

Cannulation (using the one-handed technique)

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A peripheral cannula provides the patient with short-term venous access for intravenous therapy such as fluid replacement, blood transfusion or antibiotic therapy. Most cannulae need to be resited only when clinically indicated (Loveday *et al.*, 2014). Before inserting a cannula, consider the purpose, type and duration of therapy, the condition of the vein and the patient's needs concerning location of the device (Dougherty & Watson, 2011).

Select a suitable vein before selecting the device. The veins of choice are the cephalic or basilic. Avoid using the antecubital veins as this will restrict the patient's movement and increase the risk of complications such as phlebitis and infiltration (Dougherty & Watson, 2011; RCN, 2010). The vein should feel bouncy and soft, and should refill when depressed (Witt, 2011). Select the gauge size of the cannula according to the patient's vein size, and the cannula's ability to accommodate the type of therapy (e.g. viscous fluids and the flow rate of the infusion) (Dougherty & Watson, 2011), but use the smallest-gauge cannula that will meet the patient's needs (RCN, 2010). Wherever possible, use an extension set. Although it increases the cost, it reduces the risk of mechanical phlebitis and dislodgement. By preventing movement of the cannula (piston-like motion that could drag microorganisms into the vein) it could also prevent infection (Dougherty, 2008).

Use of a disposable tourniquet is recommended (RCN, 2010). Apply the tourniquet so it does not pinch the skin; it should impede venous but not arterial flow (Witt, 2011). Clean the patient's skin adequately before cannulation. Use 2% chlorhexidine gluconate in 70% isopropyl alcohol (Loveday *et al.*, 2014) for a minimum of 30 seconds, and allow the skin to air dry to ensure the coagulation of any organisms and to prevent stinging as the needle pierces the skin (RCN, 2010). Shaving of the site is not recommended (RCN, 2010). The one-handed or hooded technique is more difficult to learn initially, but is more successful: the vein is stabilised throughout insertion, thereby preventing a through puncture, and reducing damage to the endothelium, and pain (Dougherty & Watson, 2011).

Gloves should be worn to protect from blood spillage and to reduce the amount of exposure to blood should a needlestick injury occur (RCN, 2010; NICE, 2012). Dispose of sharps immediately. Use of safety cannulae and needle-free injection caps will minimise the risk of needlestick injuries during the insertion of a cannula and their use is recommended (Health and Safety Executive, 2013; The European Council, 2010; RCN, 2010). Documentation is important. Record the date, time of insertion and removal, location and gauge size, and sign the record (DoH, 2010; RCN, 2010).

Monitor the patient's cannula whenever an infusion is connected, an injection administered or at least once a day if not in use (DoH, 2010). Check for signs of phlebitis or infection (erythema and pain) using a phlebitis scale, such as the visual infusion phlebitis score (Loveday *et al.*, 2014; Dougherty & Watson, 2011), and for signs of infiltration (oedema at insertion site). Cannulae should be removed as soon as therapy is completed or when there are any signs of complications (Loveday *et al.*, 2014; DoH, 2010; RCN, 2010).

Explain the procedure to the patient before beginning and give him or her the opportunity to voice any concerns, express any preferences or ask any questions. Ensure that the patient gives consent (Hyde, 2011).

Equipment



Before opening packets of sterile equipment, disinfect the surface of a tray with an alcohol wipe or spray, or a detergent wipe, or soap and water, according to local policy.

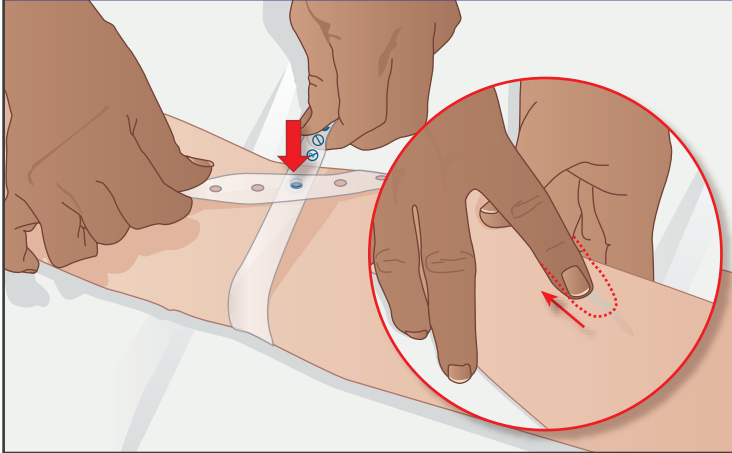
Wash your hands



Wash your hands with an appropriate bactericidal solution and dry well (NICE, 2012).

