South Australian Perinatal Practice Guideline

Uterine Inversion

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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

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 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

The purpose of this guideline is to provide clinicians with information to help them identify the signs and symptoms of uterine inversion and its management.



Informal Copy When Printed

Flowchart 1| Management of Uterine Inversion





See Appendix 1 for printable copy

Informal Copy When Printed

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Summary of Practice Recommendations

Uterine inversion is an obstetric emergency.

Recognition and management of uterine inversion needs to occur promptly. Call for help early to obtain medical emergency team or senior clinical/obstetric/anaesthetics staff support, as per local protocols (see <u>flowchart 1</u>).

Follow maternal resuscitation procedures, concurrently with the treatment of the uterine inversion (see <u>flowchart 1</u>).

Stop uterotonics immediately to relax the uterus until successful correction of the inversion.

The woman's uterus should be replaced as soon as possible.

Do not attempt to remove placenta until inversion has been corrected and woman transferred to theatre for management.

Uterine inversion is associated with PPH due to uterine atony. A PPH should be anticipated and acted on immediately see *Postpartum Haemorrhage PPG* found in the A-to-Z index at <u>www.sahealth.sa.gov.au/perinatal.</u>

If the replacement of the uterus is not successful, and the woman is haemodynamically stable consider tocolysis with terbutaline, salbutamol, or glyceryl trinitrate (GTN) prior to the next attempt. Use with caution as this can exacerbate the risk of postpartum haemorrhage (PPH).

If non-surgical methods are not successful, consider the use of hydrostatic pressure where surgical options are not possible. Exclude uterine rupture prior to attempting this procedure.

Consider surgical replacement in theatre if the manual and hydrostatic methods are unsuccessful.

After replacement of the woman's uterus and the removal of the placenta, administer oxytocin infusion (40 International Units in 500 mL sodium chloride 0.9% at 125 mL/hour over 4 hours).

Antibiotics are recommended due to the infection risk associated with handling the woman's uterus see *Antibiotics in Peripartum Period PPG* found in the A-to-Z index at <u>www.sahealth.sa.gov.au/perinatal.</u>

A detailed description of the management of the emergency should be documented in the maternal case notes or electronic medical record.

Offer the woman and her family/support persons opportunities to debrief and discuss the events. Ongoing support should also be considered (e.g., mental health referral).



Aboriginal women should be consulted on any follow up plans and supported their nominated Aboriginal Health Professional. Aboriginal women should be referred to an Aboriginal Health Professional to support their care.



Abbreviations

>	Greater than		
2	Equal to or greater than		
<	Less than		
≤	Equal to or less than		
+/-	Plus or minus		
BP	Blood pressure		
bpm	Beats per minute		
EUA	Examination under anaesthetic		
CBE	Complete blood examination		
IV	Intravenous		
g	Gram(s)		
GA	General Anaesthetic		
GTN	Glyceryl Trinitrate		
HR	Heart rate		
L	Litre(s)		
LHN	Local Health Network		
mg	Milligram(s)		
MHP	Major haemorrhage protocol		
mL	Millilitre(s)		
Microg	Microgram(s)		
PPG	Perinatal Practice Guideline		
PPH	Postpartum haemorrhage		
RR	Respiratory rate		
subcut	Subcutaneous		
SpO ₂	Oxygen saturation by pulse oximetry		
TXA	Tranexamic Acid		
VBAC	Vaginal birth after caesarean		

Introduction

Uterine inversion is a rare obstetric emergency in which the uterine fundus folds down or collapses into the uterine cavity. It occurs in approximately 1 in 2000 to 1 in 23,000 births.¹ Diagnosing uterine inversion can be difficult especially in cases of grade 1 inversion, where the fundus remains within the endometrial cavity.

Uterine inversion is almost always caused by applying cord traction before the uterus has contracted firmly and placental separation has occurred. Therefore, education on the management of uterine inversion must emphasise the importance of active management of third stage and palpating the uterus to confirm that it is contracted before applying traction on the cord.

Uterine inversion is commonly associated with acute lower abdominal pain, followed by signs of hypovolemic and/or vasovagal shock, clinically presenting as bradycardia and hypotension.² Notably, the shock may be disproportionate to the degree of blood loss, as blood loss may not occur if the placenta remains attached.

