phn NORTH WESTERN MELBOURNE
An Australian Government Initiative

Shared Maternity Care Workshop 2: Improving Outcomes in Pregnancy: Preterm Birth, Growth Restriction and Family Violence

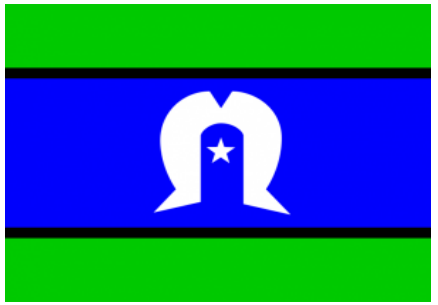
Tuesday 23 September 2025

The content in this session is valid at date of presentation

Acknowledgement of Country

North Western Melbourne Primary Health Network would like to acknowledge the Traditional Custodians of the land on which our work takes place, The Wurundjeri Woi Wurrung People, The Boon Wurrung People and The Wathaurong People.

We pay respects to Elders past, present and emerging as well as pay respects to any Aboriginal and Torres Strait Islander people in the session with us today.



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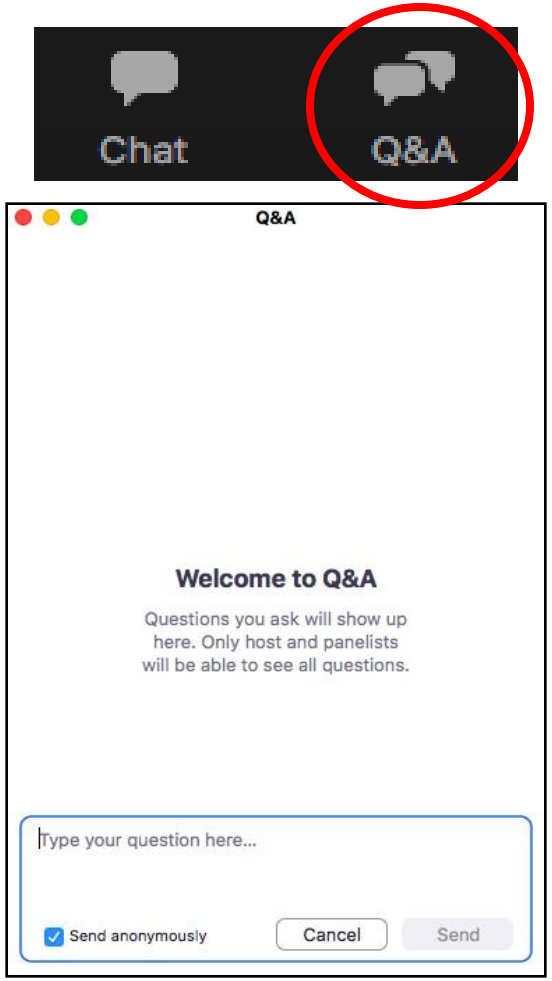

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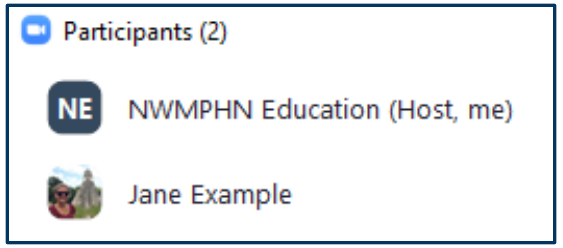

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Collaboration

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Northern Health

Shared Maternity Care Collaborative

Mercy Health
primarycare@mercy.com.au
Primary Care Liaison Manager, Caitlin Shaw
Primary Care Liaison Officer, Sharon Tjissen

Northern Health
nh-primarycareliaison@nh.org.au
GP Liaison Officer, Dr Richard Sia
Consultant Obstetrics and Gynaecology, Dr Arzoo Khalid

Royal Women's Hospital
gp.liaison@thewomens.org.au
Head of GP Liaison Unit, A/Prof Ines Rio
Primary Care Liaison Officer, Emily Lawson

Western Health
gp@wh.org.au
General Practice Integration Manager, Skye Spencer
GP Advisor, Dr Jo Silva

HealthPathways Melbourne

Shared Maternity Care Workshop 2: Improving Outcomes in Pregnancy: Preterm Birth, Growth Restriction and Family Violence

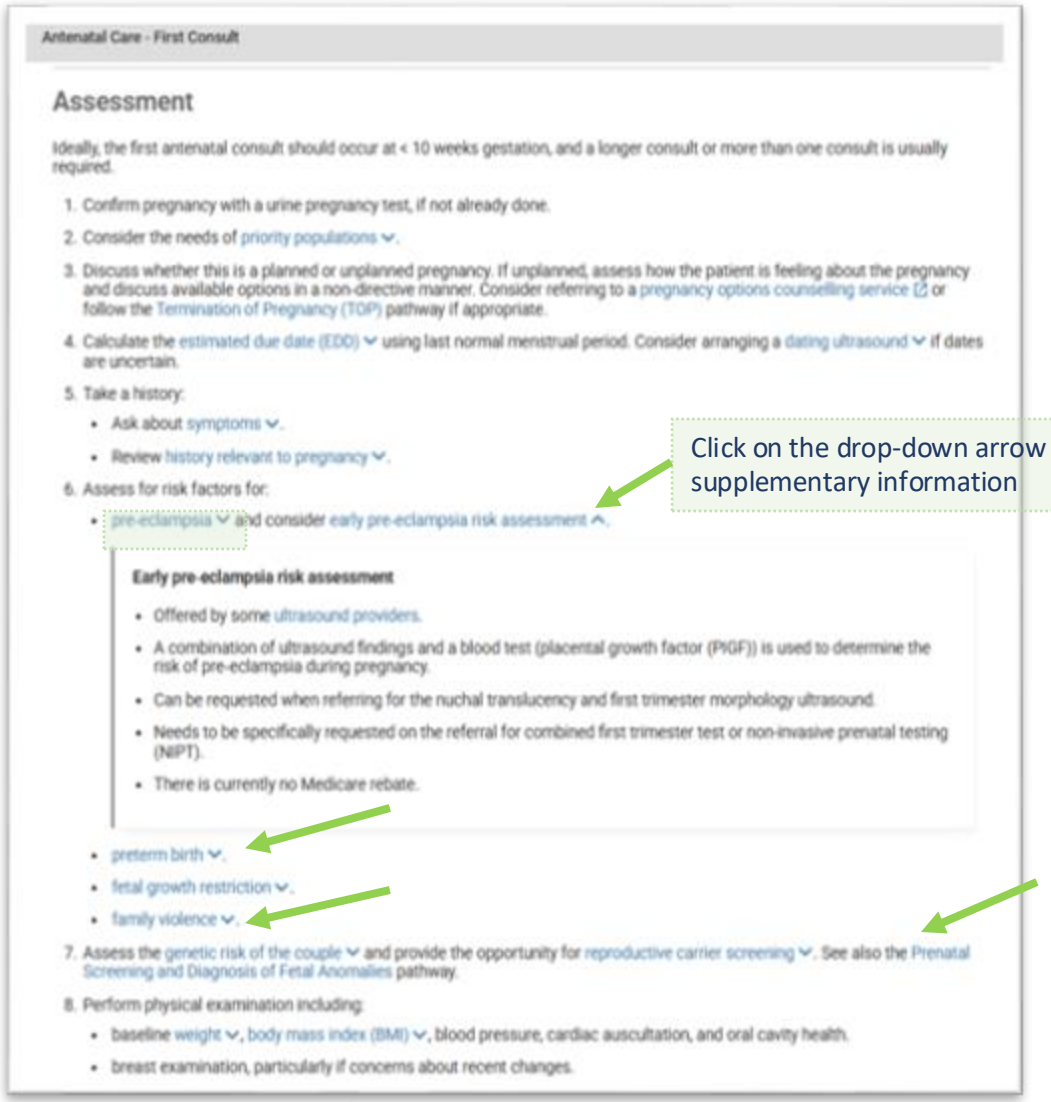
23 September 2025

Pathways are written by GP clinical editors with support from local GPs, hospital-based specialists and other subject matter experts

- clear and concise, evidence-based medical advice
- Reduce variation in care
- how to refer to the most appropriate hospital, community health service or allied health provider.
- what services are available to my patients

HealthPathways – Antenatal Care-First Consult

HealthPathways – Antenatal Care - First Consult



Antenatal Care - First Consult

Assessment

Ideally, the first antenatal consult should occur at < 10 weeks gestation, and a longer consult or more than one consult is usually required.

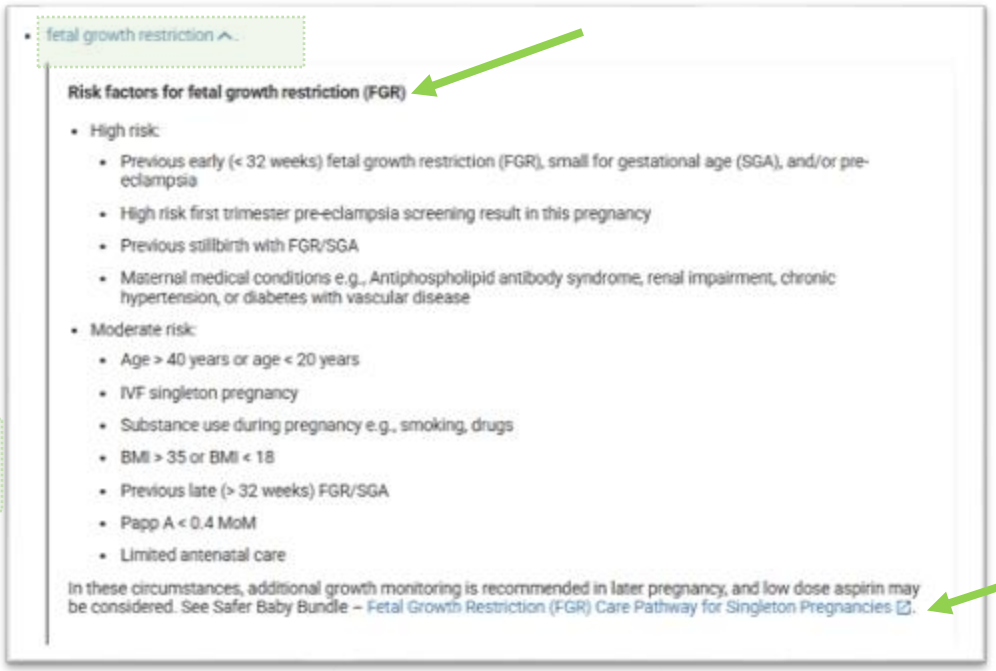
1. Confirm pregnancy with a urine pregnancy test, if not already done.
2. Consider the needs of priority populations.
3. Discuss whether this is a planned or unplanned pregnancy. If unplanned, assess how the patient is feeling about the pregnancy and discuss available options in a non-directive manner. Consider referring to a pregnancy options counselling service or follow the Termination of Pregnancy (TOP) pathway if appropriate.
4. Calculate the estimated due date (EDD) using last normal menstrual period. Consider arranging a dating ultrasound if dates are uncertain.
5. Take a history:
   - Ask about symptoms.
   - Review history relevant to pregnancy.
6. Assess for risk factors for:
   - pre-eclampsia and consider early pre-eclampsia risk assessment.

     Early pre-eclampsia risk assessment

     - Offered by some ultrasound providers.
     - A combination of ultrasound findings and a blood test (placental growth factor (PlGF)) is used to determine the risk of pre-eclampsia during pregnancy.
     - Can be requested when referring for the nuchal translucency and first trimester morphology ultrasound.
     - Needs to be specifically requested on the referral for combined first trimester test or non-invasive prenatal testing (NIPT).
     - There is currently no Medicare rebate.

   - preterm birth.
   - fetal growth restriction.
   - family violence.
7. Assess the genetic risk of the couple and provide the opportunity for reproductive carrier screening. See also the Prenatal Screening and Diagnosis of Fetal Anomalies pathway.
8. Perform physical examination including:
   - baseline weight, body mass index (BMI), blood pressure, cardiac auscultation, and oral cavity health.
   - breast examination, particularly if concerns about recent changes.

Click on the drop-down arrow to view supplementary information



- fetal growth restriction.

Risk factors for fetal growth restriction (FGR)

- High risk:
  - Previous early (< 32 weeks) fetal growth restriction (FGR), small for gestational age (SGA), and/or pre-eclampsia
  - High risk first trimester pre-eclampsia screening result in this pregnancy
  - Previous stillbirth with FGR/SGA
  - Maternal medical conditions e.g., Antiphospholipid antibody syndrome, renal impairment, chronic hypertension, or diabetes with vascular disease
- Moderate risk:
  - Age > 40 years or age < 20 years
  - IVF singleton pregnancy
  - Substance use during pregnancy e.g., smoking, drugs
  - BMI > 35 or BMI < 18
  - Previous late (> 32 weeks) FGR/SGA
  - Papp A < 0.4 MoM
  - Limited antenatal care

In these circumstances, additional growth monitoring is recommended in later pregnancy, and low dose aspirin may be considered. See Safer Baby Bundle – Fetal Growth Restriction (FGR) Care Pathway for Singleton Pregnancies.

- family violence.

Family violence

Ask all pregnant patients about family violence.

Explain to patients that asking about family violence is a routine part of antenatal care and that they are in a safe and confidential environment.

- Intimate partner violence may increase during pregnancy and postnatally.
- Studies show that patients find it acceptable to be asked about family violence.

Questions could include: [4]

- "Is there anything else going on in your life that you'd like to talk about?"
- "Are your friends and family aware of what's going on, and are they worried about you and/or the children?"
- "Are you feeling unsafe?"
- "Are you worried about your children's safety?"

See also the Disclosure of Family Violence pathway.

HealthPathways – Antenatal Care - First Consult

Management

1. If any bleeding or pain, follow the Bleeding During Pregnancy pathway.
2. Provide information about the types of pregnancy care available in your area, including discussion of costs, if relevant.
   - This may include public hospital care, GP obstetrician, private obstetrician, shared care, or caseload midwifery.
   - See also Pregnancy Booking.
3. Arrange referral for pregnancy care as soon as pregnancy is confirmed. Clearly document any reasons that identify the patient as high risk or in need of early obstetric assessment.
4. If the patient has a pre-existing medical condition, arrange review by the treating specialist or appropriate specialist referral as soon as pregnancy is confirmed.
5. If the patient identifies as Aboriginal and Torres Strait Islander, understand their specific cultural and spiritual needs and offer referral to specific Indigenous services. Ensure Indigenous status is clearly marked on all referrals to both mainstream and Indigenous services.
6. Cease medications with potential teratogenic effects. Discuss with the treating specialist first, if required. See also Medications in Pregnancy and Breastfeeding.
7. Offer influenza vaccination, pertussis vaccination, and COVID-19 vaccination to all pregnant and breastfeeding patients. See Immunisation – Pregnancy.
8. Manage patients at increased risk of pre-eclampsia.
9. Provide smoking cessation advice if relevant.
10. Advise the patient that there is no safe limit of alcohol consumption in pregnancy.
11. Provide mental health support as appropriate. Advise patient of online resources, e.g. Centre of Perinatal Excellence (COPE), Gidget Foundation, PANDA. See also Perinatal Mental Health Care.
12. Provide general nutritional advice and information about hand hygiene and food safety to prevent infections such as listeriosis, salmonellosis, and toxoplasmosis.
13. Recommend supplements:
    - Folic acid
    - Iodine
    - Vitamin D
    - Routine iron supplementation is not necessary
    - B_{12} if vegan/vegetarian diet

    See also RANZCOG – Vitamin and Mineral Supplementation and Pregnancy.

    Prior to prescribing, see Australian Medicines Handbook or similar authoritative source.
14. If BMI < 18.5 or > 25 follow the Weight Management in Pregnancy and Pre-pregnancy pathway.
15. Advise patients about safe exercise in pregnancy.
16. Refer patients with substance use and dependence to the Royal Women's Hospital alcohol and drug service. Also seek advice from obstetric care provider.

8. Manage patients at increased risk of pre-eclampsia.

Increased risk of pre-eclampsia

This section applies to any patient who has risk factors for developing pre-eclampsia and is pregnant.

1. Discuss with obstetric care provider to arrange early pregnancy care and obstetric assessment.
2. Recommend preventive therapy:
   - If the patient has ≥ 1 high risk factor (or ≥ 2 moderate risk factors), consider aspirin, unless contraindicated.
   - Consider calcium supplement if dietary intake is not sufficient (< 1 g/day). The use of supplemental calcium is strongly recommended in pregnant patients with low dietary intake for the prevention of pre-eclampsia, preterm birth, and gestational hypertension.
     - Calculate patients dietary calcium intake using SOMANZ Calcium Calculator.
     - Consider checking serum calcium in patients on calcium supplements to exclude pre-existing hypercalcaemia.
   - If anti-phospholipid syndrome, consider low molecular weight heparin (or unfractionated heparin) under guidance from an obstetrician. Do not use heparin to prevent pre-eclampsia except in this cohort.
3. Recommend moderate intensity exercise.
4. Provide patient information.
5. Educate about signs and symptoms of pre-eclampsia.
6. Complete the following checks at each visit:
   - ask about symptoms and signs of pre-eclampsia
   - check blood pressure (BP). Target BP in pregnancy is ≤ 135/85 mmHg. This has been shown to be maternally beneficial without adverse effects to the fetus.

HealthPathways – Non-acute Obstetric Referral

Non-acute Obstetric Referral (> 24 hours)

If advice about management is needed, page the public hospital on-call obstetric registrar (usually via hospital switchboard), or contact a private specialist via their consulting rooms.

See also:

- Acute Obstetric Referral (Same-day)
- Early Pregnancy Assessment Service (EPAS)
- Obstetrics pathways

Public

Public Hospitals

1. Check the referral criteria including Statewide Referral Criteria for referrals to Level 6 Maternity services.
2. Confirm that the patient is aware of the need for referral and is willing for this to take place. If the patient is not competent to consent, refer to the consent process.
3. Prepare the required referral information and mark the referral as urgent or routine.
4. Refer to the service.
   - If the patient needs to be seen before the scheduled appointment, contact the service where patient is booked to birth. Speak with clinic midwifery or obstetric staff, who can organise urgent clinic review. Then send a referral marked as urgent.
   - Specialist clinics may request referral to a named specialist or Head of Unit.
   - Consider:
     - General Practice Referral Template
     - Hospital GP Liaison
     - Aboriginal Hospital Liaison Officer
   - See also Shared Care Guidelines referral information.