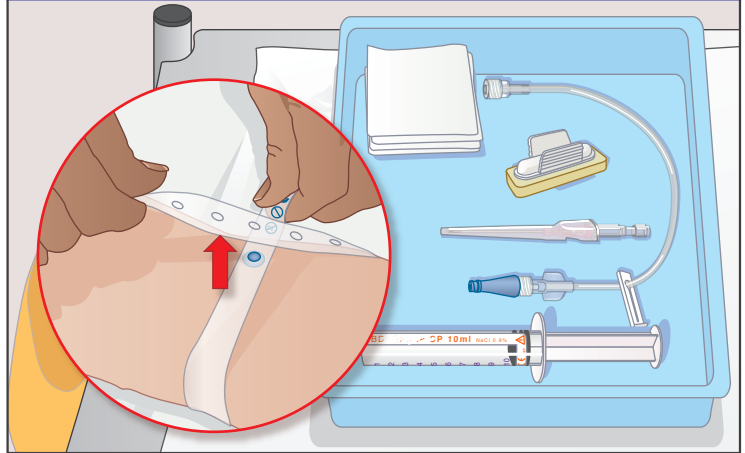
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Apply the tourniquet and encourage venous access



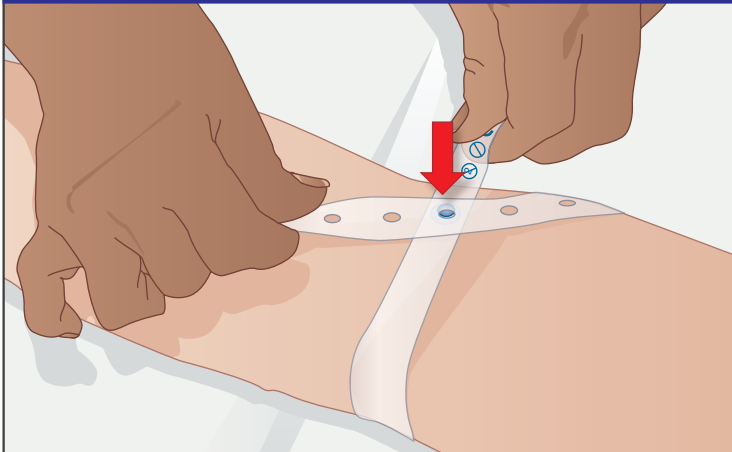
Apply the tourniquet. Assess and select a vein. *Gentle* tapping may help; or encourage venous access using gravity (ask the patient to open and close his/her fist) or by soaking the arm in a bowl of warm water (Witt, 2011).

Release the tourniquet and open the sterile pack



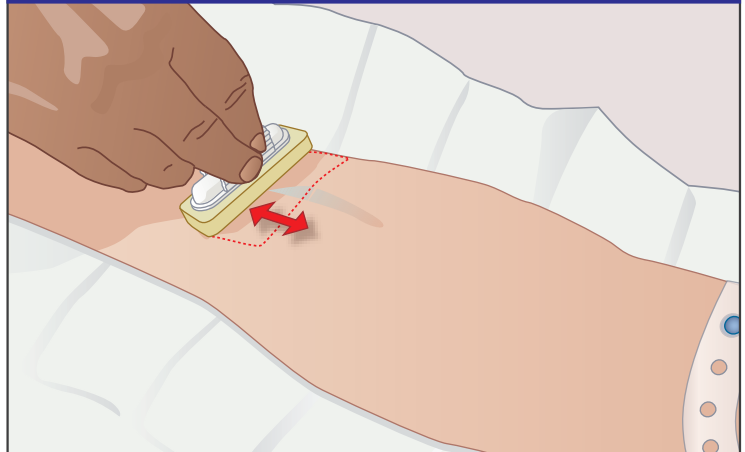
Release the tourniquet until you are ready to proceed (inset). Select the device based on vein size, location, etc. Open a sterile pack and add appropriate equipment to the tray, or otherwise create a sterile field. Prime the extension set with 0.9% sodium chloride. Place a sterile towel under the patient's arm to create a clean working area.

