

TRAUMA DURING PREGNANCY

This LOP is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this LOP.

1. AIM

- Investigation and minimisation of fetal and maternal morbidity and mortality secondary to trauma during pregnancy

2. PATIENT

- Pregnant woman presenting following trauma ≥ 20 weeks' gestation (such as fall, assault, motor vehicle accident (MVA) or injury during pregnancy)

3. STAFF

- Medical and midwifery staff

4. EQUIPMENT

- Cardiotocography (CTG) machine
- Ultrasound machine
- Blood alcohol sampling kit

5. CLINICAL PRACTICE (follow Appendix 1)

- Perform a primary trauma survey
- Resuscitate woman immediately if required:
 - call for PACE 2 or CODE BLUE depending on clinical indication
 - obtain intravenous access
- Perform secondary survey
- Obtain history of trauma, including speed of impact in MVA
 - low speed ≤ 30 km/hr
 - high speed > 30 km/hr
- Perform abdominal examination
- Assess fetal condition by:
 - auscultating fetal heart at < 26 weeks' gestation
 - applying CTG at ≥ 26 weeks' gestation (or earlier if active resuscitation planned after neonatal consultation)
- Triage woman into risk category by history of trauma and by obstetric characteristics including gestation
 - Minor: Trauma to a distal extremity not involving the abdomen/uterus, nor rapid compression, deceleration or shearing forces, and the woman does not report pain, vaginal bleeding, loss of fluid and has good fetal movement (e.g. a cut to the arm, or a twisted ankle without a fall)
 - Major (see Appendix 2)
- Perform the following blood tests if major trauma:
 - Kleihauer
 - Blood Group and antibody screen and cross match if applicable
 - FBC
 - Urea and electrolytes, coagulation studies, glucose, liver function tests, amylase, arterial blood gas analysis
- 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 (POW ED) and contains all equipment and instructions needed for sampling, packaging, identification of samples and certification by the medical practitioner

CLINICAL POLICIES, PROCEDURES & GUIDELINES

Approved by Quality & Patient Care Committee
16/3/17

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- Phlebotomy must be witnessed by another staff member and recorded in the woman's integrated clinical notes
- Medical certificates must be filled out by the medical practitioner or nurse/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 POW ED. This must be performed by TWO staff members.
- It should be recorded in the woman's integrated clinical notes the names of the staff members that deliver the collected blood to the Police Security Box located at POW ED.
- Consider obstetric ultrasound when 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 significant 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 moderate or major trauma)
 - intact membranes
 - no uterine tenderness
 - no vaginal bleeding
 - safe home environment. Consider social work referral if concerns about home safety.
 - **ALL rhesus negative women to receive 625 units of Anti D even if the Kleihauer is negative (more if indicated by Kleihauer)**
- Arrange follow up and review of Kleihauer result
- Provide discharge advice to woman who has suffered trauma. Advise her to contact Delivery Suite/Midwifery Group Practice midwife/private obstetrician if:
 - signs of preterm labour
 - abdominal pain
 - vaginal bleeding or discharge
 - change in fetal movements

6. DOCUMENTATION

- Integrated clinical notes
- Standard Maternity Observation Chart(SMOC).
- Partogram (if labour)
- Electronic medication record
- Fluid balance chart
- ObstetriX
- Mandatory blood alcohol sampling documentation

7. EDUCATIONAL NOTES

- For major trauma, Early Management of Severe Trauma (EMST) or Managing Obstetric Emergencies and Trauma (MOET) guidelines are appropriate. The first priority is to treat the woman. A multidisciplinary team that includes an obstetrician is essential and may involve a neonatologist if early delivery is likely.
- Common causes of blunt abdominal trauma include:
 - MVAs (MVAs 55% to 70%)
 - falls (9% to 22%)
 - pedestrian injuries
 - assaults (11% to 21%)

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- Risk factors for maternal trauma include young age (<25 years), Indigenous woman, use of illicit drugs or alcohol, domestic violence, non-compliance with proper seatbelt use and low socio-economic status
- 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
- 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.
- Even minor injuries in the pregnant woman can be associated with placental abruption, preterm labour, feto-maternal haemorrhage, uterine rupture and fetal loss.
- CTG provides good screening/high sensitivity for *immediate* adverse outcome. Monitor FHR via CTG for four hours at a minimum, as placental abruption has not been reported when less than one contraction is present in any 10-minute interval over a four-hour period

8. RELATED POLICIES / PROCEDURES / CLINICAL PRACTICE LOP

- RhD Immunoglobulin in Obstetrics
- Cardiotocography (CTG) - Antenatal
- Intrapartum fetal heart rate monitoring
- Acute Abdomen - Management in Pregnancy guideline
- Adult Clinical Emergency Response System and Escalation (CERS)
- Massive Transfusion
- Patient with Acute Condition for Escalation (PACE): Management of Deteriorating Adult and Maternity Inpatient
- Information Bulletin, Collecting Blood and Urine Samples in Emergency Departments - Changes to Governing Legislation. NSW Government Health 28-Jul-2015.
- Blood Alcohol Sampling by Hospital Staff, NSW HEALTH, 28-Feb-2005

