

# Improving the Outcomes of STEMI



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Cardiovascular (CV) disease is the leading cause of morbidity and mortality in Western nations. Acute STEMI is associated with a high-risk of mortality and is a common antecedent event leading to other CV conditions, including congestive heart failure and cardiac arrhythmias. Timely and effective reperfusion substantially reduces mortality and morbidity.

## How can FPs improve outcomes for STEMI patients?

Early identification of STEMI patients leads to faster reperfusion, either with fibrinolysis or primary percutaneous coronary intervention (PCI). The Canadian Cardiovascular Society guidelines recommend that eligible STEMI patients should receive:

- fibrinolytic therapy within 30 minutes, or
- primary PCI within 90 minutes from the point of first medical contact, including pre-hospital paramedical personnel.

For these benchmarks to be met, emphasis on improvements in the time to definitive care must integrate out of hospital (including family practice and community health centre) and pre-

## George's case

George, 53, walks into his FP's office complaining of unrelenting, retrosternal chest discomfort of 20 minutes duration that started while shovelling snow. He has associated symptoms of nausea and mild dyspnea.

### History

George's past medical history includes:

- hypertension, for which he takes 25 mg of hydrochlorothiazide q.d. and
- hypercholesterolemia, which he controls via diet.

The FP calls 911 because of George's obvious distress and a clinical suspicion of acute MI.

### Assessment

The paramedics arrive eight minutes later.

During a rapid initial assessment, they complete a 12-lead ECG which demonstrates ST-elevation in ECG leads V<sub>1</sub> to V<sub>4</sub> (Figure 1). The ECG is electronically sent to the Vital Heart Response physician while the paramedic:

- administers acetylsalicylic acid (ASA),
- completes a reperfusion check list and
- establishes IV therapy.

**For George's diagnosis, look to page 91.**

hospital (Emergency Medical Services [EMS] system) factors within the healthcare system.<sup>1</sup> When patients with chest pain present to their

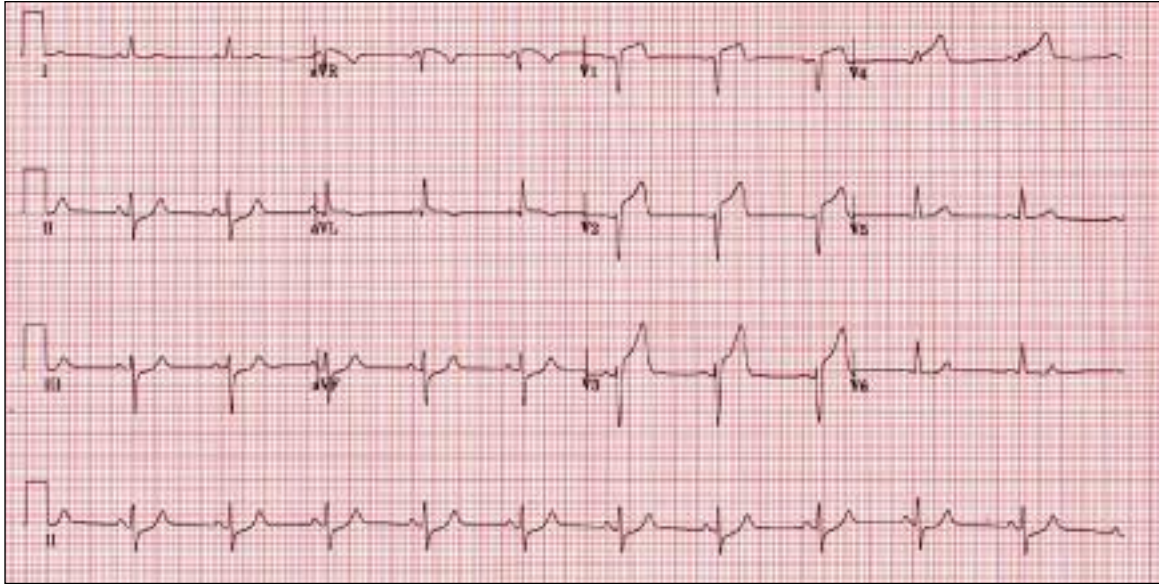


Figure 1. George's 12-lead ECG.

FP, rapid diagnosis and risk assessment will ensure initiation of treatment and best practice guidelines are met.

