

## ICU module 1: Hypothermia

A 75 year old male patient presents to A+E with left lower abdominal pain. On assessment he is found to be pale and clammy, hypotensive 80/40 and tachycardic 125bpm.

- What is the most important diagnosis to immediately exclude and how can this be achieved in A+E?
  - Rupture of abdominal aortic aneurysm
  - Ultrasound scan across abdomen
  
- What are the Initial management priorities?
  - ABC – insertion of large bore cannula and immediate IV fluid resuscitation essential
  - Crossmatch and consider the use of O negative blood
  - Commence preparation for theatre
    - Contact vascular surgeon
    - Anaesthetic review
    - Alert theatre staff
  
- What are the surgical options for this patient and what investigations are necessary for each?
  - Open abdominal aortic aneurysm repair – no specific investigation required
  - Endovascular Aneurysm Repair (EVAR) – requires a CT scan of the aorta to assess suitability and operative planning/approach
  
- Patient in theatre has become hypothermic. What possible reasons for this can you think of?
  - Cold whilst in A+E and transfer to theatre
  - Temperature in theatre
  - Blood loss
  - Anaesthetic drug induced vasodilation
  - Blood products/fluids not being warmed
  - Open wound losing heat by evaporation
  - Loss of thermoregulatory mechanisms due to muscle relaxation for example
  
- Define hypothermia
  - Core body temperature of less than 36 degrees Celsius
  
- What problems can hypothermia lead to?
  - Coagulopathy – increased blood loss
  - Immune system impairment – increasing infection risk demonstrated
  - Delayed wound healing

- Delayed recovery from anaesthesia
- What strategies can be employed to avoid hypothermia?
  - Bare hugger
  - Warmed fluids
  - Minimal unnecessary exposure

In theatre, there is significant blood loss and you need to activate the massive transfusion protocol. What are the principles of the massive transfusion protocol?

- In addition to receiving RBC, need to give early FFP to avoid coagulopathy, and platelets to avoid thrombocytopenia.
- Ultimately aim to control the source of bleeding

What is the definition of a massive blood transfusion?

- Massive transfusion is arbitrarily defined as the replacement of a patient's total blood volume in less than 24 hours, or as the acute administration of more than half the patient's estimated blood volume per hour.

What are the complications of massive blood transfusion?

- Hypothermia
- Hyperkalaemia
- Hypocalcaemia
- Dilutional thrombocytopenia
- Coagulation factor depletion
- ARDS

What monitoring tests should be undertaken to guide ongoing component replacement

- Haemoglobin – Packed red cells
- Platelet count – platelets
- Prothrombin time / activated partial thromboplastin time – Fresh frozen plasma
- Fibrinogen - Cryoprecipitate

Resources: NICE guidance into perioperative hypothermia

<http://www.nice.org.uk/nicemedia/pdf/CG65NICEGuidance.pdf>