70 YEARS OF SUPPORTING FAMILY PHYSICIANS
PROVIDING THE BEST CARE

Annual Refresher Course for Family Physicians
70th Symposium annuel pour les omnipraticiens

McGill | Department of Family Medicine | Département de médecine de famille
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DECEMBER 2-4, 2019
HOTEL BONAVENTURE MONTREAL, QC, CANADA

Update on ST-elevation myocardial infarction for the family practitioner

Dr. Mathieu Walker

Cardiology Divisional Director

Saint Mary's Hospital

These slides are preliminary

The finalized version will be uploaded a few days before the conference

Potential Conflict of Interest Disclosure

- **<u>Related to the topic being discussed:</u>**
  - *No potential conflicts of interest pertaining to this topic*
- **<u>Unrelated to the topic being discussed</u>**
  - Speaker's bureau: Honoraria received for CME delivery (Novartis)
  - Judge for the Academic Contest of Excellence in cardiology (Servier)

Session Objectives

At the end of this lecture, participants should be able to

- *Understand that "Time is muscle" in STEMI patients*
- *Recognize normal and abnormal ECG patterns that can be mistaken for STEMI*
- *Recognize underlying injury patterns in patients with LBBB/paced rhythm*
- *Describe revascularization strategies in patients with suspected STEMI*
- *Choose the correct reperfusion strategy for patients with STEMI presenting to a non-PCI capable hospital*

MAIN REFERENCE FOR THIS PRESENTATION

Canadian Journal of Cardiology 35 (2019) 107–132

Society Guidelines

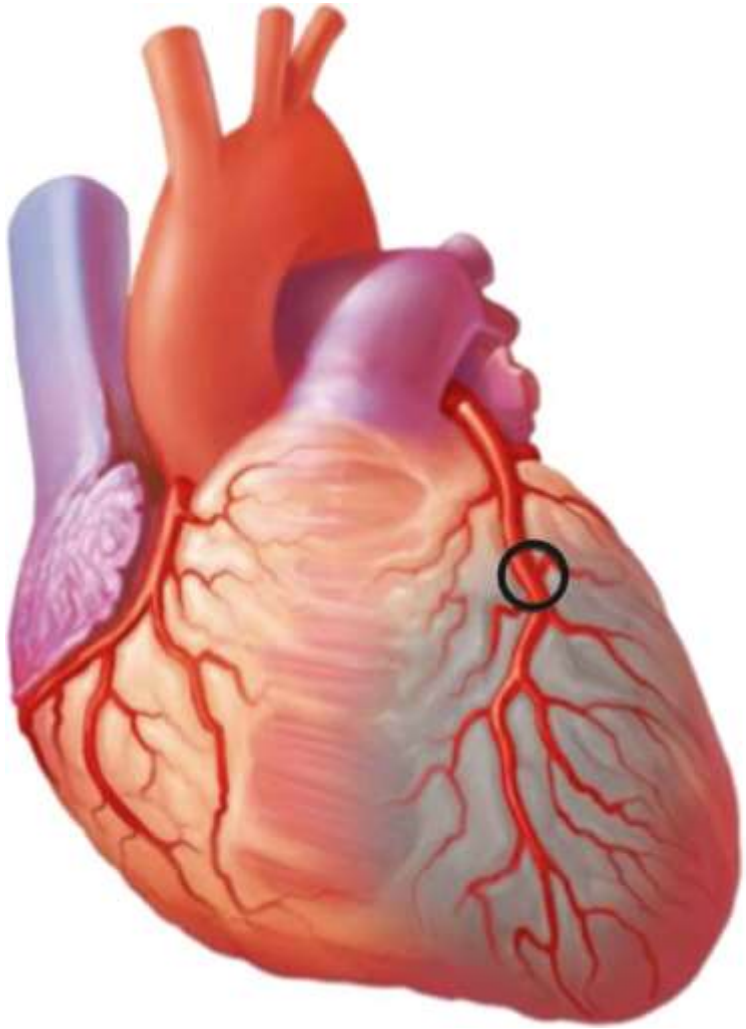
2019 Canadian Cardiovascular Society/Canadian Association of Interventional Cardiology Guidelines on the Acute Management of ST-Elevation Myocardial Infarction: Focused Update on Regionalization and Reperfusion

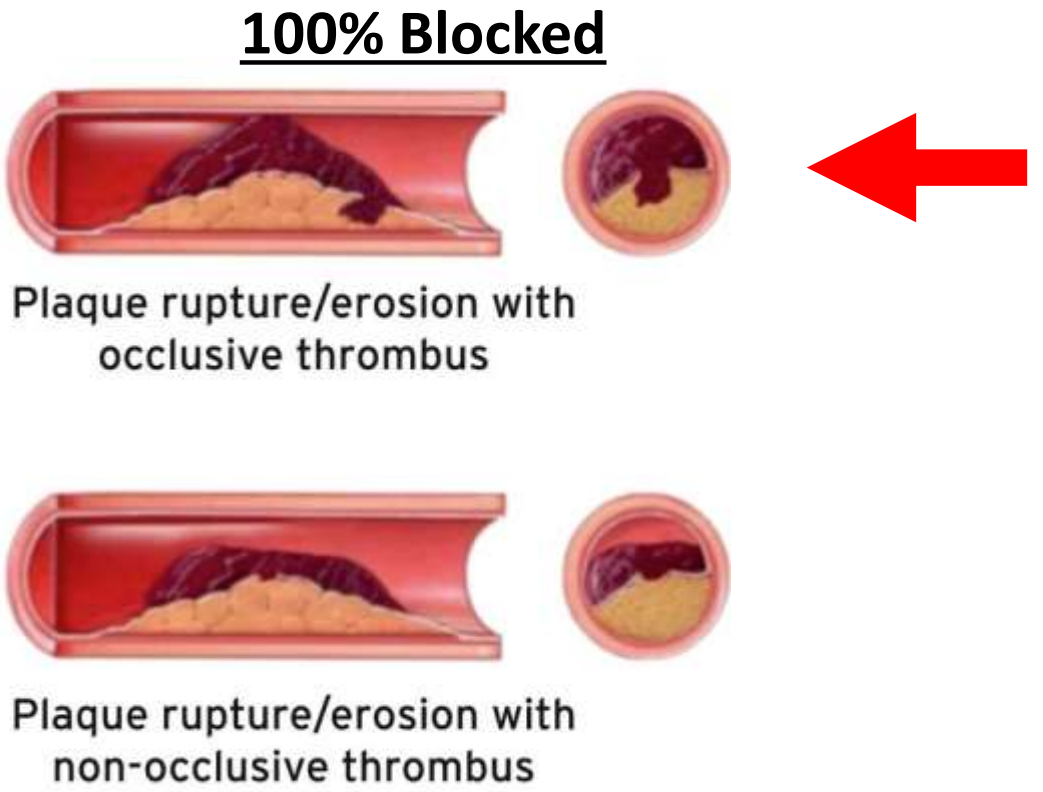
Primary Panel: Graham C. Wong, MD, MPH, (Co-chair),[a] Michelle Welsford, MD,[b] Craig Ainsworth, MD,[b] Wael Abuzeid, MD, MSc,[c] Christopher B. Fordyce, MDCM, MHS, MSc,[a] Jennifer Greene, BSc, ACP,[d] Thao Huynh, MD, MSc, PhD,[e] Laurie Lambert, MPH, PhD,[f] Michel Le May, MD,[g] Sohrab Lutchmedial, MDCM,[h] Shamir R. Mehta, MD, MSc,[b] Madhu Natarajan, MD, MSc,[b] Colleen M. Norris, RN, MN, PhD,[i] Christopher B. Overgaard, MD, MSc,[j] Michele Perry Arnesen, MHA, BSN, RN,[k] Ata Quraishi, MBBS,[d] Jean François Tanguay, MD,[l] Mouheiddin Traboulsi, MD,[m] Sean van Diepen, MD, MSc,[i] Robert Welsh, MD,[i] David A. Wood, MD,[a] and Warren J. Cantor, MD, (Co-chair);[n] and members of the Secondary Panel*

