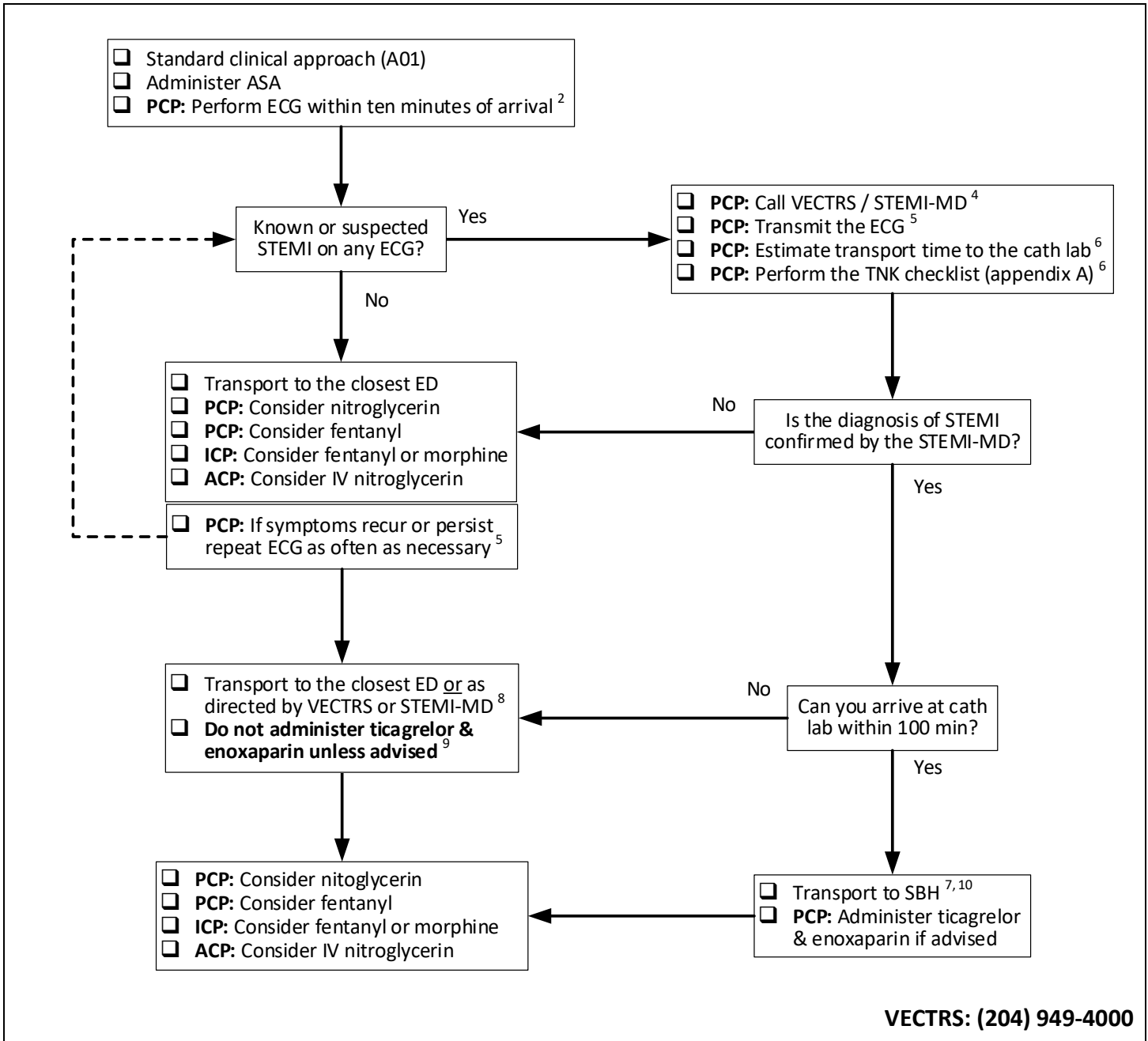
	E04 - ACUTE CORONARY SYNDROME & STEMI & NSTEMI-ACS (17 YEARS & OLDER)	
	Version date: 2025-03-18	Effective Date: 2025-04-30 (07:00)
PCP = PCP- ACP	ICP= ICP & ACP	ACP = ACP only
		None =EMR - ACP



INDICATIONS

- Known or suspected acute coronary syndrome (ACS) including ST-segment elevation myocardial infarction (STEMI), non-ST-segment myocardial infarction (NSTEMI), and unstable angina (appendix B)

