

State Trauma Guidelines for the Management of Injured Pregnant Women

IMPORTANT PLEASE READ THIS FIRST:

All Patients with Major Trauma or the potential for major trauma* should be transferred to the Adult Major Trauma Centre.

If the patient's condition is immediately life threatening, resuscitate and stabilise according to EMST principles prior to transfer.

Initial treatment and imaging priorities in the pregnant trauma patient are the same as for the non-pregnant patient¹

*Refer to Section 7 for Trauma Team Activation Criteria

Section 1: Notification Procedures

1. The most appropriate senior clinician in your medical facility should be notified as soon as possible.
2. If you do not have access to local Obstetric expertise, the on-call King Edward Memorial Hospital (KEMH) Obstetric Registrar (or other Obstetric or Gynaecology Registrar if the former is attending to another emergency call) may be called for advice (via KEMH Switchboard – **6458 2222**), or ask to speak directly to the on call Obstetric Consultant.
3. Activation of transfer processes, if required, should be initiated as early as possible. The RFDS should be contacted via the established process, utilising the single 1800 number (**1800 625 800**)²
4. If necessary the KEMH Obstetric Registrar will contact the on call Obstetrician and ring the KEMH Hospital Manager to arrange midwifery support via Switchboard **6458 2222**, pager **3333**. A conference call may be useful to facilitate a three-way conversation, if necessary.
5. The Newborn Emergency Transport Service WA (NETS WA) is a statewide retrieval service for all sick newborn or preterm neonates, and consists of 2 teams of neonatal-trained doctors and nurses 24/7. Whilst NETS WA does not and cannot provide obstetric advice, the service should be contacted early so that staff and equipment can be mobilised if delivery becomes necessary. Call **1300 NETS WA (1300 6387 92)**. Refer to Section 6 “**Resuscitation Guidelines according to Gestation**”.
6. Major Trauma Service (RPH) via switchboard: **9224 2244** Trauma Fellow (Page **1055**).



Section 2: Principles of Care

1. An injured pregnant woman needs Emergency Department care in the “Resuscitation bay” with close monitoring.
2. The risk of preterm delivery is increased after trauma and all pregnant women should be evaluated for preterm labour (often precipitated by placental abruption).
3. Pregnant women (especially those over 20 weeks gestation) should not be laid flat in the supine position if possible. A 15° degree wedge should be placed under the right side of the woman’s pelvis to effect a left lateral tilt.
4. There is an increased risk of aspiration in pregnancy due to progestosterone-mediated delayed gastric emptying and lowered esophageal sphincter tone. Early gastric decompression in gestations >16 weeks for women with altered mental status should be considered.
5. Do not assume that all abnormal findings are related to trauma – concomitant complications specific to pregnancy may also be present (e.g. placental abruption).
6. Adequate resuscitation of the mother is the most important means by which fetal resuscitation occurs. If, after the mother’s condition is optimised, the fetal condition is still unsatisfactory, delivery should be considered if the fetus is of a viable gestational age and the necessary skills and resources are available to do so. If gestation is uncertain, then urgent ultrasound assessment should be undertaken, (by radiology if required), together with Obstetric consultation (if necessary, refer to above contacts under Section 1).
7. If radiological assessment of trauma is necessary, or appropriate, it must be performed irrespective of the pregnancy, with shielding of the uterus, provided this does not interfere with the required radiological views.
8. The best indicators of uterine trauma are: unexplained vaginal bleeding, fetal heart rate abnormalities and unexplained maternal shock; presence of abdominal pain is not always a reliable indicator of uterine/placental trauma.
9. Recognition of haemorrhagic shock may be delayed secondary to the physiologic cardiovascular changes that accompany pregnancy. 30-35% of the circulating blood volume may be lost before hypotension occurs.
10. Pregnant women should be screened for domestic violence, even if the injury history is plausible.

