

Twin pregnancy

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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

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 horse shoe shape design shown in front of the generic statement symbolises a woman and those enclosing a smaller horse shoe shape depicts a pregnant women. The smaller horse shoe 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 respectively 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 Perinatal Practice Guideline

The purpose of this guideline is to provide clinicians with information on the management of women with twin pregnancy. It details potential complications, antenatal and labour management based on chorionicity and services required as well as general principles of care. Information on twin to twin transfusion syndrome is also provided.



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Summary of Practice Recommendations

- > Early assessment of chorionicity by ultrasound is essential in the management of multiple pregnancies.
- > Refer women with multiple pregnancies to additional support services.
- > Refer women with multiple pregnancies to a level 4 or higher maternity unit if she begins care in a lower level unit.
- > Women should be informed of the increased risks associated with twin pregnancy.
- > Antenatal visits may need to be more frequent than in singleton pregnancies for the timely detection and treatment of medical or obstetric complications.
- > Twin pregnancies require additional ultrasound monitoring. The frequency of this is determined by chorionicity and fetal growth patterns.
- > Discordant fetal growth requires further investigation and/or referral to specialist services.
- > Monochorionic twins require fortnightly ultrasounds to assess for twin to twin transfusion syndrome (TTTS).
- > If TTTS is suspected, refer woman to a Maternal Fetal Medicine specialist.
- > Plan for vaginal birth where twin 1 is in the vertex position.
- > Timing of birth is dependent on chorionicity: Monochorionic twin pregnancies should be offered elective birth from 36+0 weeks after a course of prophylactic corticosteroids; dichorionic twin pregnancies can be offered elective birth from 37+0 weeks.
- > Continuous electronic fetal monitoring is indicated in labour.
- > Birth of twin 1 should be no different to singleton birth except prophylactic oxytocin for third stage should be withheld.
- > The lie and presentation of the second twin should be determined immediately after the birth of twin 1. External version or internal podalic version may be used to achieve a longitudinal lie
- > If the fetal heart rate is normal, birth of the second twin can be awaited.
- > If the uterine contractions are inadequate an IV oxytocin infusion should be commenced.
- > Consider additional prophylaxis for postpartum haemorrhage following birth of the second twin.
- > Additional support for breastfeeding may be required.

Abbreviations

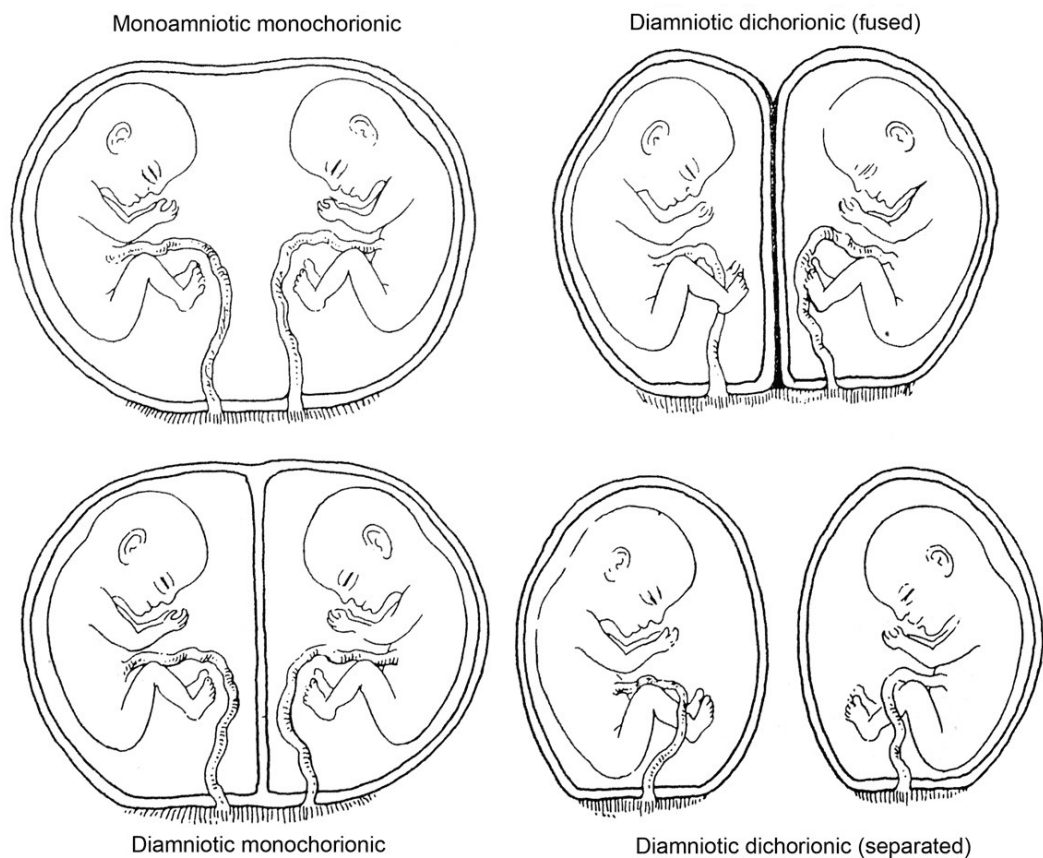
DC/DA	Dichorionic Diamniotic
EFM	External fetal monitoring
e.g.	For example
et al	And others
IU	International units
MC/MA	Monochorionic Monoamniotic
MC/DA	Monochorionic Diamniotic
%	Percent

