ferritin)
Antibody screening

Glucose Tolerance Test (GTT)

Fasting is generally required from 8-12 hours. Water can be consumed until test.

75 g GTT with venous plasma samples taken at fasting, one hour and two hours.

FBE and ferritin

A screen for anaemia, thrombocytopaenia and iron deficiency. Consider ferritin if previous low Hb, ferritin or clinical indication.

Antibody screen

An antibody screen is recommended for every woman in the second trimester, even if Rh +ve, as antibodies may develop over time.

At all services the hospital orders the routine second trimester investigations (GTT, FBE, Antibody screen) with a copy of the results sent to the SMCA.

As these pathology requests slips are usually provided to the woman at her first hospital visit, it is valuable if SMCA can remind women.

As only MHW has a routine 28-week hospital visit after these investigations, it is particularly important the results are checked and acted on as required by SMCA, even though the results were not ordered by them.

**Third trimester investigations:
36 weeks**

Test
Screening for Group B streptococcus (GBS)
Consider: FBE and ferritin

Group B streptococcus (GBS)

Group B streptococcus is a common bacterium that can colonise people of all ages without symptoms. It can be passed from mother to baby during labour and lead to infection causing respiratory disease, general sepsis or meningitis. It may also increase a risk of preterm labour, premature rupture of the membranes, intrapartum fever and chorioamnionitis in women.

GBS carriage is best detected by a single combined low vaginal and anal swab, performed around 36 weeks gestation. If a vaginal GBS swab result is obtained earlier in pregnancy, it should be repeated around 36 weeks as the results may change.

This is generally taken by the woman herself. It is not required if she is already considered colonised.

The hospitals recommend routine GBS ano/vaginal screening cultures for all pregnant women at about 36 weeks unless she is already considered GBS colonised.

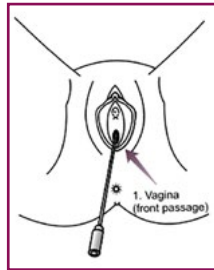
There is good and mounting evidence that routine screening results in a greater reduction of GBS neonatal disease than risk based screening.

A woman is considered colonised with GBS if any of the following applies:

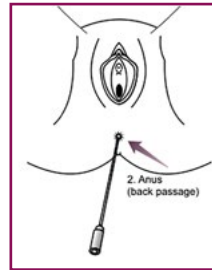
- GBS bacteriuria at any time during current pregnancy
- Previously given birth to an infant with invasive GBS disease
- GBS swab at 36 weeks is positive for GBS

To achieve maximum sensitivity, with a single swab the lower vagina (vaginal introitus) is sampled first followed by the rectum (insert swab through the anal sphincter). At the hospitals, a single swab can be used, with women often self-sampling. A speculum is not used.

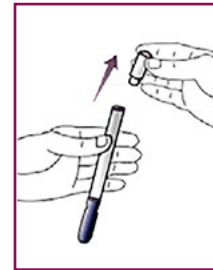
Instructions for the collection of a genital swab for the detection of group B streptococcus (GBS)



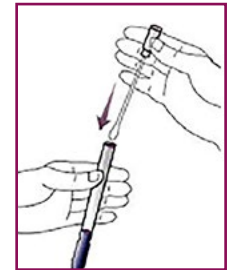
1. Remove swab from packaging. Insert swab 2cm into vagina, (front passage). Do not touch cotton end with fingers.



2. Insert the same swab 1cm into anus (back passage).



3. Remove cap from sterile tube.



4. Place swab into tube. Ensure cap fits firmly

5. Make sure swab container is fully labelled with name, u.r. number, date and time of collection. Place swab container into transport bag and hand it to a staff member.

See section on [GBS](#) for further information.

Screening tests not generally recommended

CMV and toxoplasmosis serology

Screening investigation for toxoplasmosis and Cytomegalovirus (CMV) are not routinely recommended for screening of immunity, as interventions for non-immune women are not clear. If a practitioner decides to order these to check immunity in high-risk women, consider only ordering IgG and not IgM, as the IgM levels have a high false positive rate. For investigation of suspected infections, see section on [infectious diseases](#).

Parvovirus

Screening investigation for parvovirus is not routinely recommended.

In cases of potential high maternal exposure, such as primary school teachers, childcare workers, mothers of toddlers attending childcare and primary school children and health care workers caring for young children, consider a parvovirus IgG in early pregnancy.

The purpose of this is that if the woman is immune and later exposed to parvovirus, no further testing is required; whereas if she is non immune, further testing is required if she is less than 22 weeks gestation (see section on [parvovirus](#)).

Herpes virus serology

This is not recommended. If there is concern about a lesion, take a swab of the lesion for Herpes PCR.

Pre-eclampsia screening

Early-onset pre-eclampsia screening is offered by some ultrasound services around the time of the 12-week ultrasound. It is not recommended by the hospitals. If undertaken and the result is high-risk and the woman is < 16 weeks gestation, consider starting aspirin (see [Chapter 12](#))

Repeating tests

Initial routine

Even if they have been undertaken recently, blood group and antibody, FBE and urinalysis need to be repeated in early pregnancy.

For other initial investigations performed in the 6 months prior to the current pregnancy, these can be repeated on a case-by-case basis based on risk and previous findings.

GTT

If a woman has had an early GTT with a normal finding, this needs to be repeated at 24-28 weeks.

If a woman has known diabetes (gestational or type 2), a GTT should not be performed.

For women with gestational diabetes, a GTT should be undertaken at 6-8 weeks postpartum by her GP or SMCA.

Syphilis serology

Women at increased risk of acquiring syphilis require additional syphilis screening during their pregnancy e.g. at 28 weeks.

Antenatal investigation summary

Initial investigations: Routine	Comment
Blood group	If Rh -ve and no antibodies, requires Anti D at 28 weeks, 34 weeks +/- postpartum and sensitising events
Antibody screen	If antibodies – see Chapter 10
FBE (including MCV/MCH)	If any of low haemoglobin/MCV/MCH and no previous normal haemoglobin/MCV/MCH, urgent thalassaemia testing and partner testing is required for haemoglobinopathy
Ferritin	
Hepatitis B S Ag	If hepatitis B SAg+ve, order full Hep B serology, LFTs and viral load ID consultation required (contact SCC) if: <ul style="list-style-type: none"> • New diagnosis of chronic hepatitis or • Abnormal LFTs or viral load
Hepatitis C serology	If +ve serology LFTs and viral load ID consultation (contact SCC) if: <ul style="list-style-type: none"> • New diagnosis or • Abnormal LFTs or viral load
Syphilis serology	Initial for all. Repeat at 28 weeks if at risk (and later if required)
Rubella antibodies	Non immunity. Advice on: <ul style="list-style-type: none"> • Overseas travel before 20 weeks • Presentation if contact or symptoms • Immunise in hospital after delivery
HIV serology	
MSU M&C	Give antibiotics if asymptomatic bacteriuria
Reproductive Carrier screening Cystic fibrosis, fragile X and spinal muscular atrophy	Offer if no family history and not had before (ideally pre-pregnancy) Not available at hospital Non-rebatable cost Contact Genetics service if both parents have the same recessive gene

Initial investigations to consider

Dating ultrasound (7-13 weeks of pregnancy)	(12 week US is recommended as routine and is used for both dating and a check for nuchal translucency) Ultrasound only required earlier than 12 weeks if: <ul style="list-style-type: none"> • Concerns about pregnancy (e.g. viability, ectopic) • Dates are unreliable
Varicella Ab	In early pregnancy if no known immunisation or immunity Non immunity. Advice on: <ul style="list-style-type: none"> • Avoidance • Presentation if contact or symptoms • Immunise at GP after delivery
Haemoglobin electrophoresis	In early pregnancy Urgent partner screening if woman has an abnormal electrophoresis Contact Shared Care Coordinator if partner testing is abnormal as well Request DNA analysis on the woman and her partner's blood specimen if indicated
Fasting Blood Glucose and HbA1C	In high-risk women perform, perform as soon as practicable
Vitamin B12	Vegan/ vegetarian/young mum
Chlamydia	Previous infection or <29 years old
Thyroid stimulating hormone (TSH)	High-risk women
Cervical screening	If due. Option for a self-collected swab for HPV in women > 30 years who are under-screened and refuse standard screening
Vitamin D level	RANZCOG do not recommend, even if risk factors. If do decide to do, for a rebate MBS risk factor criteria are required to be met; deeply pigmented skin or chronic and severe lack of sun exposure for cultural, medical, occupational or residential reason

Down syndrome/aneuploidy tests

12 week US 11 – 13+6 weeks for nuchal translucency (NT) and dates
Even if aneuploidy is low-risk, NT recommended
(see section on [First trimester ultrasound](#))

Offer: Down syndrome screening First trimester (10-13 weeks): ECST or NIPS
or
Second trimester (14-20 weeks)

Fetal morphology ultrasound 20-22 weeks

Routine 26-28 weeks

Glucose Tolerance Test 75 g load
Fasting, 1 hour and 2 hours

FBE

Blood group antibodies

Consider 26-28 weeks

Ferritin If previous low Hb, ferritin or clinical indication

Syphilis serology Women at increased risk of syphilis

Routine 36 weeks

Screening for Group B streptococcus Done at hospital

Consider 36 weeks

FBE, ferritin If previous low Hb, ferritin or clinical indication

Resources

Resources	Content summary
Australasian Diabetes in Pregnancy Society	Clinical Guidelines: ADIPS Consensus Guidelines for the Testing and Diagnosis of Diabetes Mellitus in Australia (2013)
Department of Health, Australia	Clinical Practice Guidelines: Pregnancy Care - 2018 edition
Diabetes Australia	Comprehensive guide for Health Professionals and Consumers: Multiple resources on diabetes, including free booklet and DVD resources
National Institute for Health and Clinical Excellence (UK)	Clinical guideline: <ul style="list-style-type: none"> • Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period (2015) • Algorithms on diabetes in pregnancy with links to various aspects of care from gestational diabetes to postnatal diabetic care
RANZCOG	Clinical guidelines: <ul style="list-style-type: none"> • Routine Antenatal Assessment in the Absence of Pregnancy Complications (2016) • Prenatal assessment of fetal structural conditions • Maternal Group B Streptococcus (GBS) in Pregnancy: Screening and Management (2016) • Prenatal Assessment of Fetal Structural Abnormalities (2018) • Prenatal screening and diagnostic testing for fetal chromosomal and genetic conditions (2018) • Subclinical hypothyroidism and hypothyroidism in pregnancy (2018) • Vitamin and Mineral Supplementation and Pregnancy, (2019). Includes advice on Vitamin D
The Royal Women's Hospital	Clinical guidelines: <ul style="list-style-type: none"> • Several related to diabetes in pregnancy and labour (2018) • Vitamin D testing and management in maternity patients and newborns (2017) • Many guidelines and resources related to the three trimesters of pregnancy
Victorian Clinical Genetics Service	Information brochures on genetic screening and request form



CHAPTER 6
SCREENING FOR FETAL
CHROMOSOMAL AND
STRUCTURAL ANOMALIES

All pregnant women, regardless of age, should be offered a:

- 12-week nuchal translucency scan (from 11 weeks to 13 weeks and 6 days)
- Aneuploidy test
- 20–22 week fetal morphology ultrasound

In addition:

- If there is a personal or family history of genetic problems, a referral to genetics services should be considered
-

Most babies are born healthy, but about 2-4% are born with a birth defect that may require medical care. A number of screening and diagnostic tests are available to determine the risk of, or to diagnose, certain congenital problems in the fetus. However, tests only have the capacity to screen for and diagnose some congenital problems.

If a woman or her partner has a genetic condition, is a carrier or if there has been a previous congenital abnormality/genetic condition in another child or the couple are consanguineous it is important that the couple is offered a referral for genetic counselling. This should be done as early as possible – preferably pre-pregnancy – as it can take considerable time to determine whether or not a prenatal test is available and, if so, to obtain the result. If a test is performed in the community, a copy of the results (if available) should be given to the woman to bring to her first hospital visit.

Screening versus diagnostic tests

Screening tests can be performed to determine the risk of having a baby with a problem such as Down syndrome, some chromosomal abnormalities, some inherited genetic conditions and neural tube defects. Screening tests do not diagnose a condition – rather, they determine the level of risk. If screening test results indicate a comparatively high likelihood of a problem, a diagnostic test such as chorionic villus sampling (CVS) or amniocentesis, or in some cases a very sensitive screening test such as a Non Invasive Prenatal Test (NIPT) may be offered.

Chromosomal screening

Although a woman's likelihood of having a fetus with Trisomy 21 (Down syndrome), and some other chromosomal abnormalities such as Trisomy 18 (Edward syndrome), and Trisomy 13 (Patau syndrome) increases with age, a woman of any age can have a baby with aneuploidy and all women, regardless of age, should be offered a test for Down syndrome.

SCREENING FOR FETAL CHROMOSOMAL AND STRUCTURAL ANOMALIES

The following table outlines risk by age of Down syndrome and other chromosomal abnormalities.

Maternal age at delivery (years)	Chance of having a live-born baby with Down syndrome* ¹⁴	Chance of having a live-born baby with a chromosomal abnormality ¹⁵
20–24	1 in 1411	1 in 506
25	1 in 1383	1 in 476
26	1 in 1187	1 in 476
27	1 in 1235	1 in 455
28	1 in 1147	1 in 435
29	1 in 1002	1 in 417
30	1 in 959	1 in 385
31	1 in 837	1 in 385
32	1 in 695	1 in 323
33	1 in 589	1 in 286
34	1 in 430	1 in 244
35	1 in 338	1 in 179
36	1 in 259	1 in 149
37	1 in 201	1 in 124
38	1 in 162	1 in 105
39	1 in 113	1 in 81
40	1 in 84	1 in 64
41	1 in 69	1 in 49
42	1 in 52	1 in 39
43	1 in 37	1 in 31
44	1 in 28	1 in 24
45	1 in 32	1 in 19

*Risk of at the time of screening are higher

14. Morris JK, Mutton DE, Alberman E. Revised estimates of the maternal age specific live birth prevalence of Down syndrome. *J Med Screen* 2002; 9(1):2–6.

15. Hook EB. Rates of chromosomal abnormalities. *Obstet Gynecol* 1981; 58:282–85.

Down syndrome / other aneuploidies

All pregnant women should be provided with information and offered the opportunity to have a discussion about the range of more common aneuploidies that can be detected and test options available to them.

Down syndrome tests are:

- Combined first trimester screening – not available at the hospital
- Non-invasive prenatal testing/screening (NIPT/NIPS) – not available at the hospital
- Second trimester maternal serum screening – available at the hospital
- Diagnostic testing (amniocentesis or CVS) – available at the hospital if high-risk

It is important that the results and management are documented, communicated and followed up adequately.

Follow-up and management of investigation results for fetal abnormalities require particular vigilance from both community and hospital providers.

This is especially important as the:

- Tests may require coordination of different components
- The hospital visit may not occur for some time
- Further tests and management may be time sensitive

First trimester tests

Screening tests for Down syndrome in the first trimester are:

- Non-invasive prenatal testing (NIPT): Cell-free DNA (cfDNA)
- Combined first trimester screening

NIPT is regarded as the “gold standard” screening test but is more costly than the combined first trimester screening.

If a NIPT is undertaken, a combined first trimester is not required or recommended.

Non-invasive prenatal testing (NIPT): cell-free DNA (cfDNA)

Cell-free DNA (cfDNA) based screening is commonly referred to as non-invasive prenatal testing (NIPT) or non-invasive prenatal screening (NIPS). It uses DNA sequencing technology to detect a fetus with common aneuploidies by analysing fetal cfDNA in the maternal plasma.

NIPT has the highest sensitivity and specificity of all the screening tests for Down syndrome. However, it is not a diagnostic test. It cannot be used in triplet or higher order pregnancies.

Indications:

- Primary screening test for women at normal risk ('gold standard')
- Primary screening test for women at higher risk (e.g. advanced maternal age, history of a prior pregnancy with trisomy). In view of its high sensitivity and no risk of miscarriage, women may choose a NIPT over a diagnostic test such as CVS or amniocentesis, if they are high-risk on a screening test or are of advanced maternal age
- High-risk combined first trimester screening or second trimester maternal serum screening. (If these are very high it may be more appropriate to proceed directly to a diagnostic test)
- Fetal ultrasound findings indicate an increased risk of aneuploidy

Tests for:

- Routinely tests for T21, T18, T13
- Can also test for 22q11.2 deletion (DiGeorge syndrome) and sex chromosome abnormalities such as Turner syndrome (45, X) and Klinefelter syndrome (47, XXY)
- Additional aneuploidies may be tested for depending on the test provider

Does not test for:

- All chromosome aneuploidies
- Sub-chromosomal abnormalities (e.g. partial deletions and duplications, etc.)
- Non aneuploidy single gene mutations (e.g. Cystic Fibrosis, Spinal muscular atrophy, Huntington disease, Thalassaemia, etc.)
- Non-chromosomal disorders, such as neural tube defects, placental abnormalities and intra-uterine growth retardation
- Cannot be used in triplet or higher order pregnancies

Sensitivity and specificity:

Detection rate (sensitivity) T21 is approximately 99%, T18 is approximately 97% and T13 is approximately 92%. The false positive rates are overall low and vary between different tests and for different aneuploidies.

In about 5% of cases, a meaningful result is not achieved. This is usually due to a low fetal fraction, with a repeat later in gestation usually yielding a result. It is more common in women who have an elevated BMI.

Timing:

- From 10 weeks gestation until the end of pregnancy
- To ensure viability and decrease the risk of not yielding a result (by increasing fetal fraction), consider ordering shortly after the 12-week ultrasound.

Cost and availability:

- Not available at the hospital.
- Currently no MBS rebate
- Widely available - VCGS, several private pathology and specialist obstetric ultrasound providers

Results:

Results are generally available within 7 days

If combined first trimester screening or second trimester maternal serum screening are very high, it may be more appropriate to advise to proceed directly to a diagnostic test than undertake a NIPT.

If a woman has received a cfDNA reported as normal/low-risk, an additional calculation for aneuploidy (e.g. by combined first trimester or second trimester serum screening) is not recommended as this will increase the false positive rate without substantially improving the detection rate.

If a woman chooses a NIPT test, consider ordering after the routine 12-week ultrasound. This will ensure the pregnancy is viable, determine the number of embryos and result in less repeat testing as there will be a higher fetal fraction.

Combined first trimester screening (CFTS):

If a NIPT is undertaken, this is not required.

It involves a risk analysis using:

- Maternal age, weight and gestation age
- Maternal blood markers of pregnancy-associated plasma protein A (PAPP-A) and free β -subunit of human chorionic gonadotrophin (β -hCG)
 - Level of these proteins vary, but tend to be different in women carrying fetuses with Down syndrome or trisomy 18
- Fetal ultrasound measuring nuchal translucency (+/- nasal bone)
 - In some cases, an additional measurement called the nasal bone is included (presence or absence of nasal bone on ultrasound)

Tests for:

- Routinely tests T21, T18, T13
- PAPP-A levels. Low levels may be associated with a higher risk of complications such as growth restriction, pre-eclampsia and preterm labour

Sensitivity and specificity:

Detection rate (sensitivity) for T21 is 90%, the false positive rate is approximately 5%, with a high-risk result is reported at of ≥ 1 in 300. The detection rate for T18 and T13 syndrome is approximately 70%, the false positive rate is 0.4%, with a high-risk result reported at ≥ 1 in 175.

Timing:

- Maternal blood test is ideally performed in the 10th week, but can be done from 9 weeks to 13 weeks and 6 days
- Ultrasound ideally done in the 12th week, but can be done from 11 weeks to 13 weeks and 6 days

Cost and availability:

- Not available at the hospital
- Medicare rebate is available. Out-of-pocket expenses will occur.
 - Individual ultrasound services should be contacted about costs and in order to reduce the costs of the blood component
 - Indicate on pathology forms that the woman is a public patient
- Widely available - VCGS, several private pathology and specialist obstetric ultrasound providers

Results:

Results are generally available within 7 days of the laboratory receiving the nuchal translucency report.

As the combined first trimester screen requires coordination of the blood and ultrasound components to generate a result, this means that ultrasound findings need to be provided by the ultrasound service to the correct laboratory to generate a result. As several pathology and ultrasound services undertake this, it is crucial this is coordinated.

In the event of any concerns or abnormal results, Genetics Services at the hospital can be contacted to provide further advice and support. Please see [Chapter 17](#) for Genetic Service's contact details.

It is strongly suggested that women are reviewed by the person who ordered the combined first trimester screen 1 week after the ultrasound to ensure a result has been generated.

If a woman has a high-risk screening result on combined first trimester screening or second trimester maternal serum screening, she may decide on:

- Non-invasive pre-natal test (NIPT), or
 - Diagnostic test (CVS or amniocentesis), or
 - Further counselling
 - If the risk is very high, a diagnostic test or counselling is generally recommended
-

Second trimester maternal serum screening

Screening tests for fetal chromosomal abnormalities in the second trimester are:

- Maternal serum screening
This test calculates risk based on maternal age and four maternal blood markers. These are alpha fetoprotein (AFP), free beta human chorionic gonadotrophin (free β -hCG), unconjugated oestriol (uE3) and Inhibin A
- Non-invasive prenatal testing (NIPT) [section on NIPT](#).

Tests for:

- Routinely tests for T21, T18 and T13
- Neural tube defects. Although this is the only aneuploidy screening test that provides a risk for neural tube defects, as the 20-22 week US is more sensitive for this, it is not generally used as a screen for this purpose.

Sensitivity and specificity:

Detection rate (sensitivity) for T21 is about 75-80%. A high-risk result is reported at ≥ 1 in 250 for T21 and ≥ 1 in 200 for T18. Its specificity (true positive) for T21 is about 90%.

Timing:

The test is ideally performed at about 15 weeks gestation (although it can be done from 14–20 weeks). Results are generally available within 7 days.

Cost and availability:

Only screening test for aneuploidy that is routinely available at the hospitals.

The only test routinely available at the hospitals to screen for aneuploidies is the second trimester maternal serum screening.

It should not be undertaken if a woman has had the more sensitive tests of a combined first screening test or NIPT.

The 20-22 week morphology ultrasound is not recommended as a primary screening test for trisomy 21 due to its relatively poor sensitivity of about 50% and poor specificity.

Comparison of prenatal screening tests: summary

	Screening tests			Diagnostic procedures
	Combined first trimester screening	Second trimester serum screening	Non-invasive prenatal testing (NIPT)	Chorionic villus sampling (CVS); amniocentesis
Type of test	Blood test and ultrasound	Blood test	Blood test	Needle aspirate of placenta or amniotic fluid
Analytes	Nuchal translucency, PAPP-A, β -hCG	Oestriol, β -hCG, AFA, inhibin A	Fetal plasma cell-free DNA	Placental cell or fetal cell
Timing of test (weeks)	Blood test ideally in 10th week Ultrasound 11-13 weeks and 6 days	15-20 weeks	From 10 weeks	CVS: 11 week-13 weeks + 6 days Amniocentesis: from 15 weeks
Conditions detected	Trisomy 21, 18, 13	Trisomy 21, 18, 13; neural tube defects	Trisomy 21, 18, 13 Depending on specific assay - +/-sex chromosome conditions - +/- limited other aneuploidies	Many chromosome and genetic conditions
Detection rate for Trisomy 21	90%	75-80%	99%	99.9%
False positive rate for Trisomy 21 (approx.)	4%	8%	<1%	<1%
Available at hospitals	No	Yes	No	If high-risk
Cost	Yes	Nil at hospitals	Yes	Nil at hospitals if indicated

Fetal structural anomalies

It is estimated that major structural conditions occur in 2-3.5% of pregnancies. Not all structural conditions can be detected by ultrasound.

The purpose of the morphology scan is to detect congenital anomalies in order to: inform further testing; inform change in pregnancy care; and allow parents to make informed decision whether to continue pregnancy or not.

Fetal ultrasound is routinely advised in the first trimester between 11-13 weeks and in the second trimester between 20-22 weeks.

Ultrasound

First trimester ultrasound (12 week ultrasound)

It is recommended an ultrasound is routinely undertaken at 11-13 weeks to:

- Confirm dates
- Confirm viability
- Determine number of fetuses
- Measure nuchal translucency

First trimester scans can examine following:

- Gestational sac: gestational sac is usually be visible from four weeks and three (3) days after the last menstrual period
- Multiple pregnancy: Late first trimester (9-13 weeks) is the optimal time to diagnose multiple pregnancy and determine chorionicity and amnionity
- Fetal heart movements: fetal heart movements are often visible from five to six weeks
- Gestational age: dating ultrasound is performed to establish estimated date of confinement. Optimal timing for most accurate dating is 7-13 weeks so that the crown rump length can be measured (as opposed to just a yolk sac measurement)
- Pregnancy failure
- Some limited fetal structures such as head, trunk and limbs (9 weeks), stomach, spine, four chambers of heart, hands and feet (11 weeks) and kidney and bladder (12 weeks)
- Nuchal translucency: between the gestational ages of 11 weeks and 13 weeks plus 6 days

The 11-13 week ultrasound is also a dating scan.

Second trimester fetal morphology ultrasound (20-22 week ultrasound)

All women should be offered a second trimester fetal morphology ultrasound.

The second trimester morphology scan is generally performed between 20-22 weeks of gestational age. It performs the following:

- Confirms gestational age
- Examines fetal anatomy: identifies some structural abnormalities
- Placenta: identifies
 - Placental location
 - Some placental abnormalities
 - Number of vessels in umbilical cord (normally three - two arteries and one vein)
 - Comments on the amount of amniotic fluid
- It may also:
 - Measure cervical length (normal length ≥ 25 mm)
 - Assess uterine artery blood flow velocity, if at high risk for pre-eclampsia
 - Note uterine abnormalities
 - Measure size of the fetus against percentiles

It is a poor screening test for Down syndrome, with a sensitivity of approximately 50%.

The hospitals have limited capacity to undertake the 20-22 week fetal morphology ultrasounds.

They are reserved for pregnancies at higher risk or social need, with women being allocated appointments based on the triage of their GP referral. SMCA's are not able to order ultrasounds at the hospitals (except for MHW where there is some limited availability for high-risk women – however, a request for US will be rejected if criteria are not met).

In most cases, SMCA will need to order and follow up on a woman's 20-22 week fetal morphology US.

Women considered high-risk (with some variation between hospitals of these criteria) generally include women who:

- Are <19 years or advanced maternal age (definition varies amongst hospitals)
- Have a BMI ≥ 35
- Have diabetes, epilepsy or other serious medical conditions
- Have had ≥ 2 previous caesarean sections
- Have had a previous fetal abnormality or a disabled child
- Have markers or are suspected of being high-risk on earlier ultrasound
- Are extremely vulnerable (e.g. homeless)

If a woman does not have a fetal morphology ultrasound organised by her first hospital visit – either in the community or at the hospital – she will be advised to make an appointment with her SMCA or GP to organise a community referral.

Follow-up results

As with all investigations, the referring practitioner is responsible for reviewing the result. If advice is required regarding a result, contact the hospital shared maternity care coordinator. In addition, the result should be noted in the results section of the hand-held pregnancy record and a copy of the results provided to the woman to bring to her next hospital visit.

If a fetal abnormality is detected on ultrasound, contact the hospital's Fetal Management Service (or in the case of WMH, NH and DjHS where there is no service – the obstetric registrar). These services work closely with Genetics Services, ultrasound and other obstetric services and can arrange counselling regarding the nature of the abnormality, or if a termination is being considered.

- RWH, MHW and WH have their own genetics and fetal management services
- For WMH and DjHS:
 - Contact the obstetric registrar who will direct as required to Western Health for Genetics and Fetal Management Services
- For NH:
 - Contact the obstetric registrar who will direct as required to Mercy Health for Genetics and Fetal Management Services

If follow-up or advice is needed or a community ultrasound is required, contact the shared maternity care coordinator or Fetal Management Unit.

See [Chapter 7](#) for further information on management on ultrasound findings.

Diagnostic tests for chromosomal abnormalities

Referral to Genetics Services or diagnostic tests such as CVS or amniocentesis should be considered/offered if:

- Screening shows increased risk of chromosome abnormality
- There is parental translocation
- There is previous trisomy
- There are major anomalies on ultrasound (refer to Genetics Services or Fetal Management Unit)
- Nuchal translucency is >3.0 mm at ultrasound at 11-13 weeks (refer to Genetics Services or Fetal Management Unit)
- There are previous neural tube defects (diagnostic method of choice is specialised obstetric ultrasound)
- There is a concern about disorders detected by DNA technology e.g. Duchenne and Becker muscular dystrophy, myotonic dystrophy, fragile X, haemoglobinopathies, alpha and beta thalassaemia, sickle cell disease, haemophilia A or B, cystic fibrosis, Tay–Sachs disease, neurological diseases such as spinal muscular atrophy or Huntington's disease (refer to Genetics Services)

There are many inborn errors of metabolism diagnosable prenatally by CVS or amniocentesis, but an exact biochemical diagnosis is needed in the index case before such a prenatal test can be considered.

If a woman later requests a termination of pregnancy (TOP), the choice between a CVS and amniocentesis has implications on options for the method of termination of pregnancy (TOP). This is because an amniocentesis is performed at a later gestation than a CVS and therefore the results may not be available in time for a surgical TOP to be an option (as surgical TOPs are usually only available up to approximately 18 weeks gestation).

Chorionic villus sampling (CVS)

A CVS diagnostic test can be performed at 11 weeks – 13 weeks and 6 days.

If there is an indication for testing, this can be undertaken at the hospitals and there are no out-of-pocket costs. The test involves approximately 0.3% (1 in 330) additional risk of miscarriage (in addition to the risk of miscarriage for all pregnancies). CVS also has a 1% risk of equivocal result (e.g. the risk of mosaicism – the presence of a mixture of cells with normal and abnormal karyotype – or maternal cell contamination of the sample). Results are generally available within 2 weeks.

Amniocentesis

An amniocentesis is usually performed from 15 weeks.

If there is an indication for testing, this can be undertaken at the hospitals and there are no out-of-pocket costs. The test involves approx. a 0.2% (1 in 500) additional risk of miscarriage (in addition to the risk of miscarriage for all pregnancies). Results are generally available within 2 weeks.

Fluorescent in situ hybridisation analysis

A fluorescent in situ hybridisation (FISH) analysis is an additional test that can be performed on the sample obtained at the CVS or amniocentesis in order to obtain an earlier preliminary result for certain chromosome abnormality. FISH analysis gives a preliminary result in 48–72 hours but does not replace complete chromosomal analysis. FISH analysis has a cost involved and no Medicare rebate is available. If a test indicating aneuploidy is obtained, full results should be awaited to confirm the diagnosis before any intervention is undertaken unless there are clear ultrasound features consistent with the result.

Arranging CVS or amniocentesis

Counselling and arrangements for a CVS or amniocentesis if a woman is high-risk are undertaken by the Genetics Services at the hospital the woman has been referred. Please refer directly to the relevant Genetics Service (see [Chapter 17](#) for Genetics Services contact details).

Resources

Resources	Content summary
Centre for Genetics Education	Comprehensive site with multiple resources for genetic testing
Cystic Fibrosis Victoria	Health professional and consumer information: Comprehensive guide with multiple resources related to cystic fibrosis, including carrier testing
National Health and Medical Research Council	<i>Medical Genetic Testing: information for health professionals</i>
RACGP	<i>Genetics in Family Medicine: The Australian Handbook for General Practitioners (2016)</i> Information on a variety of genetic conditions including cystic fibrosis and fragile X syndrome; includes testing in pregnancy <i>Family genetics (2007)</i> Genomics in general practice includes Haemoglobinopathy carrier screening (2018)
RANZCOG	Clinical guideline: Prenatal screening and diagnostic testing for fetal chromosomal and genetic conditions
US National Library of Medicine (NIH)	Consumer-friendly information about the effects of genetic variation on human health
Victorian Clinical Genetics Service	Information brochures on genetic screening and request form
World Health Organisation	Comprehensive site with multiple resources including thalassaemia, cystic fibrosis, Tay-Sachs disease, fragile X syndrome and Huntington's disease



CHAPTER 7
FETAL CHROMOSOMAL AND
STRUCTURAL ANOMALIES

It is the primary responsibility of the provider ordering the test or noting an abnormal finding to ensure appropriate follow-up, communication and management.

All providers of shared maternity care have a responsibility to appropriately assess, document and respond to problems that arise during a woman's pregnancy (including any investigations ordered, investigation results, abnormal investigation or clinical findings and action taken). All providers should check that follow-up of any incomplete or abnormal investigation or clinical findings occur.

See [Chapter 17](#) for further information on hospital support and referral pathways.

This section contains information on management of common fetal abnormal clinical conditions and referral to the hospitals. Information on fetal anomalies screening is given in [Chapter 6](#).

Fetal chromosomal and structural abnormal findings

If a fetal abnormality is detected on ultrasound, contact the hospital's Fetal Management Service (or in the case of WMH, NH and DjHS where there is no service – the obstetric registrar). These services work closely with Genetics Services, ultrasound and other obstetric services and are able to arrange counselling if a termination is being considered.

- RWH, MHW and WH have their own genetics and fetal management services
- For WMH and DjHS:
 - Contact the obstetric registrar who will direct as required to Western Health for Genetics and Fetal Management Services
- For NH:
 - Contact the obstetric registrar who will direct as required to Mercy Health for Genetics and Fetal Management Services

Contact Genetics Services, the Fetal Management Service or the obstetric registrar for advice. See [Chapter 17](#) for contact details.

RWH, MHW and WH have their own genetics/fetal management services.

Western Health provides genetics/fetal management services for WMH and DjW.

Mercy Health provides genetics/fetal management services for NH.

