DEFINITION

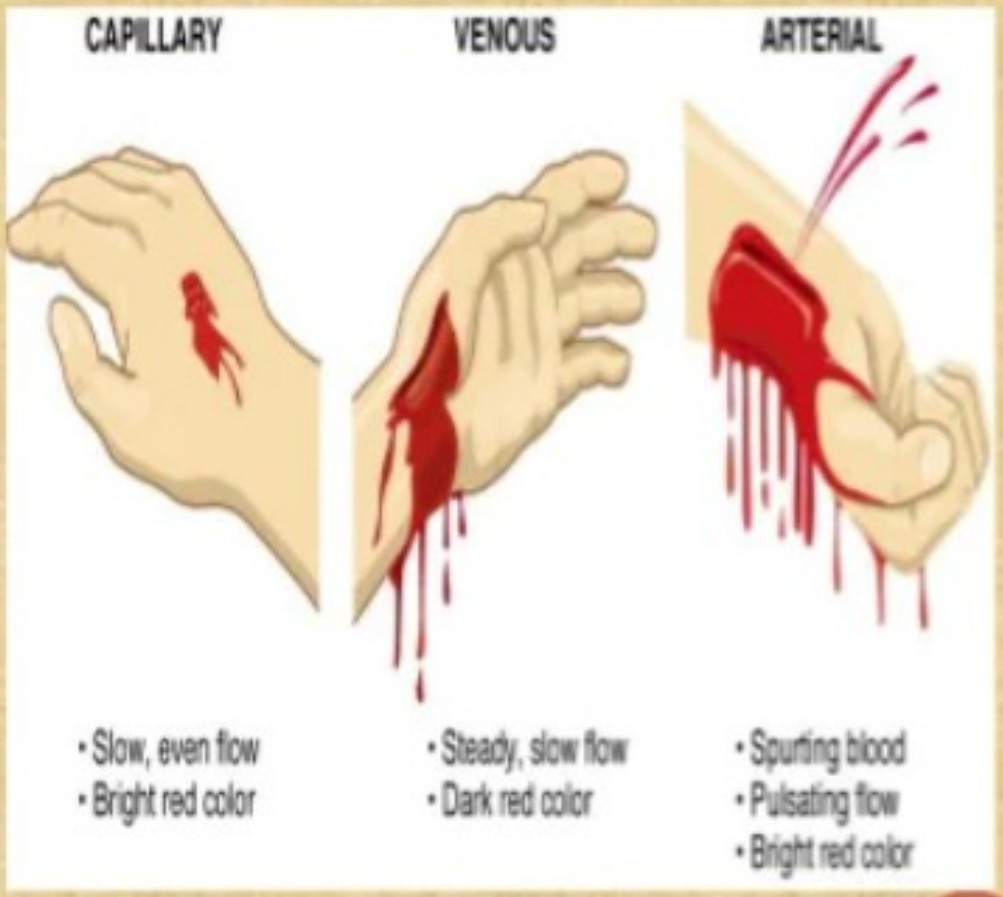
- *Haemorrhage means escape of blood outside its containing vessel.*

CLASSIFICATION

- Depending on nature of the vessel involved
- Depending on the timing of haemorrhage
- Depending on the duration of Haemorrhage
- Depending on the nature of bleeding
- Depending upon type of Intervention

