



## GUIDELINE

# Intraosseous Needle: Insertion and Care

<b>Scope (Staff):</b>	Nursing and Medical Staff
<b>Scope (Area):</b>	NICU KEMH, NICU PCH, NETS WA

### Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

## Aim

To provide emergent vascular access in the collapsed/shocked neonate, where peripheral or umbilical venous access has been unsuccessful or considered inappropriate.

## Background

This route of rapid vascular access in the term and preterm infant can be used to provide rehydration, correct hypotension, hypoperfusion and hypoglycaemia in infants where central or peripheral venous/arterial access has failed.

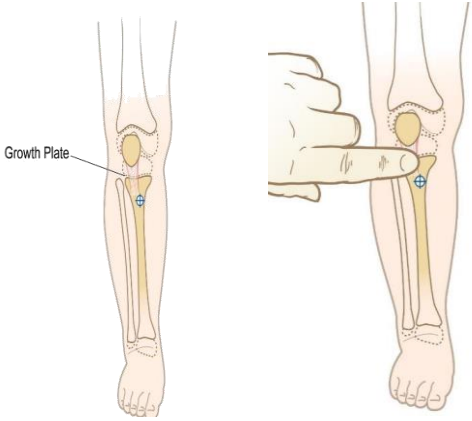

## Key points

- Medications and fluids can be administered in the same dosage as those given via the IV route.
- This procedure is scoped for medical staff that have been deemed competent.
- This is an aseptic procedure.
- The EZIO is recommended by the manufacturer to be used in infants  $\geq 3\text{kg}$ . However, depending upon the clinical situation, EZIO may be used at the discretion of the treating clinician in smaller infants.

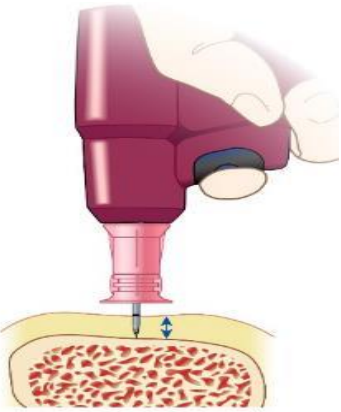
## Insertion

Procedure Specific Equipment	Additional Information
<ul style="list-style-type: none"> <li>• EZ-IO Power Driver®</li> <li>• EZ-IO 15mm (Pink) Needle Set</li> <li>• EZ-Stabilizer™</li> <li>• EZ-Connect®</li> </ul>	<ul style="list-style-type: none"> <li>• 25mm (blue) needles available in PCC for bigger babies. Both needles can be used in babies ≥3kg</li> <li>• See Appendix <b>Error! Reference source not found.</b> for pictorial reference</li> </ul>
Other Equipment	
<ul style="list-style-type: none"> <li>• Dressing pack</li> <li>• Sterile gloves</li> <li>• 10ml syringe for aspiration</li> <li>• 10ml syringe &amp; 0.9% NaCl for flush</li> <li>• Chlorhexidine 1% or Povidine 10%</li> </ul>	

## Site Selection

Proximal Tibia	Distal Femur
	
<ul style="list-style-type: none"> <li>• Anteromedial flat surface, approximately 1 cm below and medial to the tibial tuberosity</li> <li>• Approximately 1 cm proximal to upper border of patella and approximately 1-2 cm medial to midline</li> </ul>	<p><b>Distal tibia</b> (antero-medial surface) is an alternate site but cannot be used if proximal tibia has already been accessed</p>

