

# Radiographs (X-Rays): Nurse Requisitioning of Upper and Lower Extremity (Adult age 17 years and older)

## Quick Links:

- [LearningHub Course](#)
- Appendix A: [Upper Extremity Injury - Emergency RN Initiated Orders Clinical Decision Support Tool: Extremity X-ray Guidelines](#)
- Appendix B: [Lower Extremity Injury – Emergency RN Initiated Orders Clinical Decision Support Tool: Extremity X-ray Guidelines](#)
- Appendix C: [Certification for Ordering Upper and Lower Extremity X-rays](#)

## Site Applicability

### VCH and PHC:

- Emergency Departments (ED)
- University of British Columbia Urgent Care Centre (UCC)
- Health Care Centres (HCC):
  - Pemberton Health Centre
  - Whistler Health Care Centre

## Practice Level

Regulated Profession	Practice Area	Specialty Trained Basic Competencies	Advanced Competency (requiring additional education)
RN	<ul style="list-style-type: none"> <li>• Emergency</li> <li>• UBC Urgent Care Centre</li> <li>• Health Care Centres (Pemberton &amp; Whistler)</li> </ul>	<p><b>With advanced specialty education<sup>1</sup> and where the following activities are core competencies and expectations of the role:</b></p> <ul style="list-style-type: none"> <li>• Advanced emergency nursing assessment framework /skills, urgency determination and diagnostic reasoning</li> <li>• Key trauma concepts including mechanisms of injury</li> </ul>	<p><b>Nurse Independent Activities (NIAs):</b></p> <ul style="list-style-type: none"> <li>• n/a</li> </ul>
			<p><b>Nurse Initiated Protocols (NIPs):</b> for the purpose of triage of trauma related extremity injury include:</p> <ul style="list-style-type: none"> <li>• Radiographs for upper extremity: <ul style="list-style-type: none"> <li>○ Elbow, forearm, wrist, scaphoid, hand, finger(s)</li> </ul> </li> <li>• Radiographs for lower extremity: <ul style="list-style-type: none"> <li>○ Knee, ankle (including very distal tibia/fibula), foot, toes</li> </ul> </li> </ul> <p><b>Limitations</b></p> <ul style="list-style-type: none"> <li>• Clients 17 years of age and older (See Radiographs (X-rays): Nurse Requisitioning of Upper and Lower Extremity (Adult age 17 years and older)</li> <li>• Body parts not within the scope of this protocol</li> </ul>

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			<ul style="list-style-type: none"> <li>Alert Physician/NP (provider) to assess and determine diagnostic imaging required, if nursing physical assessment identifies : <ul style="list-style-type: none"> <li>neurovascular compromise or</li> <li>diminished pulses or</li> <li>obvious dislocations/severe deformities to the extremity</li> <li>open fractures</li> </ul> </li> <li>Requester (nurse) uncertainty of need or type of radiograph required</li> </ul> <p><b>Note:</b> Confirmed or suspected pregnancy is not a limitation for upper and lower extremity radiographs but if the client and/or the requester have concerns regarding the radiation risk, consult with the provider for the need and type of radiographs to request.</p>
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1. formal program of study in Emergency Nursing or Combined Emergency & Critical Care Nursing (e.g. BCIT specialty education course or equivalent)

## Education

- Completion of [required education](#) Learning Hub: Nurse Initiated X-ray Requests for Extremities
- Performance of a Nurse Initiated Protocol (NIP) (see [Nurse Independent Activities \(NIA\) and Nurse-Initiated Protocols \(NIP\) Policy](#)) is an advanced skill requiring [additional education](#).
- Learning has been validated by appropriate clinical support person (Emergency Nurse Educator/Clinician)

## Requirements

- This decision support tool is limited to guiding nurses requesting extremity radiographs for the purpose of expediting client's time to diagnosis and treatment and for the purposes of follow-up.
- This decision support tool promotes the ongoing management of clients presenting to ED/UCC/HCC who are in need of extremity radiological studies.
- RNs must follow the established RN NIPs as outlined in the DST and Quick Reference Guide outlined in this protocol.
- Prior to enacting this decision tool, all nurses are required to successfully complete the additional education and training which includes:
  - NIA/NIP required education. The use of NIA/NIP is supported within VCH/PHC and is defined as per policy: [Nurse Independent Activities \(NIA\) and Nurse-Initiated Protocols \(NIP\)](#)

