Clinical Principles of Intraosseous Vascular Access

ARROW® EZ-IO® Intraosseous Vascular Access System
Disclosure

Presenter Information
&
Disclosure as applicable
Indications & Contraindications

Indications
The ARROW® EZ-IO® Intraosseous Vascular Access System is indicated for adult and pediatric patients any time vascular access is difficult to obtain in emergent, urgent or medically necessary situations for 24 hours.

<table>
<thead>
<tr>
<th>Adults</th>
<th>Pediatrics</th>
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<tbody>
<tr>
<td>Proximal humerus</td>
<td>Distal femur</td>
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<tr>
<td>Proximal tibia</td>
<td>Proximal humerus</td>
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<tr>
<td>Distal tibia</td>
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</tr>
<tr>
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<td>Distal tibia</td>
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Contraindications
Fracture of target bone
Infection at area of insertion
Inability to identify landmarks
IO or attempted IO access in target bone within previous 48 hours
Prosthesis or orthopedic procedure near insertion site
Intraosseous Vascular Access History

1922 Drinker
1942 Papper
1945 WWII
1985 Orlowski

Global Leaders: Emergency & Critical Care

<table>
<thead>
<tr>
<th>American Heart Association (AHA)</th>
<th>European Resuscitation Council (ERC)</th>
<th>International Liaison Committee on Resuscitation (ILCOR)</th>
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<td>• 1988 PALS</td>
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<td>• 2005 ACLS</td>
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Organizational Support

Clinical Papers
Position Statements
Program Inclusion

ASTNA
SPN
AACN
NAEMSP
ITLS
ACS
INS
CoTCC
ENA
ACEP
**Evidence Based Care**

- **500+ Intraosseous Access Research Articles**
- **190 Clinical Articles Specific to the ARROW® EZ-IO® System**
  - **70+ Studies & Clinical Trials**
  - **4700+ Patients Studied**
- **Widespread Utilization of ARROW® EZ-IO® Vascular Access**
  - Estimated 2 million patients
  - 50 Countries

*Effective January 2014, the EZ-IO® System was re-branded as the ARROW® EZ-IO® System*
Who Can Utilize The ARROW® EZ-IO® Vascular Access System?

MEDICAL PROFESSIONALS
- Physicians
- Registered Nurses
- Pre-Hospital Providers
- Physicians Assistants
- Advanced Practice Nurses

TYPICAL REQUIREMENTS
- Policy/Protocol
- Education
- Competency
- Practice
When Can The ARROW® EZ-IO® Vascular Access System Be Used?

- Emergent, urgent or medically necessary situations
  - Immediate need for medications or fluids
  - Prevention of delays to vascular access during critical situations
  - Difficult Vascular Access (DVA)
  - Vein preservation

✓ Safe: <1% serious complication rate
✓ Fast: Vascular access in seconds
✓ Efficient: 97% first-attempt success rate
✓ Versatile: Can be placed by any qualified healthcare provider
✓ Convenient: Requires no additional equipment or resources
Difficult Vascular Access Options

Right Line
Right Patient
Right Time

- IO
- PIV
- USGPIV
- CVC
- PICC
- EJ

Time
Skill
Cost
Risk
Highly vascular, non-collapsible access

Rapid flush to displace marrow
Real-time Fluoroscopy – Human Model

- Deltoid muscle
- Scapula
- Greater tubercle
- Biceps tendon (long head)
- Acromion process
- Humeral head
- Greater tubercle
- Bicipital groove
- Surgical neck
- Cephalic vein
- Axillary artery
- Basilic vein
- Subclavian vein
- Axillary vein
Site Selection

- Flow rates average 5L/hr
- 3 seconds to heart with medication/fluids
- Lower insertion & infusion pain
- Less medication required for pain management
- No reported compartment syndrome due to IO access placement

High success rates in pediatric patients

Do NOT use the powered ARROW® EZ-IO® Vascular Access System in the sternum!
Proximal Humerus Site Identification
Humerus: Insert needle set at a 45° angle to the anterior plane and posteromedial

Tibia and Femur: Insert needle set at a 90° angle to the bone
Proximal Tibia Site Identification

Adult

Infant/Child

Growth Plate
Distal Tibia Site Identification

Midline on the bone
• Secure the leg out-stretched
• Ensure the knee does not bend
ARROW® EZ-IO® Needle Set Selection

- Clinical judgment should be used to determine appropriate needle set selection based on patient weight, anatomy and tissue depth overlying the insertion site.

15 mm
15 gauge
Indicated for patients weighing 3-39 kg

25 mm
15 gauge
Indicated for patients weighing 3 kg or over

45 mm
15 gauge
Indicated for patients weighing 40 kg or over, excessive tissue depth
Needle Set Selection

• Estimate tissue depth
• Confirm with 5 mm mark visible above the skin
Technique

- Precision
- Control
- Gentleness
- Speed

Cross-section of bone
Prepare Supplies

• Prep site
• Prepare supplies
  • Open EZ-Stabilizer® Dressing
  • Prime the EZ-Connect® Extension Set
  • Attach Needle Set to Driver
Insertion Completion

- Stabilize hub and remove driver
- Remove stylet
- Apply EZ-Stabilizer® Dressing
- Firmly attach primed EZ-Connect® Extension Set
- Place wrist band
Rapid Normal Saline Flush

Adults: 5-10 mL

Infants & Children: 2-5 mL

Consider for blood typing and other commonly ordered labs
• For optimal flow infuse with pressure
• Administer medications in same dose, rate and concentration as given via peripheral IV
Prime extension set with 2% lidocaine (IV lidocaine)

Slowly infuse initial dose over 120 seconds

Allow lidocaine to dwell in IO space 60 seconds

Flush with normal saline

Slowly infuse 1/2 of initial dose over 60 seconds

Observe cautions/contraindications for lidocaine, confirm dose per institution
Assessment/Documentation

- Assess frequently to ensure:
  - Wrist band is on patient
  - No evidence of complications
    - Catheter is intact/patent
    - No evidence of infiltration/extravasation
  - Dressing & connections are secure
  - Repeat flush as needed
  - Need for initial or additional lidocaine
- Removal
EZ-IO® Driver

• Clean per your institution’s protocol or Instructions for Use
  – Check to ensure nothing has attached to the magnetic tip
• Inspect driver and return to case or replace trigger guard
• Do NOT submerge or autoclave driver!
24 Hour Clinical Support  800-680-4911

Education Resources
www.teleflex.com/ezioeducation

Connect with the App for iPhone & Android
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