



THE TELEFLEX  
**ACADEMY**



MC-006381rev2.1

Arrow® EZ-IO® Intraosseous Vascular Access System

## ***Intraosseous Access: Landmarking Deep Dive***



# ***Speaker Biography***

Name of speaker

- Highlights

## *Objectives*

- Verbalize indications and contraindications of the Arrow<sup>®</sup> EZ-IO<sup>®</sup> Intraosseous Vascular Access System
- List considerations for insertion site selection
- Recognize insertion sites and landmarking techniques

## Indications

For intraosseous access anytime in which vascular access is difficult to obtain in emergent, urgent or medically necessary cases for up to 24 hours. For patients  $\geq 12$  years old, the device may be extended for up to 48 hours when alternate intravenous access is not available or reliably established.

Adults ( $\geq 22$ years old)	Pediatrics ( $\leq 21$ years old)
<ul style="list-style-type: none"><li>• Proximal humerus</li><li>• Proximal tibia</li><li>• Distal tibia</li></ul>	<ul style="list-style-type: none"><li>• Distal femur</li><li>• Proximal humerus</li><li>• Proximal tibia</li><li>• Distal tibia</li></ul>



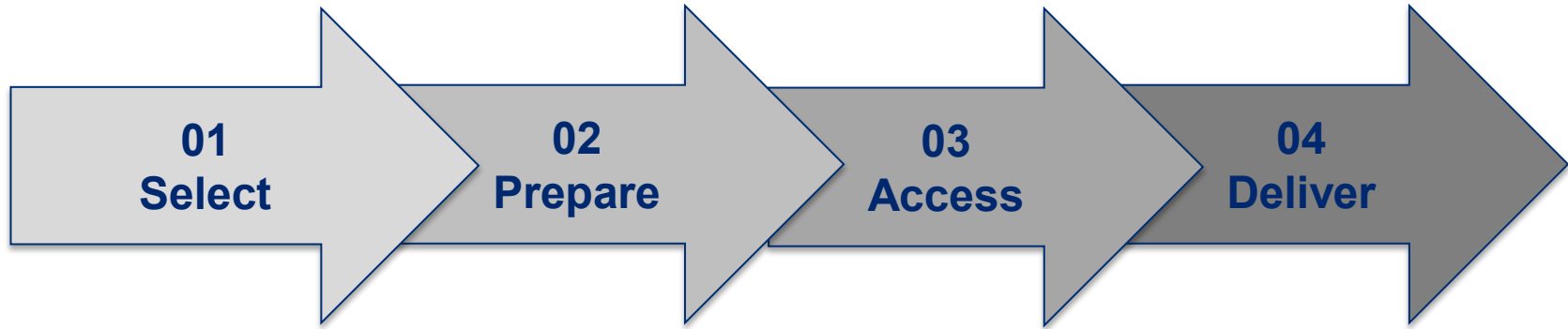
# Contraindications

- Fracture in target bone
- Infection at area of insertion
- Excessive tissue (severe obesity) and/or absence of adequate anatomical landmarks
- IO access or attempted IO access in target bone within previous 48 hours
- Previous, significant orthopedic procedure at the site, prosthetic limb or joint



# Arrow® EZ-IO® Intraosseous Vascular Access System

Four easy steps:



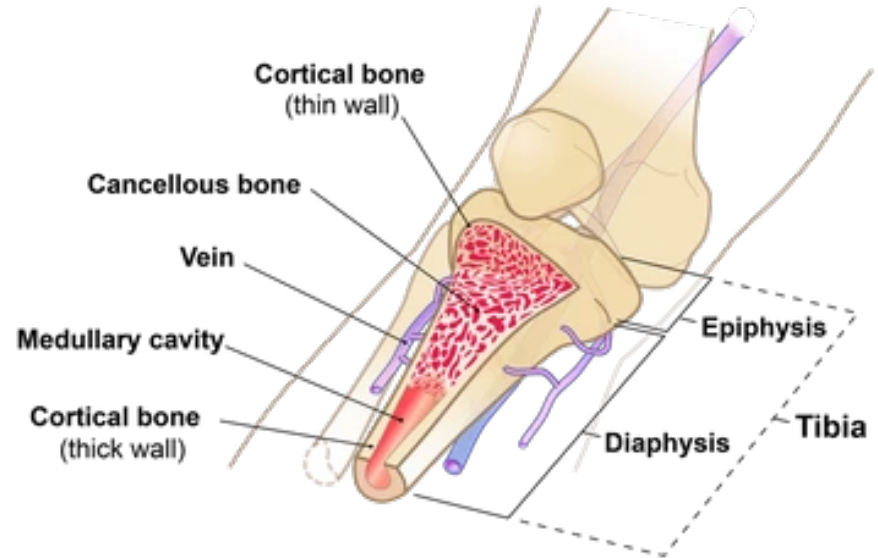
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## ***Anatomy and Physiology***