   Eastern Melbourne

   North Western Melbourne

   Statewide
5. Advise the patient:
   - that providers may charge fees.
   - to advise of any change in circumstance as this may affect the referral.

North Western Melbourne

Mercy Health - Werribee Mercy Hospital Antenatal Clinics Level 4 Maternity Service	Werribee, Wyndham
Northern Health Antenatal Care Level 5 Maternity Service	Epping, Whittlesea
Northern Health Medical Obstetrics	Epping, Whittlesea
The Royal Women's Hospital Maternity Care Clinics Level 6 Maternity Service	Parkville, Melbourne

REFERRAL OPTIONS

Fax (03) 8345-3036

Referral form(s) Referral Form

Service-specific criteria

Inclusion criteria:

- Parkville
  - Women with high risk pregnancies requiring tertiary care from the north-west of Victoria
  - Women who are pregnant and fall within the Women's local metropolitan area
- Sandringham
  - Women with low risk pregnancies who fall within the Sandringham Hospital local area
  - singleton or dichorionic twin pregnancy
  - Parity <5
  - Body Mass Index (BMI) > 17 and < 37.9 at date of referral

Exclusion criteria:

- Sandringham
  - Women with high risk pregnancies

Information for referrer

Referral advice: Phone Obstetric registrar via switchboard.

Head of unit: Dr Jenny Ryan, Director of Maternity Services

When ordering tests for a patient (or a potential patient) of the Women's, **add RWH in the cc box on your pathology request slip**. This will enable electronic transfer of results to The Royal Women's Hospital electronic medical record system

HealthPathways – Family Violence

Management section of Family Violence Pathway

Disclosure of Family Violence

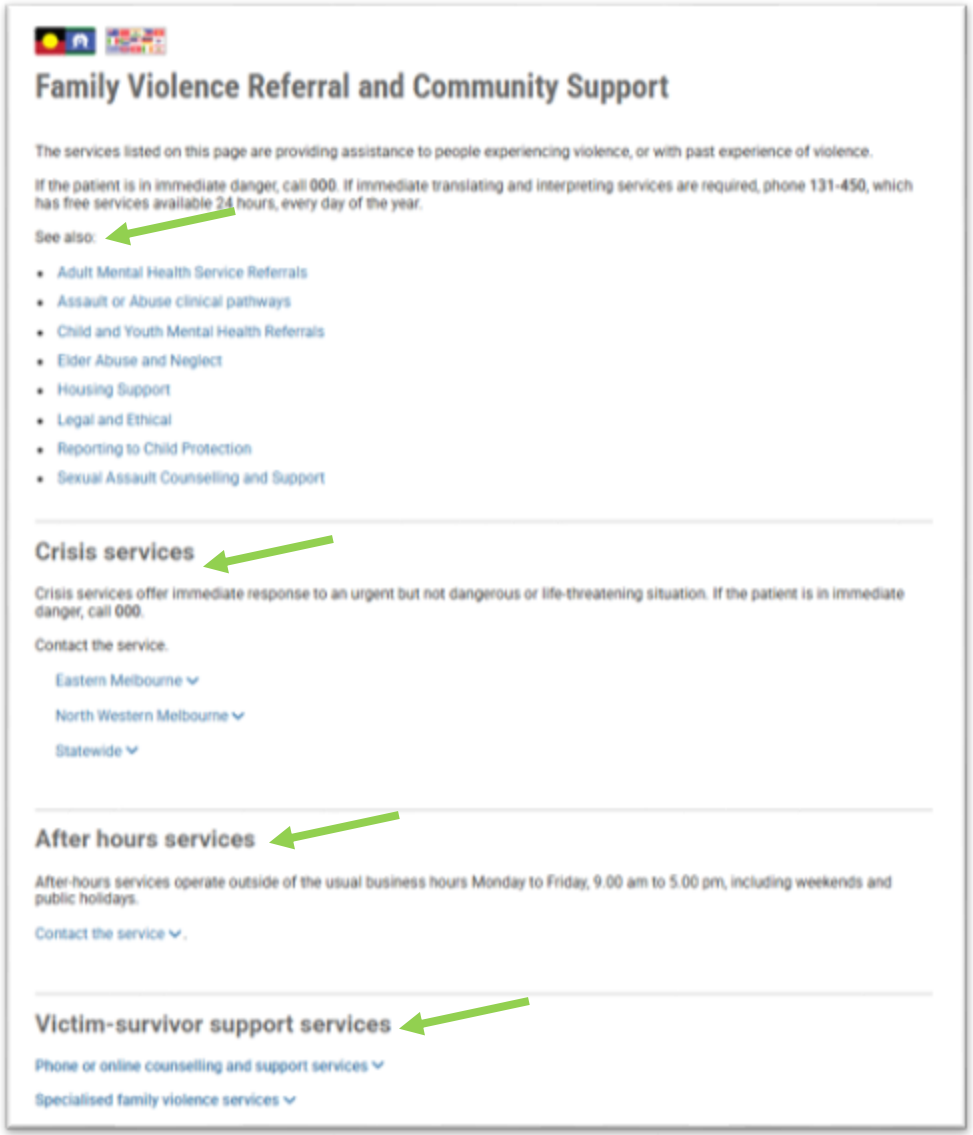
Management

1. If victim-survivor or children are in immediate danger, call **000** for police support and **1800-015-188** for safe steps family violence and support service.
2. If suspected child abuse or neglect, report to Victorian Child Protection Service.
3. Create a trustworthy and safe environment for the victim-survivor, and practice trauma-informed care. Use the LIVES framework in supporting victim-survivor disclosing experience of family violence.
4. Discuss safety and a safety plan each consultation, according to risk:
   - High risk of immediate violence

     High risk of immediate violence
     - A victim-survivor at high risk of immediate violence may not be safe to go home.
     - Assist them to call police or the National Sexual Assault, Domestic Family Violence Counselling Service on **1800-737-732** or safe steps family violence and support service on **1800-015-188**, and to find a safe place to go to e.g., friend's house.
     - If evidence exists of serious threat to life, general practitioners can inform police without victim-survivor consent. Inform and explain your decision to the person.
   - Less risk of immediate violence
     - If technology abuse is occurring, online safety planning can help victim-survivors to stay connected through technology while reducing the risks associated with technology abuse.
     - If the person who uses violence does not have access to the person's smartphone, account details or messages, these apps may be of assistance:
       - 1800RESPECT – Daisy App
       - Ask Izzy – Free on Telstra mobile network

       Consider reporting image abuse to the eSafety Commissioner.
5. Consider the needs of diverse communities or groups that experience domestic violence:
   - Parents and siblings
   - Elder abuse
   - LGBTIQA+ people
   - Aboriginal and Torres Strait Islander people
   - Migrant and refugee populations
   - People with disabilities
6. Keep accurate and confidential records of consultations and injuries.
7. Emphasise the victim-survivor's right to confidentiality and to decide on a course of action that is right for them.
8. Provide support – help the victim-survivor access information, services, and social supports. See Domestic and Family Violence Community Support.
9. Consider if there are requests or a need for information sharing via Family Violence Information Sharing Scheme (FVISS) and Child Information Sharing Scheme (CISS).
10. Review if you are seeing other members of the family. Be aware it is recommended that different general practitioners provide care for the victim-survivor and the people who use family violence.

Family Violence referral and community support services



Family Violence Referral and Community Support

The services listed on this page are providing assistance to people experiencing violence, or with past experience of violence.

If the patient is in immediate danger, call **000**. If immediate translating and interpreting services are required, phone **131-450**, which has free services available 24 hours, every day of the year.

See also:

- Adult Mental Health Service Referrals
- Assault or Abuse clinical pathways
- Child and Youth Mental Health Referrals
- Elder Abuse and Neglect
- Housing Support
- Legal and Ethical
- Reporting to Child Protection
- Sexual Assault Counseling and Support

Crisis services

Crisis services offer immediate response to an urgent but not dangerous or life-threatening situation. If the patient is in immediate danger, call **000**.

Contact the service.

- Eastern Melbourne
- North Western Melbourne
- Statewide

After hours services

After-hours services operate outside of the usual business hours Monday to Friday, 9.00 am to 5.00 pm, including weekends and public holidays.

Contact the service.

Victim-survivor support services

- Phone or online counselling and support services
- Specialised family violence services

Relevant and related pathways

Antenatal Care

Antenatal Care - First Consult
Antenatal - Second and Third Trimester Care
Anti-D Prophylaxis in Pregnancy
Preconception Assessment
Prenatal Screening and Diagnosis of Fetal Anomalies
Use and Interpretation of Pregnancy Ultrasound

Pregnancy Medical Conditions

Anaemia in Pregnancy
Asthma in Pregnancy
Hypertension and Pre-eclampsia in Pregnancy
Hypertension in Pregnancy and Postpartum
Thyroid Disease in Pregnancy

Diabetes in Pregnancy

Hyperglycaemia in Pregnancy
Pre-pregnancy Planning for Type 1 and Type 2 Diabetes
Type 1 and Type 2 Diabetes and Pregnancy

Obstetrics

Maternal Postnatal Check
Pregnancy and Postpartum Mental Health

Related and relevant Family Violence pathways

Disclosure of Family Violence
Family Violence Referral and Community Support
People Who Use Family Violence

Obstetric Referrals

Acute Obstetric Referral or Admission (Same-day)
Non-acute Obstetric Referral (> 24 hours)
Early Pregnancy Assessment Service (EPAS)
Pregnancy Booking
Statewide Referral Criteria for Specialist Clinics

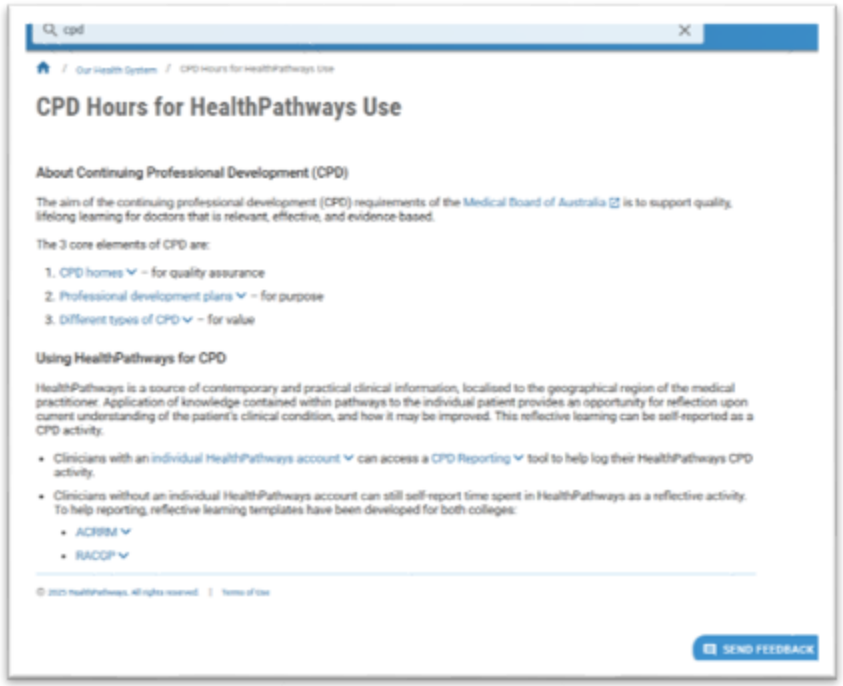
Other related Pathways

Consent
Syphilis
Notifiable Conditions in Victoria

CPD Hours for HealthPathways Use

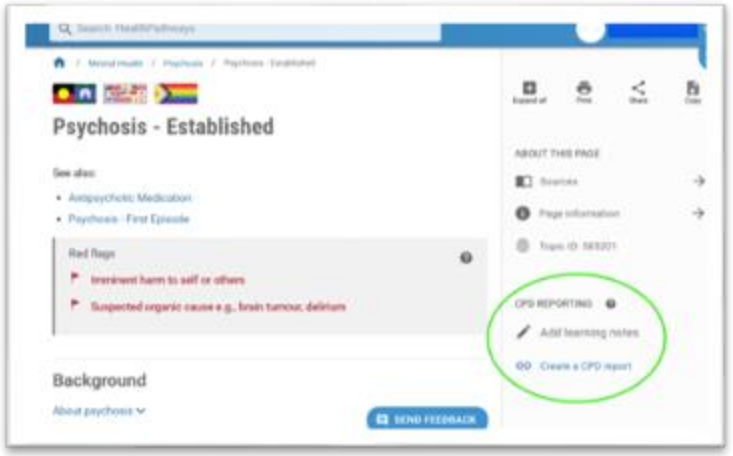
CPD Hours for HealthPathways Use and the CPD Reporting Tool:

HealthPathways Melbourne has CPD hours for HealthPathways Use to support clinicians in meeting their **CPD requirements** through everyday use of the platform

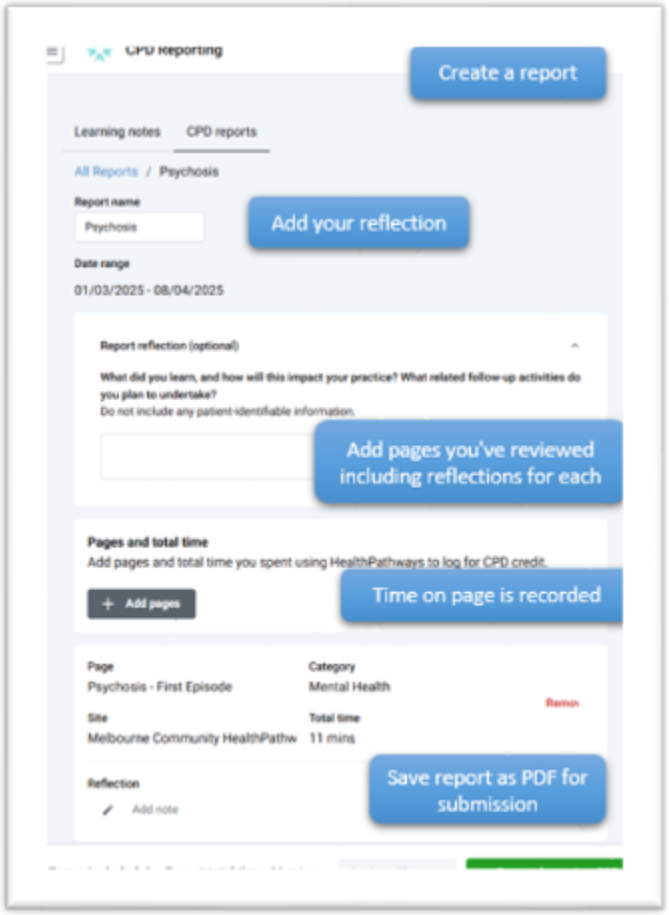


Step 1: Access Pathway page

- Navigate to a clinical pathway (e.g., *Psychosis – Established*).
- Click **"Add learning notes"** or **"Create a CPD report"** to begin tracking your CPD activity.



Step 2: Add Learning Notes



Step 3: Generate Your CPD Report

- Go to the **CPD Reporting** section.
- Add reflections, review pages, and confirm time spent.
- Export your report as a **PDF for submission**.

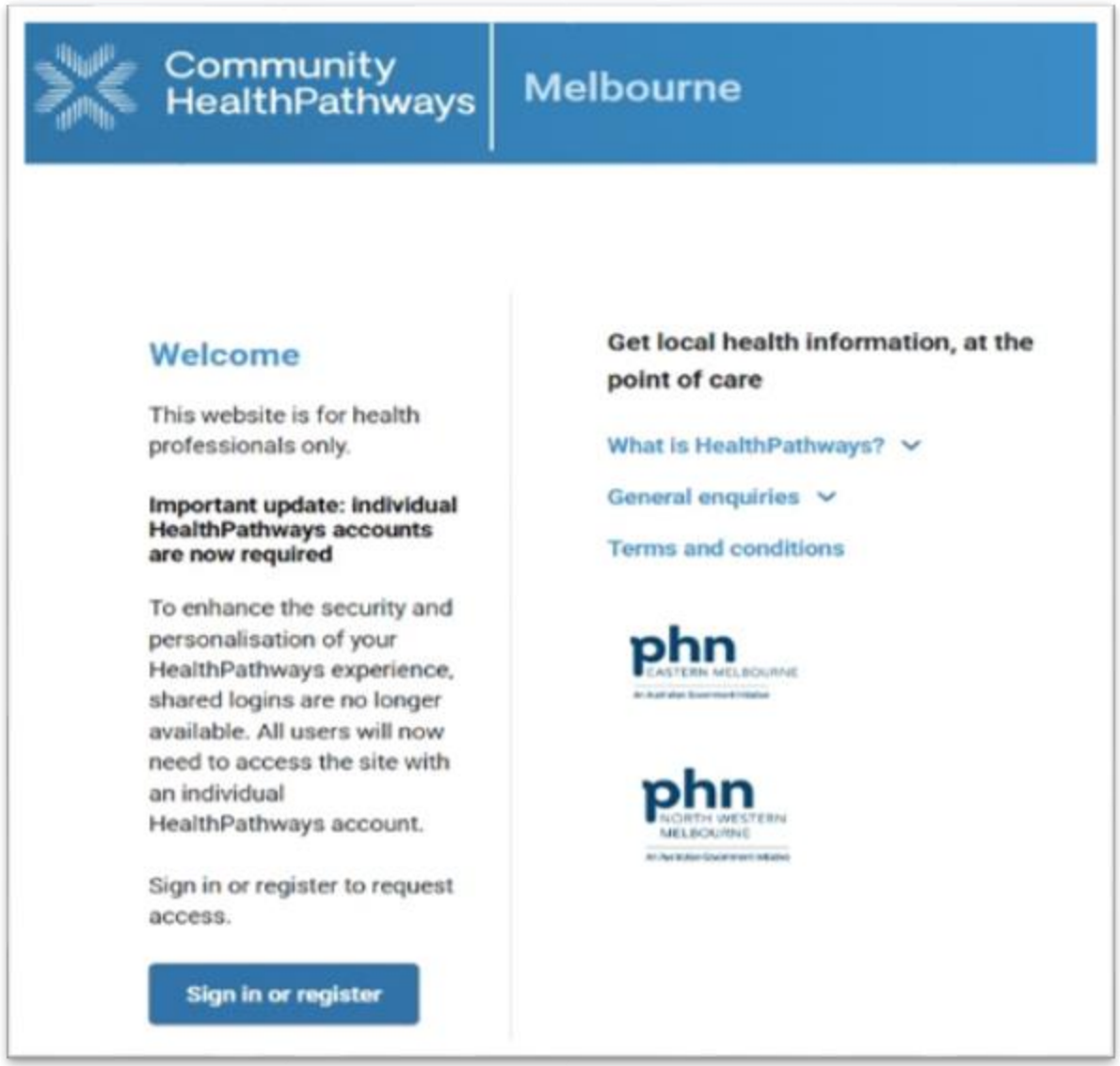
For further information on the CPD reporting tool, please see these videos:

- How to create a CPD report
- How to add learning notes

Accessing HealthPathways

Please click on the **Sign in or register** button to create your individual account or scan the QR code below.

