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 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).
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 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. If necessary, repalpate the vein. 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.

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 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**

Using a one-handed technique provides excellent skin traction, and a well-stabilised vein, and reduces the chance of penetrating the posterior wall of the vein. 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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Do not undertake or attempt any procedure unless you are, or have supervision from, a properly trained, experienced and competent person. Always first explain the procedure to the patient and obtain his/her consent, in line with the policies of your employer or educational institution.
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.

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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.

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

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 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).