



UK HEMS

*Clinical Excellence in
Helicopter Medicine*

Trauma in pregnancy

Aims:

- To describe how management of a pregnant trauma patient is different and to emphasise the legal situation
- Describe the situations when an emergency C-section is appropriate/necessary
- Describe a standard method for C-section
- What to do with the delivered baby

Background:

Maternal Physiology:

- Cardiac output increases (30-40% in the first trimester, up to 50% by term).
- Heart rate increases by 10-15 beats per minute
- Systolic and diastolic blood pressure is reduced by 10-15 mmHg during the first and second trimesters, returning to pre-pregnancy levels by term
- Circulatory volume increases by up to 40%
- Tidal volume increases, respiratory rate usually stays the same
- Intubation will be difficult: increased chance laryngeal oedema, breast may obstruct laryngoscope, increased risk of aspiration
- Increased blood flow to pelvic region makes catastrophic bleeding more likely

Key points:

- Foetus does well if mother does well – persistent maternal hypotension is associated with up to 80% foetal mortality
- Maternal survival is paramount – the foetus has NO legal standing
- Aim to optimise conditions for both mother and foetus, but mother comes first.

Pregnancy-specific trauma considerations:

The following specific conditions should be considered in the pregnant trauma victim:

- Placental abruption (with concealed blood loss)
- Uterine rupture
- Direct penetrating injury to foetus
- Amniotic fluid embolism

Policy:

Patient Management:

As with all trauma patients, plus:

- If over 20/40, manage in left lateral position, using a wedge or pillow to maintain position. This will optimise venous return and help maintain maternal BP
- Consider concealed blood loss and secure IV access early

Caesarean Section:

Consider if:

- ***Patient severely unstable and hypotensive +/- agonal respiration:*** In this situation the patient should be managed as per relevant SOPs, and after normal interventions have been performed, consider C-section if parameters have not stabilised. By removing the foetus, diaphragmatic movement improves, IVC compression is relieved, and the uterus contracts. These changes improve ventilation and cardiac output. The foetus is still a secondary consideration.
- ***Patient has arrested in front of you or within last 5 minutes:*** C-section should be performed within 5 minutes of cardiac arrest in all patients. After this time it is of no benefit. Again it is performed to try and save maternal life and the foetus is of secondary consideration. If there are enough personnel the foetus can be handed to another paramedic/doctor, but the legal obligation is to the mother until such time as it is appropriate to cease resuscitation attempts and pronounce life extinct. At least one cycle of CPR should be performed after C-section before pronouncing life extinct.

Caesarean Section: the procedure

- CPR should be ongoing if the patient has arrested, while the C-section is performed
- Equipment needed: scalpel
 - Horizontal incision 2-3cm above symphysis pubis; 20cm length incision
 - Cut through skin, then fat and the rectus sheath.
 - Use hands to pull peritoneum open
 - Now cut in same direction through uterine wall and widen hole with hands
 - Insert one hand under presenting part of foetus
 - Pull foetus out of cavity, clamp umbilical cord and cut.
 - Hand foetus to colleague or leave to one side if no spare people.
 - Remove placenta.
 - This will take less than 2 minutes
 - Put pressure on any bleeding and reassess patient.
 - Only turn your attention to foetus once everything has been done for mother that can be done. Ambulance crew and/or HEMS paramedic can begin resuscitation of foetus.

Management of delivered foetus:

Initially this should be by ambulance crew/ HEMS paramedic while attention is focused on the ongoing resuscitation of the mother

Once mother stable or resuscitation efforts have ceased, neonatal life support procedures are followed:

- Rub baby vigorously with warm blanket
- Suction any secretions from airway which may stimulate breathing
- Provide high flow oxygen
- If no respiratory effort, give 5 breaths with BVM, confirming that chest moving. Use adjuncts if necessary and ensure appropriate positioning.
- Repeat a further 2 times if foetus not making own effort
- If still no respiratory effort and pulse absent or less than 60, start chest compressions
- IO access or umbilical cord access should be attempted and appropriate drugs delivered.
- Definitive airway should be secured
- Decision about continuing CPR will need to take into account gestational age of foetus, any response to interventions, the length of time that the C-section took and the delay in resuscitation efforts of the baby