Definitions

Twin pregnancies are commonly divided according to zygosity, chorionicity and amnionicity as these have important implications for pregnancy and infant outcome

Zygoty	Refers to whether the twins arose from one (monozygous) or from two fertilized eggs (dizygous) ¹
Chorionicity	Refers to the number of outer membranes that surround the fetus in a multiple pregnancy and corresponding placentation (i.e. monochorionic or dichorionic);
Amnionicity	refers to the inner membrane layers that do or do not separate the gestational sacs of the twins (see figure 1) (i.e. monoamniotic or diamniotic)
Monochorionic Monoamniotic twins (MC/MA)	Have no separating membrane
Monochorionic Diamniotic twins (MC/DA)	Have a separating membrane consisting of amnion only (two layers)
Dichorionic Diamniotic twins (DC/DA)	Have a separating membrane consisting of both amnion and chorion. They may or may not have separate (or fused) placentae
Dizygotic twins	Have separate placentae although these can be fused together (dichorionic diamniotic)

Figure 1: Twin Chorionicity



Introduction

- > Early assessment of chorionicity by ultrasound is essential in the management of multiple pregnancies as the distinguishing features are more difficult to ascertain later on
- > The family with a multiple pregnancy requires extra support not only in pregnancy, but in the first few years after birth. There are many practical challenges in caring for two or more infants at once. Valuable sources of support are the multiple birth coordinators at public hospitals and the Multiple Birth Association. Family planning and breastfeeding advice are also important
- > Care for twin pregnancies is likely to require level IV, V or VI facilities (see *Standards for Maternal and Neonatal services in SA* available at www.sahealth.sa.gov.au/perinatal)
 - > A twin pregnancy ≥ 34 weeks should be managed at a Level 4, 5 or 6 health unit. Level 4 health units are further restricted to only managing those uncomplicated twin pregnancies which are at term and have a predicted birth weight $\geq 2,000$ g, and no other multiple high order gestations
 - > Level 5 health units are further restricted to managing those twin pregnancies ≥ 34 weeks gestation where the neonates have an anticipated birth weight of 1,500 g, and no other multiple high order gestations
 - > Level 6 perinatal health units should manage Twin pregnancies < 34 weeks gestation, and any neonate(s) with an anticipated birth weight of < 1500 g and all multiple high order gestations

