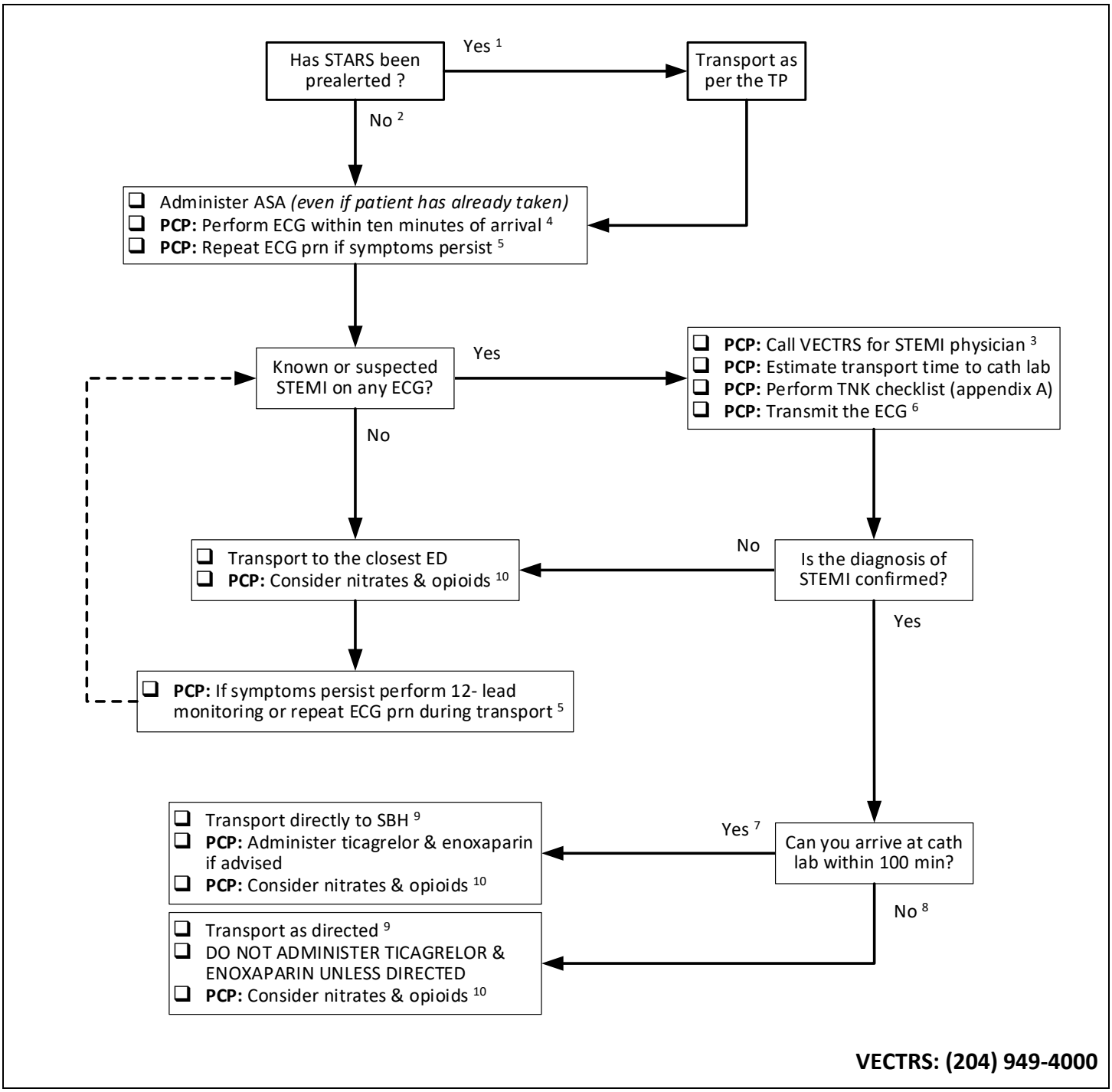
Shared health Soins communs Manitoba	E04 - ACUTE CORONARY SYNDROME & STEMI & NSTE-ACS	
	17 YEARS & OLDER	MEDICAL
Version date: 2024-10-27		Effective Date: 2024-11-05 (07:00)

ERS WORK SCOPE	EMR: EMR only	PCP: PCP & ICP	ICP: ICP only	None - All providers



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)

CONTRAINDICATIONS

- Not applicable

NOTES

1. The Medical Transportation Coordination Center (MTCC) will notify the responding ground unit when the Shock Trauma Air Rescue Society (STARS) has been prealerted for the same call. MTCC will request an initial report from paramedics by radio as early as possible. The transport physician (TP) will decide to launch or stand down based on this report.

   If STARS responds to the scene, the TP will be the most responsible physician (MRP). Paramedics will transport as directed by the TP.

   However, paramedics must also notify the Virtual Emergency Care & Transport Resource Service (VECTRS) as soon as possible to access the Code-STEMI physician.

2. If STARS is not involved or is stood down, VECTRS will assume responsibility and the VECTRS emergency physician (EP) will assume the MRP role.

   Paramedics will transport as directed by the VECTRS EP or advanced care paramedic (ACP).