Bimanual examination will confirm the diagnosis and determine the degree of inversion. Although no randomised controlled studies have determined the best management strategy, it is widely believed that the immediate replacement of the woman's uterus is the most effective approach.²



Classification

Uterine inversion is classified in grades based on the degree of the inversion:

- Grade 1: The fundus inverts into the uterine cavity, reaching the cervical canal (incomplete inversion)
- > Grade 2: The fundus inverts further into the vagina (complete inversion)
- > **Grade 3:** The fundus is visible at the introitus (complete inversion)
- **Grade 4:** The entire uterus, including the fundus, protrudes beyond the introitus (prolapsed)

Additionally, uterine inversion is further categorised based on the timing of the occurrence:

- > Acute inversion: within 24 hours of birth
- > Subacute inversion: between 24 hours and 30 days postpartum
- > Chronic inversion: after 30 days postpartum (rare)

Risk Factors

Almost all uterine inversions are unexplained and unexpected however the following risk factors can be associated with the emergency:

- > excessive traction on the umbilical cord
- > inappropriate fundal pressure
- short umbilical cord
- > multiparity
- > abnormally adherent placenta
- vaginal birth after caesarean (VBAC)
- uterine abnormalities
- previous inversion
- fetal macrosomia
- precipitous labour
- > connective tissue disorders (e.g., Marfan syndrome, Ehler-Danlos syndrome).

Presentation

Signs and symptoms of uterine inversion vary and may include:

- > irregularly shaped or impalpable fundus
- sudden onset of vaginal bleeding with haemodynamic compromise followed by hypovolemic shock that may be disproportionate to the amount of blood loss
- neurogenic shock (i.e., hypotension, bradycardia) due to the parasympathetic effect caused by traction of the ligaments supporting the uterus
- > severe abdominal pain with a strong bearing down sensation
- > urinary retention
- > in complete inversions the uterus will be visible at the introitus or prolapsed through the vagina.

Diagnosis

If the woman's fundus is not palpable on abdominal examination, there should be a high suspicion of uterine inversion, even if the uterus is not visible at the introitus. Ensure adequate pain relief where possible and use bimanual examination to locate the fundus either in the lower uterine segment or in the vagina.²⁻⁴ Sudden maternal shock or collapse is frequently seen with uterine inversion and this can occur with minimal blood loss.²



Differential Diagnosis

Some of the signs and symptoms of uterine inversion can be associated with other conditions and therefore need to be excluded during diagnosis. These include:

- atony of the uterus
- uterovaginal prolapse
- fibroid polyp
- retained placentas without inversion¹
- ➤ uterine rupture.²⁻⁵

Management

The aims of managing uterine inversion are to promptly return the uterus to its anatomical position, prevent re-inversion, and manage postpartum haemorrhage. Effective management involves immediately mobilising emergency support staff followed by resuscitation and replacement of the uterus **simultaneously**.

Remember to ensure ongoing communication between the multidisciplinary team, woman and her family/support person as the event can be a frightening experience.



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

Call for Help

Uterine inversion is an obstetric emergency.²⁻⁴

Call for Help Immediately

- Active medical emergency team (Code Blue or MET call), or senior clinical support (midwifery and obstetric) and anaesthetics as per LHN.
- Alert transfusion laboratory, theatre (if available) and orderly staff of emergency and possible need to transfer woman or activate major haemorrhage protocol (MHP).
- > State "uterine inversion emergency" clearly to the arriving team.

Regional Consideration

For rural settings without onsite staff ensure available staff as above are notified to attend and consider calling SA Pathology and activating Major Haemorrhage Protocol (MHP).

Stop/Withhold Uterotonic Medications

> Stop uterotonic medications to relax the uterus until successful correction of the inversion.

Do not attempt to remove placenta if still in situ. **Leave in place** until inversion has been resolved and sustained.

Other Actions

> Early administration of tranexamic acid (1g IM stat) and call for MHP

Resuscitate

- Follow basic life support (BLS) algorithm:
 - Maintain airway, breathing and circulation and provide support as needed.



Assess and Manage Shock

- > Lie woman flat.
- ➤ Give high flow **oxygen** (10 L/min) via a non-rebreather with reservoir facemask.
- Insert two large bore intravenous cannula (e.g., 16 or 18 gauge), if not already sited, and:
 - **collect** and **send urgent bloods**: CBE, group and crossmatch (4 units of blood) and extended coagulation studies
 - mark pathology request "Urgent" and ensure the physical delivery of the specimens to pathology.

Note: If available, ROTEM should be sent and used to guide blood component replacement (i.e., cryoprecipitate, fibrinogen replacement and FFP).