Incidence

- > The prevalence of spontaneous twin pregnancies ranges from approximately 0.6 % of pregnancies in Asia and 1 to 2 % in Australia, Europe and the USA to about 4 % in Africa²
- > The incidence of monozygotic twins is roughly similar among populations, but the frequency of dizygotic twins varies widely with geography, ethnicity, parity and maternal age, as well as use of assisted reproduction¹
- > Worldwide there is an increasing rate of twin pregnancies attributed predominantly to increasing maternal age at conception and use of stimulation of ovulation (clomiphene or gonadotropins) and less from assisted reproduction with increasing use of single embryo transfer
- > The rate of monozygotic twins is 2.25 times higher in assisted conceptions than natural conceptions³
- > Monozygotic twins have a chorionicity that relates to how early the fertilized egg splits. Of liveborn twins:
 - > 70 to 75 % are monochorionic diamniotic
 - > 25 to 30 % are dichorionic diamniotic
 - > 1 % are monochorionic monoamniotic¹

Major challenges

- > Perinatal mortality and morbidity is significantly higher in twin than in singleton pregnancies at each week of gestational age⁴. Particularly at earlier gestational ages, this often relates to:
 - > Preterm birth
 - > Intrauterine growth restriction
 - > Increased incidence of medical complications including pre-eclampsia
 - > Twin to twin transfusion
 - > Antepartum death of one of the twins



- > Twin pregnancies are also associated with a higher frequency and higher severity of discomforting maternal conditions (e.g. nausea and vomiting in early pregnancy and respiratory discomfort in late pregnancy)
- > Conditions that are considerably more frequent in twin pregnancies than in singleton pregnancies include:
 - > Miscarriage
 - > Anaemia
 - > Polyhydramnios
 - > Pre-eclampsia
 - > Gestational diabetes
 - > Congenital anomalies (more common in monozygotic twins)
 - > Malpresentations
 - > Cord accident (presentation and prolapse)
 - > Postpartum haemorrhage
- > There is also an increased frequency of long-term adverse infant outcomes including cerebral palsy, even after accounting for gestational age at birth⁵
- > On the whole the maternal age related risk of fetal chromosomal anomalies is similar for twin and singleton fetuses
- > All monozygotic twin pregnancies carry a substantial risk of twin to twin transfusion, although this complication can also occur (but rarely) in dichorionic twins with fused placentae
- > The congenital abnormality of conjoined twins may occur in 1:200 monozygotic twin pregnancies. Conjoined twins are usually diagnosed antenatally. Determination of the conjoined site allows multidisciplinary discussion and full involvement of the parents⁶ before birth as to the prognosis and possibility of surgical correction
- > Women should be informed of the increased risks associated with twin pregnancy and preterm birth in particular. Fewer than half of twin pregnancies will continue up to and beyond 38 weeks

Antenatal care in early pregnancy

- > Early (first trimester) ultrasound is recommended to ascertain or confirm gestational age, number of fetuses and their chorionicity
- > Assign nomenclature to babies (for example, upper and lower, or left and right) and document this clearly in the woman's notes to ensure consistency throughout pregnancy
- > Encourage women with a multiple pregnancy to attend antenatal education specific to care and management of multiple birth
- > Encourage women with a multiple pregnancy to join the South Australian Multiple Birth Association
- > Screening for Down syndrome by mid-trimester screening is not applicable to twin pregnancies. Where available, non-invasive fetal diagnosis can be applied in twin pregnancy. Nuchal translucency can be applied for screening. Chorionic villus sampling or amniocentesis can be used as diagnostic tests. However, reported loss rates are greater in sampling a twin pregnancy (possibly due to double puncture) and there is a possibility of inaccurate diagnosis due to sampling the same sac twice
- > Fetal reduction or termination is possible in cases of congenital anomaly in one or both twins



