

Chest Pain: Management (Adult 17 years and older)

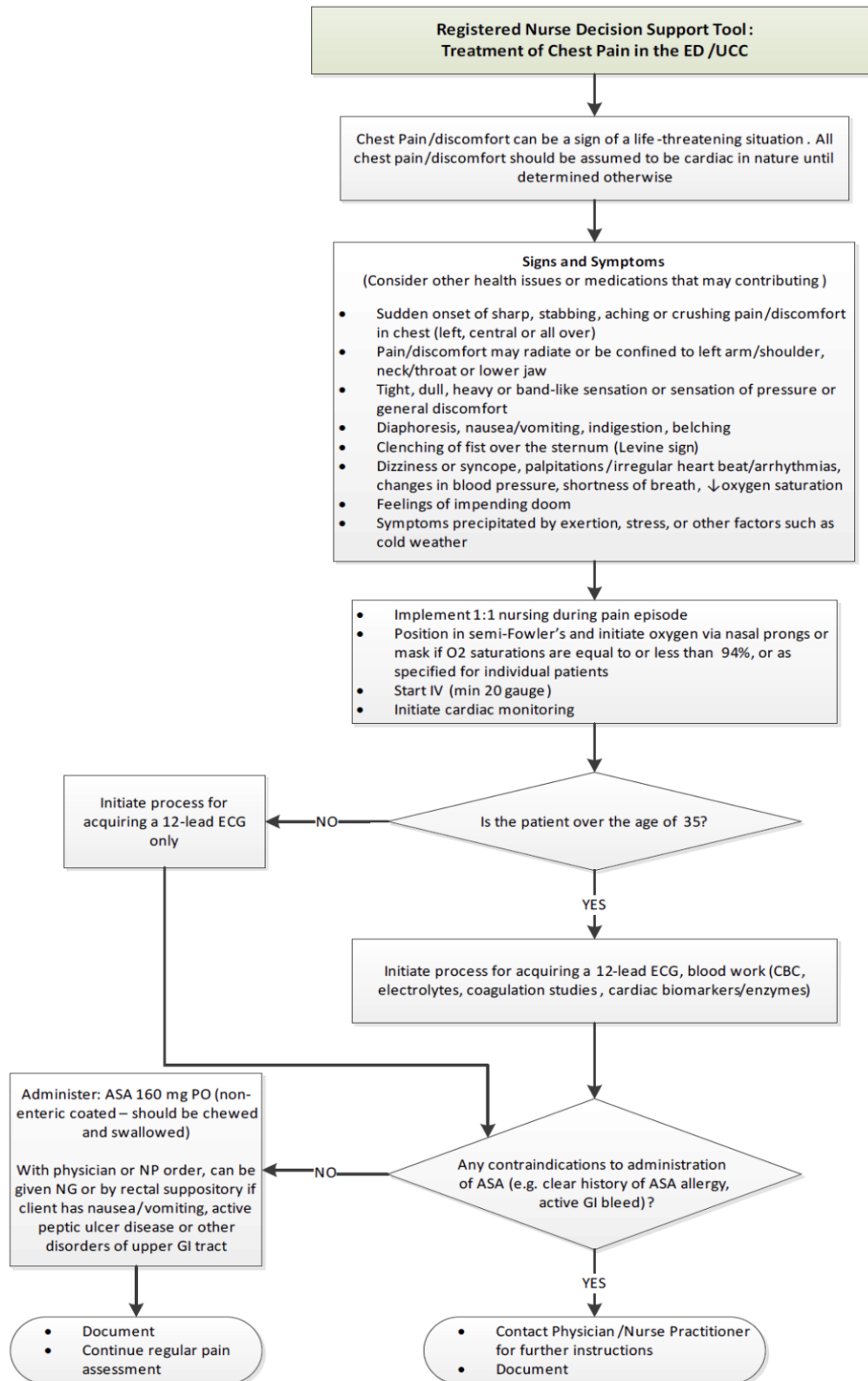
Site Applicability

All VCH & PHC Emergency Departments and Urgent Care Centres

Practice Level

Profession	Setting(s)	Basic Skill	Advanced Skill (requiring additional education)
RN	Emergency & Urgent Care Centre	With advanced education where the following are core competencies and expectations of the role: <ul style="list-style-type: none"> Oxygen to treat Hypoxia Venipuncture to establish IV access Venipuncture to collect blood samples 	Nurse Independent Activity: <ul style="list-style-type: none"> The following NIA have been approved for use as noted in the site applicability above. These medications/treatments can be administered to independently treat: <ul style="list-style-type: none"> Acetylsalicylic acid (ASA) for chest pain
			Nurse Initiated Protocol: <ul style="list-style-type: none"> The following NIPs have been agreed on by VCH & PHC for nurses to initiate/requisition and/or perform: <ul style="list-style-type: none"> ECG within 10 minutes and consult physician/NP (see below for details) Bloodwork (CBC, BUN, Creatinine, glucose, electrolytes, coagulation parameters [INR or aPTT], cardiac enzymes or biomarkers such as Troponin I and HIV test) (<i>35 years and older</i>)

Treatment of Chest Pain in the ED/UCC



Note: This is a **controlled** document for VCH & PHC internal use. Any documents appearing in paper form should always be checked against the electronic version prior to use. The electronic version is always the current version.

Goals

- To alleviate significant delays in the treatment of patients presenting with chest pain suggestive of cardiac ischemia when the physician/NP is not immediately available.
- Decreased infarct size and positive patient outcomes can be achieved if patients are identified and treated very early after symptom onset.
- Intervention should focus on identifying these patients quickly and notifying the Physician /Nurse Practitioner (NP) to prevent delay in definitive treatment.

Policy Statement

- The use of NIA is supported within VCH/PHC and is defined:
 - Policy: [Nurse Independent Activities \(NIA\) and Nurse-Initiated Protocols \(NIP\)](#)
 Education includes: LearningHub [NIA Course](#).
- Physician/NP orders override the use of NIA.

Need to Know

Chest discomfort, alone or in combination with other symptoms, may indicate an imbalance in the supply and demand of oxygen to the myocardium. The most common cause of this is atherosclerosis resulting in occlusive coronary artery disease. Other causes include low cardiac output (e.g. from hypovolemia, hypotension from other causes, cardiac arrhythmias) or use of “illicit drugs” or stimulants. Chest discomfort should be assumed to be cardiac in origin until proven otherwise. Chest