- Commence rapid fluid replacement:
 - o give up to 2 litres of crystalloid (Hartmann's solution or 0.9% sodium chloride)
 - use pressure infusion device for rapid fluid administration.
- > Perform a full set of observations:
 - RR, HR (5-minutely)
 - BP (15-minutely)
 - SpO₂ (continuous pulse oximeter).
- Assess for signs of shock (e.g., cool, clammy, pale) and evaluate woman's overall status including peripheral perfusion.
- > Check blood loss and monitor for signs of PPH.
 - Uterine inversion is highly associated with postpartum haemorrhage (PPH). As such, a PPH should be anticipated and acted on immediately.
 - See Postpartum Haemorrhage PPG found in the A-to-Z listing at www.sahealth.sa.gov.au/perinatal.

Replace Inversion

Manual Uterine Replacement

- The woman's uterus should be replaced as soon as possible. The longer the woman's uterus remains inverted it becomes more oedematous, and a constriction ring can occur which makes replacement more challenging.
- Ensure effective analgesia in place:
 - top up epidural and/or provide intravenous (IV) opioid analgesia and/or nitrous oxide, following the organisational safety procedures for the management of IV opioids and nitrous oxide and with consent from the woman.
- Consider transfer to theatre for manual replacement of the uterus, analgesia and/or surgical interventions (e.g., laparotomy).

Note: Obtain consent for procedures including possible laparotomy before or during transfer to theatre.

- Discuss procedure with the woman and after obtaining consent for manual replacement of the uterus (if woman has the capacity to do so).
- > Attempt manual replacement of the woman's uterus:
 - with sterile gloves grasp the protruding fundus with the hand and direct fingers towards the posterior fornix, pushing the uterus through the cervix into the abdominal cavity and towards the umbilicus
 - o once uterus is replaced, maintain bi-manual compression until a strong contraction is felt.
- > If the replacement is unsuccessful and the woman is haemodynamically stable, consider:
 - the use of tocolysis such as terbutaline, salbutamol or GTN before next attempt at replacement (see <u>table 1</u>). Use with caution as there is a high risk of exacerbating PPH.
 - transfer to theatre (if not already there).

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-	terine inversion	
Medication	Route	Dose and Administration
Sublingual Glyceryl Trinitrate (GTN) spray (Nitrolingual®)	Nitrolingual spray	 Nitrolingual pump spray should be primed before using it for the first time by pressing the nozzle five times. The woman should ideally be in a sitting position but in a uterine inversion it is acceptable for the woman to be supine. The bottle should be kept vertical with the nozzle head uppermost. Hold the opening of the nozzle head as close to the open mouth as possible. Give 1 metered spray (400 microg) administered as spray droplets beneath the tongue (do not inhale). Close the mouth immediately after each dose. Can be repeated after 5 minutes. No more than 2 metered doses should be given.
Salbutamol	Slow intravenous	 Draw up 0.25 mL of salbutamol in a 1 mL syringe and add it to 9 mL of 0.9% sodium chloride (use 10 mL syringe) for a resulting concentration of 25 microg/mL. Give 50 microg (2 mL) bolus. Bolus can be repeated up to a maximum of 250 microg total. Ensure medical order before administration. Monitor maternal pulse during administration. Stop administration if maternal pulse > 140 bpm.
Terbutaline	Subcutaneous or Intravenous	 Strength: 1 mL ampoule contains 500 microg of terbutaline. Subcutaneous Using a 1 mL syringe, draw up 0.5 mL (250 microg) of terbutaline and administer subcutaneously. Intravenous Using a 1 mL syringe, draw up 0.5 mL (250 microg) of terbutaline. Add to a 10 mL syringe and make up to 10 mL with sodium chloride 0.9 % (25 microg per mL). Give intravenous terbutaline slowly in 50 microg boluses up to 250 microg in total (often 100 microg will be sufficient). Ensure medical order before administration. Monitor maternal pulse during administration. Stop administration if maternal pulse > 140 bpm.

Table 1: Tocolysis for uterine inversion

Hydrostatic Pressure for Uterine Replacement

Use of hydrostatic pressure is an option for uterine replacement where initial nonsurgical interventions (i.e., manual uterine replacement) has not been successful and/or surgical intervention is not possible.

This procedure acts to distend the vagina and push the woman's fundus upward into its anatomical position. Ideally it is performed in theatre but can be done in the birth room if there is a delay or not possible to transfer.

Before commencing the procedure exclude uterine rupture and assist the woman to a lithotomy position.



Method One

- Attach two (2) x 1 litre bags of warmed irrigation fluid (e.g., sodium chloride 0.9%) to a wide bore giving set (or cystoscopy irrigation set).
- Insert the open end of the tubing into the vagina and using the other hand, seal the introitus by holding the labia tightly around the forearm, to prevent the warmed fluid from leaking out (may require an assistant).