If you have any questions, please email the team info@healthpathwaysmelbourne.org.au



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or email info@healthpathwaysmelbourne.org.au

AusCAPPS Network
Community of Practice

A free online network designed to support primary care clinicians to provide **long-acting reversible contraception (LARC)** and **early medical abortion (EMA)** services.

Benefits of joining AusCAPPS

- Connect with GPs, practice nurses, nurse practitioners, midwives, Aboriginal Health Practitioners and community pharmacists who have an interest in providing LARC and/or EMA services in Australia
- Discuss case studies and chat with peers and expert clinicians
- Find providers near you and build local networks
- Get access to the latest evidence-based resources, guidelines, webinars and podcasts
- Keep up to date with education and training opportunities related to LARC and EMA

Join AusCAPPS

Project partners

The Department of Health, Disability and Ageing is an official partner of AusCAPPS

Speakers

Dr Bethany Sampson is a generalist Obstetrician and Gynaecologist working full-time for Western Health. She is currently the clinical lead of maternity and gynaecology for Bacchus Marsh Hospital, which provides low-risk obstetrics and gynaecology to outer western Melbourne. This role spans the full continuum of women's health—from antenatal care and childbirth to postnatal support, gynaecology clinics, abortion care, and surgical services.

Professor Fabricio Costa, is a Consultant in Maternal Fetal Medicine at Gold Coast University Hospital and Professor of Obstetrics and Gynaecology at Griffith University. His research spans early pregnancy screening, pre-eclampsia prevention, and fetal DNA testing. He leads national efforts to implement a Clinical Decision Tool in Australia and has published over 220 peer-reviewed papers. His work integrates lab research, clinical trials, and health policy to improve perinatal outcomes.

Dr Tanya Ellis is a qualified clinical Social Worker with additional credentials in Management, Leadership, and Workplace Training. She has extensive experience across health, government, and community sectors, including roles as Training Officer, Team Leader, and Program Manager. Her work focuses on supporting vulnerable individuals and families facing complex medical and social challenges. Tanya has a strong interest in family violence practice and is passionate about trauma-informed care for both children and adults.

DR BETHANY SAMPSON

OBSTETRICIAN AND GYNAECOLOGIST, WESTERN HEALTH

FETAL GROWTH RESTRICTION

DEFINING GROWTH RESTRICTION: SGA VS IUGR

- Small for gestational age (SGA) is any babe born below the 10th centile for their gestation
- Not all babies who are SGA will be growth restricted, some babies who are above the 10th centile will be growth restricted
- 10th centile cut offs don't take into consideration genetic considerations for fetal size (parental height and weight, ethnicity, parity, fetal sex)
- Babies who are constitutionally small are less likely to be at an increased risk of perinatal mortality or morbidity though without individualised growth charts it can be challenging to distinguish between SGA and growth restriction
- More than 50% of babies below the 10th centile for gestation will be constitutionally small

DEFINING GROWTH RESTRICTION: SGA VS FGR

- Fetal growth restriction or intrauterine growth restriction (FGR or IUGR) is a pathological process wherein a fetus does not reach its growth potential
- Can be evidenced by:
  - Reduction in growth centiles throughout the pregnancy (fall of more than 50 percentiles for AC or EFW between scans or crossing quartiles on growth charts)
  - Reduced abdominal circumference on ultrasound compared with head circumference
  - A change in Doppler studies demonstrating increased placental blood flow restriction
  - Reduced amniotic fluid on ultrasound
  - Severe SGA (definitions may change depending on health service) i.e. <3rd centile EFW or AC

WHY DO WE CARE ABOUT FGR?

- Antenatally
  - Increase risk of still birth
  - Preterm birth
  - Caesarean section
- Neonatal period
  - Feeding difficulties
  - Jaundice
  - Late onset sepsis
  - Hypoglycaemia
  - Bronchopulmonary dysplasia
  - NEC
  - Pulmonary hypertension
- Long term consequences
  - Neurodevelopmental delay, ADHD
  - Asthma
  - Childhood and adult obesity
  - Metabolic disorders – hypertension, cardiovascular disease, T2DM

TYPES OF FGR

- Early onset
  - <32 weeks
  - Warrants MFM referral, tertiary care in a facility with high level neonatal care, frequency of scans will depend on Doppler findings
  - Consider early onset pre-eclampsia, infection, chromosomal abnormalities
- Late onset
  - >32 weeks
  - Warrants obstetric led care, more frequent growth scans (every 2 weeks), Doppler and AFI every week, CTG monitoring

TYPES OF FGR

Table 1 Main clinical characteristics of early- and late-onset fetal growth restriction (FGR)

Characteristic	*Early-onset FGR*	*Late-onset FGR*
Main clinical challenge	Management	Detection
Prevalence	30%	70%
Gestational age at manifestation	< 32 weeks	≥ 32 weeks
Ultrasound findings	Fetus may be very small	Fetus not necessarily very small
Doppler velocimetry	Spectrum of Doppler alterations that involves umbilical artery, middle cerebral artery and ductus venosus	Cerebral blood-flow redistribution
Biophysical profile	May be abnormal	May be abnormal
Hypertensive disorders of pregnancy	Frequent	Not frequent
Placental histopathological findings	Poor placental implantation, spiral artery abnormalities, maternal vascular malperfusion	Less specific placental findings, mainly altered diffusion
Perinatal mortality	High	Low
Maternal cardiovascular hemodynamic status	Low cardiac output, high peripheral vascular resistance	Less marked maternal cardiovascular findings

CASE STUDY: ISABELLE

- Isabelle is a 23 year old female in her first pregnancy. She is married to Jeremiah, her childhood sweetheart. She has no medical history, a normal BMI, non-smoker, no drugs or alcohol. Negative carrier screening pre-pregnancy. Taking pregnancy multivitamin.
- Booking bloods are normal, normal NIPT, dating scan and early anatomy scan
- Referred to local health service at 14 weeks and identified as low risk pathway and opts for shared care with her GP

RISK FACTORS

Table A: Available from history at booking (usually prior to 12 weeks)

Risk category	Definition of risk	Definition of outcome measure	Estimate measure	Point estimate and 95% CI
Maternal Risk Factors				
Age	Maternal age ≥ 35 years[22]	BW < 10th centile population	OR	1.4 (1.1–1.8)
	Maternal age > 40 years[22]†	**BW < 10th centile population**	**OR**	**3.2 (1.9–5.4)**
Parity	Nulliparity[25]	BW < 10th centile population*	OR	1.89 (1.82–1.96)
BMI	BMI < 20[28]	BW < 10th centile customised	OR	1.2 (1.1–1.3)
	BMI 25–29.9[28]	BW < 10th centile customised	RR	1.2 (1.1–1.3)
	BMI ≥ 30[28]	BW < 10th centile customised	RR	1.5 (1.3–1.7)
Maternal substance	Smoker[32]	BW < 10th centile customised	AOR	1.4 (1.2–1.7)
Exposure	Smoker 1–10 cigarettes per day[29]	BW < 9.9th centile population	OR	1.54 (1.39–1.7)
	Smoker ≥ 11 cigarettes per day[29]†	**BW < 9.9th centile population**	**OR**	**2.21 (2.03–2.4)**
	Cocaine[38]†	**BW < 10th centile population**	**OR**	**3.23 (2.43–4.3)**
IVF	IVF singleton pregnancy[41]	BW < 10th centile	OR	1.6 (1.3–2.0)
Exercise	**Daily vigorous exercise[32]†**	**BW < 10th centile customised**	**AOR**	**3.3 (1.5–7.2)**
Diet	Low fruit intake pre–pregnancy[32]◊	BW < 10th centile customised	AOR	1.9 (1.3–2.8)

RISK FACTORS

Previous Pregnancy History				
Previous SGA	**Previous SGA baby[8]†**	**BW < 10th centile customised**	**OR**	**3.9 (2.14–7.12)**
Previous Stillbirth	**Previous stillbirth[8]†**	**BW < 10th centile customised**	**OR**	**6.4 (0.78–52.56)**
Previous pre-eclampsia	Pre-eclampsia[9]	BW < 10th centile population	AOR	1.31 (1.19–1.44)
Pregnancy Interval	Pregnancy interval < 6 months[33]	SGA not defined*	AOR	1.26 (1.18–1.33)
	Pregnancy interval ≥ 60 months[33]	SGA not defined*	AOR	1.29 (1.2–1.39)
Maternal Medical History				
SGA◊	**Maternal SGA[31]†**	**BW < 10th centile population***	**OR**	**2.64 (2.28–3.05)**
Hypertension	**Chronic hypertension[17]†**	**BW < 10th centile population**	**ARR**	**2.5 (2.1–2.9)**
Diabetes	**Diabetes with vascular disease[14]†**	**BW < 10th centile population**	**OR**	**6 (1.5–2.3)**
Renal disease	**Renal impairment[15]†**	**BW < 10th centile population**	**AOR**	**5.3 (2.8–10)**
APLS	**Antiphospholipid syndrome[16]†**	**FGR no definition**	**RR**	**6.22 (2.43–16.0)**
Paternal Medical History◊				
SGA	**Paternal SGA[43]†**	**BW < 10th centile population**	**OR**	**3.47 (1.17–10.27)**

RISK FACTORS

Table B: Current pregnancy complications/developments

Risk category	Definition of risk	Definition of outcome measure	Estimate measure	Point estimate and 95% CI
Threatened miscarriage	**Heavy bleeding similar to menses[34]†**	**BW < 10th centile population**	**AOR**	**2.6 (1.2–5.6)**
Ultrasound appearance	**Echogenic bowel[62]†**	**BW < 10th centile population**	**AOR**	**2.1 (1.5–2.9)**
Pre-eclampsia	**Pre-eclampsia[8]†**	**BW < 10th centile customised**	**AOR**	**2.26 (1.22–4.18)**
Pregnancy induced hypertension	Mild[17] **Severe[17]†**	BW <10th centile population **BW < 10th centile population**	RR **RR**	1.3 (1.3–1.4) **2.5 (2.3–2.8)**
Placental abruption	Placental abruption[61]	SGA not defined*	OR range	1.3–4.1
Unexplained APH	**Unexplained APH[44]†**	**'IUGR' not defined**	**OR**	**5.6 (2.5–12.2)**
Weight gain◊	**Low maternal weight gain[13]†**	**BW < 10th centile population**	**OR**	**4.9 (1.9–12.6)**
Exposure◊	Caffeine ≥ 300 mg/day in third trimester[40]	BW < 10th centile population	OR	1.9 (1.3–2.8)
DS marker	**PAPP–A < 0.4 MoM[45]†**	**BW < 10th centile population**	**OR**	**2.6**

CASE STUDY: ISABELLE

- Isabelle come to see you at 20 weeks for her morphology scan. The result is normal, placenta is anterior and clear, EFW on the 60th centile
- The pregnancy continues to progress well, she attends regularly, has seen the local health service at 28 weeks and plans to see them again at 36 weeks
- You have an appointment at 34 weeks and notice the SFH has not changed over the last two appointments
  - 24 weeks = 24cm
  - 28 weeks = 28cm
  - 31 weeks = 31cm
  - 34 weeks = 31cm

CASE STUDY: ISABELLE

- You refer Isabelle the local health service for a review
  - CTG is normal
  - Urgent AFI and Doppler are conducted and normal
  - A growth scan is organised ASAP which shows EFW 40th centile, AC 20th centile, normal AFI and Doppler
  - She is seen by an obstetrician who repeats the SFH at 35 weeks and feels it is 35cm. They recommend a growth scan at 36 weeks and ongoing care with yourself until 38 weeks when they would like to review her again

MONITORING FOR FGR

- All pregnancies will have their risks for FGR outlined in their booking assessment by a midwife or obstetrician
- This includes
  - Confirming EDD
  - Assessing for pre-existing risk factors (smoking, maternal weight)
  - Reviewing previous pregnancy outcomes
  - Reviewing investigations to date which may be associated with FGR (low PAPP-A, placental abnormalities)
- Antenatal screening for FGR will include SFH +/- additional ultrasound between 28-36 weeks

SFH MEASUREMENTS

- Measurement in cm of distance between the symphysis pubis and the uterine fundus
- Measured from 24 weeks
- Values on the tape measure should be faced away (no cheating)
- A typical fundal height should match gestation (i.e. 34cm at 34 weeks)
- A SFH of less than or equal to 3cm warrants further investigation for FGR (and greater than 3cm also warrants investigation for LGA or polyhydramnios)
- Should also investigate further where a fundal height becomes static (e.g. 35cm at 34 weeks, then again 35cm at 36 weeks)
- A static or reduced fundal height should trigger review with CTG and an urgent ultrasound for fetal wellbeing or growth

CASE STUDY: ISABELLE

- You see Isabelle as planned at 36 weeks
- Her growth scan shows an EFW on the 20th centile, AC 15th centile, normal AFI and Doppler
- SFH at this appointment is 33cm

- You refer her back again to the local health service, accentuating the drop in centiles and ongoing reduced fundal height at this appointment
- The obstetrician who sees her this time agrees with you and plans for weekly monitoring and induction of labour at 38-39 weeks

LIMITATIONS OF MONITORING

- SFH has a sensitivity of around 27%
  - Maternal BMI
  - Fibroids
  - User variation (reliability is improved with continuity of care)
  - Fetal presentation
- Ultrasound reliability
  - EFW can be discordant by up to 500g at term
  - Human error within scanning depending on skill level, experience, environment
  - Cost of ultrasound
  - Availability

- Isabelle has a safe induction of labour at 38+4 and delivers a healthy baby girl who she names Susannah
- Susannah is on the 15th centile for her gestation. She is a well baby though has some challenges with establishing breastfeeding which is resolved with support of the local lactation consultants
- At a 3 months post partum visit, Isabelle asks you about her pregnancy and wonders if there is anything that should be managed differently in a future pregnancy or any steps to take in the interim

CASE STUDY: ISABELLE

PREVENTATIVE MEASURES

- Pre-pregnancy
  - Reduction or quitting smoking
  - Normalisation of weight
  - Good nutrition/exercise/stress management
  - Interpregnancy interval > 6 months
- Antenatally
  - No benefit for routine aspirin unless history of early onset pre-eclampsia
  - Smoking cessation or reduction
  - Engagement in healthcare
  - Continuity of care models may be more likely to identify FGR earlier

CAUSES OF FGR

- Placental
  - Substance abuse (smoking, cocaine, alcohol)
  - Medical conditions: hypertension/pre-eclampsia, diabetes, autoimmune disease, thrombophilias, renal disease
  - Abnormal placentation, placental abruption, placental infarcts
  - Umbilical cord abnormalities: velamentous, marginal cord insertion, single fetal umbilical artery
  - Multiple gestation
- Non-placental
  - Infection: HIV, CMV, malaria, rubella, syphilis, toxoplasmosis, TB, varicalla
  - Chromosomal: trisomy 13/18/21
  - Major congenital abnormalities: anencephaly, congenital heart disease, diaphragmatic hernia, gastroschisis/omplalocoele, TOF
  - Metabolic

CASE STUDY: ISABELLE

- Isabella comes to see you four years later
- She is pregnant again but is unsure of how far along she is this time
- She has separated from Jeremiah and taken up smoking 20 cigarettes per day
- The separation has placed financial strain on her and her family
- You organise a dating scan and routine bloods and discover she is already 16 weeks pregnant. All her bloods have returned normal.
- You place an urgent referral to the hospital for booking in and organise her morphology scan
- She does not want to pay for aneuploidy screening

CASE STUDY: ISABELLE

- Isabella is booked in at the hospital and again recommended for shared care
- Isabella told the hospital she is going to quit smoking and due to her last baby being above the 10th centile, she is not flagged as increased risk for SGA. She has not yet quit smoking
- Her morphology scan shows a normal fetus, EFW 60th centile, but a marginal cord insertion – this result was not yet back at the time of her booking in appointment
- You recommend to Isabella that she should have hospital based maternity care due to multiple risk factors for FGR and request she is seen at 24 weeks for a management plan

- The hospital corrects her pathway and she is recommended for growth scans at 32 and 36 weeks for maternal smoking and marginal cord insertion

CASE STUDY: ISABELLE

INVESTIGATIONS FOR FGR: ULTRASOUND

- Ultrasound is used to predict estimated fetal weight as well as markers of fetal wellbeing
- Fetal size is estimated using a combination of the measurements of biparietal diameter, head circumference, abdominal circumference and femur length
- Ultrasound accuracy is limited – human factor, fetal size/gestation, operator experience
- The use of ultrasound is most reliable for predicting growth when considered over multiple scans over several weeks

INVESTIGATIONS FOR FGR: ULTRASOUND

- Doppler studies
  - Umbilical artery Doppler
    - Increased umbilical artery Doppler indicate placental insufficiency and maternal malperfusion of placenta
    - Progressive increase corresponds with reduced placenta surface area and therefore loss of gas and nutrient exchange
    - May eventually show absent or reversed end diastolic flow
  - MCA Doppler
    - In a normal fetus the MCA would be a narrow vessel and therefore have higher flow, vasodilatation is a response to hypoxia associated with FGR which presents with a reduced MCA PI, this is called cerebral redistribution
  - DV Doppler
    - Normal DV doppler demonstrate an 'a-wave'
    - Absent or reversed a-wave is a sign of cardiac compromise in response to severe FGR (either attempted increased blood flow towards the heart or increased intra-atrial pressure secondary to high cardiac afterload)

