South Australian Perinatal Practice Guideline

Preterm Labour and Birth

Prevention, Diagnosis and Management

Note:

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate, and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements, and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

Note: The words woman/women/mother/she/her have been used throughout this guideline as most pregnant and birthing people identify with their birth sex. However, for the purpose of this guideline, these terms include people who do not identify as women or mothers, including those with a non-binary identity. All clinicians should ask the pregnant person what their preferred term is and ensure this is communicated to the healthcare team.

Explanation of the aboriginal artwork:

The Aboriginal artwork used symbolises the connection to country and the circle shape shows the strong relationships amongst families and the aboriginal culture. The horseshoe shape design shown in front of the generic statement symbolises a woman and those enclosing a smaller horseshoe shape depicts a pregnant woman. The smaller horseshoe shape in this instance represents the unborn child. The artwork shown before the specific statements within the document symbolises a footprint and demonstrates the need to move forward together in unison.

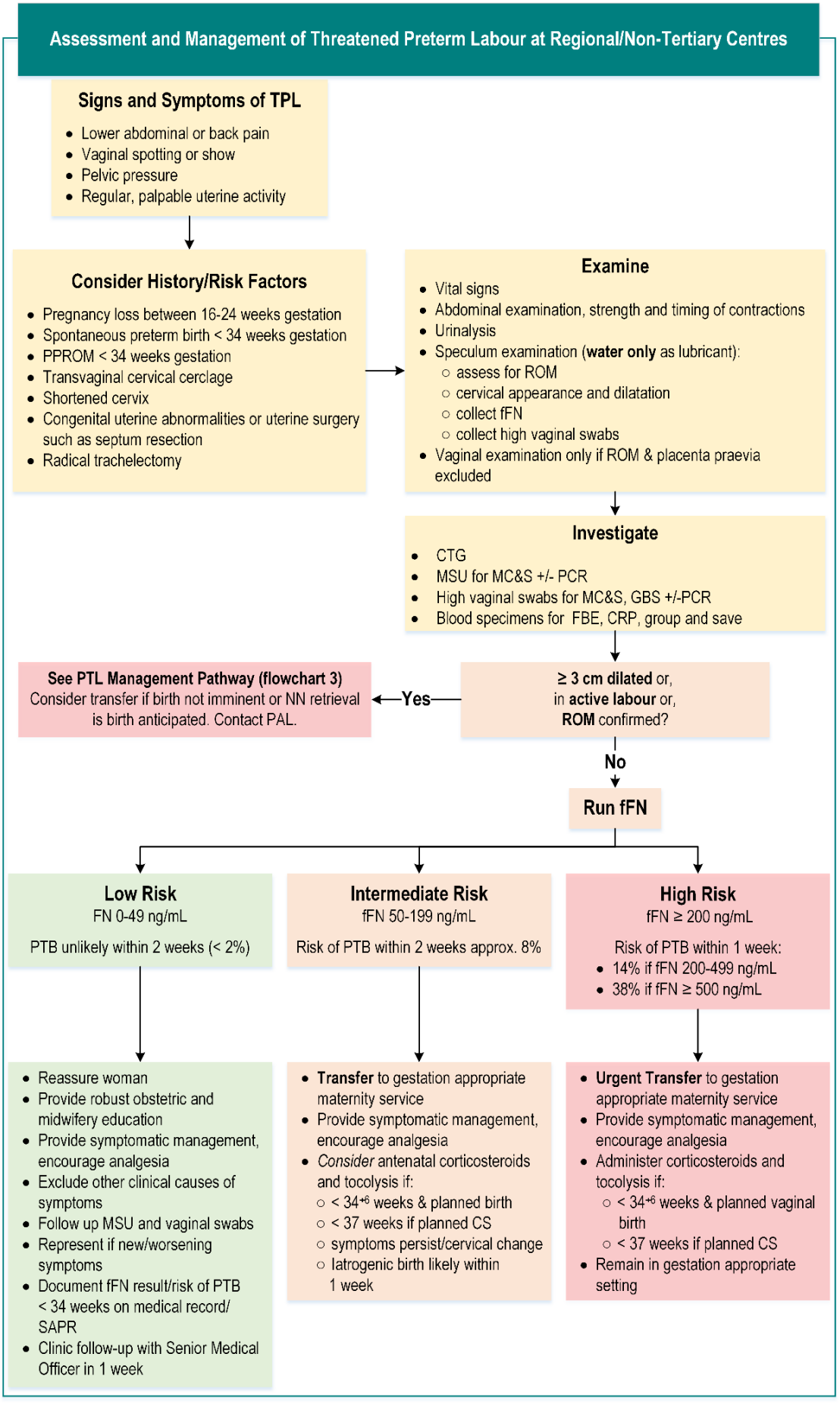
Australian Aboriginal Culture is the oldest living culture in the world, yet Aboriginal people continue to experience the poorest health outcomes when compared to non-Aboriginal Australians. In South Australia, Aboriginal women are 2- 5 times more likely to die in childbirth and their babies are 2-3 times more likely to be of low birth weight. The accumulative effects of stress, low socio-economic status, exposure to violence, historical trauma, culturally unsafe and discriminatory health services, and health systems are all major contributors to the disparities in Aboriginal maternal and birthing outcomes. Despite these unacceptable statistics the birth of an Aboriginal baby is a celebration of life and an important cultural event bringing family together in celebration, obligation, and responsibility. The diversity between Aboriginal cultures, language, and practices differ greatly and so it is imperative that perinatal services prepare to respectfully manage Aboriginal protocol and provide a culturally positive health care experience for Aboriginal people to ensure the best maternal, neonatal and child health outcomes.

Purpose and Scope of PPG

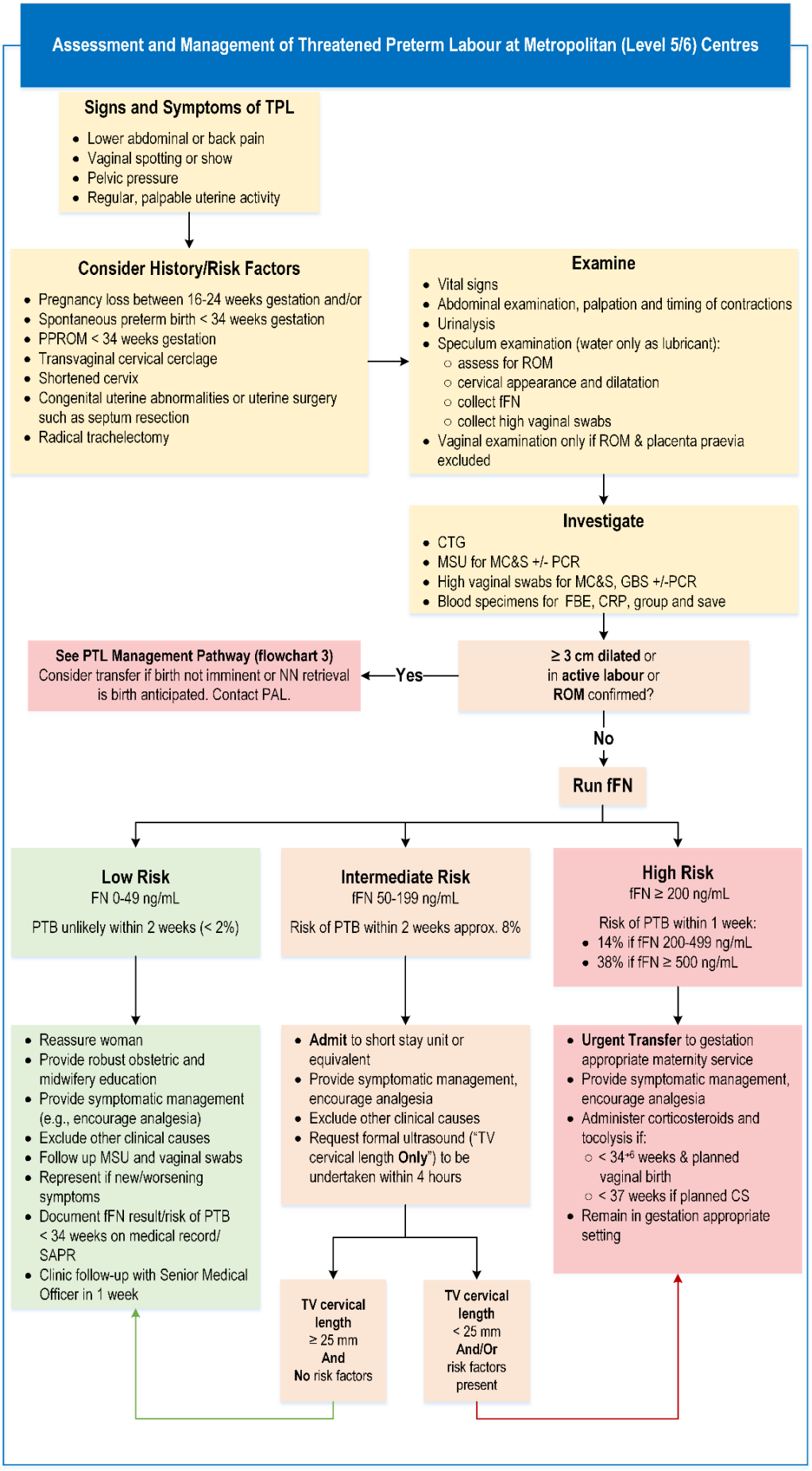
This PPG is intended to guide primary care, emergency, specialist, and midwifery practitioners in the care of women at risk of or experiencing preterm labour. It provides a standardised, evidence- based approach to the assessment and management of South Australian women presenting with threatened preterm labour and includes a statewide referral pathway for women presenting in regional/lower acuity centres. For the first time, this PPG includes recommendations for how to identify women at risk of preterm birth and strategies for prevention. It forms the basis of the "Every Week Counts" campaign to safely reduce rates of preterm birth in South Australia.

