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| 3-2 Massive blood loss v.2  |
| Expected or unexpected major haemorrhage. |

 START.

❶ Call for help, inform theatre team of problem and note the time.

❷ Increase FiO2 and consider cautiously reducing inhalational/intravenous anaesthetics.

❸ Check and expose intravenous access.

❹ Control any obvious bleeding (pressure, uterotonics, tourniquet, haemostatic dressings).

❺ 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.

❻ Begin active patient warming.

❼ Use rapid infusion and fluid warming equipment.

❽ 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.

**❾** Monitor progress:

* Use point of care testing: Hb, lactate, coagulation, etc.
* Use lab testing: including calcium and fibrinogen.

❿ Replace calcium and consider giving tranexamic acid (Box C).

⓫ If bleeding continues consider giving recombinant factor VIIa: liase with haematologist.

⓬ Plan ongoing care in an appropriate clinical area.

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| 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)
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| Box B: TRANSFUSION GOALS |
| * Maintain Hb > 80 g.l-1
* Maintain platelet count > 75x109 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)
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| 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
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