## Insertion

Steps	Additional Information
<p>1. Prepare equipment and insertion site.</p>	<ul style="list-style-type: none"> <li>• Open equipment onto sterile field. Prime EZ-Connect® and connect pink needle set to EZ-IO Power Driver®</li> <li>• Ensure appropriate needle size is selected.</li> <li>• Identify insertion site and clean skin as per <a href="#">aseptic technique</a> protocol.</li> </ul>
<p>2. Insert needle</p>  <p>The illustration shows a hand holding a red EZ-IO Power Driver. The driver's bit is positioned over the tibia of a neonate. A blue double-headed arrow indicates the depth of the needle insertion into the bone marrow space. The bone marrow is depicted as a porous, reddish structure within the bone.</p>	<ul style="list-style-type: none"> <li>• Stabilise insertion site and drill with moderate steady pressure till a loss of resistance is felt. Stop drilling as needle is now in medullary space.</li> <li>• Stabilise hub then remove driver and stylet. Aspirate marrow with syringe; a sample can be used for culture, bedside blood sugar [NOT on gas machine] and lab samples if lab aware of sample type.</li> <li>• NB: when needle set is pushed through the skin and touches periosteum, at least 55mm (1 black line), must be visible outside the skin. Otherwise the needle is too short and needs to be changed for a longer one.</li> <li>• The pink needle is almost universally appropriate for neonates.</li> </ul>
<p>3. Secure</p>	<ul style="list-style-type: none"> <li>• Secure the hub with EZ-Stabilizer™ and attach primed EZ-Connect. Proceed to flush with 2-5mls of 0.9% NaCl.</li> <li>• IO is fit for use as central intravascular access</li> </ul>
<p>4. Document</p>	<ul style="list-style-type: none"> <li>• Document the insertion of IO access in patient notes.</li> </ul>

### Important Points:

- Consider local anaesthetic if analgesia is required, as infusions can be painful stimuli.
- Monitor closely for extravasation. If this does occur, obtain alternative access as soon as possible.
- Other devices such as butterfly or LP needles may need to be considered in preterm babies.

### Removal

Removal of the intraosseous needle must be ordered by the medical team. This can be performed by senior nursing staff who are familiar with the procedure. Alternative intravenous access should be available prior to removal.

1. Disconnect infusions and remove EZ-Connect®
2. Lift and remove EZ-Stabilizer™
3. Attach 10ml Leur-lock syringe to hub of catheter
4. Withdraw catheter by applying traction whilst rotating syringe and catheter clockwise. Do not rock or bend catheter
5. Place occlusive dressing over site
6. Document removal.

### Related CAHS internal policies, procedures and guidelines

#### Neonatology Guidelines

- [Aseptic Technique in the NICU](#)
- [Resuscitation: Neonatal](#)
- [Resuscitation Medication and Fluids](#)
- [Resuscitation Algorithm for the Newborn](#)

### References and related external legislation, policies, and guidelines


1. Boon JM. Gorry DL. Meiring JH. Finding an ideal site for intraosseous infusion of the tibia: an anatomical study. *Clinical Anatomy*.16(1):15-8, 2003
2. Ellemunter H. Simma B. Trawoger R. Maurer H. Intraosseous lines in preterm and full term neonates. 80(1):74-77. 1999 Jan.
3. Lake W. Emmerson AJB. Use of a butterfly as an intraosseous needle in an oedematous preterm infant. *Archives of Disease in Childhood Fetal and Neonatal Edition*. 88 F409 2003
4. Zabala Arguelles JI. Maranon Pardillo R. Gonzalez Serrano P. Serina Ramirez C. Main Vascular access in situations of extreme urgency: intraosseous infusion.

Anales Espanoles de Pediatria. 3796); 489-92, 1992 Dec

**Useful resources**

- Arrow EZ-IO Intravascular Access Needles. Instructions for Use  
<https://www.teleflexvascular.com/files/ifu/8088.pdf>
- [Victorian Agency for Health Information; Better Safer Care Victoria; Maternity & Newborn Clinical Network; Intraosseous Needle Insertion for Neonates](#)

This document can be made available in alternative formats on request.

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## Appendix 1: Insertion Equipment List



EZ-IO Power Driver<sup>®</sup>



EZ IO 15mm (Pink) needle set

\*25mm (Blue) needles available in PCC for bigger babies



EZ-Connect<sup>®</sup>

\*Prime with 0.9% NaCl



EZ-Stabilizer<sup>™</sup>