Government of South Australia
SA Health

Flowchart 1| Assessment & Management of TPL: Regional Centres



Flowchart 2| Assessment & Management of TPL: Metropolitan Centres



Flowchart 3| Preterm Labour Management

Active Preterm Labour Or Cervical Dilatation Present
< 37 weeks gestation

- Admit to Labour ward
- IV access
- Bloods:
  - Group & hold (G&H)
  - Full blood examination (FBE)
  - C-Reactive Protein (CRP)
- Commence IV GBS prophylaxis if GBS positive or unknown, or triple IV antibiotics if chorioamnionitis suspected
- Continuous CTG
- Check fetal presentation with ultrasound
- Discuss with obstetric consultant (via PAL if in rural site +/- organise transfer)
- Notify Neonatal Team (both local and via PAL if in rural site +/- organise retrieval)
- Consider antenatal corticosteroids

Consider Tocolysis For < 35 Weeks Gestation Cases
if:
Antenatal course of corticosteroid not completed
Or
Woman requires transfer to a higher service level site
And
No contraindications

Plus

For < 30 Weeks Gestation Cases:

- Consider **magnesium sulphate** for neuroprotection.
  Note: for women at the threshold of viability consider magnesium sulphate on a case by case basis.
- Senior obstetrician and/or MFM and Neonatal team to **discuss** management plan with parents considering all aspects of the care bundle for maternal and fetal wellbeing.

See body of this PPG for detailed information and treatment regimens for:

Antenatal Corticosteroids

Nifedipine

Magnesium Sulphate for Neuroprotection of the Fetus

Table 1| Risk Factors for Preterm Birth and Management Guide

Risk Factors		Management
Maternal Characteristics		
Age	• < 20 years • > 35 years	• Offer continuity of care and postnatal LARC • Consider aspirin (Appendix 1)
Ethnicity	• Aboriginal/Torrens Strait Islander	• Refer to AFBP or continuity of carer
	• Indian, African, Indo-Caribbean	• Offer continuity of carer
Cervical surgery	• Cone biopsy • ≥ Two LLETZ • One LLETZ > 10 mm depth	• Transvaginal Ultrasound (TVUS) cervical length at 16 weeks
	• Radical Trachelectomy	• Refer to Preterm Birth Clinic/High Risk Obstetric care • Commence serial TVUS cervical length from 16 weeks
Congenital uterine anomalies/uterine surgery		• Refer to Preterm Birth Clinic/High Risk Obstetric care • Commence serial TVUS cervical length from 16 weeks
BMI	• < 18 or > 30	• Optimise BMI pre-pregnancy • Consider aspirin (Appendix 1)
Medical comorbidities	• Hypertension, DM, Renal • Disease, SLE, APLS, Scleroderma	• Optimise pre-pregnancy • Consider aspirin (Appendix 1) • Multi-disciplinary team care
Nutrition	• Vegetarian/Non-Fish Diet • Malabsorption/Inflammatory Bowel disease/gastric banding	• Encourage Omega 3 and Zinc supplements • Screen for vitamin D deficiency
Smoker or history of smoking		• Screen at antenatal booking & discuss at each visit • Refer to Quitline
Obstetric History		
Previous preterm birth > 34 weeks		• Review by obstetrician
Previous preterm birth or PPROM < 34 weeks **Mid trimester loss (16–24 weeks)** **Shortened cervix** **Cervical cerclage**		• Refer to Preterm Birth Clinic/High Risk Obstetric care • Commence serial TVUS cervical length from 16 weeks
Previous fully dilated CS/Mid trimester STOP or GTOP		• TVUS cervical length at 16 weeks
Pregnancy Features		
Shortened cervix	• < 25 mm on TVUS, especially • < 15 mm or funnelling	• Urgent referral Preterm Birth Clinic/ High Risk Obstetric care
Short interpregnancy interval	• < 6 months (but can be up to 18 months)	• Offer continuity of carer and postnatal LARC • Optimise nutrition & medical comorbidities
ART/IVF		• Single embryo transfer • Consider aspirin (Appendix 1)
Urogenital infections	• All women	• MSU and treat UTI
	• Symptomatic women	• Culture & treat urogenital infections
	• History of infection associated losses and PTB (e.g., chorioamnionitis)	• Refer to Preterm Birth Clinic/High Risk Obstetric care
Multiple pregnancy		• Refer to Obstetrician • Refer to MFM if MCMA, MCDA, DCDA complexity • Consider aspirin (Appendix 1)
Social Factors		
Low SES/Domestic and family violence		• Offer continuity of carer or any available enhanced antenatal care programs, and if applicable refer to Social work.
Substance misuse		• Offer continuity of carer and refer to Quitline/DASSA

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Summary of Practice Recommendations

No pregnancy should be ended before 39 weeks **without** obstetric or medical indication.

Women with risk factors for preterm birth (see risk factors) should be referred to a **preterm birth clinic or high-risk Obstetric care**, ideally for pre-conception counselling or as early as possible in pregnancy.

It is recommended that women with chronic hypertension, type 1 or 2 diabetes, renal disease, or autoimmune conditions commence **low dose (100 mg) oral aspirin nocte** in early pregnancy.

Vaginal **progesterone** from 16 to 36 weeks should be considered for women with a singleton pregnancy and a history of preterm birth.

Measurement of **cervical length** is recommended at **all** mid-trimester morphology scans. A transabdominal cervical length of ≥ 35 mm is adequate.

If < 35 mm found in a transabdominal ultrasound, proceed to check cervical length with a **transvaginal** ultrasound. A cervical length of < 25 mm is considered shortened and must be immediately referred to a preterm birth clinic/high-risk Obstetric care.

Vaginal progesterone is recommended for women with a shortened cervix of < 25 mm at mid-trimester **transvaginal** ultrasound screening.

Women with a **history of obstetric cervical trauma** or **cervical surgery** (e.g., cone biopsy, two or more LLETZ or one LLETZ > 10 mm depth) are at increased risk for spontaneous preterm birth therefore require an additional cervical length measurement at 16 weeks gestation.

Aboriginal and Torres Strait Islander women should be offered specialised and culturally appropriate antenatal care featuring continuity of carer and community stewardship.

Pregnant women with identified **social risk factors** for preterm birth should be allocated to enhanced models of antenatal care where available and referred to supporting services.

Women at **high risk of preterm birth** should be prioritised to receive antenatal care in a model that affords midwifery continuity of care.

Assisted reproductive technology (ART) should be used carefully and judiciously, including single embryo transfer only, to minimise the risk of multiple pregnancy.

Multiple pregnancies are at high risk of preterm birth and should be managed by an obstetrician or MFM subspecialist, see *Multiple Pregnancy* PPG found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal

Follow routine **antenatal screening** as per the *Antenatal Care* PPG found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal.

There is insufficient evidence for routine screening and treatment of bacterial vaginosis. Refer women at high risk of preterm birth to an obstetrician to consider their individual risk profile.

Counsel women about smoking and vaping in pregnancy, encourage cessation and refer women to appropriate services, i.e., Quitline.