High-risk aneuploidy screening test result

There are several options for the follow-up of a high-risk aneuploidy screening test result. The choice depends on the test done, the woman's preference, the SMCA's level of confidence and the hospital she is booked into.

High-risk NIPT: For diagnostic counselling/test:

Options:

- Refer to Genetics Services for further advice and/or testing. See [Chapter 17](#).
- Diagnostic test – CVS or amniocentesis. See [Chapter 6](#).
 - MHW and RWH and WH have Genetics Services
 - DjHS: refer directly to WH Genetics Services
 - WMH: contact the on-call obstetrician who will then arrange referral to WH Genetics Services
 - NH will arrange this at MHW: Contact the Antenatal Care Manager.

High-risk combined first trimester or second trimester screening for aneuploidy: Options:

- Non-invasive prenatal test: See [Chapter 6](#).
 - Note that for a very high-risk first combined screening test result or second trimester screening result (approximately > 1:50), women are generally recommended to go directly to a diagnostic test
- Diagnostic counselling/test: See [above](#).

If the combined first trimester or second trimester screening result is very high-risk (e.g. more than 1 in 50), a diagnostic test is generally recommended over NIPT.

This is because if NIPT is positive, a diagnostic test will still be required if the woman is considering termination. This balance of time/cost/potential differences in termination method and access needs to be weighed by the woman against the risk of miscarriage.

Fetal abnormality on ultrasound and ultrasound markers

For urgent or semi-urgent situations, contact the Fetal Management Service or on-call obstetric registrar.

For non-urgent situations, the shared maternity care coordinator can assist in organising follow-up or advice on an abnormal ultrasound finding. This includes:

- When a SMCA is unsure of the interpretation of findings from an ultrasound
- If a tertiary ultrasound is required
- If further counselling or consultation is required

The shared maternity care coordinator will require the patient information and ultrasound results.

The registrar on call, Genetics Services or the Fetal Maternal Management Service can also be contacted for advice. See [Chapter 17](#) for contact details.

'Markers' on ultrasound

Recent advances in ultrasound have led to the discovery of a growing number of findings on ultrasound that are not an anomaly in themselves, have no functional repercussions (they are not harmful in themselves) and may disappear. These are often referred to as "markers". Some of these are serious indicators of underlying problems with the fetus, whereas some are thought to be essentially normal variants or "soft" markers that are of no consequence, especially when they are isolated and in women who have a low risk of chromosomal abnormality.

In all cases woman should be referred to the hospital Genetics Service or Fetal Management Service if there is:

- A single high-risk marker present (e.g. absent nasal bone, echogenic bowel, aberrant subclavian artery)
- More than one marker
- Significantly increased nuchal translucency e.g. (≥ 3.0 mm on 11-14 week ultrasound)

If a single low-risk marker is detected on ultrasound:

- The results of Down syndrome/aneuploidy tests should be reviewed to ensure these are low-risk, and
- A detailed anatomical survey of the mid-trimester fetus needs by a specialist obstetric service (a "tertiary ultrasound") is required to exclude other abnormalities

This tertiary ultrasound can be undertaken at the hospitals, who will also direct any further investigations and follow-up as required. This can be organised via the shared maternity care coordinator (please provide the details and report to the SMCA).

In the community, there are also specialist private obstetric ultrasound services where specialist obstetrician gynaecologist sonologists can perform a tertiary ultrasound. For a specialist obstetric ultrasound, prenatal screening or invasive diagnostic testing, see services listed on [HealthPathways Melbourne](#) (does not include services in South East Melbourne PNH catchment area).

The following table provides a summary of some common markers on ultrasound, significance and management **if isolated on specialist obstetric ultrasound and there is a low-risk aneuploidy test result.**

Marker on ultrasound	Significance	Action
	If isolated on specialist obstetric ultrasound and low-risk aneuploidy result	If isolated on specialist obstetric ultrasound and low-risk aneuploidy result
Absent nasal bone	Even when isolated, absent nasal bone and, to a lesser degree, a hypoplastic nasal bone are major markers for Down syndrome and other aneuploidy	Refer to hospital
Echogenic bowel	Even when isolated, a major marker of Down syndrome and other problems (e.g. cystic fibrosis, CMV infection)	Refer to hospital
Significantly increased nuchal translucency at 11-13+6 weeks	Even when isolated, greatly increased risk of Down syndrome, other aneuploidies, and other abnormalities (e.g. heart disease)	If ≥ 3.0 mm (>95th percentile) – Refer to hospital (FMU/genetics) If 2.5mm-3.0mm – Ensure tertiary scan obtained (e.g. specialist obstetric US service)
Choroid plexus cysts	Present in 3% of fetuses at 16–24 weeks	Reassure. If isolated, no significant increase in risk of aneuploidy (If not isolated or increased risk of aneuploidy – refer to hospital)
Echogenic heart focus/ intracardiac focus	Present in 3–5% of fetuses – usually resolves in third trimester Small bright spot seen in the baby's heart – thought to represent mineralisation/small deposits of calcium in the heart valve	Reassure. If isolated, no significant increase in risk of aneuploidy (If not isolated or increased risk of aneuploidy – refer to hospital)
Pyelectasis	Enlargement of collecting system Present in 1% of pregnancies with boys > girls. >50% get in next pregnancy	If isolated, no significant increase in risk of aneuploidy (If not isolated or increased risk of aneuploidy – refer to hospital) Even if isolated need to follow-up fetal +/- newborn kidneys as, although most resolve before birth/within a few months after birth, 1:500 cases develops significant renal disease <ul style="list-style-type: none"> • If mild renal pelvis dilatation (4-7mm), then repeat ultrasound at 32 weeks. If still present at 32 weeks, postnatal follow-up will be required • If moderate to severe renal pelvis dilatation (>7mm), then refer to hospital Fetal Maternal Management Service and consider earlier repeat ultrasound at 26-28 weeks) Be vigilant next pregnancy

Marker on ultrasound	Significance	Action
Single umbilical artery	If isolated on specialist obstetric ultrasound and low-risk aneuploidy screening result Present in 2% of pregnancies	If isolated on specialist obstetric ultrasound and low-risk aneuploidy result If isolated, no significant increase in risk of aneuploidy (If not isolated or increased risk of aneuploidy – refer to hospital) Even if isolated, association with renal problems and may be at increased risk of growth restriction <ul style="list-style-type: none"> • Ensure kidneys checked on ultrasound and are normal • Greater surveillance required for fetal growth • Growth and wellbeing US in third trimester (generally at 28 and 34 weeks) There appears to be an increased risk of recurrent SUA in the subsequent pregnancy
Aberrant subclavian artery	There is thought to be an increased risk of Down syndrome, other aneuploidy, and cardiac anomalies There is currently insufficient data to quantify these risks	Refer to hospital

Abortion for fetal abnormality

When a woman is considering abortion for any reason, a referral should be made as early as possible. This is also the case if the diagnosis of a fetal abnormality is uncertain and/ or the woman is not yet sure of her decision. This allows for prompt diagnostic work-up and specialist advice to be obtained so that if this is the eventual decision, it can be performed as early as possible and treatment options are maximised. When invasive testing is indicated, some women may prefer CVS to amniocentesis so that an earlier result can be obtained, and termination of pregnancy undertaken earlier if warranted and more options are available.

RWH, NH and WH provide termination services for fetal abnormality. MHW provides the full range of screening and investigations for fetal abnormality, and refers women to another provider for advice and counselling if they wish to consider termination. DjHS refer women to WH for follow-up of fetal abnormalities. If the decision is to proceed with an abortion, this is organised by WH.

The *Abortion Law Reform Act 2008* (Vic) includes amendments as at 1 July 2010, including that termination of pregnancy may be performed at any time during a pregnancy. Section (s.) 5(1) of the Act specifies that termination after 24 weeks can be performed only if the medical practitioner “reasonably believes that the abortion is appropriate in all the circumstances” and has consulted at least one other registered medical practitioner who also reasonably believes that the abortion is appropriate in all the circumstances. In determining whether the circumstances warrant an abortion after 24 weeks, the

registered medical practitioner must have regard to “all relevant medical circumstances” and “the woman’s current and future physical, psychological and social circumstances” (s. 5(2)).

For women considering abortion in absence of fetal abnormality: 1800 My Options:

1800 My Options is Victoria’s independent information and phone line service providing women in Victoria with information and referral for contraception, pregnancy options and sexual health issues. This includes where to access clinical services (such as contraception and/or abortion providers) as well as other services and supports (such as decision-making counselling).

Women and health professionals are able to use the service.

P: 1800 696 784 or
W: www.1800myoptions.org.au



CHAPTER 8 FETAL MOVEMENT, GROWTH AND PLACENTAL CONCERNS

Decreased fetal movements

All pregnant women should be provided with verbal and written information regarding normal fetal movements during the antenatal period. The information should include a description of normal wake/sleep cycles and changing patterns of movement as the fetus develops.

Women should be asked about fetal movements at every appointment after 20 weeks and advised to contact their maternity care provider and present for assessment if they have concerns about decreased or absent fetal movements.

There is no objective definition of changed fetal movement, and the nature of movements may change as the pregnancy advances; however, their number should not decrease.

Maternal perception of decreased fetal movement (DFM) is a common reason for presentation to SMCA and hospital for assessment. There is an association between DFM and adverse perinatal outcomes, including stillbirth, fetal growth restriction, preterm birth, neonatal low Apgar and fetomaternal haemorrhage.

Formal fetal movement counting/kick charts for all women or for women at increased risk of adverse pregnancy outcomes are not currently recommended as they are not evidence-based.

Maternal concern overrides any definition of decreased fetal movement based on the number of movements felt.

For decreased fetal movements from 26 weeks onwards:

- Organise immediate referral to the hospital for clinical assessment and a CTG.

It is insufficient to perform only a fetal heart rate with a handheld Doppler.

For decreased fetal movements between 24.0 and 25.6 weeks of gestation:

- Clinical assessment of growth and confirm the presence of a fetal heart rate with a Doppler handheld device

If fetal movements have never been felt by 24 weeks of gestation, arrange an ultrasound.

Women who are concerned about changed fetal movements from 26 weeks should NOT be advised to:

- Wait until the next day for assessment
 - Rest and monitor movements
 - Drink iced water or have something to eat
-

Fetal growth concerns

Small fetus on 20-22 week morphology scan

Early onset fetal growth restriction is of high concern and indicates a high-risk pregnancy.

In the setting of accurate dates, if the fetus is \geq one week smaller on fetal morphology scan at 20-22 weeks, review is needed by the hospital doctor within the next 1-2 weeks.

Please contact the shared maternity care coordinator for an appointment.

Small for gestational age

Small for gestational age (SGA) is a term used to describe a baby or fetus who is smaller than usual for the number of weeks of pregnancy.

It is defined as a birth weight less than the 10th percentile for estimated fetal weight or an abdominal circumference on ultrasound of <10th percentile for gestation.

Clinical signs and symptoms that may indicate a fetus that is small for gestational age include:

- Symphysial fundal height of > 2cm smaller than dates
 - Poor interval growth
 - Woman reporting poor growth
-

Referral

Generally, if fundal height is more than 2 cm smaller than expected by dates or there is significant deviation or concern about growth patterns, timely referral or specialist ultrasound is required.

Referral can be made directly to the hospital's Pregnancy Day Service or the SMCA can organise a timely ultrasound at a specialist community service.

Referral to the hospital is required as soon as possible if the ultrasound indicates:

- Fetus is not biophysically well
- Fetus is \leq 15th percentile
- Poor interval growth between ultrasounds/growth pattern is not normal
- Any other concerns

Depending on the urgency, referral to hospital may occur through the shared maternity care coordinator, registrar, Pregnancy Day Service or emergency service.

Management:

- If \leq 36 weeks, a growth and wellbeing US is likely to be required. This can be organised in the community or by contacting the shared care coordinator for a hospital review
- If $>$ 36 weeks, please contact the shared care coordinator for a hospital review in the next few days.
- If there are any concerns about fetal wellbeing (e.g. on US or by decreased fetal movements, the woman must be seen **THAT DAY at the hospital**)

Growth and wellbeing ultrasounds are:

- Less accurate for weight after 36 weeks
- Generally, +/- 10-15% for weight
- Done at a minimum of 2-week intervals for serial growth scans (may be done more frequently for wellbeing markers such as blood flows).
- Should include assessment of amniotic fluid and umbilical artery doppler

Generally, if fundal height is more than 2 cm smaller than expected by dates or there is significant deviation or concern about growth pattern, timely referral or specialist ultrasound is required.

Refer to hospital if growth and wellbeing ultrasound finds:

- Any evidence of fetal compromise
- Estimation of fetal weight $<$ 15th%
- Poor interval growth

Large for gestational age

Large for gestational age (LGA) is a term used to describe a baby or fetus who is larger than usual for the number of weeks of pregnancy.

It is variably defined as a baby with a birthweight over 4,000 g or over 4,500 g, or an estimated fetal weight greater than 97th percentile of weight for gestation.

Clinical signs of large gestational age include symphysial fundal height of $>$ 2cm larger than dates.

In this case:

- Review GTT to confirm woman does not have gestational diabetes (if there are any concerns, refer to the diabetes service)
- If there is a concern about polyhydramnios, please organise an ultrasound (either in the community or refer to the Pregnancy Day Service). If ultrasound confirms polyhydramnios a tertiary scan is required at the hospital.

In the absence of diabetes or concern about polyhydramnios, how this is managed depends on the woman's previous obstetric history and preference.

The objective of undertaking a growth and wellbeing ultrasound is to either inform:

- The woman's decision about a ToLAC/VBAC, or
- Whether early induction of labour or caesarean section is a recommended option

If the woman has had uneventful vaginal delivery of a large baby before, an ultrasound is unlikely to provide any information to inform the timing and mode of delivery. However, where the size of the fetus will inform the mode or timing of delivery, an ultrasound at 34-36 weeks is valuable.

This includes:

- For a primigravida
- Where the woman has not had a large baby before by uneventful vaginal delivery
- If the woman is considering a trial of labour after caesarean section

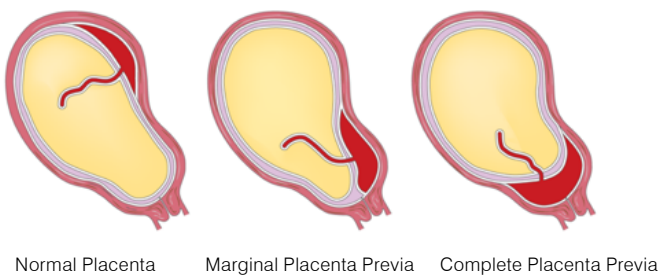
SMCAs can organise an ultrasound at 34-36 weeks in the community or by contacting the shared maternity care coordinator to organise an outpatient review. This timing is more useful than an earlier scan and allows the result to be considered at the routine 36-week hospital appointment.

If an ultrasound indicates a baby who is ≥ 95 th percentile and the 36-week visit has already occurred or for some reason it was not considered and fetal size is a factor in mode and or timing of delivery, please contact the shared maternity care coordinator to organise an appointment with a hospital doctor.

Common placental abnormalities

A range of placental findings may be reported on a fetal morphology (20-22 weeks) or another ultrasound. Placenta abnormalities can range from structural anomalies, function disorders or site of implantation abnormalities. Some of these are of great importance and require referral to the hospital, some require follow-up and advice, and some are of no apparent importance.

Low-lying placenta and Placenta Praevia



Source: Mercy Health

Low-lying placenta is when the lower edge of the placenta is close to or covering the internal os of the cervix on a mid-trimester scan (20-22 weeks). It is generally defined as < 20 mm from the internal cervical os, although the definition does vary.

Placenta praevia is when the placenta remains low in the third trimester. It is generally described as minor (< 20 mm from the internal os of the cervix but not covering the cervix), or major (covering the internal os).

Risk factors for placenta praevia and low-lying placenta are previous caesarean section, with the risk rising as the number of previous caesarean sections increases. Artificial reproductive treatment and maternal smoking also increases the risk of placental praevia.

Low lying placenta at 20-22 week Ultrasound

Low lying placenta/Placenta praevia is found on 10-30% of all pregnancies on ultrasound at the 20 week ultrasound. Approximately 90% of low-lying placentas identified on ultrasound examination at 20 weeks of gestation resolve by 37 weeks.

Two theories have been proposed to account for this phenomenon:

- Development of the lower uterine segment from 20 weeks to delivery relocates the stationary lower edge of the placenta away from the internal os
- Progressive unidirectional growth of trophoblastic tissue toward the fundus results in upward migration of the placenta away from the cervix

If the placenta is found to be low-lying:

- Determine by ultrasound whether it resolves with increasing gestational age

This ultrasound is generally undertaken at about 32-34 weeks; however, is usually done at about 28 weeks if the placenta is covering or touching the os.

This can be organised by the SMCA in the community or by the contacting the shared care coordinator.

If it persists, notify the shared care coordinator. A hospital appointment will be arranged, and shared care will cease.

- Determine whether the placenta is also morbidly adherent (placenta accreta)
 - Review the ultrasound result. If there is any concern, notify the shared care coordinator. A hospital appointment will be arranged, and shared care will cease.*
- Provide advice to present to the hospital's Emergency Department immediately with any bleeding (bleeding is often painless), abdominal pain or decreased fetal movements
- For women where the placenta is covering the os, to reduce the risk of bleeding and ensure access to timely care, provide advice to:
 - Restrict travel and avoid plane travel
 - Avoid penetrative intercourse
 - Avoid strenuous activity
 - Stay within timely access to a maternity hospital

Of note:

- In the case of praevia, digital cervical examination should be avoided
- Transvaginal ultrasound (TVS) can be performed safely in patients with placenta praevia since the optimal position of the vaginal probe for visualisation of the internal os is 2 to 3 cm away from the cervix
- Anterior placenta praevia are more likely to resolve than posterior placenta praevia
- A posterior placenta praevia may be more difficult to visualise than an anterior placenta praevia
- Bleeding can result in a hematoma under and/or proximate to the placenta, which can obscure the line between the placental edge and the cervical os, making diagnosis more difficult or increase inaccuracies

When reviewing an ultrasound report for women with a history of previous caesarean section with an anterior low-lying placenta or placenta praevia at the routine fetal anomaly scan, have an index of suspicion for placenta accreta spectrum.

If woman has had a previous caesarean section and the low-lying placenta is anterior or praevia, due to the increased risk of placenta accreta spectrum, an ultrasound should be undertaken at the hospital.

When reviewing an ultrasound report for women with a history of previous caesarean section with an anterior low-lying placenta/placenta praevia at the routine fetal anomaly scan, have an index of suspicion for placenta accreta spectrum.

Low lying placenta at third trimester ultrasound

Low-lying placenta and placenta praevia that persist into to third trimester are associated with antepartum haemorrhage, preterm birth, caesarean delivery and postpartum haemorrhage. If it persists, notify the shared care coordinator. A hospital appointment will be arranged, and shared care will cease.

An actively bleeding placenta praevia is a potential obstetric emergency. If women have any bleeding, they should be referred to the hospital urgently.

Repeat ultrasound should be organised around 32-34 weeks to identify persistent low-lying placenta or placenta praevia. This is generally undertaken about 28 weeks if the placenta is covering the os.

Women should be referred to hospital (and shared care will likely cease) if:

- Placental adhesion disorders are suspected or diagnosed at any time in pregnancy
- Low-lying placenta or placenta praevia persists at the third trimester ultrasound
- There is active bleeding with placental concerns at any time in pregnancy

Vasa praevia

In vasa praevia, fetal blood vessels are present in the membranes covering the internal cervical os.

Risk factors include placenta praevia, assisted conception, velamentous cord insertion and bi-lobed placenta.

If the vasa praevia persists and is at risk for rupture upon spontaneous or artificial rupture of the membranes, rarely, fetal bleeding occurs without membrane rupture. Since they are not protected by the structure of a normal umbilical cord, vessels are also at risk of compression from descent of the fetal presenting part.¹⁶

If identified at any stage in pregnancy:

- Notify the shared care coordinator. A hospital appointment will be arranged, and shared care will cease
- Provide advice to reduce the risk of bleeding (see [above](#))
- Provide advice to present to the hospital's Emergency Department immediately with any bleeding (*bleeding is often painless*)

Cord issues

The normal umbilical cord contains two arteries and one vein surrounded by a gelatinous stroma (i.e. Wharton's jelly) and covered by a single layer of amnion. The standard 20-22 week ultrasound includes an assessment of the umbilical cord to determine the number of vessels and assessment of the fetal and placental insertion sites.

There are several cord issues that are relatively common and have management consequences.

These include:

Single umbilical artery (SUA)

See section on [ultrasound markers](#).

Abnormal cord insertion

The risk factors and perinatal outcome in pregnancies with anomalous cord insertion are conflicting. Abnormal cord insertion seems to be associated with impaired development and function of the placenta and thus influences fetal growth. It has been linked to placenta praevia and pregnancy-induced hypertension. The altered development of the placenta with anomalous cord insertion may influence the relationship between birthweight and placental weight, but this has yet to be confirmed. It is not known whether there is an increased risk of recurrence of anomalous cord insertion in a subsequent pregnancy.¹⁷

16. Ibid

17. UpToDate. Charles J Lockwood, Karen Russo-Stieglitz, *Velamentous umbilical cord insertion and vasa previa* April 2020

Marginal cord insertion

In marginal insertion of the umbilical cord, the cord inserts into the edge of the placental disc of the developing fetus (the umbilical cord lies within 2 cm of the placental disc edge).

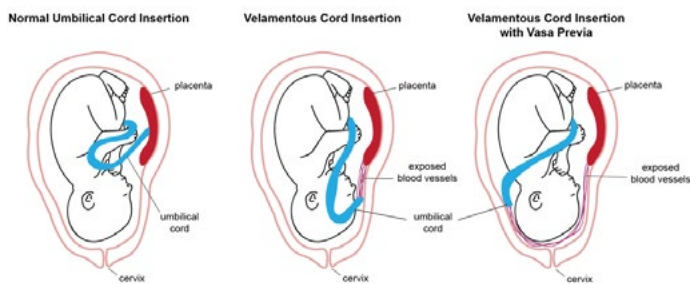
If marginal cord insertion is identified at any stage in pregnancy:

- Contact the SCC to organise a hospital doctor review
- Organise a growth and wellbeing ultrasound at about 32-34 weeks; this can be organised by the SMCA in the community or by the contacting the shared care coordinator.
- Increased clinical surveillance for growth restriction may be required.

Velamentous cord insertion

In a velamentous umbilical cord insertion, the placental end of the cord consists of divergent umbilical vessels surrounded only by fetal membranes, with no Wharton’s jelly. It occurs in approximately 1% of singleton pregnancies. There is also a higher incidence of vasa praevia.¹⁸

Because the vessels are attached to the chorion, rupture of the fetal membranes may rupture the vessels, which can result in fetal exsanguination and death within minutes. This typically occurs when the membranous vessels are close to or cover the cervix (vasa praevia). Since they are not protected by the structure of a normal umbilical cord, vessels are also at risk of compression from descent of the fetal presenting part. Velamentous cord insertions are associated with a high preterm delivery rate (37.5%) and increased perinatal risks, such as neonatal intensive care unit admissions, small for gestational age and perinatal death.¹⁹



If velamentous cord insertion is identified at any stage in pregnancy:

- Notify the shared care coordinator. A hospital appointment will be arranged, and shared care will cease
- Provide advice to reduce the risk of bleeding (see above)
- Provide advice to present to the hospital’s Emergency Department immediately with any bleeding (bleeding is often painless), abdominal pain or decreased fetal movements.

Placental Adhesion Disorders: accreta, increta and percreta

Placenta Accreta Spectrum refers to abnormal adherence of the placenta to the uterus.

The major risk factors for placenta accreta spectrum are a history of accreta in a previous pregnancy, previous caesarean delivery and other uterine surgery, including repeated endometrial curettage. This risk rises as the number of prior caesarean sections increases.

When reviewing an ultrasound report for women with a history of previous caesarean section with an anterior low-lying placenta or placenta praevia at the routine fetal anomaly scan, have an index of suspicion for placenta accreta spectrum.

If Placenta Accreta Spectrum disorder is suspected at any stage in pregnancy:

- Notify the shared care coordinator. A hospital appointment will be arranged, and shared care will cease
- Provide advice to reduce the risk of bleeding (see above)
- Provide advice to present to the hospital’s Emergency Department immediately with any bleeding (bleeding is often painless), abdominal pain or decreased fetal movements

Source: Wikipedia velamentous cord insertion

Resources

Resources	Content summary
Perinatal society of Australia and New Zealand	Clinical practice guideline for the care of women with decreased fetal movements
RANZCOG	Clinical practice guideline on placenta praevia, placenta praevia accreta and vasa praevia: diagnosis and management
University of New South Wales	Information on placenta abnormalities

18. UpToDate. Charles J Lockwood, Karen Russo-Stieglitz, *Velamentous umbilical cord insertion and vasa praevia* April 2020
 19. Ibid.



CHAPTER 9 IMMUNISATION IN PREGNANCY

Influenza and pertussis vaccination are routinely recommended in pregnancy.

Some other inactivated vaccines may be considered in high-risk groups or situations.

All live attenuated vaccines are contraindicated in pregnancy.

Routinely recommended vaccinations

Influenza (annual seasonal)²⁰

Antenatal influenza vaccination is recommended to protect both the pregnant woman and the baby from influenza and its complications. Pregnant women are a priority group for influenza vaccination, with the vaccine funded.

Influenza in pregnancy

- Pregnant women are at increased risk of morbidity and mortality from influenza compared with non-pregnant women
- Babies born to mothers who contract influenza during pregnancy are at higher risk of preterm birth and low birth weight
- Babies aged less than 6 months are more likely to be hospitalised with influenza than any other age group

Benefits of vaccination

- Vaccination of pregnant women provides protection against influenza for newborn babies by transfer of maternal antibodies across the placenta
- High levels of maternal antibodies give temporary protection to the baby for the first few months of life
- Vaccination during pregnancy is estimated to reduce the risk of influenza in babies aged less than 6 months by about half

Vaccination timing

- It is safe to administer during any stage of pregnancy or while breastfeeding
- It is recommended as a single dose at any time (as early as practicable) during each pregnancy
- It is best given prior to the onset of the influenza season; however, can be given at any time during the year. The influenza season usually occurs from June to September in most parts of Australia
- Can be given at the same time as the pertussis vaccine
- It is safe for women to have repeated flu vaccinations (for two different seasons) in pregnancy:
 - For women who received an influenza vaccine late in the previous year, revaccinate when the next vaccine becomes available before the end of pregnancy

- Women who are in their first trimester in the first quarter of a year may wish to wait until the current year influenza vaccine becomes available, rather than receiving the previous year's influenza vaccine. However, it is important to recognise that some flu seasons will have an early onset

Vaccination safety

- All influenza vaccines currently used in Australia are inactivated vaccines. Most are safe for use in pregnant women²¹
- Many large studies have shown no evidence of an increased risk of adverse pregnancy outcomes (such as stillbirth, low birth weight, pre-eclampsia, congenital abnormality, or preterm birth) related to influenza vaccination during pregnancy
- Expected adverse events, like injection site reactions and fever, do not occur more frequently in pregnant women than in non-pregnant women

20. Australian Technical Advisory Group on Immunisation (ATAGI). Australian Immunisation Handbook, Australian Government Department of Health, Canberra, 2018, (Updated March 2019) immunisationhandbook.health.gov.au. Available [online](#).

22. Influenza vaccine for over 65 year olds and FluMist® are not recommended in pregnancy.

Pertussis (whooping cough)²³

Vaccination timing

- Pertussis vaccine is recommended as a single dose at 20–32 weeks of each pregnancy, even if a recent booster has been given
- Vaccination during pregnancy has the advantage of achieving more timely and high pertussis antibody responses in the mother and infant after birth, as compared with vaccination given postpartum or prior to conception, with studies suggesting a benefit to the fetus as long as vaccine is given more than 2 weeks prior to delivery
- This 20-32 week window is recommended as it takes 2 weeks after vaccination to make antibodies, with active placental transfer occurring from 30 weeks gestation:
 - If this “window” is missed, pertussis vaccine can be administered at any time during the third trimester up to delivery
 - Women vaccinated in pregnancy prior to 20 weeks gestation do not need repeat vaccination in the same pregnancy. Evidence shows transfer of pertussis antibodies to the infant in women who received dTpa vaccine as early as 13 weeks gestation

Vaccination safety

- Side effects are minimal, with the most common being a local reaction
- There is no evidence that side effects are more common or severe in pregnancy
- There is no recommended minimum time between immunisations, but local injection site reactions may be higher in those vaccinated frequently

Pertussis-containing vaccine is recommended as a single dose between 20 and 32 weeks in each pregnancy. This includes pregnancies that are closely spaced to provide maximal protection to each infant.

Vaccination of other adults

- Adult household contacts and carers of babies (e.g. partners, grandparents) should ideally receive pertussis vaccination at least 2 weeks before beginning close contact with the infant if ≥ 10 years have elapsed since a previous dose.

In general practice:

- Influenza and pertussis vaccines are available at no cost to pregnant women.
 - Pertussis vaccine is available at no cost to a woman's partner
-

23. Australian Technical Advisory Group on Immunisation (ATAGI). Australian Immunisation Handbook, Australian Government Department of Health, Canberra, 2018, (Updated March 2019) immunisationhandbook.health.gov.au. Available [online](#).

Not routinely recommended vaccinations: consider if at high risk²³

The following vaccines are not routinely recommended. However, they are considered safe in pregnancy and should be considered in women at higher risk who are otherwise non-immune.

Vaccines	
Hepatitis B	Can be given to pregnant women at increased risk of hepatitis B (e.g. use injecting drugs, household contact with a person with chronic hepatitis, occupational risk)
Hepatitis A	Can be given where vaccination is considered necessary (e.g. travel to endemic areas)
Typhoid Parental Vi polysaccharide	Can be given where vaccination is considered necessary (e.g. travel to endemic areas) (Note the oral live attenuated typhoid vaccine is contraindicated in pregnant women)
Pneumococcal vaccines	Can be given to pregnant women at the highest increased risk of invasive pneumococcal disease (e.g. functional or anatomical asplenia, immunocompromised)
Meningococcal vaccines	Can be given to pregnant women at increased risk of meningococcal disease (e.g. travel to endemic areas or at higher risk of invasive disease)
H. influenza type B (Hib)	Can be given to pregnant women at increased risk of Hib disease (e.g. with functional or anatomical asplenia)
Injectable polio (not live)	Can be given to pregnant women at high risk of poliovirus exposure (e.g. travel to endemic countries)

Urinalysis for bacteriuria	Can be given to pregnant women at high risk of poliovirus exposure (e.g. travel to endemic countries)
Rabies	Can be given to pregnant women for whom this vaccine would otherwise be recommended (e.g. post-exposure prophylaxis)
COVID-19	As these vaccinations are new - please refer to updated and evolving recommendations

Contraindicated vaccinations²⁴

Theoretically, live attenuated vaccines given to pregnant women might be capable of crossing the placenta and infecting the fetus. As a result, most live attenuated vaccines are contraindicated during pregnancy.

Vaccines contraindicated during pregnancy (selected):

Bacillus Calmette–Guérin (BCG)
Cholera vaccine
Human Papilloma Virus (HPV) – not live, but a lack of safety data
Japanese encephalitis
Measles, Mumps, Rubella (MMR)
Typhoid Oral
Rotavirus
Varicella and zoster vaccines

23. Ibid.

24. Ibid.

Summary vaccination in pregnancy

Recommended in pregnancy	Not routinely recommended in pregnancy, but can be given if indicated: consider if at higher risk	Contraindicated in pregnancy
Influenza: At any stage of pregnancy	Hepatitis B	Bacillus Calmette–Guérin (BCG)
Pertussis dTpa vaccine: At 20–32 weeks	Pneumococcal vaccines	Cholera vaccine
	Hepatitis A	Human Papilloma Virus (HPV)
	Meningococcal	Japanese encephalitis
	Rabies	Measles, Mumps, Rubella (MMR)
	Inactivated Polio vaccine	Typhoid Oral
	Typhoid Parental Vi polysaccharide vaccines (not live)	Rotavirus
		Varicella and zoster vaccines
	COVID-19 (refer to evolving guidelines)	

Postnatal vaccines

See [Chapter 16](#).

Resources

Resources	Content summary
Department of Health and Human Services, Victoria	Resources on immunisation for health professionals and consumers
Department of Health Australia	Australian Immunisation handbook Information on immunisation for pregnant women and travel
Influenza Specialist Group	Health professional information: Links to a range of education and resources related to influenza
Melbourne Vaccine Education Centre	Comprehensive guide with multiple resources related to maternal vaccination during pregnancy, with links to other immunisation resources
Therapeutic Goods Administration	Health professional information: <i>Prescribing medicines in pregnancy database</i> . Information for health professionals planning the medical management of pregnant patients or patients intending to become pregnant
COVID-19	Australian government consumer advice on COVID-19 vaccination for women who are pregnant, breastfeeding, or planning pregnancy. This information will be updated when other vaccines become available and guidelines evolve.



CHAPTER 10
RH AND OTHER BLOOD ANTIBODIES

All women have their blood group and antibodies checked in early pregnancy and their blood group antibodies checked at 26-28 weeks.

Rh D immunoglobulin (anti-D)

All Rh D -ve women with no preformed anti-D antibodies are routinely offered Rh D immunoglobulin (anti-D) at the hospital at the following times:

Anti-D at 28 weeks

This is arranged and provided by the hospital.

At NH and WMH, an appointment is made for the woman by the hospital staff at a woman's first hospital visit, with Rh D immunoglobulin administered at the hospital (usually the Pregnancy Day Service).

There is no antenatal check at this time, with the woman still required to see her SMCA for a 28-week antenatal check.

