

Emergency Cardiac Care: Decision Support Tool #3

RN-Initiated Treatment of Chest Pain or Discomfort Suggestive of Acute Coronary Syndrome

Decision support tools are evidence-based documents used to guide the assessment, diagnosis and treatment of client-specific clinical problems or conditions. When practice support tools are used to direct practice, they are used in conjunction with clinical judgment, available evidence, and following discussion with colleagues. Nurses also consider client needs and preferences when using decision support tools to make clinical decisions.

Purpose

To guide registered nurses who may manage clients experiencing chest discomfort or other symptoms suggestive of acute coronary syndrome.

Background

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 cocaine or other 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.

<p>Applicable Nurses' (Registered) and Nurse Practitioners' Regulation</p> <p>Applicable CRNBC Limit and Condition</p>	<p>Excerpts from Section 6 of the Health Professions Act: Nurses (Registered) and Nurse Practitioners Regulation (activities that CAN be carried out without a physician's order):</p> <p>Section 6(1):</p> <p>A registrant in the course of practicing nursing may:</p> <ul style="list-style-type: none"> (a) make a nursing diagnosis identifying a condition as the cause of the signs or symptoms of an individual; (e) administer oxygen by inhalation (j) apply electricity for the purpose of defibrillation in the course of emergency cardiac care (k) compound, dispense or administer by any method a drug specified in Schedule II of the Drug Schedules Regulation, B.C. Reg. 9/98...such as the following: sublingual nitroglycerin (l) in respect of a drug specified in Schedule 1 of the Drug Schedules Regulation, compound, dispense or administer the drug... for the purpose of treating cardiac dysrhythmia <p>(1) Registered nurses who, in the course of providing emergency cardiac care, apply electricity using a manual defibrillator, must possess the competencies established by Providence Health Care and follow decision support tools established by Providence Health Care.</p> <p>(2) Registered nurses may compound or administer: ...epinephrine, atropine, amiodarone or lidocaine to treat cardiac dysrhythmia.</p> <p>(3) Registered nurses who administer epinephrine, atropine, amiodarone or lidocaine must possess the competencies established by Providence Health Care and follow decision support tools established by Providence Health Care.</p> <p>www.heartcentre.ca/EmergencyCardiacCareInformation.asp</p>
<p>For use by</p>	<p>Registered nurses in various practice settings</p>
<p>Indications</p>	<p>For use in the initial assessment and treatment of chest pain/ discomfort in the adult client. Does not cover ongoing management of continuous, unresolved chest pain or discomfort, or acute myocardial infarction.</p> <p>All chest discomfort should be assumed to be cardiac in origin until determined otherwise. This DST does not address management of clients who are receiving palliative care. Also refer to agency- and unit-specific protocols for management of chest pain or discomfort.</p>
<p>Related Resources, Policies and Standards</p>	<p>Scope of Practice for Registered Nurses https://www.crNBC.ca/Standards/Lists/StandardResources/433ScopeforRegisteredNurses.pdf CRNBC Standards of Practice: "Acting without an Order" and "Medications"</p>
<p>Definitions and Abbreviations</p>	<p>Acute Coronary Syndrome (ACS): an umbrella term encompassing unstable angina, non-ST-elevation myocardial infarction (MI) and ST-elevation MI. It is caused by a sudden disruption of an atherosclerotic plaque in a coronary artery, which leads to inadequate myocardial perfusion. For patients to benefit from treatment it must be initiated quickly. Therefore, possible acute coronary syndrome requires prompt assessment and action</p> <p>Stable Angina: a chronic condition caused by the obstruction, constriction or intermittent spasm of one or more of the coronary arteries. This causes brief episodes of chest (or</p>