In the event of preterm labour and/or birth:

- **Antenatal corticosteroids** are most effective if given between 48 hours and 7 days before birth.
- A **fFN** reading of between 10–49 ng/mL moderately increases the woman's overall risk (8.2%) of experiencing a preterm birth before 34 weeks, therefore she should be counselled to represent with persistent, worsening, or new symptoms.
- **Consider tocolysis** for women who have not completed a full course of corticosteroids or for in utero transfer of a woman to a higher-level service.
- Do **not** continue Nifedipine beyond 48 hours. A repeat course of Nifedipine should only be considered if the woman represents with preterm labour. Nifedipine is **not** to be used prophylactically.
- Commence **IV antibiotic prophylaxis** for GBS for women in active preterm labour, see *Antibiotics in the Peripartum Period* PPG found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal.
- Intravenous **magnesium sulphate** must be administered to any woman considered at imminent risk of preterm birth or where birth is planned at < 30 weeks.

Abbreviations

>	Greater than
≥	Equal to or greater than
<	Less than
≤	Equal to or less than
AFBP	Aboriginal family birthing program
AFI	Amniotic fluid index
APLS	Anti-Phospholipid Syndrome
ATAGI	Australian Technical Advisory Group on Immunisation
BMI	Body Mass Index
CoC	Continuity of care
CRP	C-reactive protein
CS	Caesarean section
CTG	Cardiotocography
DASSA	Drug and Alcohol Services South Australia
DCDA	Dichorionic Diamniotic (Twin Pregnancy)
DHA	Docosahexaenoic acid
DM	Diabetes Mellitus
ECG	Electrocardiogram
FBE	Full blood examination
FHR	Fetal heart rate
fFN	Fetal fibronectin
GBS	Group B streptococcus
GTOP	Genetic termination of pregnancy
IUFD	Intrauterine fetal death
IUGR	Intrauterine growth restriction
IV	Intravenous
LARC	Long acting reversible contraceptive
LLETZ	Large loop excision of the transformation zone
MC&S	Microscopy, culture and sensitivities
MCDA	Monochorionic Diamniotic (Twin Pregnancy)
MCMA	Monochorionic-monoamniotic
MFM	Maternal Fetal Medicine
MSU	Mid-stream urine
NAAT	Nucleic acid amplification test
NN	Neonatal
PAL	Perinatal advice line
PCR	Polymerase chain reaction
PPH	Postpartum haemorrhage
PPROM	Preterm pre-labour rupture of membranes
PTB	Preterm birth
PTL	Preterm labour
RANZCOG	Royal Australian and New Zealand College of Obstetricians and Gynaecologists
RDI	Recommended daily intake
RR	Respiration rate
SAMSAS	South Australian maternal serum antenatal screening program
SAPR	South Australian pregnancy record
SES	Socioeconomic status
SLE	Systemic lupus erythematosus
STOP	Surgical termination of pregnancy
ROM	Rupture of membranes
TPL	Threatened preterm labour
TVUS	Transvaginal ultrasound
UTI	Urinary tract infection

Definition

Preterm birth	A birth occurring before 37 weeks completed gestation

Background

Late preterm births, occurring between 34^{+0} and 36^{+6} weeks, account for over 70% of all preterm births in Australia, however, early preterm births (occurring before 34 weeks) are responsible for the majority of associated morbidity and mortality.[1]

In South Australia, non-indigenous women experienced a preterm birth rate of 9%, constituting approximately 6.5% of live births in 2021. In contrast, Aboriginal and Torres Strait Islander women experienced a higher preterm birth rate of 18.4%.[2] Notably, the rate of *iatrogenic* preterm births in South Australia has doubled in the last 20 years.[1] This increase is believed to be associated with rising maternal age at first pregnancy, higher body mass indices (BMIs) and the expanding diversity of ethnic populations during this time.[1] Nevertheless, it is important to note that women experiencing pregnancy loss and preterm birth have no identifiable risk factors.

Prevention

Spontaneous preterm birth, is the culmination of woman and fetus specific risk factors unique to each pregnancy and therefore, is it more aptly considered as a syndrome rather than a diagnosis. By extension, the prevention of spontaneous preterm birth requires a multidisciplinary and multidimensional approach.

It is important to identify pregnant women at increased risk of preterm births **early,** in order to implement risk minimisation strategies and assign an appropriate model of care.[3] Risk factors can be grouped into four categories: 1) maternal (non-modifiable/modifiable); 2) obstetric/gynaecological history; 3) pregnancy features and 4) social factors (see table 1).

Perinatal service providers need cultural sensitivity within a non-judgemental environment when planning care for the Aboriginal woman.

A simple way of minimising the burden of prematurity in South Australia is to avoid further 'obstetric creep' or iatrogenic birth at increasingly earlier gestations.[4] Therefore:

No pregnancy should be ended before 39 weeks gestation without obstetric or medical indication.

Risk Factors

Non-modifiable Maternal Risk Factors

Age

Young women (< 18 years old) may be physiologically immature and are more likely to be experiencing disadvantageous social circumstances,[5] whilst older women (> 35 years old) are more likely to have medical comorbidities such as diabetes and obesity contributing to their risk.[6]

Ethnicity

Aboriginal, South Asian, African, African American and Indo-Caribbean women are at higher risk of experiencing preterm and early preterm birth compared to other ethnicities.[2, 7] Emerging evidence suggests at least some of this risk may be attributable to genetic polymorphic differences in immune response and differences in the vaginal microbiome.[8]

Congenital Uterine Anomalies

Women with congenital uterine anomalies are at increased risk of preterm birth and therefore should have serial transvaginal cervical length monitoring fortnightly from 16–24 weeks, under the care of a Preterm Birth Clinic or High-risk Obstetric care specialist,[9, 10] Whilst the risk of preterm birth appears greatest in women with major fusion defects (e.g., unicornuate, bicornuate and didelphys anomalies), the value of combined cervical length and fetal fibronectin (fFN) in predicting preterm birth is greater for those with resorptive anomalies (i.e., septate and arcuate anomalies).[11]

Women with a congenital uterine anomaly should be referred to a Preterm Birth Clinic or High-risk Obstetric care service and have serial transvaginal cervical length monitoring fortnightly from 16–24 weeks.

Modifiable Maternal Risk Factors

BMI

Women with low BMI (< 18 kg/m^2) are at greater risk of spontaneous preterm birth, whereas women with high BMI (> 30 kg/m^2) are more likely to experience an iatrogenic preterm birth secondary to oxidative stress-related complications such as preeclampsia and fetal growth restriction.[9] Where possible, women should be encouraged and assisted to optimise their BMI before conceiving.

Medical Comorbidities

Medical comorbidities such as hypertension, diabetes, renal disease, and autoimmune conditions should also be optimised, ideally prior to conception, and managed in a multidisciplinary team, together with relevant specialists and obstetric physicians. A simple but powerful prevention strategy in addition to optimising these medical comorbidities is commencing low dose aspirin 100 mg nocte once pregnancy is confirmed (preferably after confirmation of fetal heart beat), prior to 16 weeks gestation (Appendix 1).[12]

Women with chronic hypertension, type 1 or 2 diabetes, renal disease, or autoimmune conditions such as antiphospholipid syndrome, systemic lupus erythematous and scleroderma should commence low dose (100 mg) oral aspirin nocte in early pregnancy.

Nutrition

Nutrition is integral to a healthy pregnancy outcome, yet even in a high resource setting such as South Australia, some women are at risk of malnutrition. Women with extremes of BMI (low and high), a history of bariatric procedures, inflammatory bowel disease, those who follow vegan or vegetarian diets, recent migrants and women of low socioeconomic status are at particular risk of micronutrient insufficiencies in pregnancy. Specific nutrients that have been linked with preterm birth prevention include Omega 3, vitamin D and Zinc.

Omega 3

Universal supplementation with omega-3 for all pregnant women has not shown to have a significant effect on the rate of preterm birth,[13, 14] and may cause harm if DHA levels are in the highest quartile of omega-3 fatty acids.[15] However, potential harm has been disputed by some studies, with demonstrated lower rates of preterm birth for women supplemented with omega-3, with the greatest effect observed if low DHA status is present in early pregnancy screening.[16] Testing DHA status is available in South Australia via the SAMSAS program with omega-3 supplement advice provided once omega-3 levels results are obtained as part of ongoing research. The SAPPGs encourage women to eat salmon, herring, mackerel, or sardines weekly, or any other fish 2–3 times a week to ensure adequate levels of omega-3.