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- Online learning module from LearningHub: [Nurse Initiated X-ray Requests for Extremities](#)
  - Note: the online module above includes a review of the Anatomical Landmarks for [Upper](#) and [Lower](#) Extremities within the scope of this DST
- The scope of this policy is limited to RN requesting x-rays on clients 17 years of age and older.
- The scope of this policy is **excludes** RN requesting x-rays those areas not listed.
- If nursing assessment identifies client has neurovascular compromise, diminished pulses or obvious dislocations/severe deformities to the extremity, these clients will be referred directly to the EP/NP for immediate assessment and determination of required diagnostic imaging. Under these circumstances physician/NP will override the use of NIP.
- If there is any doubt as to whether a radiograph is required or what type to request, the nurse should consult with a provider.
- The scope of this policy excludes RN interpretation and/or diagnosis of the RN initiated requested radiographs of the upper and lower extremities. Diagnosis and treatment of the client is the responsibility of the emergency physician or nurse practitioner.
- RN competency to be maintained **by re-certification** of learning by appropriate clinical support person **every one to two years** and will include:
  - Clinical testing (three patients for the upper extremity body parts within the scope of this protocol and three patients for the lower extremity body parts within the scope of this protocol) where a ED Registered Nurse performs an extremity assessment, identifies x-ray needs and reports to an appropriate clinical support person (e.g. Emergency Nurse Educator/Clinician, Emergency Physician, Nurse Practitioner)
  - Repeat of the online education "[Nurse Initiated X-ray requests for extremities](#)" testing knowledge of anatomy, history and physical examination associated with injuries of extremities (i.e. finger, hand, scaphoid, wrist, forearm, elbow, foot (including calcaneus, metatarsals/tarsals, toes), ankle (including very distal tibia/fibula), and knee every two years or as required.
  - Sign off on the "Certificate of Competency for Requesting Upper and Lower Extremity Radiographs" document (See [Appendix C](#))
  - The clinical nurse educator of the ED/UCC/HCC will maintain records of instruction, certification and re-certification.
  - Certification and re-certification records will be kept in the employee's personnel file and online education profile.
  - Sites to review volume of use of this NIP as per site protocol.

## Need to Know

This Decision Support Tool is intended to:

- Promote early identification of adult clients' in need of extremity radiological studies (x-rays) by the Emergency Department Nurse.
- To expedite client care and the timely delivery of services.
- Improve client satisfaction by decreasing the wait times and time to provider diagnosis for select clients presenting to the ED/UCC/HCC.

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- It is within scope of this protocol for nurses to request upper and lower radiographs on clients 17 years of age and older after a physical assessment has been performed and there are no identified neurovascular compromise, diminished pulses or obvious dislocations/severe deformities to the extremity.
  - Radiograph requests for the upper extremity include:
    - elbow
    - forearm
    - wrist +/- scaphoid
    - hand
    - finger (s)
  - Radiograph requests for the lower extremity:
    - Knee
    - ankle (including very distal tibia/fibula)
    - foot
    - toe(s)

## Expected Client/Client/Resident Outcomes

### Intended Outcomes

- Decrease time for provider to diagnosis for select clients presenting to VCH/PHC ED/UCC/HCC
- Increase in client satisfaction for these client's presenting to VCH/PHC ED/UCC/HCC

### Unintended Outcomes

- Radiograph delays reduction of a dislocated joint
- Radiograph deemed not appropriate by radiology staff or Emergency Provider (EP/NP)

## Algorithm

- [Upper Extremity Injury – Extremity X-ray Guidelines](#)
- [Lower Extremity Injury – Extremity X-ray Guidelines](#)

VCH/PHC ED RNs qualified to initiate x-rays requests can use these algorithm on clients 17 years of age and older to determine the need for an x-ray. All other presentations should be directed to the ED Physician or Nurse Practitioner.

## Definition

**Left Without Being Seen (LWBS):** Refers to a client who has left the health care facility without being examined or assessed by an Emergency Department/Urgent Care Centre/Health Care Centre provider (EP/NP).

