Use temporary adjuncts immediately e.g. pelvic sling or tourniquet. Proceed to damage control surgery or interventional radiology if essential to make critical decisions.

**Stop the bleeding!**

- **Uncontrolled bleeding?**
  - Review diagnosis
  - SBP below threshold?
    - Give minimal fluids
    - Give repeated small boluses of blood or other fluids (250-500 mL) to keep systolic BP > threshold
  - Exsanguinating?
    - Consider local haemostatic agents
    - Give blood or other fluids vigorously to reach threshold

**SBP threshold for deliberate under-resuscitation:**
- Blunt: 60 mm Hg
- Penetrating: 70 mm Hg
- Blunt with brain injury: 90 mm Hg

**Systolic BP thresholds for deliberate under-resuscitation:**
- SBP threshold in children: 70 + 2 x age (up to adult value)

**Near patient lab tests every hour:**
- Hb > 10 g.dL⁻¹
- Hct > 30%
- Platelets > 100 x 10⁶.L⁻¹
- INR < 1.3
- Fibrinogen > 1 g.L⁻¹

**Acute targets:**
- Convert to equivalent dose in children

**Ordering Blood and Blood Products in Uncontrolled Traumatic Haemorrhage**
- **Haemodynamic state**
  - No shock but evidence of uncontrolled bleeding
    - 4 units blood
    - 4 units FFP
    - Make available in Blood Bank
    - Platelets (PM) [Repeat or give extra products at 1 h intervals]
    - (Use to meet near-patient or laboratory test targets)
  
  - Shock but blood pressure above threshold
    - 4 units blood
    - 4 units FFP
    - 1 ATD = 4 donor units
    - (Request more to meet near-patient or laboratory test targets)

  - Shock needing < 1 L per 1/2 h to keep above threshold
    - 8 units blood
    - 8 units FFP
    - 2 ATD's = 8 donor units
    - (Repeat request every 1/2 - 1 hour)

  - Shock needing > 1 L per 1/2 h to keep above threshold
    - 8 units blood
    - 8 units FFP
    - 2 ATD's = 8 donor units
    - (Repeat request every 1/2 - 1 hour)

  - Exsanguinating
    - 8 units blood
    - 8 units FFP
    - 2 ATD's = 8 donor units

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**FURTHER INVESTIGATIONS**
- Rapidly confirm (or exclude) uncontrolled bleeding (e.g., using immediate chest x-ray, pelvic x-ray and FAST scan), so that perioperative hypotension (deliberate under-resuscitation) is not applied inappropriately.
- Consider further investigations only if feasible and necessary – there may not be time and the patient may be too sick.
- In specific circumstances, under senior control, it may be appropriate to unmask rapid CT scan only while still shocked.
- If not responding, reconsider the cause of shock (e.g., tamponade) or the source of bleeding (e.g., gastrointestinal).
- Obtain blood for near-patient testing (e.g., blood gas, TEC) and laboratory tests (e.g., CBC, INR, APTT, fibrinogen) hourly.

**PHYSICALLY STOPPING THE BLEEDING**
- Alert and mobilise surgical, anaesthetic and/or interventional radiology teams immediately.
- Employ immediate, temporary measures to help reduce bleeding (e.g., pelvic sling, tourniquet).
- Transfer the patient to the Operating Theatre or Radiology Intervention Suite.

**CORRECTING/PREVENTING COAGULOPATHY AND GENERAL SUPPORTIVE MEASURES**
- Keep the patient warm.
- Warm all intravenous bloods.
- Give blood and other intravenous fluids in aliquots of 250-500 mL.
- If SBP is below threshold, (80 mm Hg in blunt trauma; 90 mm Hg in blunt trauma with a serious head injury; 70 mm Hg in penetrating trauma).
- Take units of blood, FFP, and platelets into the ratio 1:1:1.
- Note that 1 Adult Therapeutic Dose (ATD) of platelets contains 4 donor units.
- Consider O-Rhesus negative blood if type-specific or cross-matched is not yet available.
- Consider blood salvage. Consider deliberate hypothermia in contained major arterial dissection. Give protamine complex concentrate if the patient is on warfarin and serious bleeding has been confirmed.
- Also give vitamin K to maintain reversal.
- Consider activated factor VII and tranexamic acid in specific situations. As soon as the haemorrhage stops and haemodynamic control has been regained (or if the situation becomes medical), abort unnecessary requests in progress and return surplus blood or products.
- Apply uncontrolled bleeding targets:
  - Hb > 10 g.dL⁻¹ or haematocrit > 30%
  - Platelets > 100 x 10⁶.L⁻¹
  - INR and APTT < 1.3
  - Fibrinogen > 1 g.L⁻¹
  - Ionised calcium > 1 mmol.L⁻¹.

**MODIFICATION IN CHILDREN**
- General systolic blood pressure threshold for permissive hypotension: 70 + 2 x age (up to adult value)

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