Protocol for using Hickman® and Broviac® lines

Rationale

Intravascular catheters are used for the administration of fluids, electrolytes, Drugs and blood products, nutritional support and blood sampling.

Principles of care

• To prevent infection.
• To maintain a 'closed' intravenous (IV) system with few connections to reduce risk of contamination.
• To maintain a patent device.
• To prevent damage to the device and associated intravenous equipment.
• To administer IV antibiotics and other drugs
• To take blood samples

Practice

Regardless of the type of line used, the principles of care remain the same.

Prevention of infection

• Aseptic technique and compliance with recommendations for equipment and dressing changes are essential to prevent microbial contamination (see Aseptic Non Touch Technique guideline).
• Whenever the insertion site is exposed or the IV system is broken, aseptic technique must be used.
• Cleaning solutions should be used not only on insertion sites but also to clean junctions and connections.
• Access ports should be cleaned with alcohol wipes prior to use and changed weekly.
• The catheter site should be cleaned weekly and be checked regularly for signs of phlebitis (erythema, pain and/or swelling), redness or tracking at the exit site, along the skin tunnel or up the arm or any oozing at the exit site.
• Unexpected pyrexia, pain and/or wet or soiled dressing are reasons for suspecting infection or a leak and require immediate inspection and renewal of the dressing. Medical staff should be informed.
• Chlorhexidine 0.05% has been shown to be an effective agent for skin cleansing around the insertion site at dressing changes. Drying of any cleaning solution is vital in order for the cleaning to be effective. See protocol for changing Broviac®/Hickman® line dressings.

Dressings

• Dressing on the insertion wound in the neck can be removed five days post operatively.
• Dressing covering the line should not be changed for the first 48 hours post operatively, unless instructed by a consultant.
• The placement of dressings over the catheter site protects the area from extrinsic contamination. Gauze dressing or semipermeable, transparent dressing with a high moisture vapour transmission rate (such as Opsite® IV 3000) can be used (Gillies et al. 2003).

• Transparent dressings allow continuous inspection of the site, reliably secure the device, are comfortable for the patient and help to avoid build up under the dressing. This is the method of choice in our unit.

• Patients with excessive sweating or oozing from catheter insertion sites are not good candidates for a transparent dressing (Hebden 2002). In these cases gauze dressing should be used underneath the Opsite® IV 3000.

• Central lines should always be looped gently prior to applying the dressing to help prevent dislodgment if catheter is pulled accidently.

**Maintaining a closed IV system**

• Due to the lumen size of Broviac® and Hickman® lines disconnection without clamping may cause air embolism or profuse blood loss depending on the condition and position of the patient (Andrews 2002, Ostrow 1981). If there is profuse blood loss, it is much more likely that a large air embolism has occurred. The catheter should be clamped, patient placed in a head down and left-lateral position to help the air to collect in the apex on the right side of the heart and to permit gravity to promote blood flow to the lungs and a doctor called immediately (Andrews 2002).

• To prevent accidental disconnection luer lock equipment should be used at all connections, such as administration sets, extension sets and syringes. Catheter should be clamped firmly when changing equipment.

**Maintaining patency**

• Occlusion of the line is usually caused by a clot formation due to:
  1. Infusion device being turned off for a prolonged period.
  2. Insufficient or incorrect flushing of the central line when not in use.
• Precipitate formation due to inadequate flushing between incompatible medications and kinking of the line may also impair patency.
• If the line is not used continuously, patency can be maintained by intermittent flushing (known as a ‘heparin lock’). See protocol for maintaining patency of Hickman® and Broviac® lines.
• If occlusion does occur, gentle aspiration may dislodge the clot and a flush with 0.9% sodium chloride may restore patency. Only 10ml syringes or larger should be used as smaller syringes create a larger pressure which may result in rupture of the catheter and/or clots being forced into the venous system (Hadaway 1998, Macklin 1999).
• Once the system has been checked first with a 10ml syringe containing 0.9% sodium chloride, and there is no pressure or occlusion, it is then safe to use a smaller size syringe (Hadaway 1998, Macklin 1999).

Taking blood from a line

• Use aseptic non-touch technique when taking blood from a line and clamp the line in between changing syringes, unless there is a one-way valve port attached to it.
• Check the patency of the line by flushing with 0.9% sodium chloride in a 10ml luer lock syringe.
• Withdraw 2ml of blood, do not discard this.
• Using a clean 2ml syringe withdraw the blood needed.
• Return the 2ml of blood originally taken from the line.
• Flush with 5mls of 0.9% sodium chloride and clamp the line whilst the last 0.5mls is flushed in so that the line is clamped under positive pressure.

Preventing damage to the line

• Most central venous catheters are made of silicone which is prone to cracking or splitting if handled incorrectly.
• Artery forceps, scissors or sharp-edged clamps should not be used on the catheter.
• A smooth clamp should be placed on the reinforced section of the catheter provided for this purpose. The clamp may be moved up or down the reinforced area to reduce the risk of wear and tear at one point.
• If damage occurs, the catheter must be clamped immediately proximal to the fracture or split to prevent blood loss or air embolism. The split area should be covered with an alcohol swab. A member of the medical staff should be called.

References


Standards Group/MB

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