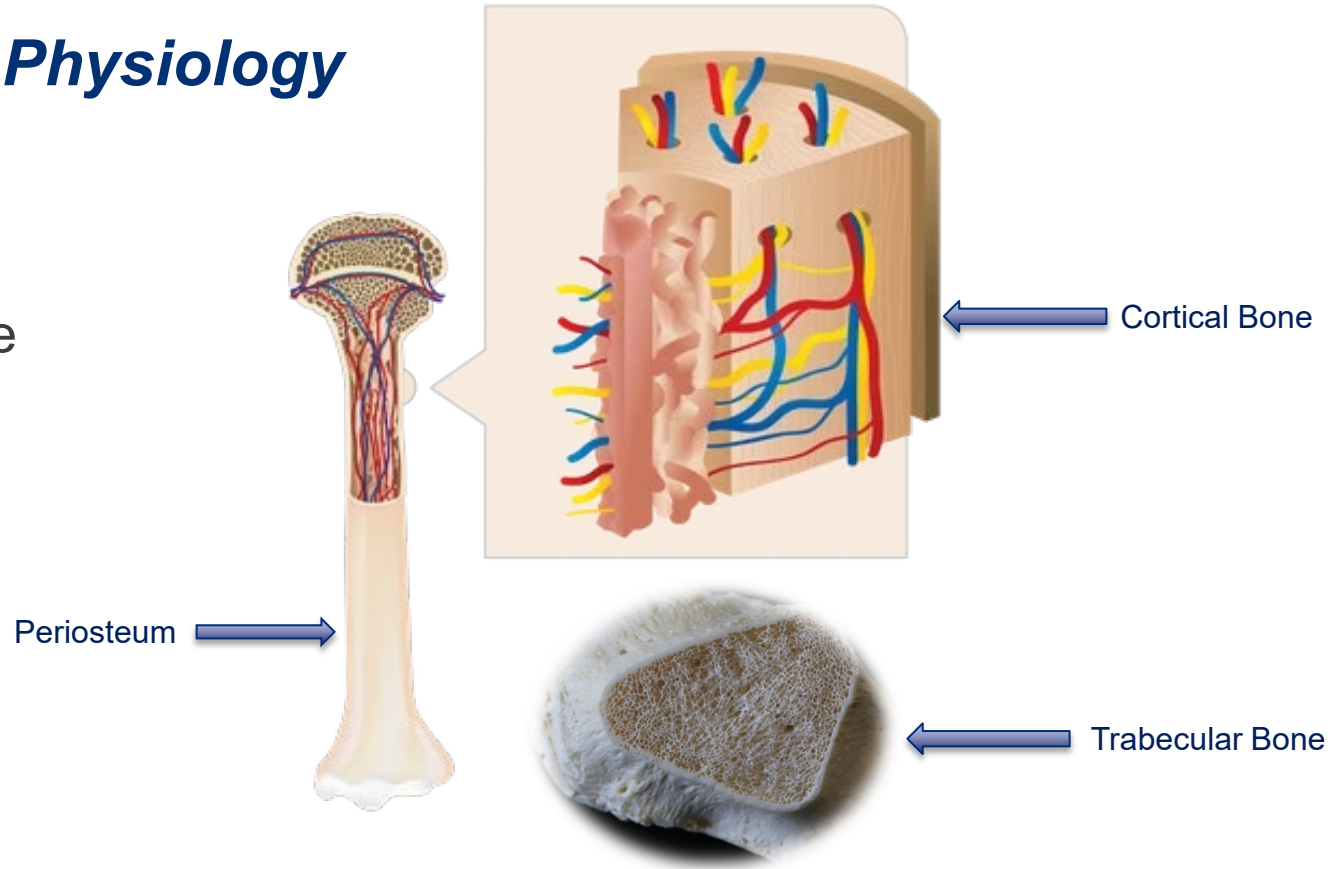
# ***Anatomy and Physiology***

- Epiphysis
  - End of bone
- Metaphysis
  - Between epiphysis and diaphysis
  - Includes epiphyseal plate
- Diaphysis
  - Bone shaft



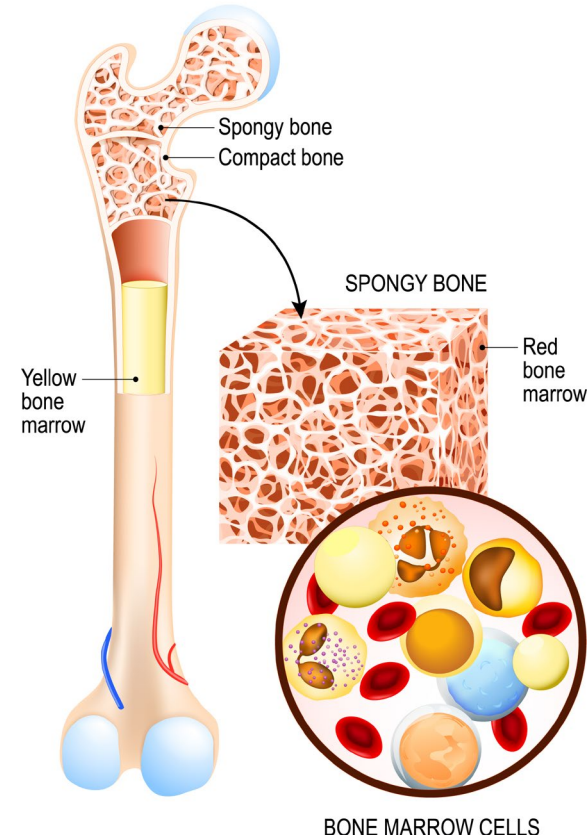
# Anatomy and Physiology

- Periosteum
- Cortical bone
- Trabecular bone



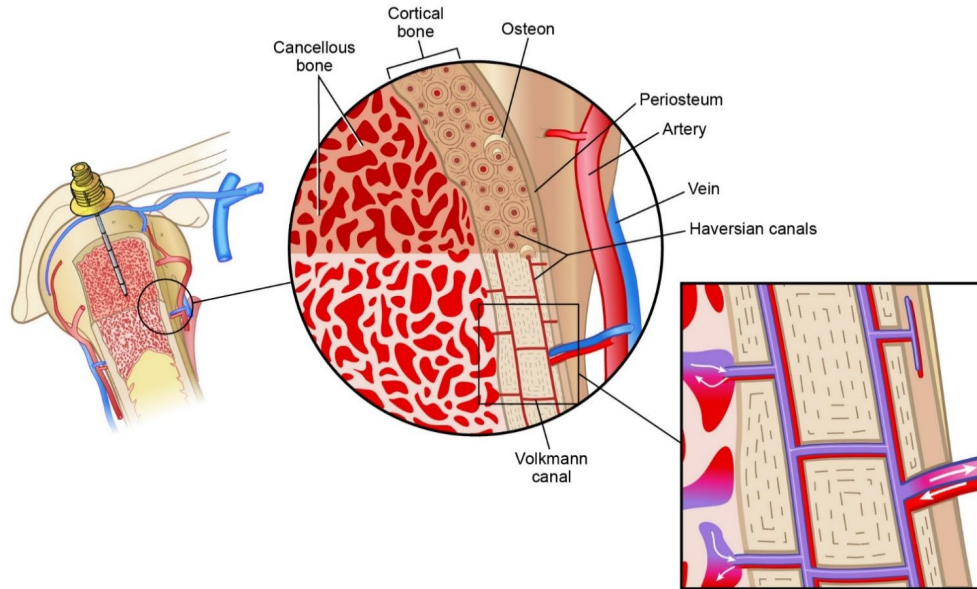
# Anatomy and Physiology

- Red Marrow
  - Red Blood Cells
  - Fluids and medications easily exchanged
- Yellow Marrow
  - Fat
  - Not supported by continuous blood flow

