

Standardize the Arrow® EZ-IO® Intraosseous Vascular Access System Inside Code Carts

Intraosseous Vascular Access is Critical in Cardiac Arrest

In cases of non-shockable cardiac arrest, every 3-minute delay in drug treatment is associated with decreased survival.^{1*}

In these time-critical situations:

- The EZ-IO® System provides vascular access via the intraosseous (IO) route within 10 seconds^{2†}, with 3 seconds for fluid and medication delivery to the heart.^{3‡}
- The EZ-IO® System has a 97% first-attempt success rate⁴ and a less than 1% serious complication rate.⁵
- The American Heart Association (AHA), American Association of Critical-Care Nurses (AACN), Association for Vascular Access (AVA), Emergency Nurses Association (ENA), European Resuscitation Council (ERC), Infusion Nurses Society (INS) and the International Liaison Committee on Resuscitation (ILCOR) endorse the use of intraosseous access to obtain vascular access during cardiac arrest for patients with difficult vascular access.^{6,7,8,9,10,11}

In patients with difficult vascular access (DVA), peripheral IV (PIV) access, ultrasound-guided peripheral IV (USGP IV) access, and central venous catheter (CVC) access can take longer and are less likely to be successful when compared with IO:

- Placement of peripheral IV catheters for vascular access is common; however, in certain circumstances, such as when patients have DVA, cannulation can be difficult and may require multiple attempts or may be unsuccessful. One study reported that more than 26% of PIV insertions in the Emergency Department failed on the first attempt.^{12§} Another study reported that PIV cannulation among patients with a history of DVA in the Emergency Department took a median of 15 minutes[¶] and that 67% of insertion attempts were ultimately unsuccessful.¹³
- For USGP IV access, a study reported that the average time to successful cannulation in the Emergency Department was 8.9 minutes, not including setup time.¹⁴
- In a prospective, observational study on IO vs. CVC during in-patient medical emergencies, IO had higher first-pass success¹⁵ (90.3% for IO vs. 37.5% for CVC), faster placement^{15¶} (1.2 min for IO vs. 10.7 min for CVC), and fewer complications^{15#} (9.1% for IO vs. 45.8% for CVC).
- Intraosseous access is a non-collapsible route to circulation offering consistent availability regardless of vein condition.¹⁶

In-hospital Emergency Readiness is a Serious Logistical Challenge

Though crucial to time-critical situations like cardiac arrest, in-hospital emergency readiness remains a serious logistical challenge:

- In a Pennsylvania Patient Safety Authority data review of event reports related to crash carts and missing or unavailable equipment submitted to the Authority during a 12-month reporting period, it was found that: *“Emergency equipment and supplies often are not readily available when a patient experiences a life-threatening emergency. The location of these clinical emergencies varies, but there is a common theme: lack of the correct equipment and supplies to optimally manage the emergency.”*¹⁷
- In restructuring the debriefing process for pediatric ward deterioration events culminating in ICU transfer at the Children’s Hospital of Philadelphia, a theme identified through qualitative analysis of debriefing guides was the availability of physical materials necessary for provision of patient care. One example noted was that IO access supplies could not be found in the code cart and that it was unclear whether these were stocked in the cart or had been removed.¹⁸
- In The Joint Commission’s *Hospital Accreditation Standards, Standard PC.02.01.11* requires that resuscitation services are available throughout the hospital and that resuscitation equipment is available for use based on the needs of the population served.¹⁹

Standardize the Arrow® EZ-IO® System Inside Your Code Carts

- The Association for Vascular Access (AVA) recommends replacing central vascular access devices (CVADs) with IOs in code carts.⁸
- If a facility elects to use IO access for emergency medications, The Advanced Cardiac Life Support (ACLS)** *Crash Cart Supply and Equipment Checklist* suggests storing an intraosseous access driver and needles in the code cart.²⁰
- *Veterans Health Administration (VHA)** Directive 1101.05(2)* detailing the minimum requirements to ensure all enrolled Veterans have access to quality emergency care recommends that an IO insertion device and needles be readily available in Emergency Departments and Urgent Care Centers.²¹
- In a systematic review of emergency department crash cart-specific literature indexed in PubMed and Embase on December 20, 2016, four articles were identified and in addition, latest resuscitation guidelines were reviewed. Following review, the authors suggested contents for the emergency department crash cart and recommended that an intraosseous kit should be stored in the fifth drawer of the emergency crash cart.²²

References:

- * Epinephrine administered in hospital cardiac arrest.
- † Time to access is measured as insertion of the needle set through the bone cortex and into the intraosseous space.
- ‡ Based on adult proximal humerus study conducted in healthy individuals.
- § Calculated from the reported 73.7% first-attempt success rate for PIV insertions in the Emergency Department.
- || Calculated from the reported 33% success rate of PIV cannulation among patients with a history of DVA in the Emergency Department.
- ¶ Placement mean time is measured from package opening to confirmation of blood/marrow aspirate.
- # All complications, including non-serious. Insertion sites were inspected 24 hours after initial placement.
- ** Comments made by the [ACLS/VHA] relate to intraosseous devices, generally, and shall not be construed as an endorsement of the Arrow® EZ-IO® Intraosseous Vascular Access System, specifically.
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The Arrow® EZ-IO® System is indicated 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 ≥ 12 years old, the device may be extended for up to 48 hours when alternate intravenous access is not available or reliably established.

Rx Only. CAUTION: Federal (USA) law restricts this device to sale by or on the order of a physician. The Arrow® EZ-IO® Needle Set is Sterile, Single Use: Do not reuse, reprocess or re-sterilize. Reuse of device creates a potential risk of serious injury and/or infection which may lead to death. Refer to Instructions for Use for complete warnings, indications, contraindications, precautions, and potential complications.

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