

## Haemorrhagic shock in the trauma patient

**Circulating volume: 7% of total lean body weight (adjust this in obese people)**  
**For kids, its 9% of lean body weight**

Hemorrhage is classified according to clinical signs.  
Volume replacement rate does not rely on this initial classification.  
**The replacement rate should be guided by response to replacement.**

- **CLASS 1 HAEMORRHAGE:**
  - 15% of blood volume is lost
  - **Mild tachycardia** is the only sign
  - Blood volume is restored within 24 hours
  - May not need fluid replacement
  
- **CLASS 2 HAEMORRHAGE:**
  - 15-30% of blood volume is lost: 750 to 1500ml of blood
  - **Tachycardia**
  - **Tachypnoea**
  - **Narrowed pulse pressure**
  - Urinary output may not be affected!
  
- **CLASS 3 HAEMORRHAGE:**
  - 30-40% of blood volume is lost – around 2000ml
  - **Marked tachycardia**
  - **Tachypnoea**
  - **Hypotension**
  - **Significant changes in mental state**
  - **Significant drop in urine output**
  
- **CLASS 4 HAEMORRHAGE:**
  - Over 40% of blood volume is lost
  - **Massive tachycardia**
  - **Extreme hypotension**
  - **Unobtainable diastolic pressure**
  - **Negligible urine output**
  - A loss of over 50% of blood volume causes a loss of consciousness

### **WHY IS THIS IMPORTANT?**

If a medically normal 70kg trauma patient arrives to ED with a low systolic blood pressure, you can work out that they must have lost AT LEAST 30% of their blood volume (30% of 5L = 1.5 litres)

This helps you work out how much you need to replace, with the “3 for 1” rule.  
I.e. this guy will need 4.5 litres of crystalloid to resuscitate.