Reapply the tourniquet



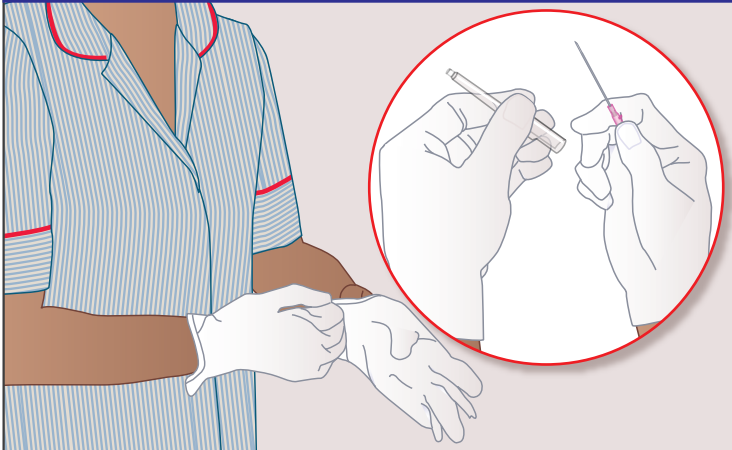
Reapply the tourniquet. If necessary, repalpate the vein.

Cleanse the skin



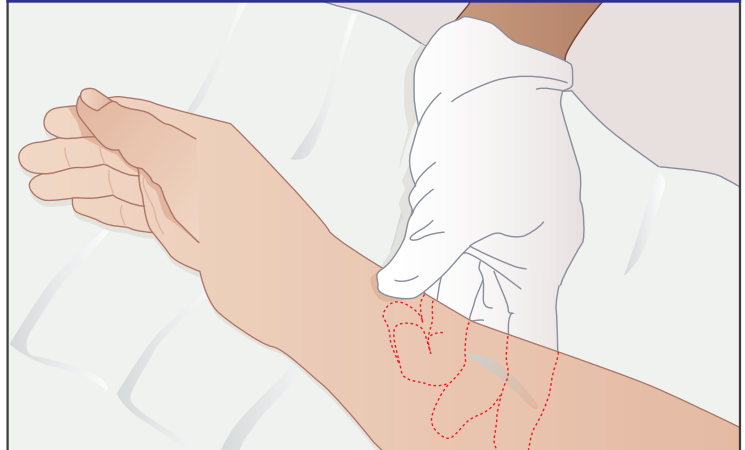
Apply 2% chlorhexidine gluconate in 70% isopropyl alcohol to the selected vein for a minimum of 30 seconds, using several strokes back and forth with friction (Loveday *et al.*, 2014; NICE, 2012; Dougherty & Watson, 2011). Allow the solution to air dry. Do not repalpate the vein or touch the skin after this.