## Protocol

### Assessment and Interventions

1. Review health history including: when injury occurred, if this is new or a chronic injury, previous injury to the same joint, identify mechanism of injury, and a pain assessment
2. Ask client if they have had a radiograph recently to assess the current chief complaint
3. A physical assessment will be performed and will include:
  - comparison to unaffected limb (undress both limbs)

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- colour of affected limb, movement, circulation, sensation, and warmth
- pain
- point of tenderness
- swelling
- bruising
- impaired range of motion
- pulses distal to the injury
- deformity
- right/left
- ability to weight bear

**Note:**

- Refer to the [Anatomical Landmarks for Upper Extremity](#) and [Anatomical Landmarks for Lower Extremity](#) included within the scope of this DST during the physical assessment
  - If indicated, perform a comprehensive pain assessment. If pain is mild to moderate, refer to [Pain Management: Acute Mild to Moderate \(Adult\)](#)
  - If assessment identifies neurovascular compromise including diminished pulses or obvious dislocation/severe deformity, notify the EP/NP to perform assessment and identify diagnostic imaging required.
4. Use [Upper Extremity Algorithm](#) or [Lower Extremity Algorithm](#) to determine if radiographs can be appropriately requested by the RN. If appropriate, radiographs can be requested by RNs both at triage and within the emergency department/urgent care centre.

Upper Extremities Radiographs (as per <a href="#">Algorithm</a> , clients only need to meet one of the listed criteria.	Lower Extremities Radiographs (as per <a href="#">Algorithm</a> , clients only need to meet one of the listed criteria.
<b>Finger</b> <ul style="list-style-type: none"> <li>• Presence of tenderness over any of the phalanges</li> <li>• Obvious deformity of the digit</li> <li>• Severe pain with injury</li> <li>• Injury involves single finger</li> </ul> <b>Hand</b> <ul style="list-style-type: none"> <li>• Presence of tenderness over the MCP joint</li> <li>• A suspected injury proximal to the MCP joint</li> <li>• Obvious deformity and/or swelling that extends from the hand into the wrist joint</li> <li>• Severe pain with injury</li> </ul>	<b>Knee 2 to 3 views</b> <ul style="list-style-type: none"> <li>• Tenderness of patella or head of fibula</li> <li>• Inability to weight bear both immediately post injury and in the ED</li> <li>• Inability to flex to 90 degrees</li> <li>• Severe pain with injury</li> </ul> <b>Ankle 2 to 3 views</b> <ul style="list-style-type: none"> <li>• Inability to weight bear both immediately post injury and in the ED</li> <li>• Bony tenderness over either the malleolus or bone of the fifth metatarsal</li> </ul> <b>Foot 2 to 3 views</b> <ul style="list-style-type: none"> <li>• No calcaneal or back pain and screens positive for the Ottawa Ankle and Foot Rules</li> </ul>

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<ul style="list-style-type: none"> <li>• Injury involves multiple fingers</li> </ul> <p>Wrist 3 views</p> <ul style="list-style-type: none"> <li>• Obvious deformity and/or swelling in the wrist joint only</li> <li>• Severe pain with injury</li> </ul> <p>Add Scaphoid View</p> <ul style="list-style-type: none"> <li>• Tenderness in the anatomical snuffbox</li> </ul> <p>Forearm 2 views</p> <ul style="list-style-type: none"> <li>• Severe pain with injury</li> <li>• Obvious deformity and/or swelling/tenderness/crepitus to the mid-shaft forearm (not isolated to the distal radius/ulna – this is a wrist x-ray)</li> </ul> <p>Elbow 2 to 3 views</p> <ul style="list-style-type: none"> <li>• Obvious swelling of the elbow joint, tenderness of the olecranon, radial head, and/or supracondylar areas following an injury</li> <li>• Inability to fully extend arm at elbow following an injury</li> <li>• Severe pain with injury</li> </ul>	<ul style="list-style-type: none"> <li>• Point tenderness over the base of the fifth metatarsal, and/or the navicular</li> <li>• Normally walks but has inability to weight bear both immediately post injury and in the ED</li> </ul> <p>Toe</p> <ul style="list-style-type: none"> <li>• Rotated, deformed toe</li> <li>• Suspected great toe fracture</li> </ul>
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5. RN to request radiograph as per [upper algorithm](#) or [lower algorithm](#) and provide appropriate documentation.
6. Discuss with client the purpose and rationale of the radiograph.
7. Follow-up of Emergency RN Initiated Radiograph request which includes:
  - Ensuring RN initiated radiograph has been entered and documented appropriately.
  - RN informing the provider (EP/NP) that a radiograph has been requested for the client.
  - Ensuring x-ray results are followed up by the client's provider (EP/NP) as per usual ED practice.

#### **Radiographer Assessment and Follow-Up**

Note: A Radiographer will review all radiographs requested, and if they have questions about the request or feels that a different radiographic view may be required, they will call the emergency department and speak to the nurse who referred the client.

