

# Phlebotomy tips for junior doctors

The term phlebotomy refers to the ancient practice of blood letting, which involved the withdrawal of large amounts of blood in an attempt to cure illnesses and disease. This practice has been virtually abandoned but the term phlebotomy is still widely used for the withdrawal of blood from a vein, artery, or the capillary bed into blood specimen collection tubes for laboratory analysis or blood transfusion.

Phlebotomy is a skill that every medical student or new doctor will have to master. This technique will be a day-to-day procedure until the doctor has juniors to whom the job can be delegated. As one goes up the medical hierarchy, the frequency of performing phlebotomy goes down; however, when the junior fails to do it, he/she will seek the senior's help. Most of the hints here are applicable to those who are new to phlebotomy, and some are applicable to NHS trainees only.

Some of the essential tips for good phlebotomy practice are often repeated. Here they are mentioned to refresh the memory. It is good to observe and learn the skills from a trained doctor, phlebotomist or nurse doing a venepuncture before you start doing them on your own.

## Remember the following before you bleed someone

**Patient's name, date of birth and hospital ID number** must be checked before bleeding them. Proceed after assessing the patient and their environment.

**High-risk patients' samples** need higher self-protection, safer disposal of material and careful cleansing of spillage if any.

**Look confident and wear a smile.** Make sure that the light source is adequate to see an appropriate vein.

**Ensure you have all the necessary equipment** before you perform the venepuncture.

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**Bleed from a good vein,** do not try multiple attempts from multiple sites and then give up.

**On site compression** should be used to prevent bleeding after withdrawal of the needle, particularly in patients who are being given anticoagulants.

**Tidy up any mess** and take care to dispose of your sharps. Write the sampling time (especially if out of hours) onto the patient's notes, so that the next shift doctor does not repeat it and is fully updated during consultant rounds. Take care to label tubes correctly with the:

Patient's surname and first name

Unique patient ID number

Date and time specimen was collected

Identity of the person who collected the specimen with bleep number whenever possible.

**Other precautions** for psychiatric and paediatric patients should be borne in mind.

**Make sure you thank the patient** for their cooperation before you leave.

**You may be welcomed** for the next venepuncture if you have done your job well.

## Lessons from experience and mistakes

Try not to repeat sampling on the same patient at very short time intervals, unless there are compelling reasons. It is better to send off an extra sample than to have to do an extra venepuncture on the patient. Examples include blood sugar on a diabetic postoperative patient or an activated partial thromboplastin time (APTT) on a patient on heparin infusion even when not asked for – use your common sense.

There may be research doctors who bleed patients for their study; you can ask them to collect samples for your investigations at the same venepuncture or offer to bleed the patient for both needs.

Be extra cautious not to puncture a vein that has been marked with indelible ink to be used for a bypass graft. Many patients are aware if their arm or leg vein is going to be used for a bypass graft – ask them before you perform the venepuncture. Similarly make sure you are not puncturing an arteriovenous fistula – feel for pulsatile veins.

Many patients will tell you which arm is better for venepuncture. Develop the 'ask' culture, patients can be very informative.

In some cases the vein can never be seen – feeling for the vein in these patients will help. Veins are compressible – try feeling them in your arm for practice. A cord-like, hard or painful vein is thrombosed, so avoid it.

A gentle tap over the vein should make it stand out better for inspection and palpation. Getting the patient to make a fist and squeeze and release will also help. In difficult cases, fill a glove with hot water (not boiling) and place it on the site where you are likely to try – it may help you identify a vein.

If you work in the vascular surgery department, a portable Doppler will give you the landmark for a vein; however, you must have heard venous signals from a Doppler before you try to use this method to identify a vein.

Always have a few spare butterfly needles (of different sizes) with you – they will be of great use especially in small calibre veins.

When obtaining blood for culture, it is very important to perform the procedure by strict aseptic technique to avoid contamination. Select the vein and clean the area around it with a steret. However tempting it may be, do not then feel the vein before you puncture the skin. Once blood has been taken into a syringe, change the needle on the syringe and fill the blood culture bottle first. Ensure that the rubber bung on the culture bottle is cleaned with a steret before it is pierced. Then proceed to obtain other samples.

Ensure that you fill the vacutainers appropriately (*Figures 1 and 2*), especially the ones going to the blood bank for cross match and the one for coagulation studies. These must be filled to the indicated mark on the vacutainer, not more or less. Failure to do so will require a repeat procedure, which is unpleasant for the patient and tiring for you.