Put on gloves



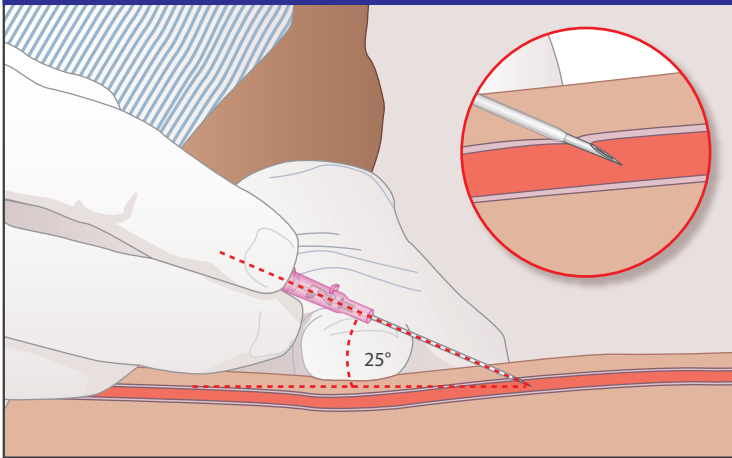
Apply bactericidal gel to your hands and put on gloves (Dougherty & Watson, 2011; De Verteuil, 2011). Remove the device from the packaging and inspect it for any faults.

Stabilise the vein with your nondominant hand



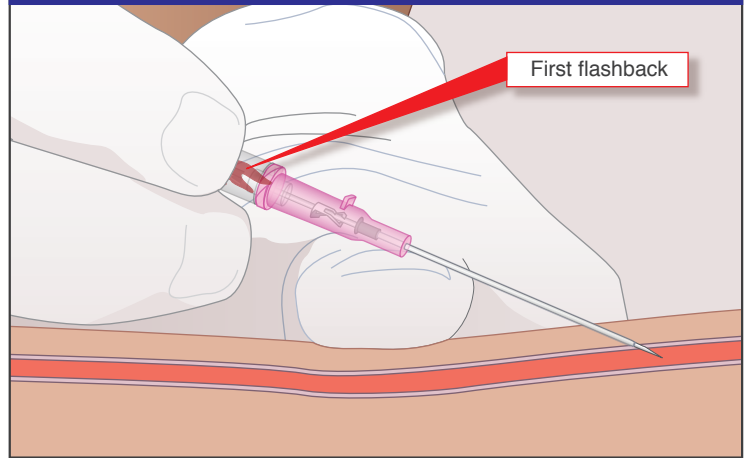
Stabilise the vein by applying manual traction on the skin (this also stabilises the arm) (Dougherty & Watson, 2011; De Verteuil, 2011).

Insert the cannula



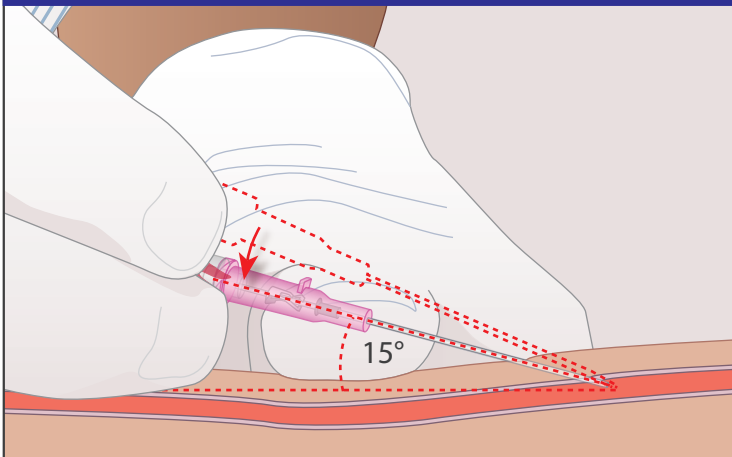
Ensure the cannula is in the bevel-up position. Place the device directly over the vein and insert the cannula through the skin at the selected angle (between 10° and 40°) according to the depth of the vein (Dougherty and Watson, 2011; De Verteuil, 2011).