### Q & A *What is Vital Heart Response?*

Vital Heart Response is a model for a regional reperfusion protocol that currently exists within the Capital Health Region of Edmonton, Alberta. Its purpose is to implement timely, evidence-based reperfusion strategies to maximize the outcomes of patients with STEMI. Vital Heart Response

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utilizes treatment at the point of first medical contact to minimize reperfusion delay and improve patient outcomes (Figure 2). A key component of the program is pre-hospital diagnosis, triage and treatment, including pre-hospital fibrinolysis or direct transfer for primary PCI when appropriate.

Optimal management of STEMI patients requires the assessment of:

- 1) Time from symptom onset to presentation
- 2) Anticipated time to reperfusion with fibrinolysis or primary PCI
- 3) Assessment of baseline patient risk including the potential risk of reperfusion therapies (Figure 3)

Certain populations require special considerations, including but not limited to:

- early presenting patients,
- late presenting patients,
- cardiogenic shock and
- contraindications/cautions to fibrinolysis.

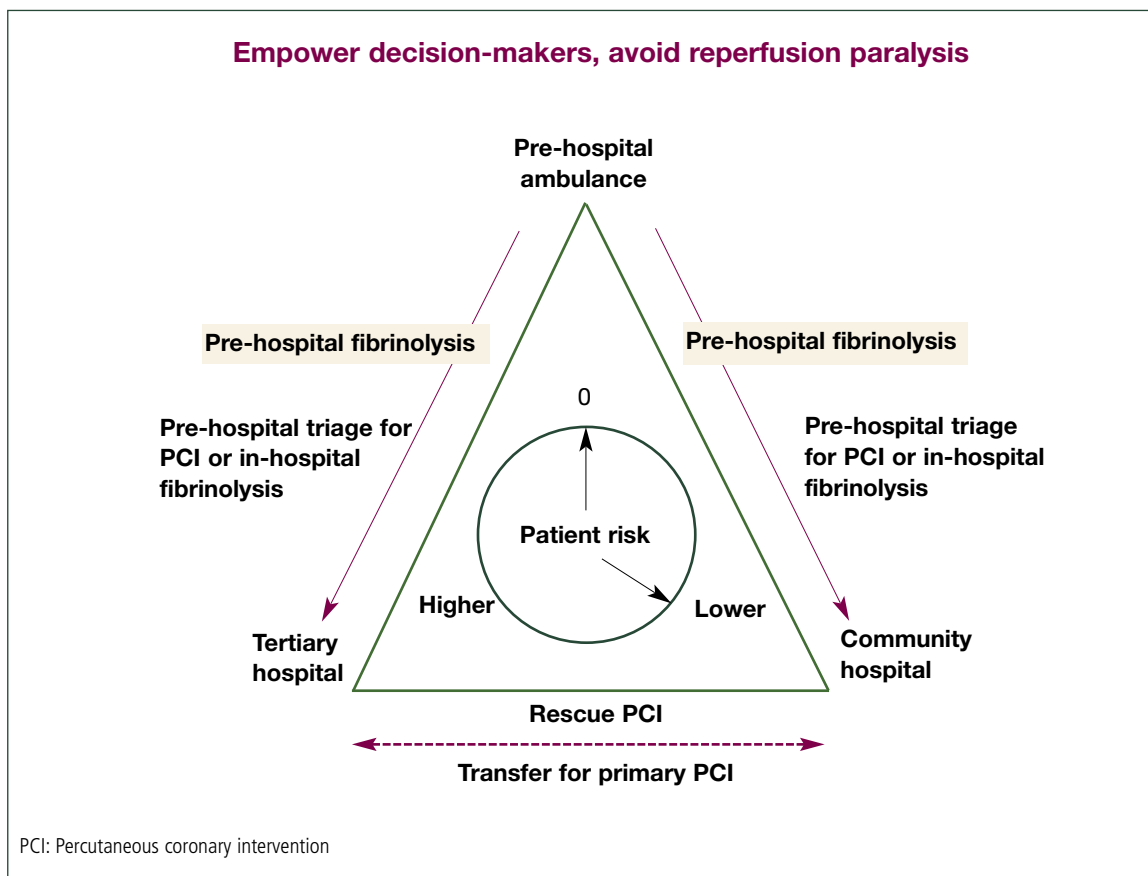


Figure 2. Vital Heart Response.