	<p>sometimes neck, jaw or arm) discomfort, most often during exertion or exercise, due to reduced myocardial blood supply. The discomfort of stable angina is relieved by rest or medication.</p> <p>Pleuritic Chest Pain: Sharp stabbing pain that typically worsens with inspiration or coughing, and is usually unilateral and quite localized, whereas ischemic cardiac discomfort does not usually worsen with inspiration and is usually more diffuse than pinpoint. Pleuritic chest pain is a symptom of pleuritis (pleurisy), pulmonary embolism, pneumothorax and other respiratory disorders.</p>

Assessment

Because most studies about symptoms of cardiac ischemic symptoms have included people 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:

Pain/Discomfort	<p>Location, radiation, character, exacerbating or relieving factors, duration, frequency, associated symptoms. Signs and symptoms might include:</p> <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 ○ Feeling of impending doom ○ Precipitation by exertion, emotional stress, a heavy meal or cold weather <p>Assess further any symptom that patient describes as an unusual discomfort</p>
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 pain
Medication History	<ul style="list-style-type: none"> ○ Cardiac medications ○ Recent use of cocaine or sildenafil (Viagra®), vardenafil (Levitra®) or tadalafil (Cialis®)

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 arm, neck, jaw/throat or back discomfort, shortness of breath or dizziness. 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 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.

Communicate all new episodes of chest pain/discomfort or ischemic symptoms to the physician or appropriate health care professional immediately to facilitate diagnosis, further monitoring and initiation of treatment. Agency protocol for management of chest pain, if one exists, may be followed after initial episode and consultation with physician or other health professional.

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 caution when administering sublingual (SL) nitroglycerin. Withhold SL nitroglycerin if patient has recently used sildenafil (Viagra®), vardenafil (Levitra®) or tadalafil (Cialis®) within 48 hours.

Interventions

The sequence of interventions may be different for patients with known cardiac history – consult agency policy/pre-printed orders.

1. Position in semi-Fowler's position and measure O₂ saturation (SaO₂). If SaO₂ is less than 94%, initiate O₂ via suitable delivery system until 94% achieved. Oxygen therapy is **not indicated** for SaO₂ greater than 94%, and may cause harm.
2. Initiate process for acquiring a 12-lead ECG
3. If client has not taken aspirin, and has no clear history of aspirin allergy and no evidence of active gastrointestinal (GI) bleeding, administer:
 - o **Aspirin** 160-325 mg PO (should be chewed, not swallowed). Can be given NG or by rectal suppository (300 mg) if client has nausea/vomiting, active peptic ulcer disease or other disorders of upper GI tract.
4. Initiate process for obtaining bloodwork (CBC, electrolytes, coagulation parameters [INR or aPTT], cardiac enzymes or biomarkers). In non-acute care, call 911 or ambulance, according to agency guidelines.
5. Administer SL **nitroglycerin spray** if systolic BP 90 mmHg or more, and if client has not used sildenafil (Viagra®), vardenafil (Levitra®) within the last 24 hours or tadalafil (Cialis®) (48 hours).

Administer **1-2 metered doses (0.4mg/dose) translingual spray** every 5-10 minutes as needed, up to 3 doses in 15 minutes.

Interventions (cont'd)

If pain unrelieved with 3 doses, anticipate (a) physician orders for morphine (if appropriate in setting) and (b) transfer to higher level of care (in collaboration with physician).

6. **Notify physician or appropriate health care professional immediately.** Initiate IV access if possible and prepare for possible transfer to higher acuity unit (telemetry, ER, ICU/CCU, other acute care site). For patients with ST-elevation myocardial infarction (STEMI), treatment includes early reperfusion therapy achieved with primary percutaneous coronary intervention (PCI) or administration of thrombolytic therapy (in appropriate clinical settings only).
7. Monitor vital signs and SaO₂ during episode of chest pain/discomfort in anticipation of further orders or until help arrives. **(1:1 nursing care should be implemented during pain episode).**
8. Initiate continuous ECG monitoring, if available. Review rhythm strip for ST deviation (elevation or depression) and report to physician if deviation of greater than or equal to 1 mm present in any lead. Multi-lead monitoring with arrhythmia recognition and continuous ST segment monitoring preferred.
9. If chest pain/discomfort is not resolved and/or patient continues to deteriorate call Code Blue as necessary or follow agency policy.
10. Complete documentation as soon as possible.