INVESTIGATIONS FOR FGR: ULTRASOUND

- Biophysical profile
  - Fetal breathing (0/2)
  - Fetal tone (0/2)
  - Fetal movements (0/2)
  - Amniotic fluid volume (0/2)
- A score of <2 has a 100% sensitivity for fetal acidaemia
- A score of <4 may indicate fetal acidaemia

INVESTIGATIONS FOR FGR: CTG

- CTG monitoring gives real time insight into fetal wellbeing
- The presence of accelerations and normal variability on a CTG are unlikely to be seen in a hypoxic fetus
- Local guidelines for the frequency of CTG monitoring for FGR will vary but typically not performed prior to 28 weeks
- CTGs may also be indicated in the case of reduced fetal movements (>28 weeks), antepartum haemorrhage, hypertension or intrapartum

INVESTIGATIONS FOR FGR

- Growth restriction prior to 24 weeks has a higher association with chromosomal abnormalities
- Infection should be excluded in patients with early onset growth restriction or polyhydramnios
- Consider pre-eclampsia at all gestations but especially with early onset – pre-eclampsia bloods (FBE, LFT, UEC, coags, urine P:CR) and BP

CASE STUDY: ISABELLE

- Isabella continues her pregnancy care through the hospital
- Her growth scan at 32 weeks shows an EFW on the 60th centile, AC on the 55th centile, with normal AFI and Doppler
- At 36 weeks the EFW is on the 15th centile, AC on 8th centile with normal AFI and Doppler
- Again, she is recommended for weekly AFI and Doppler and a CTG and has an induction of labour at 38 weeks after a period of reduced fetal movements
- She delivers a boy named Conrad who is on the 9th centile. He needs a brief period in the special care nursery with TTN but then goes home with Isabella and is feeding well

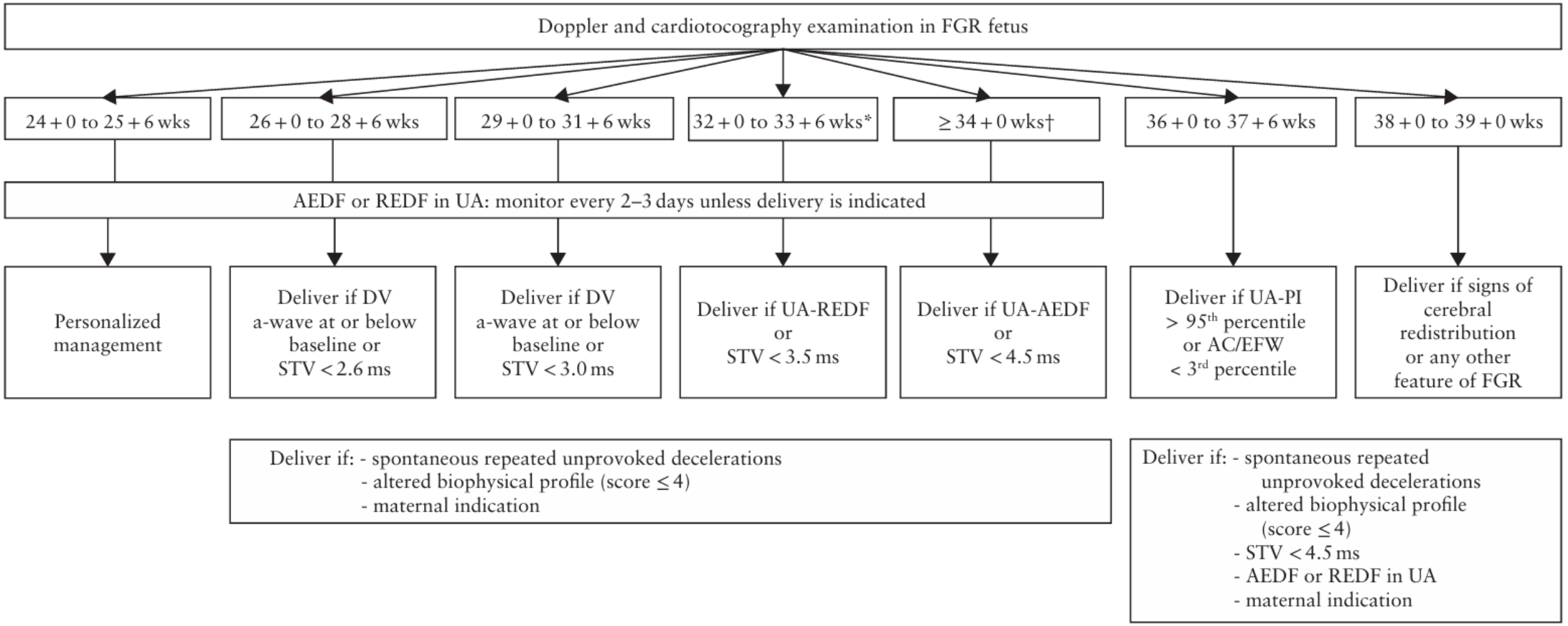


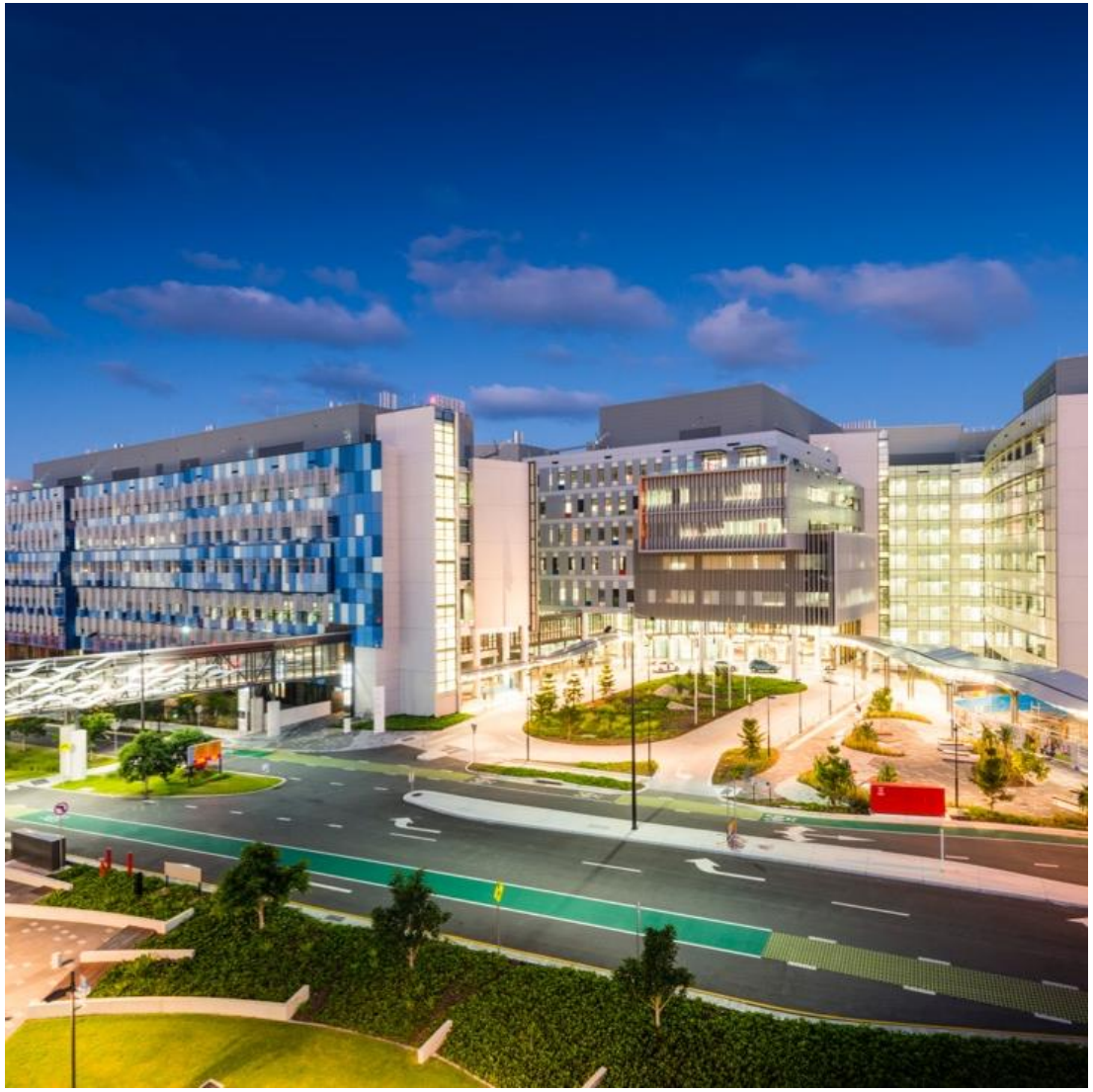
Figure 2 Recommended management of pregnancies with fetal growth restriction (FGR), based on computerized cardiotocography and Doppler findings. *Permitted after 30 + 0 weeks. †Permitted after 32 + 0 weeks. AC, fetal abdominal circumference; AEDF, absent end-diastolic flow; DV, ductus venosus; EFW, estimated fetal weight; PI, pulsatility index; REDF, reversed end-diastolic flow; STV, short-term variation; UA, umbilical artery; wks, gestational weeks.

REFERENCES

- ISUOG Practice Guidelines: diagnosis and management of small-for-gestational-age fetus and fetal growth restriction. Ultrasound Obstet Gynecol 2020; 56: 298–312
- Fetal Growth Restriction Before and After Birth ANDREA WESTBY, MD, AND LAURA MILLER, MD, MPH *Am Fam Physician.* 2021;104(5):486-492
- The Investigation and Management of the Small–for–Gestational–Age Fetus Green–top Guideline No. 31
- South Australian Perinatal Practice Guideline Fetal Growth (Restricted) Department for Health and Wellbeing, Government of South Australia.

Prediction and prevention of Pre-eclampsia

Prof Fabricio Costa



The problem statement

Gold Coast Health
Building a healthier community

Each year in Australia, more than **9,000** pregnancies are impacted by **Pre-eclampsia (PE), 27,000** babies are born **preterm**, and **2,200** babies are **stillborn**; many of these are **preventable**. Despite strong evidence for risk prediction models and effective interventions, rates vary significantly between hospitals and prevalence has remained **unchanged** for several decades.

Pre-eclampsia rate

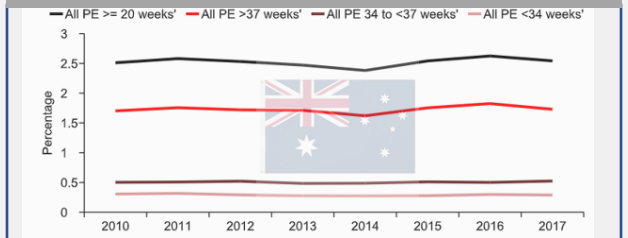
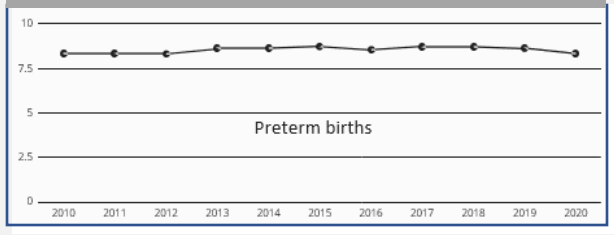
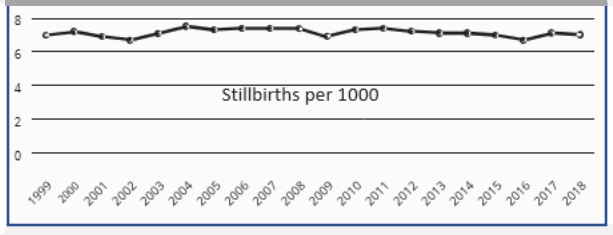


Figure S1: Time trends of all pregnancies complicated by preeclampsia (isolated and superimposed) subdivided by gestation at delivery. PE: preeclampsia;

Preterm rate



Stillbirths rate



There is a limitation with current pregnancy risk assessment and the lack of translational tools impedes progress.

Gold Coast Health
Building a healthier community

Simple, but:

- DR 40% SPR 10%
- No personalized risk

Risk scoring

NICE guidelines 2010

High risk factors

- Previous pre-eclampsia
- Chronic renal disease
- Chronic hypertension
- Diabetes mellitus
- SLE or APS

Moderate risk factors

- First pregnancy
- Age ≥ 40 yrs
- Body mass index ≥ 35 kg/m^2
- Inter-pregnancy interval > 10 yrs
- Family history of pre-eclampsia

ACOG guidelines 2018

High risk factors

- Previous pre-eclampsia
- Chronic renal disease
- Chronic hypertension
- Diabetes mellitus
- SLE or APS

Moderate risk factors

- First pregnancy
- Age ≥ 35 yrs
- Body mass index > 30 kg/m^2
- Inter-pregnancy interval > 10 yrs
- Family history of pre-eclampsia
- Black or poor

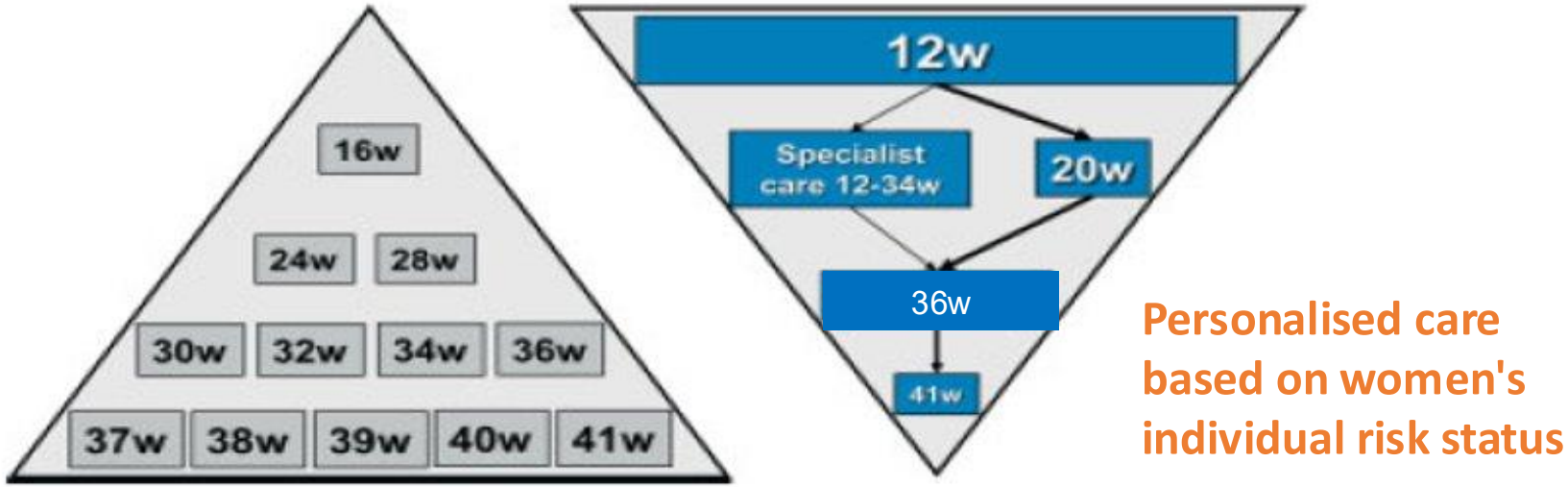
SOMANZ 2023

SOCIETY OF OBSTETRIC MEDICINE OF AUSTRALIA AND NEW ZEALAND

Factors identified as 'High Risk' for developing preeclampsia	
1 or more risk factors	Previous hypertensive disorder during prior pregnancy
	Chronic kidney disease or kidney impairment
	Multi-fetal gestation
	Pre-existing chronic hypertension
	Pre-existing Type 1 or Type 2 diabetes mellitus
	Autoimmune disorders e.g. systemic lupus erythematosus, anti-phospholipid syndrome
Factors identified as 'Moderate Risk' for developing preeclampsia	
2 or more risk factors	Advanced maternal age (>40)
	Obesity (BMI≥35)
	Nulliparity
	Family history of preeclampsia
	Interpregnancy interval of 10 or more years
	Assisted reproduction technologies
	Systolic blood pressure >130mmHg and/or diastolic blood pressure >80

Table 2.1. Clinical factors identified as high or moderate risk in identifying women at risk of developing preeclampsia.