discomfort represents an emergency because the longer the period of ischemia, the worse the outcome for the patient. Prompt and accurate assessment and treatment of chest discomfort is necessary to establish a definitive diagnosis (e.g., myocardial infarction), initiate treatment, and reduce myocardial damage. Although chest discomfort is the most common symptom of myocardial ischemia in both sexes, atypical presentation of cardiac ischemia is common particularly in diabetic patients, the elderly, and slightly more common in women than in men. Some patients (of either sex) will not have chest pain/discomfort at all but may present with symptoms such as dyspnea, sweating, nausea, malaise, dizziness, and/or general weakness.

Practice Guideline

Assessment

Because most studies about symptoms of cardiac ischemic symptoms have included men and women of primarily European ancestry, there is inadequate knowledge about the symptoms that people of other ethnicities may experience. Any unusual discomfort should be assessed carefully, including prodromal symptoms.

Assess the following:

Assessment	Signs, Symptoms, Risk Factors
Pain/Discomfort	Location, radiation, character, exacerbating or relieving factors, duration, frequency, associated symptoms. Signs and symptoms might include: <ul style="list-style-type: none"> Sudden onset of sharp, stabbing, aching or crushing pain/discomfort in chest (can be central, left- or right-sided) Pain/discomfort radiating to left arm/shoulder, neck or jaw A tight, dull, heavy or band-like pressure or general discomfort Diaphoresis Nausea/vomiting, indigestion, belching Shortness of breath Clenching of fist over the sternum (Levine's sign) Dizziness or syncope Weakness/malaise Feeling of impending doom Precipitation by exertion, emotional stress, a heavy meal or cold weather Assess further any symptom that patient describes as an unusual discomfort

Vital Signs	<p>Vital signs, including oxygen saturation. Findings might include:</p> <ul style="list-style-type: none"> • Irregular pulse or cardiac rhythm or changes in heart rate • Hypo- or hypertension • Shortness of breath, decreased O2 saturation
Health History	<ul style="list-style-type: none"> • Personal medical history and family history of heart disease or diabetes • Cardiac risk factors such as smoking, hypertension, diabetes, overweight and/or physical inactivity, high cholesterol • Any other signs or symptoms of heart disease such as general fatigue and lethargy, shortness of breath, edema • Factors precipitating, decreasing or relieving
Medication History	<ul style="list-style-type: none"> • Cardiac medications • Recent use of cocaine or sildenafil (Viagra®), vardenafil (Levitra®) or tadalafil (Cialis®) • Recent use of any non-prescription medication that might enhance sexual performance.