Outline - STEMI care in a peripheral hospital

- Case
- EKG
  - Differentiating STEMI from other causes of ST elevations
  - ST elevation in a patient with a conduction delay

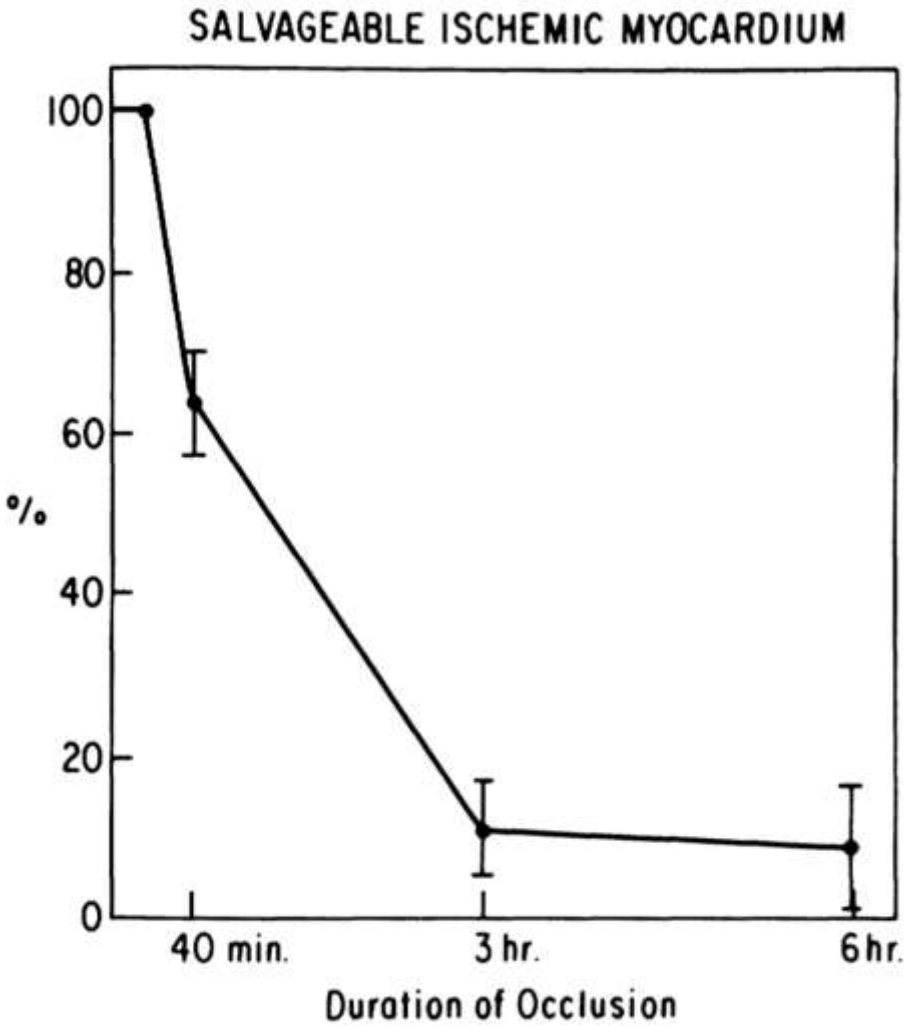
STEMI - PATHOPHYSIOLOGY





Journal of the American College of Cardiology
Volume 72, Issue 18, October 2018DOI: 10.1016/j.jacc.2018.08.1038

“Time is Muscle”!



nucleotides and hydrogen ions. These changes are progressive and do not provide a clear demarcation between reversible injury and irreversible injury. However, irreversible ischemic injury is associated with the cessation of anaerobic glycolysis and a very marked decline in the HEP levels of the tissue.[29] In addition, the transition from reversible to irreversible injury is characterized morphologically by structural changes in the mitrochondria and sarcolemma.[42]

Effect of reperfusion during the phase of reversible ischemic injury. Reperfusion of reversibly injured tissue is

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reported.[51-
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ischemic m
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tic than bypass surgery. The exacerbation of
ia that may occur during induction of anesthesia
avoided. On the other hand, thrombolysis may
cur immediately after therapy, and after lysis,
ay remain suboptimal because of severe under-

salvage of ischemic myocytes in experimenta
mals. The effects of reperfusion on ischemic m
dium and the evidence supporting the potential
fits of reperfusion in experimental ischemic inju
presented in this report.

The first detailed studies of the effect of reper

Circulation 68, Suppl I, I-25–I-36, 1983.

Prehospital Management of STEMI

EMS personnel acquire an ECG in the field to identify STEMI and alert STEMI care teams*	• FMC to ECG acquisition and interpretation ≤10 minutes*
Bypass non-PCI capable centres and transport to the nearest PPCI centre with the goal of achieving a maximum FMC-to-device time of ≤ 120 minutes*	• Ideal FMC-to-device time ≤ 90 minutes in urban settings* • Consider fibrinolysis if this timeline cannot be achieved* • Consider bypassing the PCI centre emergency department when possible#
Avoid routine administration of supplemental oxygen with oxygen saturation ≥ 90%#	• If SaO2 monitoring is not available or not reliable, may provide oxygen to patients exhibiting respiratory distress‡
Avoidance of routine intravenous opioid analgesic for STEMI-related discomfort #	• Selective use of opioid analgesics may be considered for severe pain‡
P2Y12 receptor antagonist medications should not routinely be administered in ambulance #	• P2Y12 receptor antagonists should be administered in the emergency department or cardiac catheterization laboratory as early as possible# • Prehospital administration of P2Y12 receptor antagonists may be considered for transport times > 60 minutes or for systems that administer prehospital fibrinolysis‡

* Strong recommendation
\# Weak recommendation
‡ Practical Tip

PREHOSPITAL DIAGNOSIS
(EMS)
*FMC to STEMI diagnosis < 10 min

2. UNIVERSAL DEFINITIONS OF MYOCARDIAL INJURY AND MYOCARDIAL INFARCTION: SUMMARY

Universal definitions of myocardial injury and myocardial infarction

Criteria for myocardial injury

The term myocardial injury should be used when there is evidence of elevated cardiac troponin values (cTn) with at least one value above the 99th percentile upper reference limit (URL). The myocardial injury is considered acute if there is a rise and/or fall of cTn values.