9. RISK RATING

- Low

10. NATIONAL STANDARD

- CC – Comprehensive Care

11. REFERENCES

- 1 Oxford, C and J Ludmir, *Trauma in pregnancy*. Clin Obstet Gynaecol 2009. 52(4): p611-629
- 2 Cusick SS, Tibbles CD. *Trauma in pregnancy*. Emerg Med Clin N Am 2007; 25:861-872.
- 3 Brown MA, Sirlin CB, Farahmand N, Hoyt DB, Casola G. *Screening sonography in pregnancy patients with blunt abdominal trauma*. J Trauma 2002; 52 1125- 1128.
- 4 Queensland Clinical Guideline. Trauma in pregnancy. Feb 2014 MN14.31-V1-R19
- 5 Managing Obstetric Emergencies and Trauma (MOET) Course manual third edition Cambridge University Press 2014
- 6 Early Management of Severe Trauma (EMST) Royal Australasian College of Surgeons
- 7 Information Bulletin, Collecting Blood and Urine Samples in Emergency Departments- Changes to Governing Legislation, NSW Government Health, 28-Jul-2015.
- 8 Blood Alcohol Sampling by Hospital Staff, NSW HEALTH, 28-Feb-2005

REVISION & APPROVAL HISTORY

Reviewed and endorsed Maternity Services LOPs 21/2/17
Approved Quality & Patient Safety Committee 21/8/14
Maternity Services LOPs group 12/8/14

FOR REVIEW : MARCH 2022

APPENDIX 1

MANAGEMENT OF TRAUMA IN PREGNANCY

Primary Survey

- Airway
- Breathing
- Circulation
- Disability
- Exposure
- Tilt if >20/40
- O₂ and IV fluids

Resuscitate if required

2nd Survey once stable

Secondary Survey

As for non-pregnant patient AND

- Consult Obstetric Medical Team
- 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
- Obtain obstetric history
 - Gestation
 - Estimated date of delivery
 - Pregnancy complications
- Physical examination
- Assess uterus
 - Tone, rigidity, tenderness
 - Contractions
- Estimate gestational age
 - Fundal height
 - Ultrasound (US)
 - If uncertain (i.e. severe trauma, no prior US or lack of accurate records) presume viability
- Assess and record FHR
 - Doppler
 - US

Consider – especially for major trauma

- Rectal examination
- Pelvic exam (obstetric medical team)
 - Sterile speculum
 - Assess for rupture of membranes, vaginal bleeding, cervical effacement and dilation, cord prolapse, fetal presentation
- Imaging
 - FAST ultrasound
 - Formal obstetric ultrasound
 - Other radiographs
- Blood tests:
 - Mandatory blood alcohol testing
 - Standard trauma bloods
 - Group and Antibody screen
 - Kleihauer Test if Rh D negative and all women if major trauma (EDTA tube)
 - Consider Coagulation Profile (major trauma)
- If Rh D negative and ≥ 12 weeks' gestation, administer Rh D immunoglobulin (but do not delay definitive care to do so)

Viable Gestation ?

YES, or uncertain

NO

Maternal or fetal Compromise?

YES

NO

- Apply CTG or auscultate fetal heart. CTG application and interpretation by experienced obstetric team member
- Monitor uterine activity
- Minimum 4hrs.

Consider discharge criteria

- Obstetric team consulted/agree for discharge
- Reassuring maternal status
- No vaginal loss/bleeding
- Normal CTG / FHR (minimum 4 hours CTG)
 - Interpret CTG with caution at < 28 weeks
- No contractions
- Blood results reviewed
- Rh Immunoglobulin given if required
- Social Work referral offered

Discharge criteria met?

YES

NO

Abbreviations

- CS: Caesarean section
- CTG: Cardiotocograph
- DIC: Disseminated intravascular coagulopathy
- FAST: Focused Abdominal Sonography for trauma
- FHR: Fetal heart rate
- US: Ultrasound scan
- <: Less than
- >: Greater than
- ≥: Greater than or equal to

Discharge

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

Admit

- Assess for:
 - Placental abruption
 - Feto-maternal haemorrhage
 - Uterine rupture
 - Preterm labour
 - DIC
- Continuous CTG if > 26 weeks' gestation (or resuscitation planned at earlier gestation after neonatal consultation)
- Intervene as appropriate
- Consider emergency CS
- Notify paediatric team

APPENDIX 2
Classification of major trauma in pregnancy

If any one criterion (except systolic BP*) is present from any category (vital signs, injury pattern or mechanism of injury), consider the trauma “Major” and respond accordingly.

Vital signs criteria	
Conscious state	Altered level of consciousness
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