Zinc

A Cochrane systematic review of zinc supplementation in pregnancy showed a 14% relative reduction in preterm birth, with the most recent update finding little evidence of improvement, though the majority of data came from resource poor settings, making general application in an Australian setting difficult.[17] The Australian recommended daily intake (RDI) of zinc in pregnancy is 11 mg/day, however, as absorption is greater from animal rather than plant sources, vegans and strict vegetarians require intakes that are 50% higher. The main sources of zinc are meat, fish and poultry and to a lesser extent, dairy, nuts and cereals.[18]

Consider omega-3 and zinc supplementation in women at risk of dietary insufficiency.

Vitamin D

Universal supplementation of vitamin D in pregnancy does not appear to decrease preterm birth directly, however, there is evidence that vitamin D adequacy decreases the risk of preeclampsia, gestational diabetes, low birth weight and postpartum haemorrhage (PPH). Therefore, it is recommended screening for vitamin D deficiency and optimising cholecalciferol levels in women at risk of preterm birth, particularly those with a history of prior preterm birth, in addition to women at risk of vitamin D insufficiency (see *Vitamin D Status in Pregnancy PPG* found in the A to Z index at www.sahealth.sa.gov.au/perinatal).[19]

Screen and treat vitamin D insufficiency in women at risk of preterm birth.

Smoking

Smoking remains an important modifiable risk factor for numerous pregnancy complications, including preterm birth. Women who smoke during pregnancy are more likely to experience preterm births than women who do not smoke.[20] Studies have also demonstrated that maternal passive second-hand smoke exposure (passive smoking) is associated with preterm birth.[21]

Health care workers, in providing interventions and pregnancy care, should be aware that tobacco use has become the norm in some Aboriginal and Torres Strait Islander communities. That is to say, more than half of a community may smoke. This constitutes an additional social barrier to smoking cessation. In assisting Aboriginal and Torres Strait Islander women to stop smoking, an aboriginal health professional should be engaged to support the development of achievable goals. Where possible an Aboriginal Community Controlled Health Service can provide advice. The aboriginal health professional should be engaged to seek possibilities.

All pregnant women should be asked about their smoking status at booking, and if still smoking or recently quit, at every visit in pregnancy as per the South Australian Pregnancy Record. Women and partners who continue to smoke should be offered referral to the Quitline SA, via referral form.

Ask about smoking (including partner) in pregnancy initially and at every visit if still smoking or recently quit (refer to Quitline).

Obstetric/ Gynaecological History

Previous Preterm Birth

The strongest predictor of preterm birth is an obstetric history of preterm birth and/or late intrauterine fetal demise (IUFD). This risk increases further the earlier the gestation at which the previous preterm birth occurred.[22-23] Women with a history of preterm birth should be referred to a Preterm Birth Clinic/High-risk Obstetric care service, ideally preconceptionally, to assess contributing factors and optimise modifiable risk factors, and to identify women that may benefit from early interventions such as vaginal progesterone, serial cervical length measurement and prophylactic cervical cerclage.

Vaginal Progesterone

There is contradicting evidence on the use of vaginal progesterone to prevent preterm birth in women with a history of preterm birth.[24-26] Therefore, current advice remains as per the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG).[27]

Vaginal progesterone from 16 to 36 weeks can be *considered* for women with a singleton pregnancy and a history of preterm birth.

Ultrasound and Cervical Cerclage

Where a woman's history of preterm birth is suggestive of cervical insufficiency, she should have serial ultrasound cervical length surveillance implemented from 16–24 weeks under the supervision of a Preterm Birth Clinic/High Risk Obstetric care service.[9, 10] For detailed management see *Cervical Length and Cerclage PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal.

Women with a history of preterm birth < 34 weeks, PPROM < 34 weeks, recurrent mid-trimester loss (16 to 24 weeks), shortened cervix and/or cervical cerclage should be referred to a *Preterm Birth Clinic or High-Risk Obstetric Care* service, ideally for pre-conception counselling or as early as possible in

Cervical Trauma

History of cervical trauma including surgical termination of pregnancy (STOP), induced abortions, genetic terminations of pregnancy (GTOP) and previous fully dilated caesarean sections increase risk of preterm birth in subsequent pregnancies.[28-30] However, there are currently no standard recommendations for cervical length screening for history of cervical trauma and caesarean sections.[31] Therefore, expert consensus in South Australia recommends transvaginal cervical length measurement surveillance at both 16 weeks and the mid-trimester morphology ultrasound scans for this cohort of women. For detailed management see *Cervical Length and Cerclage PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal.

Women with a history of obstetric cervical trauma should have a *transvaginal* cervical length measurement at 16 weeks and the mid-trimester morphology ultrasound.

Cervical Surgery

A history of cervical procedures such as LLETZ and cervical conisation is associated with an increased risk of preterm birth, especially with increased size of excision (> 10mm), repeated procedures and conisation.[32] Expert consensus in South Australia recommends transvaginal cervical length measurement surveillance at both 16 weeks and the mid-trimester morphology ultrasound scan (see *Cervical Length PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal).

Women with a history of radical trachelectomy will require referral to a preterm birth clinic or high-risk obstetric care service, once a viable pregnancy is confirmed, for serial cervical surveillance and management from 16 weeks.

Women with a history of cervical surgery should have a *transvaginal* cervical length measurement at 16 weeks and the mid-trimester morphology ultrasound scan.

Pregnancy Features

Shortened Cervix

Cervical length in mid-trimester is highly correlated with gestation at birth.[10, 33] It is now standard practice that all South Australian radiology services performing mid-trimester morphology scans report on the cervical length of **all** pregnant women.[34]

Measurement of cervical length is recommended for all women at the mid-trimester scan. For further management information see *Cervical Length and Cerclage* PPG found at found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal

Trials have shown that treatment with vaginal progesterone prolongs the duration of pregnancy and improves pregnancy outcomes for women with a shortened cervix on ultrasound. [27, 35, 35]

Vaginal progesterone is recommended for women with a shortened cervix of < 25 mm at mid-trimester transvaginal ultrasound screening.

Inter-pregnancy Interval

A short inter-pregnancy interval, specifically less than 6 months, from last birth, increases the risk of a subsequent preterm birth.[36, 37] Where possible, women should be counselled to delay subsequent pregnancies for 6 months and offered appropriate contraception to achieve this.

Pregnancies should be spaced at least 6 months apart from the end of one pregnancy to the beginning of the next.

Assisted Reproductive Technologies

Women who required assisted reproductive technology (ART) to conceive, in particular in vitro fertilisation (IVF) and intracytoplasmic sperm injection (ICSI), are at increased risk of preterm birth, however, other than limiting the number of embryos transferred (single embryo transfers only), there is no specific intervention to mitigate this risk.[38] Optimisation of weight, nutrition, and medical comorbidities is recommended prior to use of ART and consideration be given to whether women meet criteria for low dose aspirin prophylaxis after conceiving.

ART should be used carefully and judiciously, including single embryo transfer only, to minimise the risk of multiple pregnancy.

Urogenital Infections

Urogenital infection is a strong risk factor for preterm birth. The initiation of labour is an inflammatory event, and many cases of preterm birth are associated with systemic or urogenital infection. Routine screening and treatment of urogenital infection in pregnancy currently consists of:

- syphilis serology screening with antenatal screening bloods and additional screening in the third trimester (28 and 36 weeks), at birth and 6 weeks postnatally for women in outbreak areas or otherwise at high risk
- a mid-stream urine (MSU) microscopy, culture and sensitivity performed together with antenatal screening bloods
- screening for chlamydia (+/- gonorrhoea) in pregnant women < 25 years old or at high risk of a sexually transmitted infection (STI) at the first visit, with additional screening at 36 weeks.

For more information on STI high risk factors, see *Antenatal Care* PPG found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal

Routine urogenital antenatal screening for infection must include syphilis serology, a mid-stream urine sample to detect asymptomatic bacteriuria and screening for Chlamydia in women < 25 years of age or otherwise at high risk.

Whilst periodontal disease and bacterial vaginosis in pregnancy have been associated with preterm birth, causation has not been established and universal treatment of these conditions has not reduced the incidence of preterm birth.[39-41] Women who are symptomatic with bacterial vaginosis or other genital tract infections should be treated as per local protocols.[42]

There is insufficient evidence for routine screening and treatment of bacterial vaginosis. Women with risk factors for preterm birth should be referred to an obstetrician to consider their individual risk profile.

Systemic Infections

Intercurrent systemic infections with pathogens such as malarial parasites or influenza are associated with preterm birth.[43] These should be identified and treated. In the case of influenza, the Australian Government recommends and provides free vaccination to all pregnant women in recognition of their status as a vulnerable population.[44]

All pregnant women should be offered the influenza vaccine.