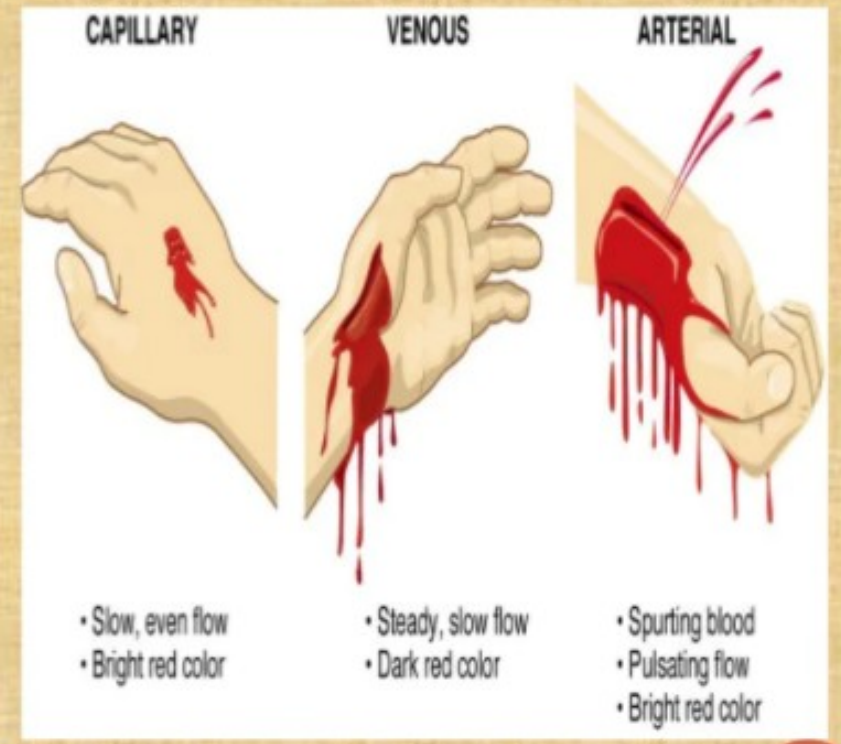
1A - SOURCE - ARTERIAL

- Bright red
- Emitted as spurting jet
- Can lead to severe blood loss
- Often hard to control



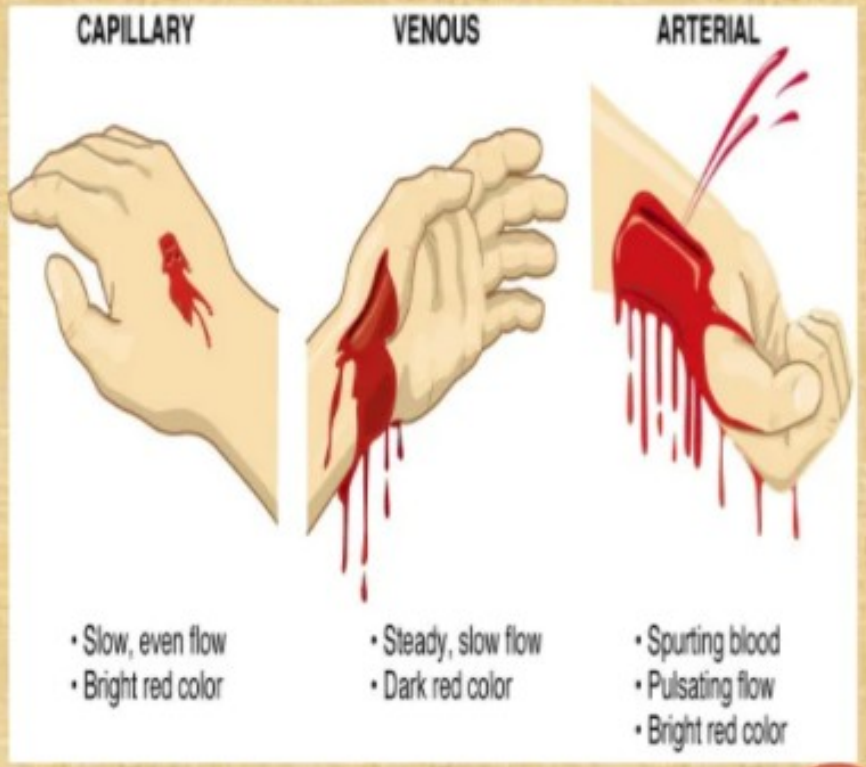
1B - SOURCE – VENOUS

- Darker red
- Steady and copious flow
- Color becomes further darker with oxygen desaturation
- Usually easy to control



1C- SOURCE – CAPILLARY

- Bright red
- Rapid and oozing
- Blood loss becomes serious if continues for hours
- Generally minor & easy to control



2A - TIMING - PRIMARY

- Occurs at the time of surgery
- Cause is injury to vessels
- May be arterial, venous or capillary
- More common in surgery on malignancies

2B - TIMING - REACTIONARY

- Bleeding within 24 hours (usually 4-6 hrs) of surgery
- Cause is slipping of ligature, dislodgement of clot or cessation of reflex vasospasm
- Bleed starts when there is a rise in the arterial or venous pressure.