Confirm access into the vein



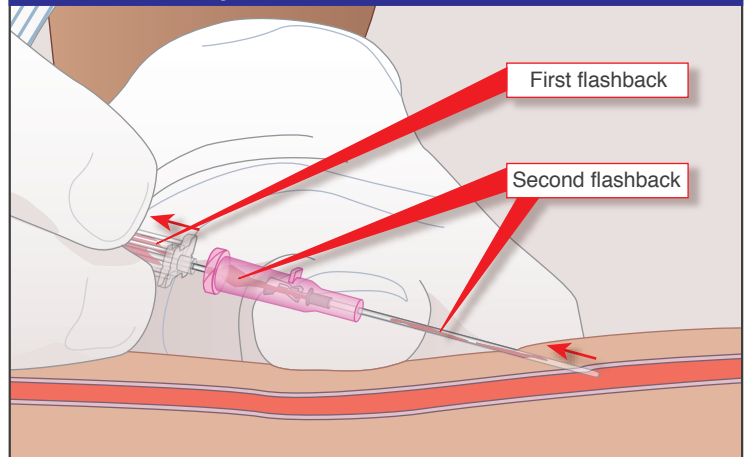
Wait for the first flashback of blood into the flashback chamber of the stylet (Dougherty and Watson, 2011; De Verteuil, 2011).

Level the cannula



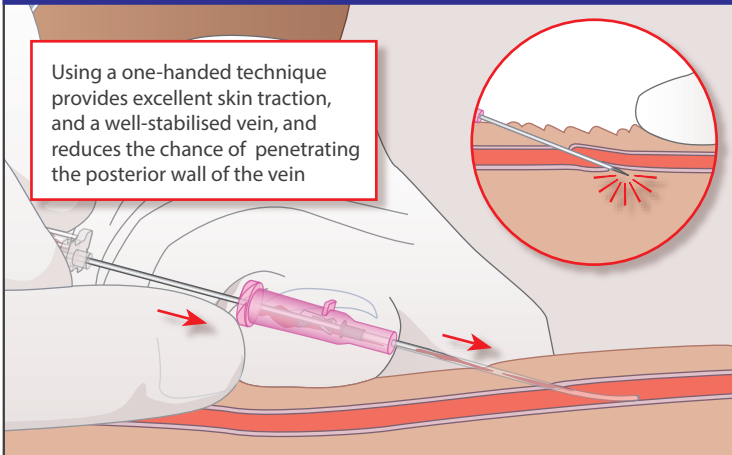
Level the cannula by decreasing the angle between it and the skin. In this example, the cannula is lowered to an angle of 15° with the skin, but the angle can be less. Advance the cannula slightly to ensure entry into the lumen of the vein (Dougherty and Watson, 2011; De Verteuil, 2011).

Withdraw the stylet



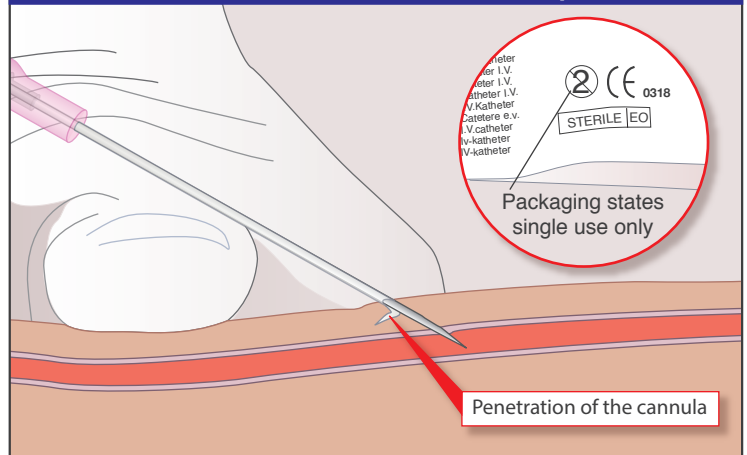
Once you have observed the first flashback, withdraw the stylet slightly through the cannula. You will see a second flashback of blood along the shaft of the cannula (Dougherty and Watson, 2011; De Verteuil, 2011).

Advance the cannula



Maintaining skin traction with the nondominant hand, slowly advance the cannula off the stylet and into the vein with the dominant hand. Release traction and then release the tourniquet (Dougherty and Watson, 2011; De Verteuil, 2011).