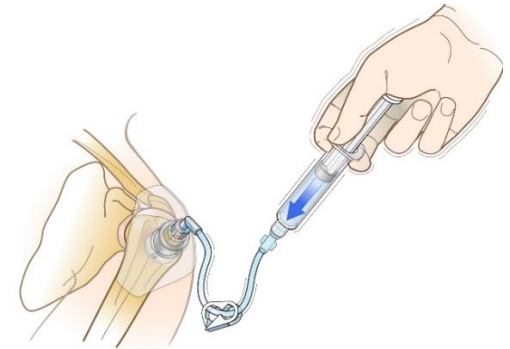


# Anatomy and Physiology

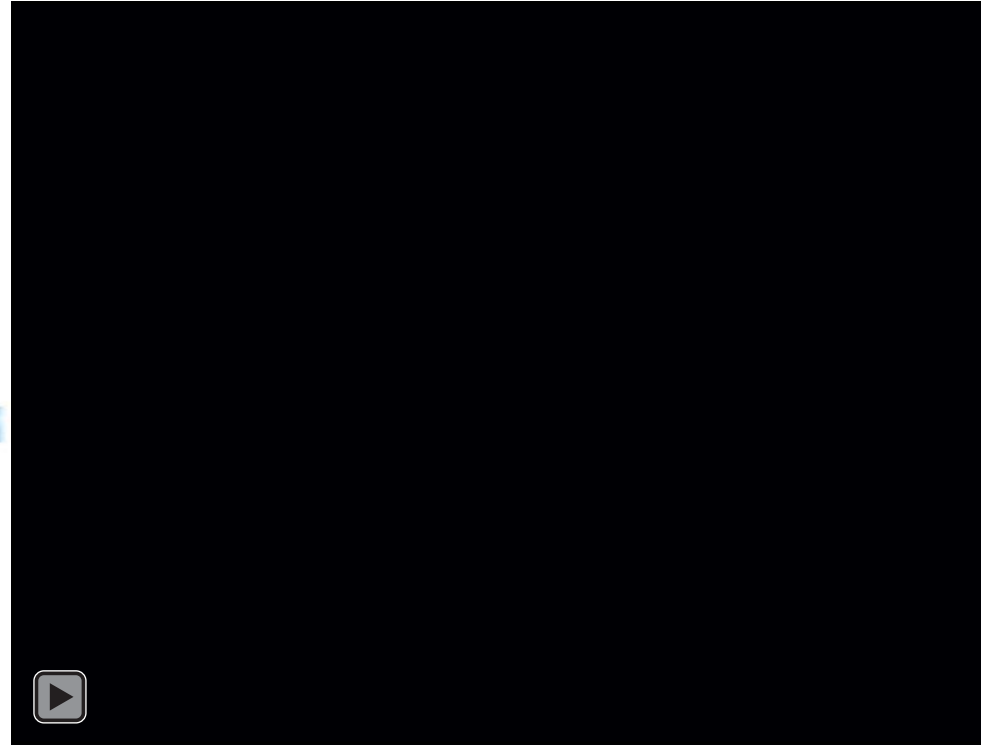
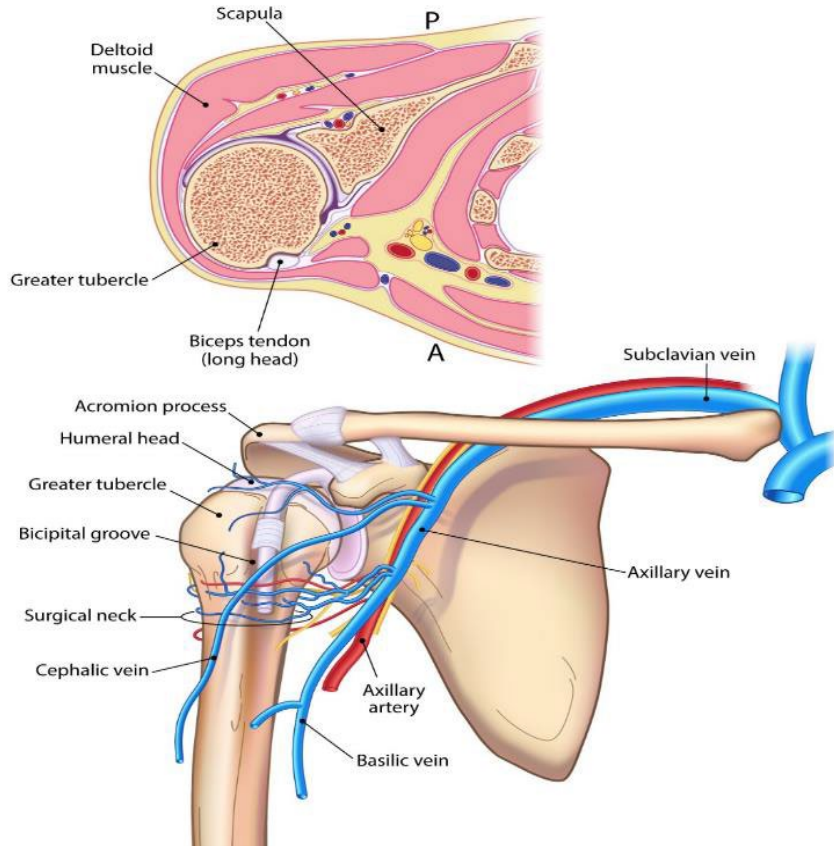
Highly vascular, non-collapsible access



Tip: Rapid flush to  
displace marrow



# Real-time Fluoroscopy - Human Model

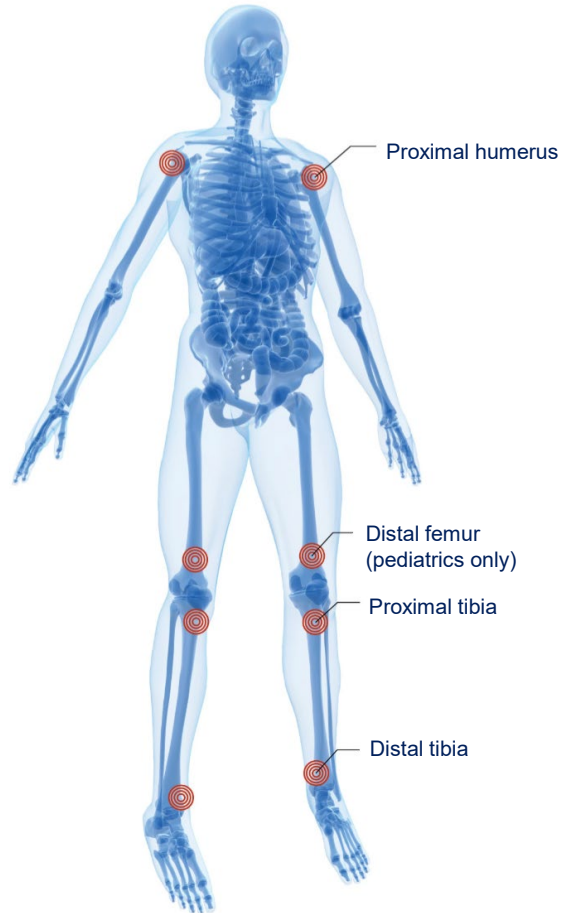




## ***Insertion Site Identification***



# Insertion Site Selection



- 3 seconds to heart with medication/fluids<sup>1\*</sup>
- Flow rates average 6.3 L/hr. under pressure<sup>2\*</sup>
- Less pain reported with saline flush<sup>3\*†</sup>
- Less medication required for pain management during infusion<sup>3\*†</sup>