Pregnant women are at increased risk of severe illness if infected with COVID-19.[45, 46] Meta-analyses demonstrate an increased risk of preterm birth for symptomatic, COVID-19 positive mothers, with risk relative to severity of illness, particularly late in pregnancy, and often complicated by underlying comorbidities.[46, 47] Women who are pregnant and unvaccinated have a higher risk of severe illness from COVID-19 than pregnant women who are vaccinated.[48] Women should be routinely offered an mRNA vaccine at any stage in pregnancy as recommended by RANZCOG and ATAGI.[45] Refer to the RANZCOG website for more information.

All pregnant women should be offered the CoViD-19 vaccine.

Multiple Pregnancies

Nearly three-quarters (73.5%) of multiple births are preterm in South Australia.[2] The increased risk of general (hypertensive, cholestatic, diabetic) and multiple-specific (e.g., twin-twin transfusion, selective intra-uterine growth restriction) pregnancy complications, as well as the risk of stretch mechanoreceptor initiation of labour, contribute to both iatrogenic and spontaneous preterm births in multiple pregnancies, respectively.[49] Aside from minimising the risk of multiple gestations arising from ART, twin and higher order multiple pregnancies require specialised care with either an obstetrician or MFM subspecialist.

Multiple pregnancies are at very high risk of preterm birth and should be managed by an obstetrician or MFM subspecialist.

Social Determinants

Social disadvantage has consistently been linked with preterm birth and is associated with a range of independent risk factors such as poor nutrition, substance abuse, periodontal disease, lower educational attainment, and psychological stressors.[50-52]

The accumulation effects of stress, low socio-economic status, racism, exposure to violence, loss and historical trauma contributes to adverse birthing outcomes.

Women in lower socioeconomic groups are also more likely to be over-represented in other at-risk groups related to ethnicity, extremes of age and BMI.[52] There is a lack of high quality evidence to support enhanced antenatal care programs for socially disadvantaged women to reduce preterm births in high-income,[3] however, this is still of clinical significance when individual outcomes and cost, financial and otherwise, of a single early preterm birth are taken into account.

Aboriginal and Torres Strait Islander Women

Prevalent themes across available literature emphasise the importance of cultural safety and continuity of care (CoC) to engagement in antenatal care provision.[53] A Brisbane study, found a 50% reduction in preterm birth in Aboriginal women receiving 'culturally safe CoC within a holistic service with high levels of community investment-ownership-activation and health service leadership across partner organisations.[54] It is note that 25% of identified Indigenous births at the health service were excluded from the analysis, including women allocated to other specialised care such as MFM and drug and alcohol dependency services, nevertheless, the translatable absolute reduction in preterm births suggests this to be a worthwhile model of antenatal care for women known to be at significantly increased risk of preterm birth.

Closer to home, Aboriginal women participating in the South Australian Aboriginal Family Birthing Program highly value receiving care from another Aboriginal woman, paving the way for greater engagement with antenatal care and improved outcomes. These women achieved similar birth outcomes, including preterm birth rates, to Aboriginal women in other models of care, despite having greater medical and social complexity.[55]

Aboriginal and Torres Strait Islander women should be offered specialised and culturally appropriate antenatal care featuring continuity of carer and community stewardship.

Socially Disadvantaged and Vulnerable Women

A lack of high-quality evidence similarly pertains to enhanced antenatal care provision to other socially disadvantaged women such as teenagers, pregnant women with substance abuse issues and women in low socioeconomic groups. Whilst studies suggest improved outcomes including preterm birth rates, women in these categories suffer from selection bias and other methodological limitations.[50]

Women experiencing domestic and family violence are represented among all socioeconomic groups and are at high risk of preterm birth.[56] The importance of screening for domestic and family violence has been recognised by RANZCOG and the Australian Government by linking it to several antenatal (and postnatal) Medicare item numbers.

Pragmatically, despite low grade evidence, socially vulnerable women should be offered enhanced antenatal and adjunct service provision including prioritisation to midwifery CoC models and other specialised antenatal care streams, as well as access to Drug and Alcohol Services South Australia (DASSA), social work and mental health services, to optimise their individual health and pregnancy outcomes, as any reduction in preterm births in terms of absolute numbers will still be clinically and economically meaningful.

Pregnant women with identified social risk factors for preterm birth such as young age, substance abuse and exposure to domestic and family violence should be allocated to enhanced models of antenatal care where available and referred for supporting services.

Antenatal Care Provision

Midwifery Continuity of Carer

It is well reported that women engaging in midwifery-led continuity care models (CoC) express greater satisfaction with health services, enjoy greater autonomy, and choice, and report notably lower levels of stress and anxiety compared to women opting for alternative care models.[57] Considering the established link between maternal and anxiety and risk of preterm births, midwifery led continuity of care models may act as moderators, mitigating the impact of women's stress, potentially reducing the risk of preterm birth.[58]

Women at high risk of preterm birth should be prioritised to receive antenatal care in a model that affords midwifery continuity of carer.

Aboriginal women should be referred to an Aboriginal Health Professional to support their care.

Dedicated Preterm Birth Clinics

The provision of antenatal care in dedicated preterm birth clinics helps to facilitate the streamlining of multidisciplinary care and predictive and preventive measures such as urogenital tract infections screening, second trimester alkaline phosphatase measurement, serial fetal fibronectin quantification, access to serial transvaginal cervical length measurement and midwifery and medical CoC.[59] Evidence from pre-term birth clinics in the UK and Australia, both alone and as part of a comprehensive state-wide intervention, have demonstrated significant reductions in the incidence of preterm birth, improved prediction of women requiring inpatient management and improved timing of interventions (e.g., antenatal corticosteroids).[60] The high personal and societal cost of each preterm birth together with the array of interventions requiring individualisation to each at-risk woman's circumstances justify the need for dedicated preterm birth clinics and parents' anxiety and satisfaction with care must be factored.[61]

Women at high-risk of preterm birth benefit from specialised antenatal care to provide timely and evidenced access to predictive and preventive interventions; local health networks should strongly consider the establishment of dedicated preterm birth prevention clinics to facilitate this.

Perinatal service providers need cultural sensitivity within a non-judgemental environment when planning care for the Aboriginal woman.

Assessing Threatened Preterm Labour

For summary of assessment and management of threatened preterm labour in regional areas see flowchart 1 and in metropolitan areas see flowchart 2.

Signs and Symptoms

Women may present with:

- lower abdominal cramping, regular, painful contractions or tightening
- lower back pain
- vaginal or rectal pressure
- vaginal discharge including bleeding
- one-third of women will experience premature prelabour rupture of membranes (PPROM) before regular, painful tightening. Intrauterine infection is a major concern, manage as per the *Preterm Prelabour Rupture of Membranes PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal

History and Risk Factors

A brief history should review the woman's risk factors for preterm birth including:

- any previous preterm births, PPROM and/or mid-trimester losses, and the gestations at which these occurred
- congenital uterine anomalies or uterine surgery
- cervical surgery (e.g., LLETZ or cone biopsy)
- obstetric cervical trauma (fully dilated caesarean or mid-trimester STOP or GTOP)
- shortened cervix
- cervical cerclage, multiple pregnancy, or polyhydramnios (these women are at higher risk of preterm birth and require MFM input)
- social risk factors (a lower threshold for admission should be considered to obtain assistance and minimise ongoing risk where possible).

Examination

Initial triage and midwifery assessment should incorporate:

- maternal vital signs including temperature
- fetal heart rate assessment either by Doppler auscultation or CTG
- assessment of vaginal losses
- abdominal examination including presentation
- timing of uterine activity
- urinalysis.

Further assessment (within a midwife's or doctor's scope of practice) should incorporate:

- A speculum examination using only water as lubrication, assessing for:
  - PPROM, including any bedside detection tests
  - cervical length, dilatation, and appearance
  - cervical and vaginal swabs for MC&S and Chlamydia/Gonorrhoea NAAT
  - fFN swab from the posterior fornix.

Note: *whilst recent digital or ultrasound vaginal examination, coitus and the presence of blood in the vagina are relative contraindications to performing a fFN measurement and increase the risk of both false and true positive results, a negative fFN in these situations is still clinically valid and should be performed if it will help appropriately time intervention and/or discharge planning.*

If PPROM and placenta praevia have been excluded:

- a digital vaginal examination to assess the dilatation of the cervix; this may be repeated in 4 hours' time to help determine if the woman is in active labour.