Intended Outcomes

With safe and effective initiation of treatment, chest pain/discomfort is relieved within 10-15 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

Communication takes place with the physician 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 higher acuity setting).

Unintended Outcomes

- Hypotension (side effects of nitroglycerin)
- Chest pain unresolved for longer than 15 minutes
- Acute myocardial infarction
- Cardiac arrest

See "Precautions / Special Considerations".

Client Education

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

Documentation

- Initial and ongoing assessment
- Diagnosis of chest pain/discomfort
- Date, time and dose of medications
- Oxygen concentration or flow
- Client's response to treatment
- Education/information given to client
- Any other interventions (e.g., transfer to high acuity setting)
- Communication with physician or other health care professional and any related orders for ongoing monitoring and/or management of chest pain/discomfort

**Registered Nurse Initiated Activities
Decision Support Tool:
Treatment of Chest Pain and Discomfort Suggestive of Acute Coronary Syndrome**

Chest pain/discomfort can be a sign of a life-threatening situation. All chest pain/discomfort should be assumed to be cardiac in nature until determined otherwise.

Signs and Symptoms (consider compounding health or medication history)

- Sudden onset of sharp, stabbing, aching or crushing pain/discomfort in chest (left, central or all over)
- Pain/discomfort may radiate or be confined to left arm/shoulder, neck/throat or lower jaw
- Tight, dull, heavy or band-like sensation or sensation of pressure or general discomfort
- Diaphoresis, nausea/vomiting, indigestion, belching
- Clenching of fist over the sternum (Levine sign);
- Dizziness or syncope, palpitations/irregular heart beat/arrhythmias, changes in BP, SOB, ↓ oxygen saturation
- Feelings of impending doom
- Symptoms precipitated by exertion, stress or other factors such as cold weather

- ✓ Position in semi-Fowler's position and measure O₂ saturation (SaO₂). If SaO₂ is less than 94%, initiate O₂ via suitable delivery system until 94% achieved. Oxygen therapy is *not* indicated for SaO₂ greater than 94%, and may cause harm.
- ✓ Initiate process for acquiring a 12-lead ECG, bloodwork (CBC, electrolytes, coagulation studies, cardiac enzymes) and chest x-ray where possible (non-acute care would call 911 or ambulance according to agency guidelines).

Any contraindications to administration of aspirin (aspirin allergy, **active** GI bleeding, **definitely** took aspirin within past 24 hrs)?

NO

Administer: Aspirin 160-325 mg PO (should be chewed & swallowed).
Can be given NG or by rectal suppository if client has nausea/vomiting, active peptic ulcer disease or other disorders of upper GI tract.

Any contraindications to SL nitroglycerin? (systolic BP below 90, recent use of sildenafil (Viagra®) or vardenafil (Levitra®) [within last 24 hours] or tadalafil (Cialis®) [within 48 hours])

NO

Administer: SL nitroglycerin one to two metered doses (0.4mg/dose) translingual spray
Can be administered every 5-10 minutes (as needed) x maximum 3 doses in 15 minutes

- ✓ NOTIFY Physician or appropriate health care professional immediately. Initiate IV access if possible and prepare for transfer to higher acuity setting (Telemetry, ER, ICU, other site).
- ✓ MONITOR vital signs and oxygen saturation during episode of chest pain/discomfort in anticipation of further orders or until help arrives. (1:1 nursing care should be implemented during pain episode).
 - ✓ If chest pain/discomfort is not resolved and/or condition continues to deteriorate CALL CODE BLUE or OBTAIN MEDICAL ASSISTANCE per agency policy.
- ✓ DOCUMENT as soon as possible

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