- Insertion success rate of 98-100%<sup>4</sup>

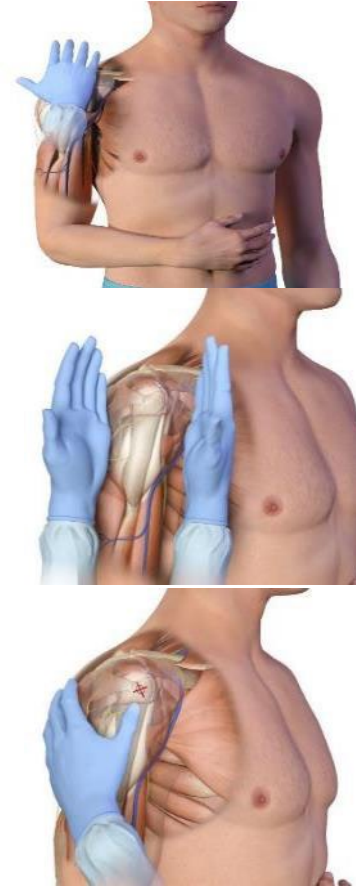
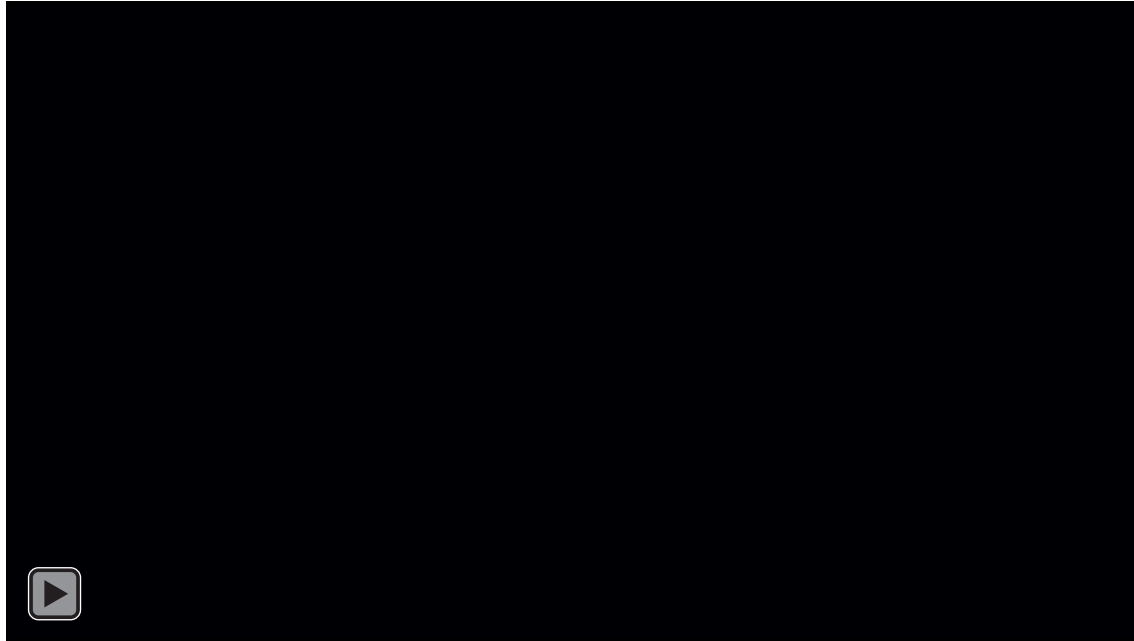
- Flow rates average 1.0 L/hr. under pressure<sup>3†</sup>

\*Based on adult proximal humerus data

†Based on adult proximal tibia data

‡Compared to EZ-IO® System tibial insertions

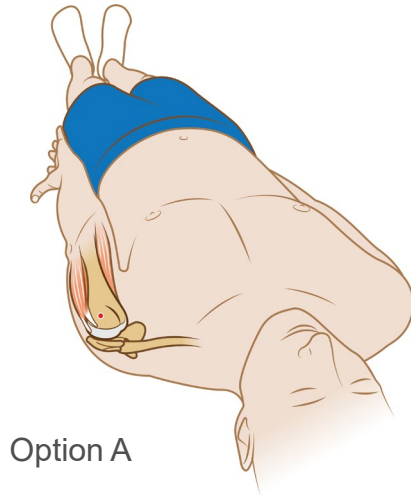
# Proximal Humerus Site Identification



# Positioning for Proximal Humerus Site Identification

Using either method below, adduct elbow to rotate humerus internally

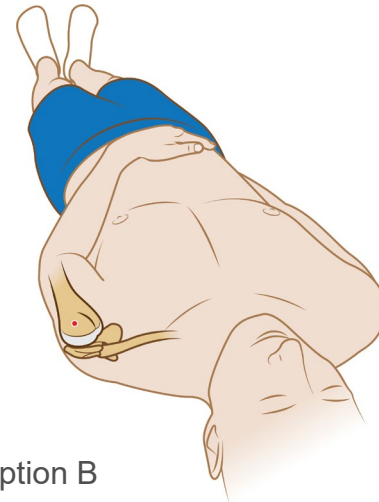
Place the arm tight against the body; rotate the hand so the palm is facing outward, thumb pointing down



Option A

OR

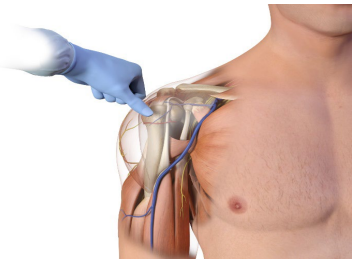
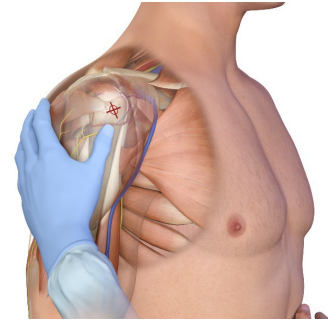
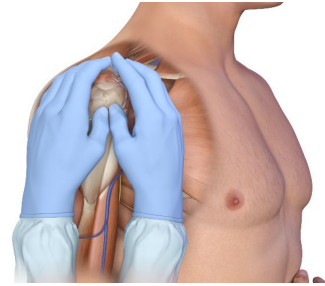
Place the patient's hand over the abdomen with arm tight to the body



