

# Intraosseous Cannulation and Infusion With Bone Injection Gun (B.I.G.) Device

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## Preamble

Intravenous cannulation can be very difficult in the critically ill or injured patient. Intraosseous cannulation and infusion is a relatively safe method to obtain vascular access in this setting. Fluid and pharmacologic agents reach the central circulation via the intraosseous route at approximately the same speed as those delivered via a peripheral intravenous line.

## Requirements

1. Fully licensed Technician-Paramedic.
2. Certification in the intraosseous cannulation and infusion protocol by the Medical Director.
3. Certification in the appropriate intravenous cannulation protocol by the Medical Director.

## Indications

1. Patient in extremis with rapid deterioration in clinical status or in cardiopulmonary arrest and
2. Two unsuccessful attempts at peripheral intravenous cannulation or greater than 90 seconds elapsed time.
3. Certification in administration of age-appropriate intravenous medications.

## Contraindications

1. Fracture of tibia or femur on selected side.
  - consider other side if not injured
2. Skin infection or burn at selected site (unless no other suitable site available).

3. Transport time less than time required to initiate intraosseous line.

### **Procedure**

1. Perform patient assessment and record vital signs.
2. Assess that patient meets criteria for this protocol.
3. Ensure there are no contraindications to use of this protocol.
4. Initiate basic life support treatment measures, including supplemental oxygen.
  - these take precedence over management using this protocol
5. Immobilize the lower leg with the knee flexed at 30°. Select the intraosseous cannulation site as follows:  
  
Greater than 12 years of age:  
Proximal tibia:  
- 2 cm medial and 1 cm proximal to tibial tuberosity  
  
Less than 12 years of age:  
Proximal tibia:  
- 1 cm medial and 2 cm distal to tibial tuberosity
6. Prepare the intraosseous infusion needle, intravenous setup, and appropriate intravenous solution.
7. Insert the intraosseous needle in the prescribed method.
8. Stabilize the intraosseous needle.
9. Aspirate using a 5 ml syringe.
10. Irrigate with 5 ml of normal saline to clear the needle's lumen.
11. Connect an intravenous line and adjust the infusion rate.
12. Secure the intraosseous needle with gauze and tape.
13. If an intraosseous cannulation attempt is not successful, a load and go should be initiated.

## **Documentation Requirements**

The following information must be documented on the patient care report form:

1. Patient's presenting signs and symptoms, including vital signs and initial cardiac rhythm.
2. Indications for protocol use.
3. Site used, number of attempts, and needle size.
4. Intravenous solution used and volume infused.
5. Repeat assessment and vital signs, as indicated.
6. Changes from baseline, if any, that occur during treatment or transport.
7. Signature and license number of EMS personnel performing any transfer of function skills.

## **Certification Requirements**

1. Attend in-depth classes and lectures on intraosseous infusions.
2. Identify:
  - criteria for establishment of an intraosseous infusion
  - indications for establishing an intraosseous infusion
  - contraindications for establishing an intraosseous infusion
3. Demonstrate the correct technique for intraosseous cannulation.
4. Pass a written examination.
5. Certification is by the Medical Director.

### **Recertification Requirements**

1. Review class and recertification is done every 12 months.
2. A record will be kept to document all cases where this protocol is used.

### **Decertification**

1. Decertification is at the discretion of the Medical Director or the Provincial Medical Director, Emergency Medical Services, Manitoba Health & Healthy Living.

### **Quality Assurance Requirements**

1. Appropriate quality assurance policies must be in place. The Medical Director or designate must review all instances where this protocol is used. As a minimum, the following must be assessed:
  - i) appropriateness of implementation
  - ii) adherence to protocol
  - iii) any deviation from the protocol
  - iv) corrective measures taken, if indicated
2. Yearly statistics for protocol use compiled and forwarded to Emergency Medical Services, Manitoba Health & Healthy Living.