If bedside ultrasound is available:

- confirm presenting part of fetus
- assess AFI and umbilical artery Dopplers.

Investigations

- Urine MC&S
- Cervical and vaginal swabs for NAAT and MC&S, respectively
- Bloods including full blood examination (FBE), group and hold and C reactive protein (CRP)
- fFN quantification
- TVUS cervical length if fFN > 50 ng/mL
- A formal ultrasound assessment of growth should form part of the work up if the woman requires admission.

Preterm Birth Risk by Fetal Fibronectin Concentration

See appendix 2 for stratification of preterm birth risk by fFN concentration summary table.

Fetal fibronectin 0–49 ng/mL

These women have a **very low risk** (< 2%) of experiencing a preterm birth in the next 2 weeks and can therefore be managed symptomatically and discharged with timely (within 1 week) antenatal follow up. A reading between 10–49 ng/mL modestly increases women's overall risk of experiencing a preterm birth before 34 weeks gestation. Therefore, she should be counselled to represent if persistent, worsening or experiences new symptoms, and her antenatal care provider should remain vigilant of the risk of preterm birth later in pregnancy.

Fetal fibronectin 50–199 ng/mL

These women are at a **moderately increased risk** (7.7%) of progressing to a preterm birth within 14 days. They should be transferred to a gestation appropriate maternity setting for a full assessment including growth ultrasound and transvaginal cervical length assessment (flowchart 3). Antenatal corticosteroids should be considered but not automatically commenced as very few babies will benefit from them within 7 days. Any urogenital infections should be screened for and treated if clinically indicated or confirmed.

Fetal fibronectin > 200 ng/mL

These women are **increased risk** of delivering within 1 week (14%) and must be transferred to a gestation appropriate maternity and nursery setting (flowchart 3) with commencement of an antenatal corticosteroid course (with tocolysis) if less than 34^{+6} weeks gestation. They may need to remain in this setting even on discharge as their risk of birth within 2 weeks is as high as 29%.

Fetal fibronectin > 500 ng/mL

These women are at **very high risk** of preterm birth: 38% within 1 week, and 47% within 2 weeks. They must be urgently transferred to a gestation appropriate maternity and nursery setting (flowchart 3) and remain there for the duration of their pregnancy or until they attain a gestation suitable to be transferred to a lower acuity centre. Antenatal corticosteroids must be commenced as a priority with tocolysis if appropriate (see antenatal corticosteroids).

Threatened Preterm Labour Management

For summary of assessment and management of threatened preterm labour in regional areas see flowchart 1 and in metropolitan areas see flowchart 2.

For Aboriginal women, discuss eligibility for Closing the Gap Medicines Access Program to support affordable access to medications in pregnancy.

Antenatal Corticosteroids

Initial Course

Indication:

- gestational age is between 23^{+0} and 34^{+6} weeks.
- risk of imminent preterm birth, even if within 24 hours.
- preterm birth is planned or expected within the next seven days.
- elective caesarean section at less than 37^{+0} weeks.

Dosage: ***11.4 mg betamethasone IM***

- Repeat same dose 24 hrs later.

Note: *if betamethasone is unavailable, give IM dexamethasone in two doses of 12 mg, 24 hours apart.*

Repeated Course

Indication: For gestational age of **32^{+6} days or less**, a repeat antenatal corticosteroid dose may be given 7 days or more after the first course in women still considered at risk of early preterm birth.

Dosage:

- **Single (repeat) dose of 11.4 mg of betamethasone IM**
  Or
- **Two doses of 11.4mg of betamethasone IM** (24 hrs apart)

Note: *if betamethasone is unavailable, give 12 mg of dexamethasone IM.*

Further Course:

Indication: To be given 7 days after the first single repeat course, and less than 14 days after the two-dose initial course if the woman is still considered at risk of preterm birth at 32^{+6} days or less.

Dosage: ***Single dose of 11.4 mg betamethasone IM***

Note: *do not give any further betamethasone if two doses of repeat course have been given.*

Nifedipine

Oral nifedipine is the preferred available tocolytic for suppression of preterm labour due to its reduced side effects, ease of administration and greater efficacy compared to betamimetics.[62]

Indication

Tocolysis with nifedipine is **only** indicated if:

- the woman is less than 34^{+6} weeks pregnant and
- requiring transfer to a gestation appropriate maternity service and/or
- yet to complete an initial course of antenatal corticosteroids.

Contraindications

Table 2: Maternal and fetal contraindications for nifedipine use.

Maternal	Fetal
• Systolic blood pressure of < 90 mmHg • Cervical dilatation > 3 cm, especially in the context of PPROM • Hypersensitivity to nifedipine or any excipients within the formulation • Cardiac comorbidities including congestive cardiac failure and aortic stenosis • Hepatic dysfunction • Preeclampsia/eclampsia • Concurrent use of IV salbutamol.	• chorioamnionitis • placental abruption/antepartum haemorrhage • fetal distress (consider expediting birth instead) • severe IUGR • IUFD • known lethal fetal anomalies.

Administration and Dosage

- Confirm threatened or actual preterm labour.
- Check systolic blood pressure > 90 mmHg before administering nifedipine.
- Give stat oral dose nifedipine 20 mg (chew or crush to aid the speed of absorption).
- If uterine contractions persist after 30 minutes:
  - Give stat oral dose nifedipine 20 mg (chew or crush to aid the speed of absorption). The maximum dose of nifedipine in the first hour is 40 mg.
- If uterine contractions persist after 3 hours:
  - Give stat oral dose nifedipine 20 mg (chew or crush to aid the speed of absorption)
  - Repeat oral nifedipine 20 mg every three hours for 48 hours (unless contractions cease, or labour is established)
  - Maximum dose of nifedipine is 160 mg in 24 hours
- **Do not** continue nifedipine beyond 48 hours. A repeat course of nifedipine should only be considered if the woman represents with PTL and the same conditions are met.
- Nifedipine is **not** to be used prophylactically.

- Nifedipine tablets may be crushed to aid administration.
  - Crushed tablets should be administered within 30–60 seconds of crushing to avoid significant loss of potency.

Observations:

- maternal baseline BP, Temp., Pulse, RR, FHR before administering the first dose of nifedipine 20 mg
- continue hourly BP and maternal pulse for 4 hours
- temperature every 4 hours
- rate of observations should be tapered according to the clinical situation
- continuous CTG while contracting.
- Recommence CTG in the presence of:
  - regular abdominal pains or tenderness
  - change in amount, colour of liquor
  - antepartum haemorrhage
  - arrange medical review.
- Stop nifedipine if:
  - there is marked hypotension e.g., systolic < 90 mm Hg
  - significant dyspnoea.

Salbutamol **Use as second-line agent with caution**

Betamimetics such as salbutamol have historically been used for tocolysis. Betamimetics can delay birth effectively, however, are associated with **serious (potentially life threatening) maternal side effects including pulmonary oedema**.[62, 63] In situations where nifedipine is unavailable, salbutamol may be used with caution as a tocolytic. It is not to be used in conjunction with nifedipine due to a high degree of synergism.

Indication for IV salbutamol requires that:

- woman is less than 34^{+6} weeks pregnant and,
- requiring transfer to a gestation appropriate maternity service.

Contraindications

Table 3: Maternal and fetal contraindications for salbutamol use

Maternal	Fetal
• A systolic blood pressure of < 90 mmHg • Cervical dilatation > 3 cm, especially in the context of PPROM • Hypersensitivity to salbutamol or any excipients within the formulation • Cardiac comorbidities including congestive cardiac failure and aortic stenosis • Hepatic dysfunction • Preeclampsia/eclampsia • Insulin-dependent diabetes • Thyroid disease • Multiple pregnancy (increased risk of pulmonary oedema)	• Chorioamnionitis • Placental abruption/Antepartum Haemorrhage • fetal distress (consider expediting birth instead) • Severe IUGR • IUFD • Known lethal fetal anomalies. • Cardiac anomalies