A model for a new pyramid of prenatal care based on the 11 to 13 weeks' assessment



Personalised care based on women's individual risk status

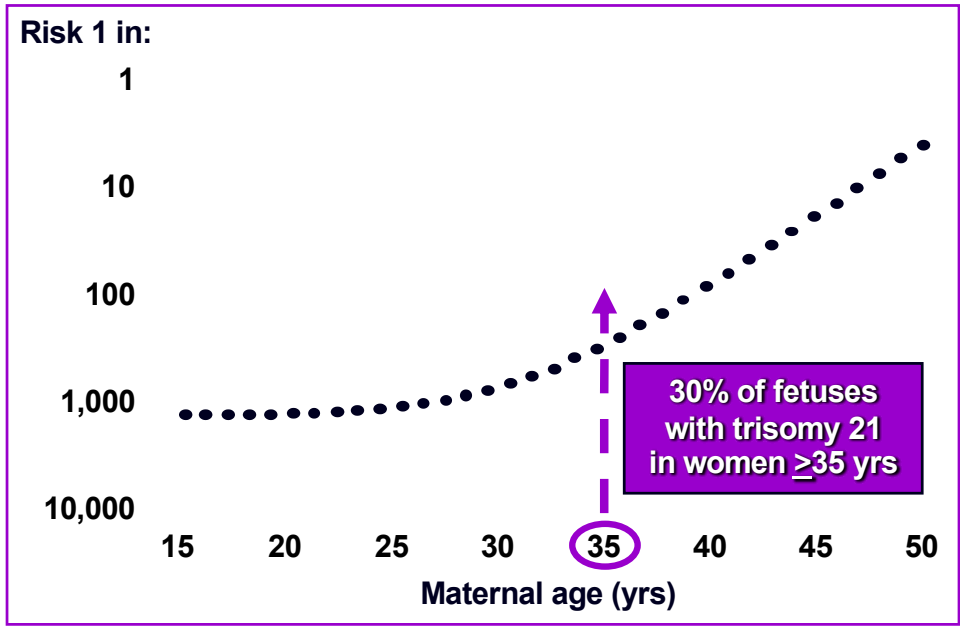
Figure 1—Pyramid of prenatal care: past (left) and future (right)

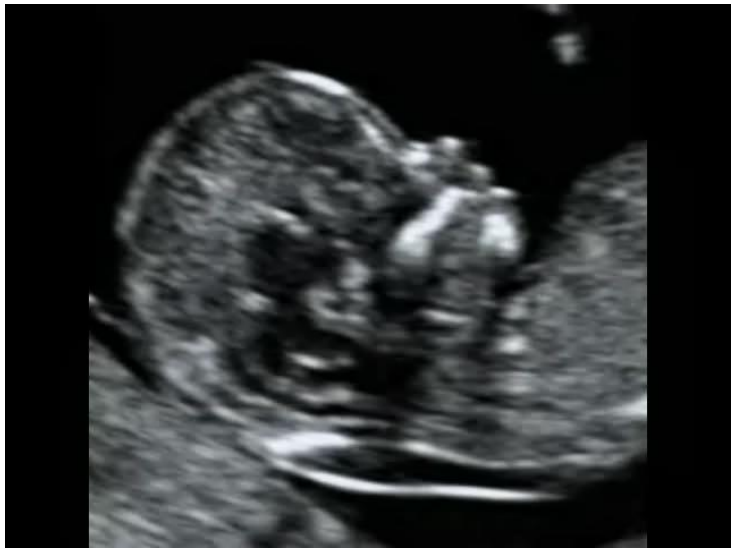
Kypros H. Nicolaides

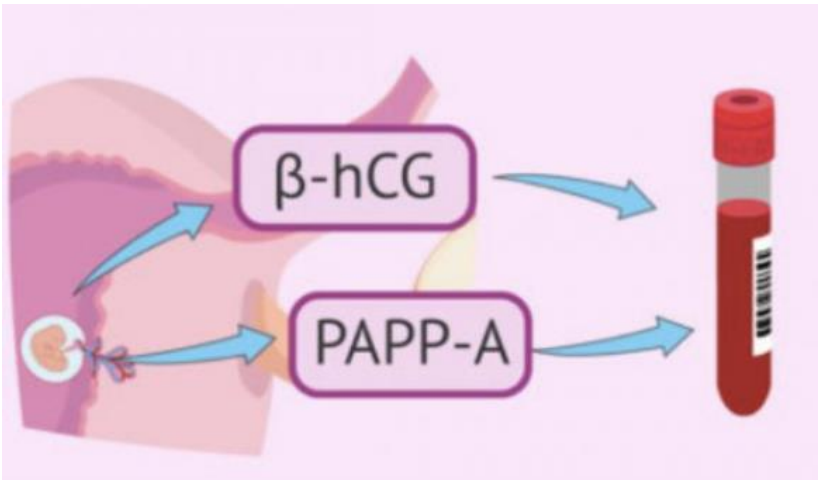
Prenat Diagn 2011; ***31: 3–6.***

Gold Coast Health
Building a healthier community

Prediction of pre-eclampsia
A parallel with aneuploidy screening







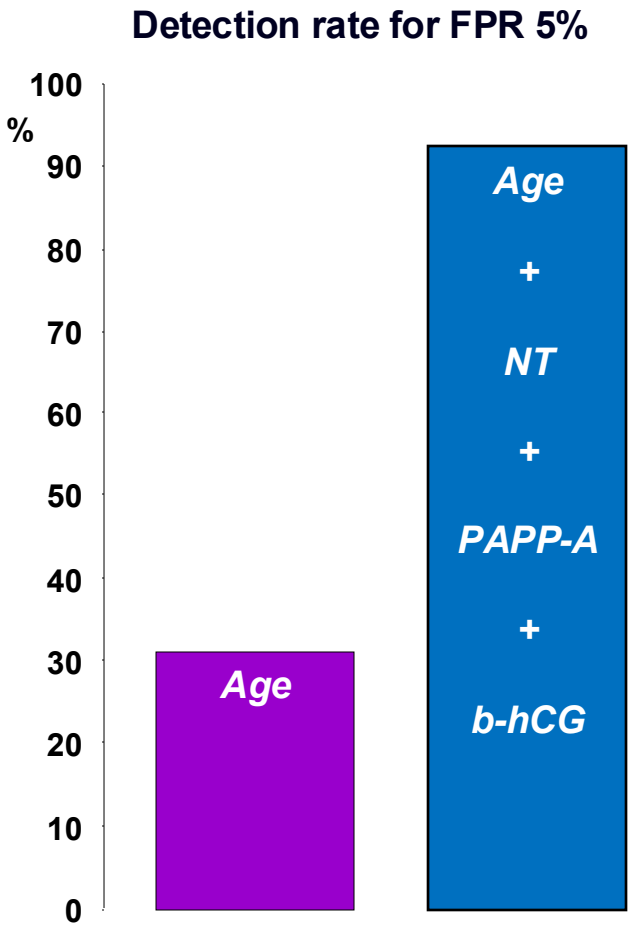
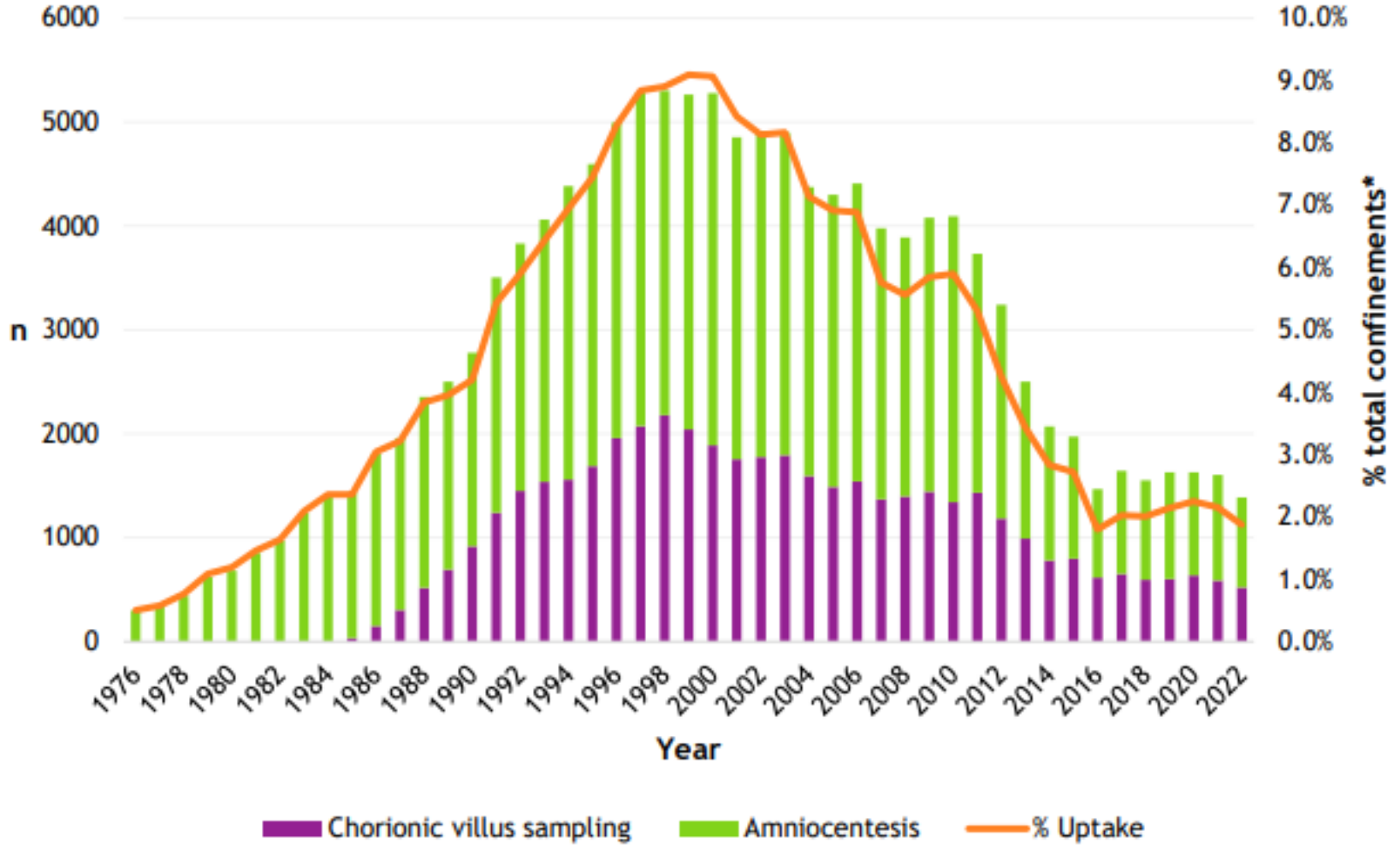


Figure 1. Prenatal diagnostic tests and uptake as % total confinements



Annual report on Prenatal Diagnosis in Victoria 2022, The Victorian Prenatal Diagnosis Database, Murdoch Children's Research Institute 2022.

Early placental dysfunction algorithm - FMF

Please record the following information and then press Calculate.

Pregnancy type

Singleton or twins

Pregnancy dating

Fetal crown-rump length ___ mm (45-84 mm)

Examination date dd-mm-yyyy

Maternal characteristics

Date of birth dd-mm-yyyy

Height ___ cm ___ ft ___ in

Weight ___ kg ___ lbs

Racial origin

Smoking during pregnancy ○ Yes ○ No

Mother of the patient had PE ○ Yes ○ No

Conception method

Medical history

Chronic hypertension ○ Yes ○ No

Diabetes type I ○ Yes ○ No

Diabetes type II ○ Yes ○ No

Systemic lupus erythematosus ○ Yes ○ No

Anti-phospholipid syndrome ○ Yes ○ No

Obstetric history

○ Nulliparous (no previous pregnancies at ≥24 weeks)

○ Parous (at least one pregnancy at ≥24 weeks)

Biophysical measurements

Mean arterial pressure ℹ ___ mmHg

Mean uterine artery PI ℹ ___

Date of measurement dd-mm-yyyy

Biochemical measurements

Includes serum PLGF ● No ○ MoM ○ Raw data

Includes serum PAPP-A ● No ○ MoM ○ Raw data

Calculate risk

Gold Coast Health always care

High risk > 1/100

- Aspirin 150mg
- Growth scans at 28w and 36w
- Delivery at 39w

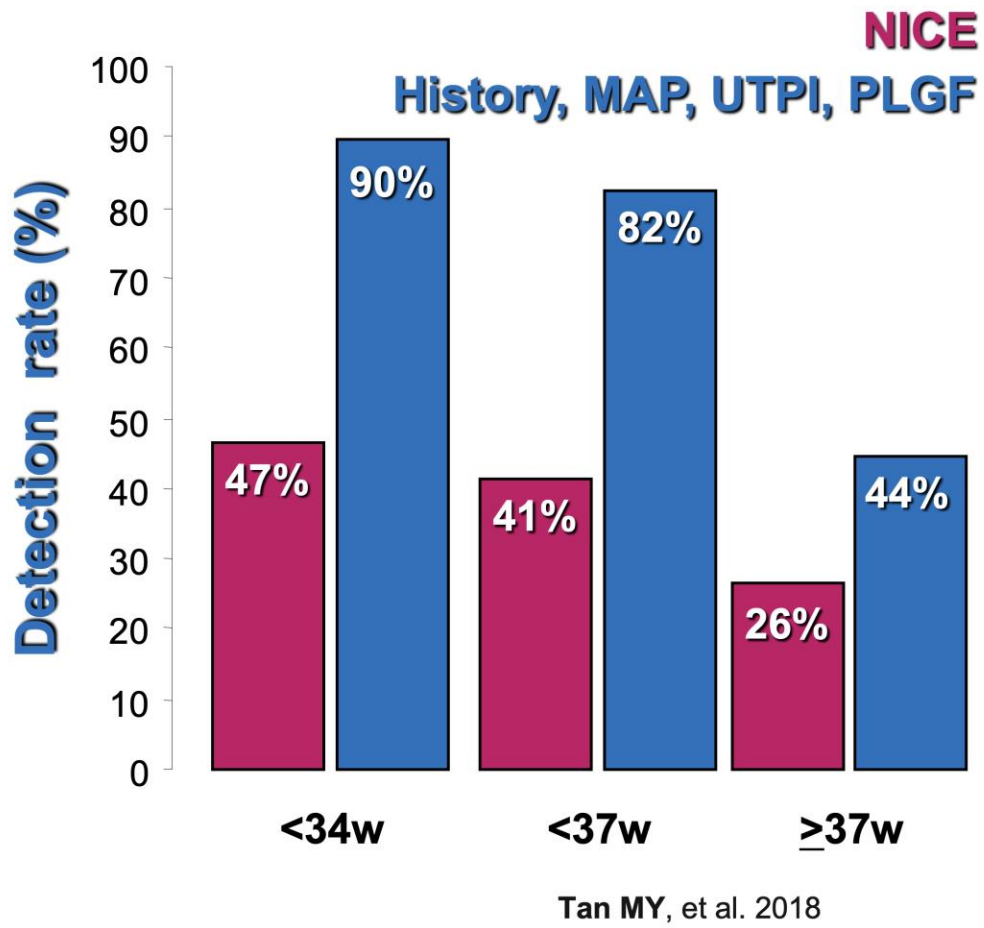
Queensland Government

The Fetal Medicine Foundation

Prediction of pre-eclampsia

SPREE study

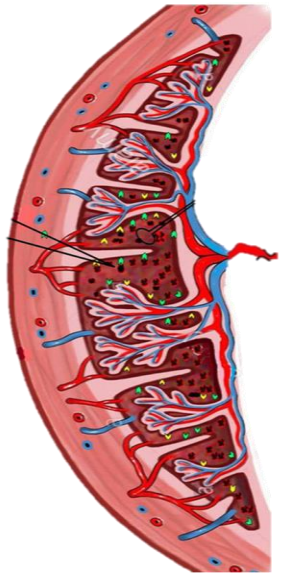
SCREENING METHOD	<34w	<37w	≥37w
NICE	**47**	**41**	**26**
History	48	42	30
MAP	**65**	**49**	**40**
UTPI	73	63	33
PLGF	67	59	34
PAPP-A	57	46	30
PLGF, PAPP-A	70	62	35
MAP, UTPI	**88**	**74**	**44**
MAP, PLGF	**73**	**69**	**40**
MAP, PAPP-A	67	54	38
MAP, UTPI, PLGF	**90**	**82**	**44**
MAP, UTPI, PAPP-A	87	77	43
MAP, PLGF, PAPP-A	78	69	39
MAP, UTPI, PLGF, PAPP-A	90	82	44



Tan MY, et al. 2018

Placental dysfunction

Gold Coast Health
Building a healthier community



SGA

Stillbirth

Preeclampsia

Preterm birth

RESEARCH ARTICLE

BJOG An International Journal of Obstetrics and Gynaecology

Adverse pregnancy outcomes in women at increased risk of preterm pre-eclampsia on first-trimester combined screening

Monica Minopoli[1,2] | Laure Noël[3] | Anna Meroni[1,4] | Margaret Mascherpa[1,5] | Alex Frick[1] | Basky Thilaganathan[1,6]

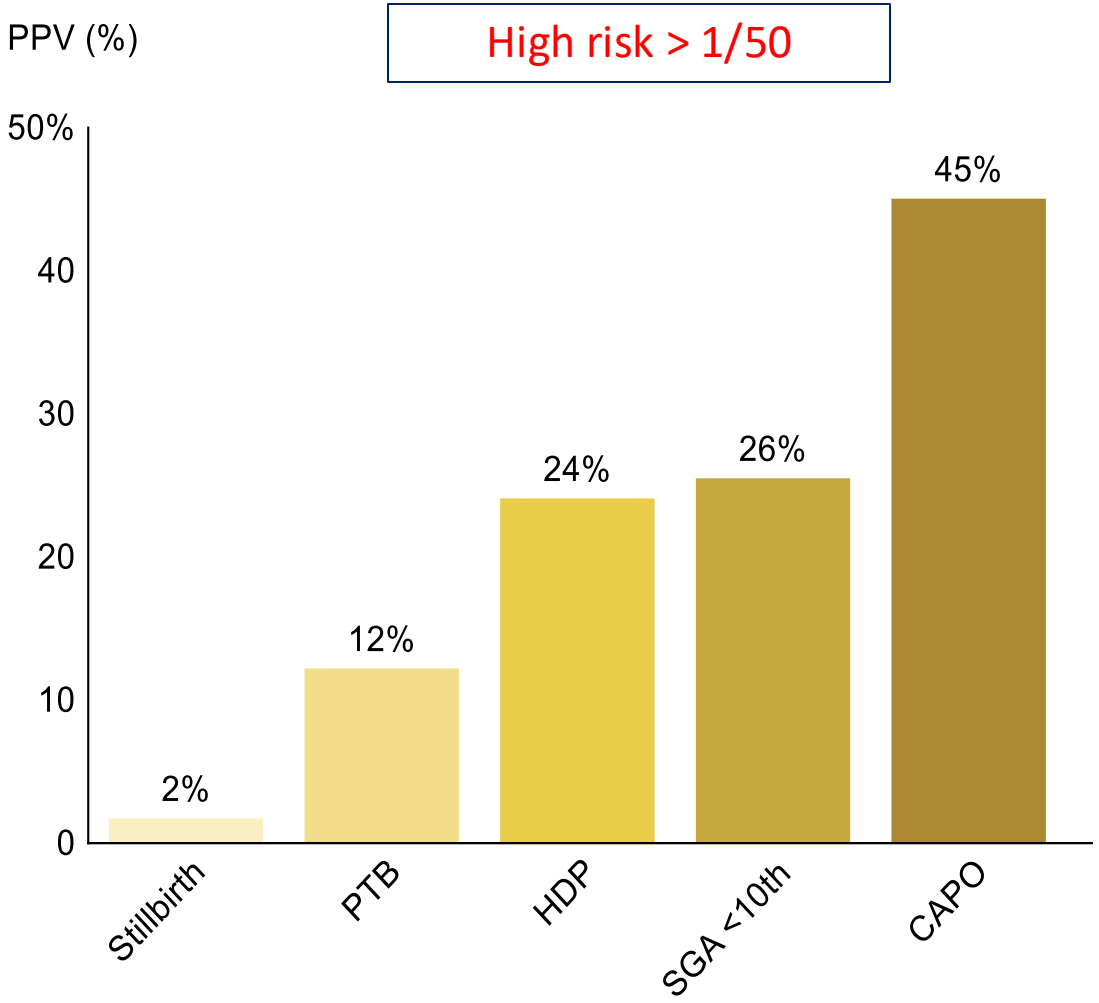


FIGURE 3

Countries and regions with successful external validation of the first trimester FMF preeclampsia prediction models