Method Two

- > The open end of the tubing is attached to a 6 cm silastic ventouse cup.
- The silastic ventouse suction cup is positioned in the lower vagina at the inner aspect of the introitus to create a seal.
- Run copious amounts of the warmed fluid by gravity or by pressure on the bag.
 Up to four litres may be required.

For Both Methods

- Generally, the inversion will be reduced within 5–10 minutes of commencement of either method followed by a rapid resolution of the shock.
- Once replaced the clinician should manually hold the uterus in position to prevent another inversion for several minutes.
- > The placenta can then be removed under anaesthesia.
- > Thereafter contraction of the uterus must be maintained by appropriate oxytocic treatment.

Surgical Replacement of the Uterine Inversion

- If manual or hydrostatic methods for replacing the uterine inversion are unsuccessful, continue with resuscitation and transfer woman to theatre (if not already there) for general anaesthetics (GA), including consideration of Sevoflurane, to provide full uterine relaxation.
- Once the woman is under GA and following the administration of uterine relaxants, repeat either manual or hydrostatic methods:
 - o exclude uterine rupture first and
 - o combine vaginal pressure with abdominal traction on the round ligaments.
- If this fails again proceed to transvaginal cervical incision and repair or laparotomy to correct the defect.

Laparotomy

- During a laparotomy, the uterine position may be corrected by traction on the round ligaments. If this fails, the retraction ring at the level of the cervix should be incised.
- > The incisions should be made at 12 o'clock and 6 o'clock to avoid the uterine vessels.
- > In the trans-cervical approach, the woman's bladder and rectum are also vulnerable.
- > Uterotonic drugs are then given to maintain uterine contraction and to prevent reinversion.

Note: Multiple site strong digital pressure peripherally with direction towards the fundus is required and typically takes several minutes. If this fails, then laparoscopy can be a great asset by directing the pressure required and if necessary, providing traction from above. If this also fails, then laparotomy and direct traction on the inverted surface is usually effective.

Following this procedure, the woman's placenta should be manually removed with careful observation and prevention for atonic postpartum haemorrhage.



Post Uterine Inversion Replacement Care

Removal of Placenta

- The placenta should only be removed once the uterus has inversion has been corrected and a contraction is sustained.
- If not already given, administer tocolytics as per active management of third stage of labour (see Labour and Birth Care PPG found in the A-to-Z listing at www.sahealth.sa.gov.au/perinatal).
- > Following removal of the placenta, administer:
 - oxytocin infusion (40 International Units in 500 mL sodium chloride 0.9%) at a rate of 125 mL/hour over 4 hours.

Antibiotics

Antibiotics are recommended because of the infection risk associated with handling of the woman's uterus, see *Peripartum Antibiotics PPG*, in the A-to-Z listing found at www.sahealth.sa.gov.au/perinatal.

Documentation

A detailed description of the management of the emergency should be documented in the maternal case notes.

Open Disclosure, Debriefing and Ongoing Support

All uterine inversion cases should be managed as per the <u>SA Health Patient Incident Management</u> and Open Disclosure Policy. Considerations include:

- clear communication and instructions to the woman and support persons is vital during the emergency.
- after the birth, the woman and her support persons should be offered opportunities to debrief with a senior obstetrician involved in the emergency and opportunity to discuss future pregnancies and birth.



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

- > counselling and or social work referral should be offered.
- Arrange a clinical review postnatally to further debrief and discuss the recommended approach to future pregnancy.



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) <u>Pregnancy, Birth and Baby | Pregnancy Birth and Baby (pregnancybirthbaby.org.au)</u>

Pathology Tests Explained: (https://pathologytestsexplained.org.au/) Pathology Tests Explained

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Write Group Lead

Dr Angela Brown

Write Group Members

Victoria Sutton Marnie Aldred Kassie Whitworth Carly Jones Dr Kym Osborn Michael McEvoy

Major Contributors

Amy Rigano Dr Charlotte Taylor Dr Amanda Poprzeczny

SAPPG Management Group Members

Dr Michael McEvoy (Chair) Monica Diaz (SAPPG EO) Marnie Aldred Dr Elizabeth Allen Elise Bell **Elizabeth Bennett** Dr Angela Brown Marnie Campbell John Coomblas Dr Danielle Crosby Imogen Downard John Kate Greenlees Dr Gemma Hardi Dr Susie Keynes Catherine Leggett Dr Linda McKendrick Dr Scott Morris Dr Amanda Poprzeczny Dr Charlotte Taylor



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