Radiographers review all radiograph requests, interview patients, look at injured area and document patients comments and any key observations of the injured part for the radiologists in the radiology patient history section. If during this assessment the radiograph request based on their imaging and anatomical expertise does not align with patient's clinical presentation and

verbal history given, the radiographer will call the ED or urgent care center and request to review the findings with the patient's primary nurse and together agree on the most appropriate request.

8. Clients Left Without Being Seen (LWBS):

- If any client leaves the ED without being assessed by the provider, the nurse will inform the most-responsible physician/NP that radiographs were requested and completed and need to be reviewed to determine if client needs to be contacted regarding the results.

9. Follow up of abnormal x-ray results will be the responsibility of the EP or NP.

**Patient/Client/Resident Education**

When appropriate, explain rationale for the radiograph being requested and possible outcomes if the client refuses the X-Ray to diagnose the source of pain. Instruct client about the importance of and method of communicating change in symptoms.

## Documentation

1. **On Emergency Department/Urgent Care Centre/Health Care Centre Nursing Assessment:**

- Initial extremity assessment, on-going nursing treatments and response to treatment
- Any protocol or NIA followed
- If applicable, pain assessment scale score per pain site for initial and ongoing pain assessment
- Ongoing patient/family teaching
- Discharge teaching/instructions provided as applicable
- Follow up re: Discharge instructions/referrals with any HCP for ongoing pain management

2. **RN to complete nurse initiated protocol (NIP) for extremity radiograph ordering including:**

- Date and time
- Name of radiograph
- Site and Side
- Clinical history or criteria (e.g. Client fell 10 feet, ? Right ankle fracture)
- Nurse first and last name printed (automatically present if online order entry)
- Nurse signature and designation (automatically present if online order entry)
- MRP (most responsible provider) first and last name printed to receive the radiograph report

3. **NIA/NIP Documentation** (in the Orders section of the client chart) – will be in accordance with Health Authority NIA/NIP Policy: [Nurse Independent Activities \(NIA\) and Nurse-Initiated Protocols \(NIP\)](#)

## Related Documents

- [Pain Management: Acute Mild to Moderate \(Adult\)](#)
- [BCCNP Scope of Practice for Registered Nurses](#)

## Guidelines/Procedures/Forms

- [Lower Mainland Medical Imaging Clinical Practice: Mobile Radiography Request Guidelines](#)
- [Lower Mainland Medical Imaging Mobile Radiography Request Quick Reference Poster](#)

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## Appendix A: Upper Extremity Injury Emergency RN Initiated Orders Clinical Decision Support Tool: Extremity X-ray Guidelines (Adopted from FHA)



How you want to be treated.

Emergency RN Initiated Orders Clinical Decision Support Tool:

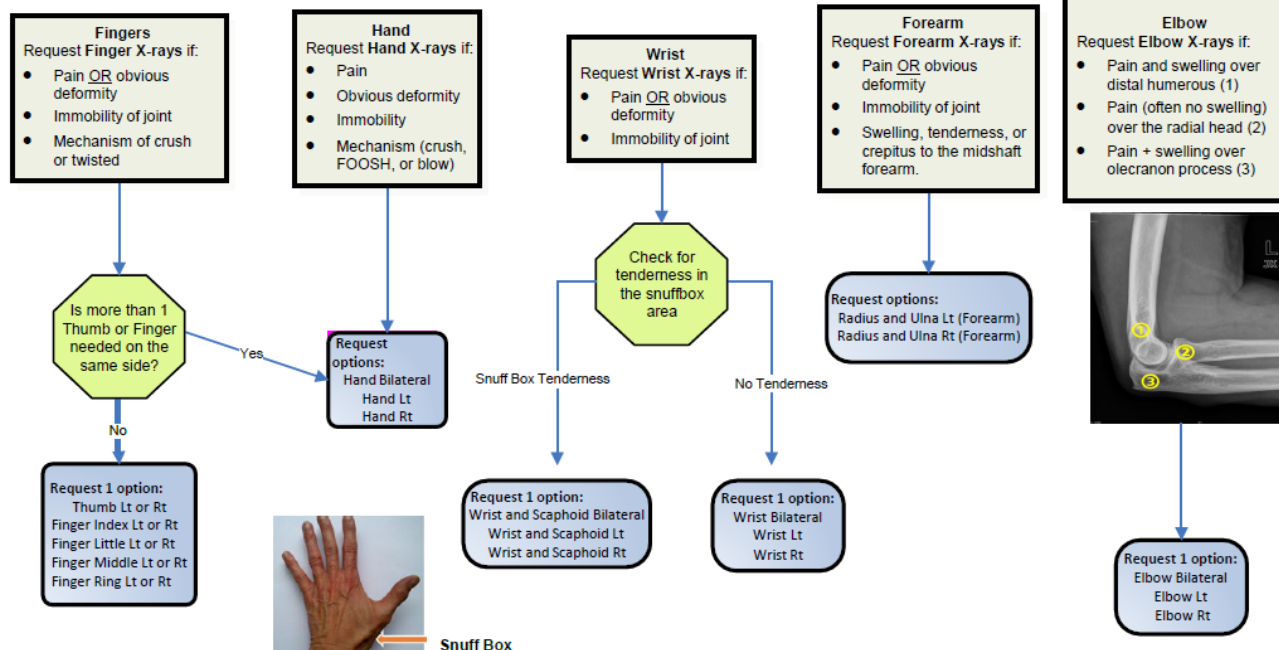
### Extremity X-ray Guidelines

Patients 17 years of age and over

\*\* RN must also complete Extremity Xray certification (Online education and competence assessment)\*\*

### Upper Extremity Injury

\*\*\* Any suspected neurovascular compromise, dislocation, severe deformity, open fracture or non-accidental injury must be assessed by the ERP or NP prior to x-rays being requested.\*\*\*



References: Ottawa Hospital Research Institute: Ottawa Ankle Rules. Retrieved on Nov 16, 2012 from: <http://www.ohri.ca/emerg/cdr/ankle.html>  
FHA Online Extremity Xray course: <https://learndev.vch.ca/course/view.php?id=527>  
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## Appendix B: Lower Extremity Injury – Emergency RN Initiated Orders Clinical Decision Support Tool: Extremity X-ray Guidelines



How you want to be treated.