Criteria for acute myocardial infarction (types 1, 2 and 3 MI)

The term acute myocardial infarction should be used when there is acute myocardial injury with clinical evidence of acute myocardial ischaemia and with detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL and at least one of the following:

- Symptoms of myocardial ischaemia;
- New ischaemic ECG changes;
- Development of pathological Q waves;
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic aetiology;
- Identification of a coronary thrombus by angiography or autopsy (not for type 2 or 3 MIs).

Post-mortem demonstration of acute athero-thrombosis in the artery supplying the infarcted myocardium meets criteria for *type 1 MI*.

Evidence of an imbalance between myocardial oxygen supply and demand unrelated to acute athero-thrombosis meets criteria for *type 2 MI*.

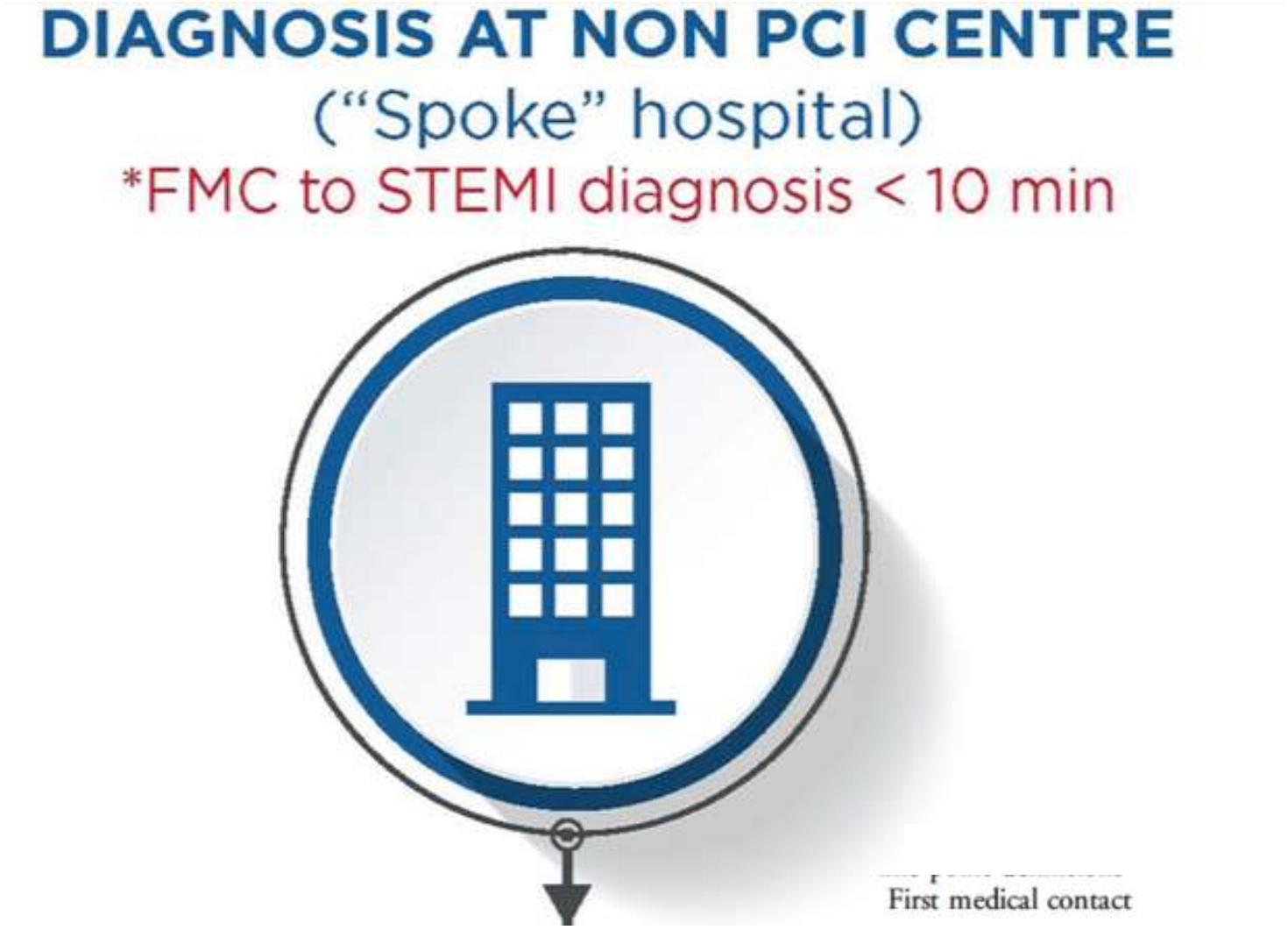
Cardiac death in patients with symptoms suggestive of myocardial ischaemia and presumed new ischaemic ECG changes before cTn values become available or abnormal meets criteria for *type 3 MI*.

Myocardial Infarction and Myocardial Injury Definition

- Biomarkers are **not available** make clinical decisions
- The clinician in the E.D. must rely on
  - **Symptoms** of myocardial ischemia (may be non-specific)
  - **ECG abnormalities** (not always straightforward)

Journal of the American College of Cardiology
Volume 72, Issue 18, October 2018DOI: 10.1016/j.jacc.2018.08.1038

First Medical Contact to STEMI diagnosis (ECG) < 10 min



First medical contact

Time of EMS arrival at scene (prehospital) or hospital registration ("walk in")

TABLE 2 Electrocardiographic Manifestations Suggestive of Acute Myocardial Ischaemia (in the Absence of Left Ventricular Hypertrophy and Bundle Branch Block)

ST-elevation
New ST-elevation at the J-point in 2 contiguous leads with the cut-point: ≥1 mm in all leads other than leads V_2–V_3 where the following cut-points apply: ≥2 mm in men ≥40 years; ≥2.5 mm in men <40 years, or ≥1.5 mm in women regardless of age.[a]
ST-depression and T wave changes
New horizontal or downsloping ST-depression ≥0.5 mm in 2 contiguous leads and/or T inversion >1 mm in two contiguous leads with prominent R wave or R/S ratio >1.

