NICU: Intravenous Initiation of Over-the-Needle Cannula

Site Applicability

SPH NICU

Practice Level

Specialized: NICU Registered Nurse

Requirements

A physician order is required for Intravenous Catheter insertion and for fluid(s) and rate.

Need to Know

Intravenous (IV) access via over-the-needle cannula is established for the purposes of administration of fluids, medications, and blood components to infants in the NICU.

Important factors to be considered when initiating an intravenous catheter include infant comfort, developmental supportive care, maintenance of the cannula in a vessel, and risk of complications from chosen site.

Equipment and Supplies

1. Appropriate PPE including gloves
2. Appropriate size intravenous catheter
3. Q-Tips
4. Chlorhexidine gluconate 0.5% antiseptic clear solution
   OR
5. Chlorhexidine Gluconate 0.5% antiseptic pre-packaged swabs
6. Plastic Medication Cup to hold Chlorhexidine 0.5% antiseptic solution
7. Sterile Tegaderm transparent dressing cut in half
8. Clear tape
9. 2” X 2” gauze
10. Cotton Balls
11. Limb board (if needed)
12. Alaris Y set extension tubing with 2 smart site ends primed with NS
13. 3ml syringe (filled with NS for flush)
14. Scissors
15. Alaris IV pump
16. Primed IV infusion set

Procedure

Assessment

1. Confirm correct patient with 2 identifiers.
2. Review Physicians order for fluid and total fluid intake (TFI).
3. Calculate TFI and rate. Confirm with second RN.

Intervention

1. Wash Hands & Don PPE.
2. Gather Equipment including preparing tape to secure PIV.
3. Flush Y set extension line using a pre-filled 3ml normal saline syringe. Clamp off with positive pressure. Ensure BOTH extension lines are primed.
4. Explain the procedure to parents if present. Adhere to Family Centered Care principles.
5. Locate suitable vein:
    a. Dorsal network in hands & feet.
    b. Scalp.
    c. Avoid veins in antecubital fossa and saphenous. These can be used for emergency peripheral access.
    d. Start with distal end of vein and move proximally. Avoid areas of flexion.
    e. Use a transilluminator to locate the vein if necessary. Use the transilluminator with care – there has been evidence of burns with extended use.
    f. Apply warm pack as needed to help dilate the vein. Do not use a warm water compress as there has been evidence of burns.
    g. For scalp veins, trim hair with scissors if needed. Avoid sites outside of the hairline.

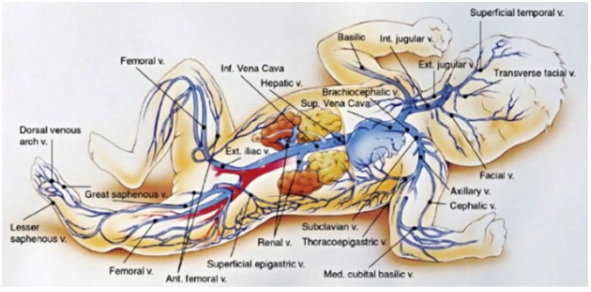

Figure 1. Frequently used sites for venous access in the neonate. (From Verklan, M.T., Walden, M. (2015). Core curriculum for neonatal intensive care nursing. St.Louis:Saunders.)

6. Position infant and have a second person provide developmentally supportive care to minimize stress response.
7. Perform hand hygiene. Don clean gloves.
8. If tourniquet is used, apply the tourniquet 2 to 3 inches above the intended insertion site.
    a. Use caution when using a tourniquet. It can cause hemolysis of blood and affect blood work results such as electrolytes.
9. Clean/prepare selected insertion site with chlorhexidine solution using circular motion for a minimum of 30 seconds. Allow the areas to dry completely for 60 seconds.
    a. Do NOT re-use q-tip or swab.
    b. Use a new q-tip or swab and repeat cleaning procedure for each attempt to reduce risk of infection.
    c. After cleaning and drying DO NOT touch or palpate prepared insertion site.
    d. If you are not using a no touch technique, don sterile gloves to palpate vein.

10. Ensure skin is stretched and taut to prevent vein from rolling. Hold limb in normal anatomical position with joint supported.
11. Remove protective sheath from the IV catheter. Inspect the catheter for roughness on needle level and for bumps/ frayed edges.
12. Hold the IV catheter with thumb and index fingers on opposite sides (or individual preference).
13. Insert the needle slowly at 30-40 degrees bevel up. Once the needle has punctured the skin, lower the catheter to almost skin level and gently advance the stylet/cannula with a straight, forward motion.
    a. Preterm neonates' veins are superficial, consider using a decreased angle of catheter entry.
14. If blood flashback is visible, thread the cannula forward while removed the stylet.
    a. Remove tourniquet
    b. **Never reinsert the needle into the cannula**. This could result in an emboli as the needle may puncture or fragment the cannula.
15. Complete blood sampling if necessary.
16. Connect primed IV catheter to Y extension. Gently flush while observing the site.
    a. If blanching or swelling is present, remove IV catheter.
17. If attempt was unsuccessful, withdraw needle/cannula and apply pressure to the puncture site with 2" X 2" gauze for 2-3 minutes to stop bleeding.
18. If attempt was successful, secure the IV catheter and tape:
    a. The catheter hub tubing junction with transparent occlusive dressing.
    b. Chevron with clear tape.
    c. Wedge cotton under catheter if needed.
19. Loop IV Y extension tubing over the dressing and tape the tubing to the dressing. Intermittently flush catheter during taping to maintain patency.
20. Connect IV Y extension tubing to IV fluids and infusion.
    a. Ensure the dead space at hub of IV catheter is filed with NS after removing the flush (syringe) from IV extension set before connecting to IC line. Ensure correct rate/ fluid infusing.
21. Apply limb board as protector over site as needed.
    a. Ensure the limb board straps do not impede on visibility of the IV insertion site.
22. Settle the infant and place in cot/incubator.
23. Remove gloves and wash hands.

Documentation

Document insertion attempts and hourly site checks in CERNER. Cerner → Interactive View → NICU Lines-Devices- Procedures → Peripheral IV

Document IV Fluids in Cerner → Nurse Review Fluid Order → Administer infusion in MAR

Document Hourly Infusion in Cerner → Interactive View → Intake and Output → Continuous Infusions

Document Rate Changes in Cerner → MAR

Patient and Family Education

It is the RN and Pediatrician responsibility to explain the indications for IV access, potential complications and anticipated course of treatment.

Ask the caregivers if they would like to be present for insertion.

Explain the process and procedure including the developmentally supportive care you will be providing for pain management.

Teach the parents signs and symptoms of complications (ex. Redness, swelling, bleeding at insertion site).

Answer questions or refer to appropriate teams members as they arise.

Related Documents

1. B-00-12-10041 – Blood Culture (Newborn)
2. B-00-12-10091 – NICU: IV Fluid Preparation and Administration

References

BC Women's Hospital. (2017). Intravenous (IV) therapy: over-the-needle cannula insertion procedure.

Elselvier. (2019). Intravenous Therapy: Line Insertion (Neonatal). Clinical Skills. Retrieved from: https://point-of-care.elsevierperformancemanager.com/skills/1301/quick-sheet?skillId=NN_032#scrollToTop Accessed July 6 2021.

O'Grady, N.P. et al. (2011). Guidelines for the prevention of intravascular catheter-related infections. Centers for Disease Control and Prevention Atlanta. Accessed March 11 2015 at http://www.cdc.gov/

Verklan, M.T. & Walden, M. (2015). Core curriculum for neonatal intensive care nursing. 5th edition. St.Louis: Saunders.

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