Am J Obstet Gynecol. 2020 Jul 16:S0002-9378(20)30741-9

The Fetal Medicine Foundation

funded by EU FP7 ASPRE project

SEVENTH FRAMEWORK PROGRAMME

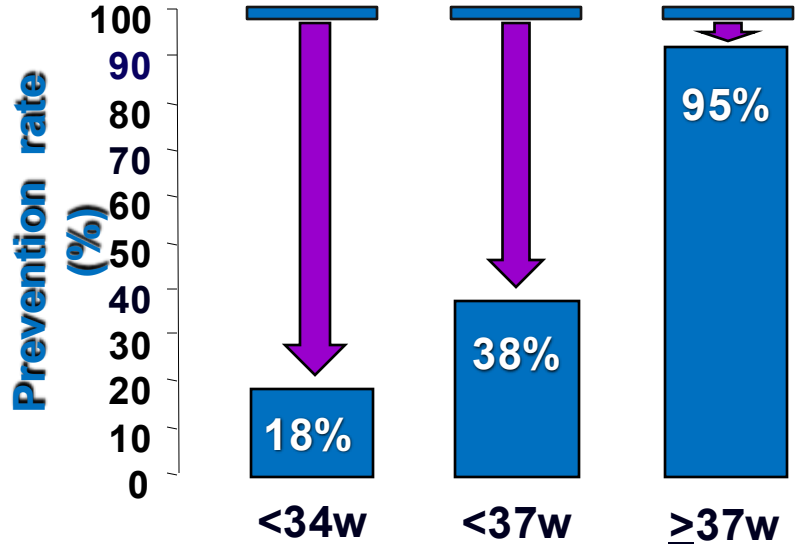
Prevention of pre-eclampsia

ASPRE trial

PE <34 w: 1.8% vs 0.4% 82% drop

PE <37 w: 4.3% vs 1.6% 62% drop

PE ≥37 w: 7.2% vs 6.6% 5% drop



Rolnik DL et al, Aspirin versus Placebo in Pregnancies at High Risk of Preterm Preeclampsia. ***NEJM* 2017**

Gold Coast Health
Building a healthier community

Prediction and prevention of PE
Guidelines (2019-2021)

The hypertensive disorders of pregnancy: ISSHP classification, diagnosis & management recommendations for international practice

Mark A. Brown[a,b,*], Laura A. Magee[c], Louise C. Kenny[d], S. Ananth Karumanchi[e], Fergus P McCarthy[f], Shigeru Saito[g], David R. Hall[h], Charlotte E. Warren[i], Gloria Adoyi[j], Salisu Ishaku[j], on behalf of the International Society for the Study of Hypertension in Pregnancy (ISSHP)

No first or second trimester test or set of tests can reliably predict the development of all cases of pre-eclampsia; however, a combination of maternal risk factors, blood pressure, Placental Growth Factor (PlGF) and uterine artery Doppler can select women who may benefit from 150 mg/day of aspirin to prevent pre-term (before 37 weeks gestation) but not term pre-eclampsia. ISSHP supports first trimester screening for risk of pre-eclampsia when this can be integrated into the local health system, although the cost effectiveness of this approach remains to be established.

FIGO International Federation of Gynecology and Obstetrics
THE GLOBAL VOICE FOR WOMEN'S HEALTH

FIGO Committee Report

Considering that aspirin reduces the risk of preterm pre-eclampsia with no potential harm, and only when it is initiated before 16 weeks of gestation and at a daily dose of 100 mg or more, FIGO recommends the following (Box 2):

1. All pregnant women should undergo screening for preterm pre-eclampsia by the combination of maternal factors with mean arterial pressure, measurement of uterine artery pulsatility index, and serum placental growth factor (combined test) at 11–13 weeks.

WHEN ASPIRIN ADMINISTRATION SHOULD BE RECOMMENDED

Prophylactic aspirin should be given to women identified by screening as being at high risk of developing pre-eclampsia, rather than to the whole population.[23] The traditional approach has been to define the high-risk group based on factors in maternal characteristics and medical history.[9,24] However, evidence suggests that the most effective way of identifying the high-risk group is through a combination of maternal factors with biophysical and biochemical markers[10,12] as described in the ASPRE trial.[21] Large screening studies have shown that use of the approaches advocated by NICE[9] and ACOG[24] would only identify about 40% of cases at a 10% false-positive rate and 5% at a 0.2% false-positive rate, respectively.

Florence, 2019

isuog.org GUIDELINES

ISUOG Practice Guidelines: role of ultrasound in screening for and follow-up of pre-eclampsia

Recommendations

- A combination of maternal factors, maternal arterial blood pressure, uterine artery Doppler and PlGF level at 11–13 weeks appears to be the most efficient screening model for identification of women at risk of PE (GRADE OF RECOMMENDATION: B).
- Given the superiority of combined screening, the use of Doppler cut-offs as a standalone screening modality should be avoided if combined screening is available (GRADE OF RECOMMENDATION: B).

Gold Coast Health
Building a healthier community

SOMANZ guideline 2023
RANZCOG guideline April 2024

SOMANZ

RANZCOG
Excellence in Women's Health

Executive Summary of Recommendations

Chapter 2: Screening for women at risk of preeclampsia

Clinical question	Type of Recommendation	Recommendation	Rating of Recommendation
2. Screening for women at risk of developing preeclampsia			
2.1	Evidence based recommendation	The use of maternal risk factors (maternal characteristics, medical and obstetric history) to screen all pregnancies for risk of preeclampsia is strongly recommended (Table 2.1)	1A
2.2	Evidence based recommendation	The use of a combined first trimester screen (combined maternal features, biomarkers and sonography) to identify women at risk of developing preeclampsia is conditionally recommended based on local availability and access to the required resources.	2B

Category: Clinical Guideline

Early pregnancy screening and prevention of preterm preeclampsia and related complications (C-Obs 61)

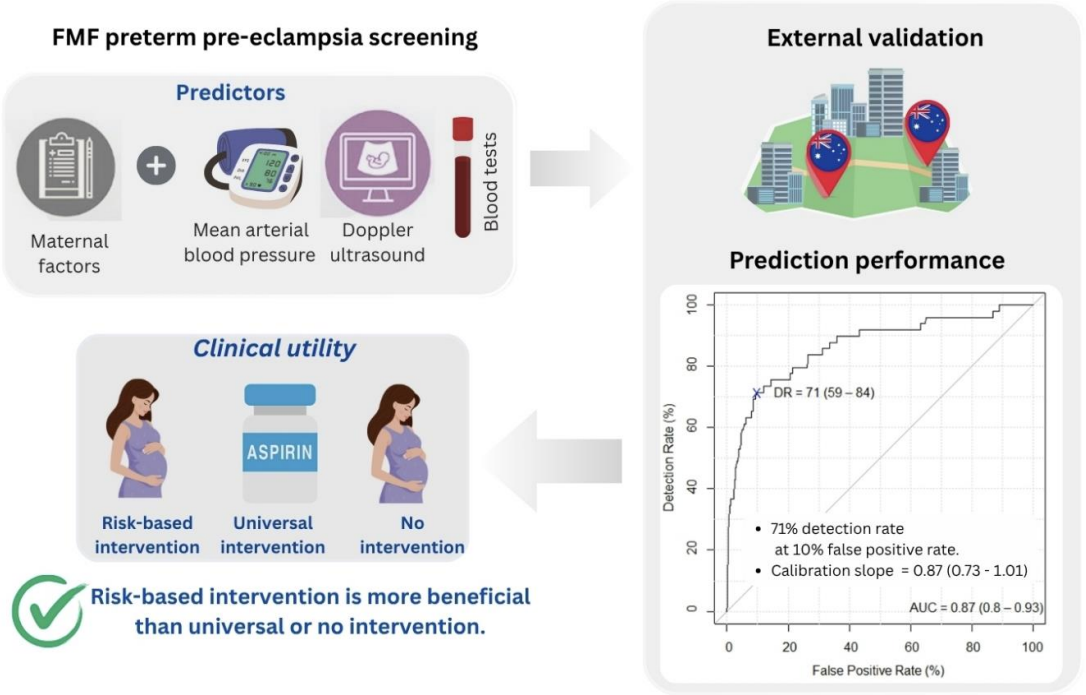
Screening

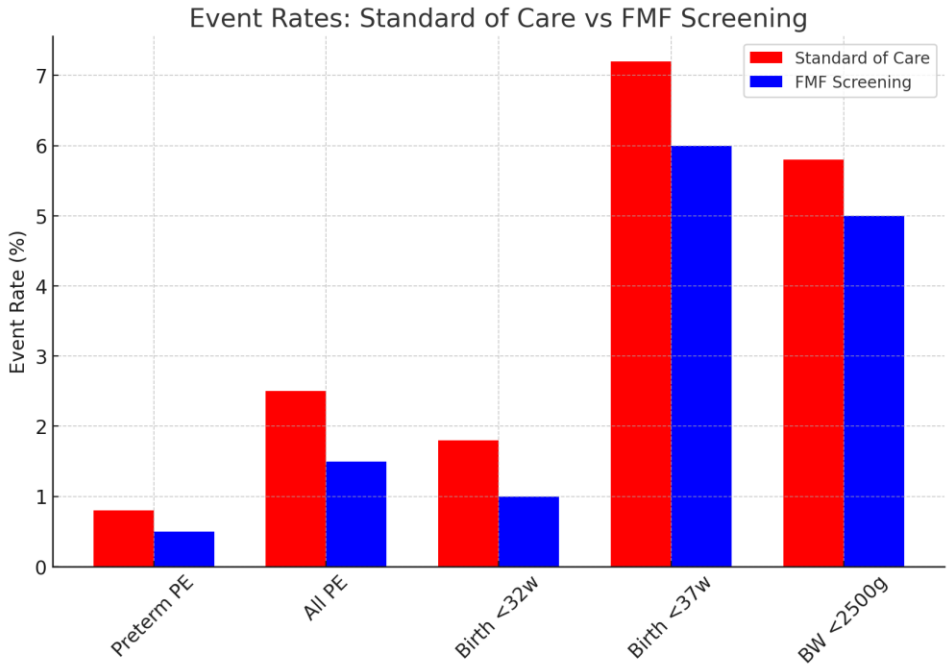
Recommendation 1	Evidence based recommendation

Strong: Offer routine screening in early pregnancy for preterm preeclampsia to all women.

Screening algorithms that include clinical history, blood pressure (MAP), ultrasound with mean uterine artery pulsatility index (UtPI), and maternal serum biochemical markers (PAPP-A, and/or PlGF) are recommended as they more accurately predict which women are at risk for developing preterm preeclampsia compared to risk assessment by history alone.

GRADE of evidence: Moderate





Acta Obstet Gynecol Scand. 2025;00:1–9

Int J Gynaecol Obstet . 2022 Sep;158(3):634-642

1st trimester screening for placental dysfunction in real clinical practice

Australian impact study: outcomes in screened population and in standard care population

Outcome	Screened (n=29,618)	Standard care (n=301,566)	Crude risk ratio (95% CI)	Adjusted risk ratio (95% CI)
Preterm preeclampsia	132 (0.4)	2,096 (0.7)	0.64 (0.54-0.76) P < 0.001	0.70 (0.58-0.84) P < 0.001
All preeclampsia	455 (1.5)	7,340 (2.4)	0.63 (0.57-0.89) P < 0.001	0.69 (0.63-0.76) P < 0.001
Birth <32 weeks	278 (0.9)	4,435 (1.5)	0.64 (0.57-0.72) P < 0.001	0.83 (0.74-0.95) P = 0.004
Birth <37 weeks	1736 (5.9)	21,283 (7.1)	0.83 (0.79-0.87) P < 0.001	0.92 (0.88-0.97) P = 0.001
Birthweight <2500g	1354 (4.6)	17,295 (5.7)	0.80 (0.76-0.84) P < 0.001	0.89 (0.85-0.94) P < 0.001

Daniel Rolnik, Fabricio Costa, et al., Int J Gynecol Obstet. 2021;00:1–9.

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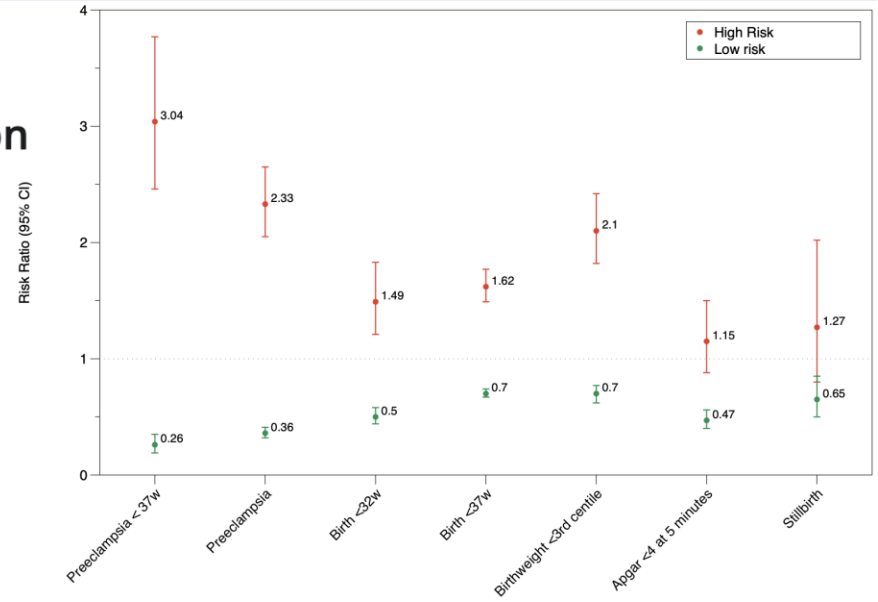
Prediction and prevention of PE
Validation - Australian experience

Routine first trimester combined screening for preterm preeclampsia in Australia: a multicenter clinical implementation cohort study

Daniel L. Rolnik ✉, Roshan J. Selvaratnam, Dagmar Wertaschnigg, Simon Meagher, Euan Wallace, Jon Hyett, Fabricio da Silva Costa, Andrew McLennan

First published: 27 November 2021 | https://doi.org/10.1002/ijgo.14049



No combined screening
n = 301,566

Combined screening
n = 29,618

Outcome	No combined screening n = 301,566	≥ 1 in 100 n = 4,068	Relative Risk (95% CI)	< 1 in 100 n = 25,550	Relative Risk (95% CI)
Pre-eclampsia < 37 w	2096 (0.7)	86 (2.1)	**3.04 (2.46–3.77)**	46 (0.2)	**0.26 (0.19–0.35)**
Pre-eclampsia	7340 (2.4)	231 (5.7)	2.33 (2.05–2.65)	224 (0.9)	0.36 (0.32–0.41)
Preterm birth < 32 w	4435 (1.5)	89 (2.2)	1.49 (1.21–1.83)	189 (0.7)	0.50 (0.44–0.58)
Preterm birth < 37 w	21283 (7.1)	466 (11.5)	1.62 (1.49–1.77)	1270 (5.0)	0.70 (0.67–0.74)
Birth weight < 3rd centile	6466 (2.1)	183 (4.5)	2.10 (1.82–2.42)	379 (1.5)	0.70 (0.62–0.77)
Apgar < 4 at 5 minutes	3424 (1.1)	53 (1.3)	1.15 (0.88–1.50)	137 (0.5)	0.47 (0.40–0.56)
Stillbirth	1049 (3.5 /1,000)	18 (4.4 / 1,000)	1.27 (0.80–2.02)	58 (2.3 / 1,000)	0.65 (0.50–0.85)

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Cost-effectiveness

Royal Prince Alfred Hospital

JOHN HUNTER HEALTH AND INNOVATION PRECINCT

Park F, Deeming S, Bennett N, Hyett J. Cost effectiveness analysis of a model of first trimester prediction and prevention for preterm preeclampsia against usual care. UOG 2020

Australian Government
Department of Health and Aged Care

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1705 – Structured prenatal risk assessment for preterm preeclampsia

Page last updated: 21 June 2023

Net financial implications of structured prenatal risk assessment for preeclampsia to the Commonwealth

	2024	2025	2026	2027	2028	2029
Incremental cost to MBS for preeclampsia screening	$6,930,299	$6,749,756	$6,569,213	$6,388,670	$6,208,128	$6,296,694
Incremental hospital costs	-$11,658,113	-$11,702,166	-$11,746,219	-$11,790,273	-$11,834,326	-$11,878,379
Overall net cost to Commonwealth	**-$4,727,815**	**-$4,952,411**	**-$5,177,006**	**-$5,401,602**	**-$5,626,198**	**-$5,581,685**

External validation of the Fetal Medicine Foundation model for preterm pre-eclampsia prediction at 11–14 weeks in an Australian population

Sofonyas Abebaw Tiruneh[1] | Daniel Lorber Rolnik[2] | Roshan Selvaratnam[3] | Fabricio da Silva Costa[3,4] | Andrew McLennan[5,6] | Jon Hyett[7] | Helena Teede[1] | Joanne Enticott[1]