[a]When the magnitudes of J-point elevation in leads V_2 and V_3 are registered from a prior electrocardiogram, new J-point elevation ≥1 mm (as compared with the earlier electrocardiogram) should be considered an ischaemic response. For bundle branch block, see section below.

Journal of the American College of Cardiology
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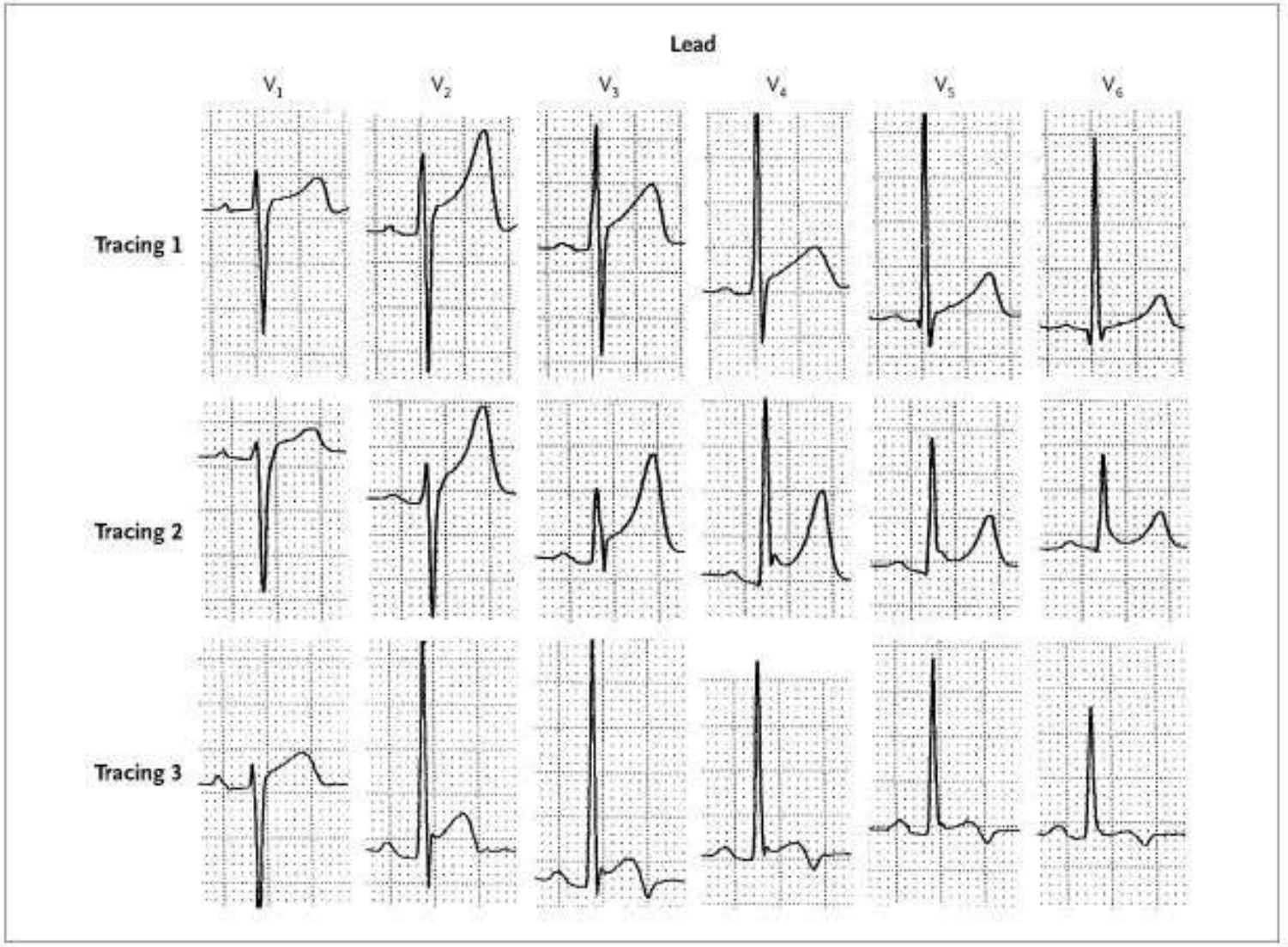
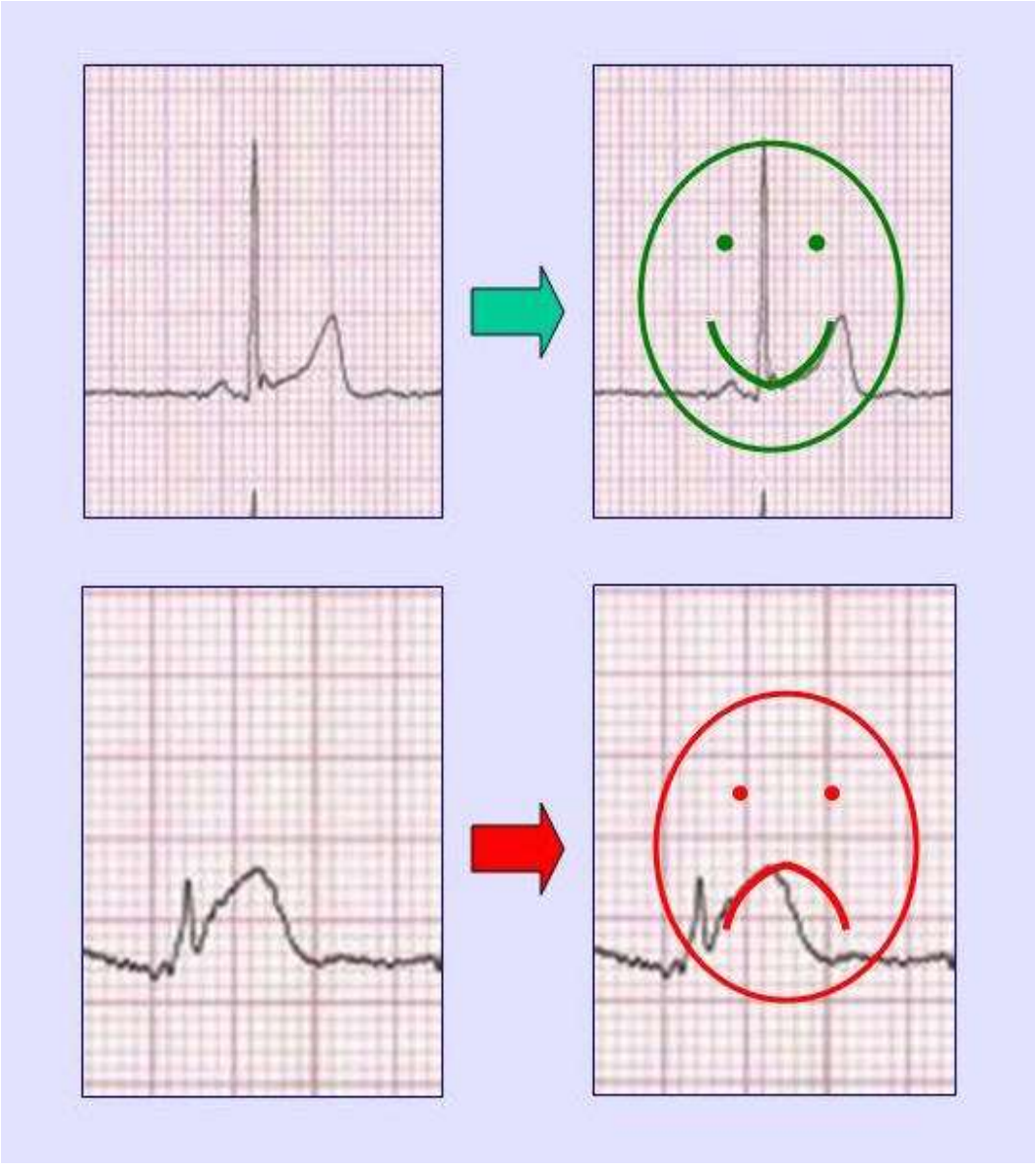
ST elevations can be normal…