Section 3: Assessment Details

1. Pregnant trauma patients who are Rh(D) negative with no preformed anti-D antibodies should be given **CSL Rh(D) Immunoglobulin-VF**, as follows:
 - 250 IU: 1st trimester (<13 weeks gestation)
 - 625 IU: 2nd and 3rd trimester (≥13 weeks), and 1st trimester multiple pregnancies.
 - 2nd and 3rd trimester patients: quantitative assessment of fetomaternal haemorrhage (FMH) is required (Kleihauer Test / flow cytometry) to determine if additional doses of Rh(D) Immunoglobulin are required.



2. If possible, a cardiotocograph (CTG) should be commenced by any midwifery staff in attendance, once the patient's initial condition is stabilised, and if the gestation is such that the fetus is potentially viable i.e. after 23 weeks. The CTG should be recorded for 20 minutes per hour for 6 hours if accelerations are seen, or continuously if no accelerations are seen or if there are contractions, vaginal bleeding or abdominal pain.
3. **Kleihauer Test (4 ml EDTA sample) should be done to assess for FMH in pregnant women with abdominal trauma. If the CTG is not reassuring and/or the fetus is inactive on ultrasound, the Kleihauer should be done urgently. Arrange for the sample to be sent to KEMH TMU.**
4. If vaginal bleeding or fluid loss occurs, or if there are palpable contractions, a vaginal speculum examination should be performed once the patient's general condition is stabilised. In the absence of such signs or symptoms, vaginal speculum examination should be performed once all other assessment is complete. If blood or amniotic fluid is seen the KEMH guideline for preterm labour³ is to be followed, bearing in mind the possibility of uterine trauma.
5. If there is no evidence of fetal compromise, complete fetal assessment (ultrasound biometry, amniotic fluid index, umbilical arterial blood flow assessment) should occur within 24 hours, and fetal growth / welfare should be regularly assessed over subsequent weeks as prescribed by the treating KEMH Consultant.

Section 4: Peri-mortem Caesarean Section

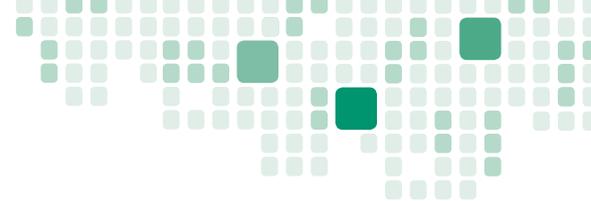
Effective maternal resuscitation in the setting of a maternal cardiac arrest is difficult, secondary to the effects of the gravid uterus on venous return. In addition to conventional resuscitation efforts, the patient should have uterine displacement performed either manually or with a wedge underneath the right side of the pelvis if over 20 weeks gestation. Early securing of the patient's airway and mild maternal hyperventilation is recommended. In women who have suffered a complete loss of cardiac output/arrest and where there has been no response to conventional resuscitation measures for four minutes, with a fetus that is thought to be of a viable gestational age (over 23 weeks gestation, or a fundus above the umbilicus if gestation is unknown), a peri-mortem caesarean delivery should be performed. Ideally, staff skilled in neonatal resuscitation should be present but their absence should not delay the performance of the caesarean delivery.

Minimal equipment is required to perform the caesarean delivery. A pre procedure ultrasound to determine whether the fetus is alive is not recommended as the relief of the aortocaval compression is potentially beneficial whether the fetus is alive or dead. A midline laparotomy and midline incision into the uterus is recommended, but it is acceptable to use the incision with which the surgeon is most comfortable e.g. Pfannenstiel. The surgery should be performed by the person present with the most experience/surgical expertise to perform the procedure. There is no time to transfer the patient to an operating theatre or to await the arrival of an obstetrician from offsite. Should advice be required, the on call obstetrician for KEMH may be contacted via their switchboard (refer to contact details in Section 1). NETS WA should also be informed via their emergency line: **(1300 NETS WA – 1300 6387 92)**. Should maternal cardiac output be restored, the uterus can be packed and immediate transfer to an operating theatre organised.