At MHW, RWH, WH and DjWS, Rh D immunoglobulin is provided by hospital staff along with an antenatal visit at the 28-week hospital visit (i.e. both an antenatal check and Rh D immunoglobulin).

Anti-D at 36 weeks²⁵

This is arranged and provided by the hospital.

Anti-D postnatally if baby is Rh +ve

The baby's cord blood is routinely taken after birth and Rh status checked.

If the baby is Rh -ve, then the mother is not administered Rh D immunoglobulin. If the baby's Rh status is positive, the woman is administered Rh D immunoglobulin within 72 hours postnatally at the hospital.

All Rh -ve women with RH +ve babies also have a test for fetal-maternal haemorrhage (FMH test) soon after birth at the hospitals to determine whether any additional doses of Rh immunoglobulin are required (625IU of anti-D neutralises approximately 6mls of fetal RBCs).

Anti-D for sensitising events

Unless a woman has already received Rh D immunoglobulin for the particular sensitising event, SMCAs should send women to the hospital Emergency Department for anti-D as soon as possible after a sensitising event. If Rh D immunoglobulin is indicated, it should be given within 72 hours of a sensitising event.

Sensitising events include:

In the first trimester (<12 weeks):^{26,27}

- Ectopic pregnancy
- Miscarriage
- Termination of pregnancy* (medical or surgical)
- Molar pregnancy
- Invasive prenatal diagnostic procedure (including chorionic villus sampling, amniocentesis and cordocentesis) in any trimester
- Curettage
- Abdominal trauma considered sufficient to cause fetomaternal haemorrhage

*In the COVID-19 situation, based on the NICE guideline (2019) *that rhesus status determination and anti-D are not required for early medical abortion up to 10 weeks, RANZCOG advises that a clinician may appropriately decide not to administer anti-D prior to 10 weeks, for medical management of abortion, particularly when an additional visit may increase exposure of women and staff.*²⁸

After the first trimester, in addition to the above:

- Obstetric haemorrhage e.g. vaginal bleeding/ antepartum haemorrhage
- External cephalic version (whether successful or not)
- In-utero therapeutic interventions (invasive prenatal diagnostic procedures, transfusion, fetal surgery, insertion of stent, laser)
- Abdominal trauma, or any other suspected intra-uterine bleeding or sensitising event.

Rh D immunoglobulin (anti-D) is not required in the event of threatened miscarriage in the first trimester (prior to 12 weeks gestation).

Note:

- For first trimester miscarriage with no instrumentation, there is conflicting evidence as to whether anti-D is indicated, with some services recommending Rh D immunoglobulin and others not
- Women with continued PV bleeding between 12 and 20 weeks gestation, should be offered Rh D immunoglobulin at a minimum of 6-weekly intervals

25. When required, second prophylactic Rh D immunoglobulin is usually provided around 34 weeks. However, to align with hospital visit and GBS swab this is undertaken at 36 weeks for women undertaking shared maternity care.

26. National Blood Authority guidelines on the prophylactic use of Rh D immunoglobulin (Anti-D) in obstetrics, 2003

27. RANZCOG Guidelines for the use of Rh (D) Immunoglobulin (Anti-D) in obstetrics in Australia (2012)

28. RANZCOG, COVID 19, Anti D and abortion, News, view [online](#)

Other blood antibodies

Other than Rh D, there is a range of blood antibodies that can be identified.

Some of these have serious consequences (high risk), whereas others do not (low risk). This distinction depends on their likelihood of causing haemolytic disease of the fetus and newborn (HDFN). Haemolytic disease of the fetus and newborn (HDFN) refers to haemolysis of fetal or neonatal RBCs by maternal alloantibodies to a fetal RBC antigen.

For maternal antibodies to cause HDFN they will need to cross the placenta and be directed against an antigen expressed on fetal red blood cells (RBCs).

Antibody identified	Action
No antibodies	Repeat antibody screen as per usual at 26-28 weeks gestation
Previous history of infant affected by Haemolytic disease of newborn	Refer to Maternal Fetal Medicine (MFM)
High risk Abs (associated with HDFN) <ul style="list-style-type: none"> • Rh D • RhC, Rhc, RhE • Kell • Duffy • MNS, s, U, Mur • P • ABO 	Refer to Maternal Fetal Medicine (MFM)
Low risk Abs (not associated with HDFN) <ul style="list-style-type: none"> • Lewis blood group antigens • I antigens • P antigen P1 	<p>Women require an early blood group screen prior to caesarean birth, induction of labour or on admission to birth suite to facilitate safe blood provision (due to potential difficulty cross matching if blood is required for transfusion). This is a hospital responsibility</p> <p>At Western –refer to MFM</p> <p>Other hospitals – referral not required, but note on handheld record</p>

Resources

Resources	Content summary
National Blood Authority	Clinical Guideline: <i>Guidelines on the prophylactic use of Rh D immunoglobulin (anti-D) in obstetrics</i> (2003)
RANZCOG	Clinical Guideline: <i>Guidelines for the use of Rh (D) immunoglobulin (anti-D) in obstetrics in Australia</i> (2015) (Under Red cell Iso-immunisation and Rh(D) prophylaxis)



CHAPTER 11 LABOUR AND DELIVERY

Trial of labour after caesarean section

Women who have undergone a previous caesarean delivery have the option of proceeding with a trial of labour after caesarean (ToLAC) delivery or planned repeat caesarean delivery (PRCD). Planned ToLAC may result in labour with vaginal birth (VBAC) or unplanned intrapartum caesarean delivery.

There is a wide range of success rates (23-85%) for achieving a vaginal birth following a ToLAC.

Decision

Women with a previous caesarean section will have a discussion with a hospital doctor to determine eligibility, discuss the potential risks and benefits, and decide on and plan the birth. The decision takes into consideration the woman's preferences, obstetric history, data on the risks and benefits of ToLAC versus PRCD, and availability of ToLAC in the hospital.

Factors affecting success³⁰

Favouring success rate	Reducing success rate
<ul style="list-style-type: none"> • Previous vaginal birth • Previous successful VBAC • Spontaneous onset of labour • Uncomplicated pregnancy without other risk factors 	<ul style="list-style-type: none"> • Previous caesarean section for dystocia • Previous caesarean due to obstructed labour • Fetal macrosomia (≥ 4 kg) • Maternal obesity • Advanced maternal age • Short stature • Gestational age beyond 41 weeks • Coexisting fetal, placental or maternal conditions

However, a woman's decision regarding route of delivery is influenced by factors other than the VBAC rate and risk of uterine rupture.

Common reasons women choose ToLAC include³¹:

- Future pregnancy plans (since multiple caesarean deliveries increase the risk for placenta praevia/accreta)
- Family obligations that make a speedy return to normal activities postpartum desirable
- Desire to experience a vaginal birth
- Desire for their partners' involvement in labour and birth

RWH Sandringham hospital and DjHS do not undertake ToLAC.

For ToLAC: At around 36 weeks, RWH Sandringham refer women to RWH Parkville and DjHS refer women to WH.

A 2010 meta-analysis of ToLAC found the factors most strongly associated with a successful VBAC was a history of VBAC or vaginal delivery prior to the caesarean and the most factor most strongly associated with failed ToLAC was a prior caesarean delivery for a recurring indication, such as failure to progress. Other factors that played a role, but were not as strongly associated with failed ToLAC, were increasing body mass index and older maternal age.²⁹

There are overseas [VBAC calculators](#) that may assist in informing the probability of success of a ToLAC.

Common reasons women choose planned repeat caesarean delivery (PRCD) include:

- Concern about risk of uterine rupture in labour and associated adverse perinatal outcomes
- Scheduling convenience
- Fear of failed trial of labour and emergency caesarean delivery
- Ease of sterilisation (tubal ligation) at the time of delivery

29. New insights on vaginal birth after caesarean: Can it be predicted? Eden KB, McDonagh M, Denman MA, Marshall N, Emeis C, Fu R, Janik R, Walker M, Guise JM *Obstet Gynecol.* 2010;116(4):967

30. RANZCOG, Birth after previous caesarean section, C-Obs 38. View [online](#).

31. National Institutes of Health Consensus Development conference statement: vaginal birth after caesarean: new insights March 8-10, 2010. National Institutes of Health Consensus Development Conference Panel Obstet Gynecol. 2010;115(6):1279 and Vaginal birth after caesarean: new insights. Guise JM, Eden K, Emeis C, Denman MA, Marshall N, Fu RR, Janik R, Nygren P, Walker M, McDonagh M *Evid Rep Technol Assess (Full Rep).* 2010 Mar

Eligibility for ToLAC at the hospitals

- One previous lower segment caesarean section
- Singleton pregnancy
- Otherwise appropriate for a vaginal birth
- No induction required

Relative ineligibility for ToLAC at the hospitals

- Previous unknown incision scar, classical or inverted T incision, uterine rupture, myomectomy involving uterine cavity or extensive myometrium dissection
- Two or more previous caesarean sections
- Less than 18-24 months since the previous caesarean section
- BMI > 40
- Estimated fetal weight > 4 kg
- Vaginal birth not recommended e.g.
 - Placenta praevia and adhesion disorders
 - Fetal malpresentation
- Woman wants an elective caesarean section

Women who are otherwise eligible for a ToLAC may be able to have an external cephalic version if the baby has a non-cephalic presentation at 36 weeks. This will be assessed individually by the hospital doctor.

Risks and benefits of ToLAC

The medical and obstetric benefits of a successful ToLAC largely derive from avoidance of the potential adverse outcomes associated with repeat caesarean delivery, especially multiple repeat caesarean deliveries over a woman’s future reproductive life.

Most maternal morbidity associated with ToLAC occurs when emergency intrapartum caesarean delivery becomes necessary, as this is associated with greater postoperative infection and other morbidities than planned repeat elective caesarean section. A less common but serious potential adverse outcome associated with ToLAC is uterine rupture, which can be associated with serious morbidity, particularly for the neonate for whom uterine rupture can be fatal.

Conversely, the medical and obstetric benefits of planned repeat elective caesarean section derive predominantly from the avoidance of the potential adverse outcomes associated with ToLAC – primarily uterine rupture and the morbidity associated with emergency intrapartum caesarean delivery.

Benefits if successful	Risks of ToLAC
<ul style="list-style-type: none"> • Avoid major surgery Severe maternal morbidity (e.g. cardiac arrest, wound hematoma, hysterectomy, major puerperal infection, anaesthetic complications, venous thromboembolism, and haemorrhage requiring hysterectomy may be higher with planned caesarean delivery than with planned vaginal delivery – although absolute rates are low for both) • Earlier mobilisation and discharge from hospital • Any following pregnancy is more likely to be vaginal • Decrease morbidity associated with multiple caesarean sections (e.g. placental adhesion, uterine rupture, increasingly difficult caesarean sections, and the consequences of this) • Lower rate of transient respiratory morbidity 	<ul style="list-style-type: none"> • Greater risk of uterine rupture compared with planned LUSC (about 1 in 200 ToLACs c.f 1 in 3,800 in planned caesarean) <ul style="list-style-type: none"> – Outcomes of uterine rupture include hysterectomy (about 1 in 4 women) and of perinatal death (about 1 in 7) • If emergency caesarean is required, this has increased risks compared with elective caesarean section • Risks of vaginal delivery such as pelvic floor and perineal trauma • Vaginal birth has an increased risk of perinatal loss of 1.8 per 1000 pregnancies compared with elective caesarean section at 39 weeks. This is due to: <ul style="list-style-type: none"> – Antepartum stillbirth while waiting spontaneous labour beyond 39 weeks – Delivery-related perinatal mortality – Intrapartum death or neonatal death related to scar rupture in labour • Risk of perinatal brain injury (Hypoxic Ischaemic Encephalopathy) of 0.4/1000

Term and planned ToLAC

For women who decide on a ToLAC who do not go into spontaneous labour by term, an elective caesarean section will generally be organised. This is due to the increased risk of uterine rupture with induction. If the pregnancy is otherwise unremarkable, this generally occurs about 40-41 weeks.

Care in Labour for ToLAC

Women having a ToLAC require intravenous access and will be closely monitored with continuous CTG monitoring. They will therefore have more restricted ability to be mobile and to use the bath or shower.

Women in labour can have an epidural.

Induction of labour

General indications for induction of labour at the hospitals

Indication	Recommendation
Prolonged pregnancy	Recommended between 41 and 42 weeks for uncomplicated pregnancies
Advanced maternal age (≥ 40 years)	Offer at 38-39 weeks gestation
BMI ≥ 50	Recommended at 38-39 weeks
Suspected fetal macrosomia	Offer at 38-39 weeks gestation
Rupture of membranes at term – GBS negative	Within 24 hours of confirmed rupture
Rupture of membranes at term – GBS positive, meconium liquor, suspected sepsis	Semi urgent or urgent depending on clinical symptoms
Rupture of membranes at term- GBS unknown	Clinical assessment on timing
Preterm rupture of membranes	<37/40 – expectant management
History of precipitate labour	Do not routinely offer
Pregnancy complications: <ul style="list-style-type: none"> • Abnormal CTG • Abnormal Ultrasound findings, including oligohydramnios, polyhydramnios and abnormal Doppler studies • Antepartum haemorrhage • Suspected or diagnosed fetal growth restriction • Intrauterine fetal death • Decreased fetal movements • Hypertensive disorders • Gestational diabetes • Maternal medical conditions • Obstetric cholestasis • History of previous stillbirth 	Individual assessment by hospital doctor
Assisted reproduction	Do not routinely offer, but depending on obstetric history may offer at 38-39 weeks
Maternal request	Not routinely offered, but will consider $\geq 39/40$
Ethnicity	Not currently indicated for maternal country of birth alone
IOL not generally offered	
Previous caesarean	Not generally undertaken due to increased risk of uterine rupture
Breech presentation	None of the hospitals undertake planned breech births

Contraindications for induction of labour

- Any reason that vaginal birth is contraindicated
- Any reason requiring immediate delivery
- Previous classical uterine incision or previous caesarean section of unknown type

Methods of induction

The hospitals all have different protocols for induction of labour depending on factors such as favourability of cervix, engagement, fetal wellbeing and maternal conditions. The options generally include: artificial rupture of membranes, vaginal prostaglandin, balloon catheter or Syntocin.

Nonmedical methods for induction of labour for planned vaginal birth

Most non-medical methods for induction of labour such as nipple stimulation, exercise, sex, acupuncture or eating certain foods are used by some on the basis of traditional knowledge, rather than scientific research. Currently, the clinical evidence is sparse, and it is not possible to make firm conclusions regarding the effectiveness of these therapies.

Membrane sweeping

Membrane sweeping (also known as a *stretch and sweep*) is a relatively simple procedure that seeks to reduce the use of formal induction of labour and can be performed without the need for hospitalisation. It involves the clinician inserting one or two fingers into the lower part of the uterus (the cervix) and using a continuous circular sweeping motion to free the membrane from the lower uterus. There is some evidence that undertaking this at term may result in a higher spontaneous onset of labour.

It is routinely offered to women at RWH and MHW at 40-41 weeks of pregnancy who are planning a vaginal birth before organising induction of labour. It is not offered routinely at the other hospitals and is clinician dependant. This can also be undertaken by SMCA if requested by a woman. GBS status is not relevant.

External Cephalic Version and Breech Delivery

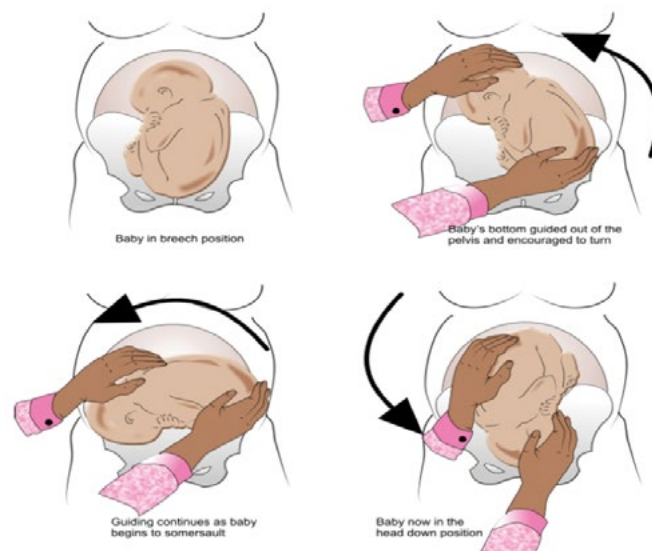
For non-cephalic presentations at ≥ 36 weeks, all hospitals will undertake an individual assessment and, if appropriate, offer an external cephalic version by an experienced doctor.

If a SMCA notes a non-cephalic presentation from 36 weeks onwards, please contact the shared care coordinator or Pregnancy Day Service to arrange hospital review.

This is generally undertaken in the Pregnancy Day Service where a woman will have a CTG and ultrasound to confirm the presentation and ensure adequate liquor. If suitable and there

are no contraindications, tocolytics may be used to relax the uterus. The doctor will then palpate the baby's bottom and head and try and "help the baby do a somersault". At the conclusion, a CTG and ultrasound will be performed.

The success rates vary from about 50-70%. It is at the lower end in primigravida, with increasing gestation and dependant on position (transverse and oblique lies have higher success rates and frank breeches (extended legs) have lower success rates than non-frank breeches. About 1 in 1,000 women go into labour after an ECV and about 1 in 200 women require an emergency caesarean section.



Source: The Royal Women's Hospital

If the ECV is not successful, a caesarean section will be organised.

Due to an increase in cord prolapse and the need to organise a caesarean, women with an ongoing non-cephalic presentation should be counselled to attend the hospital's Emergency Department immediately if they go into labour or rupture their membranes.

None of the hospitals offer planned vaginal breech delivery.

Resources

Resources	Content summary
RANZCOG	Birth after previous caesarean section
Safer Care Victoria	Birth after caesarean



CHAPTER 12 ASPIRIN, CALCIUM AND HEPARIN

Aspirin

Low-dose aspirin is most commonly used in pregnancy to prevent or delay the onset of pre-eclampsia (and its associated complications such as stillbirth, fetal growth restriction and preterm delivery). This is thought to be due to its anti-inflammatory and anti-platelet properties.

When indicated, and if there are no personal contraindications such as allergy, if possible, it should be started prior to 16 weeks of gestation.

Indications:

For women with a high risk of pre-eclampsia, including:

Strong indications (routine):

- Past history of pre-eclampsia, especially if associated with preterm delivery and/or fetal growth restriction
- Multiple pregnancy
- Renal disease
- Chronic hypertension
- Autoimmune diseases such as SLE and antiphospholipid syndrome
- Diabetes (type 1 or 2)

Moderate indications (consider):

- Primigravida or interpregnancy interval of ≥ 10 years
- Advanced maternal age (≥ 40 years)
- First-degree family history of pre-eclampsia
- High BMI (≥ 35)
- Donor sperm +/- donor egg pregnancies
- If an early pre-eclampsia screening result shows an increased risk of 1:180 or higher.
(Note: this is not a routinely recommended test)

In the absence of such risk factors for pre-eclampsia, aspirin is not currently indicated for early pregnancy loss, unexplained stillbirth, idiopathic preterm birth, and co-morbidities such as coeliac disease and rheumatoid arthritis.

Timings:

Where indicated, low-dose aspirin should be started by 16 weeks' gestation (please do not wait for hospital review prior to starting).

As its method of action is on the vascularisation of the placenta, there is a theoretical basis that commencing earlier in pregnancy may be more effective; however, there is currently no evidence to support this. As such the starting point varies, with some clinicians starting at identification of pregnancy and others preferring to wait until the end of the first trimester.

Although there is no evidence it is effective after 16 weeks, it can be initiated until 20 weeks.

Dose:

- Should be at a dose of 100-150 mg and given orally at night (when it appears more efficacious)
 - If half a 300 mg dispersible tablet is used, the remaining half should be discarded
- Is generally continued until about 36 weeks gestation

The majority of RCTs have found no increase in haemorrhagic complications and risk of placental abruption associated with low-dose aspirin during pregnancy.

In the case of early bleeding in pregnancy with an ongoing pregnancy, aspirin should not be ceased.

Calcium

For women at risk of pre-eclampsia, adequate dietary calcium has also been found to decrease the risk of pre-eclampsia.

The recommended intake of calcium in pregnancy is 1,000 mg per day (1,300 mg/ day if < 19 years).

Click [here](#) for the calcium content of food.

High-dose calcium supplementation (≥ 1 g/day) may decrease the risk of pre-eclampsia and associated problems in women with low dietary intake, and should be considered if adequate dietary intake is not feasible.

Low molecular weight heparin

All women should undergo a documented assessment of risk factors for venous thromboembolism (VTE) in early pregnancy or pre-pregnancy.

Women at risk should be provided education on symptoms of concern and what to do if these develop.

If a woman is at risk of venous thromboembolism, in order to identify her as potentially requiring an early hospital appointment, please include this in her referral to hospital.

Most common indications for thromboprophylaxis with enoxaparin (Clexane™, Lovenox™, Xaparin™), which is a low molecular weight heparin (LMWH), are:

Antenatal

The following are NOT exclusion criteria for shared maternity care:

- Personal history VTE
- Family history of VTE (in first degree relative)
- Immobilisation (anticipated bed rest \geq 7 days)

Exclusion criteria for shared maternity care:

- Antiphospholipid syndrome
- Homozygous for high-risk thrombophilia genes
- Active systemic lupus erythematosus (SLE)
- Nephrotic syndrome with albumin \leq 19g/L
- Cardiac disease (in some cases)

Postnatal³²

- After caesarean until mobile
- Been on antenatal anticoagulation for maternal venous thromboprophylaxis, regardless of mode of delivery. For 6 weeks postnatally
- Personal history of venous thromboembolic event, regardless of mode of delivery or whether they were on antenatal thromboprophylaxis. For 6 weeks postnatally

Dose, duration, and use:

The hospital will ensure there are no contraindications and advise on dose, duration and use according to the weight of the woman and the indication.

When to cease:

Women should be advised to cease enoxaparin at any of the following:

- At first sign of labour (until hospital review and further advice)
- At rupture of membranes (until hospital review and further advice)
- Before induction of labour, planned caesarean, epidural, or spinal (timing as per hospitals advice)
- With any bleeding (until hospital review and further advice)

Resources

Resources	Content summary
RANZCOG	Clinical Guideline: For the Prevention of Venous Thromboembolism in Patients Admitted to Australian Hospitals Guidance regarding the use of low-dose aspirin in the prevention of pre-eclampsia in high-risk women
American Society of Haematology	2018 Guidelines for Management and Thromboprophylaxis of Venous Thromboembolism in the Context of Pregnancy

32. National Health and Medical Research Council. *Clinical practice guideline for the prevention of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to Australian hospitals*. Melbourne: National Health and Medical Research Council; 2009.



CHAPTER 13
COMMON MATERNAL CONDITIONS

Medicines in pregnancy

When considering the use of medications in a pregnant woman, the potential risk of a drug must be balanced against the effects of untreated disease. Despite the potential for harm, few drugs have been proven harmful in pregnancy and less than 1% of congenital malformations can be attributed to drugs. However, statistical and ethical considerations, as well as the long follow up required, make it unlikely that any drug will ever be “proven safe” in pregnancy.

Medicines information

The following are sources of information for health professionals on medicines in pregnancy and breastfeeding:

- Detailed information on the safety of medicine use during pregnancy or breastfeeding can be obtained by contacting the Royal Women’s Hospital Pharmacy Department Medicines Information
Hours: 9am to 4pm Monday to Friday
T: (03) 8345 3190
F: (03) 8345 3195
E: drug.information@thewomens.org.au
- Health professionals can also purchase [The Women’s Pregnancy and Breastfeeding Medicines Guide \(PBMG\)](#), a quick reference guide that provides information on medicine use in pregnancy and breastfeeding
- [MIMS](#) (Australia or New Zealand)
- [Prescribing medicines in pregnancy database](#) (Australian Department of Health TGA)
- [National Register of Antipsychotic Medication in Pregnancy](#): register to access Healthcare Professionals Portal via website or E: maprc-nramp@monash.edu
- [Lactmed®](#)
A free online USA database with information on drugs and lactation from National Center for Biotechnology Information (NCBI)

LactMed database contains information on drugs and other chemicals to which breastfeeding mothers may be exposed. It includes information on the levels of such substances in breast milk and infant blood, and the possible adverse effects in the nursing infant. Suggested therapeutic alternatives to those drugs are provided, where appropriate. All data are derived from the scientific literature and fully referenced. A peer review panel reviews the data to assure scientific validity and currency.

Australian categories for prescribing medicines in pregnancy³³

Resources	Content summary
A	<p>Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed</p>
Human data are lacking or inadequate for drugs in the B1, B2 and B3 categories Subcategorisation of the B category is based on animal data The allocation of a B category does not imply greater safety than a C category	
B1	<p>Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed</p> <p>Studies in animals that have not shown evidence of an increased occurrence of fetal damage</p>
B2	<p>Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed</p> <p>Studies in animals that are inadequate or may be lacking, but available data show no evidence of an increased occurrence of fetal damage</p>
B3	<p>Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed</p> <p>Studies in animals that have shown evidence of an increased occurrence of fetal damage, the significance of which is considered uncertain in humans</p>
C	<p>Drugs which, owing to their pharmacological effects, have caused or may be suspected of causing, harmful effects on the human fetus or neonate without causing malformations. These effects may be reversible. Accompanying texts should be consulted for further details</p>
D	<p>Drugs that have caused, are suspected to have caused or may be expected to cause, an increased incidence of human fetal malformations or irreversible damage. These drugs may also have adverse pharmacological effects. Accompanying texts should be consulted for further details.</p> <p>Medicines in category D are not absolutely contraindicated during pregnancy (e.g. anticonvulsants are usually category D)</p>
X	<p>Drugs that have such a high risk of causing permanent damage to the fetus that they should not be used in pregnancy or when there is a possibility of pregnancy</p>

33. Australian Department of Health, Therapeutic Goods Administration. Access [online](#) in June 2020

Common maternal conditions

Hypertensive disorders

The four major hypertensive disorders that occur in pregnant women are:

- Gestational hypertension
- Pre-eclampsia
- Chronic (pre-existing) hypertension
- Pre-eclampsia superimposed upon chronic hypertension

Gestational hypertension

Gestational hypertension refers to hypertension (≥ 140 mmHg systolic and/ or ≥ 90 mmHg diastolic) first detected after 20 weeks of gestation in the absence of proteinuria or other diagnostic features of pre-eclampsia. Over time, some patients with gestational hypertension will develop pre-eclampsia, others will be diagnosed with pre-existing hypertension because of persistent blood pressure elevation postpartum and others will develop neither pre-eclampsia nor persistently elevated blood pressure with the hypertension resolving within 3 months postpartum.

Pre-eclampsia

Pre-eclampsia refers to the syndrome of new onset of hypertension (≥ 140 mmHg systolic and/ or ≥ 90 mmHg diastolic) and proteinuria or new onset of hypertension and end-organ dysfunction with or without proteinuria after 20 weeks of gestation in a previously normotensive woman. Eclampsia is diagnosed when seizures have occurred. It is important to note that pre-eclampsia can first appear postpartum when urgent referral to an Emergency Department is required.

Classification:

Mild to moderate: systolic blood pressure of 140- <160 mmHg and/or diastolic blood pressure of 90 - <110 mmHg or higher measured on at least two occasions over several hours. Severe: Systolic BP ≥ 160 mmHg and/or diastolic BP ≥ 110 mmHg combined with proteinuria. Usually accompanied by other haematological, neurological, hepatic or renal derangement

Symptoms and signs:

Possible symptoms of pre-eclampsia:

- Oedema of face, hands or feet
- Headache
- Visual disturbance
- Epigastric pain or vomiting
- Maternal irritability

Possible signs of severe pre-eclampsia:

- Pitting oedema
- Papilloedema
- Liver tenderness
- Clonus
- Eclampsia
- Jaundice, petechiae

Complications:

- Fetal growth restriction
- Preterm labour
- Placental abruption
- Fetal death in utero
- Eclampsia
- Maternal stroke and end organ failure

Chronic (pre-existing) hypertension

Chronic hypertension is defined as hypertension pre-pregnancy, present before the 20th week of pregnancy or that persists longer than 12 weeks postpartum.

Pre-eclampsia superimposed upon chronic hypertension

Pre-eclampsia-eclampsia superimposed upon chronic hypertension is diagnosed when a woman with chronic hypertension develops worsening hypertension with new onset proteinuria or other features of pre-eclampsia.

When to treat hypertension

The decision to treat hypertension during pregnancy is made by a hospital doctor.

This is based on risks and benefits to both the mother and fetus, with the level of blood pressure the most important factor. Treatment of severe hypertension (systolic BP ≥ 160 mmHg and/or diastolic BP ≥ 110 mmHg) persisting for ≥ 15 minutes generally requires treatment because of the risk of maternal stroke and other serious maternal complications.

If a woman's BP is ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg (with or without proteinuria), hospital review is required that day for BP monitoring and investigations as appropriate.

It is not appropriate for a SMCA to commence pregnant women on antihypertensive medicine without prior discussion with a hospital obstetrician.

Management

The hospital obstetrician undertakes ongoing management of women with hypertension in pregnancy. This includes close observation for severe disease and fetal compromise and often consists of:

	Management likely	Comment
Chronic hypertension	<p>Assess for proteinuria at each visit*</p> <p>Pre-eclampsia bloods**</p> <p>Fetal growth US in 3rd trimester: repeat as indicated</p> <p>AFI, CTG and Doppler as required</p>	<p>Antihypertensive generally prescribed if BP systolic BP ≥ 150 mmHg and/or diastolic BP ≥ 100 mmHg</p>
Pre-eclampsia/gestational hypertension	<p>Monitor BP 1-3 times weekly</p> <p>Weekly – twice weekly bloods / CTG and urine checks for proteinuria (urine protein and creatinine ratio)</p> <p>Pre-eclampsia bloods</p> <p>Initial growth scan and 2-4 weekly thereafter</p> <p>Steroids as per hospital policy on gestation and indication</p> <p>AFI, CTG and Doppler as required</p>	<p>Antihypertensive generally prescribed if systolic BP ≥ 150 mmHg and/or diastolic BP ≥ 100 mmHg</p> <p>Frequency of investigations depends on history, risk factors, clinical and investigation findings, and hospital policy</p>

*Urinalysis by dipstick followed by spot urine PCR if $\geq 1+$ proteinuria. Once significant proteinuria has been detected, there is no established role for serial testing as the severity or progress of proteinuria should not alter management decision

**FBC, Electrolytes and creatinine, Uric acid, LFT and coagulation study only if indicated

Post-partum hypertension

See [Chapter 16](#), postnatal care.

Prevention in next pregnancy

Women with pre-eclampsia and gestational hypertension are at increased risk of developing:

- Pre-eclampsia in following pregnancies
- Hypertension with age

In following pregnancies, it is recommended that women (also see [Chapter 12](#)):

- Start aspirin 100-150mg at night before 16 weeks gestation
- Have adequate dietary calcium of 1000 mg/day. Consider calcium supplementation in women with low calcium intake

Hypothyroidism

Due to stimulation by hCG in early pregnancy, the thyroid stimulating hormone (TSH) decreases from week 6 until the end of the first trimester, returning to normal concentrations from the beginning of the second trimester.

The increased renal blood flow and glomerular filtration rate in pregnancy leads to increased iodine clearance and, therefore, the need for increased iodine intake during pregnancy.

It is recommended that women who are pregnant, planning a pregnancy or breastfeeding should take an iodine supplement of 150 micrograms (μg) each day.

TSH is not recommended as a routine test in pregnancy.

The normal adult reference range for TSH should be used until 6 weeks of gestation.

From 6 weeks gestation, laboratory pregnancy-specific TSH reference intervals should be used if available.

If these are not available, it is reasonable to use 4 mU/L as the upper limit of the normal range of TSH in pregnancy.

Hypothyroidism (or overt hypothyroidism) is defined as:

- Low FT4 and/or FT3 with high TSH, or
- TSH > 10 with normal FT4 and FT3

Overt hypothyroidism is associated with adverse effects on pregnancy and fetal development, including increased risks of miscarriage, pregnancy-induced hypertension, pre-eclampsia, placental abruption, anaemia and postpartum haemorrhage. Hypothyroidism has been strongly associated with poor outcomes in pregnancy for both the mother and baby, and requires treatment.

In women with pre-existing hypothyroidism, the thyroid gland cannot respond to the physiological demands of pregnancy, and so increased thyroid replacement is required during pregnancy.

Thyroxine replacement is likely to return to a pre-pregnancy dose for most women, but TFTs should be checked about 6 weeks postpartum. Women will require long-term follow-up with their GP.

It should be treated by/with:

- Ensuring a woman is on iodine supplementation of at least 150mcg/day
- Thyroxine
- Regular testing of TFTs and titration of medication
- In women with newly diagnosed hypothyroidism, organising a hospital endocrinology review via the shared care coordinator

In women with known thyroid disease, TSH and FT4 should be regularly monitored to ensure thyroxine dose is adequate:

- Thyroxine requirements generally increase during pregnancy and decrease in the immediate postpartum time
- Dose usually needs to be increased by 30% when pregnancy is diagnosed.
- TSH and FT4 tests are generally performed every 4-6 weeks with the aim of keeping TSH 0.1 - 2.5 mU/L and T4 in normal range.

Thyroxine (T4) is required for replacement as T3 does not cross the placenta.

Desiccated thyroid extract (usually from pigs) is not recommended as it is a mixture of T4 and T3, has greater variability in its dosage batch to batch, and does not have the same safety data.

Subclinical hypothyroidism

Subclinical hypothyroidism is defined as a TSH concentration elevated beyond the upper limit of the pregnancy-specific reference range (but < 10 mU/l), with a normal FT4. In such cases no further testing is required.

