Royal Hospital for Women (RHW)
BUSINESS RULE
COVER SHEET

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EXECUTIVE SPONSOR	Medical Co-Director of Maternity Services
AUTHOR	Dr W Hawke (Obstetrician) Dr T Morgan (JMO)
SUMMARY	Trauma affects around 8% of pregnancies and is the second leading cause of death in the pregnant population

Royal Hospital for Women (RHW)
CLINICAL BUSINESS RULE

Trauma during Pregnancy — RHW CLIN046

This Clinical Business Rule (CBR) is developed to guide safe clinical practice at the Royal Hospital for Women (RHW). Individual patient circumstances may mean that practice diverges from this Clinical Business Rule. Using this document outside RHW or its reproduction in whole or part, is subject to acknowledgement that it is the property of RHW and is valid and applicable for use at the time of publication. RHW is not responsible for consequences that may develop from the use of this document outside RHW.

1. BACKGROUND

Trauma affects around 8% of pregnancies and is the second leading cause of death in the pregnant population; 90% of trauma will be classified as minor[6,7]

Aim of this CBR is the management of trauma during pregnancy to minimise fetal and maternal morbidity and mortality

Definitions

Minor Trauma

- Trauma to a distal extremity not involving the abdomen/uterus, nor rapid decompression, deceleration, or shearing forces e.g. a cut to the arm, or a twisted ankle without a fall
- No pain, vaginal bleeding, loss of vaginal fluid observed or reported by woman
- Good/normal fetal movement is felt by the woman

Major Trauma

Trauma fulfilling any one criterion (except systolic BP*) from ANY category listed below:

- Observations
- Injury pattern
- Mechanism of Injury

Observations criteria	
Conscious state	Altered level of consciousness and confusion
Respiratory rate	<10 or>30 breaths per minute
SpO_2 (room rate)	<95%
Heart rate	>120bpm
Systolic BP *	<90 mmHg
*Interpret BP in conjunction with gestation, other vital signs, injury pattern and mechanism of injury	

Injury pattern criteria
Penetrating or blast injury to the head, neck, chest, abdomen, pelvis, axilla, or groin
Significant blunt injury to a single region of head, neck, chest, abdomen, pelvis, axilla, or groin
Injury to any two or more body regions of head, neck, chest, abdomen, pelvis, axilla, or groin
Limb amputation above the wrist or ankle
Burns >20% or other complicated burn injury including burn injury to the head, face, genitals, airway, and respiratory tract
Serious crush injury
Major compound fracture or open dislocation with vascular compromise
Fractured pelvis
Fractures involving two or more of the following: femur, tibia, humerus

Mechanism of injury criteria
Ejected from the vehicle
Fall from height >3 metres
Involved in an explosion
Involved in a high impact motor vehicle crash with incursion into the occupant's compartment
Involved in a vehicle rollover
Involved in a road traffic collision in which there was a fatality in the same vehicle
Entrapped for >30 minutes
Pedestrian impact
Motorcyclist impact>30 kph

Adapted from: Queensland Government. Queensland Ambulance Service (QAS) Clinical Practice Manual (CPM) Clinical Practice Guideline: Trauma/Pre-hospital trauma by-pass. 2017 and Queensland Government, Retrieval Services Queensland. RG1001 Early notification of trauma guidelines 2017

2. RESPONSIBILITIES

2.1 Medical Staff – assess woman and fetus, diagnose minor or major trauma and manage appropriately
2.2 Midwifery and nursing Staff – assess woman and fetus, monitor for signs of deterioration, escalate as appropriate