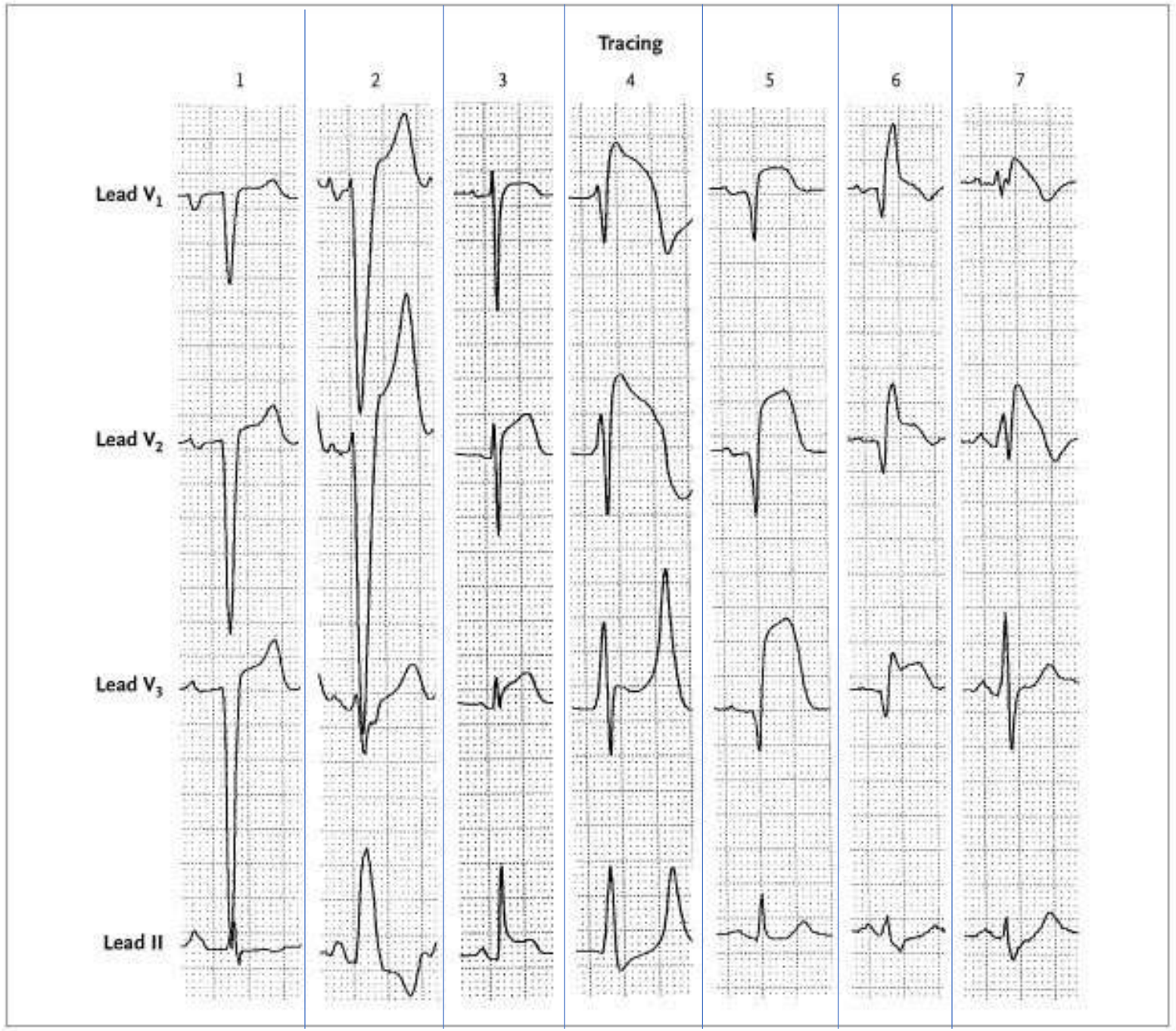
- **Normal ST-segment elevation**
  - Approximately 90 percent of healthy young men have ST-segment elevation of 1 to 3 mm in one or more precordial leads
  - The ST segment is **concave**
- **Early-repolarization pattern**, with a notch at the J point in V_4.
  - The ST segment is **concave**, and the T waves are relatively tall.
- **Normal variant** that is characterized by terminal T-wave inversion.
  - The QT interval tends to be short, and the ST segment is **coved**

