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| **Huron Perth Healthcare Alliance** |
| **1. Clinical Policies and Procedures** | Original Issue Date:  | December 29, 2006 |
| **Intraosseous Devices - Insertion, Care and Management of (Adult and Pediatric)**  | Review/Effective Date:  | December 10, 2018 |
| **Approved By: VP People and Chief Quality Executive** | Next Review Date:  | December 10, 2020 |

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| https://intranet.hpha.ca/myalliance/imgs/spacer.gif |
| This is a CONTROLLED document for internal use only.Any documents appearing in paper form are not controlled and should be checked against the document (titled as above) on the file server prior to use.  |
| **Scope:**This policy applies to Registered Nurses who have received appropriate theoretical preparation and who have met the competency requirements listed in this policy to care for intraosseous devices and manage the delivery of medications and/or fluids by the intraosseous (IO) route in the adult and pediatric patient population.**Note:** The insertion of an intraosseous device is a skill that only specifically trained Emergency Department and Critical Care Unit Registered Nurses have the authority to perform at the HPHA in an emergent and/or medically necessary situation by physician order or in accordance with the HPHA Medical Directive entitled Intraosseous Insertion.**Policy:** This policy, in addition to the associated Elsevier skill modules below, describes the steps involved with the insertion, care, management and removal of intraosseous (IO) devices.This policy acts as a guideline for Registered Nurses to safely apply best practice in the provision of high quality care for the patient requiring medication or fluid administration by the IO route. It is expected that nursing staff shall adhere to the principles outlined in this policy, the IO manufacturer’s recommendations, as well as in the associated Elsevier Modules:* [Intraosseous Access](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=197)
* [Intraosseous Needle Placement (Pediatric)](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=884)
* [Intraosseous Needle Care and Removal (Pediatric)](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=873)

Prior to initiating any of the interventions outlined in this policy, nurses must have the knowledge, skill and ability to identify associated risks and precautions, manage potential adverse reactions and provide ongoing assessment and monitoring of the patient prior to, during and post IO medication and fluid administration.**Definitions:***Intraosseous:* situated within, occurring within, or administered by entering a bone. *“IO”*indicates the abbreviation for “intraosseous”.**Indications:**Indications for IO device insertion may include but are not limited to:* Short-term administration of fluids or medications when intravascular access cannot be achieved in a timely manner, thereby potentially increasing the risk of morbidity or mortality
* IO needles are recommended for resuscitation in any age group

**Contraindications:** Contraindications for IO device insertion may include but are not limited to:* Fracture of the tibia or femur (consider alternate tibia)
* Previous significant orthopedic procedure
* Previous IO attempt in the same bone within 48 hours
* Infection at insertion site (consider alternate site)
* Inability to locate landmarks (significant edema)
* Excessive tissue at insertion site (obesity)
* Pre-existing medical condition affecting the integrity of the bone (tumor near site, osteogenesis imperfecta, severe osteoporosis, etc.) increase the risk for fractures in patients with some IO devices, but IO infusion may be used in extreme circumstances even in these cases.

**Competency requirements:**I. **IO care, management and removal**- Emergency Department and Critical Care Unit Registered Nurses employed at the HPHA will have received the appropriate theoretical preparation and competency requirements to care for, manage and remove IOs upon successful completion of the following:* Review of the HPHA Policy and Procedure: Intraosseous Devices- Insertion, Care and Management of (Adult and Paediatric)
* Review of the Elsevier Modules appropriate for the patient population under their care**:**
	+ [Intraosseous Access](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=197) (applicable for adult and pediatric)
	+ [Intraosseous Needle Care and Removal (Pediatric)](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=873)

II. **IO insertion-** Emergency Department and Critical Care Unit Registered Nurses employed at the HPHAwill have received the appropriate theoretical preparation and competency requirements to insert IOs upon:* Review of the HPHA Policy and Procedure: Intraosseous Devices- Insertion, Care and Management of (Adult and Paediatric)
* Review of the HPHA Medical Directives: [Intraosseous Insertion - Adult](https://intranet.hpha.ca/myalliance/Default.aspx?cid=12941&lang=1) and [Intraosseous Insertion - Paediatric](https://intranet.hpha.ca/myalliance/Default.aspx?cid=12942&lang=1)
* Review the Elsevier Modules appropriate for the patient population under their care:
	+ [Intraosseous Access](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=197) (Adult)
	+ [Intraosseous Needle Placement (Pediatric)](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=884)
* Obtaining initial certification by successful completion of the Teleflex IO self-directed learning module and post-test **and** the accompanying hands-on competency assessment
* Maintaining competency- On an annual basis certified RNs will complete the Teleflex IO self-directed learning module **and** self-assess their own knowledge, ability and skill to insert intraosseous devices, and take appropriate measure to ensure competency in the skill is maintained. Nurses will retain a record of related learning activities, as per CNO practice standards.

