

Memorial EMS
Decatur Memorial EMS
Springfield Memorial EMS

Section 23

Pediatric Vascular Access



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Pediatric Intravenous Cannulation Protocol 23.A.1
Pediatric Intraosseous Infusion Procedure..... 23.B.1



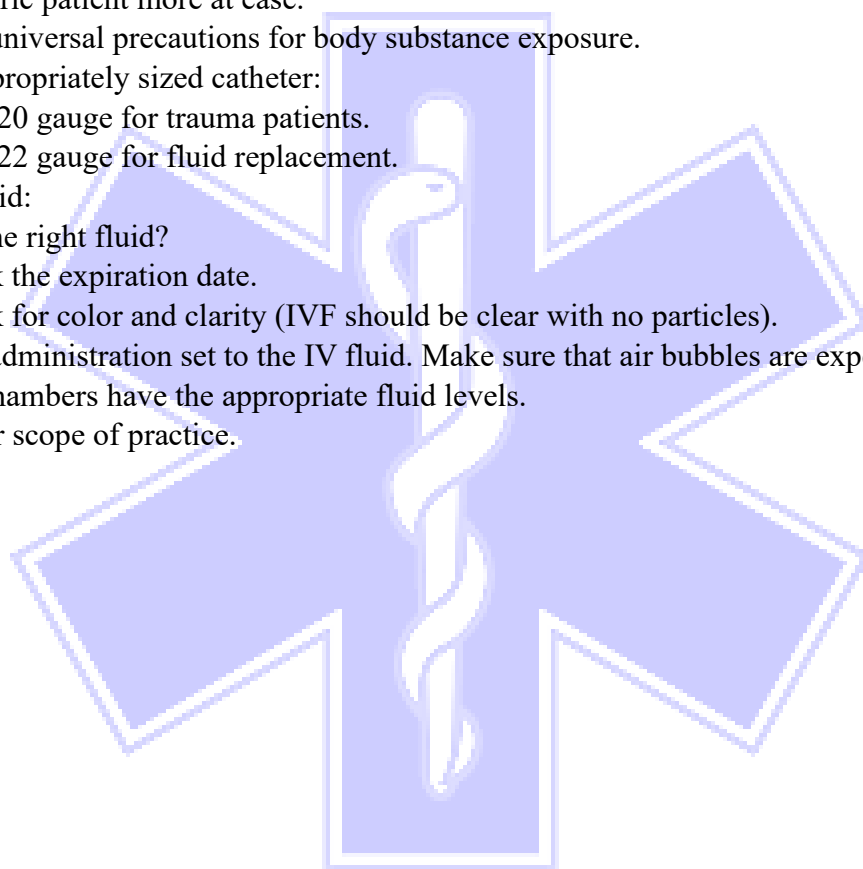
Pediatric Intravenous Cannulation Protocol

(A-EMT/EMT-I & **Paramedic** ONLY)

IV Access

Intravenous cannulation is used in the pre-hospital setting to establish a route for drug administration and/or to provide fluid replacement. Intravenous cannulation should not significantly delay scene times or be attempted while on scene with a trauma patient who meets load-and-go criteria.

1. Explain to the patient the need for and a brief description of the procedure. Use distraction therapy to put the pediatric patient more at ease.
2. Observe the universal precautions for body substance exposure.
3. Obtain an appropriately sized catheter:
 - a. 18 or 20 gauge for trauma patients.
 - b. 20 or 22 gauge for fluid replacement.
4. Check the fluid:
 - a. Is it the right fluid?
 - b. Check the expiration date.
 - c. Check for color and clarity (IVF should be clear with no particles).
5. Connect the administration set to the IV fluid. Make sure that air bubbles are expelled from the tubing and that all chambers have the appropriate fluid levels.
6. Procedure per scope of practice.



Pediatric Intravenous Cannulation Protocol

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Saline Locks

Saline locks may be used if fluid replacement is not indicated:

1. Procedure per scope of practice.

Fluid Replacement

Age	Average Weight for Age in Pounds (lbs)	Average Weight for Age in Kilograms (kg)	Fluid Bolus at 20mL/kg
Newborn	7	3	60
3 months	13	6	120
6 months	15	7	140
9 months	20	9	180
12 months	22	10	200
2 years	26	12	240
4 years	35	16	320
6 years	44	20	400
8 years	57	26	520
10 years	66	30	600
12 years	90	41	820

** A fluid bolus for pediatric patients should be 20 mL/kg. If needed, a second bolus at 20 mL/kg can be administered. If additional fluid is needed, **Medical Control** approval must be obtained prior to administering a third bolus at 20 mL/kg. Total fluid resuscitation in the field will not exceed 60mL/kg.