The significance and treatment of subclinical hypothyroidism in pregnancy remains controversial. Current RANZCOG guidelines do not support treatment; however, some clinicians prefer to treat women with subclinical hypothyroidism.

If it is decided to treat subclinical hypothyroidism, the general recommendation is to treat with thyroxine 50mcg daily if TSH > 4.0.

In these cases:

- Test TFTs along with the routine bloods at 26-28 weeks
- Target TSH is 0.1 to 2.5 mU/L
- If TSH is in the normal range, continue therapy throughout pregnancy and cease post-delivery
- In subsequent pregnancies, check TSH in early pregnancy

If on thyroxine, this should be ceased immediately postpartum, with postpartum TFTs not required.

There are currently no evidence-based recommendations for the long-term surveillance of TSH in women with gestational subclinical hyperthyroidism.

If considering another pregnancy in the short term, it is not unreasonable to continue with low-dose thyroxine and TFT check. Some clinicians prefer to also check for anti-thyroid antibodies in this case if it informs the decision-making; however, there is no evidence base for this, and it is not recommended by RANZCOG.

In the case of subclinical hypothyroidism in pregnancy and other strong risk factors for hypothyroidism, it would seem reasonable to consider clinical or investigation surveillance for hypothyroidism every few years, although there is no evidence base for this at this stage.

Diabetes

Hyperglycaemia first detected at any time during pregnancy is classified as either:

- Diabetes mellitus in pregnancy, or
- Gestational diabetes mellitus

Early Testing for Diabetes

- Indications for Early Diabetes Testing (see Chapter 5)
- For results in the first trimester, the hospitals vary in the threshold where referral is required to the hospital team. Please refer in a timely manner to shared maternity care coordinator or diabetes team if:
 - RWH/WH/: FBG ≥ 6 mol/L
 - MHW/WMH/DjHS: FBG ≥ 5.1 mol/L

or for all sites: HbA1C $\geq 5.9\%$ or RBG ≥ 7.8 mmol/L

Diabetes mellitus in pregnancy

Diabetes mellitus in pregnancy is diagnosed if one or more of the following criteria is met following a 75 g oral glucose load:

- Fasting plasma glucose ≥ 7.0 mmol/l
- 2-hour plasma glucose ≥ 11.1 mmol/l

Or

- random plasma glucose ≥ 11.1 mmol/l in the presence of symptoms of diabetes

Note: there is no established criterion for the diagnosis of diabetes mellitus in pregnancy based on the 1-hour post-load value.

Gestational diabetes mellitus

Gestational diabetes mellitus is diagnosed if one or more of the following criteria are met following a 75g oral glucose load:

- Fasting plasma glucose 5.1–6.9 mmol/l
- 1-hour post ≥ 10.0 mmol/l
- 2-hour post 8.5–11.0 mmol/l

Hyperglycaemia in pregnancy usually resolves in the postpartum period. Diabetes is more likely to be confirmed in the postpartum period when the hyperglycaemia in pregnancy is diagnosed early and/or the degree of hyperglycaemia is marked.

If a SMCA confirms a diagnosis of hyperglycaemia in pregnancy, contact the shared maternity care coordinator as soon as possible.

The shared maternity care coordinator will:

- Make appropriate hospital appointments with the diabetes team
- Cease shared care

In some instances, modified shared maternity care can continue (see Chapter 3). If so, the hospital will ensure this is documented in the patient-held pregnancy record and communicated to the SMCA).

Management of gestational diabetes and diabetes in pregnancy is a multidisciplinary task that involves regular monitoring of blood glucose levels, eating a healthy balanced diet, undertaking regular physical activity and sometimes insulin use. It also requires increased surveillance, blood tests and ultrasounds and may necessitate earlier delivery.

Asthma

Asthma is one of the most common medical conditions encountered during pregnancy. Pregnancy may be associated with changes in the course of asthma; it may improve, worsen or remain unchanged in severity during pregnancy.

Previous severe asthma is a risk factor for exacerbation of asthma during pregnancy.

Evidence suggests that asthma may have a negative impact on various aspects of pregnancy. However, the effect of asthma on pregnancy should not be considered a contraindication to pregnancy for patients with asthma, as adequate therapy and good asthma control can minimise these complications. Acute asthma rarely occurs during labour and delivery, although some women may experience asthma symptoms.

Manage asthma during pregnancy as for asthma in other adults, aiming to maintain the best possible asthma control and to avoid asthma flare.

The primary goals of asthma therapy during pregnancy are the prevention of acute exacerbations and optimisation of ongoing pulmonary function.

The important components of effective asthma therapy during pregnancy are:

- Monitor maternal symptoms, lung function and fetal wellbeing as a guide to therapy
- Control triggers for asthma
- Patient education
- Pharmacologic therapy

Triggers

Identify and manage comorbid conditions that may affect asthma control or mimic asthma symptoms (e.g. allergic rhinitis, gastro-oesophageal reflux disease).

Potential triggers

- Non-adherence to preventer medicines
- Viral infections
- Exposure to smoke and cigarette smoking
- Animal allergen exposure
- Allergic rhinitis
- Range of other factors such as obesity and gastro-oesophageal reflux

Pharmacologic therapy**Safety of asthma medicines in pregnancy:**

see [Asthma Handbook](#)

Acute asthma – flare-ups

Intervene early during exacerbations to minimise risk to the fetus.

The management of acute asthma exacerbations during pregnancy does not differ substantially from that of non-pregnant patients and includes inhaled short-acting beta agonist salbutamol, inhaled ipratropium and glucocorticoids.

For a pregnant woman with asthma, prescribe oral corticosteroids if indicated, just as for other adults. Dosages of glucocorticoids for treatment of acute asthma exacerbations in pregnancy are not different than those for non-pregnant patients.

Longer-term control

For a pregnant woman with asthma, prescribe preventers, if indicated, just as for other adults, aiming to maintain the best possible asthma control and to avoid asthma flare-ups.

Do not withhold **preventer** treatment due to pregnancy. Pregnancy is not a contraindication for asthma preventers.³⁴

Immunotherapy

It is recommended not to initiate allergen immunotherapy during pregnancy.

Women with asthma should be specifically advised to continue with their asthma medication during pregnancy:

- Provide (or update) an individualised asthma action plan
 - Regularly review asthma control during pregnancy
 - Prescribe preventers, if indicated, just as for other adults, aiming to maintain the best possible asthma control and to avoid asthma flare-ups
 - Reinforce the importance of Influenza vaccination and a smoke-free environment
-

Rhinitis

Pregnancy may be complicated by new-onset or pre-existing allergic disease, including rhinitis, urticaria, angioedema or atopic dermatitis. Other than asthma, there is little evidence on the management of allergic disorders in pregnant women.

The most common causes of nasal symptoms necessitating treatment during pregnancy are:

- Pregnancy rhinitis
- Allergic rhinitis
- Rhinitis medicamentosa
- Sinusitis

Pregnancy rhinitis

Pregnancy normally induces hyperaemia and oedema of the nasal mucosa.

In pregnancy rhinitis, symptoms include nasal congestion that may be accompanied by watery or viscous clear nasal secretions that last many weeks, mouth breathing at night and reduced quality of sleep. There are no other signs of respiratory tract infection. It resolves within two weeks after delivery. It is a diagnosis of exclusion.

It is common, with 20-30% of pregnant women developing it. The pathophysiology is not known, but may be due to hormonal changes. There is no known allergic cause and neither asthma nor hay fever is more common among women who develop pregnancy rhinitis.

Pregnancy rhinitis does not usually require therapy, nor does it respond well to medications. In those who seek specific treatment, non-pharmacological measures are suggested.

Allergic rhinitis

Allergic rhinitis is usually pre-existing, although it may develop or be recognised for the first time during pregnancy. Pre-existing rhinitis may worsen, improve or remain unchanged during pregnancy. Patients with allergic rhinitis may have symptoms of sneezing, nasal pruritus and watery rhinorrhoea, and some have concomitant ocular itching and irritation. Common triggers include dust mites, animal dander, moulds and pollens.

Allergen testing

Although allergy skin testing is considered extremely safe, there are rare cases where, for highly sensitive patients, skin testing can induce systemic allergic reactions. Thus, if in pregnancy it is required to identify the specific inhalant allergens to which a previously untested patient is sensitive, blood testing for allergen-specific immunoglobulin E is preferred. Alternatively, empirical therapy can be initiated.

34. National Asthma Council. Australian Asthma Handbook, 2019

Management

Management techniques include:

- **Allergen avoidance**
- **Non-drug therapies**

Non-pharmacologic interventions may be considered first in pregnant women with rhinitis symptoms:

- Saline nasal sprays or nasal irrigation – saline nasal spray and irrigation is associated with improvement in a variety of rhinitis conditions and carries little risk if properly performed. A variety of devices, including bulb syringes and bottle sprayers, may be used to perform nasal lavage. This can be performed daily or only as needed for intermittent symptoms
- Exercise – regular physical exercise can help by causing physiologic nasal vasoconstriction
- Nasal dilator strips – adhesive strips that mechanically hold the nasal valves open (external nasal dilators) are available over-the-counter and can be useful at night
- Elevation of the head of the bed by 30 to 45 degrees
- placing bricks or other objects under the legs of the bed is often more effective than using extra pillows

- **Drug therapies**

As there are few well-controlled clinical studies in pregnant women examining the safety of, medications for allergic rhinitis, these should only be used during pregnancy if the benefit to the mother justifies the potential risk to the fetus. Ideally, drug therapy should be avoided in the first trimester of pregnancy; however, these are some options:

- Cromolyn sodium nasal spray – intranasal cromolyn sodium (intranasal chromones) is considered safe in pregnancy and therefore a first-line drug therapy. Cromolyn sodium is also minimally absorbed into the systemic circulation when applied to a mucosal surface
- Glucocorticoid nasal sprays – intranasal glucocorticoids are highly effective for allergic rhinitis and are particularly helpful for alleviating nasal congestion and postnasal drip. Glucocorticoid sprays are the treatment of choice for moderate-to-severe allergic rhinitis during pregnancy.

The lowest effective dose should be used during pregnancy. If required, fluticasone (Flonase TM, Xhance TM) or mometasone (Nasonex TM, Sinuva TM, Propel TM) are the agents more commonly used

- **Oral antihistamines**

Oral antihistamines are less effective for the treatment of allergic rhinitis compared with intranasal glucocorticoids, particularly for the relief of nasal congestion and postnasal drip. Several studies have evaluated the safety of antihistamines during pregnancy. Second-generation agents are less sedating and have fewer cholinergic side effects compared with first-generation agents, however have a lower safety drill.

- Among second-generation antihistamines, loratadine (10 mg once daily) and cetirizine (10 mg once daily) may be considered the antihistamines of choice in pregnancy. They are rated category B1 and B2 respectively in pregnancy
- First-generation agents are widely available, inexpensive and can be useful on an as-needed basis and/or before bed. Among the first-generation agents, Chlorpheniramine is generally recommended as the first-generation antihistamine of choice for use during pregnancy because it has been used for decades, and animal and human data are reassuring. They are rated category A in pregnancy

- **Antihistamine nasal sprays**

Intranasal antihistamines have a “B3” category (i.e. have been used by a limited number of pregnant women without any proven increases in harmful effects on the fetus, but animal studies have demonstrated foetal harm). Until more information is available, it is generally suggested that these medications are avoided in pregnancy

- **Decongestants**

Decongestants are vasoconstrictors that are available as both oral preparations and nasal sprays. It is not known whether or not this group of drugs crosses the placenta. Nasal or oral decongestants are not generally recommended for use in pregnancy

Rhinitis medicamentosa

Rhinitis medicamentosa refers to symptoms of rhinitis resulting from application of topical agents to the nasal mucosa. The most common precipitants are over-the-counter decongestant nasal sprays. Several days of nasal decongestant use leads to rebound nasal congestion as the medication wears off. This prompts patients to increase the dose in an effort to relieve symptoms, thus establishing a vicious cycle of nasal congestion and escalating decongestant use.

It is best avoided by limiting use of these sprays to fewer than three days. Treatment involves discontinuation of the nasal decongestant and, often, concomitant treatment with intranasal glucocorticoids.

Acute bacterial rhinosinusitis

Sinusitis may occur during pregnancy and may be more common. Many pregnant women with sinusitis lack classic clinical findings. Antibiotics are generally required.

Anaemia

Physiologic anaemia of pregnancy and iron deficiency are the two most common causes of anaemia in pregnant women. However, other potential causes of anaemia such as haemoglobinopathy and other nutritional deficiencies should not be overlooked.

Definitions of anaemia:

- Anaemia in pregnancy – Hb <110 until 20 weeks and <105g/L after 20 weeks³⁵
- Severe anaemia – Hb <70g/L

Effect of severe anaemia:

- For the fetus:
 - Preterm birth
 - Fetal growth restriction
- For the mother:
 - Tiredness, shortness of breath, cardiovascular compromise
 - Blood transfusion
 - Infection
 - Death in the event of an antepartum/postpartum haemorrhage
 - Delayed recovery and wound healing in the postpartum period

Physiologic anaemia of pregnancy (dilutional)

In pregnancy, plasma volume increases by 10 to 15% in the first trimester, expands rapidly until 30 to 34 weeks and then plateaus to term. The total gain in plasma volume is around 1000-1600 ml, which is a 30 to 50% increase from pre-pregnancy. Despite an associated overall increase in red blood cell mass of about 15 to 30%, these physiologic changes result in a dilutional anaemia. Typically, these changes result in mild anaemia with haemoglobin of 100 to 110 g/L. However, there is no specific haemoglobin or haematocrit value that can be used to distinguish physiologic dilutional anaemia from other causes of anaemia.

Iron deficiency anaemia

Demand for iron increases during pregnancy and insufficient iron intake, absorption or blood loss can result in iron deficiency or microcytic anaemia. Iron deficiency anaemia is generally accompanied by a ferritin <30ug/L (note that different laboratories use different assays, so cut-offs vary).

Note: Women with anaemia in the presence of a normal ferritin should have further testing to exclude other causes of anaemia (e.g. thalassaemia/haemoglobinopathy, folate or Vitamin B12 deficiency).

35. Department of Health, Pregnancy care guideline 2018, view [online](#)

Management of iron deficiency in pregnancy

Although there is an increase in iron requirements during pregnancy, universal iron supplementation in pregnancy is not recommended.

Iron supplementation is routinely recommended for women with iron deficiency anaemia or those at risk of developing iron deficiency during pregnancy.

Oral iron supplementation:

Dietary changes alone are usually insufficient to correct significant iron deficiency anaemia, with oral iron supplementation usually necessary. Oral iron supplementation is effective and safe to replace iron. Most multivitamins do not contain sufficient amounts of elemental iron to treat iron deficiency.

Oral iron supplements containing 100-200mg elemental iron daily or every second day is usually recommended. Absorption may be improved by taking Vitamin C concurrently with iron and/or avoiding coffee, tea, and milk at the time the iron supplement is taken.

Commonly reported side effects of oral iron supplementation include constipation, black stools, abdominal discomfort, nausea, and vomiting.

When a rapid rise in haemoglobin is not required, intermittent dosing (1 tablet every second day or 2-3 times/week) or lower doses of 60mg elemental iron often reduce gastrointestinal side-effects along with improved absorption of oral iron.

Following administration of oral iron, haemoglobin level typically increases by 20g/L every 3-4 weeks or 1-2g/L per day. Once the haemoglobin level is in the normal range, replacement should continue for 3 months and until at least 6 weeks postpartum to replenish iron stores.

Referral to a dietitian for assessment and advice could also be considered for women on restricted diets.

Oral iron supplements available in Australia BRAND NAME ®	Formulation	Elemental Iron Content	Other Active Ingredients
Fefol	270mg ferrous sulfate controlled release capsule	87.4mg	Folic acid 300 micrograms
Ferro-f-tab	310mg ferrous fumarate tablet	100mg	Folic acid 350 micrograms
Ferro-grad C	325mg ferrous sulfate controlled release tablet	105mg	Ascorbic acid 500mg
Ferro-Gradumet	325mg ferrous sulfate controlled release tablet	105 mg	Nil
Ferro liquid	30mg/5mL ferrous sulfate oral liquid	6mg/mL	Nil
Ferro-tab	200mg ferrous fumarate tablet	65.7 mg	Nil
FGF	250mg ferrous sulfate controlled release tablet	80 mg	Folic acid 300 micrograms
Maltofer Syrup	185mg/5mL Iron polymaltose complex syrup	50mg/5mL	Ethanol 3.25mg/mL
Maltofer tablet	370mg Iron polymaltose complex tablet	100mg	Nil

FBE and ferritin	Oral treatment (elemental iron)	Interval to repeat FBE +/- ferritin	Duration of treatment
Normal Hb (≥ 100 g/L) and low ferritin	100mg daily	28 weeks and 36 weeks of gestation	Minimum of 12 weeks
Low Hb (< 100 g/L) and low ferritin	100-200mg daily	≤ 4 weeks depending on gestation and degree of anaemia	

Intravenous iron therapy

Intravenous (IV) iron is used in women who cannot tolerate oral iron; those with severe anaemia, especially later in the pregnancy; and those for whom oral iron is not effective in raising the haemoglobin. Intravenous iron is much more costly to the health care system than oral iron.

Intravenous iron is generally avoided in the first trimester, due to a lack of safety data. Iron sucrose may be considered in severe anaemia in the first trimester in a hospital setting.

IV iron is associated with severe adverse reactions in about one per 1000 women. Therefore, it is important that women receive IV iron in a setting where rapid resuscitation can be provided should an adverse reaction occur. Anaphylaxis is also associated with adverse fetal outcomes. For this reason, it is generally recommended that it is undertaken at the hospital.

IV therapy should be considered in:

- Iron deficiency anaemia (Hb < 100 g/L) in late gestation (> 36 weeks)
- Iron deficiency anaemia (Hb < 100 g/L) < 36 weeks where 4 weeks of sufficient oral iron replacement has failed or cannot be tolerated
- Severe symptomatic anaemia (Hb < 90 g/l), to avoid imminent decompensation/transfusion

Not all IV therapy has adequate safety data. After the first trimester, the hospitals use Ferric carboxymaltose (Ferrinject™) for ease as it is rapid to administer.

Of note:

- Intramuscular iron injections tend to be painful and there is significant risk of permanent skin staining. Administration by the IM route is no safer than the IV route and use of IM iron is not recommended
- Oral iron supplements should be ceased after an iron infusion
- FBE and ferritin should be checked 2-4 weeks after an iron infusion

Advantages of IV iron replacement	Disadvantages of IV iron replacement
Rapid delivery of iron	Allergic reactions and anaphylaxis (about 1 in 1000)
Avoidance of gastrointestinal side effects	Flu-like illness (common)
	Need for close observation for administration
	Cost
	Skin staining – may be permanent

Women with low ferritin in the absence of anaemia should generally not receive an iron infusion. However, it may be considered late in pregnancy if there is an increased risk of major blood loss (e.g. placental adhesion disorder) or where it is reasonably anticipated that anaemia will result.

Vitamin B12 deficiency

Cobalamin (Vitamin B12) is essential for infant neurodevelopment, with untreated maternal Vitamin B12 deficiency potentially resulting in irreversible neurological damage.

Recommended Daily Intake [RDI] for Vitamin B12 is 2.6 micrograms/day during pregnancy and 2.8 micrograms/day during breastfeeding.

Women with diets restricting Vitamin B12 (e.g. vegans and some vegetarians) and women with B12 absorption problems (e.g. previous bariatric surgery and some Crohn's disease) should be supplemented with Vitamin B12 in pregnancy and lactation.

Diagnosis

- Total serum B12 levels fall during pregnancy in the absence of B12 deficiency.

If low or indeterminate total serum B12 is detected (<260 pmol/L), holotranscobalamin (active B12) will be routinely tested under Medicare Benefits Schedule (MBS) rules

Treatment:

- Treat if active B12 (holotranscobalamin) is low
- Increase oral amount of Vitamin B12 supplementation to 1000mcg per day
- As poor bioavailability, intramuscular (IM) B12 is often also required
 - Common replacement is Vitamin B12, 1mg IM. Repeat levels in 1 week and review in 2 weeks, when dose is repeated if required
 - Maximum of 3 doses; minimum of 2 weeks apart
- Consider if woman may have other nutritional deficiencies such as iron and omega 3

Vitamin D deficiency

Management of Vitamin D deficiency includes:

- Increasing food intake of Vitamin D (e.g. eggs and fish)
- Adequate calcium dietary intake
- Increasing safe sun exposure
- Vitamin D supplementation. Reasonable advice for pregnant women is:
 - Vitamin D level below 30nmol/L commence 2,000 IU/day
 - Vitamin D levels 30-49 nmol/L commence 1,000 IU/day

In cases where more Vitamin D supplementation is recommended, the maximum Vitamin D supplementation is 3,000 International Units (IU) /day. High-dose weekly and monthly Vitamin D supplementation should not be used in pregnancy.

Also see [chapter 14](#).

Thalassaemia

Thalassaemia is an inherited disorder associated with impaired synthesis of one or more globin chains of haemoglobin, with alpha thalassaemia and beta thalassaemia being the most common forms.

Clinical manifestations range from asymptomatic carrier status to profound abnormalities, including severe anaemia, extramedullary haematopoiesis, skeletal and growth deficits, iron overload and a dramatically shortened life expectancy in the absence of aggressive treatment. The severity of clinical features correlates with the number of globin chains that are impaired.

Diagnosis:

(see section on [Haemoglobinopathy screening](#))

Management

Urgent partner screening is essential if a woman has an abnormal haemoglobin electrophoresis or anaemia and thalassaemia cannot be excluded.

Partner testing consists of: FBE, Haemoglobin electrophoresis, Ferritin +/- DNA analysis.

If partner testing is also abnormal, contact the shared maternity care coordinator as soon as possible and provide results in order for appropriate referral to the correct hospital department.

Pregnant women in whom beta thalassaemia minor is identified should:

- Receive high dose folic acid (5mg daily) throughout pregnancy and lactation as there is some evidence that this is beneficial in optimising haemoglobin levels
- Iron supplementation should not be given in the absence of documented iron deficiency. Many patients with thalassaemia minor have a mild degree of iron overload and iron supplements do not improve haemoglobin or red cell indices unless iron deficiency is present

Infectious diseases

Support and resources

The [Australasian Society of Infectious Diseases Management of Perinatal Infections](#) is a useful resource that covers the management of 14 common perinatal infections, including CMV, Herpes Simplex, Toxoplasma gondii, Parvovirus, Varicella and Streptococcus Group B.

Each hospital has access to physician advice regarding infectious diseases.

An infectious disease may be detected prior or after a woman has attended her first hospital appointment.

- For urgent assessment of an infectious illness or exposure to an infectious disease, refer women to the Emergency Department or contact the on-call registrar/obstetrician for advice.

If referring to the Emergency Department, please call prior to sending the woman so appropriate arrangements can be made to minimise exposure to others.

- If a non-urgent infectious disease appointment is required and the woman is registered for shared maternity care, contact the shared maternity care coordinator or nurse coordinator. See [Chapter 17](#) for SMCC contact details
- If a non-urgent infectious disease appointment is required and the woman has not yet been seen at the hospital, please send a comprehensive referral in via the normal referral pathways, clearly stating that the woman is pregnant and what the issues are.
Please be clear on the referral if the woman has already been referred for maternity care or if the referral is for both maternity care and infectious diseases referral

Referral to an infectious diseases physician at the hospital should occur with:

- Newly diagnosed hepatitis B or C
- Hepatitis B or C with abnormal liver function tests or high viral loads.

Antiviral treatment in pregnancy for women with chronic hepatitis B and high viral load should be considered as this decreases the risk of vertical transmission.

See [Chapter 5](#) for infectious disease screening.

Genital herpes

If a woman develops herpes in pregnancy, it is important to establish if it is a primary infection or a recurrence, as the implications and management differ.

If unsure, perform urgent genital lesion/s swab for HSV 1 and 2 polymerase chain reaction (PCR) and blood HSV 1 and 2 serology.

Primary herpes

The highest risk of vertical transmission to the baby and the development of neonatal herpes is if a woman contracts her first (primary) episode of genital herpes infection during the pregnancy, especially if this occurs in the third trimester.

Primary genital herpes is diagnosed if the woman's blood test is seronegative for the HSV Ig G type, which has been detected on her genital swab HSV PCR.

In such cases, it is recommended SMCA commence prompt antiviral treatment and refer to the hospital for both obstetric and infectious diseases (ID) review. At the hospital, the risks of the modes of delivery will be discussed.

Recurrence of herpes

If a woman has a history of recurrent herpes, then consider the use of prophylactic antivirals from 36 weeks until birth. There is evidence antiviral use decreases recurrence, caesarean section and viral shedding (and therefore infection of a non-congruent partner). However, there is no evidence for a decrease in neonatal herpes. The decision to use antivirals is therefore individualised to the woman.

If the woman decides on prophylactic antivirals or has a recurrence of herpes in pregnancy, then Acyclovir (Zovirax™) 400mg dose three times per day or Valacyclovir (Valtrex™) 500 mg dose twice per day are the drugs most commonly used. In addition, to decrease the risk of recurrence, the woman should be advised to care for the skin of her perineum and treat symptomatic thrush promptly.

Careful speculum examination for active genital HSV should be performed at the hospital in early labour on all women if vaginal delivery is planned.

Varicella

Of note, testing for seroconversion after varicella vaccination is not recommended. Antibody levels after vaccination may be up to 10-fold lower than levels induced by natural infection with tests are usually sensitive enough to detect these levels.

If a woman develops varicella in pregnancy or has been exposed to varicella during pregnancy and she is non-immune or of unknown immunity, the woman should be referred to the Emergency Department for specialist advice as soon as possible. If a woman is thought to be potentially infectious, please call the Emergency Department prior to sending in the woman so appropriate arrangements can be made to minimise exposure to others.

Women with varicella infection may be treated with antivirals, especially if delivery is imminent, infection is recent, or she is symptomatically unwell.

Pregnant women who are not immune are at high risk of severe disease and complications:

“varicella infection during the first trimester of pregnancy confers a small risk of miscarriage. Maternal infection before 20 weeks may rarely result in the fetal varicella zoster syndrome, with the highest risk (2%) occurring at 13–20 weeks. Clinical manifestations include growth retardation, cutaneous scarring, limb hypoplasia and cortical atrophy of the brain.

Intrauterine infection can also result in herpes zoster in infancy. This occurs in less than 2% of infants. The highest risk is associated with infection in late pregnancy. In the third trimester, maternal varicella may precipitate the onset of premature labour.

Severe maternal varicella and pneumonia at any stage of pregnancy can cause fetal death.”³⁶

Women who have been exposed to varicella and are non-immune/unknown immunity may be offered zoster immune globulin (VZIG) for prophylaxis. This generally needs to be given within 72 hours of exposure to varicella.

Women who are non-immune to varicella with no known immunisation history should be advised to:

- Avoid unwell people
- Present to the Emergency Department immediately if in contact or potential contact with varicella (phone prior)
- Reconsider overseas travel
- Be immunised in general practice after delivery. (As varicella vaccine is a live vaccine, it is contraindicated in pregnancy)

Slapped cheek infection (parvovirus)

Parvovirus B19 (slapped cheek) infection in the first 20 weeks of pregnancy can cause fetal anaemia with hydrops fetalis. Fetal death occurs in less than 10% of cases.

Pregnant women who have been exposed to parvovirus infection in the first 20 weeks of pregnancy should be offered serological testing for parvovirus-specific IgG to determine their susceptibility. The diagnosis of parvovirus infection is usually made serologically by demonstration of IgG seroconversion and/or the presence of parvovirus IgM. IgM is usually detectable within 1–3 weeks of exposure and lasts for 2–3 months. Repeat testing in 10–14 days may be required.³⁷

Women who are diagnosed with parvovirus at < 22 weeks gestation should be referred to the hospital promptly so that a tertiary ultrasound and obstetric review can be undertaken. This can be facilitated by the shared maternity care coordinator. If further management is required, including serial ultrasound, this will be arranged by the hospital and shared maternity care is usually ceased.

36. Department of Human Services. Chicken Pox or Shingles (Varicella/Herpes Zoster), in Blue Book: Guidelines for the Control of Infectious Diseases, 2005. Accessed 15 June 2020 <http://ideas.health.vic.gov.au/bluebook/chicken-pox.asp>.

37. GL Gilbert, Parvovirus B19 infection and its significance in pregnancy, Centre for Infectious Diseases and Microbiology, Institute of Clinical Pathology and Medical Research, Westmead Hospital, Westmead, New South Wales, April 2000.

Group B streptococcus

Group B streptococcus (GBS) or *Streptococcus agalactiae* is a gram-positive coccus that frequently colonises the human genital and gastrointestinal tracts and, less frequently, the upper respiratory tract of children and adults. It is an important cause of illness in neonates, young infants, pregnant women and adults with underlying medical conditions.

GBS infections in pregnant women include urinary tract infection, intra-amniotic infection, endometritis and bacteraemia. Invasive maternal infection with GBS is associated with pregnancy loss and preterm delivery.

Asymptomatic bacteriuria

GBS is a frequent cause of asymptomatic bacteriuria, cystitis and pyelonephritis during pregnancy. It is isolated in 7-30% of pregnancy-associated cases of asymptomatic bacteriuria. Untreated asymptomatic bacteriuria (independent of the bacterial species) is associated with progression to pyelonephritis, low birth weight or preterm delivery, with these adverse outcomes decreased with antibiotic treatment.

However, whether asymptomatic GBS bacteriuria during pregnancy warrants treatment at the time of identification depends on the quantification of bacteria (in colony-forming units [CFU] per mL) in the urine:

- Bacteriuria $\geq 10^5$ CFU/mL – Significant bacteriuria that warrants antimicrobial treatment in addition to intrapartum antibiotics.
- Bacteriuria $< 10^5$ CFU/mL – Reflection of anogenital colonisation. Antimicrobial treatment not required. Requires intrapartum antibiotics.

If treatment is undertaken, a post treatment retest MSU M/C is indicated.

Asymptomatic GBS bacteriuria in pregnancy is also a marker for heavy anogenital colonisation with GBS.

As such, if woman has GBS bacteriuria at any gestation, the woman is considered colonised with GBS in delivery. Therefore intrapartum antibiotics are recommended and the routine 36-week anovaginal swab for GBS is not required.

Neonatal GBS disease

Approximately 1 in 4 women test positive for group B streptococcus on routine anovaginal swab at 36 weeks (see section on GBS).

Although GBS colonisation is asymptomatic for women, maternal colonisation is the critical determinant of infection in neonates and young infants (less than 90 days of age), in whom GBS is the most common cause of bacterial infection. Vertical transmission usually occurs during labour or after rupture of membranes.

A woman is considered colonised with GBS if any of the following applies:

- GBS bacteriuria at any time during current pregnancy
- Previously given birth to an infant with invasive GBS disease
- GBS swab at 36 weeks is positive for GBS

Approximately 50% of women who are colonised with GBS will transmit the bacteria to their newborns. In the absence of intrapartum antibiotic prophylaxis, 1–2% of those newborns will develop GBS early onset disease (i.e. GBS infection within first week of life).

Intrapartum antibiotics for maternal GBS colonisation have resulted in a reduction in GBS early-onset disease of >80% of cases. The incidence of the much less common late-onset GBS disease has remained stable.³⁸

If a woman is colonised with GBS:

- Antenatal treatment is not routinely required. A (antibiotic administration remote from delivery does not eradicate GBS colonisation at the time of delivery) (Women at high risk of premature labour or premature rupture of membrane (e.g. previous premature labour, short cervix, or cervical suture) may have screening GBS swabs undertaken in the first and second trimester at the hospital. In such cases, if GBS positive, antibiotic treatment may be indicated antenatally, with this decided by the hospital doctor).

If a woman is GBS colonised, she should be advised to present to the hospital early in labour or on rupture of membranes

- Intrapartum intravenous antibiotic treatment will be administered at the hospital. Intravenous route is required to achieve a rapid high concentration in maternal serum for placental transfer to the fetal systemic circulation and amniotic fluid. It is preferable that antibiotic treatment is administered at least 4 hours prior to delivery. Unless there is an allergy, penicillin is used

GBS colonisation is not an indication for routine induction or caesarean delivery. In the case of term pre-labour rupture of membranes, the hospitals have various protocols on the timing of induction.

Bacterial vaginosis

Pregnant women with Bacterial Vaginosis (BV) have a higher risk of premature rupture of membranes, preterm labour and preterm birth due to ascending infection. Fever during and after delivery is also more common (due to post-partum endometritis and wound infection). BV is asymptomatic for 50% of women in pregnancy, but may result in a vaginal discharge that can be grey in colour with fishy odour.

Routine testing for asymptomatic BV is not recommended.

Treatment is recommended for all symptomatic pregnant women. Because oral therapy has not been shown to be superior to topical therapy for treating symptomatic BV in effecting a cure or preventing adverse outcomes of pregnancy, symptomatic pregnant women can be treated with either of the oral or vaginal regimens recommended for non-pregnant women.

However, there is no current evidence that treatment changes the risk of preterm birth, low birth weight or premature rupture of the membranes in women at low risk of preterm birth.

Ureaplasma

Ureaplasma can be a commensal, but can also be a pathogen under certain circumstances.

Routine screening for ureaplasma is not indicated and if ureaplasma is found on a vaginal swab in a low-risk pregnancy and there are no symptoms, then no treatment is required (with the question remaining as to why the swab was performed). However, if asymptomatic ureaplasma is detected in women at high risk of premature labour or premature rupture of membrane (e.g. previous premature labour, short cervix, or cervical suture) then antibiotic treatment may be considered. This decision will be undertaken by the hospital doctor.