Dosage

Salbutamol intravenous infusion (IV) regimen for tocolysis	
Use with care, as it is associated with maternal tachycardia, hypotension, tremor, pulmonary oedema, hyperglycaemia, and hypokalaemia.	
Preparation of Infusion	• Add 5 mg of salbutamol (5 mL ampoule, Ventolin Obstetric Injection®) **to 100 mL of 0.9% sodium chloride** for a total concentration of 50 microgram/mL • Using a medication added label write "salbutamol 50 micrograms per mL" and attach label to syringe
Administration	IV infusion/syringe pump must be used for administration. **Initial rate:** 12 mL/hour (10 micrograms/minute) **Increments:** increase by 4 mL/hour (3.3 micrograms/minute) every 30 minutes **Cease if:** contractions stop, or maternal pulse rate reaches 120 beats/minute **Maximum rate:** 36 mL/hour (30 micrograms/minute) • Maintain rate for 1 hour after contractions have stopped, then gradually reduce by half every 6 hours. • Do not exceed 48 hours of salbutamol therapy. Only in exceptional circumstances should the treatment be continued for more than 24 hours.
Practice Points	• The dose is determined by the woman's tolerance (i.e., clinical indicators) of adverse effects against desired response. • Women should be warned about tremors, anxiety, dizziness, and headaches. • Collect baseline electrolytes, urea, creatinine, and maternal blood sugar level before commencement of infusion; repeat 4-hourly if abnormal. • Perform half hourly maternal pulse, BP and respiratory rate until the maintenance dose is reached. • Exercise caution with any additional intravenous fluids to avoid fluid overload. • Perform cardiovascular examination including auscultation of lung bases once in the first 24 hours of therapy. • Reduce the infusion if the maternal pulse > 120 bpm. • Cease the infusion and request medical review immediately if there is chest pain, dyspnoea or the respiratory rate > 30/min. • Continuous electronic fetal heart rate monitoring > 28/40. ○ cease the infusion if the fetal heart rate > 180 bpm. • Betamimetics can cause a fall in serum potassium (K+). This is related to the movement of K+ intracellularly and is usually limited and self- reversing. No treatment is needed unless ECG changes occur, or the serum potassium falls below 2.5 mmol/L
Adverse Reactions	• Tachycardia • Hypotension • Tremor • Pulmonary oedema • Hyperglycaemia • Hypokalaemia.

Antibiotics for Threatened Preterm Labour

There is no role for the use of antibiotics to treat threatened preterm labour without any other indications (e.g., PPROM) as doing so has been associated with an increased risk of cerebral palsy.[64]

Preterm Labour Management

If a woman is more than 3 cm dilated at presentation, or contracting regularly with progressive cervical effacement and dilatation, management of preterm labour must be initiated according to the gestational age of the baby and the setting. In units without neonatal facilities suitable for the gestation, consult with tertiary centre (see flowchart 3).

Consider maternal transfer if birth is not imminent (telephone the Perinatal Advice Line on 137 827) or consult with neonatal retrieval service (also phone 137 827) if birth is anticipated (see *Perinatal Advice and Emergency Transport PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal).

Monitor for signs of Chorioamnionitis

- Signs include:
  - maternal pyrexia
  - maternal tachycardia
  - fetal tachycardia
  - uterine tenderness
  - offensive and/or purulent vaginal discharge
  - elevated white cell count
  - raised C-Reactive Protein.
- Consult with senior obstetrician, MFM and/or Infectious Diseases physician when deciding whether to augment labour. Uncertainty in diagnosis, particularly at very preterm gestations may warrant amniocentesis to confirm the clinical suspicion of chorioamnionitis.
- Complete septic screen should include histological and microbiological examination of the fetal and maternal surfaces of the placenta and membranes after birth (see *Histopathology Management of the Placenta* PPG)

Antibiotics in Preterm Labour

Intravenous antibiotics for GBS prophylaxis are recommended to reduce the risk of early onset GBS neonatal sepsis in active preterm labour cases.[64] For antibiotic choice see *Antibiotics in the Peripartum Period PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal.

Commence IV antibiotic prophylaxis for GBS for women in active preterm labour.

If there is a significant clinical suspicion of chorioamnionitis, birth should be expedited under intravenous antibiotic cover to improve maternal and neonatal outcomes. For antibiotic choice see *Antibiotics in the Peripartum Period PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal.

For Aboriginal women, discuss eligibility for Closing the Gap Medicines Access Program to support affordable access to medications in pregnancy.

Magnesium Sulphate

Intravenous magnesium sulphate must be administered to any woman considered at imminent risk of preterm birth or where birth is planned at < 30 weeks.

The administration of a bolus magnesium sulphate in women at imminent risk of preterm birth at less than 30 weeks' gestation has been shown to reduce neonatal deaths and cerebral palsy.[65]

- In situations where urgent birth is necessary because of maternal or fetal compromise, the birth should **not** be delayed administering magnesium sulphate.

See *Magnesium Sulphate for Neuroprotection of the Fetus in Women at Risk of Preterm Birth PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal for full details.

Mode of Birth

Mode of birth for women in active preterm labour needs to consider:

- the exact gestation at which the birth is occurring
- the presentation of the fetus
- the clinical circumstances relating to maternal and fetal wellbeing
- neonatal resuscitation availability
- clinical experience of the obstetric team (e.g., obstetrician/GP obstetrician and/or midwife).

See *Perinatal Care at the Threshold of Viability PPG* found in the A-to-Z index at www.sahealth.sa.gov.au/perinatal for further information to guide decision making at very preterm gestations.

In each circumstance consider:

- Is there clinical justification for birth by emergency caesarean section on maternal grounds?
- What is the agreed gestation of the fetus?
- Is aggressive neonatal resuscitation planned and available?
- What is the presentation of the fetus?
- Is the labour advanced and are the membranes intact? Emergency caesarean section can result in severe maternal and fetal injury where a preterm fetus with ruptured membranes is deep in the pelvis with little or no lower segment.
- What is the condition of the fetus? For example, is there growth restriction, or a known congenital anomaly or insult? Chorioamnionitis and suspected fetal acidosis are relative contraindications to birth by caesarean section.
- What is the parity and age of the mother?
- What is the skill and experience of the most senior available accoucheur?

Involve a senior Obstetrician and/or Maternal Fetal Medicine sub-specialist in your decision-making where possible.

Practice Points

- Birthing extremely preterm fetus *en caul* (in membranes) will minimise fetal trauma in both vaginal and caesarean births.
- Birth using vacuum extraction (ventouse) is contraindicated at less than 34 weeks' gestation.
- Birth using forceps is relatively contraindicated at less than 34 weeks' gestation.
- Preterm breech births are at greater risk of cervical head entrapment; if proceeding with a vaginal preterm breech birth, be prepared to incise the cervix and aim to ensure adequate maternal analgesia i.e., epidural (see appendix 3).
- A classical caesarean section can facilitate ease of birth, minimise fetal trauma and is preferable to an extended lower segment incision (J or T incision). This does however have implications for future pregnancy management, and a significantly increased risk of placenta accreta.