Pediatric Intraosseous Infusion Procedure

(A-EMT/EMT-I & Paramedic ONLY)

Intraosseous infusion is defined as a puncture into the medullary cavity of a bone that provides a rapid access route for fluids and medications. Obtaining emergency intravenous access in critically ill pediatric patients (especially those less than 3 years old) can be extremely difficult, time consuming and, at times, impossible. Intraosseous access is performed on critically ill children in whom fluid and/or drug treatment is paramount and intravascular access is not rapidly accessible or feasible.

Indications for IO (No I.V. attempts required)

- Any infant/ child in extremis and in need of immediate drug administration or fluid resuscitation.
- Unresponsive or severely altered LOC that is not readily explainable (i.e. not Post-ictal, Hypoglycemia etc.).
- Cardiac/ respiratory arrest.

EZ-IO Procedure

NOTE: The EZ-IO System is the preferred device, however this device can only be used on children greater than 3kg. For children less than 3kg, refer to the Jamshidi procedure.

1. Observe universal precautions.
2. Prepare the EZ-IO driver and pediatric needle set:
 - a. 15ga, 15mm long needle (pink) for patients weighing between 3kg and 39k
 - b. 15ga, 25mm long needle (blue) for patients weighing greater than 40kg
3. Locate landmark of insertion site by palpating the anterior surface of the tibial bone 1-3 cm below the tibial tuberosity and slightly medial. Landmark for insertion must avoid the joint and epiphyseal plate.
4. Prep the site with Betadine and set up infusion solution as for regular IV.
5. Stabilize site and insert appropriate needle set.
6. Remove EZ-IO driver from needle set while stabilizing catheter hub.
7. Remove stylet from the catheter; place stylet in EZ-IO shuttle or approved sharps container.
8. Attach 5-10mL syringe and aspirate bone marrow to confirm placement.
 - a. IO catheter should be at a 90-degree angle and firmly seated in the tibial bone.
 - b. Blood may be visible at the tip of the stylet.
 - c. The IO catheter should flush freely without difficulty or evidence of extravasation.
9. Connect the luer-lock equipped IV administration set.
10. For conscious patients you may first administer Lidocaine (slowly): 0.5mg/kg IO (maximum dose; 40mg).
11. Then rapidly flush the IO catheter with 5mL of normal saline.
12. Utilize a pressure bag for continuous infusions where applicable. If a pressure bag is not available, wrap a BP cuff around the bag of IV fluids and inflate the cuff until desired flow rate is achieved.

Pediatric Intraosseous Infusion (IO) Procedure

EZ-IO Procedure {Continued}

13. Dress site, secure tubing and apply wristband as directed.
14. Closely monitor EZ-IO site en route.

• Critical Thinking Elements

- Do not access a site that is fractured at or above the insertion site or has obvious indications of infection
- Do not use an area previously used for IO attempts.
- Sometimes marrow cannot be aspirated and does not necessarily indicate improper placement.
- Excessive movement of the IO needle may result in leakage.
- The volume of pediatric fluid resuscitation is based on weight and clinical response. Pediatric fluid administration must be carefully regulated.

Jamshidi Style IO Procedure- (**Paramedic** ONLY)

NOTE: The EZ-IO System is the preferred device for children weighing greater than 3kg. The Jamshidi IO should be used in children weighing less than or equal to 3kg.

1. Observe universal precautions.
2. Assemble and prepare equipment.
3. Locate landmarks of insertion site by palpating the anterior surface of the tibial bone 1-3 cm below the tibial tuberosity and slightly medial. Landmark for insertion must avoid the joint and epiphyseal plate.
4. Prep the site with Betadine and set up infusion solution as for regular IV.
5. With sterile technique, using a commercial IO (Jamshidi) needle, insert needle at a 90-degree angle and slightly 10-15 degrees inferior through the bone using firm downward pressure with a twisting motion. You should feel a “pop” when the needle goes into the medullary space.
6. Remove the inner stylet and attach a 5-10mL syringe. Aspirate for bone marrow contents, and then connect a conventional IV line with pressure infuser (or BP cuff).
7. Secure the line with tape and dressing.
8. Administer drugs and fluids as needed.
9. Assess sight for signs of infiltration or leakage. Discontinue IO line if either of these occurs.

Pediatric Intraosseous Infusion (IO) Procedure

Critical Thinking Elements

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- Do not use an area previously used for IO attempts.
- Sometimes marrow cannot be aspirated and does not necessarily indicate improper placement.