Please refer to KEMH Clinical Guideline: Resuscitation in late pregnancy for more detailed resuscitation considerations in this patient cohort. Acute deterioration (adult):

Resuscitation and life support⁴

[https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/NMAHS/WNHS.OG.AcuteDeterioration\(Adult\).pdf](https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/NMAHS/WNHS.OG.AcuteDeterioration(Adult).pdf)



Section 5: Management of the dead fetus

1. In the event of a dead fetus (ideally confirmed on ultrasound by a practitioner qualified in obstetric ultrasound), the Anti-D protocol must still be adhered to.
2. The KEMH Obstetric Registrar and Consultant must be notified immediately and subsequent management plans regarding delivery of the fetus will be determined, in consultation with the Major Trauma Service (RPH).
3. In hours the Clinical Midwife Consultant for the KEMH Perinatal Loss Service may be notified via the KEMH Switchboard, Ph: **6458 2222**, page **3430**. After hours contact the KEMH Hospital Manager via switchboard, pager **3333**.⁵
4. The Perinatal Loss Service will manage all issues regarding bereavement and clinical psychology support of the mother.

Section 6: Resuscitation Guidelines according to Gestation

- < 23 weeks – No offer of resuscitation (poor outcomes associated).
- 23-24 weeks – Resuscitation is considered. If resuscitation is commenced the fetus is then reviewed.
- > 24+0 weeks – The fetus is routinely cared for (predicted >70% survival). The fetus should be monitored and a caesarean section performed if fetal distress is present.
- These resuscitation guidelines according to gestation are **guidelines only**. Any decision regarding fetal resuscitation should be made in conjunction with the Obstetrician on call and the neonatal team. Under these extreme circumstances it is not always appropriate to await the arrival of the neonatal team, however NETS WA should be advised as soon as practical to ensure full care of the baby can commence as soon as possible after birth.

Section 7: Trauma Team Activation Criteria

There is potential for major trauma when any one of the following criteria is met:

Mechanism	Injuries	Haemodynamics
MVA > 60kph Ejection/Extrication Rollover Fatality Pedestrian MBA Cyclist Fall >3m Penetrating	Crush Injury 2 or more limbs broken 2 or more body parts injured Spinal pain or paralysis Burns >15% Penetration of Torso	SBP < 100mmHg P <50 or > 130 bpm RR <10 or >29 GCS <12



References/Links:

1. Royal Melbourne Hospital. 2006. The Pregnant Trauma Patient. Emergency & Trauma Services
2. RFDS Western Operations 2018. . Clinical Manual: Part 1 Clinical Guidelines Version 8.0 January 2018 Royal Flying Doctor Service, Western Operations.
[https://www.flyingdoctor.org.au/assets/magazine/file/Part_1 - Clinical Manual - January 2018 - Version 8.0 - FINAL.pdf](https://www.flyingdoctor.org.au/assets/magazine/file/Part_1_-_Clinical_Manual_-_January_2018_-_Version_8.0_-_FINAL.pdf) Accessed January 2021
3. KEMH clinical guideline for preterm labour
[https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/NMAHS/WNHS. OG.PretermLabour.pdf](https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/NMAHS/WNHS/WNHS.OG.PretermLabour.pdf) Accessed January 2021
4. KEMH clinical practice guideline for Acute deterioration (adult): Resuscitation and life support [https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/NMAHS/ WNHS. OG.AcuteDeterioration\(Adult\).pdf](https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/NMAHS/WNHS.OG.AcuteDeterioration(Adult).pdf) Accessed January 2021
5. KEMH Maternal Fetal Medicine Service (Perinatal Loss)
[https://wnhs-healthpoint.hdwa.health.wa.gov.au/directory/OGandID/Emergency/ MFMS/Pages/Perinatal-Loss.aspx](https://wnhs-healthpoint.hdwa.health.wa.gov.au/directory/OGandID/Emergency/MFMS/Pages/Perinatal-Loss.aspx) Accessed January 2021
6. Sakamoto J, Michels C, Eifelder B, Joshi N. 2019. Trauma in pregnancy. *Emerg Med Clin N Am* 2019;37:317-338.

Date Issued: 16th May 2012

Review Date: April 2021

Next Review: April 2023

Written by: State Trauma Office

Authorised by: WA State Trauma Committee

Review Team: State Trauma Office, Professor Jan Dickinson (Professor Obstetrics & Gynaecology KEMH)