2C - TIMING – SECONDARY

- Occurs after 7-14 days of surgery
- Cause is sloughing of vessel due to infection, pressure necrosis or malignancy.
- 1st a warning stain followed by a sudden severe bleed
- Common after hemorrhoids surgery, GI surgery & amputations.

3 – DURATION

- ***Acute Haemorrhage***: occurs suddenly. eg. Oesophageal variceal bleeding due to portal HT.

- ***Chronic Haemorrhage.***

4A – NATURE / TYPE

- ***External Haemorrhage or Revealed*** :
- External or visible bleed – soft tissue injuries
- Bleeding from the limb vessels, wound,nose etc.

4B – NATURE / TYPE

- ***Internal Haemorrhage or Concealed*** :

- Internal or invisible bleed – Blunt or Penetrating trauma
- May remain concealed as in ruptured spleen or liver
- Concealed hemorrhage may become revealed as in haemetemesis or melaena in peptic ulcer bleed

5 – TYPE OF INTERVENTION

- ***Surgical Haemorrhage***: is the result of injury and amenable to surgical control, or from angioembolism.

- ***Non-Surgical Haemorrhage***: is general ooze from all raw surface due to coagulopathy, it can not be stopped by surgical mean, require correction coagulation abnormalities.


A
B
C

PATHOPHYSIOLOGY

Bleeding → Hypovolaemia → Hypoperfusion

Cellular anaerobic metabolism + Lactic acidosis

↓ coag.proteases → coagulopathy & Hge

{ ↑ Ischaemic cells - anticoagulation pathway }

↓ tissue perfusion + BS – gut & muscle ↓

[early in compensatory process]

- CONTD

Underperfused muscle – unable to generate heat

↓

Hypothermia
Coag. Fn. Poor ↓ temp.

↙ ↓ ↘

Hge Hypoperfusion Acidosis

↓

DEATH

CLINICAL FEATURES

- Pallor, thirsty, cyanosis
- Tachycardia, tachypnoea
- Cold clammy skin due to vasoconstriction
- Dry face, dry mouth and goose skin appearance (due to contraction of arrector pilorum).
- Rapid thready pulse, hypotension
- Oliguria
- Features related to specific causes

DEGREE OF HAEMORRHAGE

- Degree of hemorrhage is classified into 4 classes
  1- Blood volume loss < 15%
  2- Blood volume loss between 15 – 30%
  3- Blood volume loss between 30 – 40%
  4- Blood volume loss > 40%

MEASUREMENT OF BLOOD LOSS

- ***Normal blood volume (5 l) is estimated as 70 ml/kg – children & adults and 80ml/kg – neonates.***
- Estimation – difficult & inaccurate
- OT - Blood in suction apparatus – measured & swabs soaked in blood – weighed.
- Hb% and PCV estimation.

MANAGEMENT - CONCEPTS

- Identify – Hge / Hypovolaemia & Shock – clincally
- Resuscitation – O2 / Blood & Fluids
- Identify site of Hge - U/S, endoscopy, CT scan, DPL, Blood tools etc.
- Control of Hge – Surgery, endoscopic control, therapeutic embolisation.
- Definitive treatment if any
- Sepsis control
- Prevention of coagulopathy
- Critical care management
- End-point resuscitation, fluids & electrolyte management, prevention of organ failure

“When there is **blood loss**, replace with **blood**”

Apply direct pressure:
- with gloved hand,
- sterile dressing(s).

No ← **Bleeding stopped?** → **Yes**

Elevate extremity:
- above victim's heart, continue direct pressure

No ← **Bleeding stopped?**

Locate pressure point, apply pressure:
- maintain direct pressure over wound

No ← **Bleeding stopped?**

Bleeding from extremity? → **Yes**

Yes → **Apply tourniquet** (last resort)

No → **Definitive therapy**

Treat for shock:
- care for wound,
- seek definitive care