3. PROCEDURE

3.1 Clinical Practice

- Perform Initial assessment (see appendix 1). This should occur in a location where all trauma patients are managed (i.e. Emergency Department, Resuscitation Area)
- Call obstetric team to attend a trauma call for any pregnant woman
- Resuscitate woman immediately if required
- Call Rapid Response or CODE BLUE if criteria met
- Obtain intravenous access
- Perform secondary assessment (see appendix 2)
- Obtain history of trauma, including speed of impact in Motor Vehicle Accident (MVA):
    - Low speed ≤ 30km/hr
    - High speed >30km/hr
- Perform abdominal examination
- Triage woman into risk category by history of trauma as outlined in definitions, and by obstetric characteristics including gestation
- Assess fetal condition by:
    - auscultating fetal heart at < 23 weeks' gestation
    - ≥ 23 to < 25 weeks gestation, consider CTG at senior obstetric clinician discretion
    - applying CTG at ≥ 25 weeks' gestation. CTG should be applied as soon as practicable but must not interfere unduly with the treatment of that woman. It should be **continued for 4 hours if deemed major trauma**
- Perform the following blood tests if major trauma:
    - Kleihauer
    - Blood group, antibody screen and cross match if applicable
    - Full Blood Count (FBC)
    - Urea and electrolytes, coagulation studies, glucose, liver function tests, amylase, arterial blood gas
- Perform mandatory blood alcohol sampling if woman was involved in an MVA:
    - This is compulsory regardless of whether the woman was operating the vehicle, as legislated by the Road Transport Act 2013, clause 11 of Schedule 3
    - This should occur as soon as possible and within 12 hours of the accident

- The kit is available from Prince of Wales Emergency Department (POWH ED) and contains all equipment and instructions needed for sampling, packing, identification of samples and certification by the medical practitioner
- Phlebotomy must be witnessed by another staff member and recorded in the woman's medical record
- Medical certificates must be filled out by the medical practitioner or midwife. The woman is given the pink copy, and the other two copies are returned, with the blood sample to the Police Security Box located at POWH ED. This must be performed by two staff members
- It should be recorded in the woman's medical record the names of the staff members that deliver the collected blood to the Police Security Box in POWH ED

- Consider obstetric ultrasound when the woman's condition is stable

Admission/Discharge criteria

- Ensure review by obstetric consultant/registrar for woman ≥ 20 weeks' gestation with abdominal trauma
- Consider admission for at least 24 hours if major trauma and/or high risk of abruption
- Discuss with obstetric consultant when considering discharge from hospital. The woman must meet the following discharge criteria:
  - resolution of contractions
  - reassuring fetal heart rate monitoring after 4 hours of monitoring (required for major trauma)
  - intact membranes
  - no uterine tenderness
  - no vaginal bleeding
  - safe home environment. Consider social work referral if concerns
  - rhesus negative woman to receive RhD immunoglobulin as per RhD Immunoglobulin (Anit-D) – Maternity MoHGL2015_011 (major trauma and/or abdominal involvement)
- Arrange follow up and review of Kleihauer result (within 72 hours)
- Provide discharge advice and when to return to woman who has suffered trauma
- Advise woman to contact Birth Unit/Midwifery Group Practice midwife/private obstetrician if:
  - signs of preterm labour
  - abdominal pain
  - vaginal bleeding or discharge
  - change in fetal movements

3.2 Documentation

- Medical record
- Mandatory blood alcohol sampling documentation

3.3 Educational Notes

- The priority is to treat the woman. A multidisciplinary team includes an obstetrician and may involve a neonatologist [1,5]
- In management of major trauma, Early Management of Severe Trauma (EMST) or Managing Obstetric Emergencies and Trauma (MOET) guidelines are appropriate [2]
- The woman should be treated in the usual location where all trauma is managed, e.g. emergency department, resuscitation room etc. **Only** when any other injuries have been excluded should she be moved to a perinatal area for ongoing external fetal monitoring[2]
- Common causes of blunt abdominal trauma include[1,9,10]:
  - MVAs (55% to 70%)
  - Falls (9-22%)
  - Pedestrian injuries
  - Assaults and Domestic Violence (11% to 21%)
- Risk factors for maternal trauma include young age (<25 years), Indigenous women, use of illicit drugs or alcohol, domestic violence, non-compliance with proper seatbelt use and low socio-economic status [10]
- All pregnant women should be given information about correct placement of a seat belt. Lap belt should be positioned over hips and below uterus. Sash should be between breasts and above uterus [1,8]

- The most common complication from blunt trauma to the abdomen in a pregnant woman is placental abruption. Signs of placental abruption include pain, a tense tender uterus, vaginal bleeding, uterine tetany, and irritability
- CTG provides good screening/high sensitivity for immediate adverse outcome [1,9]

