

INTRODUCTION

Coping with pregnant women with major injuries is a rare problem, but demands a special approach. Pregnancy produces physiological changes, particularly in the cardiovascular system:

- cardiac output increases by 20–30% in first 10 weeks of pregnancy
- average heart rate increases by 10 to 15 beats per minute
- both systolic and diastolic blood pressure (BP) fall on average by 10–15mmHg
- **in the supine position the enlarged uterus compresses the inferior vena cava. This reduces venous return to the heart, causing a further drop in BP**
- as the pregnancy develops, the diaphragm becomes splinted and breathing effort, rate and tidal volume are increased.
- both blood volume (45% increase) and numbers of red cells increase, but not in proportion, so the patient becomes relatively **anaemic**
- gastric emptying is delayed and the lower oesophageal sphincter is relaxed, therefore **both vomiting and passive regurgitation are more common** and the airway is at increased risk.

There are three fundamental rules which must be followed at all times when dealing with the pregnant patient:

1. the maternal well-being is essential to the survival of the fetus and thus resuscitation of the mother must always be the priority. Also, remember that **'resuscitating the mother will resuscitate the fetus'**
2. compression of the inferior vena cava by the pregnant uterus (beyond 20 weeks) is a serious potential complication and suitable positioning or manual displacement must be employed (see manual displacement below)
3. signs of shock appear very late during pregnancy and hypotension is an extremely late sign. **Any signs of hypovolaemia during pregnancy are likely to indicate a 35% (class III) blood loss and must be treated aggressively. ESTABLISH LARGE BORE IV CANNULATION EARLY.**

HISTORY

Refer to trauma emergencies guideline.

Enquire about stage of the pregnancy, and any problems so far with the pregnancy. Ask the mother if she has her pregnancy record card with her.

Enquire about the movement of the baby felt by the mother (fetal movements) (**refer to obstetric and gynaecology guidelines**).

ASSESSMENT

Assess and correct deficits with:

- AIRWAY
- BREATHING
- CIRCULATION
- DISABILITY (mini neurological examination)

Specifically assess:

- assess for fetal movement or abdominal pain in the mother
- evaluate whether the patient is **TIME CRITICAL** or **NON-TIME CRITICAL** following criteria on **trauma emergencies guideline**
- **if patient is TIME CRITICAL, correct A and B problems, LOAD ON TO LONGBOARD and TRANSPORT to NEAREST SUITABLE RECEIVING HOSPITAL with a Hospital Alert Message / Information call**

DO NOT MANAGE A PREGNANT FEMALE (>20 weeks) ON HER BACK ON THE LONGBOARD – AIM FOR 30 degree TILT (preferably to left side)

- it is **vital**, therefore, to **tilt the longboard** by propping it up under the **right side** so tilting the mother to her left
- if this is impossible, the uterus should be manually displaced to the left side
- provide a **Hospital Alert Message**
- en-route continue patient **MANAGEMENT** (see **below**)
- **CAUTION:** The usual increase in plasma volume, tachycardia, and lowered BP can mask initial signs of **hypovolaemic shock** until quite significant bleeding has occurred
- reduced blood volume caused by haemorrhage will induce maternal **hypoxia** as well as **hypovolaemia**. This will cause fetal hypoxia due to reduced placental blood flow

- if the mother is dead or develops cardiac/respiratory arrest en-route to hospital, commence adult basic life support (BLS)/advanced life support (ALS) (*refer to BLS/ALS guidelines*) and transport immediately to nearest suitable receiving hospital with **Hospital Alert Message** to have an **OBSTETRICIAN ON STANDBY IN THE EMERGENCY DEPARTMENT (ED)** for emergency caesarean section. Caesarean section should ideally be carried out if there is no response within 5 minutes of instituting BLS/ALS. Remember that the prime aim of perimortem caesarean section is to facilitate **MATERNAL** resuscitation (also, with effective BLS/ALS the infant **may** have a chance of survival)
- in non-time critical patients, perform a more thorough patient assessment with brief secondary survey.

MANAGEMENT

Follow Trauma Emergencies Guideline

Specifically consider:

- do not transport supine on a long board. **Tilt the mother to her left side.**

Respiration

- administer high concentration oxygen (O₂) (*refer to oxygen protocol for administration and information*) via a non-rebreathing mask, using the stoma in laryngectomy and other neck breathing patients. High concentration O₂ should be administered routinely, whatever the oxygen saturation, in patients sustaining major trauma and long bone fracture, except for patients with chronic obstructive pulmonary disease (COPD) (*refer to COPD guideline*)
- consider assisted ventilation at a rate of 12–20 respirations per minute if any of the following are present:
 - oxygen saturation (SpO₂) is <90% on high concentration O₂
 - respiratory rate is <10 or >30bpm
 - inadequate chest expansion.

Fluid Therapy

Obtain IV access (large bore cannula).

Although, current research in non-pregnant women shows little evidence to support the routine use of IV fluids in adult trauma patients,¹ **IN PREGNANCY**, the

uterus, and thus the fetus, will often become 'under-perfused' **PRIOR** to the women becoming tachycardic or hypotensive. Hypovolaemia is manifested late in pregnant women, thus the fetus may be compromised if adequate fluid replacement is **NOT** given; therefore fluid replacement should be given earlier.

If there is visible external blood loss greater than 500mls, fluid replacement should be commenced with a 250ml bolus of crystalloid.

Central pulse **ABSENT**, radial pulse **ABSENT** – is an absolute indication for urgent fluid.

Central pulse **PRESENT**, radial pulse **ABSENT** – will normally need fluid replacement in the pregnant patient.

Central pulse **PRESENT**, radial pulse **PRESENT** – **DO NOT** commence fluid replacement,² unless there are other signs of poor central tissue perfusion (e.g. altered mental state, abnormal cardiac rhythm or in the pregnant patient a high index of suspicion of significant blood loss.

Re-assess vital signs prior to further fluid administration.

ADDITIONAL INFORMATION

All pregnant women involved in a traumatic situation, however trivial, require to be assessed in an ED with an obstetric unit.

Abdominal pain after trauma should be presumed to be significant and may be associated with internal blood loss.

Key Points – Trauma in Pregnancy

- Maternal well-being is essential to the survival of the fetus.
- Compression of the inferior vena cava by the pregnant uterus (>20 weeks) is a serious potential complication; tilt the patient 30 degrees to the left side or manually displace the uterus.
- Signs of shock appear very late and hypotension is an extremely late sign. Any signs of hypovolaemia during pregnancy are likely to indicate a 35% (class III) blood loss and must be treated aggressively.
- All trauma is significant.
- If the mother is dead or develops cardiac/respiratory arrest en-route, commence life support and alert the hospital so that an obstetrician can be on standby in the ED for emergency caesarean section.

REFERENCES

- ¹ Turner J, Nicholl J, Webber L, Cox H, Dixon S, Yates D. A randomised controlled trial of pre-hospital intravenous fluid replacement therapy in serious trauma: The NHS Health Technology Assessment Programme 4(31), 2000.
- ² Revell M, Porter K, Greaves I. Fluid Resuscitation in Prehospital trauma care: a consensus view. *Emergency Medical Journal* 2002;19(494-98).

METHODOLOGY

Refer to methodology section.