N Engl J Med 2003; 349:2128-2135

Concave versus **Coved** ST segments



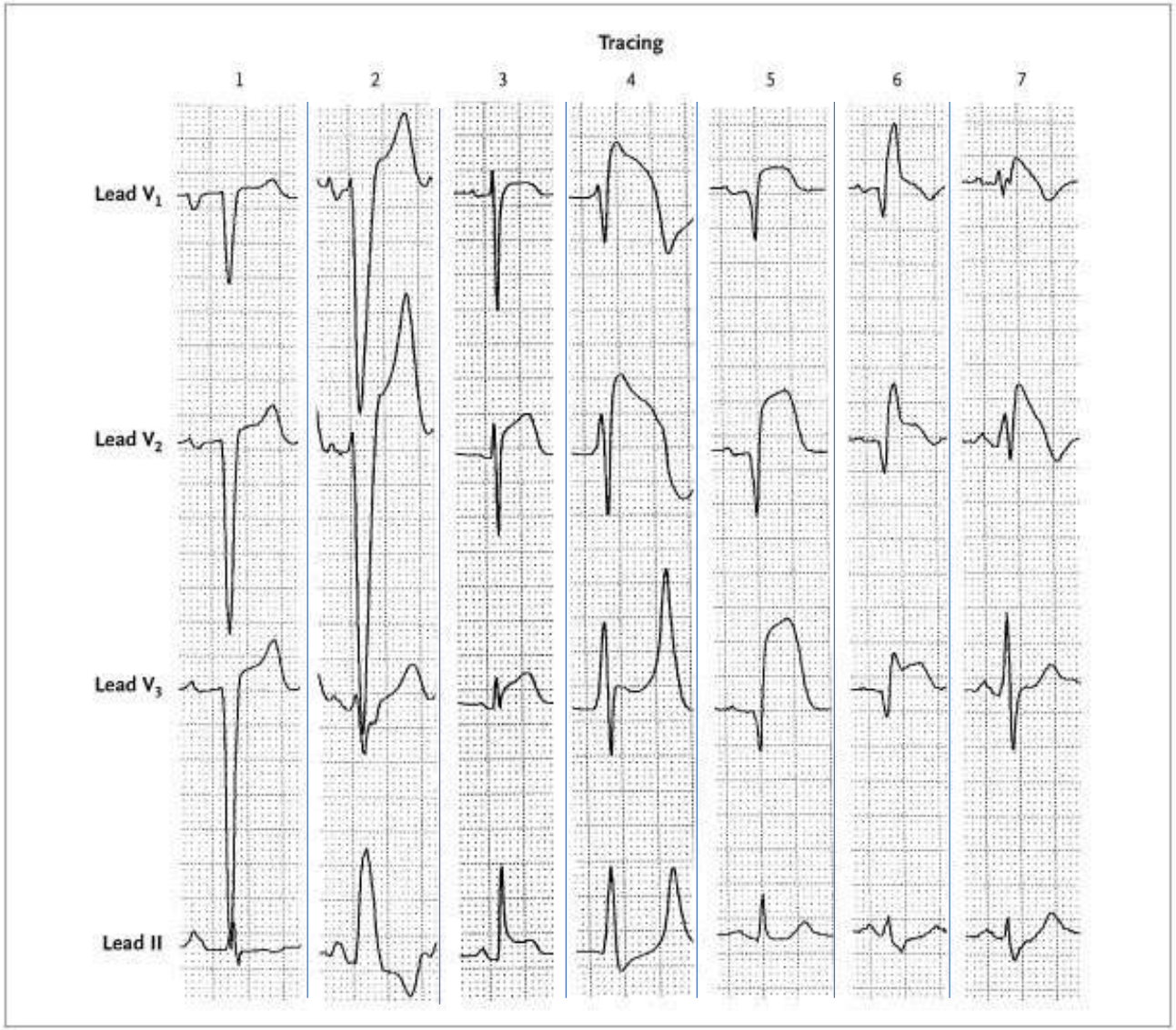
http://ems12lead.com/2009/06/04/st-segment-morphology/#gref



Even when abnormal, ST-elevations do not always equal STEMI

N Engl J Med 2003; 349:2128-2135

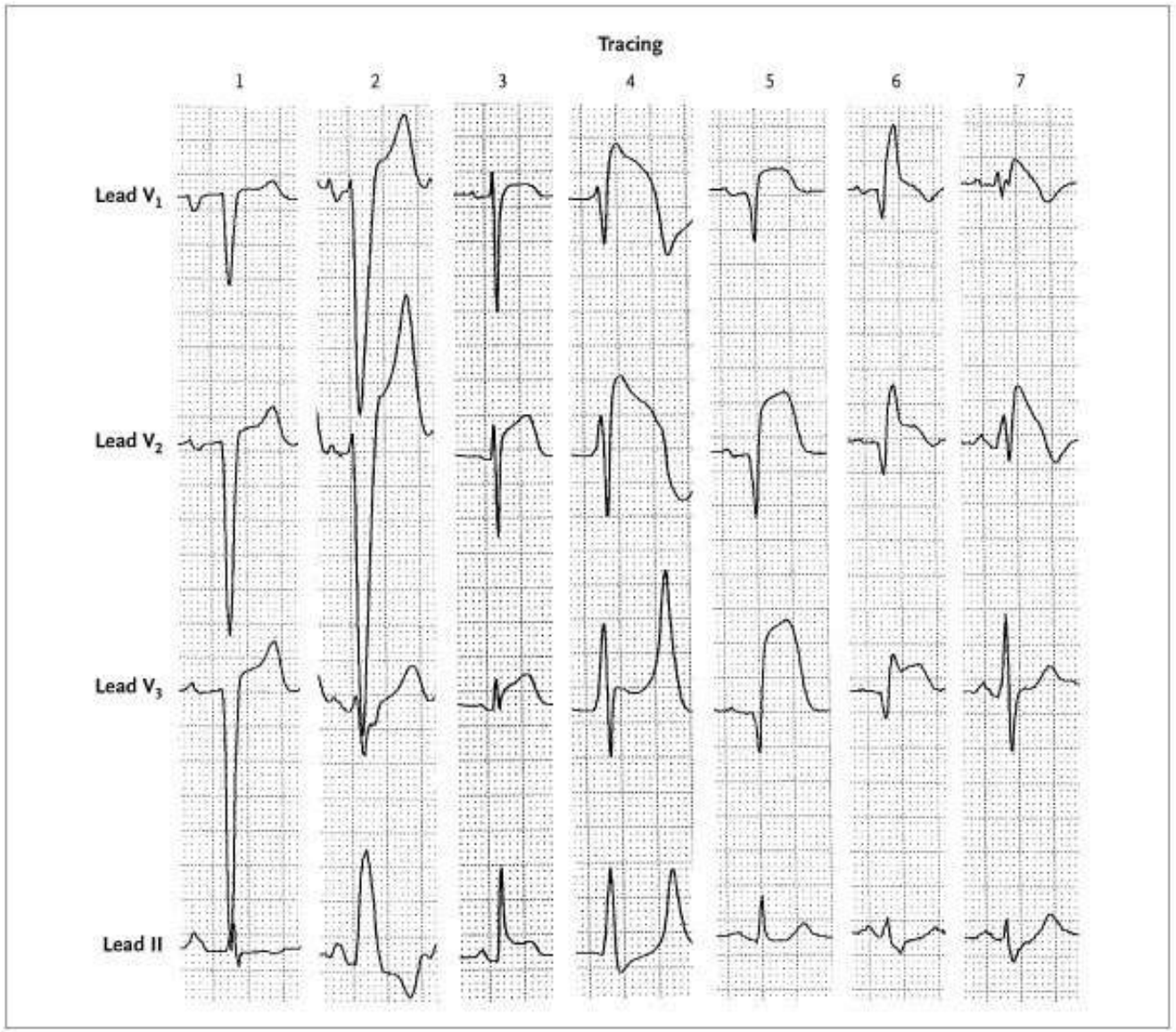
MATCH EACH ST-ELEVATION TRACING ON THE LEFT WITH THE CORRECT DIAGNOSIS



1. Hyperkalemia
2. Acute STEMI with RBBB
3. Brugada Syndrome
4. Pericarditis
5. LBBB
6. LVH
7. Acute STEMI

N Engl J Med 2003; 349:2128-2135

ANSWERS!

