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AIMS

- To give you a basic understanding of the relevant anatomy & physiology
- Prepare you to be able to carry out safe and competent collection of blood samples
- Prepare you to minimise the risks of venepuncture and deal with complications that may arise
- Help you achieve your venepuncture competency

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Accountability

- Who are you accountable to ?
- How do you ensure you work safely and competently?
  - Ensure trained
  - Ensure assessed as competent
  - Follow trust procedures and policies
  - Say NO if unsure
  - Always work within NMC Code of Professional Conduct
  - Report all errors and near misses

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Anatomy & Physiology

- OVERVIEW OF CARDIOVASCULAR SYSTEM
- ARTERIES
- VEINS
- CAPILLARIES

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Arteries

- Pulsatile flow of oxygenated blood under high pressure.
- Thick muscular walls.
- Contract or relax under the influence of various stimuli.

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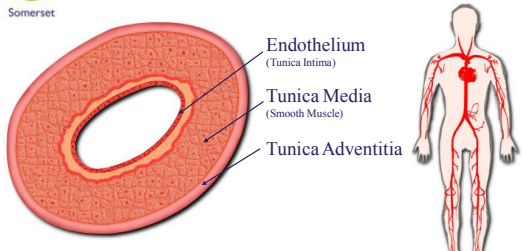
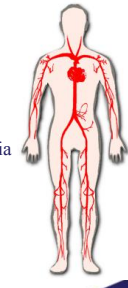
Arteries





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VEINS

- Non pulsatile flow of deoxygenated blood under low pressure.
- Thinner more elastic muscle layer.
- Series of one way valves.

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Veins

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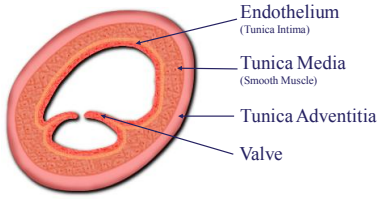

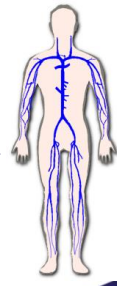

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Veins

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- Contract and relax when stimulated.
  - Heat encourages dilation.
  - Cold causes vasoconstriction.
- Anxiety - can initiate a vasovagal reaction.
  - will cause peripheral shutdown.
  - veins difficult to identify/access.

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Valves

- Veins return blood to the heart and lungs against gravity.
- Valves prevent backflow and pooling.
- Intimately located to muscles which act as a pump.

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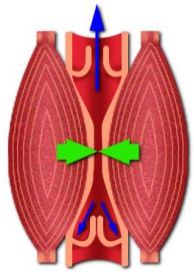
Venous Pump



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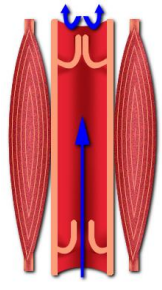
Venous Pump



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The Endothelium

- This is the innermost lining of all blood vessels.
- Acute damage following venepuncture can lead to:
  - inflammation
  - phlebitis
  - clotting
  - thrombosis

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The Endothelium

Damage could result from poor technique eg:

- Rapid needle advancement.
- Poor anchoring of the vein.
- Inserting too large a needle.
- Inadequate securement of device.
- Poor aseptic technique.

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The Function Of Blood

- To carry oxygen and nutrients to all tissues and remove waste products

COMPONENTS

- Red blood cells
- White blood cells
- Platelets
- Plasma

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Biochemistry & Haematology Tests

- Indicate relatively common disorders
- Enable diagnosis
- Follow the course of a disease
- Regulate therapy

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Infection

EXOGENOUS from
- micro-organisms that originate outside body

i.e. cross-infection from
  - environment
  - equipment
  - staff

ENDOGENOUS from
- organisms already present in or on the body

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Intrinsic Contamination

Occurs prior to use of equipment and may be due to:
- faulty manufacturing
- poor transport
- poor storage
- inappropriate use of equipment

From:
- creams, lotions, ointments used at IV site
- venepuncture device
- dressings

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Extrinsic Contamination

- Occurs at any point during use of equipment
- Generally due to poor adherence to policy.

from:

- insertion / manipulation of device
- dressings

- Can be reduced by:
  - good hand hygiene
  - suitable equipment choice
  - Good technique

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Hand Washing The Most Important Job Of The Day

- Correct choice of washing agents
- Good technique
- Dry thoroughly
- Protect hands with moisturising creams
- Cover all cuts and abrasions
- Use alcohol gel to decontaminate

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1

Palm to palm.