Option B

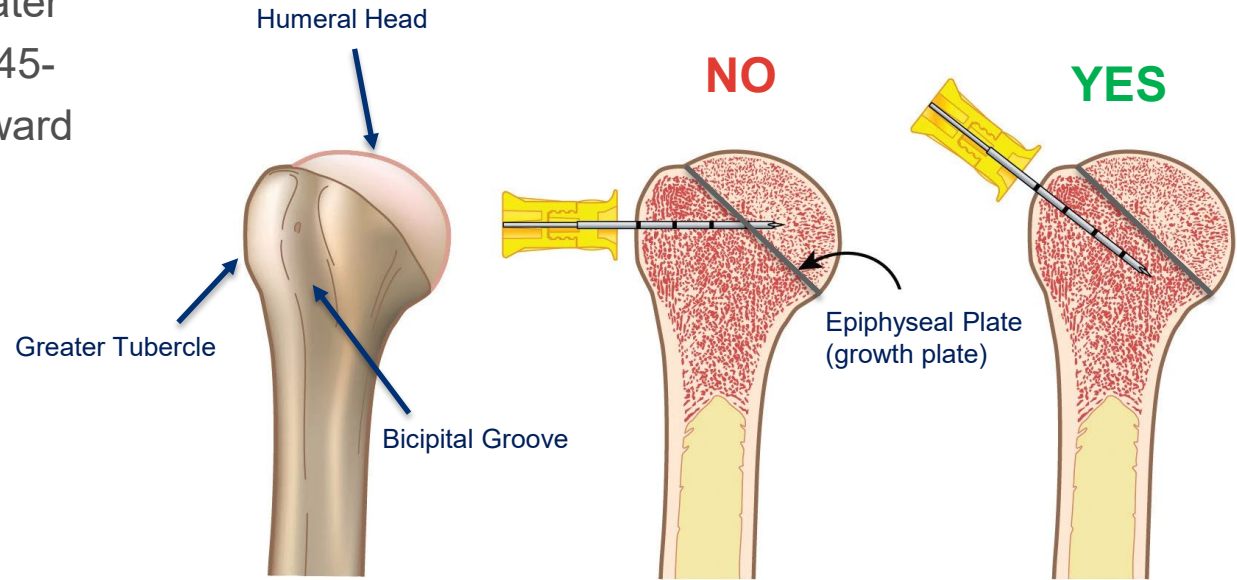
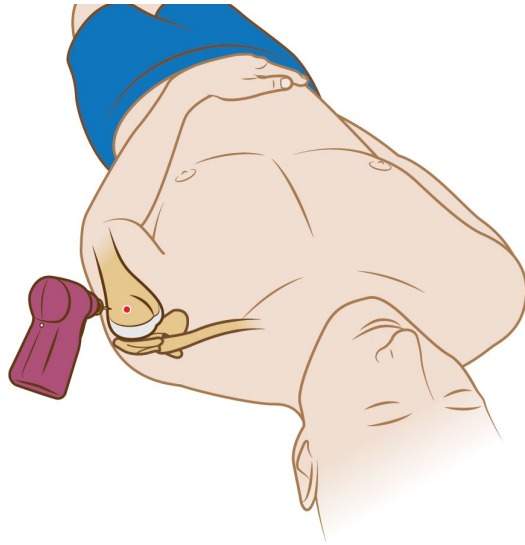
# Proximal Humerus Landmarking

1. Palpate the surgical neck of the proximal humerus
  - It will feel like a golf ball on a tee – the spot where the “ball” meets the “tee” is the surgical neck
2. The insertion site is on the most prominent aspect of the greater tubercle, 1-2 cm above the surgical neck



# Proximal Humerus Insertion Angle

Insert needle set into the greater tubercle at an approximately 45-degree angle, as if aiming toward the opposite hip.

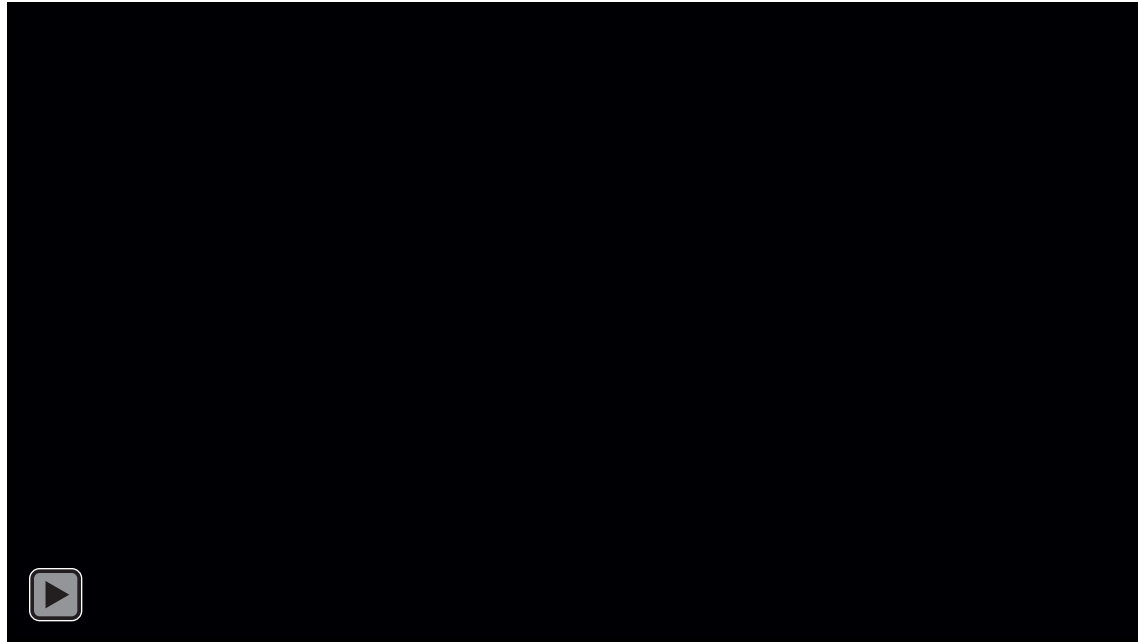


# Proximal Humerus Landmarking



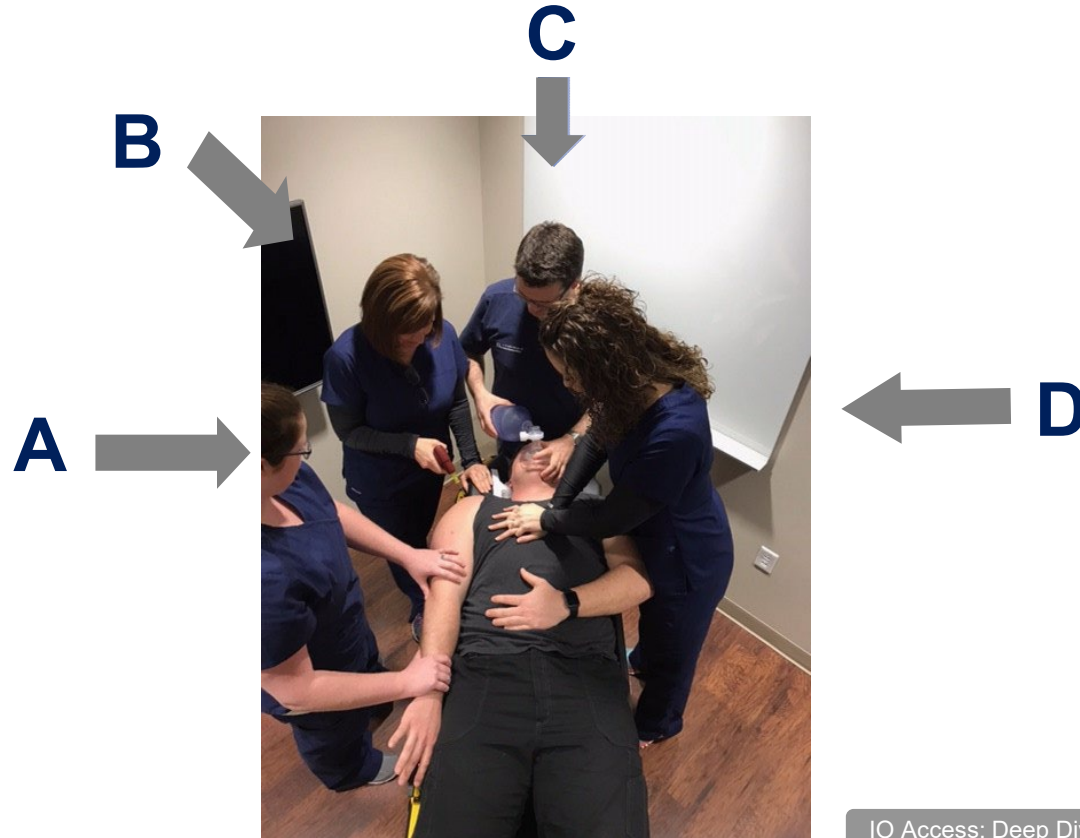


# *Proximal Humerus Landmarking*





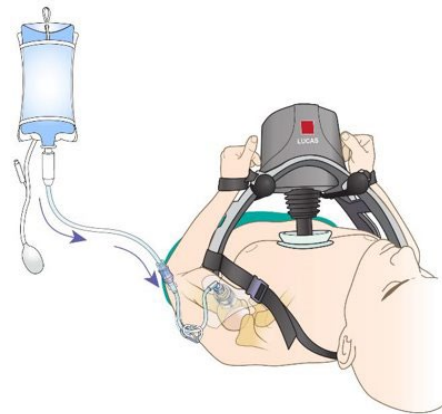
***Myth: "There is not enough space at the head of the bed."***