3.4 Implementation, communication, and education plan

The revised CBR will be distributed to all medical, nursing and midwifery staff via @health email. The CBR will be discussed at ward meetings, education and patient quality and safety meetings. Education will occur through in-services, open forum, and local ward implementation strategies to address changes to practice. The staff are asked to respond to an email or sign an audit sheet in their clinical area to acknowledge they have read and understood the revised CBR. The CBR will be uploaded to the CBR tab on the intranet and staff are informed how to access

3.5 Related Policies/procedures

- RhD Immunoglobulin (Anti D) - Maternity MoHGL2015_011
- Fetal Heart Rate Monitoring - Maternity - MoH GL2018/025
- Acute Abdomen - Management in Pregnancy
- Clinical Emergency Response System (CERS) - Management of the Deteriorating Patient
- Critical Bleeding Protocol – POWH/RHW
- Forensic Drug and Alcohol sampling in Emergency Departments PD2021_010

3.6 References

1. Queensland Clinical Guideline. Trauma in pregnancy. Aug 2019 MN19.31-V2-R24
2. Managing Obstetric Emergencies and Trauma (MOET) Course manual third edition Cambridge University Press 2014
3. Early Management of Severe Trauma (EMST) Royal Australasian College of Surgeons
4. Information Bulletin, Collecting Blood, and Urine Samples in Emergency Departments- Changes to Governing Legislation, NSW Government Health, 28-Jul-2015.
5. South Australian Perinatal Practice Guideline. Abdominal pain and trauma in pregnancy Oct 2019. ISBN: 978-1-76083-165-3
6. Huls CK, Detlef s C. Trauma in pregnancy. Semin Perinatol 2018;42(1):13-20. 2.
7. Agency for Clinical Innovation, Emergency Care Institute, New South Wales. Clinical Tools, Trauma in Pregnancy. Updated 2024.
8. Transport NSW. Road safety, seatbelt in pregnancy. 2024
9. Mendez-Figueroa, H., Dahlke, J. D., Vrees, R. A., & Rouse, D. J. (2013). Trauma in pregnancy: an updated systematic review. American journal of obstetrics and gynecology, *209*(1), 1–10
10. Murphy, N. J., & Quinlan, J. D. (2014). Trauma in pregnancy: assessment, management, and prevention. *American family physician*, *90*(10), 717–722

4. ABORIGINAL HEALTH IMPACT STATEMENT DOCUMENTATION

- Considerations for culturally safe and appropriate care provision have been made in the development of this Business Rule and will be accounted for in its implementation.
- When clinical risks are identified for a Aboriginal or Torre Strait Islander woman or family, they may require additional supports. This may include Aboriginal health professionals such as Aboriginal liaison officers, health workers or other culturally specific services.

5. CULTURAL SUPPORT

- For a Culturally and Linguistically Diverse CALD woman, notify the nominated cross-cultural health worker during Monday to Friday business hours

- If the woman is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017_044-Interpreters Standard Procedures for Working with Health Care Interpreters.

6. REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
Amended August 2019 – changed from PACE Reviewed and endorsed Maternity Services LOPs 21/2/17 Approved Quality & Patient Safety Committee 21/8/14 Maternity Services LOPs group 12/8/14		
6.5.24	3	Endorsed at BRGC

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Appendix 1 **Initial Assessment**

Principles of care for the pregnant trauma patient

- Follow ATLS guidelines
- First priority is to treat the woman
- Multidisciplinary team that includes an obstetrician is essential
  - Contact neonatal team early if viable gestation and birth imminent/likely
- Recognise anatomical and physiological changes of pregnancy
- Clear, coordinated, and frequent communication essential
- Generally, medications, treatment, and procedures as for non-pregnant patient
- Thoroughly assess all pregnant women – even after minor trauma

Initial stabilisation

- As indicated for all trauma patients
- Follow ATLS guidelines
- Initiate early obstetric consultation

Additionally for pregnancy

- Position (tilt or wedge):
  - Left lateral 15–30° (right side up) *or*
  - Manual displacement of uterus
  - Place wedge under spinal board if necessary
- Routinely administer oxygen therapy
- Large-bore IV access

Airway compromise?