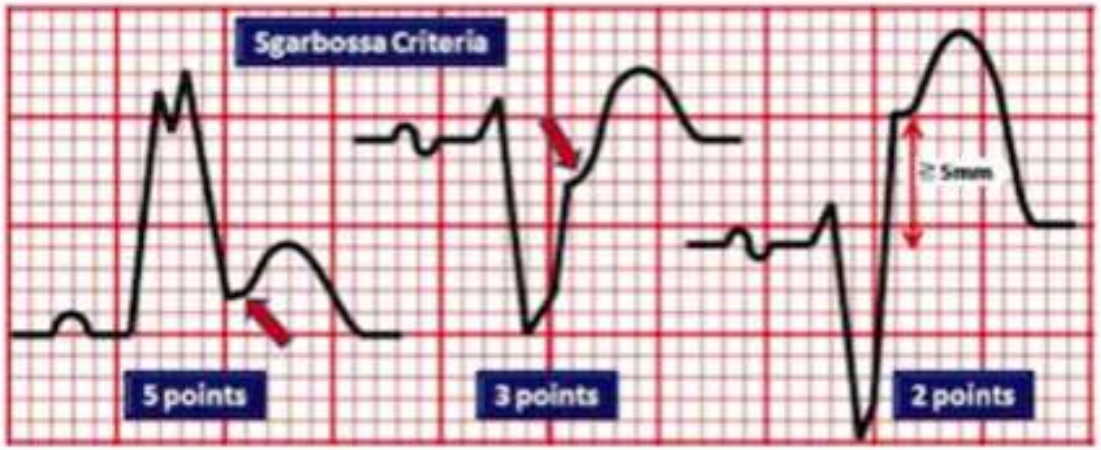


1. LVH
2. LBBB
3. Pericarditis
4. Hyperkalemia
5. Acute STEMI
6. Acute STEMI with RBBB
7. Brugada Syndrome

N Engl J Med 2003; 349:2128-2135

Recognizing signs of myocardial injury in a patient with LBBB or a paced rhythm
Sgarbossa Criteria

Sgarbossa E et al. Electrocardiographic Diagnosis of Evolving Acute Myocardial Infarction in the Presence of Left Bundle-Branch Block. NEJM 334: 481-7



	ST Segment Elevation ≥ 1 mm Concordant with the QRS Complex	ST segment depression ≥ 1 mm in lead V1-3	ST segment elevation ≥ 5 mm and discordant with the QRS complex
Sensitivity	73%	25%	31%
Specificity	92%	96%	92%
(+) LR	9.13	6.25	3.88
(-) LR	0.29	0.78	0.75

A score > 3 has a

- Specificity of > 95% for STEMI

https://coreem.net/core/stemi-lbbb/

Recognizing signs of myocardial injury in a patient with LBBB or a paced rhythm
Modified Sgarbossa Criteria

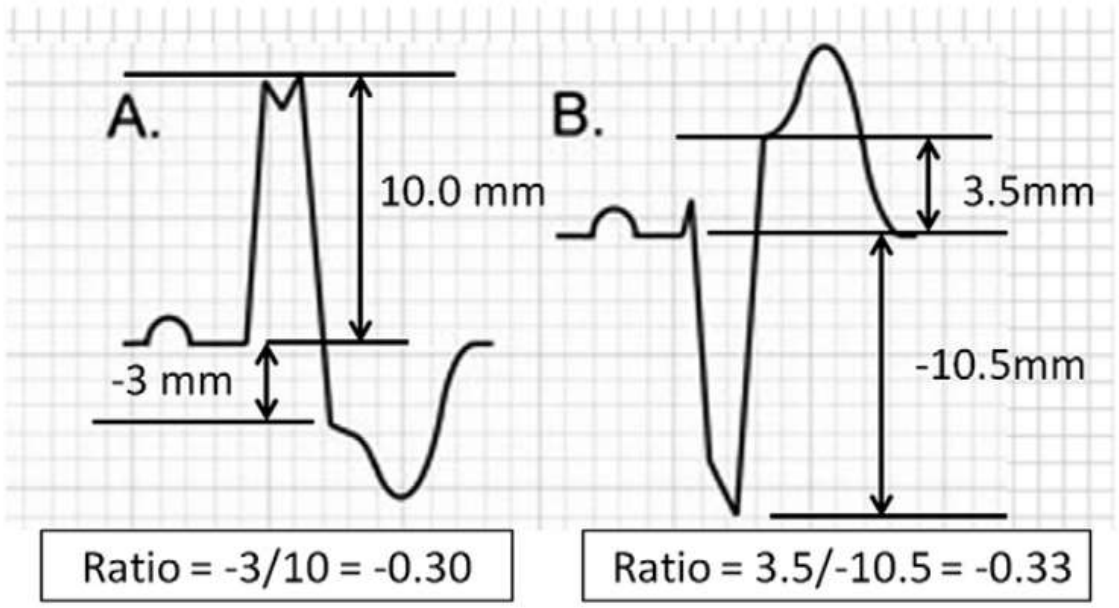
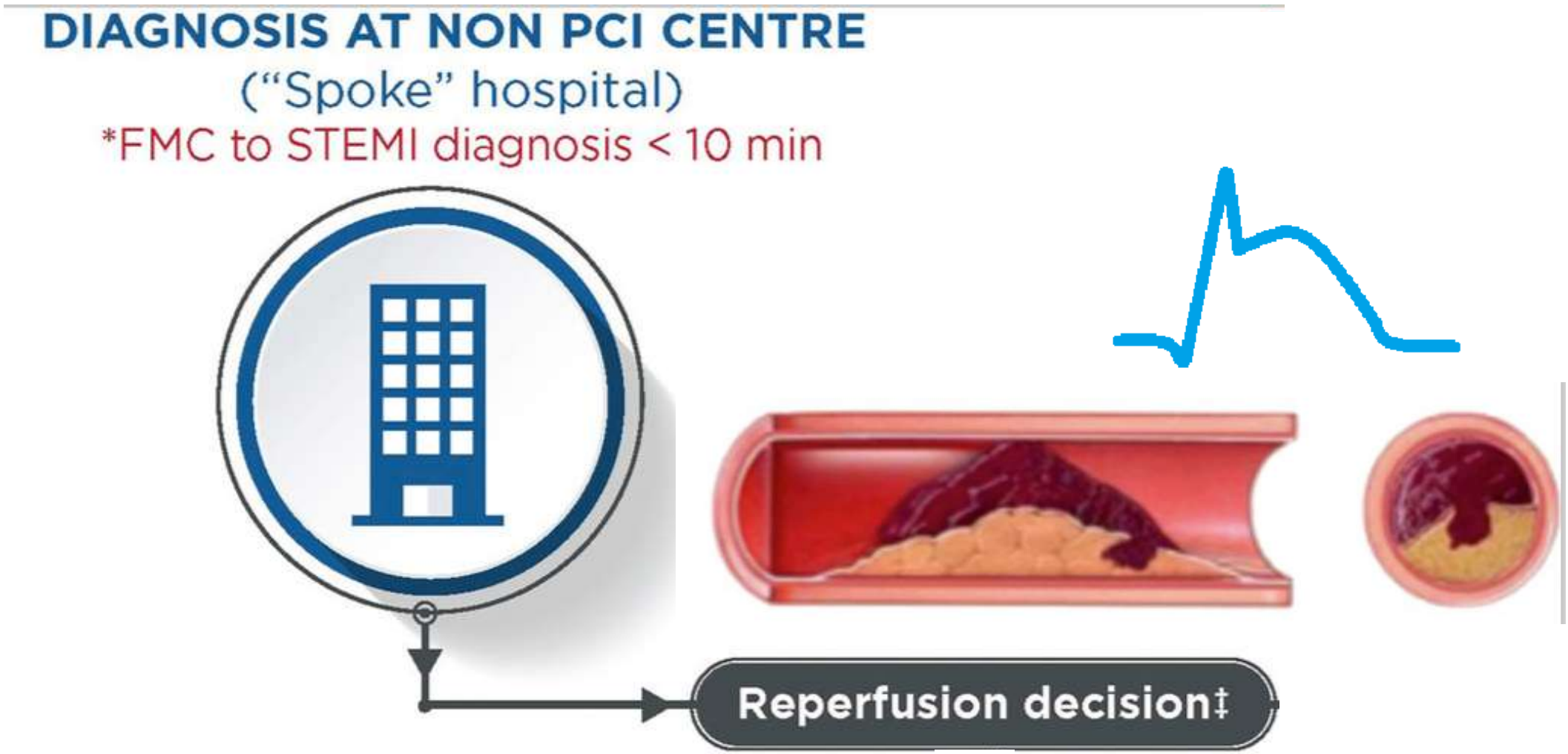