Diagnosis: Discomfort and symptoms suggestive of acute coronary syndrome

Precautions/Special Considerations:

- All chest pain/discomfort should be assumed to be cardiac in nature (ACS or MI) until determined otherwise. Some patients may not have distinct chest pain, but may have left arm, neck, jaw/throat or back discomfort, shortness of breath, dizziness or general fatigue. Both severe and more subtle pain can indicate ACS.
- Women and men are equally likely to have coronary heart disease and experience ACS. Women may report more vague and higher number of symptoms than men, making diagnosis more difficult, but most research has shown that as many women as men who are having ACS report chest discomfort.
- Elderly patients, women and patients with diabetes **may not** have typical symptoms of a MI.
- **Immediately** communicate all new episodes of chest pain/discomfort or ischemic symptoms to the physician/NP or appropriate health care professional to facilitate diagnosis, further monitoring and initiation of treatment.
- Pulmonary embolus should be suspected with acute onset of pleuritic chest pain accompanied by dyspnea, severe hypoxia, in the setting of recent surgery, known malignancy or immobility.
- Nitroglycerin can cause a sudden drop in blood pressure. If BP is less than 90 mmHg, **use with caution** when administering sublingual (SL) nitroglycerin. Withhold SL nitroglycerin if patient has recently (within 48 hrs) used sildenafil (Viagra®), vardenafil (Levitra®) or tadalafil (Cialis®), unless otherwise specified by physician/NP orders. Patients who are experiencing a right sided MI, should not receive Nitro without the guidance of a physician/NP due to the risk of a drop in pre-load which in turn, can cause profound hypotension if fluids are not initiated
- Patients between the ages of 17 to 35, order an ECG and consult the physician/NP for further orders.

Interventions: see [Treatment of Chest Pain Algorithm](#)

The sequence of interventions may be different for patients with known cardiac history

1. Initiate process for acquiring a 12-lead ECG. **Must ensure ECG is done and given to physician/NP within 10 minutes of arrival to ED** (where physician/NP is not on site, ECG is performed and physician/NP is contacted).
2. Position in semi-Fowler's and measure O₂ saturation (SpO₂). If SpO₂ is less than 94%, initiate O₂ via nasal prongs or mask (if available) until 94% achieved. Oxygen therapy is not indicated for SpO₂ greater than 94% and may cause harm.
3. Initiate cardiac monitoring.

4. If client has not taken 160mg of ASA within the last 12 hours, and has no history of ASA allergy and no evidence of gastrointestinal (GI) bleeding, administer:
 - ASA 160 mg PO (NON-enteric-coated; should be chewed and swallowed, (not swallowed whole). With physician or NP order, can be given NG or by rectal suppository if client has nausea/vomiting, active peptic ulcer disease or other disorders of upper GI tract.
5. Initiate IV access and prepare for possible transfer to higher acuity unit (critical care and/or PCI-capable hospital).
6. Initiate process for obtaining blood work (CBC, BUN, Creatinine, glucose, electrolytes, coagulation parameters [INR or aPTT], cardiac enzymes or biomarkers). *(35 year s and older)*
7. **Obtain physician/NP order** to administer SL **nitroglycerin** if systolic BP 90 mmHg or more, and if client has not used sildenafil (Viagra®), vardenafil (Levitra®) or tadalafil (Cialis®) within the last 48 hours, or is showing signs of a right sided MI (RV infarct). Administer 1 metered dose (0.4mg/dose) sublingual spray every 5 to 10 minutes as needed, up to 3 doses in 15 minutes.
 - **Avoid Nitroglycerin if:**
 - **SBP is below 90 mmHg**
 - **SBP drops more than 30 below baseline after first spray, or**
 - **the patient has a HR below 50 bpm**
 - If pain unrelieved with 3 doses of nitroglycerin, contact physician/NP for further orders e.g. morphine.
8. Monitor vital signs and SpO₂ during episode of chest pain/discomfort in anticipation of further orders or until physician/NP attends. **(Recommended 1:1 nursing care should be implemented during pain episode).**
9. If chest pain/discomfort is not resolved and/or patient continues to deteriorate, inform physician/NP STAT.
10. Complete documentation as soon as possible.