2

Right palm over left dorsum and left palm over right dorsum.

3

Palm to palm fingers interlaced.

4

Backs of fingers to opposing palms with fingers interlocked.

5

Rotational rubbing of right thumb clasped in left palm and vice versa.

6

Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa.

5.3

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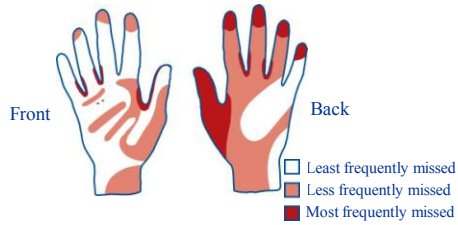
Hand washing is the single most important measure for preventing infection.



5.2

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Needlestick Injuries

- Don't suck it!!
- Encourage bleeding immediately
- Hold under running water for 4 – 5 minutes, still encouraging bleeding
- Cover with a waterproof dressing
- Complete incident form with senior member of staff and report to OH or oncall haematologist

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The Patient

What should you check before beginning

- That the sample is needed
- Identity of patient
- Consent
- Patient allowed to ask questions and discuss procedure
- Patient is comfortable

The Environment

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What you should check before beginning

- Area clean and free from hazards
- Privacy
- Patient comfortable (support arm)
- Equipment assembled correctly
- Patient (and nurse!) warm enough
- Adequate lighting

The Nurse

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What you should check before beginning

- Equipment assembled
- Hands washed
- PPE worn (personal protective equipment)
- Competent to perform procedure

Labelling Of Samples

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- Ensure correct patient identity – **positive identification**
- Never pre label tubes
- Complete all details on sample tube
  - **<u>*NB blood transfusion</u>**
    - Full name of patient
    - Location
    - NHS number
    - Date of birth
    - Date and time of sample
    - Initial / sign bottle

Completion Of Request Form

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Ensure the following completed

- Full name of patient
- Date of birth
- NHS number
- Address
- Location of patient eg Fosse Ward
- Where to send copy if applicable eg GP
- Test(s) required
- Relevant clinical details
- Other info the lab should know

The Procedure (part 1)

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- Select vein
- Apply tourniquet (may be needed to enhance selection of vein but do not leave on too long)
  - Patient choice
  - Visual inspection of both limbs
  - Distal first
  - Palpate vein
  - Check for valves

Selection Criteria

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- Use distal veins first.
- Use veins that feel soft and resilient.
- Use large veins where possible.
- Use veins on patient's non dominant limb.
- Ensure limb is well supported.

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Areas To Avoid

- Veins that feel hard and sclerosed.
- Small, visible but impalpable veins.
- Veins in close proximity to arteries/arterial lines.
- Veins in lower limbs.
- Veins damaged by previous cannulation.
- Areas close to existing wounds.
- Limbs affected by lymph node dissection or radiotherapy or on fractured limb.

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The Procedure

- Clean skin
  - Rub with Steret for 30 secs and **allow to dry (Do not repalpate vein)**
- Assemble needle and barrel
- Stabilise vein with digital traction
- Insert needle into vein with bevel up
- Insert 1st sample collecting tube
- Repeat until all samples withdrawn
- Remove tourniquet during filling of last tube * (tourniquet may need to be removed prior to certain samples)

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Procedure continued

- Cover insertion site with sterile gauze
- Remove needle **then** apply pressure to site
- Dispose of equipment safely
- Label samples
- Dress insertion site and ensure patient well

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Problems

- Unable to find a vein
- Anxiety
- Spurt of blood on insertion of needle
- Missing the vein on insertion of needle
- Blood stops flowing through the device
- Haematoma
- Pain
- Faint
- Hitting an artery
- Hitting a nerve

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Documentation

- Date
- Time
- Samples collected
- Site(s) used for puncture
- Any difficulties encountered
- Any further actions needed eg warfarin
- Signature and designation

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Any Questions????????