Resources

SAPPGs Web-based App:
Practice Guidelines (sahealth.sa.gov.au)
Medicines Information: (sahealthlibrary.sa.gov.au)
https://sahealthlibrary.sa.gov.au/friendly.php?s=SAPharmacy
SA Health Pregnancy:
Pregnancy | SA Health
Australian Government Pregnancy, Birth and Baby: (www.pregnancybirthbaby.org.au)
Pregnancy, Birth and Baby | Pregnancy Birth and Baby (pregnancybirthbaby.org.au)
Pathology Tests Explained: (https://pathologytestsexplained.org.au/)
Pathology Tests Explained
Every Week Counts:
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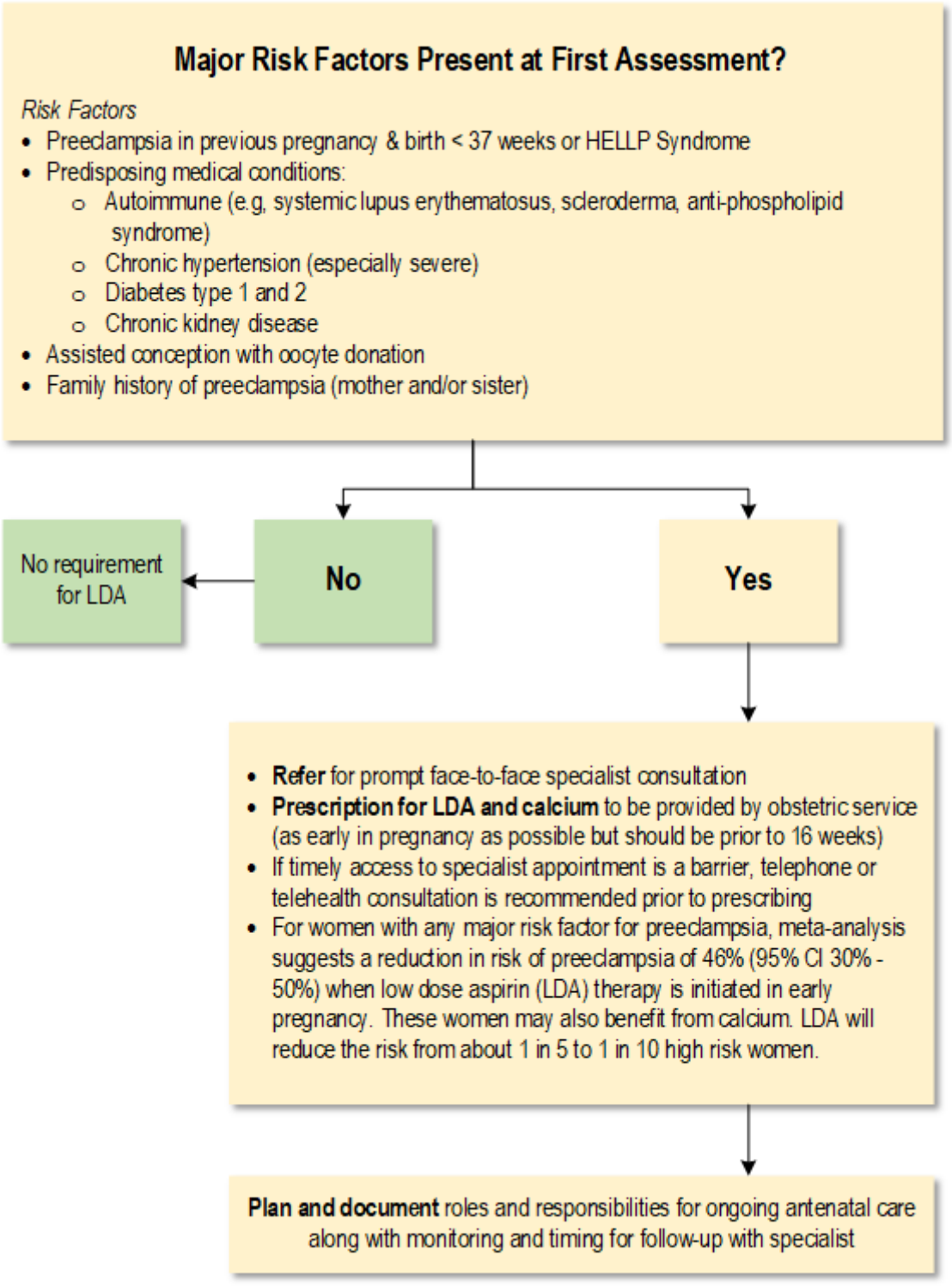
Appendix 1| Aspirin Prophylaxis for Major Risk Factors of Preeclampsia



Appendix 2| Stratification of Preterm Birth Risk by fFN Concentration in Symptomatic Women

fFN Level	N (%)	Delivery ≤ 7 days	Delivery ≤ 14 days	Delivery before 34 wks, 0 days
< 10 ng/mL	170 (57%)	1%	1.8%	1.5%
10 to 49 ng/mL	62 (21%)	0%	1.6%	8.2%
50 to 199 ng/mL	41 (14%)	0%	7.7%	11.5%
200 to 499 ng/mL	14 (5%)	14%	29%	33%
≥ 500 ng/mL	13 (4%)	38%	46%	75%

Appendix 3| Management of Cervical Head Entrapment at Vaginal Breech Birth

Manoeuvres	Description	Risks
McRobert's position	Flexion of maternal knees so that the anterior aspect of the thighs are pressed against the abdomen	
Uterine relaxation	• Beta adrenergic agonist: **terbutaline 250 microg subcutaneous** • **Nitroglycerin 50–200 micrograms IV** or one metred dose of **sublingual spray 400 microg** • General anaesthesia	• Maternal tachycardia • Uterine atony
Duhrssen's incision	1–2 fingers placed between the partially dilated cervix and the presenting part, with incisions made along the length of the undilated cervix at 6, 2 and 10 o'clock	• Extension of incision to the lower uterine segment or broad ligament • Injury to uterine vessels, ureter and bladder • Severe haemorrhage Cervical incompetence in subsequent pregnancy
Symphysiotomy	Infiltration of the symphysis pubis and overlying skin with local anaesthesia Insertion of firm catheter into the urethra to displace it laterally Incision made over the symphysis to separate it just enough to deliver the head	• Pelvic instability, requiring delayed orthopaedic repair
Zavanelli manoeuvre and caesarean birth	Administration of tocolytic and attempt to replace the fetal body into the uterus, followed by caesarean section	• Complications of caesarean section Cervical injury and subsequent cervical • incompetence

Vaginal Progesterone

This fact sheet has been developed to help you understand why your doctor or midwife recommends using vaginal progesterone pessaries. It includes instructions on how to put the progesterone into your vagina.

What is Vaginal Progesterone?

A hormone supplement pessary (soft capsule) that you put in your vagina. It is **not to be swallowed.**

Why is it used?

Using vaginal progesterone pessaries lowers the chance of having a baby born early (preterm birth). Babies born preterm have a higher chance of short and long term health and behaviour problems.

Why have I been asked to start using it?

- You have a short cervix, or
- You have had a previous preterm birth before 34 weeks, or
- You have had a pregnancy loss (miscarriage or stillbirth) between 16 and 24 weeks.

How do I get it?

Your doctor or midwife will write you a prescription. You can take your prescription to any pharmacy.

Are there any side effects?

Some women might feel itching in the vagina. Rare side effects include headaches, nausea, vomiting and constipation. If you experience any side effects, please contact your doctor or midwife for advice.

Will I need to pay for the progesterone?

Yes. Medicare will cover part of the cost. If you are not eligible for Medicare, you may be charged the full amount. If you have a concession card or are registered for the Closing the Gap (CTG) medicines program, the progesterone will be much cheaper.

Is there anything else I should know?

You will need to use it every day until you are 36 weeks pregnant. After putting in the pessary, it is best to wait:

- 15 minutes before showering or having a bath
- 30 minutes before having sex

If you have any bleeding or fluid loss from your vagina, or contraction pain (pain that comes and goes), call your doctor or midwife straight away.

If you are currently smoking, by stopping completely, you will further reduce the chance of your baby being born preterm. Speak with your care provider about your options to help you quit.

For more information

SA Pharmacy Medicines Information Service
Women's and Children's Hospital
Phone: (08) 8161 7555 (9am – 5pm Weekdays)
Email: medinfo@sa.gov.au
www.sahealth.sa.gov.au

January 2024 (DM7870).

Interpreter

Government of South Australia
SA Health

How do I use Vaginal Progesterone?

(Refer to the instructions in the packet)

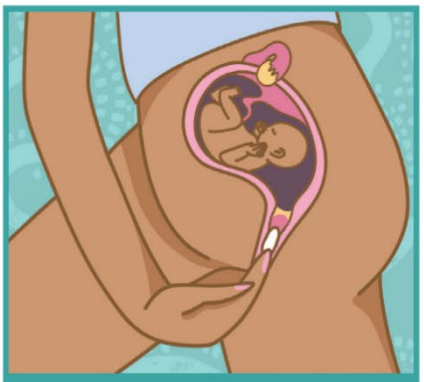
1 The best time to put in the pessary is in the evening before bed.

2 Wash your hands with soap and water.

3 Remove pessary from packaging.

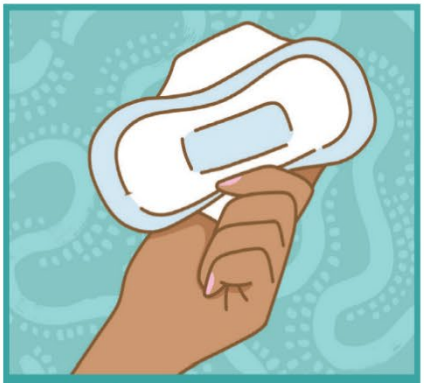
4 **Do not swallow.** This is only for the vagina.

5 You can moisten the pessary by dipping it in cold water for a few seconds to make it easier to insert.



7 Gently push the pessary as far into your vagina as you can using your finger or the applicator provided.

8 Wash your hands again with soap and water.



9 You may want to wear a pad in your underwear for any vaginal discharge from the dissolving pessary.

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07/05/2024	V8	Domain Custodian, Clinical Governance, Safety and Quality	Formally reviewed to line up with new cervical length screening recommendations.
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07/09/2015	V6	SA Health Safety and Quality Strategic Governance Committee	Revised
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29/12/2008	V2	SA Maternal & Neonatal Clinical Network	Revised
10/05/2004	V1	SA Maternal & Neonatal Clinical Network	Original SA Maternal & Neonatal Clinical Network approved version