Haemolysed samples will give false values and the lab may call you to repeat the sample. It is difficult to know if the sample is haemolysed or not at the time of sampling, but good technique often avoids the problem. To prevent this from happening,

vein selection has to be good and there should be minimal or no effort to forcefully aspirate blood into a syringe, especially when used for blood sampling.

Avoid strangulating the limb with a tourniquet; do not leave it on and go away from the patient. Some tourniquets can only be removed by familiar hands. Patients should not be expected to be tourniquet trained.

There may be times when you are asked to site a venous cannula in a patient who has no good veins. Try and combine cannulation and sample drawing in one go – it saves time and pain for you and the patient.

If you cannot draw a blood sample from a peripheral vein and the patient has a central venous access, you can get blood from it keeping the following points in mind:

- Do not stop any drug infusion into it without telling a senior nurse
- If you stop a crystalloid or colloid infusion to facilitate sampling, wait for a

minute or two before commencing the sampling

- Discard the first sample drawn from the access line, as it can give erroneous biochemistry and haematology results
- Do not let the three-way adapter usually attached to the venous access open in the wrong direction as this can cause massive bleeding or create an air embolism
- Ensure that you flush the access line with saline
- Restart the ongoing infusion or close the adapter.

Rarely you may encounter patients with exactly the same name, especially on the receiving week. Avoid bleeding them in succession to ensure that you do not mix the vacutainers inadvertently.

Label your samples and fill in the forms with care. Use sticky labels when provided. Some hospitals request crossmatch samples to be labelled by hand.

In university hospitals there is always someone in the labs to run samples, but in small district general hospitals you may have to call the lab technician to inform them about the despatch of sample(s) from your end and occasionally get verbal reports before the results are available on the intranet system. The same applies for porters in hospitals without a chute system. Do not refrigerate blood culture bottles – bacteria need to grow! Wherever possible, place them in an incubator.

**Figure 1. Adult blood collection tubes. 1. Large EDTA (ethylenediamine tetra-acetic acid): cross match. 2. Small EDTA: full blood count. 3. Lithium heparin: urea and electrolytes, liver function tests, bone profile. 4. Coagulation studies. 5. Plain tube for immunology. 6. Fluoride tube glucose. 7. Erythrocyte sedimentation rate tube.**



**Figure 2. Paediatric blood collection tubes: 1. EDTA (ethylenediamine tetra-acetic acid) tubes in various sizes 2.5 ml, 2 ml, 1 ml and 0.5 ml. 2. Lithium heparin 1 ml and 0.5 ml. 3. Citrate tube for coagulation studies. 4. Fluoride tube. 5. Erythrocyte sedimentation rate tube.**



### Taking blood from children

- Do not perform a blood test unless absolutely essential.
- Always explain the procedure both to the child and parents – children are capable of understanding. Try to avoid using jargon.
- Always offer a local anaesthetic cream – EMLA and amethocaine (Ametop) are widely used in all but small infants. Give it time to work – Ametop takes about half an hour, EMLA takes nearly an hour to work and they last for 4–6 hours. Some children may be allergic to the agents – watch out for them.
- Select the site you want for venepuncture, so that the correct place is anaesthetized. Unless specifically instructed nursing staff tend to apply two or three patches of Ametop or EMLA cream on

areas such as the cubital fossa. This is not a suitable site in infants and toddlers. This could waste time and lead to ineffective analgesia.

- Parents often want to stay in the room; do not let that unnerve you. Remember that their presence will comfort the child.
- Have an able assistant who will restrain the limb.
- Remove all dressings with anaesthetic cream before you start.
- Warn children before you insert the needle – otherwise you might scare them – the cream numbs the pain but they will still feel the jab.
- If cannulating, then use the largest cannula you think will fit the vein as this will last longer.
- Patience is the key. Advance the needle slowly – you may not get a flashback immediately.
- Once successful, fix the cannula. Getting it in is the easy bit, keeping it in is harder.
- Compliment your patient for being brave and you will be rewarded with a smile. Reward stickers are available on most children's wards.
- Never force an unwilling child to have blood taken. Try and reason with the child or get the parents to convince the child. Contact your senior if there is a problem.

### Conclusions

This is an overview of the authors' general and personal experience. However, there is no substitute for one's own experience. Taking every available opportunity to perform venepuncture will considerably increase your skills. **BJHM**

*Conflict of interest: none.*

### KEY POINTS

- Phlebotomy is an essential skill for all doctors.
- Preparation and practice is the key to a successful outcome.
- Sometimes special precautions need to be borne in mind.
- Venepuncture in children demands a more considerate approach.