3-2 Massive blood loss v.2

Expected or unexpected major haemorrhage.

START

1. Call for help, inform theatre team of problem and note the time.
2. Increase FiO_2 and consider cautiously reducing inhalational/intravenous anaesthetics.
3. Check and expose intravenous access.
4. Control any obvious bleeding (pressure, uterotonics, tourniquet, haemostatic dressings).
5. Call blood bank (and assign one person in theatre to liase with them):
   - Activate major haemorrhage protocol.
   - Communicate how quickly blood is required.
   - Communicate how much blood and blood product is required.
6. Begin active patient warming.
7. Use rapid infusion and fluid warming equipment.
8. Discuss management plan between surgical, anaesthetic and nursing teams:
   - Liaise with haematologist if necessary (Box A).
   - Consider interventional radiology.
   - Consider use of cell salvage equipment.
9. Monitor progress:
   - Use point of care testing: Hb, lactate, coagulation, etc.
   - Use lab testing: including calcium and fibrinogen.
10. Replace calcium and consider giving tranexamic acid (Box C).
11. If bleeding continues consider giving recombinant factor VIIa: liase with haematologist.
12. Plan ongoing care in an appropriate clinical area.

Box A: SPECIAL CASES

Seek advice from haematologist if:

- Non-surgical uncontrolled bleeding despite PRBCs/FFP/platelets
- Warfarin overdose
- Newer oral anticoagulants (eg dabigatran/rivaroxaban)
- Inherited bleeding disorder (eg haemophilia, von Willebrand disease)

Box B: TRANSFUSION GOALS

- **Maintain Hb > 80 $g.l^{-1}$**
- **Maintain platelet count > $75x10^9$ l^{-1}**
- **Maintain PT and APTT <1.5 x mean control** (FFP)
- **Maintain fibrinogen >1.0 $g.l^{-1}$** (cryoprecipitate)
- **Avoid DIC** (maintain blood pressure, treat/prevent acidosis, avoid hypothermia, treat hypocalcaemia and hyperkalaemia)

Box C: DRUG DOSES

CALCIUM: (use either the chloride or gluconate)

- Adult: 10 ml of 10% calcium chloride i.v.
- Adult: 20 ml of 10% calcium gluconate i.v.

- Child: 0.2 $ml.kg^{-1}$ of 10% calcium chloride i.v.
- Child: 0.5 $ml.kg^{-1}$ of 10% calcium gluconate i.v.

TRANEXAMIC ACID:

- Child: 15 $mg.kg^{-1}$ i.v. bolus then 2 $mg.kg^{-1}.h^{-1}$ until bleeding stops
- Adult: 1 g i.v. bolus, then:
  - Obstetric haemorrhage, repeat dose 30 mins later
  - Non-obstetric haemorrhage, 1 g i.v. infusion over next 8 h