Expected Client/Family Outcomes

Intended Outcomes

Chest pain/discomfort is relieved within 10 to 15 minutes, as evidenced by subjective and objective data, and associated complications are prevented or minimized.

- Signs of improvement within 5 minutes of initiating treatment
- Complete resolution of pain within 15 minutes
- Transfer patient to higher level of care if needed for ongoing management of cardiac ischemia

Communication takes place with the physician/NP or appropriate health care professional and orders are received for ongoing monitoring and/or management (client with unresolved chest pain may require urgent transfer to critical care and/or PCI-capable hospital).

Unintended Outcomes

- Hypotension (side effects of nitroglycerin)
- Chest pain unresolved for longer than 15 minutes
- Decreased LOC
- Cardiac dysrhythmias (bradycardia/tachycardia)
- Signs and symptoms of cardiogenic shock
- Cardiac arrest

See ["Precautions / Special Considerations"](#).

Discontinuing Cardiac Monitoring

RN will discontinue cardiac monitoring as indicated by physician/NP orders

A patient with chest pain can be removed from cardiac monitoring on initial physician/NP assessment if:

- the patient is currently chest pain free
- the patient's electrocardiogram is normal or has non-specific changes (no signs of acute ischemia; infarction; bundle branch block; prolonged QRS, QT or PR interval; left ventricular hypertrophy with strain; or arrhythmia)

Physician/NP will determine when cardiac monitoring can be discontinued as per Ottawa Chest Pain Cardiac Monitoring Rules – see [Appendix A](#).

Patient/Client/Resident Education

When appropriate, explain rationale for the treatment being provided and possible side effects. Instruct patient about the importance of and method of communicating future episodes of chest pain/discomfort.

Documentation

1. On Emergency Department Nursing Assessment:

- Initial pain assessment, ongoing nursing treatments and response to treatment
- Patient history including psycho/social/spiritual considerations
- Any protocol or NIA followed
- 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 regarding discharge instructions/referrals with any HCP for ongoing pain management

2. RN to complete nurse initiated activity/action (NIA) for chest pain including:

- Date and time
- Name of Drug, Dose & Route
- Nurse first and last name printed (automatically present if online order entry)
- Nurse signature and designation (automatically present if online order entry)

3. NIA Documentation (in the Orders section of the client chart) – should be in accordance with health authority NIA/NIP Policy:

[Nurse Independent Activities \(NIA\) and Nurse-Initiated Protocols \(NIP\)](#)

Site Specific Practices: Refer to site specific PPO's for Chest Pain

- Regional Ischemic Pain Suspected Initial Management
- Regional STEMI Primary PCI and Ongoing Management
- Regional STEMI Fibrinolytic Orders
- Regional STEMI Medical Management
- Regional NSTEMI and Unstable Angina Orders
- Regional Cardiology Discharge Prescription
- Regional GP IIb/IIIa Inhibitor for Acute Coronary Syndrome

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Appendix A: Cardiac Monitoring

Ottawa Chest Pain Cardiac Monitoring Rule

A patient with chest pain can be removed from cardiac monitoring on initial physician/NP assessment if:

- The patient is currently chest pain free
- The patient's electrocardiogram is normal or has non-specific changes (no signs of acute ischemia; infarction; bundle branch block; prolonged QRS, QT or PR interval; left ventricular hypertrophy with strain; arrhythmia or paced rhythm)

<https://canet-nce.ca/canet-newsroom/the-ottawa-chest-pain-cardiac-monitoring-rule/>

(Gatien M, Perry JJ, Stiell IG, et al. A clinical decision rule to identify which chest pain patients can safely be removed from cardiac monitoring in the emergency department. Ann Emerg Med 2007; 50: 136-43)
<https://www.ncbi.nlm.nih.gov/pubmed/17498844>)