Subsequent care in pregnancy

- > Hospitalisation for bed rest, and prophylactic tocolytics have not been shown to confer advantage and do not reduce the frequency of preterm birth or perinatal death
- > Progesterone does not reduce preterm delivery of twins
- > Hospitalisation may be appropriate for specific pregnancy complications
- > Nutritional advice is recommended and may include supplementary iron and folate to accommodate the increased needs in twin pregnancies
- > Recommend the avoidance of strenuous work in the second half of pregnancy
- > Antenatal visits may need to be more frequent than in singleton pregnancies for the timely detection and treatment of medical or obstetric complications
- > Anti-D prophylaxis 625 IU is recommended at 28 and 34 weeks for all Rh negative women
- > In dichorionic twin pregnancy, ultrasound is recommended every 3-4 weeks from 24 weeks onwards to detect discordance in fetal size, amniotic fluid volume and umbilical artery Dopplers. Umbilical artery flow velocity studies are indicated especially in monochorionic pregnancies and when there are signs of discordancy⁷
- > **Twins growing to their full potential should follow the singleton growth curve until 32 – 35 weeks**
- > Discordant growth may be due to IUGR of one fetus or twin to twin transfusion syndrome, aneuploidy, anomaly or viral syndrome affecting only one fetus
- > Consider further investigations or delivery depending on gestation if growth is below the 10th percentile for the singleton curve or showing significant disparity between twin measurements
- > Twin pregnancies require specialist antenatal care and referral to hospitals with adequate facilities when complications such as inadequate or discordant fetal growth occur

Timing and mode of birth

- > The optimal timing of birth is uncertain, with clinical support for both elective delivery at 37 weeks' gestation (either by induction of labour or caesarean birth), and for waiting for labour to start spontaneously (expectant management)⁸
- > NICE 2011 recommends the following:¹²
 - > Monochorionic twin pregnancies: elective birth from 36⁺⁰, after a course of prophylactic corticosteroids has been offered
 - > Dichorionic twin pregnancies: elective birth from 37⁺⁰
- > Prophylactic corticosteroid cover as above:
 - > Administer IM betamethasone in two doses of 11.4 mg (5.7 mg x 2) 24 hours apart to the woman
 - > If betamethasone is unavailable, give IM dexamethasone in two doses of 12 mg, 24 hours apart
- > When appropriate obstetric experience is available, vaginal birth is the preferred mode of birth for all twin pregnancies that meet the following criteria:
 - > Twins must be diamniotic
 - > Twin I is cephalic
 - > Twin II is not > 500g heavier than twin I
 - > Neither twin has any evidence of fetal compromise requiring caesarean section
- > A multinational, multicentre randomised controlled trial assessing the mode of birth for women with twin I presenting cephalic and no contraindication to vaginal birth from 32 weeks of gestation, found planned caesarean delivery did not significantly decrease or increase the risk of fetal or neonatal death or serious neonatal morbidity, as compared with planned vaginal delivery⁹



Monochorionic twins

- > In addition to the complications that can be associated with any twin pregnancy, there are several complications that can occur almost always with monochorionic twins e.g. twin-twin transfusion syndrome and selective intrauterine growth restriction (IUGR) (commonly due to unequal placental sharing and velamentous cord insertion)
- > The death of one twin has significant implications in the setting of a monochorionic twin pregnancy where there is a shared placental circulation
- > Ultrasound studies every two weeks from 16–26 weeks are recommended to detect TTTS

Timing of birth

- > The optimal timing of birth is unclear, with some practitioners advocating delivery at 36⁺⁰ weeks for women with an otherwise uncomplicated monochorionic twin pregnancy (Level IV)

Twin to twin transfusion syndrome TTTS

- > 15 % of monochorionic twin pregnancies show clinical evidence of twin to twin transfusion syndrome (TTTS)
- > If TTTS is suspected, a maternal fetal medicine specialist should be consulted and frequent ultrasound follow-up will be necessary