COVID-19³⁹

Information on the infectivity, transmission and impact of COVID-19 infection on pregnant women, their babies and during breastfeeding is limited as a result of the recency of the disease's emergence. Understanding will continue to rapidly evolve, with this informing advice and management.

To access the latest information:

RANZCOG: COVID-19 hub

- [A message for pregnant women and their family](#)
- [WorkSafe: Exposure to viruses in workplaces](#)

Department of Health: [Clinical guidance and resources](#)

Royal College of Obstetrician and Gynaecologist:

[Coronavirus infection and pregnancy](#)

Evidence in mid-2020 suggests that:

- COVID-19 is not teratogenic in the second and third trimester; however, it is unknown in the first trimester
- Data does not yet suggest an increased risk of miscarriage in relation to COVID-19
- Women do not appear to be more severely unwell if they develop COVID-19 infection than the general population. It is expected that the large majority of pregnant women will experience only mild or moderate cold/flu like symptoms
- Babies do not generally appear to become readily infected during vertical transmission or to become unwell

Antenatal care during COVID

If a woman undertaking shared care is COVID positive, contact the shared maternity care coordinator. The hospital will decide on her eligibility for shared maternity care and her antenatal care on a case-by-case basis, based on evolving evidence.

Malaria

See [Chapter 14](#).

Zika

See [Chapter 14](#).

Hepatitis E

See [Chapter 14](#).

Skin changes and dermatoses

Skin conditions caused by normal hormonal changes during pregnancy include striae gravidarum, hyperpigmentation, and hair, nail and vascular changes.

Striae gravidarum

Striae gravidarum (stretch marks) occur in up to 90% of pregnant women by the third trimester. They are caused by the rupture of dermal elastic fibres. Striae appear as pink-purple, atrophic lines or bands on the abdomen, buttocks, breasts, thighs or arms.

They are more common in younger women, women with larger babies and women with a higher BMI. Women with darker skin, a history of breast or thigh striae or a family history of striae gravidarum are also at higher risk.

Although many women use emollients, and oils (e.g. Vitamin E cream, cocoa butter, aloe vera lotion, olive oil) to prevent striae, there is no evidence these are effective.

Melasma (chloasma or mask of pregnancy)

Melasma has been reported in 75% of expectant mothers, predominantly in the second or third trimester. Exposure to sunlight and other ultraviolet radiation worsens melasma; therefore, using high-potency, broad-spectrum sunscreens and avoiding excessive exposure to sunlight may prevent melasma from developing or being exacerbated.

Vascular changes

Spider naevi are more common in fair-skinned individuals with the usual sites are around eyes, neck, face, upper chest, hands and arms. They appear in the second trimester and the majority will disappear by the third postnatal month.

Hair and nail changes

During pregnancy, loss of hair decreases so many women experience some degree of hirsutism on the face, limbs and back. This is caused by endocrine changes during pregnancy and thickening of hair, caused by a prolonged active (anagen) phase of hair growth.

Postpartum, most women notice increase hair loss as scalp hair enters a prolonged resting (telogen) phase of hair growth, causing increased shedding (telogen effluvium), which may last for several months or more than one year after pregnancy.

Nails usually grow faster during pregnancy. Pregnant women may experience increased brittleness, transverse grooves, onycholysis and subungual keratosis. Most of these conditions resolve postpartum.

Physiological skin changes in pregnancy

Pigmentation

- Linea nigra (abdomen)
- Nipples
- Axillae
- Genitalia
- Perineum
- Melasma (chloasma gravidarum or pregnancy mask) on forehead, malar distribution

Glands

- Eccrine: Miliaria, hyperhidrosis
- Apocrine: Decreased activity (improves conditions such as hidradenitis suppurative)

Sebaceous

- Activity increases in third trimester, but efforts on acne variable
- Montgomery tubercles (follicles) may develop (hypertrophic sebaceous glands, non-pigmented elevations in the primary areola)

Vasculature

- Spider Naevi
- Telangiectasia
- Palmer erythema
- Varicosities: Saphenous, Vulval/vestibular/vaginal, Haemorrhoidal
- Vasomotor instability, such as, flushing
- Increased hydrostatic pressure, such as, purpura
- Increased capillary permeability such as, oedema in extremities and face

Connective tissue

- Striae gravidarum
- Skin tags (epithelial polyps)

Dermatoses of pregnancy

The dermatoses of pregnancy are a heterogeneous group of pruritic inflammatory dermatoses that occur exclusively during pregnancy or in the immediate postpartum period. They include:

- Pruritic urticarial papules and plaques of pregnancy
- Polymorphic eruption of pregnancy
- Atopic eruption of pregnancy
- Intrahepatic cholestasis of pregnancy
- Pustular psoriasis of pregnancy
- Pemphigoid gestationis

Pruritis

Differential diagnosis

Pruritus in pregnancy is common, affecting approximately 1 in 4 women. The most common cases are dry skin and eczema. Other causes are PUPPP (pruritic urticarial papules and plaques of pregnancy) where liver function is normal, intrahepatic cholestasis of pregnancy where liver function is abnormal and pemphigoid gestationis.

Referral

- If pruritus is associated with clinical jaundice, abdominal pain, systemic illness or decreased fetal movement, urgent referral to the hospital Emergency Department is required due to the concern about cholestasis
- If there are no associated systemic symptoms, but cholestasis remains a concern, then urgent LFTs and serum bile acids are required. If these are abnormal, refer the woman to the Pregnancy Day Service or Emergency Department
- If there are concerns about pemphigoid gestationis or pustular psoriasis of pregnancy, semi-urgent referral is required

Pruritic urticarial papules and plaque of pregnancy (PUPPP)

PUPPP is a benign, self-limiting pruritic inflammatory disorder that usually affects women late in the last trimester of pregnancy or immediately postpartum. It is characterised by an intense pruritic rash and erythematous papules within striae that generally first appear on the abdomen. The disorder is more common with first pregnancies and multiple gestations. The rash typically resolves 1 to 2 weeks after delivery. This condition does not harm the baby and improves after the baby is born.

The diagnosis is usually clinical, based upon history and physical examination. A skin biopsy is generally not necessary for diagnosis and there are no laboratory abnormalities related to PUPPP. The goal of management is relief of symptoms. Antihistamines and topical steroids may be used to treat pruritus. Systemic corticosteroids are sometimes required for extreme pruritus.

Intrahepatic cholestasis of pregnancy

Intrahepatic cholestasis of pregnancy is also known as cholestasis of pregnancy, jaundice of pregnancy or pruritus/prurigo gravidarum. Unlike other dermatoses, this condition does not have primary skin changes. Patients experience severe, generalised pruritus, predominantly on the palms and soles, which is usually more severe at night. Secondary skin

changes may occur as a result of pruritus. Itching is common and mainly affects the hands, feet and pressure areas. The condition usually resolves postpartum. It is more common in women of Indian or South-American origin or those with chronic hepatitis B or hepatitis C.

Obstetric cholestasis is diagnosed when otherwise unexplained pruritus occurs in pregnancy along with abnormal liver function tests (LFTs) and/or raised bile acids. Some women develop pruritus days/weeks before the development of abnormal liver function.

There is an increased rate of fetal and maternal mortality and morbidity, and women need to be referred to hospitals urgently for surveillance and a decision regarding delivery.

Atopic eruption of pregnancy

Atopic eruption of pregnancy (AEP) is a pruritic disorder of pregnancy that presents as an eczematous or papular eruption in patients with an atopic background. It is the most common dermatosis of pregnancy.

Affected women may experience dry skin, with rough red patches or itchy bumps affecting any part of the body. Scratch-marks (excoriations) or weeping (exudation) of the skin may be present. The rash is very itchy.

They may or may not have experienced eczema (atopic dermatitis) before pregnancy or they may develop a rash for the first time during pregnancy. This condition does not harm the baby and often improves after the baby is born.

There is a higher incidence of atopic eruption of pregnancy in women with a family history of atopy. It is likely triggered by pregnancy-specific immunological changes.

AEP generally starts during early pregnancy and often recurs in subsequent pregnancies. Liver function and bile acid tests are normal.

There are two forms of this condition:

- Eczematous (E-type AEP) – rough and red patches develop. This typically occurs on the face, neck, creases of elbows and backs of knees
- Prurigo (P-type AEP) – bumps develop and can affect widespread areas like the abdomen, arms and legs

AEP is usually diagnosed from a physical examination. A skin biopsy may be performed, and blood tests may show elevated IgE.

The goal of management is relief of symptoms. Oatmeal baths, emollients, topical antipruritics and calamine in aqueous cream, topical steroids and oral antihistamines, and ultraviolet light may help to alleviate symptoms. Wearing soft light clothes and staying in a cool environment is recommended.

Pustular psoriasis of pregnancy (PPP) (formerly called impetigo herpetiformis)

Pustular psoriasis of pregnancy is a rare variant of generalised pustular psoriasis occurring during pregnancy or triggered by pregnancy.

PPP typically occurs in the third trimester of pregnancy, but can occur anytime during pregnancy. The rash begins in the flexural areas and spreads centrifugally. Pruritus is usually absent. The trunk and extremities are usually involved, while the hands, feet and face are usually spared. It usually presents with symmetric, erythematous plaques studded at the periphery with concentric rings of sterile pustules. The plaques then enlarge from the periphery and the centre becomes crusted. The nails may become onycholytic and pitted.

There is an increased rate of fetal morbidity and women need to be referred to hospitals urgently for surveillance and a decision regarding delivery.

Pemphigoid gestationis (formerly called herpes gestationis)

Pemphigoid gestationis is a rare autoimmune bullous disease caused by circulating immunoglobulin G1 (IgG1) autoantibodies. It occurs during the second or third trimester of pregnancy and may be associated with increased fetal risk.

It is characterised by intense pruritus that may precede the onset of visible skin lesions. The rash typically begins on the trunk as urticarial plaques or papules surrounding the umbilicus. The rash spreads rapidly and forms tense blisters. The entire body surface may be involved including the palms and soles of the feet, however mucous membranes and the face are usually spared. The mother is at high risk of recurrent pemphigoid gestationis with subsequent pregnancies.

There is an increased rate of fetal morbidity and women need to be referred to hospitals urgently for surveillance and a decision regarding delivery.

[DermNet NZ](#) is an excellent resource for information on skin diseases.

Resources

Resources	Content summary
Alfred Health	Psychotropic drug advisory service (PDSA). It provides information on psychiatric medicines and other psychoactive substances. Email: PDSA@alfred.org.au Phone: 9076 8036 M: 0417 536 655 Mon - Fri 9.00am to 5.00pm
American Academy of Neurology	Health professional information: <ul style="list-style-type: none"> • Article on Management issues for women with epilepsy - Focus on pregnancy (2009)
Centre for Genetics Education	Neural tube defects
Department of Health and Human Services, Victoria	Health professional information: <ul style="list-style-type: none"> • Low Vitamin D in Victoria, includes section on Vitamin D testing & treatment • Neonatal e Handbook • Information on small for gestational age infants • Guideline on decreased fetal movement
DermNet NZ	Have a range of resources on skin diseases and management
Endocrine Society (US)	Clinical guideline: Management of Thyroid Dysfunction during Pregnancy and the Postpartum (2017)
Merck Manual	Large for gestational age fetus

National Asthma Council Australia	Health professional information: <ul style="list-style-type: none"> • <i>Australian Asthma Handbook</i> available for purchase and download
National Institute for Health and Clinical Excellence (UK)	Clinical guideline: <ul style="list-style-type: none"> • Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period (2015) • Algorithms on diabetes in pregnancy with links to various aspects of care from gestational diabetes to postnatal diabetic care
Pregnancy Care Guideline	Guidelines on antenatal care, includes anaemia
RACGP	<ul style="list-style-type: none"> • Epilepsy in pregnancy • Article: <i>Decreased fetal movements: a practical approach in a primary care setting</i> (2014) • Article <i>Does it matter if I'm "just" pregnant?</i> (2010), outlining how medical problems should be managed differently during early pregnancy
RANZCOG	<ul style="list-style-type: none"> • Clinical Practice Guideline for the Care of Women with Decreased Fetal Movements (2016) • Guideline for the management of hypertensive disorders of pregnancy (2014) • Obstetric Cholestasis (2011) • Resources on COVID-19 • Vitamin and mineral supplementation and pregnancy
RCOG United Kingdom	Clinical guideline: <i>Care of women with obesity in pregnancy (Green top Guideline No. 72)</i>
Society of Obstetric Medicine of Australia and New Zealand (SOMAZ)	Guideline for the management of hypertensive disorders of pregnancy (2015)



CHAPTER 14 NUTRITION AND LIFESTYLE

Nutrition and food safety

The nutritional status of a woman before and during pregnancy plays a vital role in fetal growth and development. Women's requirements for some nutrients increase during pregnancy and breastfeeding in order to support physiological changes, and fetal and infant growth.

Evidence shows more than 90% pregnant women do not meet the national recommendations for fruit and vegetable intake and more than 80% consume excess amounts of food high in saturated fats and sodium. A nutritious and balanced diet is essential for good maternal health and infant growth and development. Additionally, supplementation with folic acid and iodine is evidence-based routine recommendation. There is increasing evidence that regular fish intake (low-mercury fish) is also beneficial.

Women should be advised to:

Intake

- Include lots of fresh fruits, vegetables and whole grains, some low-fat dairy products, and a few sources of protein, such as meat, fish, eggs or dried peas or beans.
- Eat the recommended number of daily serves of the five food groups and drink plenty of water
- Eat 2-3 servings of fish (very low in mercury) per week

Women with restricted diets or who are obese or underweight may benefit from referral to a hospital dietitian.

Avoid

- Fish that are high in mercury (see below)
- Intake of caffeine during pregnancy (one to two cups of coffee or tea a day is reasonable)
- High consumption of liver or liver-based foods (e.g. liver patties or sausage). This may be harmful in pregnancy because of excessive intake of Vitamin A
- Processed foods and fast foods
- Bisphenol A (BPA) and pesticides
BPA is ubiquitous in food, particularly from its presence in the lining of canned goods. Exposure is a concern during pregnancy because of potential neural and behavioural effects in fetuses and infants.
Women should be encouraged to avoid use of plastics for food and beverage containers that contain BPA, and avoid canned goods that use BPA linings.

Fish consumption:

- Pregnant women are advised to eat only cooked fish to avoid potentially harmful organisms
- Fish may be contaminated by environmental pollutants, such as methylmercury, which can cause fetal central nervous system damage.

For this reason, pregnant women (or women who might become pregnant or who are breastfeeding) should:

- Avoid fish that may contain high levels of mercury, such as shark, swordfish, king mackerel, marlin, orange roughy or bigeye tuna (other kinds of tuna are acceptable)
 - Eat 2-3 servings per week of seafood that is likely very low in mercury or other contaminants
 - Check local advisories about the safety of fish caught in local lakes, rivers and coastal areas.
-

Take supplements:

- Supplement with folic acid (minimum 500mcg) from one month prior to pregnancy until the end of the first trimester (see below)
- Supplement with iodine (minimum of 150mcg) from pre-pregnancy until the end of breastfeeding (see below)

Food and water safety:

- Wash hands well before and after handling and preparing food
- Fully cook eggs, fish, chicken, beef, and other meats
- Avoid foods that can easily carry infectious agents, including:
 - Raw sprouts (including alfalfa, clover, radish, and mung bean)
 - Unpasteurised dairy products and fruit/vegetable juices
 - Cured meat or meat products
- Avoid infectious agents and toxins:
 - Thoroughly rinse fresh fruits and vegetables under running water (approximately 30 seconds) before eating
 - Consider peeling fruit
 - Consider purchasing organic fruit and vegetables
- Minimise lead intake; only drink water from cold tap and run water well prior to drinking or use for cooking
- Avoid artificial sweeteners (although not known to be harmful, this is prudent)

The following foodborne infections can have adverse effects on pregnancy:

Toxoplasmosis

Toxoplasmosis is acquired by ingestion of undercooked or cured meat or meat products, unpasteurised milk products, fruit or vegetables contaminated by infected soil, and contaminated unfiltered water as well as non-food sources such as pets, cat litter and soil.

Listeria monocytogenes

Listeria is a common low-level contaminant of both processed and unprocessed foods of plant and animal origin. It is most commonly associated with processed/delicatessen meats, hot dogs, soft cheeses (feta, brie, and blue vein), smoked seafood, meat spreads and pâté, but has also been transmitted by pre-packaged salads, fresh fruits and vegetables that are commonly eaten uncooked. Hot cooked foods are not a vehicle of transmission for Listeria.

Brucellosis

Brucellosis is acquired by ingestion of contaminated food such as raw milk, cheeses made from unpasteurised (raw) milk or raw meat.

Throughout pregnancy, regularly discuss diet, physical activity and weight change with women.

Recommended supplements⁴⁰

The only three universally recommended supplements for pregnancy are iodine, folic acid and Vitamin D.

Iodine

The Recommended Daily Intake (RDI) of iodine is 250 micrograms/day. Women who are pregnant, breastfeeding or considering pregnancy should take an iodine supplement of at least 150 micrograms/day. This is contained in most pregnancy multivitamin supplements.

Folic acid

It is recommended that folic acid is taken for a minimum of one month before conception and for the first 12 weeks of pregnancy to decrease the risk of neural tube defects (NTD). The recommended dose of folic acid is at least 0.5mg daily.

The most robust data for the efficacy of higher dose folic acid supplementation are for women with a previously affected offspring or where either parent has a personal history of NTD. More limited data support recommendations for higher dose folic acid supplementation in the specific other high-risk groups discussed below.

It is generally recommended that the following women take high-dose folate (5mg per day). Women with:

- B thalassaemia minor
- Family history of neural tube defects in a first or second degree relative
- Pre-existing diabetes
- Epilepsy on Medication for epilepsy
- On medications other than antiepileptic drugs that have been associated with reductions in available folic acid (e.g. triamterene, trimethoprim, sulfasalazine)
- Conditions associated with malabsorption (e.g. celiac disease, inflammatory bowel disease, major intestinal resection, some bariatric surgery, advanced liver disease, renal failure)
- BMI ≥ 35 (lacks strong evidence – expert opinion only)

Vitamin D

RANZCOG updated their recommendation for Vitamin D supplementation in 2019.

They recommend:

- All pregnant women take 400IU of Vitamin D daily as part of a multivitamin supplement (irrespective of skin pigment and/or sun exposure)
- Testing of Vitamin D levels in pregnancy is not recommended as part of routine pregnancy screening, regardless of maternal risk factors⁴¹
- Exclusively breastfed babies should be given 400IU of Vitamin D for at least the first 6 months. Infants on full formula do not routinely require supplementation

If Vitamin D testing is undertaken then, under MBS criteria, in pregnancy it is generally limited to women with:

- Deeply pigmented skin
- Chronic and severe lack of sun exposure for cultural, medical, occupational or residential reasons
- Taking medication known to decrease 25OH-D levels (for example, anticonvulsants)
- Malabsorption: conditions that impair fat absorption are associated with inadequate Vitamin D absorption from the gut (e.g. inflammatory bowel disease, untreated coeliac disease, cystic fibrosis, bariatric surgery)
- Chronic renal failure or renal transplant recipient, hyperparathyroidism, hypo or hypercalcaemia, or hypophosphataemia

Management of Vitamin D deficiency includes:

- Increasing food intake of Vitamin D (e.g. eggs and fish)
- Adequate calcium dietary intake
- Increasing safe sun exposure
- Vitamin D supplementation. Reasonable advice for pregnant women is:
 - Vitamin D level below 30 nmol/L commence 2,000 IU/day
 - Vitamin D levels 30-49 nmol/L commence 1,000 IU/day

In cases where more Vitamin D supplementation is recommended, the maximum Vitamin D supplementation is 3,000 International Units (IU) /day. High-dose weekly and monthly Vitamin D supplementation should not be used in pregnancy.

Other supplements

In the absence of evidence for their benefit, it is recommended that unless there is a known deficiency, women do not take supplements, especially in the first trimester.

Omega 3 fatty acids

There is some evidence that adequate intake of Omega 3 fatty acids may significantly decrease the risk of preterm birth. At this stage, the evidence would support that all women consume fish very low in mercury 2-3 times per week.

For women who cannot increase their dietary intake of Omega 3 fatty acids to this level, the value of dietary supplementation of fish oil or pregnancy multivitamin supplement containing Omega 3 fatty acids is inconclusive. However, as there are issues of environmental sustainability of fish oil and potential concerns with quality assurance in its production, it is preferable Omega 3 fatty acids are obtained from whole foods and also that fish oil is not used in the first trimester.

40. RANZCOG, Vitamin and mineral supplementation and pregnancy C-Obs 25, November 2017. View [online](#)

41. RANZCOG guidelines November 2019. Grade A evidence.

Calcium

The Recommended Daily Intake (RDI) of calcium during pregnancy is 1,000 mg/day (19-50 years) or 1,300 mg / day (ages 14-18 years). Adequate dietary calcium is important in decreasing the risk of pre-eclampsia for those at higher risk. For these women, if this cannot be achieved by dietary intake, calcium supplements may be useful. As calcium supplementation has been found to have negative effects on vascular health in other population groups, it is preferable that adequate calcium is obtained from whole foods.

Infections

In order to decrease the risk of infections that affect the fetus and/or mother, women should be advised to:

- Ensure immunity to rubella and varicella pre-pregnancy (and measles if the woman is from overseas or has no history of immunisation) (see [Chapter 9](#))
- Immunise for pertussis and annual influenza in each pregnancy (see [Chapter 9](#))
- Ensure food safety (see [above](#))
- Practice pet safety in order to decrease the risk of toxoplasmosis by:
 - Not changing animal litter boxes or wearing gloves and then washing hands carefully afterwards
 - Wearing gloves while gardening and washing hands after working in the yard since soil can be contaminated by cat faeces
- Decrease the risk of acquiring infections such as cytomegalovirus (CMV) by:
 - Avoiding people who are unwell in pregnancy
 - Washing hands often with soap and water, especially after changing nappies, feeding a young child, wiping a young child's nose or drool, and handling children's toys
 - Not sharing food, drinks or eating utensils with young children
 - Not putting a child's pacifier in mouth
 - Not sharing toothbrushes with a young child
 - Avoiding contact with saliva when kissing a child
 - Cleaning toys, countertops and other surfaces that come into contact with children's urine or saliva
- Delay travel to areas affected by Malaria, Zika and COVID-19 virus
- Some women require individualised advice e.g. safe sex practices, advice to not share needles, advice if their close contacts have infections such as HIV or viral hepatitis

Travel advice

There is no consistent evidence-based guidance available on absolute contraindications to travel in pregnancy.

Risks depend on:

- Obstetric factors: gestation, pregnancy number, placental site, risk of pregnancy, previous obstetric history
- Maternal factors: medical conditions and history
- Immunity status
- Risks during and at travel site: infections, toxins, food and water, accidents
- Care during travel and at travel site
- Mode and length of travel

Indications for caution to travel⁴²

Conditions	Risk
Obstetric	
Pregnancy of unknown location	Ectopic pregnancy
Recent invasive procedure (such as amniocentesis)	Miscarriage
Severe anaemia or haemoglobinopathy	Fetal hypoxia at reduced partial pressure of oxygen
Multiple gestation	Preterm delivery
Gestational hypertension	Progression to preeclampsia
Fetal growth restriction	Fetal compromise
Placenta praevia	Serious haemorrhage
Previous preterm delivery	Recurrent preterm delivery
Medical (if poorly controlled)	
Maternal heart disease	Decompensation
Chronic hypertension	Severe hypertension, progression to preeclampsia, fetal growth restriction, placental abruption
Diabetes	Hypoglycaemia or hyperglycaemia, need for adjustment of timings of insulin if crossing time zones
Epilepsy	Seizures
High risk of thrombosis	Thromboembolic event

Provided there are no complications, the safest time for travel is during the second trimester.

42. Hezelgrave NL, Whitty C, Shennan AH et al. Advising on travel during pregnancy 2011: 342:d2506. View [online](#)

Discussion points

Car travel

Women should be advised to wear a seatbelt while seated, strapped above and below the “bump”, not over it.

Long distance air travel

Healthy pregnant women with uncomplicated pregnancies can generally fly safely up to 36 weeks' gestation for singleton pregnancies and 32 weeks for twin pregnancies. However, airline's individual policies may vary so women should check.

Fetal heart rate is not affected during flight if the mother and fetus are healthy. Maternal physiologic adaptations to the reduced barometric pressure at high altitude include haemoconcentration, increased heart rate and blood pressure and decreased aerobic capacity with reduction of partial oxygen pressure.

Women with medically or obstetrically complicated pregnancies that may be exacerbated by flight conditions or require emergency care should avoid air travel.

For these reasons, certain precautions are suggested during air travel. These include:

Thromboembolic

Minimise the risk of thromboembolic events (e.g. DVT) by:

- Maintaining hydration
- Regularly moving lower extremities to minimise stasis and reduce the risk of venous thrombosis
- Use of below-knee graduated compression stockings and avoidance of restrictive clothing may also be helpful.

Women at higher risk of thromboembolic problems include those with previous venous thromboembolism (VTE), heritable thrombophilia, morbid obesity or medical problems such as nephrotic syndrome. For long distance travel, if these women are not already on low-molecular-weight heparin (LMWH), consider LMWH in doses recommended for antenatal prophylaxis on the day of travel, during travel and for few days after.

Diabetes mellitus

East-west travel across times zones often requires adjustments in insulin dosing. Women need to carry their BGL monitoring, syringes, medications and snacks in carry-on bags.

Seat belt use

Wear seat belts continuously to protect against injury from unexpected turbulence.

Radiation

The amount of cosmic radiation received during airline travel is below the level at which there begin to be concerns about possible harmful fetal effects. However, pilots, flight attendants and frequent fliers might exceed this level, particularly if they fly during solar particle events when radiation levels can increase significantly. They should be aware of and monitor their personal radiation exposure.

Circadian rhythms

Long-distance airline travel also disrupts circadian rhythms; the effects of this on pregnancy are unknown.

Malaria epidemic area

Pregnant women should avoid travel to malaria areas where possible.

Beyond the first trimester, mefloquine is approved for use to prevent malaria.

Neither malarone nor doxycycline is recommended for prophylaxis any time during pregnancy. Chloroquine (or hydroxychloroquine) plus proguanil is safe, but less effective, so seldom used. For areas where only malaria vivax is endemic, chloroquine or hydroxychloroquine alone is appropriate.

Zika-affected areas

Zika primarily spreads through infected mosquitoes or through sex without a condom with someone infected by Zika. Zika infection during pregnancy can cause microcephaly. Most Zika infections are mild or asymptomatic for women and men. There is currently no vaccine or treatment for Zika.

A pregnant woman and her partner should be advised not to travel to Zika-affected areas when she is planning pregnancy or pregnant. If travel is unavoidable, then advise her to avoid unprotected sex with a male partner who has been to a Zika-affected country for the duration of the pregnancy or 6 months; whichever is longer. Women should also be advised to protect against mosquito bites.

See The Department of Health [website](#) for Zika virus information and testing.

Hepatitis E

Hepatitis E virus (HEV) is one of the most common causes, yet least diagnosed causes of acute viral hepatitis. It has a global distribution, but is more common in developing countries with Asia and Africa having the highest prevalence.

Transmission of HEV most often occurs through contaminated food and water, but it can also be obtained from blood transfusions and mother-to-child transmission. There is no vaccination available.

In the majority of non-pregnant patients, HEV is a self-limiting and spontaneously cleared infection. However, pregnant women are at a much higher risk of morbidity and mortality, with acute HEV infection during pregnancy associated with a mortality rate of 15 to 25% and a high rate of liver failure.

Exercise

Regular exercise has many well-established benefits for women with uncomplicated pregnancy. These include physical benefits for maternal fitness and cardiorespiratory function, and the prevention of excessive weight gain, as well as psychological wellbeing and lifelong benefits including reduced risk of cardiovascular disease and Type 2 diabetes.

Regular exercise during pregnancy has also been associated with shorter and less complicated labour, as well as fewer neonatal complications. In addition to their regular aerobic activity and muscle strengthening exercises, all pregnant women should be advised to do pelvic floor exercises.

Most exercises/activities during pregnancy present minimal risk to the mother or the child. Some modifications to exercise techniques and/or programs may be required to accommodate the anatomical and physiological changes that occur as pregnancy progresses.

However, the following should be avoided:

- Environmental temperatures > 32°C and hydrotherapy pool temperatures ≥35°C (to avoid hyperthermia)
- Scuba diving, because the fetus is at increased risk for decompression sickness
- Exercise during the first three to four days of exposure to moderate to high altitude (until acclimatised) because of the reduction in oxygen availability)

Assessment of medical and obstetric risks should be undertaken to identify potential contraindications to exercise for the pregnant woman prior to commencing an exercise program.

Contraindications to exercise include⁴³:

- Ruptured membranes, premature labour
- Persistent second or third trimester bleeding/placenta praevia
- Incompetent cervix
- Multiple pregnancies (e.g. triplets)
- Uncontrolled Type 1 diabetes, hypertension or thyroid disease, other serious cardiovascular, respiratory or systemic disorder

Relative contraindications³⁷

- History of spontaneous abortion or premature labour in previous pregnancies
- Mild/moderate cardiovascular or respiratory disease (e.g. chronic hypertension, asthma)
- Pregnancy induced hypertension or pre-eclampsia, if not medically controlled
- Evidence of intrauterine growth restriction
- Anaemia or iron deficiency (Hb < 100 g/L)
- Malnutrition or eating disorder (anorexia, bulimia)
- Twin pregnancy after 28 weeks

Frequency and duration of exercise

Most guidelines suggest at least 30 minutes of exercise daily on most days of the week. Pregnant women who have been physically inactive prior to pregnancy should gradually increase the duration of exercise.

While no evidence exists for an upper limit to exercise duration, intensity must also be considered in this assessment. In general, fit pregnant women who want to engage in prolonged exercise (over 45 minutes of continuous exercise) should exercise in a thermoneutral environment or in controlled environmental conditions (air conditioning), with attention to proper hydration and subjective feelings of heat stress.

When to stop exercising

A pregnant woman should stop exercising and call her SMCA or hospital if she has any of the following warning signs of a potential problem:

- Vaginal bleeding
- Uterine contractions
- Regular painful contractions
- Leakage of amniotic fluid
- New dyspnoea before exertion
- Dizziness or syncope
- Headache
- Chest pain
- Muscle weakness affecting balance
- Calf pain
- Sudden onset of swelling ankles, hands and face

When advising on exercise, consider: physiological adaptations to pregnancy and the gestational age; the frequency, intensity, duration and type of exercise; and the woman's habits and preferences.

43. PARmed-X for pregnancy. Physical Activity Readiness Medical Examination. Canadian Society for Exercise Physio, Canada. View [online](#)

Practical advice on exercise

Physiological adaptations to pregnancy and gestational age:

- After the first trimester, avoid lying in flat postures due to compromised venous return
- The centre of gravity will alter with the growing uterus and challenge balance
- Avoid heavy weight-lifting, straining and sustained isometric contractions
- To minimise dizziness due to reduced blood pressure, avoid quick changes in posture

Appropriate frequency, intensity, duration and type of exercise:

- Duration: 30 minutes most days (frequency). If inactive or high BMI, begin with shorter duration
- Intensity: Moderate. Rated perceived exertion (6-20 scale) = “somewhat hard” or the “Talk Test” – being able to walk and comfortably maintain a conversation
- Type:
 - Walk outside on most days
 - Undertake muscle conditioning/ strengthening in at least two sessions per week (frequency) on non-consecutive days, covering major muscle groups

Woman’s habits and preferences:

- Where possible, building on women’s usual and historical physical activity is more likely to be sustainable and enjoyable

Alcohol and tobacco use in pregnancy

Screening

Screening for substance use should be included in the usual antenatal history. All pregnant women should be asked for their current and previous history of substance use at initial assessment to help decide the appropriate model of pregnancy care or provider. This screening should be repeated at periodic re-assessments. Simple questions about substance use from the time of conception (or earlier if possible) are appropriate for screening. The assessment should include:

- Name of substance
- Amount and route of administration
- Frequency and duration of use
- Any prescribed medicines

Management principles

Pregnant women with significant substance use require multidisciplinary care including obstetric care, drug and alcohol advice, nutrition advice and social work. This is coordinated by the alcohol and drug services at each of the hospitals. Care often involves:

- Where appropriate, re-screening for blood borne viruses including hepatitis B, hepatitis C, syphilis and HIV later in pregnancy
- Assessment and care for co-existing mental disorders such as anxiety and depression, bipolar disorder, schizophrenia or personality disorders

- Assessment for experiencing violence, nutrition, housing, finances, etc.
- Education and counselling about pregnancy, childbirth, breastfeeding and parenting as well as the effects of substances on health and wellbeing and treatment options
- Enhanced surveillance and monitoring of their pregnancy and fetal growth and wellbeing

Alcohol

Use of alcohol in pregnancy is common. While less than 1% of women report alcohol use in pregnancy to maternity care givers, population surveys show that one third drink some alcohol during pregnancy, commonly in the setting of an unplanned pregnancy, and up to two thirds of women drink some alcohol during lactation. Women with a history suggesting alcohol dependence, alcohol withdrawal symptoms in pregnancy, or signs of alcohol intoxication should have a more detailed assessment of their alcohol use.