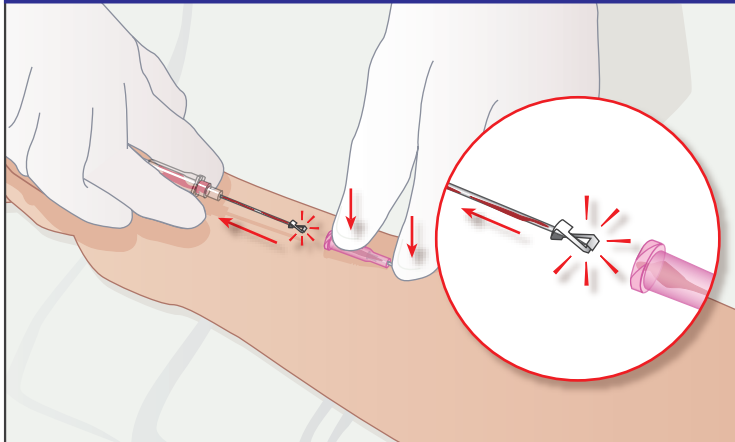
Failure to access the vein at the first attempt



Never reintroduce a stylet, because you could penetrate the cannula and/or the vein (Dougherty and Watson, 2011; De Verteuil, 2011). The tip could shear off and result in a catheter embolism. The tip may also be blunted from the first attempt.

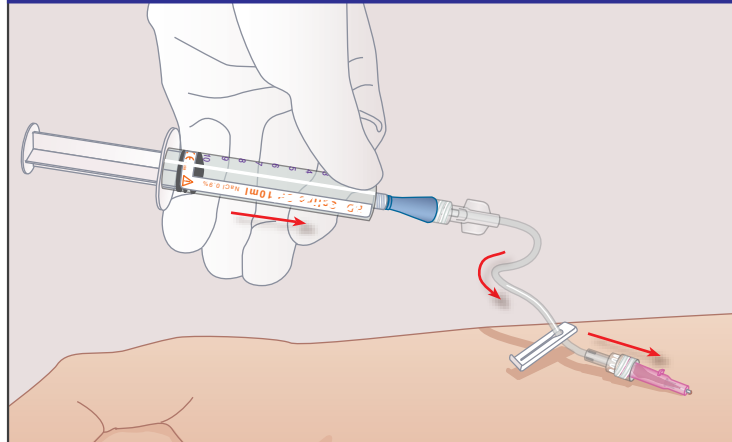
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Remove the stylet



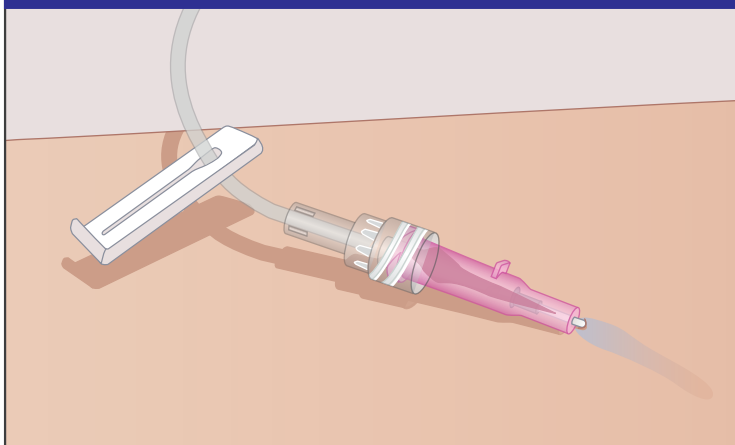
To remove the stylet, apply pressure to the vein above the cannula tip and to the device, to avoid dragging it out with the needle. As the needle is withdrawn, the safety device may activate itself (inset) or the practitioner may need to activate it; follow manufacturer's instructions (Health and Safety Executive, 2013; RCN, 2011; The European Council, 2010). Dispose of the stylet into an appropriate sharps container.