Yes

- Early ETT intubation
  - Pre-oxygenation
  - Consider cricoid pressure
  - Consider smaller ETT
- Insert oro/nasogastric tube

No

Respiratory compromise?

Yes

- Administer supplemental oxygen to maintain saturations > 95%
- Consider tube thoracostomy in 3rd or 4th rib space if pneumothorax or haemothorax

No

Cardiac arrest

- Manually displace uterus
- If ≥ 20 weeks gestation, commence Resuscitative Hysterotomy (Perimortem CS) as soon as possible
- Follow ATLS guidelines
- Defibrillate as for non-pregnant patient
- Advanced cardiac life support drugs as indicated for non-pregnant patients

Haemodynamic compromise?

Yes

- Control obvious haemorrhage
- 2 x large-bore IV access
- Recognise occult bleeding
- Minimise crystalloid infusion
  - Avoid volumes > 1 L
  - Assess response
- Early CBP activation
- FAST
- Rapid transfer to OT

No

Proceed to flowchart:
Secondary assessment and management of pregnant trauma patient

ATLS: Advanced Trauma Life Support, **CPR:** Cardiopulmonary Resuscitation, **CS:** Caesarean section, **ETT:** Endotracheal tube, **FAST:** Focused Abdominal Sonography for Trauma, **IV:** Intravenous, CBP: Critical Bleeding Protocol, **OT:** Operating Theatre

Adapted from QLD GL 2019

Appendix 2 **Secondary assessment**

Fetal assessment and secondary survey

As for non-pregnant patient AND

- Consult obstetric team
- Obtain obstetric history
  - Gestation
  - Pregnancy complications
- Assess and record FHR
- Maintain high index of suspicion for occult shock and abdominal injury
- Maintain position (tilt or wedge) left lateral 15-30° (right side up) *or*
  - Manual displacement of uterus
  - Wedge spinal board if required
- Physical examination
- Assess uterus
  - Tone, rigidity, tenderness
  - Contractions
- Estimate gestational age
  - Fundal height
  - USS
  - If uncertain (i.e. severe trauma, no prior USS or lack of accurate records) presume viability

Consider - especially for major trauma

- Pelvic exam (obstetric team)
  - Sterile speculum
  - Assess for rupture of membranes, vaginal bleeding, cervical effacement and dilation, cord prolapse, fetal presentation
- Imaging
  - Formal obstetric USS
  - FAST if haemodynamically unstable
  - Other radiographs
- Blood tests
  - Standard trauma bloods
  - Group and Antibody screen
  - Coagulation Profile, ROTEM®/TEG® for major trauma
  - Kleihauer Test:
    - For all Rh D negative women ≥ 13+0 weeks gestation
    - Major trauma
- If Rh D negative and ≥13+0 weeks, administer RhD immunoglobulin (do not delay care to do so)

Gestation ≥ 23+0 weeks?

Yes or uncertain

- CTG
  - ≥23 to <25 weeks gestation at senior obstetric discretion
  - >25 weeks gestation (continue for 4 hours if major trauma)
- Monitor uterine activity

No

Maternal or fetal compromise?

Yes

No

Consider discharge criteria

- Obstetric team consulted/agree for discharge
- Reassuring maternal status
- No vaginal loss/bleeding
- Normal CTG/FHR
  - Interpret CTG with caution at < 28 weeks
- No contractions
- Blood results reviewed
- Rh immunoglobulin given if required
- Social worker referral offered

Discharge Criteria met?

Yes

No

Discharge

- Advise to seek medical advice if:
  - Signs preterm labour
  - Abdominal pain
  - Vaginal bleeding or discharge
  - Change in fetal movements
- Inform usual care provider of trauma event

Admit

- Assess for:
  - Placental abruption
  - FMH
  - Uterine rupture
  - Preterm labour
  - DIC
- If ≥23 weeks and major trauma requiring CTG longer than 4 hours
- Further treatment/investigations
- Birth- Consider CS

CS: Caesarean section, CTG: cardiotocograph, DIC: Disseminated intravascular coagulation, FAST: Focused Abdominal Sonography for Trauma, FHR: Fetal Heart rate, FMH: Fetal Maternal Haemorrhage, USS: Ultrasound scan

Adapted from QLD GL 2019