Advice for pregnant women should include the following:

- There is no known level of safe alcohol use during pregnancy or while breastfeeding, and therefore it is safest to abstain from alcohol.
- The level of risk to the fetus from alcohol consumption is hard to predict. The risk of harm to the fetus is likely to be low if only small amounts of alcohol have been consumed
- Stopping drinking at any time in the pregnancy will reduce the risk to the fetus

Advice for breastfeeding mothers includes the following:

- Not drinking alcohol is the safest option
- Women should avoid alcohol in the first month after birth/delivery until breastfeeding is well established
- If women decide to drink, then:
 - Alcohol intake should be limited to no more than two standard drinks a day
 - Women should avoid drinking immediately before breastfeeding
 - Women could consider expressing milk in advance
 - Baby should be cared for by a responsible adult who has not been drinking until the woman is able to manage the care herself

Each hospital has services to support women with alcohol and substance use issues during pregnancy and postpartum. These units work closely with the hospital social work and mental health services and can also provide advice to GPs and SMCAs.

See [Chapter 17](#) for Alcohol and drug service contact details.

Tobacco

The harm caused by tobacco smoking during pregnancy is well established, and includes an increased incidence of threatened and spontaneous miscarriage, preterm birth, low birth weight for gestational age, perinatal death, sudden infant death syndrome (SIDS), and other longer-term effects on the health of the child.

Advice for breastfeeding mothers includes the following:

- Provide information about the risks to the unborn child of smoking and the hazards of exposure to second hand smoke for both mother and baby
- Explain the health benefits of stopping for the woman and her baby
- Encourage her to stop smoking – not just “cut down”. Reducing the number of cigarettes does not reduce harm, because of the tendency to draw more deeply on the cigarettes that are smoked
- Stopping smoking at any time in the pregnancy will reduce the risk to the fetus
- Provide her with supports such as [Quit](#)

Nicotine Replacement

There is mixed evidence on the effectiveness and safety of nicotine in pregnancy to aid smoking cessation. For women who continue to smoke heavily in pregnancy despite non-pharmacological interventions, the use of nicotine replacement therapy likely reduces the overall risk to the fetus.

Resources

Resources	Content summary
Beyond Blue	Multiple resources on mental health during pregnancy and early parenthood, including where to get help for parents
Centers for Disease Control and Prevention (CDC)	Travel during pregnancy Pregnant travellers
Department of Health and Human Service	Information on Zika
Australian Food Standards	Pregnancy and food safety Mercury in fish
NSW government	Clinical Guidelines for the Management of Substance Use During pregnancy, Birth and the Postnatal Period
Quit	Resources to help quit smoking
RANZCOG	<ul style="list-style-type: none"> Guideline on vitamin and mineral supplementation in pregnancy Prevention of congenital cytomegalovirus (CMV) infection Guideline on exercise during pregnancy
Safe steps - Family Violence Response Centre	<ul style="list-style-type: none"> Domestic Violence Crisis Service – available 24/7. Central contact point for women’s refuges in Victoria Provides telephone crisis counselling, referral, information and support <p>Phone: 1800 015 188 or 03 9322 3555</p>
Smiling Mind & Beyond Blue – Mind the Bump	Free meditation app to help support mental and emotional wellbeing in the journey to parenthood for both individuals and couples
The American College of Obstetricians and Gynaecologists	Clinical guideline on air travel during pregnancy
The Royal Women’s Hospital	<ul style="list-style-type: none"> Medicine use during pregnancy Multiple fact sheets relating to mental health and pregnancy including baby blues, depression, bipolar, anxiety, schizophrenia, eating disorders and post-partum psychosis Medicine use while breastfeeding Alcohol, cigarette smoking and drug use during pregnancy Contains multiple multilingual resources relating to family violence and what to do Multiple factsheets on exercise Perineal tears- third and fourth degree Pelvic floor exercise fact sheet and video Active pregnancy, information on exercise in pregnancy



CHAPTER 15
MENTAL HEALTH AND WELLBEING

Perinatal depression is common with around 1 in 7 to 1 in 10 women experiencing antenatal or postnatal depression (defined as within 12 months of having a baby). Symptoms range from mild to severe and therapeutic interventions range from supportive care to hospital admission. Untreated depression and anxiety effects attachment, child development and the safety of mother and child.

Risk factors

- History of anxiety, depression, or mood swings, especially if occurred perinatally
- Ceased psychotropic medications recently
- Edinburgh Postnatal Depression Scale score \geq 13 (See [COPE](#))
- Medical history of serious pregnancy or birth complications, neonatal loss, poor physical health, chronic pain or disability
- Family history of bipolar disorder (postnatal period is associated with first occurrence of bipolar disorder)
- Family violence
- Recent migration/refugee status
- History of trauma or abuse (including childhood sexual abuse)
- Many recent stressful life events
- Personal characteristics like guilt-prone, perfectionist, feeling unable to achieve, low self-esteem
- Unplanned or unwanted pregnancy
- Lack of emotional and practical support
- Young woman
- Expecting first child or has many children already
- Low socioeconomic status, unemployment
- Perinatal sleep deprivation

Screening

All pregnant women should be routinely screened for symptoms of depression and assessed for anxiety and psychosocial wellbeing.

Depression

There are number of screening tools available for antenatal and postnatal depression screening. [The Edinburgh Postnatal Depression Scale \(EPDS\)](#) tool and [Whooley questions](#) are two commonly used tools for screening for possible symptoms of depression.

Ideally screening should be completed in the early stage of pregnancy, at least once in later pregnancy and 6-12 weeks after birth and as clinically indicated.

[Edinburgh Perinatal Depression Scale \(EPDS\)](#) tool:

- Score between 10 and 12, monitor and repeat the EPDS in 2-4 weeks or earlier if clinically indicated
- Score of 13 or more: further assessment is recommended
- Question 10 positive: immediate further assessment is required, including exploring disclosure of suicidal ideation

[Whooley Questions](#):

- Q 1: During the past month, have you often been bothered by feeling down, depressed or hopeless?
- Q 2: During the past month, have you often been bothered by little interest or pleasure in doing things?

'Yes' to either question requires further comprehensive evaluation.

Anxiety

In the absence of adequate evidence for a tool, use clinical judgment.

Psychosocial wellbeing

Asking about psychosocial risk factors is part of routine antenatal and postpartum care.

- Assess the mother-infant interaction in women with mental health issues and refer to a parent-infant therapist as available and appropriate
- Women experiencing mild depressive or anxiety symptoms in the early postnatal period may benefit from practical and emotional support (e.g. advice on parenting, unsettled infants, sleep deprivation) and monitoring to determine the effectiveness of such support
- Women with a significant mental health history or history of abuse are at increased risk of poor psychosocial outcome

[AnteNatal Risk Questionnaire \(ANRQ\)](#) may be a useful tool and is applicable for both pregnancy and postnatal.

- It covers relationship with partner, social support, recent stressful life events, anxiety or perfectionism, past history of depression or other mental health conditions (and treatment for same), having experienced abuse as a child or as an adult, and quality of relationship with mother in childhood.
- Score of 23 or more is recommended as requiring further assessment

Suicide

Suicide risk assessment requires clinical judgement, a sense of the woman in context, understanding of the baby/infant as both a protective factor and a risk factor, and awareness of how mental health symptoms might affect impulsivity.

Assessment of risk involves asking about the extent of suicidal thoughts and planning, including:

- Suicidal thoughts – if a woman has suicidal thoughts, how frequent and persistent are they?
- Plan – if the woman has a plan, how detailed and realistic is it?
- Lethality – if the woman has a planned method, how lethal is it?
- Means – does the woman have the means to carry out the method?

Consideration should also be given to:

- Risk and protective factors
- Mental state – hopelessness, despair, psychosis, agitation, shame, anger, guilt, impulsivity
- History of suicidal behaviour
- Family history of suicidal behaviour
- Substance use – current misuse of alcohol or other drugs
- Strengths and supports – availability, willingness and capacity of supports

Whenever a woman is assessed as at risk of suicide, her capacity to care for the infant and any thoughts of harm to the infant and other children should be assessed.

Screening and assessment summary

Assessment	When	Actions
Depression and suicide risk e.g. by using EPDS tool	As early as practical in pregnancy and 6-12 weeks after birth	If using EPDS: <ul style="list-style-type: none"> - Score between 10 and 12: monitor and repeat the EPDS in 2-4 weeks or earlier if clinically indicated - Score of 13 or more: further assessment is recommended - Question 10 positive: immediate further assessment is required, including exploring disclosure of suicidal ideation
Anxiety	Clinical judgement	
Psychosocial wellbeing	As early as practical in pregnancy and 6-12 weeks after birth	Further explore psychosocial risk as needed
Emotional wellbeing	Ask at every antenatal visit	Determine whether repeat assessments are required
Lifestyle advice	Provide at least once during pregnancy	Focus on healthy eating, physical activity and sleep hygiene
Psychological preparation for parenthood	At least once during pregnancy	Focus on coping, problem-solving and decision-making skills and psychosocial issues
Mother-infant interaction	At postnatal contacts	If there are concerns, consult with or refer to appropriate specialist service
Infant safety	At postnatal contacts	Manage immediate risk and refer for mother-infant intervention

Management principles for depression

The approaches that may be appropriate vary depending on the woman's situation such as suicidal risk, risk to baby and other children, severity of symptoms, past history of severe mental illness and psychosocial risks.

For women with severe mental health problems (e.g. bipolar disorder, schizophrenia, severe depression, taking antipsychotic medication or mood stabilisers or with a history of severe mental health problems in the perinatal period), it is preferable that specialist advice is sought pre-pregnancy or early in pregnancy.

Both psychological and pharmacological treatments have been shown to be effective in treating perinatal anxiety and depression.

Non-pharmacological management

Partners, family and friends have an important role in a woman's recovery from perinatal depression. A woman with perinatal depression may withdraw from everyone, including her baby and partner. The support of family members, especially her partner, is crucial in helping her recover.

Good nutrition, sleep, physical activity, relaxation activities, enhanced support and safety netting are fundamental aspects of management.

The following are fundamental aspects of management for women with perinatal depression:

- Physical activity
- Good nutrition
- Adequate high quality sleep
- Enhanced support and safety netting

The following may also be helpful for women with perinatal depression:

- Psychological therapies, specifically cognitive behavioural therapy (CBT), interpersonal psychotherapy (IPT) and psychodynamic therapy
(In women with more significant depression or anxiety, for psychological therapies to be effective, medication(s) often needs to be commenced prior and time allowed to have some positive effect)
- Yoga and meditation
- E-mental health supports such as apps, online forums where people can connect with others with similar experiences. **Head to Health** can help a woman in finding digital mental health app from some of Australia's most trusted mental health organisations
- Social support groups

Pharmacological management

For most women with moderate to severe anxiety or depressive disorders as well as the above, pharmacological treatment will be required. For psychological therapies to be effective, women often need to wait until their medication(s) have become effective. A woman should be informed about the possible risks of mental health conditions and the benefits and harms of treatment in pregnancy and the postnatal period.

- Women with more severe depression or with bipolar disorder generally require medication
- Pharmacological treatment of depression with antidepressants during the perinatal period is not likely to differ from approaches at other times
 - It is important to undertake a risk/benefit assessment, taking into consideration that not treating with appropriate medication could also be harmful to the woman, fetus and baby
 - Medications should only be prescribed after careful discussion with the woman. When symptoms are severe, involving a psychiatrist is often required
- When deciding on pharmacological treatment in the perinatal period, consider:
 - The medication with the lowest risk profile for the woman, fetus and baby
 - A woman's previous response to medication
 - Changes in pharmacodynamics in pregnancy, which may necessitate dose adjustment
 - Using the lowest effective dose (this is particularly important when the risks of adverse effects to the woman, fetus and baby may be dose-related), but note that sub-therapeutic doses may lead to ineffective treatment of the mental health episode
 - Where possible, use a single drug
 - For women who are on medication at time of conception sudden cessation should generally be avoided
 - Paroxetine is generally avoided in pregnancy due to a possible increase in fetal cardiovascular defects
 - Plan for review in the early postpartum period for a woman who ceases psychotropic medications during pregnancy
 - If breastfeeding, consider the:
 - Peak maternal serum concentration as this can sometimes guide when to avoid breastfeeding. For SSRIs this is generally 6-10 hours after ingestion
 - Breast milk concentration against the maternal serum concentration (for duloxetine this is 0.1-0.8% and for the below SSRIs is approx. 2%)

Serotonin reuptake inhibitors (SSRIs) (except for paroxetine) are generally considered to be relatively low-risk and safe to prescribe during pregnancy and while breastfeeding. For women where antidepressants are first initiated in the perinatal period, the SSRIs with the best known safety profile, and therefore the most commonly prescribed as first-line treatment for moderate to severe depression in postnatal women are:

- Sertraline (Australian categories for prescribing medicines category C)
- Citalopram (category C)
- Escitalopram (category C)

The postnatal period is associated with a higher risk of relapse of bipolar disorder and first experience of bipolar (more likely in women with a family history of bipolar).

MBS items 16590, 16591

MBS items for the planning and management of pregnancy (16590 and 16951) and for postnatal consultations between 4-8 weeks (16407).

This aims to ensure:

- Early identification of risk factors that may increase a woman's likelihood of experiencing mental health disorders in the perinatal period, as well as the presence of any symptoms of depression or anxiety
- Appropriate assessment, support and management.

It is intended that drug and alcohol problems be taken into consideration in the mental health assessment of the woman in order to facilitate education about the inherent risks of drug and alcohol misuse in pregnancy. It is not the intention to require drug and alcohol testing of the patient (e.g. the provision of blood or urine samples).

Practitioners are only able to bill items 16590 or 16591 in each pregnancy, once the woman's pregnancy has progressed beyond 28 weeks.

Mental health services

If a woman experiences mental health issues during her pregnancy, the services that can be accessed depend on:

- The nature and acuity of the problem
- Where she is booked for maternity care
- Where she lives
- Whether she can access private services

Hospital services

All the hospitals have outpatient mental health services that can assess and manage women with mental health issues receiving pregnancy care at these hospitals. However, the capacity at each hospital varies. They are generally only available for women undertaking care at the hospital and during the antenatal period and hospital stay.

In addition, WMH has Mother and Baby Unit that provides an outpatient service for women in WH and DjHS's catchment.

To obtain appropriate hospital triaging and support, referrals for maternity care should contain current and past psychiatric history and medication and significant family and social history.

To access these services in a non-urgent situation, GPs and SMCAs can:

- Include details and a request in the referral letter for maternity care
- Contact the shared maternity care coordinator to arrange an appointment at the hospital if the woman is undertaking shared maternity care.

Contact the relevant hospital mental health team directly via the hospital switchboard for advice during business hours. See [Chapter 17](#).

Severe mental health issues

- For women with severe mental health problems (e.g. bipolar disorder, schizophrenia, severe depression, taking antipsychotic medication or mood stabilisers or with a history of severe mental health problems in the perinatal period), it is preferable that specialist advice is sought pre-pregnancy or early in pregnancy.

Urgent care

- If the matter is urgent, the woman can present to the hospital Emergency Department for triage and appropriate referral or the Crisis Assessment and Treatment Team (CAT) can be contacted.
- If a woman requires admission during pregnancy, this is usually arranged by the referring hospital psychiatric team or CAT Teams.
- Women with private insurance may be able to access private inpatient care.

Inpatient services

If a woman requires admission for a psychiatric condition during pregnancy, this is usually arranged by the referring hospital psychiatric team or Crisis Assessment and Treatment Team (CATT). Admissions are at hospitals including Melbourne Health, Austin Health, St Vincent's Health and Werribee Mercy Hospital. There are inpatient beds at NH that are managed by Melbourne Health. Similarly, inpatient beds at WH are managed by Mid-West Mental Health Service.

In the postnatal period, both public and private mother and baby services and early parenting centres provide clinical and support services for parents experiencing difficulties (including mental health problems). Where there are concerns about the wellbeing of a child or family, **Child FIRST** is the referral point for family services in Victoria.

Community services

Adult Specialist Mental Health Services (including Crisis Assessment and Treatment Team (CATT))

Adult Specialist Mental Health Services provide psychiatric triage and referral 24 hours, 7 days a week. They provide a range of services, including urgent community-based assessment and short-term treatment interventions to people in psychiatric crisis. CATT have a key role in deciding the most appropriate treatment option and in screening all potential inpatient admissions. CATT provide intensive community treatment and support, often in the person's own home, during the acute phase of illness as an alternative to hospitalisation. CATT also provide a service to designated hospital Emergency Departments through an onsite presence.

For a full list of services across Victoria, refer to the '**Adult Specialist Mental Health Services (16-64 Years)**' page of the Department of Health website.

Adult Specialist Mental Health Services contact details (including CATT)

**Northern (Whittlesea, Darebin),
North West (Hume, Moreland),
Mid West (Melton, Brimbank),
Inner West (Moonee Valley, Melbourne)**

Ph: 1300 874 243

Inner Urban East (Yarra, Boroondara)

Ph: 1300 558 862

South West (Wyndham, Hobson's Bay, Maribyrnong)

Ph: 1300 657 259

North East (Nillumbik, Banyule)

Ph: 1300 859 789

Primary Health Networks

The Australian Government has funded **Primary Health Networks (PHNs)** to commission mental health services such as perinatal mental health support, suicide prevention and support, alcohol and drug and psychological support services in the community. There are six in Victoria and 31 in Australia. These services are targeted to people who have low income or are disadvantaged. Other eligibility criteria may also apply. Referrals can be made by anyone including GPs and other primary health providers, social services, other organisations and in some cases self-referral.

SMCAs are advised to visit the website of the PHN catchment in which the woman lives. Referral and mental health service information is available on each PHN website.

HeadtoHelp

HeadtoHelp is a single point assessment, triage and support services for a range of mental health services commissioned by all the Victorian PHNs. It provides care navigation, access to a multidisciplinary mental health team at 15 hubs across Victoria and a team-care approach, to complement and supplement GP care. It is currently funded for a limited period.

It is not designed for acute crisis care.

It is available for people of any age, carers and for support and referral from GPs.

Ph: 1800 595 212

W: headtohelp.org.au

PHN contact details and services

Primary Health Network	Mental health services	How to refer
Eastern Melbourne PHN	<p>Psychiatric advice and consultation service over the phone for GPs</p> <p>Alcohol and other drugs</p> <p>Suicide prevention and support after suicide</p> <p>Psychosocial support service</p>	<p>Mental health referral and access team</p> <p>Email: referral.access@emphn.org.au</p> <p>Ph: (03) 9800 1071</p> <p>Fax: (03) 8677 9510</p>
Murray PHN	<p>Psychological Therapy Services (PTS - General)</p> <p>Primary Mental Health Clinical Care Coordination (PMHCCC) - supporting people who experience severe mental illness</p>	<p>Psychiatric triage services</p> <p>North West 1300 366 375</p> <p>North East Call the office closest to where you are located:</p> <ul style="list-style-type: none"> • Wodonga: 1300 881 104 • Wangaratta: 1300 783 347 • Albury: 1800 800 944
North Western Melbourne PHN	<p>Drug and alcohol</p> <p>Suicide prevention and support after suicide</p> <p>Wellbeing support service</p> <p>Targeted psychological support services</p> <p>Intensive support services for complex mental illnesses</p> <p>Dual diagnosis services for people with drug/ alcohol and mental health issues</p>	<p>Referral inquiries CAREinMIND™</p> <p>Ph: 9088 4277</p> <p>Fax: 9348 0750</p> <p>Email: careinmind@nwmpnh.org.au</p>
South East Melbourne PHN	<p>Psychosocial support service</p> <p>Mental Health Integrated Complex Care (MHICC) services</p> <p>Mental health support group</p> <p>Mental health service and support finder to find mental health services in Casey, Dandenong and Cardinia region</p>	<p>Mental health Access and Referral team</p> <p>Ph: 1800 862 363</p> <p>Fax: 1300 354 053</p>
HeadtoHelp	<p>Victoria wide (currently funded for limited time)</p> <p>Triage</p> <p>Support</p> <p>Referral</p> <p>Advice for GPs, patients and carers</p> <p>Not for acute crisis care</p>	<p>Ph: 1800 595 212</p>

Private psychiatrists psychologists

Referring a woman directly to a private provider (e.g. psychiatrist, psychologist, mental health nurse, social worker) may be an option when caring for a pregnant woman with mental health issues. Even if a woman has private supports and care, if the woman has a significant mental health issue, it is important this is communicated to the hospital staff, as she may have issues when she is hospitalised, postpartum and in caring for her child.

The [National Health Services Directory](#) and Royal Australian and New Zealand College of Psychiatrists '[Find a Psychiatrist](#)' are useful websites to search for community mental health providers and sites.

Mother and baby mental health services

The three public inpatient mother and baby services in Victoria are located at the Austin Hospital, Werribee Mercy Hospital and Monash Medical Centre. These services provide specialist assessment and management of women with mental illness in the postnatal period. Generally, infants up to 12 months of age are admitted with their mothers. SMCAs can refer a woman through the local Adult Mental Health Service, where an intake worker will assess the woman and arrange admission if eligible.

Private facilities with both mother and baby units and parenting centres are also available. To refer, SMCAs should contact the facilities directly. All services provide both day and inpatient programs.

Public mother and baby inpatient unit contact details

Austin Health – Heidelberg

Ph: 9496 6406 or 9496 6407

Fax: 9496 4366

Monash Medical Centre (Clayton)

Ph: 9594 1414

Fax: 9594 6615

Werribee Mercy Hospital (Werribee)

Ph: 9216 8465

Fax: 9216 8470

Public mother and baby inpatient unit contact details

Albert Road Clinic Parent Infant Unit

Ph: 9256 8311

Fax: 9256 8361

Mitcham Private Hospital (Mitcham)

Ph: 9210 3134

Fax: 9210 3183

North Park Private Hospital (Bundoora)

Ph: 9468 0850

Fax: 9468 0300

Early parenting centres

Early parenting centres provide non-urgent support for families with children 0-3 years who have difficulty establishing feeding, sleeping and other early childhood routines. Families can stay at the centres or attend day stay programs. Women can usually self-refer to these services.

Early parenting centre contact details

Masada Private Hospital (St Kilda East) (now changed to Early Parenting Centre)

Ph: 9038 1300

Fax: 9038 1405

Mercy Health O'Connell Family Centre (Canterbury)

Ph: 8416 7600

Fax: 9816 9729

Mitcham Private Hospital (Mitcham)

Ph: 9210 3222

Fax: 9210 3183

Queen Elizabeth Centre, Noble Park

Ph: 9549 2777

Fax: 9549 2779

Tweddle Child and Family Health Service (Footscray)

Ph: 9689 1577

Fax: 9689 1922

Child protection and support services

Mandatory reporting requirements for health professionals

The Children and Young Persons Act 1989 (Vic.) (s.64 (1C)) mandates that certain professionals (including Medical Practitioners and midwives) report to Child Protection Services when, in the course of their professional duty:

- They “form the belief on reasonable grounds that a child is in need of protection [because] the child has suffered, or is likely to suffer significant harm as a result of physical injury and the child’s parents have not protected or are unlikely to protect, the child from harm of that type”, or
- “the child has suffered, or is likely to suffer, significant harm as a result of sexual abuse and the child’s parents have not or are unlikely to protect, the child from harm of that type.” For more information, visit the [AIFS website](#).

Child Protection Services contact details

To make a notification of child abuse, contact the relevant regional Child Protection Service:

Ph: 1300 664 977 (Northern)
 Ph: 1300 360 391 (Eastern suburbs)
 Ph: 1300 655 795 (Southern suburbs)
 Ph: 1800 075 599 (West- rural and regional)
 Ph: 1300 664 977 (Western suburbs)

Child Protection Crisis Line

Phone: 13 12 78 (after hours service)

Child and family services and support

Child and family information, referral and support teams (Child FIRST) include enhanced maternal child health services and other support services (e.g. social work, housing, legal and drug and alcohol services) and can be contacted when a health professional feels a family requires additional support.

Issues may include:

- Young, isolated or unsupported families
- Parenting problems that may affect the child’s development
- Social or economic disadvantage that may adversely affect a child’s care, safety or development
- Family conflict or breakdown
- Families under pressure due to a family member’s physical or mental illness, substance use, disability or bereavement

GPs are encouraged to contact the Maternal Child Health Service to discuss additional support if required. Referral to this service does not replace mandatory reporting of child abuse to the Victorian Child Protection Service (see below).

Child and family services and support contact details

Child FIRST

Ph: 1300762 125
 (Boroondara, Manningham, Monash, Whitehorse)
 Ph: 1800 319 355
 (Banyule, Darebin, Nillumbik, Whittlesea, Yarra)
 Ph: 1300 138 180
 (Brimbank, Melton)
 Ph: 1300 786 433
 (Hume, Moreland)
 Ph: 1300 775 160
 (Hobson’s Bay, Maribyrnong, Melbourne, Moonee Valley, Wyndham)
 Ph: 1300 319 353
 (Bayside, Glen Eira, Kingston, Port Phillip, Stonnington)

Visit the [Department of Health website](#) for full list of referral numbers.

Perinatal Psychotropic Medicines Information Service

The Perinatal Psychotropic Medicines Information Service (PPMIS) at RWH provides information for health professionals on psychotropic medicines (e.g. antidepressants, antipsychotics, anxiolytics) when considering pregnancy, during pregnancy and breastfeeding. Health professionals can phone PPMIS for advice and speak with an experienced pharmacist at The Royal Women’s Hospital. If a query cannot be resolved, it is escalated to a psychiatrist who will contact the health professional to provide advice.

This service is available to all health professionals, regardless of where the woman’s hospital care is provided.

Contact details:

The Royal Women’s Hospital Pharmacy Department
 Hours: 9am to 4pm Monday to Friday
 T: (03) 8345 3190
 F: (03) 8345 3195
 E: drug.information@thewomens.org.au

Health professionals can also purchase [The Women’s Pregnancy and Breastfeeding Medicines Guide \(PBMG\)](#), a quick reference guide that provides information on medicine use in pregnancy and breastfeeding.

See [Chapter 13](#) for other medicines information.

Domestic violence

All hospitals have social workers and other services that have experience in managing family and intimate partner violence.

Intimate partner violence is responsible for more ill-health and premature death in Victorian women under the age of 45 than any other preventable risk factor, including high blood pressure, obesity and smoking. Findings from a 2004 VicHealth study of the health costs of violence demonstrate the seriousness and prevalence of intimate partner violence.⁴⁴

Intimate partner violence has wide-ranging and persistent effects on a woman's physical and mental health, contributing 8.8% of the total disease burden of Victorian women aged 15 to 44. Direct health consequences for women exposed to violence include depression, anxiety, phobias, suicide attempts, chronic pain syndromes, psychosomatic disorders, physical injury, gastrointestinal disorders, irritable bowel syndrome and a variety of reproductive consequences. The influence of the abuse can persist long after it has stopped and, the more severe it is, the greater the impact on a woman's physical and mental health.

One in five Australian women report being subjected to violence at some stage in their adult life, increasing their risk of mental health problems, behavioural and learning difficulties. The risk of violence is higher in pregnant women and in the period following the birth of a child. Young women who have been exposed to violence are more likely to have an unplanned pregnancy, termination or miscarriage. It takes them longer to make contact with medical services for antenatal care than women who are not exposed to violence and their babies are more likely to have a problem diagnosed after birth. In addition, it is estimated that one in four Victorian children have witnessed intimate partner violence, increasing their risk of mental health problems, behavioural and learning difficulties.

Screening for family violence

All women should also be asked about family violence. This is routinely done at the first hospital visit. As a result of the continuity of care, SMCA are in the ideal position to also screen for family violence and are encouraged to do so. SMCA can use the four-question validated ACTS tool to assess family violence:

- A = Abused
- C = Controlled
- T = Threats
- S = Slapped (physical acts)

Questions:

In the last year, has a partner, ex-partner or other family member(s):

- Done something that made you feel afraid?
- Controlled your day-to-day activities (e.g. who you see, where you go) or put you down?
- Threatened to hurt you in any way?
- Hit, slapped, kicked or otherwise physically hurt you?

If "yes" to any of the above question, then further assessment for immediate and elevated risk is required.

SMCA are encouraged to screen women during and after pregnancy for intimate partner violence without her partner present, e.g. "How safe are you with your partner/at home?"

Referral

The services listed below are available in the community for women victims of family violence. These services will conduct a comprehensive assessment to ascertain and respond to the support needs of all victims.

- **Child Protection**
If a child is believed to be at risk of significant harm or to **Child FIRST** if there is significant concern for the wellbeing of a child or unborn child (this does not need consent from the victim)
- **Police**
Phone 000 if a crime has been committed or if the victim's safety is not currently assured
- **Legal centre or court**
If an **Intervention Order** is required

44. VicHealth. The Health Costs of Violence: Measuring the Burden of Disease Caused by Intimate Partner Violence. Carlton South, Vic: Victorian Health Promotion Foundation, 2004 (reprinted 2010). Accessed 15 June 2015 <www.vichealth.vic.gov.au/Publications/Freedom-from-violence/The-Health-Costs-of-Violence.aspx>.

Family violence services

Organisation	Contact	Website
<p>National sexual assault, domestic family violence counselling service</p> <p>1800RESPECT</p>	1800 737 732	www.1800respect.org.au
<p>Safe Steps – Family Violence Response Centre</p> <ul style="list-style-type: none"> • State-wide 24-hour crisis support and safe accommodation for women and their children. • Central contact point for women’s refuges in Victoria 	Ph: 1800 015 188 toll-free or 03 9322 3555	www.safesteps.org.au
<p>inTouch Multicultural Centre Against Family Violence</p> <p>Provides phone support and advice to women from culturally and linguistically diverse backgrounds in their primary language</p>	1800 755 988 toll-free	www.intouch.org.au
<p>Elizabeth Morgan House Aboriginal Women’s Service</p> <p>Provides range of support to Aboriginal women and children experiencing family violence in the community</p>	Ph: 03 9403 9400 Mon-Fri 9.00am – 5.00pm Email: info@emhaws.org.au	www.emhaws.org.au
<p>Djirra</p> <p>Family violence support services help vulnerable Aboriginal women</p>	Toll free 1800 105 303 Monday to Friday 9 am to 5 pm After hours, call Safe Steps Family Violence Response Centre on Ph: 1800 015 188 toll-free or 03 9322 3555	www.djirra.org.au
<p>The Orange Door</p> <p>Family violence support and safety hubs for adults, children and young people who are experiencing or have experienced family violence and families who need extra support with the care of children.</p>	To find your nearest location visit the website	www.orangedoor.vic.gov.au
<p>Rainbow Door</p> <p>Specialist helpline providing information, support and referral to all LGBTIQ+ people.</p>	1800 729 367	www.rainbowdoor.org.au

Resources

Resources	Content summary
Beyond Blue	Comprehensive guide with multiple resources related to perinatal mental health
Clinicians health channel	A suite of databases offering drug, disease and toxicology-oriented information for health care professionals and patients
COPE	Perinatal clinical guidelines and assessment tools
Department of Health and Human Services, Victoria	Website for Adult Specialist Mental Health Services (16–64 years) with links to metropolitan and rural support services
Domestic Violence Resource Centre, Victoria	Peak body for family violence services in Victoria. Provides training, publications, research and other resources to those experiencing (or who have experienced) family violence, and practitioners and service organisations who work with family violence survivors
inTouch	Provides phone support to women from culturally and linguistically diverse backgrounds in their primary language Ph: 1800 755 988 or 9413 6500
Perinatal Anxiety & Depression Australia (PANDA)	Comprehensive guide with multiple resources related to perinatal depression and anxiety for parents
Safe steps - Family Violence Response Centre	Domestic Violence Crisis Service – available 24/7. <ul style="list-style-type: none"> • Central contact point for women’s refuges in Victoria • Provides telephone crisis counselling, referral, information and support Phone: 1800 015 188 or 03 9322 3555
Smiling Mind & Beyond Blue – Mind the Bump	Free meditation app to help support mental and emotional wellbeing in the journey to parenthood for both individuals and couples
Therapeutic Goods Administration	Health Professional Information: Comprehensive guide with multiple resources including Australian categorisation of risk of drug use in pregnancy and links to the <i>Obstetric Drug Administration Service</i>



CHAPTER 16 POSTNATAL CARE

In hospital

The average hospital stay after the birth of a baby is 1-2 days for a vaginal birth and 2-3 days for a caesarean section. A hospital discharge summary is sent to the SMCA and nominated GP within 48 hours of discharge. In the case of significant complications, fetal or neonatal death, the GP and SMCA will be contacted by phone by the registrar or consultant.

Routine postnatal care at the hospital includes:

- Physical assessment of mother and baby
- Wound/perineal/breast care
- Parenting and emotional wellbeing
- Supporting parents to care for their baby
- Breastfeeding/infant feeding (initiation and support)
- Routine newborn screening test for hypothyroidism, phenylketonuria (PKU), cystic fibrosis and some metabolic disorders (Guthrie test)
- Hepatitis vaccination to baby
- Routine newborn hearing screening
- Advice on pelvic floor exercise
- Contraception discussion
- Information on Sudden Infant Death Syndrome (SIDS) and advice about safe sleeping

Additionally:

- Rh D Immunoglobulin (anti-D) is provided if required (mother Rh -ve and no preformed antibodies and baby is Rh +ve)
- Rubella immunisation for mother if needed (MMR vaccination)
- Hepatitis immunoglobulin to baby if mother has chronic hepatitis B

Child health record

All parents are provided with a My Health and Development Record⁴⁵ (child health record) in hospital. This document is used by parents, maternal child health nurses and GPs as a record of a child's health and development, including growth immunisations and development milestones. The child health record also provides a communication tool between parents and health care providers, and documents all maternal child health nurse visits.

Routine newborn investigations in hospital

Newborn blood screening – Guthrie test

The newborn screening test (Guthrie test) involves a blood sample obtained with a heel prick and placed on pre-printed filter paper. All tests are done at the hospital and are processed by the Victorian Clinical Genetics Service (VCGS). Newborn screening identifies babies with an increased risk of having hypothyroidism, phenylketonuria (PKU), cystic fibrosis and more than 20 additional metabolic disorders.