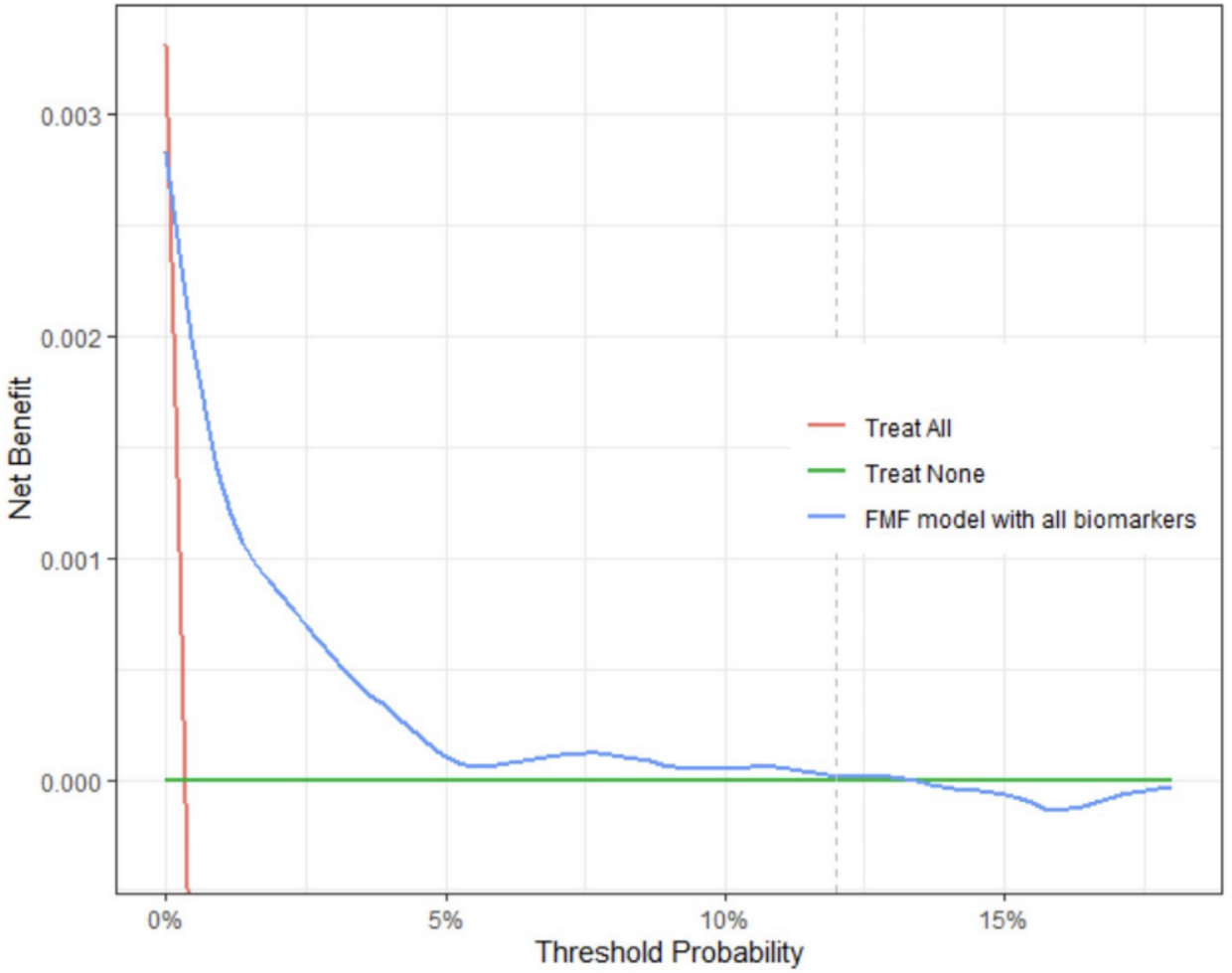


FIGURE 3 Decision curve analysis (DCA) of the FMF competing risks model utilizing maternal factors with all biomarkers. The red line depicts the 'treat all' strategy where intervention is provided for all women assuming all women are at high risk of preterm PE. The green line depicts the 'treat none' strategy where no interventions were undertaken, considering that all women are at low risk of preterm PE. The blue line indicates the net benefit of limiting intervention to those women deemed at high risk based on the FMF competing risks model.

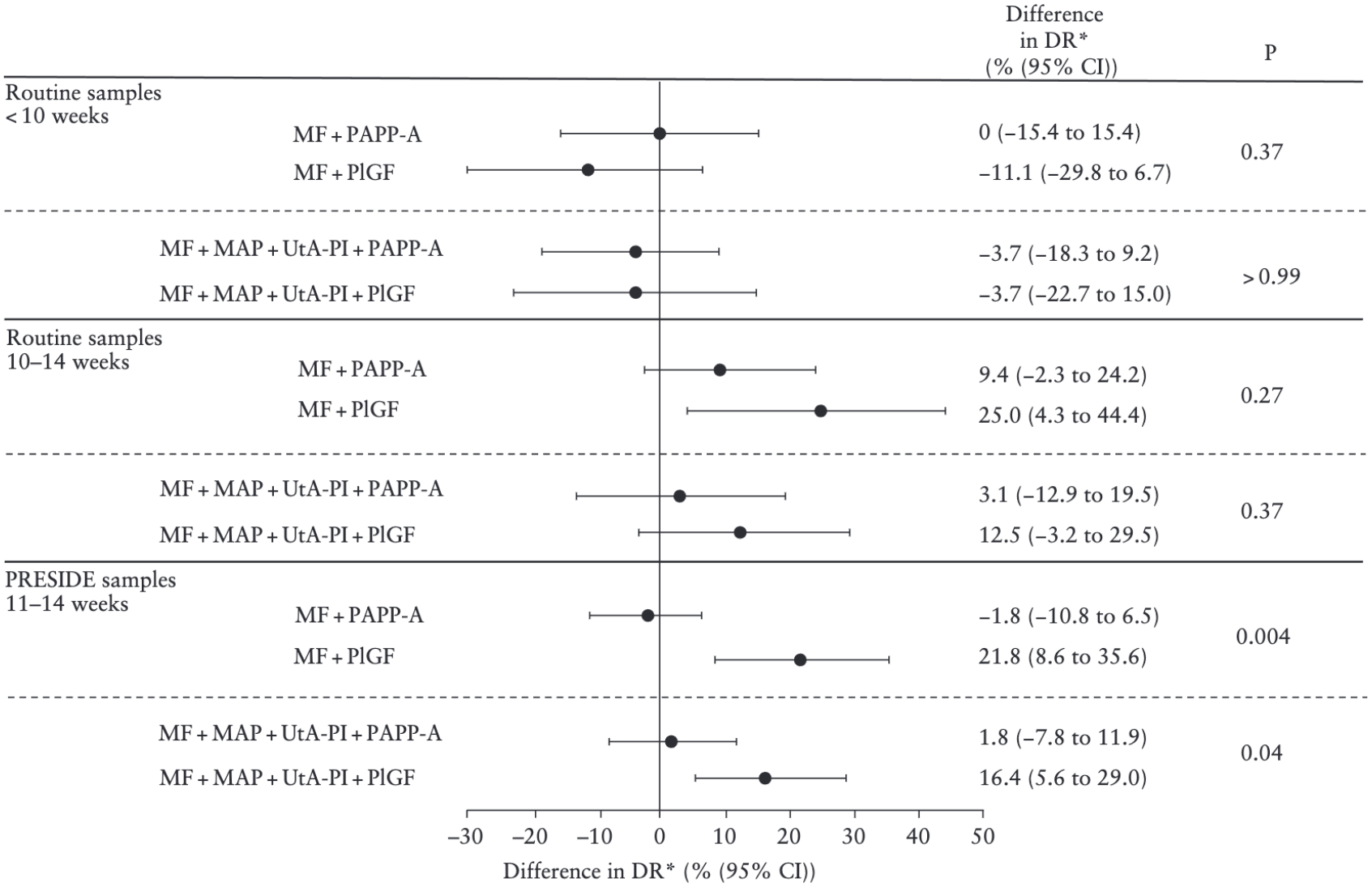
External validation of the Fetal Medicine Foundation model for preterm pre-eclampsia prediction at 11–14 weeks in an Australian population

Sofonyas Abebaw Tiruneh[1] | Daniel Lorber Rolnik[2] | Roshan Selvaratnam[3] | Fabricio da Silva Costa[3,4] | Andrew McLennan[5,6] | Jon Hyett[7] | Helena Teede[1] | Joanne Enticott[1]

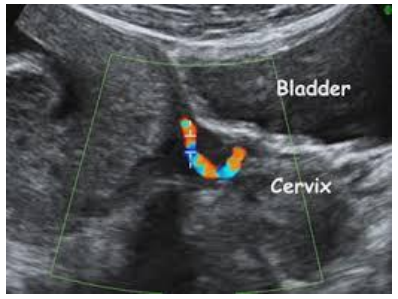
Supplementary Table 3. The screening performance of the preterm PE FMF models 1, 2, and 3 and detection rates was compared to the existing FMF model at 5% and 10% false positive rates.

Method of screening	Current study					Existing FMF model[4]	
	Sample size (events)§	AUC (95% CI)	Calibration (intercept, slope) (95% CI)	DR at fixed FPR (95% CI)		DR at fixed FPR (95% CI)	
				5%	10%	5%	10%
MF + MAP + UtA-PI (Model 1)	5,765 (33)	0.82 (0.75 – 0.88)	-0.39 (-0.75 – -0.04), 0.68 (0.49 – 0.86)	33 (18 – 52)	48 (33 – 67)	53 (47 - 59)	70 (64 -75)
MF + MAP + UtA-PI + PAPP-A (Model 2)	5,425 (35)	0.84 (0.79 – 0.89)	-0.17 (-0.52 – 0.18), 0.69 (0.51 – 0.86)	26 (12 – 43)	40 (26 – 57)	55 (49 - 61)	70 (65 - 75)
MF + MAP + UtA-PI + PAPP-A + PIGF (Model 3)	14,789 (49)	0.87 (0.79 – 0.92)	-0.73 (-1.02 – -0.44), 0.87 (0.73 – 1.01)	59 (45 – 73)	71 (59 – 84)	64 (58 - 70)	75 (70 - 80)

Note: Models 1 and 2 were partial versions of the FMF models. AUC, Area Under the Curve; DR, Detection Rate; FPR, False Positive Rate; MF, Maternal Factors; PIGF, Placental Growth Factor; MAP, Mean Arterial Pressure; UtA-PI, Uterine Artery Pulsatility Index; PAPP-A, Pregnancy-Associated Plasma Protein A; CI, Confidence Interval;
§ = The sample sizes included for each model had different sample characteristics.


Difference in DR* (% (95% CI))
P
Routine samples < 10 weeks
MF + PAPP-A
0 (–15.4 to 15.4)
MF + PlGF
–11.1 (–29.8 to 6.7)
0.37
MF + MAP + UtA-PI + PAPP-A
–3.7 (–18.3 to 9.2)
MF + MAP + UtA-PI + PlGF
–3.7 (–22.7 to 15.0)
>0.99
Routine samples 10–14 weeks
MF + PAPP-A
9.4 (–2.3 to 24.2)
MF + PlGF
25.0 (4.3 to 44.4)
0.27
MF + MAP + UtA-PI + PAPP-A
3.1 (–12.9 to 19.5)
MF + MAP + UtA-PI + PlGF
12.5 (–3.2 to 29.5)
0.37
PRESIDE samples 11–14 weeks
MF + PAPP-A
–1.8 (–10.8 to 6.5)
MF + PlGF
21.8 (8.6 to 35.6)
0.004
MF + MAP + UtA-PI + PAPP-A
1.8 (–7.8 to 11.9)
MF + MAP + UtA-PI + PlGF
16.4 (5.6 to 29.0)
0.04
–30 –20 –10 0 10 20 30 40 50
Difference in DR* (% (95% CI))

Multiparametric approach



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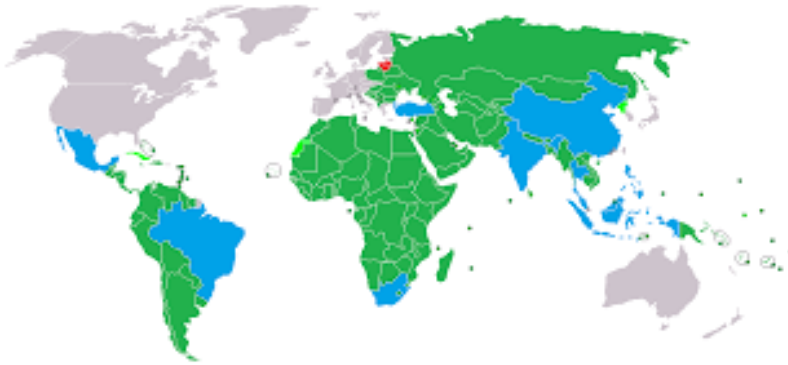


Models / TFP	PE total			PE preterm			PE term		
	5%	10%	20%	5%	10%	20%	5%	10%	20%
MF	26%	38%	56%	33%	43%	48%	24%	44%	53%
MAP	20%	31%	40%	43%	43%	62%	-	-	-
MAP + MF	22%	44%	53%	43%	67%	71%	-	-	-

Rocha RS, Alves JAG, Maia E Holanda Moura SB, Araujo Júnior E, Peixoto AB, Santana EFM, Martins WP, Vasconcelos CTM, **Da Silva Costa F**, Oriá MOB. J Perinat Med. 2017 Oct 26;45(7):843-849.

What will my result mean?

Low Risk

If you are low risk, it is very unlikely that you will develop early severe pre-eclampsia in your pregnancy.

You will continue to receive normal antenatal care.

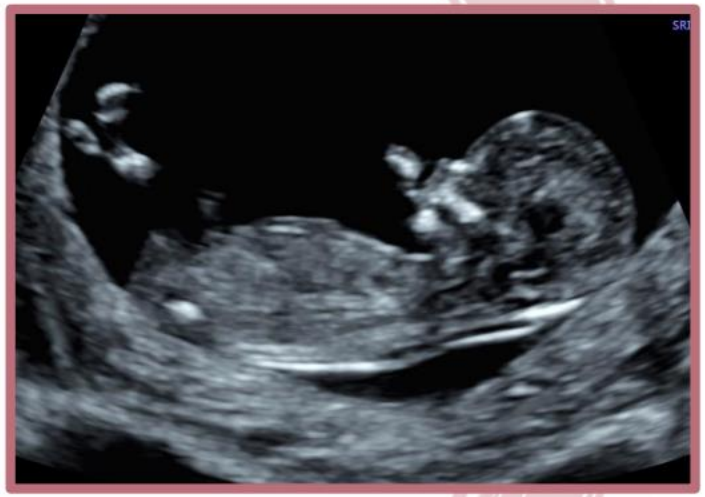
High Risk

If you are high risk, it does not mean you definitely will get pre-eclampsia, but the chances are higher.

By knowing this risk your healthcare team can tailor your antenatal care. This gives your team the best chance of diagnosing and treating pre-eclampsia early if you do develop it.

You will have more scans to monitor your pregnancy

As well as this, your specialist may suggest that you commence taking low dose aspirin to lower your chance of getting pre-eclampsia. Aspirin is a safe and effective treatment in pregnancy.



Pre-eclampsia Screening

Pre-eclampsia is manageable

With regular and specialised antenatal care, pre-eclampsia can be diagnosed early and well managed to give you and your baby the best possible outcome.

Contact us:
P: (07) 5687 1149
E: MFMAdmin_gcuh@health.qld.gov.au

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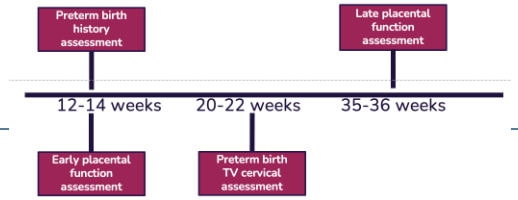

NHMRC Partnership Grant 2024

Implementation | Investigation

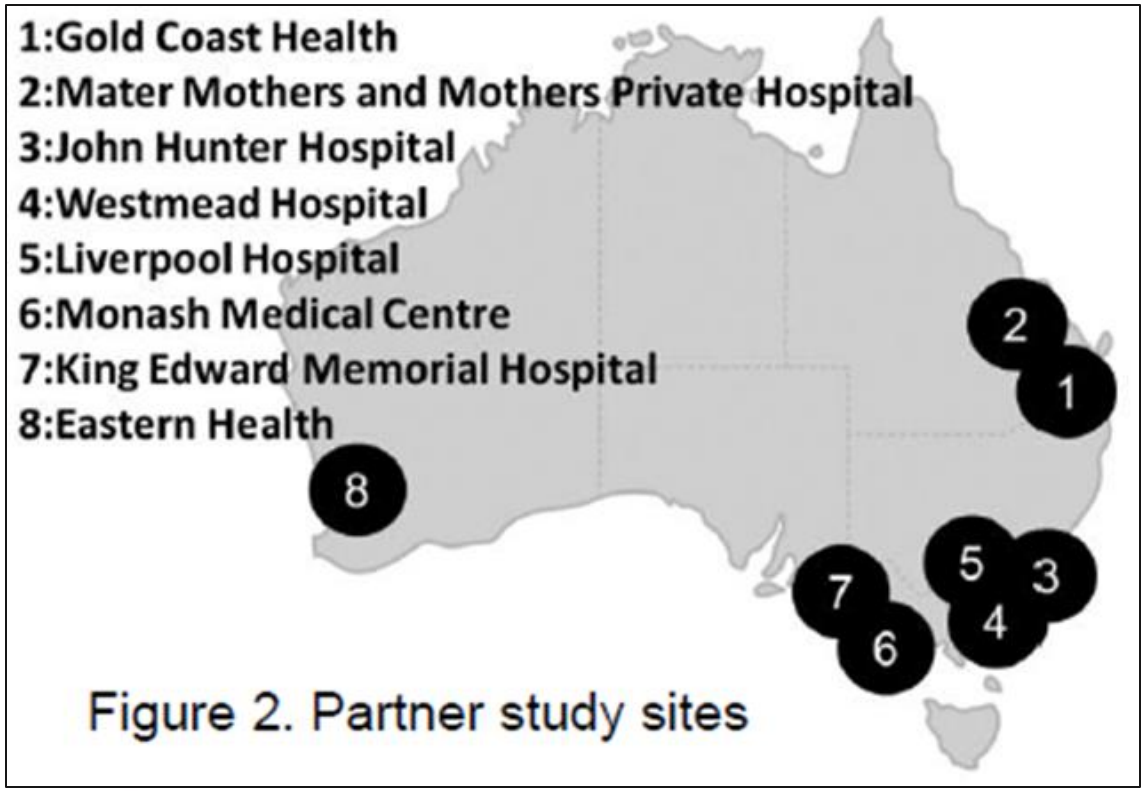

Figure 2. Partner study sites

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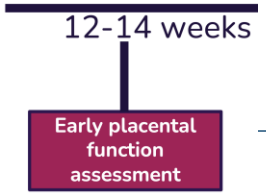
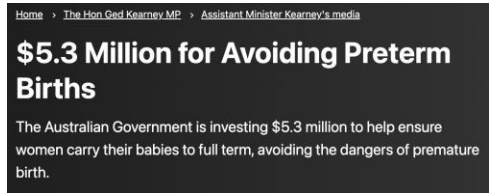
Stillbirth CRE



APBPA Strategy 8 - Aspirin

Implementation

- First trimester screening for preterm PE - FMF
- 9 Centres
- Regional / Remote
- First Nations Communities
- Pragmatic approach (sometimes uterine artery Doppler and blood biomarkers not available)


Home › The Hon Ged Kearney MP › Assistant Minister Kearney's media

$5.3 Million for Avoiding Preterm Births

The Australian Government is investing $5.3 million to help ensure women carry their babies to full term, avoiding the dangers of premature birth.