Adapted from Welsh, Ornato J, Armstrong PW: Prehospital management of acute ST-elevation myocardial infarction: A time for reappraisal in North America. *Am Heart J* 2003; 145(1):1-8.

### *Early presenting patients*

There is evidence that patients who present early in the course of their symptoms have excellent outcomes with rapid pharmacological reperfusion. Administration of fibrinolysis within the first three hours of symptom onset has consistently demonstrated results as good as and sometimes better than primary PCI (due to the inherent time delay).<sup>2,3</sup> Therefore, in early presenting patients, fibrinolysis is generally the preferred treatment.

### **George's case cont'd...**

#### **Diagnosis**

A diagnosis of MI is confirmed and a collaborative decision is made to proceed with fibrinolytic therapy on scene.

Upon arrival to hospital, George experiences pain relief and has an uncomplicated in-hospital course.

George's FP played a significant role in improving George's outcome through rapid action and collaboration.

## Frequently Asked Questions

### 1. How do I find out whether my community has a STEMI program similar to Vital Heart Response?

Begin by calling your local Emergency Medical Services (EMS) system and hospital EDs. These will both be excellent resources for STEMI treatment options in your community

### 2. As a FP in a rural community, how can I help improve outcomes for my patients?

Begin with prevention and education for your patients. Initiate partnerships with the team (paramedic, emergency and cardiology) in your community who will play a role in the care for these patients

### 3. I am a FP in an urban centre. Our EMS system has a STEMI program in place. Should I take the time to do a 12-lead ECG on patients who present to my office with chest pain highly suspect of acute MI?

Do not delay calling the paramedics by taking a diagnostic ECG. If time permits, an ECG can be taken while the paramedics are responding to your office

## Late presenting patients

Late presenting patients are those who arrive six to 24 hours after symptoms onset. Reperfusion therapy in patients that present after a prolonged period of symptoms has been shown to have benefit up to 12 hours, with benefit expected from 12 to 24 hours in selective patient populations. Although the scientific evidence is somewhat limited, it is generally believed that the preferred treatment strategy, in this late presenting patient population, would be primary PCI and that the acceptable time delay to achieve primary PCI is > 60 minutes; though recognizing that reperfusion should be achieved as rapidly as possible.

## Cardiogenic shock

Cardiogenic shock diagnosed with hypotension in conjunction with hypoperfusion, in association with acute STEMI, is associated with a very poor prognosis. Rapid reperfusion therapy has been shown to decrease the occurrence of cardiogenic shock. In patients with cardiogenic shock, it improves outcome and should be implemented.<sup>2</sup> Primary PCI is recommended for those patients < 75-years-of-age and for selected patients ≥ 75 years if it can be completed rapidly. If a prolonged time of coronary angiography and potential revascularization are expected, patients should have fibrinolysis administered as quickly as possible, linked to urgent transfer for cardiac catheterization and revascularization.

## Contraindications/cautions to fibrinolysis

If absolute or relative contraindications to fibrinolysis exist, then rapid consultation with a cardiologist is recommended to determine which treatment option is most applicable, given:

- patient presentation,
- location and
- availability of services within that community.

*Administration of fibrinolysis within the first three hours of symptom onset has consistently demonstrated results as good as and sometimes better than primary PCI.*