The newborn screening test is performed when the baby is between 48 and 72 hours old. A greater number of false positives and false negatives occur when the screening is done before 48 hours. If a baby is discharged before 48 hours, the hospital is responsible for ensuring the baby is screened, with this carried out in the community by the hospital domiciliary midwife.

This includes babies who are transferred to other hospitals or domiciliary midwifery programs.

About 0.1% of babies that undergo newborn screening are diagnosed with a condition. If the screen delivers a positive result, parents are contacted by VCGS and referred to a specialist for further testing. Positive screens are usually confirmed by testing a sample of urine or blood.

In addition, the laboratory may need a repeat blood sample if the first sample was collected too early, was contaminated or produced an unclear result, with most of these subsequently being normal.

Newborn blood screening laboratory contact details

Victorian Clinical Genetics Services (VCGS)

Ph: 8341 6201 or 1300 118 247

Fax: 8341 6390

Email: screeninglab@vcgs.org.au

Royal Children's Hospital Genetic Counselling Service

Ph: 8341 6201

Newborn hearing screening

All babies born at the hospitals undergo a routine hearing screen and risk factor assessment prior to discharge, as part of the Victorian Infant Hearing Screening Program (VIHSP). If a baby has not been screened prior to discharge, an outpatient appointment will be organised for the screening to be undertaken. Screening results are documented in the My Health and Development Record, and a diagnostic audiology referral is organised if indicated. This is followed up by VIHSP.

If a "pass" result is obtained but risk factor/s are identified, this is documented in the child health record along with the recommended follow-up, including referral for diagnostic

45. For further information, see the 'My Health and Development Record' page on the Department of Education and Training website (www.education.vic.gov.au/childhood/parents/mch/pages/record.aspx).

audiology at the 2 week and/or 6–8 month check, if required. If a GP identifies additional risk factors or parental concerns about a baby’s hearing, a referral for diagnostic audiology may be needed.

Risk factors for hearing loss include:

- Family history of congenital hearing impairment
- Rubella, cytomegalovirus or toxoplasmosis during pregnancy
- Admission to neonatal intensive care or special care nursery for 2 or more days
- Apgar score <4 at 5 minutes of age
- Birth weight <1500 g
- Severe jaundice
- Congenital abnormalities of the head and neck
- Bacterial meningitis
- Later risk factors e.g. developmental delay, head injury

Victorian Infant Hearing Screening Program contact details

Ph: 9345 4941

Fax: 9345 5049

Email: vihsp@rch.org.au

In the community

In addition to providing immediate postnatal care, the hospitals offer at least one domiciliary midwife visit for all women in the first few days after discharge. At the time of hospital discharge, the hospitals notify the local government where the woman resides, who then notifies the relevant Maternal Child Health Service. The Maternal Child Health Service generally undertakes a home visit within the first two weeks after discharge and link women and babies into their services.

Most postnatal care is undertaken in the community by GPs in conjunction with the Maternal Child Health Service. Infants in Australia have a higher percentage of GP visits during the first year of life than any other year.⁴⁶ The table below shows high levels of maternal morbidity at 6 months postpartum and low levels of maternal satisfaction with hospital postnatal care in Victoria. The hospitals encourage all women and their babies to visit their GPs for a postnatal check at 6 weeks, and earlier if needed.

Common maternal postnatal problems in first 6–7 months after childbirth (Victoria)

Problem	Primiparas (%)	Multiparas (%)
Backache	44	43
Bowel problems	10	11
Constantly reliving baby’s birth	7	5
Contraception	8	9
Depression	19	20
Haemorrhoids	26	24
Mastitis (if breastfeeding)	16	18
More coughs and colds than usual	9	13
No health problems	5	6
Other	7	8
Pain from a caesarean wound (if LUSC)	63+	60
Painful perineum	31	15
Relationship with partner	19	18
Sex	31	24
Tiredness/exhaustion	68	70

46. Goldfeld SR, Wright M, Oberklaid F. Parents, infants and health care: utilization of health services in the first 12 months of life. *J Paediatr Child Health* 2003; 39(4):249–53.

Six week mother and baby check

The following is recommended as part of postnatal care:

- Woman should see their GP for postnatal care
- Timing of visits should be individualised and reflect a woman's needs
- Both mother and child should be assessed by the GP at the 6-week postnatal check-up
- A patient-centred approach should be adopted, focusing on relevant issues and concerns

The 6-week postnatal check-up with the GP should include:

- Follow-up of any issues from pregnancy, birth and the postpartum period
- Physical assessment and wellbeing of mother
- Physical and growth assessment and wellbeing of baby
- Developmental assessment of the baby
- Feeding and settling
- Emotional wellbeing and bonding of mother/parents
- Parenting, relationship and relationship safety
- Social supports
- Health promotion to support breastfeeding and positive parent-child interactions
- Address parental concerns or issues
- Baby immunisation

Mother

Ask about/explore:

Physical recovery and wellbeing

- Vaginal blood loss and discharge – signs of postpartum haemorrhage (persistent or profuse blood loss) or associated symptoms of anaemia (i.e. faintness, dizziness, palpitations) or infection or sepsis (i.e. offensive odour, fever and shivering and/or abdominal pain)
- Breastfeeding/breast problems
- Perineal symptoms
- Urinary and faecal continence
- Intercourse and dyspareunia
- Contraception

Mental and emotional health

- Emotional wellbeing and happiness, depression and anxiety (both parents)
- Attachment with baby and family adjustment
- Safety and intimate partner violence, parenting and child mistreatment
- Relationship with partner

Self-care, recovery and supports

- Weight
- Exercise, including pelvic floor
- Nutrition and iodine supplementation (routine if breastfeeding)
- Sleep and rest
- Alcohol, smoking and drug use
- Linkages to maternal child health, parents' groups, family and other support
- Support by others

Physical assessment of the mother

- BP check
- Check of perineum or LUSC wound
- Breast inspection
- Abdominal examination
- Weight (BMI)
- (Consider EPNDS)

Follow-up of complications of pregnancy

(e.g. hypertension, pre-eclampsia and gestational diabetes)

Common investigations and immunisations to consider

- Haemoglobin, if previous anaemia or postpartum haemorrhage
- If gestational diabetes or diabetes in pregnancy, arrange a GTT about 6 weeks after birth
- Cervical screening, if due
- MMR immunisation if rubella antibody titre is low antenatally. MMR vaccination is usually given at the hospital postpartum in this situation
- Varicella immunisation if non-immune. This is not usually given at the hospital
 - Hepatitis B/C surveillance if relevant

Baby

Physical assessment

- General physical examination (assessment of tone, reflexes, skin, jaundice, fontanelles, palate, heart sounds, groin pulses, testes, genitalia/anus, spine/natal cleft, squint, eyes [red reflex], hips)
- Assessment of growth (weight, head circumference, length)
- Check to see if the baby is smiling and following
- Addressing any parental concerns

Investigations and immunisations

- Immunisations as per [National Immunisation Schedule](#)
- Ensure hearing test and heel prick were performed

Common investigations and follow-up to consider

- Follow-up of any required investigation from antenatal period (e.g. fetal hydronephrosis)
- Follow-up of abnormal clinical findings (e.g. prolonged jaundice, heart murmurs)
- Screening hip ultrasound for babies at risk of hip dysplasia (breech, talipes, family history)

Other issues for discussion

- Feeding and weight gain
- Settling and sleep
- Sudden Infant Death Syndrome (SIDS) prevention
- Dangers of passive smoking
- Car safety and other injury prevention
- Sun protection

Vitamin D supplementation for babies

Risk factors for Vitamin D deficiency in newborns include:

- Maternal Vitamin D deficiency – Vitamin D is transferred from the mother to the fetus across the placenta, and reduced Vitamin D stores in the mother are associated with lower Vitamin D levels in the infant
- Prematurity – Vitamin D levels are particularly low in premature infants who have less time to accumulate Vitamin D from the mother through transplacental transfer

Babies do not routinely have Vitamin D levels checked, even if the mother is Vitamin D deficient.

RANZCOG consensus guidelines suggest exclusively breastfed infants should be given 400 IU Vitamin D (e.g. Pentavite®) daily for at least 6 months of life, at least while exclusively breastfeeding. However, this practice varies in different hospitals. Infants on full formula feeds do not routinely require supplementation.

Follow-up for common maternal issues

Gestational diabetes

If a woman had gestational diabetes or diabetes in pregnancy, SMCA should arrange a GTT at around 6-12 weeks after the birth. The hospitals do not routinely arrange a follow-up GTT. Even if the result of this postnatal GTT is normal, women are at increased risk of developing diabetes later in life (30% –50% chance within 15 years after a pregnancy). Therefore, this is an opportunity to offer women counselling, to discuss minimisation of risk factors for diabetes and vascular disease, and for the GP to arrange regular testing (e.g. 2-yearly fasting blood glucose and HbA1C). Women should also be advised to test for diabetes early in her next pregnancy.

Hypertensive disorders

First 6 weeks

For women with gestational hypertension and pre-eclampsia, blood pressure (BP) usually falls immediately after delivery, but tends to subsequently rise, reaching a peak 3-6 days postpartum.

- Review blood pressure and taper off antihypertensive medicine as appropriate. Hospital review may have been arranged or may not be required
 - After 2 weeks, antihypertensive medication can usually be decreased and ceased from two weeks to two months post-partum, dependant on BP
 - Women with chronic hypertension, a long duration of antihypertensive treatment in pregnancy, higher maximum systolic and diastolic blood pressures, higher body mass index or occurrence of preterm pre-eclampsia are more likely to have sustained hypertension postpartum (exceeding 6 weeks)

For women with significant antenatal biochemical disturbances, pathology testing may be indicated (e.g. FBE, U/E and Cr, Urine Pr: Cr, uric acid, +/- LFTs and clotting)

For women with hypertension in pregnancy, avoid non-steroidal anti-inflammatories in the immediate postpartum time as this may cause elevation of BP

After 6 weeks

- Follow-up after 6 weeks is required to ensure normalisation of BP and urine/blood parameters
 - If remain hypertensive at the 12th postpartum week then consider chronic hypertension and investigate and treat accordingly
- As there is an increased risk of development of hypertension and cardiovascular disease, ensure other risk factors and surveillance for cardiovascular risk factors is addressed
- In any following pregnancy, start aspirin 100-150mg nocte by 16 weeks and ensure adequate dietary calcium
- Review results of hospital investigations and review if needed

Chronic hepatitis B

If the mother has chronic hepatitis B (formerly called a hepatitis B carrier), GPs should:

- Undertake hepatitis B surveillance of the mother for several months postpartum as there is an increased risk of hepatitis flares during this time
- If the woman is on antiviral medication, ensure this is not suddenly ceased due to the risk of "hepatitis B flare"
- Confirm the baby has received two injections post birth (Hepatitis B immunoglobulin and hepatitis B paediatric formulation) (Engerix-B paediatric or H-B-VAX II paediatric)
- Reinforce the need for full immunisation of the child
- Test the child's immunity (Hep B SAb) and carrier status (Hep B SAg) at around 12 months (can be done from 9 months)
- Ensure all other family members and household contacts have been immunised and that immunity is confirmed with serology

Breastfeeding is not contraindicated for women who have chronic hepatitis B if the baby has been given immunoprophylaxis after birth.

Thyroid disease

Hypothyroidism

For most women with clinical hypothyroidism, pregnancy has resulted in an increased requirement for thyroxine. Following delivery, thyroxine dosing is generally reduced to pre-pregnancy levels, with thyroid function tests checked 6 weeks postpartum. Women should continue iodine supplementation until the end of breastfeeding.

Subclinical hypothyroidism

For women with subclinical hypothyroidism on thyroxine, thyroxine should be ceased after delivery. Thyroid function tests do not require retesting. Women should continue iodine supplementation until the end of breastfeeding. The longer-term surveillance of women with subclinical hypothyroidism in pregnancy is not known. Women who are considering a short inter-pregnancy interval may choose to continue with a small amount of thyroxine (especially if they are known to have thyroid antibodies).

Postpartum thyroiditis

Postpartum thyroiditis is a destructive thyroiditis induced by an autoimmune mechanism within one year after parturition. It usually presents in one of three ways:

- Transient hyperthyroidism alone
- Transient hypothyroidism alone
- Transient hyperthyroidism followed by hypothyroidism and then recovery

It is not uncommon. Serum antithyroid peroxidase antibody concentrations are high in most women with postpartum thyroiditis.

Clinical symptoms can mimic the typical fatigue following delivery and postpartum depression. As such, a high level of suspicion is required to differentiate these conditions. Women with a history of Type 1 diabetes and women with elevated thyroglobulin or thyroperoxidase autoantibodies are at increased risk of postpartum thyroiditis.

Investigation for postpartum thyroiditis is recommended if there is a clinical suspicion and should be considered as a differential diagnosis in women presenting with depressive symptoms in the postpartum period.

Postnatal advice

Family planning and interpregnancy interval

Family planning counselling should include discussion about a woman's and/or couple's plans to have more children and the number, her age, the couple's fecundity, their preferred birth spacing and what works best for them.

There is no quality evidence on pregnancy interval after vaginal birth and caesarean section for fetal and maternal wellbeing. There is some evidence that that inter-pregnancy intervals (from the end of one pregnancy to the beginning of another) of less than 18 months or more than 59 months have some minor impact on perinatal outcomes such as preterm birth, low birth weight and small size for gestational age. However, the evidence is not strong and may be due to confounders such as socioeconomic factors, weight, nutrition, and poor sleep.

For women who have had a caesarean section who wish to have a ToLAC/VBAC for their next pregnancy, it is recommended they wait at least 2 years between deliveries as this increases the change of a success and decreases the risk of dehiscence.

In some cases where a caesarean section scar is "thin" or there has been a difficult LUSC, the doctor may recommend an interval of at least 12-18 months before another caesarean section.

Driving⁴⁷

Women should be advised that the period of returning to driving after vaginal birth or caesarean is variable. It may take 1-6 weeks before women are ready to resume driving after abdominal surgery such as caesarean section.

Women should be advised to assess whether they can comfortably sit in the car, work the controls, wear a seatbelt, look over their shoulder, make an emergency stop and be free from the effects of sedating medications when considering resuming driving after surgery.

It is recommended women check with their insurance company regarding any policy requirements or exclusions relating to driving after abdominal surgery, including caesarean delivery.

Weight and exercise

Retention of post-pregnancy weight has been associated with subsequent adverse obstetric consequences such as gestational diabetes, hypertensive disorders, stillbirth, large for gestational age neonates, caesarean delivery, and longer-term obesity.

For the most part, the physiologic and anatomic changes of pregnancy return to the pre-pregnancy state by approximately six weeks postpartum. Pre-pregnancy exercise routines can be resumed gradually postpartum, based upon an individual woman's physical capability and comfort and as soon as medically safe, depending on the mode of delivery and the presence of medical or surgical complications. Women can generally resume normal pre-pregnancy exercise routine after 6 weeks post-caesarean delivery. Strenuous exercise which

involves running, jumping and fast or jolting movements should not be undertaken for at least 12-24 weeks after birth.

Women should be encouraged to reach their pre-pregnancy weight by 6-12 months postpartum and ultimately to achieve a normal BMI.

Sex and contraception

Women should resume intercourse when they wish to do so, are comfortable and are on adequate contraception. Advice regarding the timing of resumption of sexual intercourse is variable and without a strong evidence base. Vaginal dryness can be caused by changes in hormone levels postnatally. Lubricants and local oestrogen therapy may be helpful.

Insertion of an IUD postpartum is associated with increased risk of uterine perforation but can be offered immediately after delivery. A progestogen-only implant (IMP) can be inserted immediately after delivery. The progesterone-only oral contraceptive pill is safe in breastfeeding.

Oral combined pill contraception and NuvaRing™ contain oestrogen and are therefore contraindicated in women who are breastfeeding as it interferes with breast milk production.

Hair treatment

Hair treatments include hair colouring, hair curling (perms), hair bleaching and hair straightening (relaxers) agents.

Information about having hair treatments while breastfeeding is limited. However, it is highly unlikely that a significant amount of the chemicals used would enter the breast milk because very little enters the mother's bloodstream.

47. RANZCOG, Driving after abdominal surgery including caesarean section, C Gen 21, view [online](#)

Postnatal vaccination

Immunisation in the postpartum period is a simple and effective way to protect the woman and her child from certain infections, particularly when the woman was not immunised during pregnancy.

If not provided in pregnancy, diphtheria, tetanus and acellular pertussis (dTpa) is recommended for the mother. If needed, this usually occurs in the hospital. To maximise the protection of infants, other carers should also be immunised.

Women who are rubella non/low immune require a single dose of the measles–mumps–rubella (MMR) vaccine postnatally. This is usually given in hospital.

Women who are varicella non-immune require two doses of the varicella vaccine at least 2 weeks apart. This is **not** given in hospital and should be given by the woman’s GP.

Vaccines except smallpox can generally be given to breastfeeding women. Yellow fever must be administered cautiously and only in cases where the benefits outweigh the risks. The situation with COVID-19 vaccines is not known at the time of this guideline development.

Breastfeeding

Australia’s infant feeding guidelines recommend exclusive breastfeeding of infants to around six months of age when solid foods are introduced and continued breastfeeding until the age of 12 months and beyond, if both mother and infant wish.⁴⁸ According to the 2010 Australian National Infant Feeding Survey, exclusive breastfeeding was initiated for 96% of babies at birth (i.e. their first feed was breast milk or equivalent). The proportion of babies decreased to 61% exclusive breast milk, and 75% any breast milk, before the end of the first month of life, and continued to decrease, with 39% of babies exclusively breastfed (69% any breast milk) to around 4 months of age and 15% exclusive and 60% any breast milk to around 6 months.⁴⁹

Breastfeeding positively influences the physical and emotional health of both mother and infant. It provides protection against many diseases and infections for both mother and baby, and adequate nutrition for normal growth and development of the baby.

The hospitals strongly encourage breastfeeding with support and education at each hospital for all women in the antenatal and postnatal period. Breastfeeding is discussed and encouraged by hospital staff at antenatal visits and childbirth education sessions; however, not all women will attend childbirth education. In the immediate postnatal period, lactation consultants may be available at the hospital to provide advice and support, but the majority of the care will be undertaken by hospital midwives.

Breastfeeding challenges

The following are clinical guidelines/fact sheets for managing common issues associated with breastfeeding, such as inverted nipples, low supply and mastitis.

Resources	Information covered
National Infant feeding guidelines	Information on breastfeeding, how to establish, common problems and their management, expressing and storing breast milk and infant formula, and introducing solid food
RWH open access breastfeeding fact sheets for women and health professionals	Resources for health professionals on breastfeeding, medicines and breastfeeding problems
RWH open access clinical guidelines	Range of resources for women on breastfeeding, issues with breastfeeding and infant feeding
Victorian breastfeeding guidelines	Includes information on breastfeeding physiology, advice and common issues/problems associated with breastfeeding

Breastfeeding challenges

Consider referral to breastfeeding services for following:

Pregnancy

- Nipples are non-protractile and has never successfully breastfed
- Multiple pregnancy
- Previous difficulties breastfeeding
- Breast surgery

Postnatal

- Poor infant weight gain/low milk supply
- Breastfeeding problems e.g. attachment or painful/damaged nipples, tongue-tie impacting on breastfeeding

Medicines during breastfeeding

See [Chapter 13](#) for medicines information.

48. NHMRC (National Health and Medical Research Council) (2013). Infant Feeding Guidelines: Summary. Canberra: National Health and Medical Research Council.
 49. Australian Institute of Health and Welfare. A Picture of Australia’s Children 2012, Cat. no. PHE 167, Canberra: AIHW. Accessed [online](#) on 16 June 2020

Postnatal support and contact details

Hospital

This is available for women who are booked for birth, have birthed or have a baby in NICU/SCN at the hospital.

GPs, SMCAs and women can contact breastfeeding services at the hospitals directly for advice.

In addition to the hospital breastfeeding services, maternal and child health services and early parenting centres provide assessment and support. Peer support is available via the Australian Breastfeeding Association.

Maternal and Child Health Line

Ph: 13 22 29

Mercy Hospital for Women Breastfeeding Support Centre

Ph: 8458 4677 or 8458 4676

Northern Health

Ph: 8405 8202 (lactation consultant)

The Royal Women's Hospital Breastfeeding Service (Parkville and Sandringham)

Ph: 8345 2496 (lactation consultant) or 8345 2400 (to make an appointment at Parkville)
Ph: 9076 1233 (Sandringham)

Werribee Mercy Health

Ph: 8754 3407 or 8754 3428 (lactation consultant)

Western Health Breastfeeding Centre

Ph: 9055 2448 and leave a message or 8345 1767 (maternity ward – if the matter is urgent)

Djerriwarrh Health Service

Ph: 5367 9873 (lactation consultant)
Email: lactationconsultant@djhs.org.au

Maternal child health support services

Most local government maternal child health (MCH) and family services have midwives and lactation consultants who can assist women. These are available to all women who reside in their catchment. Several have drop-in lactation services. Women can get information about community breastfeeding services by asking their maternal and child health nurse.

The Maternal Child Health Service and local government family services provide a range of support services for babies, women and families, including assessment, referral, home support and visits from a maternal child health nurse, enhanced maternal child health services, help with breastfeeding, parenting and social connections, and drop-in centres. Many also have culturally sensitive groups and activity groups. Many services also have a range of multidisciplinary services such as social work.

The hospital, women and GPs can contact the local service to arrange support or contact their relevant service.

Maternal and Child Health Line

Ph: 13 22 29 (24 hours, 7 days a week)
Directory services with postcode search

MCH Local Government Area

Bayside
Boorondara
Brimbank
Darebin
Glen Eira
Hobson's Bay
Kingston
Maribyrnong
Melbourne
Melton
Moonee Valley
Moreland
Port Phillip
Stonnington

Aboriginal and Torres Strait Islander services

Koori Maternity Services

The Koori Maternity Services program offers flexible, inclusive, culturally appropriate pregnancy and postnatal care to Aboriginal and Torres Strait Islander women in Victoria. Services provided:

- Antenatal and postnatal care by midwives and Aboriginal health workers. Also offer antenatal shared care and home visits
- Health promotion
- Breastfeeding support

The [Victorian Aboriginal Health Service](#) provides Midwifery Antenatal Shared Care for Aboriginal families.
Ph: 9419 3000

The [Cradle to Kinder program](#) is an ante and postnatal support service to provide longer-term family support for young pregnant women less than 25 years of age.

Other

[Australian Breastfeeding Association](#): Run different support services in community such as local support groups and a breastfeeding helpline.

Health professionals can also visit www.lcanz.org to find a lactation consultant.

Resources

Resources	Content summary
Academy of Breastfeeding Medicine	A worldwide organisation for medical practitioners providing evidence-based solutions to promote breastfeeding
Australian Breastfeeding Association	Multiple resources on breastfeeding including the contact details for their helpline
Australian Physiotherapy Association	<ul style="list-style-type: none"> • Look good feel good after pregnancy • A resource on postpartum physiotherapy advice and exercise
Better Health Channel	Information on newborn blood screening
Child FIRST and family services	Comprehensive guide with multiple resources related to Child and Family Protection Services across Victoria, including mandatory reporting requirements for child abuse
Department of Health and Human Services, Victoria	<ul style="list-style-type: none"> • Neonatal e-Handbook. • Developmental dysplasia of the hip in neonates
Department of Health, Australia	Comprehensive guide with multiple resources including the electronic version of The Australian Immunisation Handbook
Maternal and Child Health Services	Comprehensive guide with multiple resources for consumers and Maternal and Child Health Service professionals and other health professionals
Pelvic floor first	Returning to sport or exercise after birth
RANZCOG	Provides advice on driving following abdominal surgery, including caesarean section
Red Nose, saving little lives	Information on SIDS
The Royal Women's Hospital	<ul style="list-style-type: none"> • Breast and nipple thrush guideline • Breastfeeding: the healthy term baby guideline
The Royal Children's Hospital	<ul style="list-style-type: none"> • Victorian Infant Hearing Screening Program (VIHSP) with links to public, private, metropolitan and rural maternal screening services • Clinical Practice Guidelines on Jaundice in Early Infancy
VCGS	Newborn blood screening



CHAPTER 17 HOSPITAL SERVICES AND CONTACTS

This section contains information on pregnancy-related services offered in each hospital and their contact details.

Quick links

Service	When to refer	Comment
Early Pregnancy Assessment Service	Woman presenting with pain and/or bleeding in the first sixteen weeks of pregnancy who are clinically stable	Pain and bleeding < 16 weeks gestation Women who are clinically unstable and require emergency review should be referred to Emergency Department at each hospital
Emergency Department	Emergency care Semi-urgent care when Pregnancy Day Service is closed	24 hours/day
Fetal Maternal Management Service	Complicated pregnancies due to high-risk conditions (e.g. heart disease in the woman) or fetal abnormalities	If a fetal abnormality is detected on ultrasound, these services can be contacted directly for referral or advice
Obstetric registrar/on-call obstetrician (call via switchboard)	Contact registrar on call for any urgent or complex clinical issues	24 hours/day
Labour Assessment Services	Women in labour	24 hours/day
Pregnancy Day Service	Semi-urgent care	Business hours At some services, this is incorporated into the Maternity Assessment Service
Shared maternity care coordinator	Non-urgent follow-up and appointments for shared maternity care patients	Business hours Phone or email directly

Hospital Switch

Mercy Hospital for Women

Ph: 8458 4444

Werribee Mercy Hospital

Ph: 8754 3000

Northern Health

Ph: 8405 8000

Western Health

Ph: 8345 6666

The Royal Women's Hospital (Parkville)

Ph: 8345 2000

Ph: 8345 2058 (GP Quick Access Number - GP use only)

The Royal Women's Hospital (Sandringham)

Ph: 9076 1000

Djerriwarrh Health

Ph: 5367 2000

Shared maternity care coordinator

The hospital shared maternity care coordinator is the key person for non-urgent contact for SMCAs and women. The shared maternity care coordinator responds to issues that may arise and ensures that non-urgent queries from SMCAs are dealt with in a timely manner. The shared maternity care coordinator's qualifications and role vary between health services.

At all sites, the shared maternity care coordinator is the point of contact for:

- Updating a woman's contact details
- Organising routine hospital appointments
- Organising extra appointments for additional non-urgent clinical consultation with, for example, obstetric doctors/allied health/psychiatry/genetics/physicians
- Organising hospital follow-up for gestational diabetes
- Obtaining non-urgent information about hospital care (e.g. discharge summaries, investigation results)
- Changing shared maternity care providers (if requested by the woman)
- Notifying SMCAs of cessation of shared maternity care

The shared maternity care coordinator may also be able to assist with:

- Non-urgent reassessment, review of and advice on community ultrasound results and other pathology results by the relevant department

If more urgent assessment, care or referral is required, contact the Emergency Department, Pregnancy Assessment Service, Genetics Services and the on-call obstetric registrar. Also see [Chapter 7](#), [Chapter 13](#).

The hospital shared maternity care coordinator is the key person for non-urgent contact for both SMCAs and women.

Shared maternity care coordinator contact details

Mercy Hospital for Women

Ph: 8458 4120
Fax: 8458 4205
Email: sharedcare@mercy.com.au

Werribee Mercy Hospital

Ph: 8754 3393
Fax: 8754 6710
Email: werribeesharedcare@mercy.com

Northern Health

Contact Antenatal Clinic Manager
Ph: 8405 8772
Mobile: 0437 103 097
Fax: 8405 8766
Email: maternitysharedcare@nh.org.au

Western Health

Ph: 9055 3012
Fax: 9055 2135
Email: maternitysharedcare@wh.org.au

The Royal Women's Hospital (Parkville)

Ph: 8345 2129
Fax: 8345 2130
Email: sharedcare@thewomens.org.au

The Royal Women's Hospital (Sandringham)

Ph: 9076 1233
For clinical inquiries phone: 9076 1232
Email: sharedcare.sandringham@thewomens.org.au

Djerriwarrh Health

Ph: 5367 9871
Fax: 9746 0668
Email: patriciar@djhs.org.au

For non-urgent abnormal results, contact the shared maternity care coordinator.

For urgent enquiries, contact the Emergency Department or obstetrician on-call.

Other services available to assist SMCAs for semi urgent concerns and referrals include Fetal Maternal Management, Genetics, Pregnancy Day and Early Pregnancy Assessment services.

Pregnancy Day Service

Each hospital has a Pregnancy Day Service that provides obstetric, midwifery and investigations, monitoring and management for maternal and fetal assessment for issues including:

- High blood pressure or concerns about pre-eclampsia
- Small for dates, poor interval growth or fetal growth restriction
- Decreased fetal movements
- Non-cephalic presentation at ≥ 36 weeks
- Prolonged pregnancy (post-dates)
- Hyperemesis
- Concerns about cholestasis

Pregnancy Assessment Service hours vary between services, but are generally within business hours. Outside these times, women should be referred to the Emergency Department.

Referral to the Pregnancy Day Service is recommended if a woman has:

- Hypertension (when systolic BP is ≥ 140 mmHg and/or diastolic BP is ≥ 90 mmHg)
- Small fundal height (2cm more or less than for dates, significant deviation from growth pattern or concerns on ultrasound)
- Intractable vomiting
- Decrease in fetal movements
- Jaundice or symptoms of cholestasis
- Non-cephalic presentation ≥ 36 weeks gestation

The above list is not exhaustive, and the Pregnancy Day Service does not replace referral to the hospital Emergency Department for urgent problems. The SMCA is encouraged to phone the service prior to sending a woman in to discuss the concerns with a senior midwife. The outcome of each visit will be documented in the patient hand-held record.

Pregnancy Day Service contact details and operating hours

SMCAs can refer a woman directly to the Pregnancy Assessment Service (except for WMH – see below).

PAS operating hours differ, but are generally business hours. At some services, this is incorporated into the Maternity Assessment Service.

SMCA should detail concerns in the hand-held record for the woman to take with her and should also phone the service prior to her arrival.

Mercy Hospital for Women

Ph: 8458 4266 or 8548 4000

Monday to Friday: 8.00am to 5.00pm.

Saturdays by appointment only.

Ph: 8458 4266 to book an appointment

Werribee Mercy Hospital

WMH has limited facilities, with no direct referrals to the Pregnancy Day Service.

The SMCA should contact the on-call obstetrician to discuss the situation.

Ph: 8754 3462 (on-call obstetrician)

Northern Health

Ph: 8405 8330

Mon to Sun: 9.00am-4.00pm

Western Health (Maternity Assessment Service)

Ph: 9055 2300

24 hours

The Royal Women's Hospital (Parkville)

Ph: 8345 2184

Mon – Fri: 9.00am – 5.00pm

Sat: 8.00am – 12.00pm

The Royal Women's Hospital (Sandringham)

Ph: 9076 1233

Mon, Tues, Wed & Friday: 9.00am – 5.30pm

Thurs: 12pm – 8.30pm

Djerriwarrh Health (Maternity Assessment Service)

Ph: 5367 9615

Available 24/7

Labour assessment services

All hospitals have a 24-hour service for women in labour. The hospitals have different names for this service (e.g. Maternity Assessment Service). At some hospitals, the Pregnancy Day Service or birth suite is incorporated in this.

Mercy Hospital for Women

A woman in labour can go to the Emergency Department or call the Birth Suite to talk to Midwife
Ph: 8358 4058

Werribee Mercy Hospital

Ph: 8754 3400 Maternity reception. A woman who is in labour will be looked after by staff in the maternity ward

Northern Health

Ph: 8405 8213 Delivery Suite

Western Health (Maternity Assessment Service)

Ph: 9055 2300

The Royal Women's Hospital (Parkville)

A woman in labour can go to the Emergency Department or call the Birth Suite and talk to Midwife
Ph: 8345 3635

The Royal Women's Hospital (Sandringham)

Ph: 9076 1232 Maternity Service to talk to Midwife

Djerriwarrh Health (Maternity Assessment Service)

Ph: 5367 9615

Emergency Department

The Emergency Department provides urgent assessment and treatment for women with acute gynaecological and obstetric problems, and emergency care for newborn babies who were born at the hospital. Western Health will see all babies.

Each hospital Emergency Department is available 24 hours a day for assessment of urgent antenatal or postnatal problems. Phone advice is also available 24 hours a day for SMCAs and GPs. Referral by phone or letter is appreciated. Presentation to the Emergency Department will be documented in the woman's VMR. The SMCA will also receive correspondence within 48 hours of the woman's presentation.

Referral to the hospital Emergency Department is recommended if the woman has:

- First trimester bleeding or pain that cannot be appropriately diagnosed and managed in the community or by referral to the EPAS service (see below)
- Threatened preterm labour (≤ 37 weeks)
- Undiagnosed abdominal pain
- Preterm rupture of membranes
- Antepartum haemorrhage
- Unusual migraines/visual disturbances
- Seizures
- Requirement for Rh D immunoglobulin (anti-D) following a sensitising event
- Requirement for immunoglobulin post varicella or measles exposure if non-immune
- Problems usually seen in the Pregnancy Assessment Service, if after hours

The above list is not exhaustive.

Emergency Department contact details

Mercy Hospital for Women

Ph: 8458 4000 or 8458 4514
Fax: 8458 4025

Werribee Mercy

Ph: 8754 3318

Northern Health

Ph: 8405 2610
Ph: 8405 8610 (GP use only)

Western Health

Ph: 8345 1596

- Pregnant women > 16 weeks gestation with pregnancy-related complaints should present directly to the Maternity Assessment Centre at Joan Kirner Women's and Children's Hospital at Sunshine Hospital (24-hour service)
- Pregnant women < 16 completed weeks gestation should present directly to the Sunshine Hospital Emergency Department

The Royal Women's Hospital (Parkville)

Ph: 8345 2000 (option 1)
Ph: 8345 2058 (GP Quick Access Number - GP use only)
Fax: 8345 3645

The Royal Women's Hospital (Sandringham)

Ph: 9076 1470

Djerriwarrh Health

Ph: 5367 2000

Obstetric registrar/on-call obstetrician

At RWH, MHW and WH, the on-call obstetric registrar can be contacted 24 hours a day to discuss urgent or complex clinical issues. During business hours, if contactable, it may be worthwhile to contact the registrar of the pregnancy team the woman is under at the hospital.