WARNINGS

- Not applicable

NOTES

1. Obtain an initial electrocardiogram (ECG) within 10 minutes of arrival at the patient.
2. Call the Virtual Emergency Care & Transport Resource Service (VECTRS) and consult the the Code-STEMI physician (STEMI-MD) regardless of the patient's geographical location or the time since symptom onset, if any of the following are present.
 - a. A paramedic with the primary (PCP), intermediate (ICP) or advanced (ACP) work scope must consult the STEMI-MD if the Zoll X-series monitor's automated interpretation indicates ****STEMI****.
 - b. Any paramedic *may consider* consulting the STEMI-MD if any ECG shows one or more of the following:
 - ST-segment elevation of at least 1 mm at the J-point in any two or more anatomically contiguous leads;
 - ST-segment elevation at the J-point of leads V2 and V3 of at least 2 mm in males over age 40, at least 2.5 mm in males under age 40, or at least 1.5 mm in all adult females; or
 - a new (or suspected new) left bundle branch block (LBBB).
 - c. A paramedic with the ACP work scope must consult the STEMI-MD if any ECG with a left bundle branch block (LBBB) or paced rhythm shows any one or more of the following (appendix D):
 - at least 1 mm of ST-segment elevation at the J-point in the same direction as the QRS-complex in any lead (concordant ST elevation);
 - at least 1 mm of ST-segment depression at the J-point in the same direction as the QRS-complex in lead V1, V2, or V3 (concordant ST depression); or
 - a ratio of ST-segment elevation at the J-point to S-wave amplitude greater than 0.25 in any lead that has at least 1 mm of ST-segment elevation (ST/S discordance).
3. When transmitting the ECG to the Code-STEMI physician ensure that the patient's identifying data is covered or obscured.
4. Indicate your current location and estimated transport time to St. Boniface Hospital (SBH). Perform the TNK / tenectaplast checklist (appendix A) if you are more than 100 minutes from the SBH.
5. Note that ECG finding are often subtle and dynamic in early ACS. ST-segment elevation can appear within minutes. If the first ECG is nondiagnostic but the patient's symptoms persist, repeat the ECG every 10 to 15 minutes or perform 12-lead monitoring during transport.
If signs of STEMI develop on any subsequent ECG, immediately call VECTRS and prepare to reroute.
6. If your patient can arrive at SBH within 100 minutes of first EMS contact, the Code-STEMI physician will advise transport to SBH, will pre-alert staff in the interventional cardiology suite (cath lab), and notify the coronary care unit or cardiology service in-house physician. If your patient is just beyond the 100-minute window, the Code-

STEMI physician may still advise direct transport to SBH. Unless contraindicated, the STEMI-MD will order administration of administration of ticagrelor & enoxaparin.

DO NOT PROCEED TO THE CATH LAB UNLESS ADVISED. If the patient is stable on arrival at SBH, proceed directly to the cath lab unless advised otherwise. If the patient becomes unstable during transport, call VECTRS for on-line medical support (OLMS) as soon as possible. If the patient remains unstable upon arrival at SBH, go to the ED.

7. If the patient cannot reach the cath lab near the 100-minute window, the Code-STEMI physician may advise transport to the closest emergency department (ED) capable of performing fibrinolysis with tenecteplase (TNK). Remain with the patient for subsequent emergent transport to the cath lab, unless directed otherwise.
8. Ticagrelor and enoxaparin are usually contraindicated before TNK (ASA is not).
9. Cardiac output in patients with right ventricular infarction (RVI) may be more sensitive to right ventricular filling pressure. Use nitroglycerin (NTG) and opioids with caution. If hypotension develops, hold / discontinue medications, and administer boluses of intravenous crystalloid solution (repeat as required).

LINKS

- A01 - Standard Clinical Approach
- M03.1 - Morphine
- M03.2 - Fentanyl
- M08 - Acetylsalicylic Acid
- M10 - Ticagrelor
- M12 - Enoxaparin
- M21 - Nitroglycerin

APPROVED BY



EMS Medical Director



EMS Associate Medical Director

VERSION CHANGES (refer to X05 for change tracking)

- Addition of advanced work scope & IV nitroglycerin

APPENDIX A: POTENTIAL CONTRAINDICATIONS TO FIBRINOLYSIS (TNK CHECKLIST)

Inform the STEMI-MD if the patient has / had any of the following:

- ☐ Current use of anticoagulant
- ☐ Active internal bleeding (excluding menses)
- ☐ Ischemic stroke within the last 3 months
- ☐ Prior intracranial hemorrhage
- ☐ Intracranial or intraspinal surgery or trauma within the last 2 months
- ☐ Major closed head or facial trauma within the last 3 months
- ☐ Intracranial neoplasm / tumor, arteriovenous malformation, or aneurysm
- ☐ Severe uncontrolled hypertension (any systolic BP greater than 180 mmHg during this encounter)
- ☐ Bleeding disorder
- ☐ Traumatic or prolonged (more than 10 minutes) CPR
- ☐ Suspected aortic dissection

APPENDIX B: ACUTE CORONARY SYNDROME DEFINITIONS

For the purposes of this protocol, **ST elevation myocardial infarction (STEMI)** is defined as symptoms suspicious for ACS (appendix C) with diagnostic ST-segment elevation, a new left bundle branch block (LBBB), or changes to a pre-existing LBBB or paced rhythm on prehospital ECGs. STEMI is a medical emergency with a high mortality rate when treatment is delayed. Prompt identification by paramedics is paramount to ensure the patient is transported to the correct destination for emergent revascularization therapy.

Non-ST elevation myocardial infarction (NSTEMI) is defined as symptoms suspicious for ACS, but with ST-segment depression, or deep T-wave inversions on prehospital ECG. Occasionally there are no ECG abnormalities, and there are usually no Q-waves. Some myocardial cell death (infarction) occurs causing an eventual rise in cardiac biomarkers.

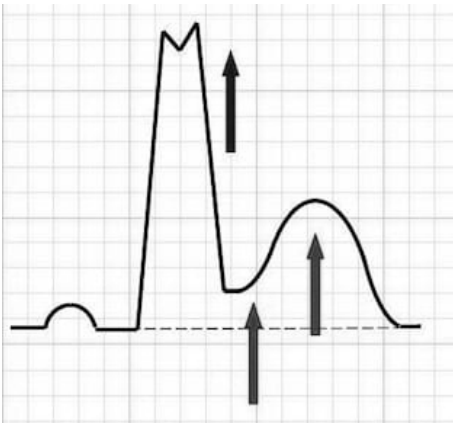
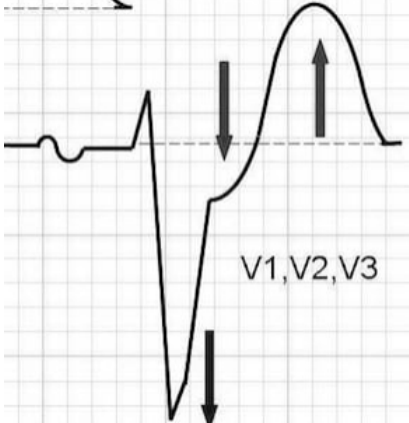
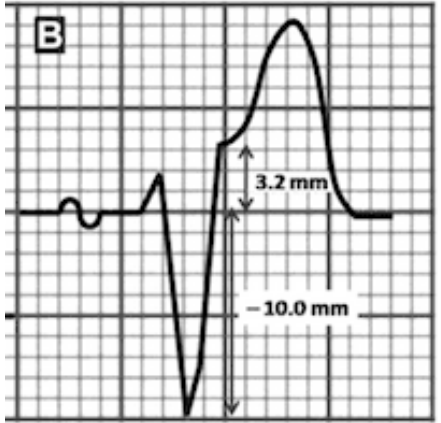
Unstable angina (UA) is similarly defined, but there is no evidence of infarction and no rise in biomarkers.

NSTEMI and UA are indistinguishable without cardiac biomarkers, so they are often together referred to as **non-ST elevation acute coronary syndrome (NSTEMI-ACS)**. Prehospital differentiation may not be possible, but identification of a patient at risk for either is important as these are time-sensitive conditions, often requiring semi-urgent angiography.

APPENDIX C: SYMPTOMS SUSPICIOUS FOR ACUTE CORONARY SYNDROME

- Chest discomfort, pain, pressure, or heaviness
- Arm or jaw pain
- Shortness of breath
- Nausea / vomiting (not due to a gastrointestinal condition)
- Sweating (not due to weather or exercise)
- Palpitations or presyncope / syncope
- Dizziness or lightheadedness or syncope
- Anxiety or a feeling of “impending doom”
- Acute mental status changes in the elderly

APPENDIX D: MODIFIED SGARBOSSA CRITERIA

CONCORDANT ST ELEVATION	CONCORDANT ST DEPRESSION	ST/S DISCORDANCE
		 <p>ST/S ratio = 3.2 / 10 = 0.32</p>