**Considerations:*** Most fluids and/or medications that can be administered intravenously can be administered via the intraosseous (IO) route.
* IOs should not remain in place for more than 24 hours
* The following are potential complications that the patient should be observed for:
* Extravasation; Compartment syndrome; Fracture of the target bone; Infection; Pain on insertion; Skin necrosis; Embolism
* Children have a higher risk of fluid extravasation and compartment syndrome because of their small bone size and variable needle lengths. Careful assessment for proper IO placement and local fluid extravasation are essential.
* Assessments should include but are not limited to:
	+ Measuring the circumference of the upper or lower extremity in which the IO device is inserted every hour;
	+ Circulation, sensation and movement to the extremity every hour;
	+ Monitor IO insertion site every 30 minutes for signs of swelling and needle displacement
	+ Patency of the IO device.

**Procedure:**The following **Elsevier Modules** and Teleflex’s IO device **manufacturer’s instructions** shall be used for complete step-by-step procedure on IO insertion (Physician or trained ED/CCU RNs only), care, maintenance, assessment and documentation:* + [Intraosseous Access](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=197) (applicable to adults and pediatric patients)
	+ [Intraosseous Needle Placement (Pediatric)](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=884)
	+ [Intraosseous Needle Care and Removal (Pediatric)](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=873)
	+ [Arrow® EZ-IO® Intraosseous Vascular Access Needles](https://www.teleflex.com/global/clinical-resources/ez-io/8082_Rev_02_-_FDA_Intraosseous_Infusion_System_IFU_ATH_v2_-_PRESS.pdf)
	+ [Arrow® EZ-IO® Intraosseous Vascular Access Driver](https://www.teleflex.com/global/clinical-resources/ez-io/8047Rev05EZ-IODriverIFUATH.pdf)

**Related resources:*** **Elsevier Module:** [Medication Administration-IV Direct](http://mns.elsevierperformancemanager.com/SkillsConnect/Default.aspx?Token=1046880&SkillID=604)
* **Medical Directives:** [Intraosseous Insertion - Adult](https://intranet.hpha.ca/myalliance/Default.aspx?cid=12941&lang=1) and [Intraosseous Insertion - Paediatric](https://intranet.hpha.ca/myalliance/Default.aspx?cid=12942&lang=1)

**References:**Cardiff and Vale University Health Board. (2017). Adult Intraosseous Cannulation Protocol using the EZ-I) Device for Emergency Intravenous Access. Retrieved from <http://www.cardiffandvaleuhb.wales.nhs.uk/sitesplus/documents/1143/EZIO%20Protocol%202017.pdf> Gomella, T., Cunningham, M. & Eyal, F., (eds), (2009). *Neonatology Management, Procedures, On-call Problems, Diseases, and Drug,s* 6thed.New York: The McGraw-Hill Companies.MacDonald, M. & Ramasethu, J. (eds), (2007). *Procedures in Neonatology*, 4thed. Baltimore: MD: Lippincott Williams & Wilkins.Saskatoon Health Region. (2011). Intraosseous Infusion-Assisting with Insertion and Removal. Policies and Procedures. Retrieved from <https://www.saskatoonhealthregion.ca/about/NursingManual/1186.pdf> Teleflex® Incorporated. (2015). ARROW®EZ-IO®: EZ-IO® Intraosseous Vascular Access Needles Instructions for Use. Retrieved June 6, 2018, from <https://www.teleflex.com/global/clinical-resources/ez-io/8082_Rev_02_-_FDA_Intraosseous_Infusion_System_IFU_ATH_v2_-_PRESS.pdf> Vidacare. (2006). Vidacare Protocol Development Guide. Retrieved from [www.vidacare.com](http://www.vidacare.com/)  |