To contact the registrar, phone the hospital switchboard and ask for the on-call obstetric registrar or registrar of the woman's pregnancy team.

At WMH the on-call obstetrician can be contacted directly 24 hours a day to discuss urgent or complex clinical issues.

On-call registrar/obstetrician contact details

Mercy Hospital for Women

Ph: 8458 4444 (paged via hospital switchboard)

Werribee Mercy Hospital

Ph: 8754 3448 (direct line to on-call obstetrician)

Northern Health

Ph: 8405 8000 and request on-call obstetrician/registrar

Western Health

Ph: 8345 6666 (paged via hospital switchboard)

The Royal Women's Hospital (Parkville)

Ph: 8345 2000 (paged via hospital switchboard)

The Royal Women's Hospital (Sandringham)

Ph: 9076 1000 (paged via hospital switchboard)

Djerriwarrh Health

Ph: 5367 9615 (via maternity ward)

Early Pregnancy Assessment Service (EPAS)

The EPAS provides clinical services for the stable woman presenting with pain and/or bleeding in the first sixteen weeks of pregnancy. Common reasons for referral include: vaginal bleeding, unexplained pain, missed miscarriage, suspected ectopic pregnancy and retained products post-surgical or medical management of miscarriage.

EPAS offers early pregnancy ultrasound, diagnostic tests, counselling and management.

Women who are clinically unstable and require emergency review should be referred to Emergency Department at each hospital.

EPAS contact details

Mercy Hospital for Women

Ph: 8458 4000
Fax: 8458 4025

Werribee Mercy

Ph: 8754 3390
Fax: 8754 6710

Northern Health

Refer to Emergency Department
Fax: 8405 8616

Western Health

Ph: 9055 2110 (Mon–Fri: 8am - 4.30pm)

Or via O&G registrar Ph: 8345 6666
Fax: 9055 2125

The Royal Women's Hospital (Parkville)

Ph: 8345 3643
Fax: 8345 3036

The Royal Women's Hospital (Sandringham)

Ph: 9076 1470

Djerriwarrh Health

Ph: 5367 9150
Fax: 9746 0668 (Marked clearly "EPAS URGENT")

Fetal Maternal Management Service

All hospitals have services that manage women with complicated pregnancies due to high-risk conditions (e.g. heart disease in the woman) known or suspected fetal abnormalities. These are called by various names.

If a fetal abnormality is detected on ultrasound, these services can be contacted for referral or advice. This should be done directly to the service.

To ensure the provision of timely advice and access, it is best to contact the Services directly and not to utilise the general referral fax or email systems at hospitals.

These services work closely with Genetics Services, ultrasound and other obstetric services and are able to arrange counselling if a termination is being considered.

Fetal Maternal Management Service contact details

Mercy Hospital for Women – Perinatal Medicine Unit

Ph: 8458 4248 (Perinatal Medicine reception)
Fax: 8458 4504

Werribee Mercy Hospital

Phone: 8754 3448 (direct line to on-call obstetrician).

The SMCA should contact the on-call obstetrician, who will discuss the referral with the SMCA and then refer to Western Health (which provides fetal maternal management services for WMH)

Northern Health

Ph: 8405 8000 and request on-call obstetrician
The SMCA should contact the On-Call Obstetrician, who will discuss the referral with the SMCA and then refer to Maternal Fetal Medicine specialist clinic

Western Health – Maternal Fetal Medicine Unit

Ph: 9055 2110
Fax: 9055 2125

The Royal Women’s Hospital – Fetal Medicine Unit (Parkville and Sandringham)

Ph: 8345 2158
Fax: 8345 2139

Djerriwarrh Health (DjHS)

DjHS refers to Western Health
Ph: 5367 9871
Contact to ANUM Antenatal Clinic to organise a referral

Genetics Services

Genetics Services at the hospitals provide advice to GPs, SMCA's and women, and counselling, testing and referral for women and their partners either pre-pregnancy or during pregnancy. Genetics Services work closely with obstetric services (including fetal management units), ultrasound departments and Victorian Clinical Genetics Services.

Generally, women must be booked for care at the hospitals or eligible for such (if pre-pregnancy), but requirements for access vary.

Some reasons genetic counselling may be required or recommended include where a:

- Woman is unsure about whether to undertake diagnostic testing
- Woman or her partner has a genetic condition or a family history of a genetic condition that they wish to find out more about (including testing and the possible implications). This is best done pre-pregnancy
- Woman has a high-risk screening result
- Couple with a high risk of having a child with a genetic condition wish to discuss prenatal testing, including diagnostic testing
- Health care provider requires secondary advice

To ensure the provision of timely advice, and access, it is best to contact the Services directly and not to utilise the general referral fax or email systems at hospitals.

Genetics Services will also see women who are booked for care privately or pre-pregnancy for inheritable risks.

Genetics Services contact details

Mercy Hospital for Women – Perinatal Medicine Unit

Ph: 8458 4346 (fetal intake worker for urgent referrals)

Fax: 8458 4205 for referral

Note: If you wish to arrange obstetric ultrasound for a suspected fetal anomaly, contact the Fetal Intake Worker directly, who will arrange the required ultrasound appointments and clinical review

Werribee Mercy Hospital

Ph: 8754 3448 (direct line to on-call obstetrician)

The SMCA should contact the on-call obstetrician, who will discuss the referral with the SMCA and then refer to Western Health (which provides genetics services for WMH)

Northern Health

Ph: 8405 8763 or 9496 3027

Western Health (Maternal Fetal Medicine Unit and Genetics)

Ph: 9055 3006

Fax: 9055 2125

The Royal Women's Hospital (Parkville and Sandringham)

Ph: 8345 2180

Fax: 8345 2179

Djerriwarrh Health

DjHS refers to Western Health

Ph: 5367 9871

Contact to ANUM Antenatal Clinic to organise a referral

Hospital Ultrasound Service

SMCAs are unable to order ultrasounds at the hospitals (except for MHW where there is some limited availability for high-risk women for 20-22 week US).

If non-urgent follow-up or advice is needed for a community ultrasound is required, contact the shared maternity care coordinator. If more urgent advice or follow-up is needed contact the Fetal Maternal Management service or obstetric registrar on call (see above).

The following details are provided to obtain results only.

Hospital Ultrasound Service contact details

Mercy Hospital for Women

Ph: 8458 4300

Fax: 8458 4241

Werribee Mercy Health

Ph: 8754 0400 (MIA Radiology)

Northern Health

Ph: 9408 2222

(Epping Consulting Centre & Healthcare Imaging)

Western Health

Ph: 8345 0351

The Royal Women's Hospital (Parkville)

Ph: 8345 2250

The Royal Women's Hospital (Sandringham)

Ph: 9076 1411

Djerriwarrh Health

Lake Imaging at Bacchus Marsh Hospital

Ph: 5367 9144

Mental health services

Hospital mental health services provide a range of individual and group-based antenatal and postnatal care. The mental health team may include psychiatrists, clinical psychologists, infant health clinicians and psychiatric consultation-liaison nurses.

They are generally only available for women undertaking care at the hospital and during the antenatal period and hospital stay.

Hospital Mental Health Service contact details

Mercy Hospital for Women

Ph: 8458 4444 (switchboard – ask for the psychiatry registrar)

Phone: 8458 4843 (Perinatal Mental Health)

Werribee Mercy Hospital

Ph: 1300 657 259

Northern Health

Ph: 8405 8772

Perinatal referral via maternity services

Western Health

Ph: 8345 6666

(page psychiatry registrar) – women can self-refer

The Royal Women's Hospital (Parkville)

Ph: 8345 2071 (psychiatric consultation liaison nurse)

The Royal Women's Hospital (Sandringham)

Alfred Hospital Sandringham provides Mental Health service to the Sandringham Women's patients

Ph: 9076 1288 (outpatient clinics)

Djerriwarrh Health

DjHS refer patients to North West Mental Health Services available at Melton

Drug and alcohol services

Each hospital has services to support women with alcohol and substance use issues during pregnancy and postpartum. They provide specialist clinical services and professional support in the care of pregnant women with complex substance use and alcohol dependence. They utilise a multidisciplinary team approach to advance a woman and her fetus/infant's health and wellbeing. These units work closely with the hospital social work and mental health services and can also provide advice to GPs and SMCAs.

Alcohol and drug service contact details

Mercy Hospital for Women

Ph: 8458 4201 (coordinating midwife – women can self-refer after booked for care at the hospital)

Werribee Mercy Health

Ph: 8754 3341 (AOD Liaison)
Women can call on 1800 888 236 and self-refer

Northern Health

Managed at RWH. Contact the Antenatal Clinic Manager to organise a referral

Western Health

Ph: 8345 1727 (Maternity Outreach and Support Service Clinic)
Refer to general hospital D&A services.
Ph: 8345 6682

The Royal Women's Hospital (Parkville and Sandringham)

Ph: 8345 3931 (Women's Alcohol and Drug Service – women can self-refer after booked for care at the hospital)

In addition to the above, all hospitals have:

- Physician services such as general physician (cardiology, renal, etc.), endocrinology, haematology and infectious diseases
- MHW, RWH, WH have Recurrent Miscarriage Clinic and Multiple Birth Clinic

Allied health

All hospitals provide social work services, diabetic education service, dietitian and physiotherapy services. SMCAs can contact the Shared Care Coordinator if women require any of these service

Physiotherapy

Patients can be referred to the physiotherapy department at each hospital. Depending on the hospital, this may be via the shared maternity care coordinator or via an outpatient referral. Women are generally eligible for physiotherapy up to 12 weeks after delivery at most of the hospitals.

Specialities:

- Pelvic floor dysfunction, including incontinence and prolapse
- Musculoskeletal pain in the childbearing years
- Sexual dysfunction, including dyspareunia, vaginismus, post-radiation care
- Chronic pelvic pain
- Vulval conditions, including vulvodynia or vaginismus
- Exercise therapy
- Diabetes during pregnancy
- Women's cancers, including breast and gynaecological
- Bowel disorders including constipation and incontinence

Physiotherapy service contact details

Mercy Hospital Heidelberg

Ph: 8458 4141

Werribee Mercy

Ph: 8754 3150

Northern Health

Ph: 8405 8580

Western Health

Ph: 8345 1727

The Royal Women's Hospital (Parkville)

Ph: 8345 3160 (Contact Shared Care Coordinator for referral)

The Royal Women's Hospital (Sandringham)

Alfred Hospital Sandringham provides physiotherapy service to the Sandringham Women's patients
Ph: 9076 1292

Djerriwarrh Health

Ph: 5367 2000

Nutrition/dietetics

Dietitians provide a service to maternity patients for gestational diabetes, pre-existing diabetes, weight management, morning sickness and nutrient deficiencies. SMCA's should contact the Shared Maternity Care Coordinator if women require referral to a dietitian.

Nutrition service contact details

Mercy Hospital for Women

Ph: 8458 4165

Werribee Mercy Health

Ph: 8754 3629

Northern Health

Ph: 8405 8583

Western Health

Ph: 8345 1727

The Royal Women's Hospital – Parkville

Ph: 8345 3160

The Royal Women's Hospital – Sandringham

Ph: 9076 1230
Alfred Hospital Sandringham provides nutrition service to the Sandringham Women's patients

Djerriwarrh Health

Ph: 5367 2000

Diabetes Educators

Diabetes Educators are available at all hospitals to help women monitor and record blood glucose levels and provide education on diet. For a woman doing modified shared care with diet-controlled GDM, please contact Diabetes Educator with any concerns about the woman's glucose control. If women develop GDM, please notify the SMCA.

Diabetes Educations contact details

Mercy Hospital Heidelberg

Ph: 8458 4152

Werribee Mercy

Ph: 8754 3062

Northern Health

Ph: 8405 5280

Western Health

Ph: 8395 9503

The Royal Women's Hospital (Parkville)

Ph: 8345 2153

Monday to Friday 8.00 am to 4.00 pm

The Royal Women's Hospital (Sandringham)

Ph: 9076 1253

Djerriwarrh Health

Ph: 9747 7609

Monday to Friday 9.00 am to 5.00 pm

Aboriginal and Torres Strait Islander services

SMCAs managing women who identify as Aboriginal or Torres Strait Islander and would like to be cared for by the Aboriginal and Torres Strait Islander women's health services are advised to clearly mention Aboriginal and Torres Strait Islander on their initial referral form.

Aboriginal and Torres Strait Island service contact details

Mercy Hospital Heidelberg

Nangnak Baban Murup Midwives

Ph: 8458 4444

Northern Health

Koori Maternity Service

Ph: 8405 8773

Email: KMS@nh.org.au (not to send initial referral)

The Royal Women's Hospital (Parkville)

Baggarrook Midwives

Ph: 8345 2000

Fax your referral to (03) 8345 3036 marked "ATTENTION: Red Team Baggarrook Caseload".

Western Health

Koori Maternity Program

Ph: 8345 0949 Mobile: 0481 010 333

Email: aboriginalhealthunit@wh.org.au (not to send initial referral)

Breastfeeding service

Lactation consultants are available at each hospital to support women with breastfeeding advice in hospital or after discharge, for example:

- Positioning and attachment advice
- Management of sore nipples
- Assessment of milk supply
- Medications and breastfeeding
- Feeding support for twins or triplets
- Cleft lip and or palate
- Mastitis
- Breast and nipple thrush
- Tongue-tie
- Any other breastfeeding concerns, including concerns arising during pregnancy

Breastfeeding service contact details

Mercy Hospital Heidelberg

Ph: 8458 4677 or 8458 4676

Werribee Mercy

Ph: 8754 3407 or 8754 3428 (lactation consultant)

Northern Health

Ph: 8405 8202 (lactation consultant)

Western Health

Ph: 9055 2448 and leave a message or 8345 1767 (maternity ward – if the matter is urgent)

The Royal Women's Hospital (Parkville)

Ph: 8345 2496 (lactation consultant) or 8345 2400 (to make an appointment at Parkville)

The Royal Women's Hospital (Sandringham)

Ph: 9076 1233

Djerriwarrh Health (DjHS)

Ph: 5367 9873 (lactation consultant)
Email: lactationconsultant@djhs.org.au

Domiciliary service

All hospitals support all mothers and babies once they have had their babies and been discharged home from the postnatal ward. A hospital midwife or nurse visits the new mother's home in the first few days after discharge from the hospital. They will provide support with wound care, breastfeeding, parenting and newborn checks. SMCA's can contact the domiciliary team via each hospital's [Hospital switch](#).

Women who have been circumcised

RWH, MHW and WMH have African Women's workers for women who had female circumcision and would like to talk about their circumcision and/or reversing it.

A woman can self-refer:

- RWH: 8345 3037 or 1800 442 007 for an appointment.
- MHW: African Liaison worker Ph: 8458 4150

At WH, WMH, NH and DjW, this is done through the obstetrician.

In addition to above, the hospitals provide many support services for pregnant women who require additional support;

- Young mothers
- Women with physical disabilities
- Women with intellectual disabilities and learning difficulties

Contact details for all pregnancy care services in each collaborative hospital are summarised in [Appendix 1](#).

Summary of hospital maternity services

Pregnancy-related services	DjHS	NH	MHW Heidelberg	RWH Parkville	RWH Sandringham	WH	WMH
Aboriginal and Torres Island women	Y	Y	Y	Y	Y	Y	Y
Alcohol and substance use	N	Y	Y	Y	Y	Y	Y
CVS and Amniocentesis	Y	Y	Y	Y	Y	Y	Y
Emergency Department	Y	Y	Also treat newborn up to 14 days delivered at Mercy	Also treat newborn up to 28 days delivered at Women's	Y	Y	Y
Fetal maternal service	Y	Y	Y	Y	Y	Y	Y
Genetics	Y	Y	Y	Y	Y	Y	Y
Incontinence management	Y	Y	Y	Y	Y	Y	Y
Infectious diseases	N	Y	Y	Y	Y Managed at Alfred Hospital, Prahran	Y	N
Mental health services (inpatient and outpatient)	N	Internal referral only	Y	Internal referral only	Y Limited outpatient service at Alfred Hospital Sandringham	Y	Inpatient and outpatient both
Multiple pregnancy	N	Y (DCDA Twins only)	Y	Y	N	Y	N (Refer to WH)
Pregnancy advisory services (considering termination of pregnancy)	Y	Y	N Women with an abnormal fetus will be referred to other hospital for termination after counselling and testing	Y	Y	Y	N Women with an abnormal fetus will be referred to other hospital for counselling, testing and termination
Recurrent miscarriage clinic (history of ≥ 3 consecutive miscarriages)	N	N	Y	Y	Y	Y	N
Women with individual needs (eg intellectual disabilities, physical disabilities or sensory impairments)	N	N	Y	Y	Y	Y	N
Young women's pregnancy care (≤ 19 years)	Y	Y	Y	Y	Y	Y	Y



CHAPTER 18 PATIENT RESOURCES

General Information

Categories	Organisation	Content summary
Wide range of resources on pregnancy care including pre-pregnancy counselling, common pregnancy-related issues, testing, antenatal care, nutrition and lifestyle issues.	Healthdirect Australian government	Planning for pregnancy, tests, lifestyle, fetal development, common issues in pregnancy, labour and birth and child safety and wellbeing
	Royal Hospital for Women, NSW The Royal Women's Hospital, Victoria Better Health Channel RANZCOG	Planning for pregnancy, tests, lifestyle, fetal development, common issues in pregnancy, labour and birth and child safety and wellbeing
Gestation calculator	Mercy Health	Gestation calculator
Pregnancy Day Service	Better Health	Types of pregnancy care and birthing options in Victoria

Shared Maternity care

Shared Maternity Care	Mercy Hospital for Women The Royal Women's Hospital Western Health Werribee Mercy Hospital
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Specific Resources

Categories	Organisation	Content summary
A	Alcohol and substance use	
Alcohol	Australian government Alcohol think again	Alcohol in pregnancy and breastfeeding
Amphetamine	RWH	Amphetamine use during pregnancy and breastfeeding
Marijuana	National Institute on Drug Abuse	Evidence on harm of marijuana use during and after pregnancy
	Centre for Disease Control and Prevention	Marijuana use in pregnancy
A	Aboriginal and Torres Strait Islander women	
	Victorian Aboriginal Health Service	Pregnancy related resources for Aboriginal and Torres Strait Islander women
	RWH	Resources for Aboriginal and Torres Strait Islander women who are pregnant and their families who are affected by alcohol and other drugs.
	Elizabeth Morgan House Aboriginal Women's services	Family violence support services for Aboriginal and Torres Strait Islander women
	Djirra	
B	Birthmarks	
	Better Health Channel	Causes, types and treatment of birthmark
B	Breastfeeding	
	Australian Breastfeeding Association	Multiple resources on breastfeeding and helpline
	Lactation Consultants of Australia & New Zealand	Find a lactation consultant
	Global Health Media Project Breastfeeding videos	Breastfeeding training videos
	Kelly Mom	Breastfeeding and parenting
C	Child and Parenting (see N for Newborn screening)	
Child health record	Better Health Channel	Resources related to My Health & Development Record (the green book given to parents), such as ages and stages, parenting and support

Child safety	The Royal Children Hospital, Safety Centre	Multiple resources on safety and contact details. Includes furniture, dogs, home, water, road and home safety checklist
Safe sleeping	Red Nose	Safe infant sleeping
Parenting	Victoria State government	Range resources on parenting information for babies, toddlers and school age children and support lines
	Raising Children Network, Australian government	Multiple resources on parenting
	The Royal children hospital	Parents interacting with their newborn
D	Diet, nutrition, supplements, and food safety	
Diet	Dietitian Association of Australia	Nutrition requirements in pregnancy
	Eat for Health	Pregnancy diet plan
	Queensland government	Healthy eating for vegetarian or vegan pregnant and breastfeeding mothers
	Department of Health Australia	Healthy eating during pregnancy
	National Health Service UK	Vegetarian and vegan diet in pregnancy
Food safety	Food Authority	Safe eating guidelines
	Food standard Australia and New Zealand	Pregnancy and healthy eating (information on iodine, folic acid, mercury in fish, listeria)
Iodine	Food Standards Australia and New Zealand	Iodine and pregnancy
Iron	RWH	Factsheet on iron and pregnancy
Weight	RWH Ministry of Health NZ Diabetes Australia	Weight gain in pregnancy
E	Exercise and pelvic floor	
	Sports Medicine Australia RWH	Exercise in pregnancy
	Continence Foundation of Australia	Pelvic floor exercises
	RWH	Pelvic floor exercise video

		RWH	Recovery after birth. Includes after caesarean birth, pelvic floor exercises, healthy bladder and bowel habits, back care and correct lifting technique and abdominal muscles exercise	
		Continence Foundation of Australia	Pregnancy-related bladder and bowel continence issues – including video	
F	Family violence	Safe Steps	State-wide 24-hour crisis support and safe accommodation for women and their children	
		In Touch	Phone support and advice to women from culturally and linguistically diverse backgrounds in their primary language	
		Elizabeth Morgan House Aboriginal Women's services	Family violence support services for Aboriginal women	
		Djirra		
F	Fetal development and issues	Fetal development	American Congress of Obstetricians and Gynaecologists Fetal development during pregnancy	
		Decrease fetal movements	Safer Care Victoria Movement matters: information for women on decreased fetal movement	
		Central nervous system birth defect	Better Health Channel Risk factors and prevention of CNS birth defect and includes information on spina bifida, anencephaly and encephalocele	
I	Infections and Immunisation	<i>Infections</i>		
		Cytomegalovirus	NSW Government Cytomegalovirus symptoms, diagnosis and management	
		Toxoplasmosis	Healthdirect, Australian Government Toxoplasmosis causes and risks	
		Parvovirus	Better Health Channel Slapped cheek (parvovirus) disease	
		Genital herpes	ACT Government Genital herpes in pregnancy, treatment and how to protect a baby	
		Immunisation (see T for Travel vaccines)		

Immunisation	Department of Health Australia	Recommended vaccines in pregnancy
	Department of Health Australia	Immunisation schedule and other information on vaccination
	Healthdirect, Australian government	Immunisation before and during pregnancy
Hepatitis B vaccination	Department of Health Australia	Hepatitis vaccine for infants born to mothers who are hepatitis B positive
L	Labour and Birth	
<i>Labour</i>		
	RWH	Video on stages and types of labour and pain management
	Raising children, Australian government	Labour choices
	RWH RANZCOG	Non-medical and medical pain relief methods
<i>Childbirth education</i>		
	RWH	Childbirth education videos on labour, birth, and early parenthood
<i>Caesarean section</i>		
	Better Health Channel	Caesarean section. Includes reason for caesarean section, risks and complications, post caesarean care and vaginal birth after caesarean
M	Maternal issues in pregnancy	
Common concerns during pregnancy	RWH	Common pregnancy concerns, weight and pregnancy, nutrition and food, back care and pelvic floor muscle care
Anaemia	Healthdirect Australian government	Causes for anaemia, tests and supplements
Asthma	National Asthma Council Australia	Asthma in pregnancy. Includes link to an asthma plan
Epilepsy	Epilepsy Foundation	Pre pregnancy counselling, anti-epileptic drugs and pregnancy, breastfeeding and motherhood

Gestational diabetes	Australasian Diabetes in Pregnancy society (ADIPS)	Pregnancy and diabetes
	Diabetes Australia	Pregnancy and diabetes
	itunes Apple	Free Diabetes App for women with Type 1, Type 2 and gestational diabetes
	Australasian Diabetes in Pregnancy society (ADIPS)	Aboriginal and Torres Strait pregnant women with diabetes
Thyroid	Thyroid Foundation Australia	Thyroid and pregnancy, iodine supplementation for pregnant and breastfeeding women
<i>Infections – see under I</i>		
<i>Mental Health and wellbeing – see under M</i>		
M	Mental Health and wellbeing	
	PANDA Beyond Blue Centre of Perinatal Excellence (COPE)	Multiple resources on perinatal mental health
	Headspace Mind the Bump	Meditation and learn how to meditate. Mind the Bump is a free mindfulness meditation app
	Head to Health , Australian Department of Health	Range of apps, resources, online programs and forums, services on mental health
	Children of Parents with a Mental Illness (COPMI)	For parents with mental illness, their family and friends in support of these kids and young people
N	Newborn screening	
	Victorian Clinical Genetics Services	Newborn bloodspot screening
	Raising children	Newborn bloodspot screening process and health conditions screened for
	The Royal Children Hospital	Victorian infant hearing screening program and process
O	Oral health	
Dental Health Services, Victoria	Oral health in pregnancy	
P	Pregnancy Planning	
	Family Planning NSW	Nutrition, exercise, vaccination, smoking, genetic counselling, and blood group check for women planning for pregnancy
	Better Health Channel	Planning for pregnancy
	Pregnancy, birth, baby	Range of resources on pregnancy planning, birth, and parenting

	Placental disorders	RACOG	Placenta praevia, vasa praevia and placental adhesion disorders
	Pelvic floor and continence: see Exercise and pelvic floor		
	Postnatal care		
		Health Direct, Australian government	Range of resources on: -Setting and feeding your baby -Postpartum psychosis -Physical and emotional wellbeing -Looking after your body -Physiotherapy advice after pregnancy -Postnatal depression
	Contraception	Family Planning Victoria	Contraception choices and options if breastfeeding
S	Sex and sexual health		
	Sex	Raising Children Network, Australian government	Sex in early pregnancy information for men
		Raising children	Sex and intimacy after a baby
	Sexual health	Melbourne Sexual Health Centre	Factsheets on different sexual health conditions and related issues
	Sleep	Cure Kids, New Zealand government	Sleeping on side information
	Smoking	QUIT, Cancer Council	Smoking and quitting in pregnancy. Aboriginal and Torres Strait Islander-specific information
T	Testing in pregnancy		
	GBS Screening	Better Health Channel	Group B streptococcal infection screening and treatment
	Haemolytic disease for Rh -ve women	Red Cross Australia	Prevention of haemolytic disease of the newborn in Rh -ve women
	Blood Group	Healthdirect, Australian government	Rh -ve in pregnancy
	Antenatal testing	RANZCOG	Routine antenatal testing and screening
		Victorian Clinical Genetics Service	Second trimester and Combined first trimester screening
	Genetic testing and syndrome		

<i>Testing</i>		
Prenatal screening	RANZCOG RWH	Prenatal screening for chromosomal and genetic conditions
	Murdoch Children's Research Institute	Booklet to inform decision about prenatal screening for aneuploidy
	Raising Children Network, Australian government	Antenatal tests for chromosomal abnormalities and other conditions
Amniocentesis and CVS	RANZCOG	Amniocentesis procedure
	Mater Hospital	Amniocentesis and CVS
Carrier screening	RANZCOG	Reproductive carrier screening
	Centre for Genetics Education, NSW government	
<i>Genetic conditions</i>		
Down syndrome	Down Syndrome Australia	Down syndrome
Fragile X	Fragile X Association of Australia	Fragile X, with links to services and support groups
Genetic Conditions and testing	Centre for Genetics Education, NSW Government	Genetic testing and genetic abnormalities
	US National Library of Medicine (NIH)	Effects of genetic variation on human health
	Better Health Channel	Diagnosis and types of congenital anomalies
<i>Genetic services</i>		
Genetic Services in Victoria	Better Health Channel	Genetic services in Victoria
T Travel	RANZCOG RCOG (UK) ACOG (USA)	Travel in pregnancy
	Better Health Channel	Travel in pregnancy- includes information on time to travel, risks, safety and immunisation
T Teenage pregnancy	Family Planning Victoria	Teenage pregnancy, pregnancy options and complications, social issues

Appendix 1: Hospital Contact details

October 2020	Mercy Hospital for Women (Heidelberg)	Werribee Mercy Hospital	Joan Kirner Women's and Children's at Sunshine Hospital	The Northern Hospital	The Royal Women's Hospital Parkville	The Royal Women's Hospital Sandringham
GP Hotline/ Access (GP use only)	NA	NA	NA	NA	8345 2058	NA
Emergency Department	8458 4514	8754 3318	8345 1596	8405 2610 8405 8610 (GP use only)	8345 2058 (via Switch: Option 1)	9076 1470
Switchboard	8458 4444	8754 3000	8345 6666	8405 8000	8345 2000	9076 1000
Fax Referral (Outpatients)	8458 4205	8754 6710	9055 2125	8405 8616	8345 3036	8345 3036
Website	www.mercy.com.au	www.mercy.com.au	www.westernhealth.org.au	www.nh.org.au	www.thewomens.org.au	www.thewomens.org.au
Aboriginal Liaison	8458 4393	8754 6736	Aboriginal Maternity Service 8345 0949	Koori Maternity 8405 8773 Aboriginal Liaison Unit 8405 8476	8345 3047	NA
Abortion Services	NA	NA	9055 2300 (if < 10 weeks gestation)	8345 5004	8345 2832	NA
Breastfeeding Support Services	8458 4677	8754 3407	9055 2448	8405 8202	8345 2400/2496	9076 1570
Childbirth/Parent Education	8458 4152	8754 3400	Via outpatient 8345 1727	8405 8211	8345 2142	sandringham.childbirtheducation@thewomens.org.au
Diabetes Educator	8458 4164	8754 3062	8395 9500	8405 5280	8345 2153	9076 1253
Dietitian	8458 4165	8754 3629	8345 1727	8405 8583	8345 3160	9076 1230
Early Parenting Centre	O'Connell Family Centre, Canterbury 8416 7600	NA	Tweddle Child & Family Health Services 9689 1577	Tweddle Child & Family Health Services 9689 1577	NA	NA
Early Pregnancy Assessment Service (early pregnancy bleeding/pain)	8458 4000	8754 3390	9055 2110 (Mon–Fri, 8am - 4.30pm) Or via O&G registrar 8345 6666	NA	8345 3643	Emergency Department 9076 1470
Perinatal Medicine (fetal abnormality/high-risk pregnancy)	8458 4248 FAX 8458 4205	8754 3400 (Fetal monitoring/ Pregnancy Day Stay)	9055 2110	8405 8000 (page O&G registrar)	8345 2158	8345 2158 (Parkville site)
Genetic Services	8458 4346	Contact Western Health Genetics	9055 3006	8405 8763 / 9496 3027	8345 2180	8345 2180 (Parkville site)
GP Liaison Unit	8458 4831/4833	8754 3497	8345 1735 gp@wh.org.au	8405 8815/ 9495 3140	8345 2064 / 3070	8345 2064 / 3070

Appendix 1: Hospital Contact details

May 2020	Mercy Hospital for Women (Heidelberg)	Werribee Mercy Hospital	Joan Kirner Women's and Children's at Sunshine Hospital	The Northern Hospital	The Royal Women's Hospital Parkville	The Royal Women's Hospital Sandringham
Interpreter Services	8458 4282	8754 3439	8345 7148	8405 8188	8345 3054	1800 131 450
Outpatients Appointments (urgent)	8458 4111	8754 6700	8345 1727	8405 8335	GP Quick Access Number 8345 2058 (Option 2)	9076 1232/1233
Multicultural Services	8458 4255 African Liaison: 8458 4150	NA	8345 1302	NA	8345 3058 African Women	NA
Pathology	9496 3100 (Austin Pathology)	9244 0472 (Dorevitch–Drs only)	9244 0472 (Dorevitch–Drs only)	8405 8356	9345 4200 (Network Pathology)	9076 1555
Patient Advocate/ Consumer Liaison Officer	8416 7783	8416 7783	8345 1502	9495 3312	8345 2290/2291	8345 2290
Pharmacy/Drug Information	8458 4666	8754 3541	8345 6435	8405 2532	8345 3190	NA
Pregnancy Day Service (fetal monitoring)	8458 4266	8754 3462	9055 2300	8405 8000 (page O&G registrar)	8345 2182/2184	9076 1233
Physiotherapy	8458 4141	8754 3150	8345 1727	8405 8580	8345 3160	9076 1292
Perinatal Mental Health Services	8458 4843 (message) or Page Psych registrar: 8458 4444	1300 657 259	8345 6666 (page Psych registrar)	8405 8772 (via maternity services)	8345 2000 (page Psych liaison nurse)	NA
Shared Maternity Care Coordinator	P: 8458 4120 Fax: 8458 4205 sharedcare@mercy.com.au	P: 8754 3393 Fax: 8754 6710 werribeesharedcare@mercy.com.au	P: 9055 3012 Fax: 9055 2135 maternitysharedcare@wh.org.au	P: 8405 8772 Fax: 8405 8766 maternitysharedcare@nh.org.au	P: 8345 2129 Fax: 8345 2130 sharedcare@thewomens.org.au	General: P: 9076 1233 Clinical enquiries P: 9076 1232 sharedcare.sandringham@thewomens.org.au
Social Work	8458 4149	8754 3054	8345 1727	8405 8653	8345 3050	9076 1290/1000 (to page Social Worker)
Ultrasound/Imaging	8458 4300 FAX 8458 4241	8734 0400 (MIA Radiology)	8345 0351	9408 2222 (Epping Consulting Centre & Healthcare Imaging)	8345 2250	9076 1411
Women's Health Information Centre	NA	NA	Patient Information Centre on site at Sunshine	NA	8345 3037	8345 3037

GUIDELINES FOR SHARED MATERNITY CARE AFFILIATES 2021