- A/Prof Chris Lehner
- Prof John Newnham
- Prof Jonathan Morris
- A/Prof Daniel Rolnik
- Prof Fabricio Costa

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Take home messages

Prediction PE (and other complications) by history alone is not good enough

Combined screening – individualised risk assessment

In high-risk women

- Aspirin **150 mg,** initiate **before 16 weeks**
- **Reduces PE < 37w by more than 60%** and PE < 32w by about 90%
- Reduces PTB < 37 by ~8% and PTB < 32w by ~17%

Screening program:

- Staff training and feedback
- Implementation of screening strategies already validated in Australia
- Validation of new screening strategies not yet validated in Australia

Personalised care improves maternal and perinatal outcomes and decreases unnecessary interventions

Griffith UNIVERSITY
Queensland, Australia

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Thank you!

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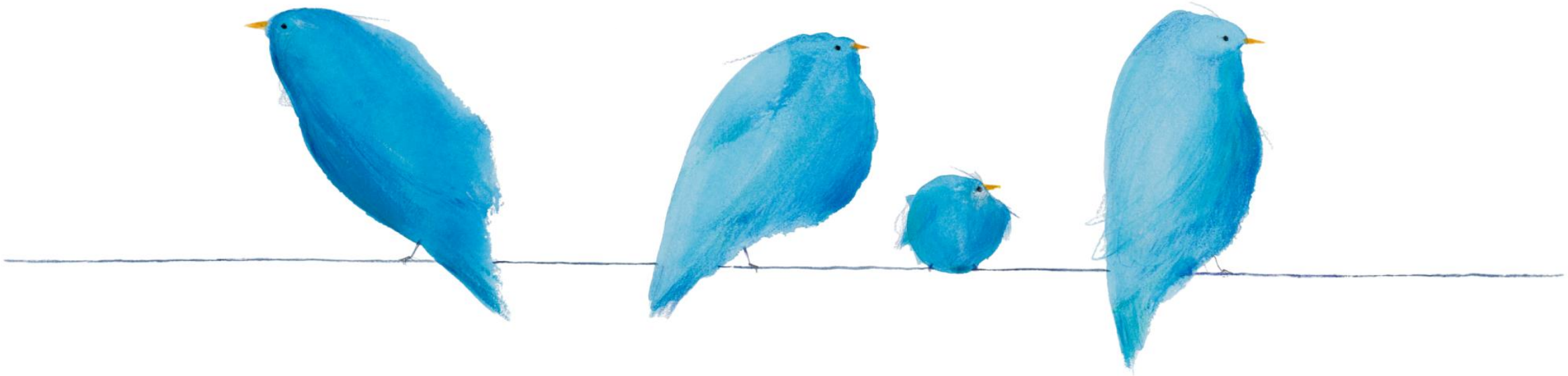
Strengthening Hospital Responses to Family Violence



Northern Health: Family Violence Practice

Dr. Tanya Ellis

VICTORIA State Government

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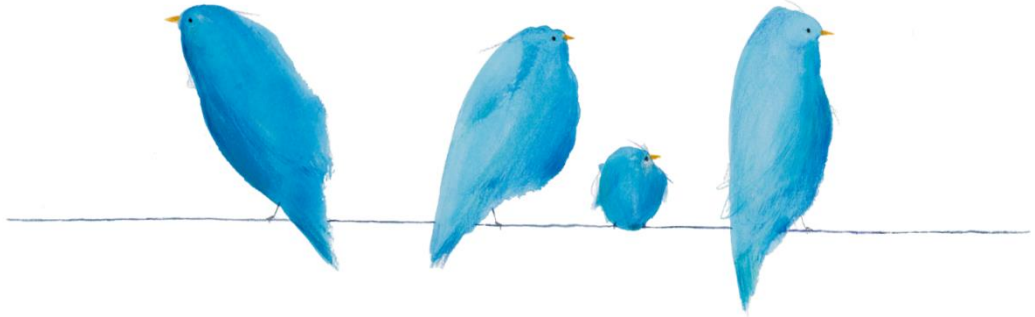
Presentation Overview:

- Define Family Violence
- Prevalence and Gendered Nature of Family Violence
- Victorian Family Violence Legal Reforms
- ANC Clinical Responsibilities: Family Violence Mandatory Screening & Dedication Consultation Time (DCT)



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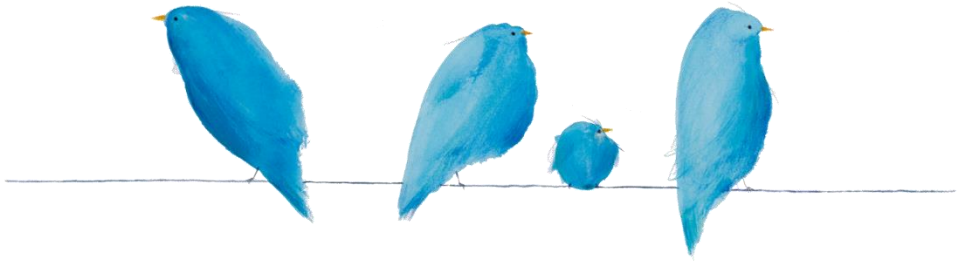

Defining Family Violence

What is Family Violence?

Behaviour by a person towards a family member that:

- **is physically or sexually abusive**
- is emotionally or psychologically abusive
- **is economically abusive**
- is threatening or coercive or dominating
- **causes fear**

Family Violence Protection Act 2008 (Vic)

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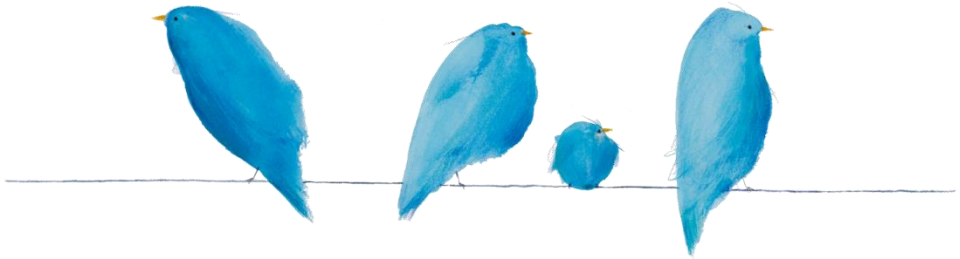

Prevalence and Gendered Nature of Family Violence

Prevalence and the Gendered Nature of Family Violence

Australian Institute of Health and Welfare. (2018). Family, domestic and sexual violence in Australia 2018 Canberra: AIHW

Family Violence is a Health Issue

On average,

8 women a day

are hospitalised

after being assaulted by their spouse or partner

(AIHW, 2018)

In 2014-15

1 in 12 women

hospitalised for partner violence **were pregnant.**

(AIHW, 2018)

Family and domestic violence is a leading cause of homelessness:

72,000 women | **34,000 children** | **9,000 men**

sought homelessness services due to family violence in 2016–17

Intimate partner violence is the greatest health risk factor for women

aged **25–44**

$22 billion was the estimated cost of **violence against women and children in Australia** in 2015–16

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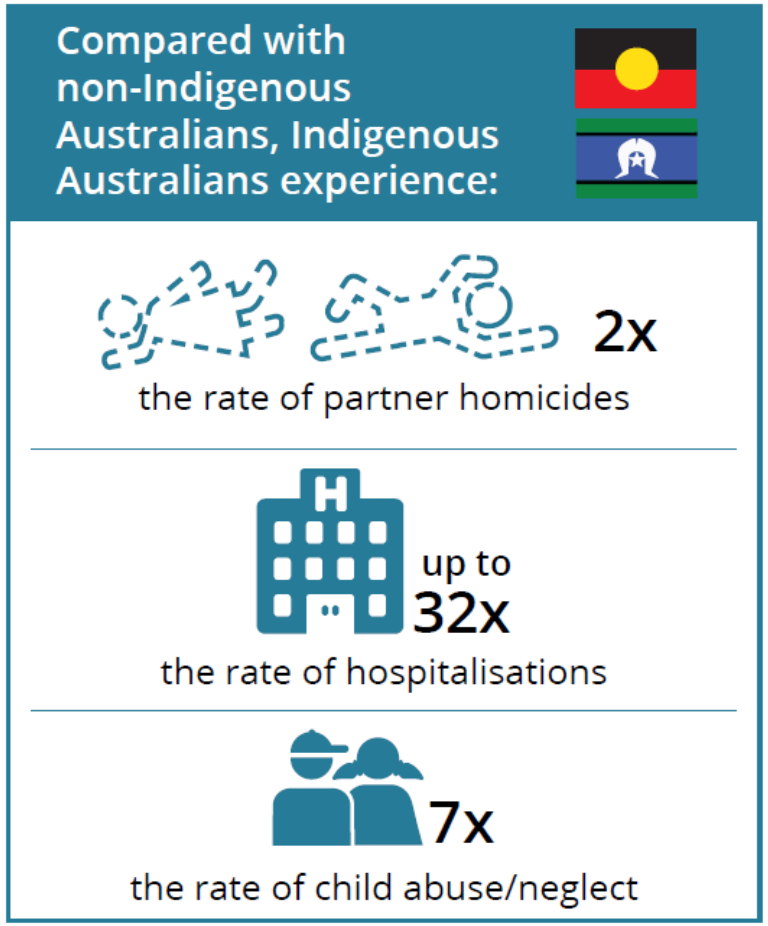
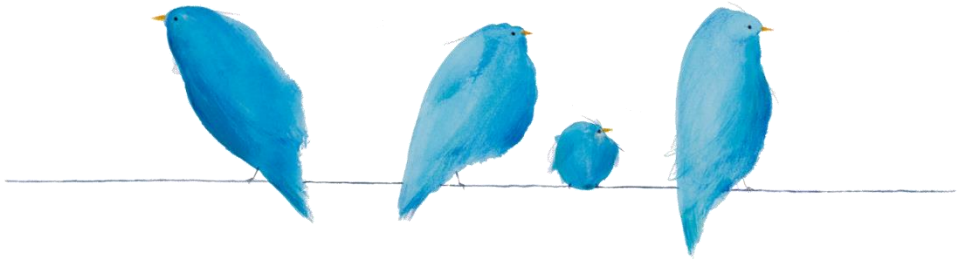
Women at Greater Risk of Family Violence



Australian Institute of Health and Welfare. (2018). Family, domestic and sexual violence in Australia 2018 Canberra: AIHW.



Family Violence Legal Reforms

The MARAM Framework at Northern Health

The Multi-Agency Risk Assessment and Management Framework (MARAM) guides effective responses to family violence across the Victorian service system.

The MARAM Framework has three broad levels of response to family violence:

1. Identification and Screening (Screening Practice & Sensitive Practice)
2. Intermediate Practice
3. Comprehensive Practice

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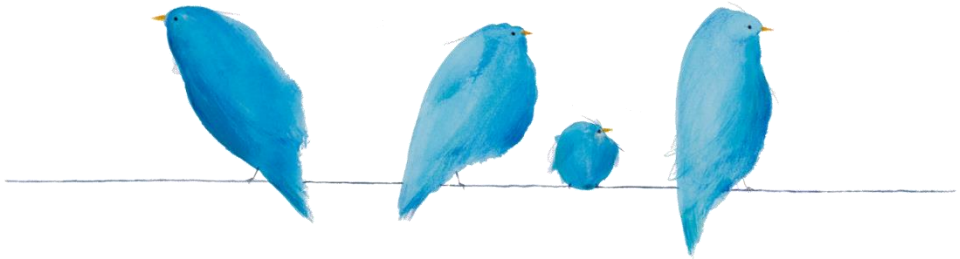

Family Violence Screening & Dedicated Consultation Time (DCT)

Family Violence Mandatory Screening

Family Violence Screening must occur a minimum of 3 times during pregnancy:

- The booking appointment
- The 22-week
- The 32-week appointment

Family Violence Mandatory Screening is to occur during Dedicated Consultation Time (DCT)

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Dedicated Consultation Time (DCT)

Northern Health has introduced compulsory Dedicated Consultation Time (DCT) in the antenatal clinics.

DCT is a brief period of time at the beginning of all antenatal appointments where each patient is seen on her own. The clinician is required to inform support people to wait in the waiting area during this time.

Family Violence Mandatory Screening is to occur during DCT when the patient is on her own and not in the presence of others. DCT ensures that screening occurs safely and that women have protected time to speak about any sensitive health issues.

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Family Violence – Screening & Identification Questions (1-4)

1. Has anyone in your family done something, that made you or your children feel unsafe or afraid?
2. Have they controlled your day-to-day activities (ie. who you see, where you go, how you spend your money) or put you down?
3. Have they threatened to hurt you or your children in any way?
4. Have they ever physically hurt you in any way? If so, how?

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Family Violence – Immediate Risk Questions (5-7)

5. Do you have any immediate concerns about the safety of your children or someone else in your family?

6. Do you feel safe to leave here today?

7. Would you engage with a trusted person/professional or police if you felt unsafe or in danger?

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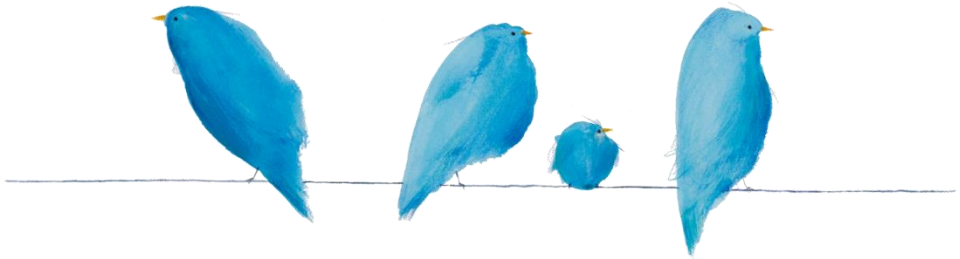

Referral Pathways

Referral Pathways

Internal Service:

-Social Work Department

External Services:

-Police Tel: 000

-Safe Steps: 24/7 Tel: 1800 015 188

-Orange Door Tel: 1800 319 355

-1800 RESPECT 24/7 Tel: 1800 737 732

-Child Protection (BH): 1300 598 521 (AH): 13 12 78

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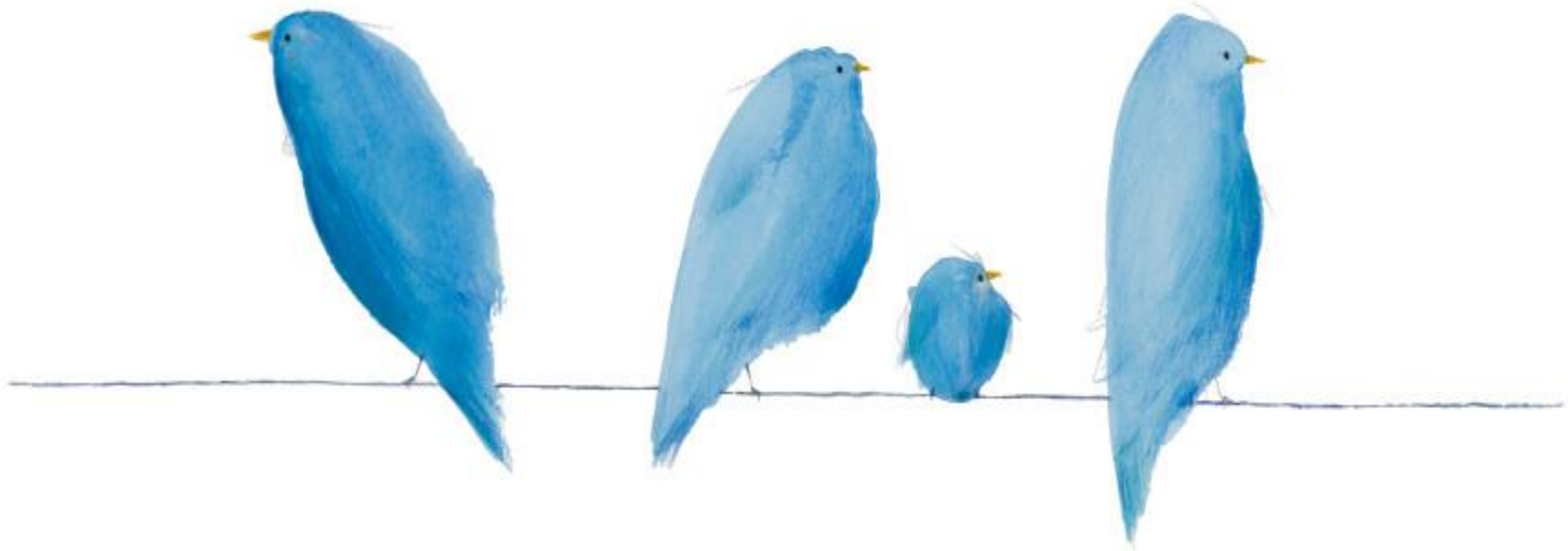
Questions?



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Session Conclusion

We value your feedback, let us know your thoughts.

Scan this QR code

You will receive a post session email within a week which will include slides and resources discussed during this session.

Attendance certificate will be received within 4-6 weeks.

RACGP CPD hours will be uploaded within 30 days.

To attend further education sessions, visit,

https://nwmphn.org.au/resources-events/events/

This session was recorded, and you will be able to view the recording at this link within the next week.

https://nwmphn.org.au/resources-events/resources/