TTTS may take two forms¹⁰

1. TOPS (twin Oligohydramnios / polyhydramnios sequence), approximately 10% of monochorionic twins (usually seen in the mid trimester)
 - > TOPS is recognised as 'classical' TTTS, with oligohydramnios, poor growth and abnormal umbilical artery Doppler's in the donor, and polyhydramnios progressing to cardiac dysfunction and failure in the recipient
2. TAPS (twin anaemia / polycythaemia sequence) affects approximately 5% of monochorionic twins, and 10% of twins that have undergone laser treatment for TOPS
 - > TAPS results in very slow transfusion (5-15 mL/ 24 hours) from donor to recipient, so is not characterised by extreme amniotic fluid discordance and cardiac dysfunction, but by significantly discordant middle cerebral artery (MCA) peak systolic velocities, reflecting anaemia and polycythaemia in the donor and recipient, respectively
 - > It is more common in later pregnancy, and is often recognised as 'neonatal TTTS' when very discordant haemoglobin levels are recognised at birth. Nevertheless, TAPS can also be associated with significant fetal anaemia and in utero compromise requiring treatment

Fetal surveillance

- > Ultrasound examination in monochorionic twins should include growth, amniotic fluid volume in each sac, bladder volume, umbilical artery and, preferably, middle cerebral artery Doppler wave forms (after 24 weeks)¹⁰
- > Fetal hydrops is a pre-terminal sign
- > Clinical suspicion is raised antenatally when monochorionic twins show disparity in fetal size. Early polyhydramnios in the sac of the bigger twin is common while oligohydramnios is commonly associated with the smaller twin
- > Clinical suspicion is raised when there is:
 - > Early discordance in fetal size and or nuchal translucency measurement
 - > Discordance in fetal growth / size (alone or with associated polyhydramnios / oligohydramnios)
 - > Rapid increase in maternal abdominal girth representing rapid accumulation of polyhydramnios



TTTS treatment

- > Amnioreduction (by amniocentesis) is an established method of treatment
- > In experienced hands, fetoscopic laser ablation of placental vascular anastomoses in the second trimester of pregnancy has been found to improve infant outcome compared with serial amnioreduction¹¹. The fetoscopic laser ablation procedure requires referral of the woman to interstate Maternal Fetal Medicine units where this is practised (e.g. Mater Mothers' Hospital, Brisbane)

Death of one twin

- > Death of one twin is not uncommon in twin pregnancy. Mostly this occurs early in gestation but even late antepartum death is not rare
- > In early pregnancy, there is usually some extent of resorption of the fetus and placenta. The perinatal risk for the remaining fetus remains higher than it would have been for a singleton pregnancy
- > In monochorionic twin pregnancy, death of one fetus later in pregnancy is associated with a much higher risk of death and subsequent disability for the other fetus. Death after 20 weeks of gestation may carry a risk of death or damage for the remaining fetus of up to 20%. For dichorionic twin pregnancies, the risk of cerebral damage is far lower
- > At the time of birth, identify any remains of 2nd twin and ensure the remains are identified and sent to Histopathology

Preterm labour

- > The wellbeing of both twins should be ascertained by cardiotocography before tocolytics are considered
- > If inhibition of labour is indicated follow the guidelines for tocolysis in preterm labour (see Nifedipine for preterm labour PPG available at www.sahealth.sa.gov.au/perinatal)
- > Corticosteroids are indicated as in a singleton pregnancy

Delivery

- > Vaginal birth is suitable in cases where twin one is vertex

Intrapartum management

- > Intravenous mainline Hartmann's (or 0.9 % sodium chloride) with side-line oxytocin 10 units in one litre Hartmann's (or 0.9 % sodium chloride) on hand for second twin
- > Blood for complete blood picture, group and save
- > Ensure extra equipment for delivery of twin II on hand
 - > Amnihook
 - > IV oxytocin 10 units in one litre Hartmann's (or 0.9 % sodium chloride) infusion.
 - > Bolus dose oxytocin 10 units (prophylaxis of 3rd stage **after delivery of twin II**)
 - > Portable ultrasound
 - > Forceps (Neville Barnes, Simpsons, Kjellands) and Ventouse
 - > Extra cord blood syringe (20 mL), blood sample tubes, container to receive cord blood, cord gas syringes and needles
 - > Extra cord clamp for twin II (and to identify placental cords I and II)
 - > Extra drying towel (cloth napkin) and warm wraps