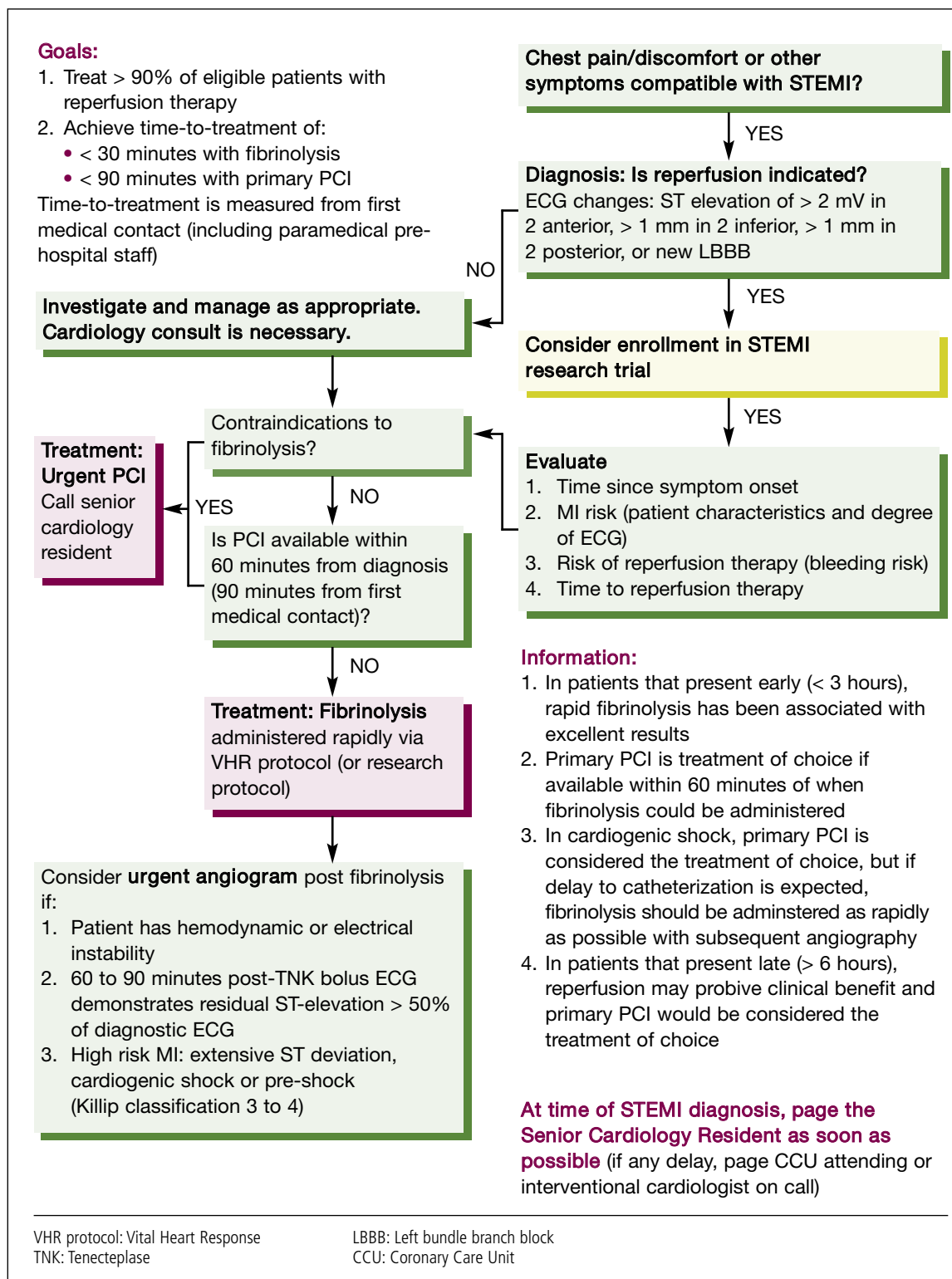


Figure 3. Vital Heart Response: University of Alberta Hospital strategy for STEMI.  
Adapted from Capital Health Edmonton Area, Vital Heart Response, Regional Reperfusion Protocol.

## Q What is the community's approach?


Once the acute phase of treatment is completed, the patient is transferred back into the community to be managed by a team of healthcare professionals that involves a combination of:

- education,
- psychological support,
- exercise training and
- behavioural change.<sup>4,5</sup>

Maximizing appropriate evidence-based therapy is the responsibility of all healthcare professionals. The following must be optimized to prevent second events:

- appropriate antiplatelet therapy (acetylsalicylic acid and/or clopidogrel),
- angiotensin-converting enzyme inhibitors,
- $\beta$ -blockers and
- cholesterol reduction therapy.

*Rapid reperfusion therapy has been shown to decrease the occurrence of cardiogenic shock.*

Vital Heart Response uses a collaborative and coordinated approach to care. It formalizes patient treatment strategies for the paramedic, emergency and cardiology communities to achieve superior patient outcomes. It is important for FPs to be familiar with the services available in their respective communities. 

### References

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For more information visit [www.capitalhealth.ca/EspeciallyFor/HeartSchool/default.htm](http://www.capitalhealth.ca/EspeciallyFor/HeartSchool/default.htm)



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