Flush the device



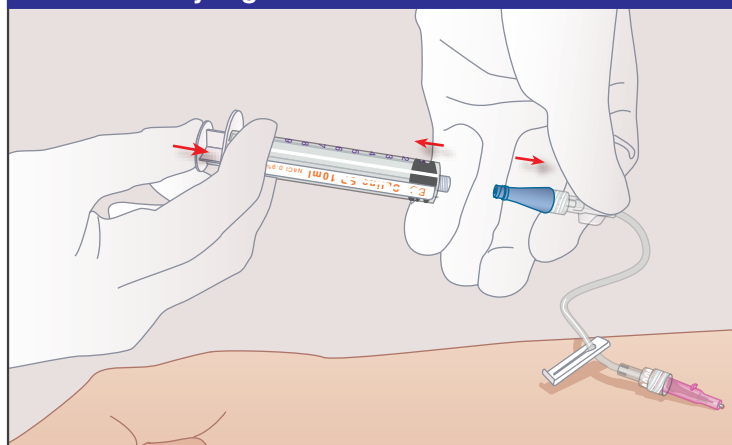
Attach a needle-free injection cap, the primed extension set or an administration set, and flush to check patency. Use a pulsatile (push-pause) technique to inject the 0.9% sodium chloride (NICE, 2012), which aims to create a turbulent flow that will remove blood from the internal wall of the cannula (RCN, 2010).

Observe the site



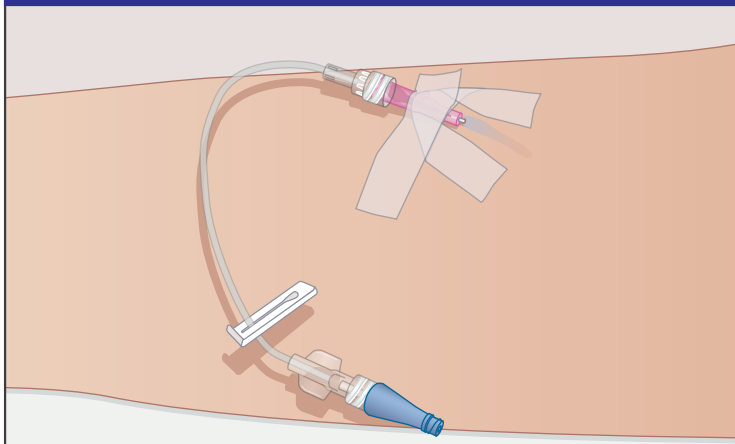
Observe the site for signs of swelling or leakage, and ask the patient if he or she feels any discomfort.

Remove the syringe



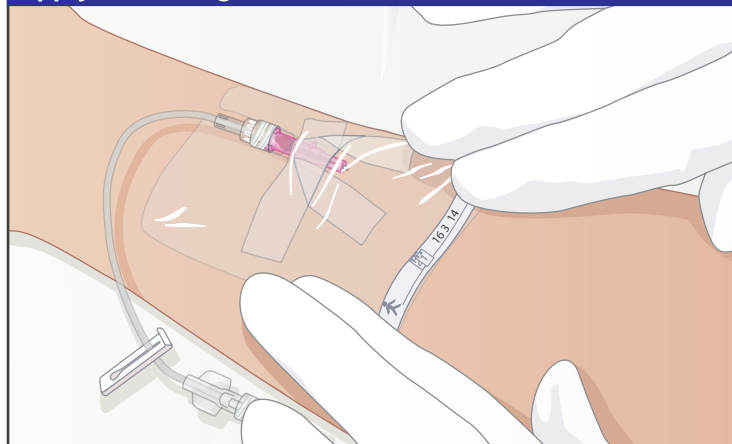
When removing the syringe from the injection cap, maintain pressure on the plunger with your thumb as you remove the syringe, creating positive pressure and preventing blood reflux into the cap (Dougherty, 2008). Dispose of waste.

Secure the needle



Close the clamp on the cannula. Secure the cannula to the skin, ensuring that the tape does not cover the insertion site. Use only sterile tape—either the sterile tape supplied with the dressing or new tape, as shown here. Alternatively, secure following local policy.

Apply a dressing



Apply an appropriate dressing such as a moisture-permeable transparent dressing (Loveday *et al.*, 2014; NICE, 2012) or sterile gauze; include a date label. Document the following details in the patient's notes: date and time, size and location of device, reason for resiting (if appropriate) and signature of person inserting the cannula (DoH, 2010).