### Emergency RN Initiated Orders Clinical Decision Support Tool:

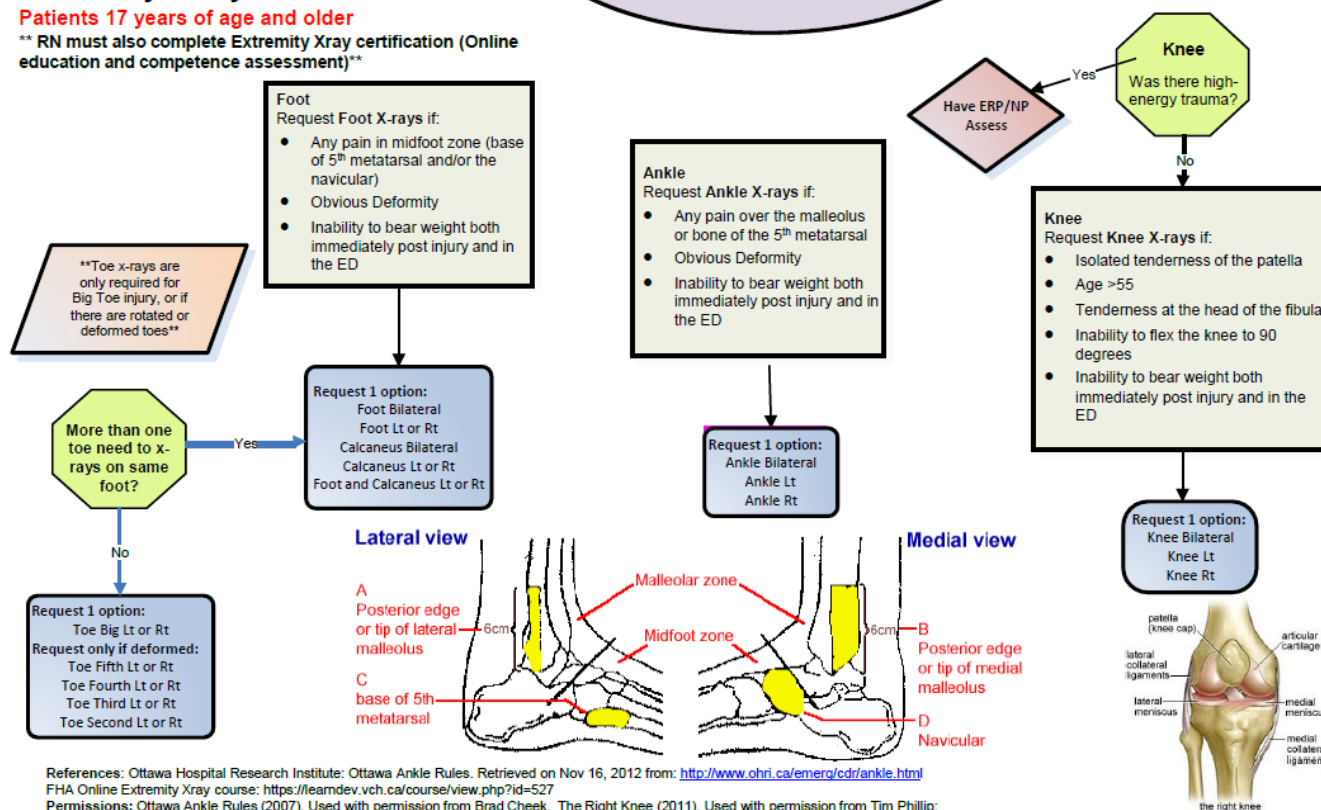
### Extremity X-ray Guidelines

**Patients 17 years of age and older**

**\*\* RN must also complete Extremity Xray certification (Online education and competence assessment)\*\***

### Lower Extremity Injury

\*\*\*Any suspected neurovascular compromise, dislocation, severe deformity, open fracture or non accidental injury must be assessed by the ERP or NP prior to x-rays being requested.\*\*\*



References: Ottawa Hospital Research Institute: Ottawa Ankle Rules. Retrieved on Nov 16, 2012 from: <http://www.ohri.ca/emerg/cdr/ankle.html>

FHA Online Extremity Xray course: <https://learndev.vch.ca/course/view.php?id=527>

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## Appendix C: Extremity X-ray Certification

### Certification for Ordering Upper and Lower Distal Extremity X-rays

Name: \_\_\_\_\_ Employee ID: \_\_\_\_\_ has successfully completed the Educational component including:

- Nurse Initiated X-ray Requests for Extremities online module:  
<https://learninghub.phsa.ca/Courses/19601>
- Review of [Nurse Independent Activities \(NIA\) and Nurse-Initiated Protocols \(NIP\)](#)

Clinical testing (three patients) where the ED Registered Nurse performs an extremity assessment, identifies x-rays needs, and reports to Provider (Emergency Physician/Nurse Practitioner) or appropriate clinical support person (Emergency Nurse Educator/Clinician).

- Date: \_\_\_\_\_ EP/NP/Clinical support: \_\_\_\_\_
- Date: \_\_\_\_\_ EP/NP/Clinical support: \_\_\_\_\_
- Date: \_\_\_\_\_ EP/NP/Clinical support: \_\_\_\_\_

Please return completed form to the Clinical Educator

Date completed: \_\_\_\_\_

Signature: EP/NP/Clinical Support Person \_\_\_\_\_

<b>Effective Date:</b>	26-AUG-2019	
<b>Posted Date:</b>	26-AUG-2019	
<b>Last Revised:</b>	26-AUG-2019	
<b>Last Reviewed:</b>	26-AUG-2019	
<b>Approved By:</b> <i>(committee or position)</i>	PHC	VCH
	<b>Endorsed By:</b> Professional Practice Standards Committee	<b>Endorsed By:</b> (Regional SharePoint 2nd Reading) Operations Directors Professional Practice Directors <b>Final Sign Off:</b> Vice President Professional Practice and Chief Clinical Information Officer, VCH
<b>Owners:</b> <i>(optional)</i>	VCH/PHC	
	<b>Development Team:</b> <ul style="list-style-type: none"> <li>Regional Program Planning Lead – Emergency and Trauma Services, VCH/PHC</li> <li>Practice Initiatives Lead, Professional Practice, VA</li> <li>Emergency Department Clinician, VGH</li> <li>Nurse Educator, Emergency Department, SPH</li> <li>Nurse Educator, Emergency Department, MSJ</li> <li>Associate Medical Director, Regional Emergency Services Program</li> <li>Clinical Nurse Educator, STS</li> <li>Clinical Educator, Emergency Department, RH</li> <li>Emergency Clinician, Emergency Department, VGH</li> <li>Clinical Services Coordinator, WHCC/PHCC</li> <li>Clinical Educator, Emergency Department, RH</li> <li>Critical Care Coordinator, PRGH</li> <li>Nurse Educator, Emergency Department. LGH</li> <li>Clinical Educator, Urgent Care Centre, UBCH</li> </ul>	

## Date of Creation/Review/Revision

Initial Posting Date: August 26, 2019

Revised: June 3, 2022