   VECTRS may conference in the TP and air medical crew (AMC) for consideration of air intercept. Paramedics may be directed to an alternate location for rendezvous.

3. Paramedics will contact the VECTRS regardless of the patient's geographical location or the time since symptom onset. Indicate your current location and *estimated transport time* to the "cath lab" at St. Boniface Hospital (SBH). VECTRS will conference in the Code-STEMI physician.

   Perform the tenectaplase (TNK) checklist if you are more than 100 minutes from the SBH (appendix A).

4. Obtain an initial electrocardiogram (ECG) within 10 minutes of arrival at the patient

   a. Paramedics with the primary (PCP) work scope and above must call VECTRS if the Zoll X-series monitor's automated interpretation indicates **STEMI**.

   b. Any paramedics *may consider* calling VECTRS 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. Paramedics with the advanced (ACP) work scope must call VECTRS 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).

5. Note that ECG finding are often subtle and dynamic in early ACS. ST-segment elevation can appear within minutes. If symptoms persist and the first ECG is nondiagnostic, perform12-lead monitoring or repeat the ECG every 10 to 15 minutes as required (prn) during transport. If signs of STEMI develop on any subsequent ECG, immediately call VECTRS and prepare to reroute.
6. When transmitting the ECG to the Code-STEMI physician ensure that the patient's identifying data is covered or obscured.
7. If your patient can arrive at the cath lab within 100 minutes of first EMS contact, the Code-STEMI physician will authorize bypass to SBH, pre-alert cath lab staff, and approve the administration of ticagrelor & enoxaparin.

   If your patient is just beyond the 100-minute window, the Code-STEMI physician may still advise transport to SBH and approve the administration of ticagrelor & enoxaparin.
8. 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 tenectaplase (TNK).

   Do not administer ticagrelor or enoxaparin unless advised to do so by a physician. Ticagrelor and enoxaparin are usually contraindicated before TNK (ASA is not).

   Paramedics will remain with the patient for subsequent emergent transport to the cath lab, unless directed otherwise.
9. If the patient is stable on arrival at SBH, go 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. DO NOT PROCEED TO THE CATH LAB UNLESS ADVISED.
10. Cardiac output in patients with right ventricular infarction (RVI) may be more sensitive to right ventricular filling pressure. Use nitrates and opioids with caution. If hypotension develops, hold / discontinue medications, and administer boluses of intravenous crystalloid solution (repeat as required).
11. Paramedics will provide appropriate pre-arrival notification (including an estimated time of arrival) to receiving ED staff as soon as possible.

LINKS / REFERENCES

- B01 - STANDARD DESTINATION
- B02 - REDIRECTION ADVISORY
- B03 - WINNIPEG DESTINATIONS FOR ACUTE CARE
- 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)
• Retitled from ACUTE CORONARY SYNDROME • Paramedics will radio MTCC if STARS has been pre-alerted • Paramedics will contact VECTRS to access the Code-STEMI physician

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

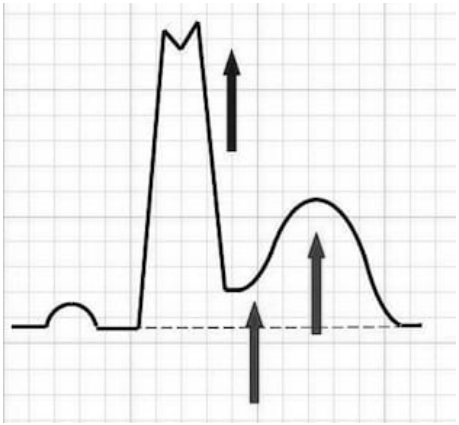
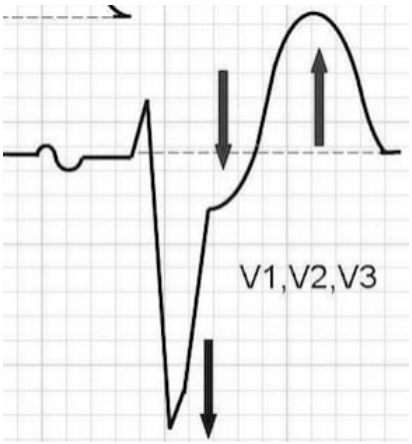
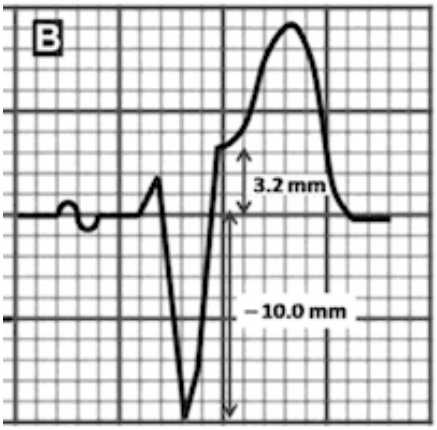
For the purposes of this protocol, **ST elevation myocardial infarction** (STEMI) is defined as symptoms suspicious for ACS (appendix C) with diagnostic ST-segment elevation, a new left bundle branch block (LBBB), or changes to a pre-existing LBBB or paced rhythm on prehospital ECGs. STEMI is a medical 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** (NSTE-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**
		 ST/S ratio = 3.2 / 10 = 0.32