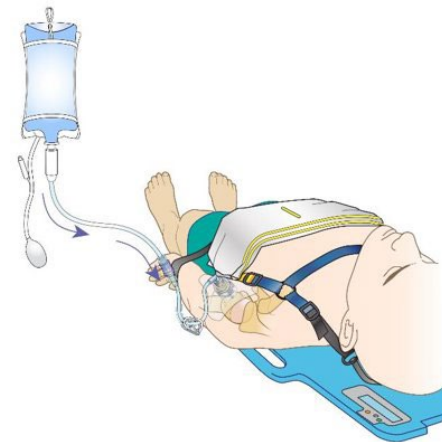
# Proximal Humerus IO Access and Mechanical CPR Devices

- Properly position arm and landmark for insertion
- Immobilize arm with IO vascular access
  - Arm should remain adducted
  - Maintain appropriate stabilization; if mechanical CPR device has arm straps, these may be used to secure arms
  - Ensure Arrow® EZ-Stabilizer® Dressing is utilized
- Use caution when lifting or rolling patient
  - Avoid rolling to side where IO access is in place

## LUCAS® Chest Compression System

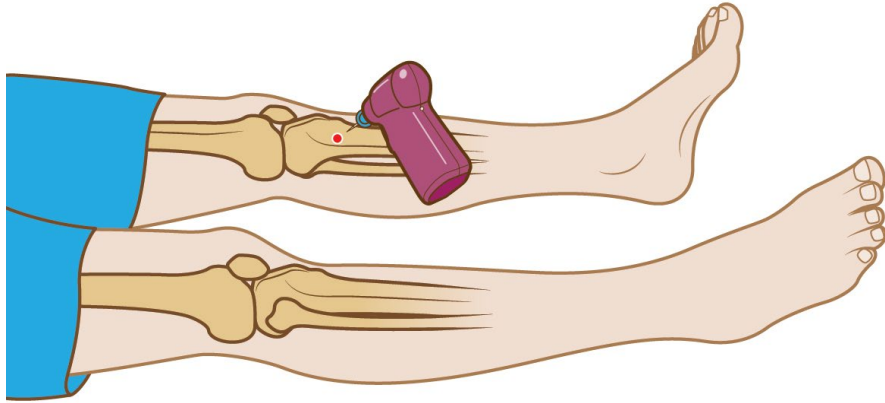


## AutoPulse® from ZOLL®

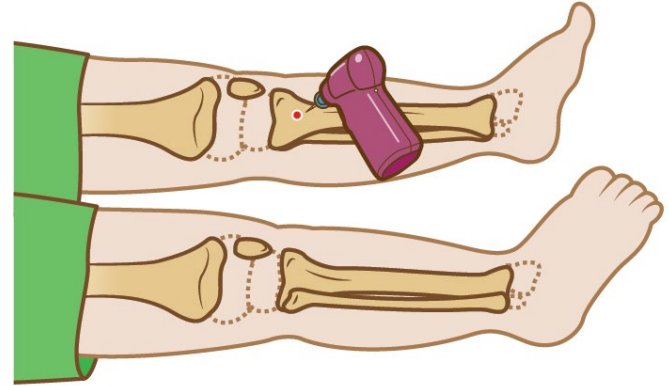


# Proximal Tibia Site Identification

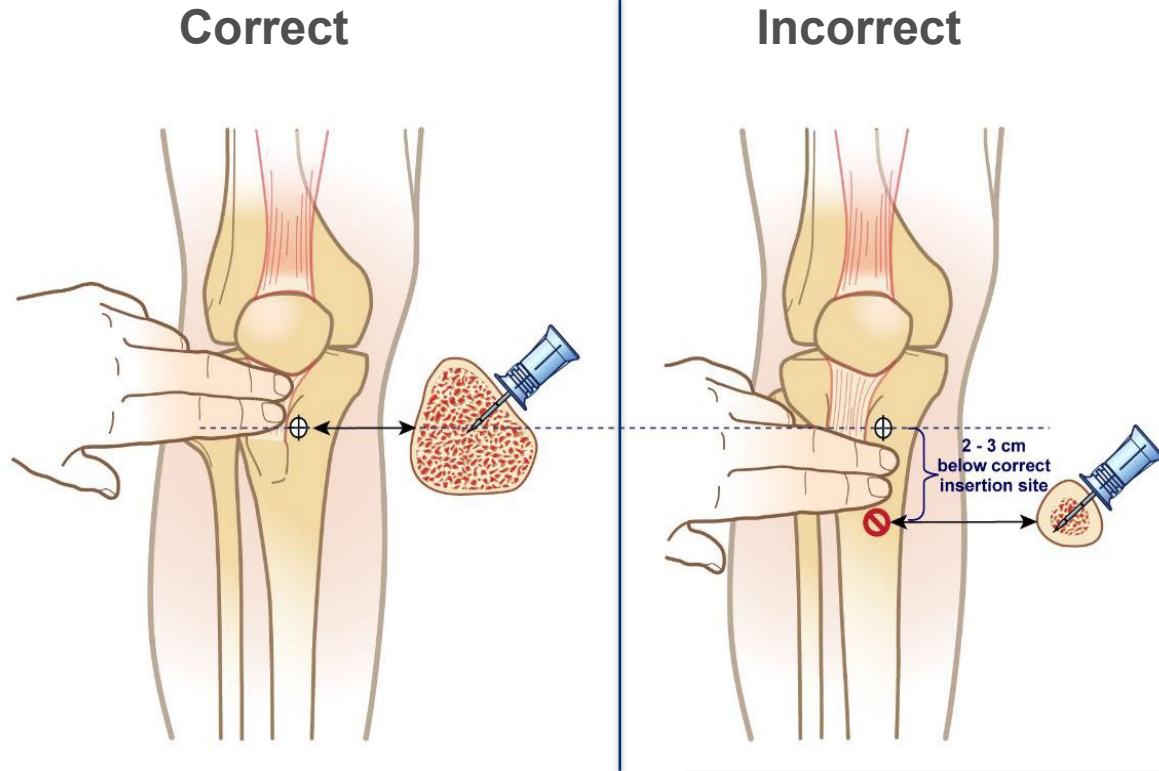
## Adult/Older Child



## Neonate/Young Child



# Proximal Tibia Site Identification

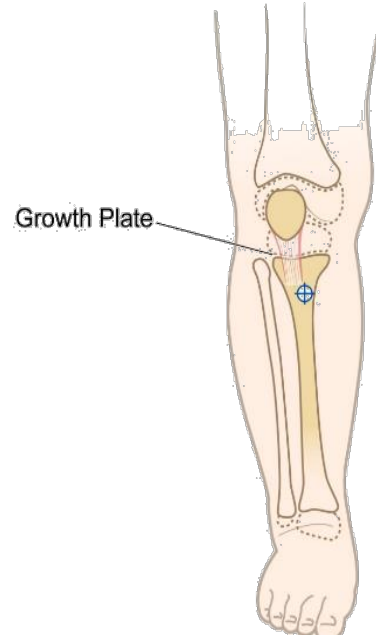




# ***Proximal Tibia Site Identification***



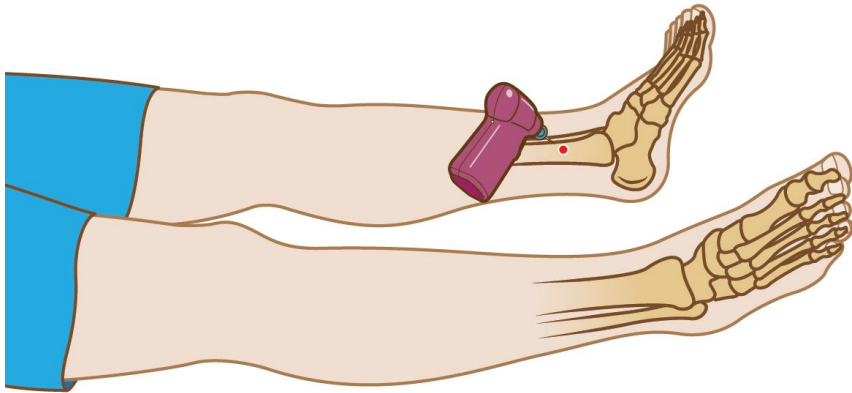
# Proximal Tibia Site Identification



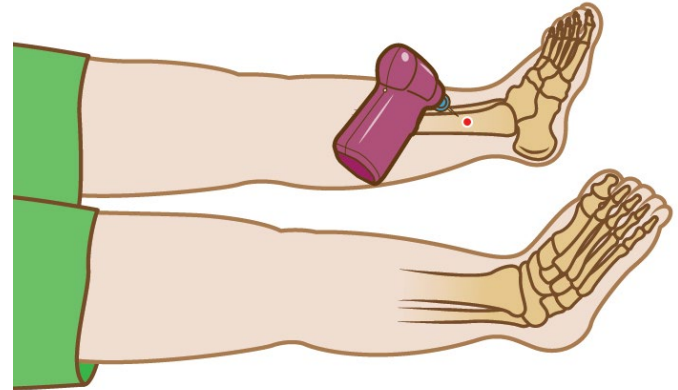
# ***Distal Tibia Site Identification***