- > Continuous electronic fetal monitoring (EFM) for both twins
 - > Consider fetal scalp electrode for twin one if technical difficulties with external monitoring
- > Reconsider mode of delivery if unable to continuously record the second twin's heart rate
- > Ensure portable ultrasound machine available in Delivery unit
- > Effective epidural anaesthesia at delivery may be useful if interventions for the birth of the second twin are needed
- > Delivery of the first twin may be conducted as for normal vaginal birth. Ensure adequate preparation has been made in case of complications with the second twin
- > Blood should be available and an operating theatre on standby
- > An experienced obstetrician or registrar should supervise the delivery
- > The anaesthetist should be available
- > Appropriate neonatal or paediatric staff should be present

Delivery of first twin

- > Birth of twin one as per normal vaginal birth
- > After birth of the first baby, withhold oxytocic
- > If possible a nuchal cord should not be clamped and cut until after the birth of twin I (lift over the fetal head as rarely the cord may be that of twin II)

Delivery of second twin

- > Immediately after the birth of twin I, perform an abdominal and vaginal examination to determine the lie and presentation of the second twin
- > Ultrasound to confirm presentation if uncertain
- > Commence oxytocin 10 units in one litre Hartmann's (or 0.9 % sodium chloride) infusion as per medical order if indicated
- > Continuous electronic fetal monitoring
- > If the fetal heart rate is normal, birth of the second twin can be awaited
- > External version or internal podalic version by an experienced obstetrician may be used to achieve a longitudinal lie
- > If the uterine contractions are inadequate an IV oxytocin infusion should be commenced
- > Encourage the woman to commence active pushing after adequate contractions have been achieved
- > The birth of the second twin should not be rushed if all is normal and the fetal heart rate is satisfactory
- > Amniotomy should not be performed unless the fetus is in a longitudinal lie and well applied in the pelvis or as part of planned internal podalic version
- > Be aware of the risk of cord prolapse
- > If signs of fetal compromise occur, birth can be expedited with an instrumental delivery, breech extraction or caesarean section
- > Give stat dose of oxytocin 5-10 units IV after the anterior shoulder of the second twin has been delivered
- > Obtain cord blood for group Rh, direct coombs and blood gases for both twins
- > Perform active management of third stage by controlled cord traction (follow link to [Active management of the third stage – CCT](#))
- > After delivery of twin II and the placenta and membranes, commence a 40 units oxytocin infusion (in 500 mL 0.9 % sodium chloride) at 125 mL / hour for PPH prophylaxis as indicated



Elective caesarean section

- > Twin pregnancies with breech presentation of twin one or other major obstetric risk factors may require elective caesarean section at 38 weeks gestation
- > Breech presentation of the second twin is not a contraindication to vaginal birth^{8,13}

Paediatric consultation

- > The babies should be checked immediately by the paediatrician because of the higher risk of anomalies, IUGR, anaemia, polycythaemia, hypoglycaemia and coagulopathy

Postnatal management

- > Intravenous oxytocin 40 units (prophylactic) should run at 125 mL / hour for 4 hours after delivery unless contra-indicated. In all cases extra observations are required to ensure the uterus remains contracted to reduce postpartum haemorrhage
- > Fused placentae of like sex twins should be sent unfixed for pathological examination to help confirm chorionicity



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Additional Resources

Cochrane Database of Systematic Reviews available from: <http://cochranelibrary-wiley.com/cochranelibrary/search/>

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Write Group Leads

Prof Jeffrey Robinson
Dr Brian Peat
Prof Jodie Dodd
Dr Elinor Atkinson

Other major contributors

Prof Marc Keirse
A/Prof Bob Bryce
Dr Chris Wilkinson
Dr Jay McGavigan

SAPPG Management Group Members

Sonia Angus
Dr Kris Bascomb
Lyn Bastian
Elizabeth Bennett
Dr Feisal Chenia
John Coombas
A/Prof Rosalie Grivell
Dr Sue Kennedy-Andrews
Jackie Kitschke
Catherine Leggett
Dr Anupam Parange
Dr Andrew McPhee
Rebecca Smith
A/Prof John Svigos
Dr Laura Willington

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