Insert medially on the flat, center aspect of the bone

**Adult/Older Child**

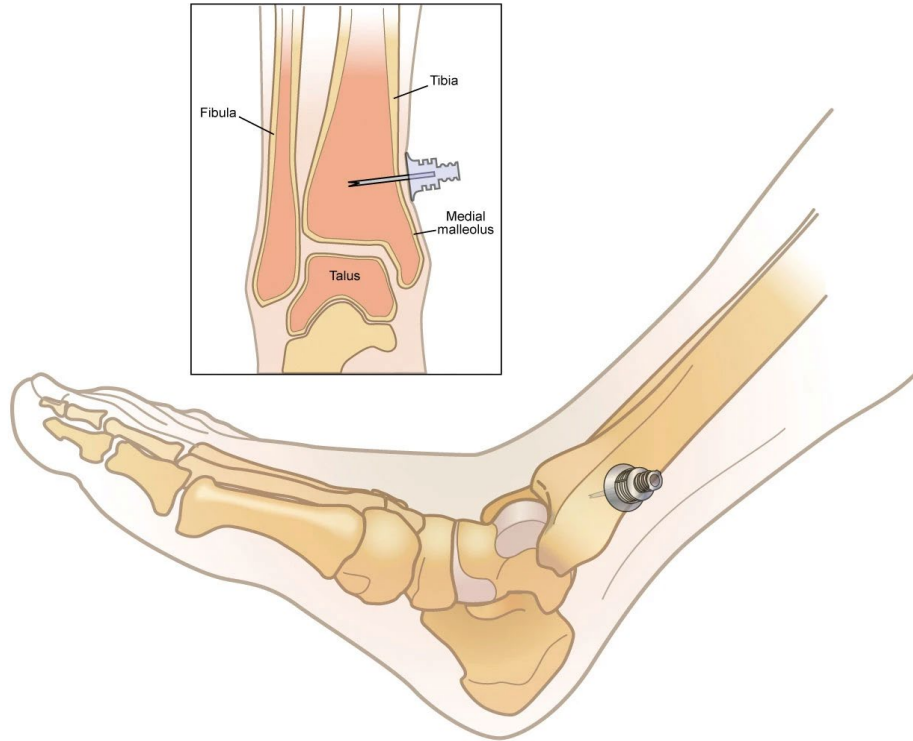


**Neonate/Young Child**



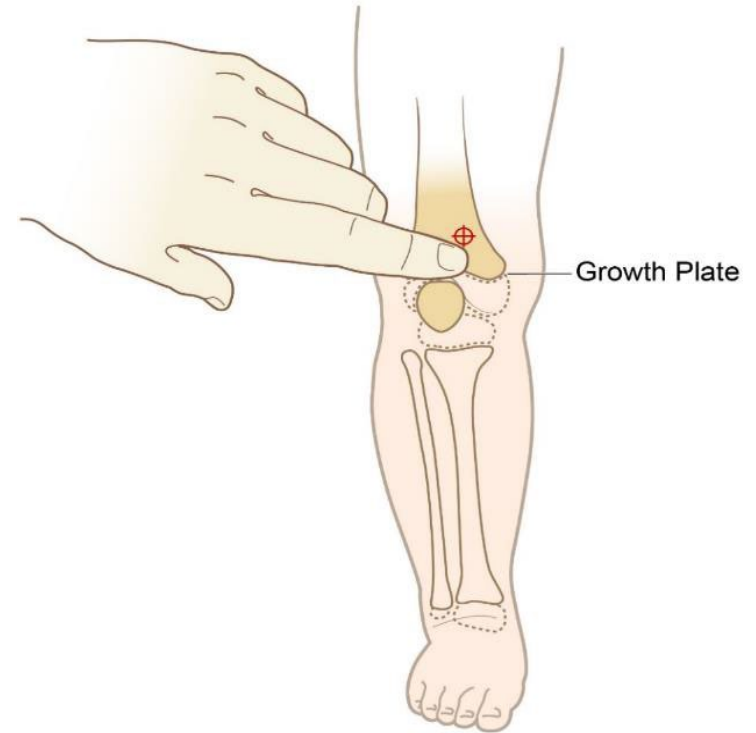
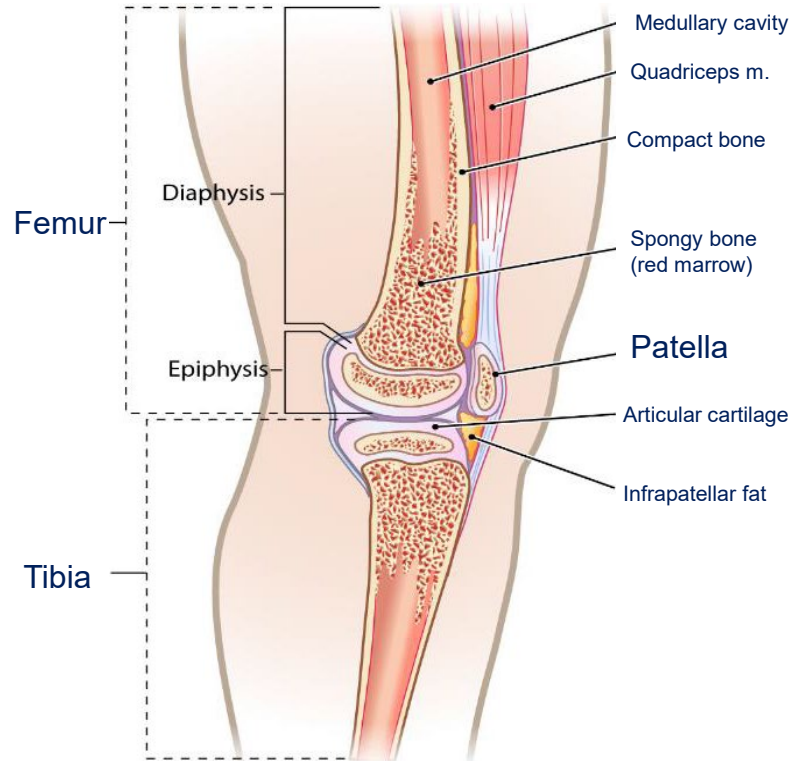


# Distal Tibia Site Identification

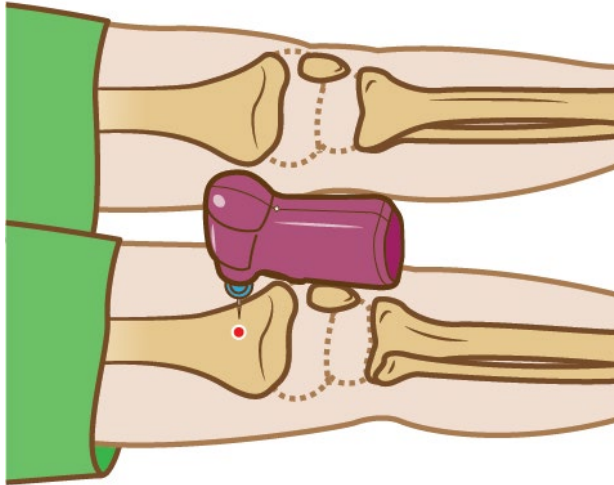




# Distal Femur Site Identification - Pediatrics



# Distal Femur Site Identification - Pediatrics



Ensure leg remains immobilized throughout dwell



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## *Insertion*





# *Insertion Preparation and Technique*



# Clinical Scenarios

## Emergent/urgent situations

Anaphylaxis	DKA	RSI	Shock
Altered LOC	Drug overdose	Resuscitation	SCC
Burns	Dysrhythmias	Seizures	Stroke
Dehydration	ESRD	Sepsis	Trauma

## Non-urgent/medically necessary situations; difficult vascular access (DVA)

Analgesia	Chest Pain	Induction	Rescue Line
Antibiotic Therapy	Fluid Management	Metabolic disorders	Sedation



# Education Resources

**Clinical Education Webpage:** [www.teleflex.com/ezioeducation](http://www.teleflex.com/ezioeducation)

- PowerPoint Download
- Bibliography

**Teleflex Academy:** [www.teleflex-academy.com](http://www.teleflex-academy.com)

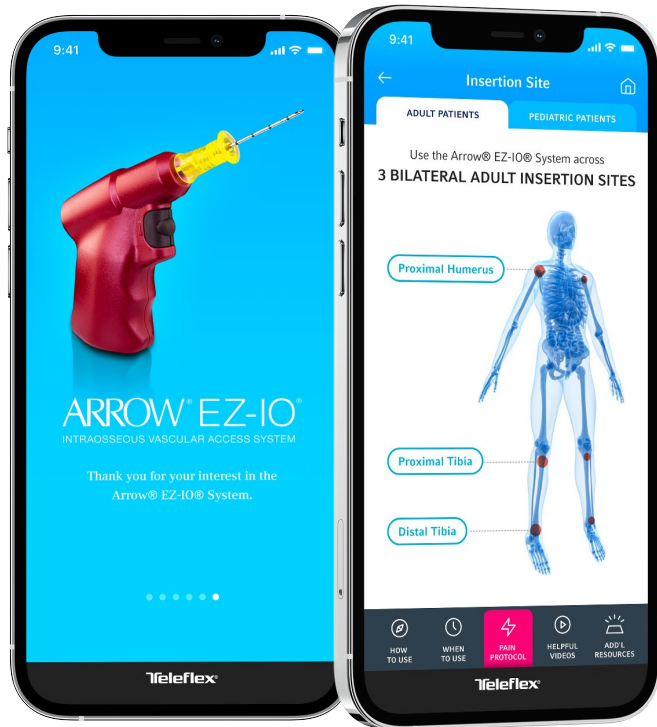
- Online learning module with quiz and certificate

**Cadaveric Lab Program:** [www.teleflex.com/en/procedural-lab-registration](http://www.teleflex.com/en/procedural-lab-registration)

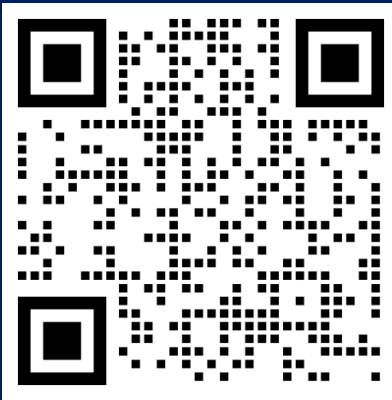
**Teleflex Emergency Medicine YouTube Channel:** [www.teleflex.link/IO-Access](http://www.teleflex.link/IO-Access)

- Testimonials: Patient and Clinician
- Proximal Humerus Fluoroscopy
- Site Identification and Insertion
- Animated
- Alert Patient
- Cadaveric

# Connect With Us



The Arrow® EZ-IO® System Mobile App



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***Any Questions?***



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Rx only.

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***Thank You***