Figure 1. Abnormal, excessive discordance, with the ST segment and T wave in the opposite direction from QRS. Method of measurement: ST segment is measured at the J point, relative to the PR segment. R wave and S wave are also measured relative to the PR segment.

- **Modified Sgarbossa Criteria:**
- ≥ 1 lead with ≥1 mm of concordant ST elevation
- ≥ 1 lead of V1-V3 with ≥ 1 mm of concordant ST depression
- **≥ Proportionally excessive discordant STE, as defined by ≥ 25% of the depth of the preceding S-wave**

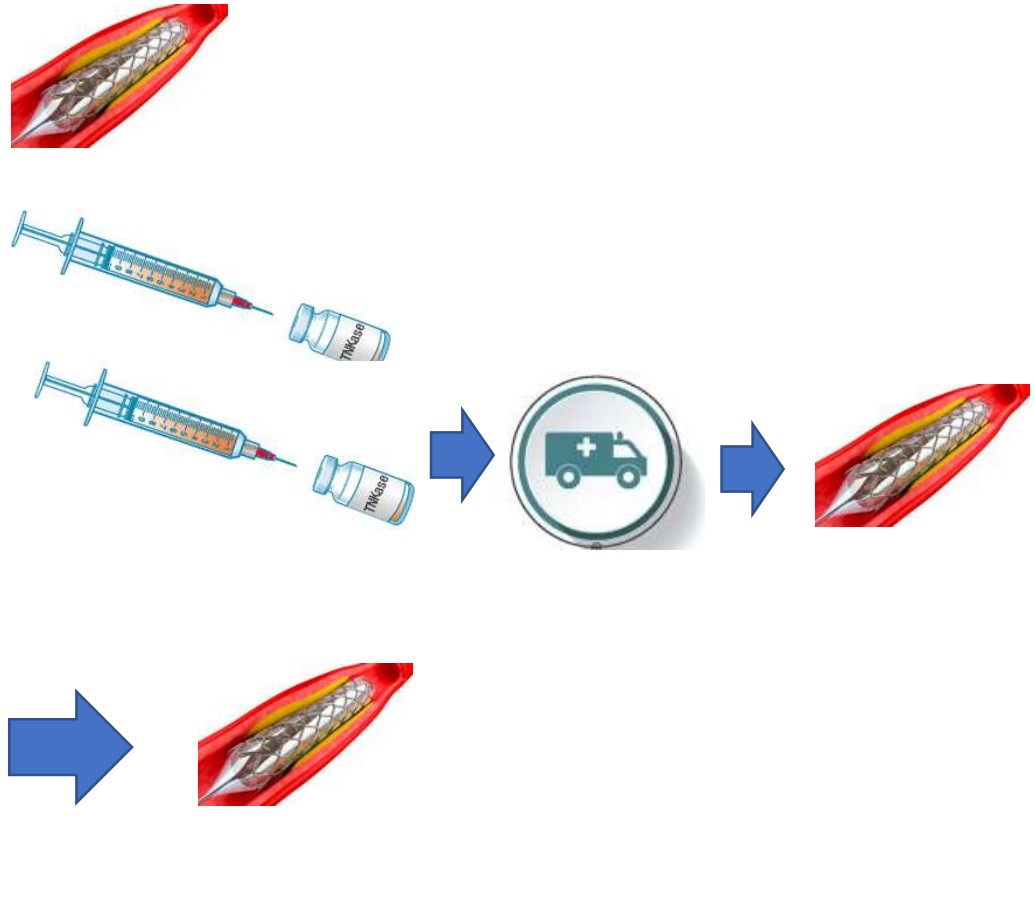
S.W. Smith, K.W. Dodd, T.D. Henry, D.M. Dvorak, L.A. Pearce
Diagnosis of ST-elevation myocardial infarction in the presence of left bundle branch block with the ST-elevation to S-wave ratio in a modified Sgarbossa rule
Ann Emerg Med, 60 (2012), pp. 766-776

First Medical Contact to STEMI diagnosis (ECG) < 10 min



Reperfusion strategies for suspected STEMI patients managed in a non PCI-capable hospital

1) **Primary PCI**
2) ~~Fibrinolysis alone~~
3) **Pharmacoinvasive PCI**
4) ~~Facilitated PCI~~

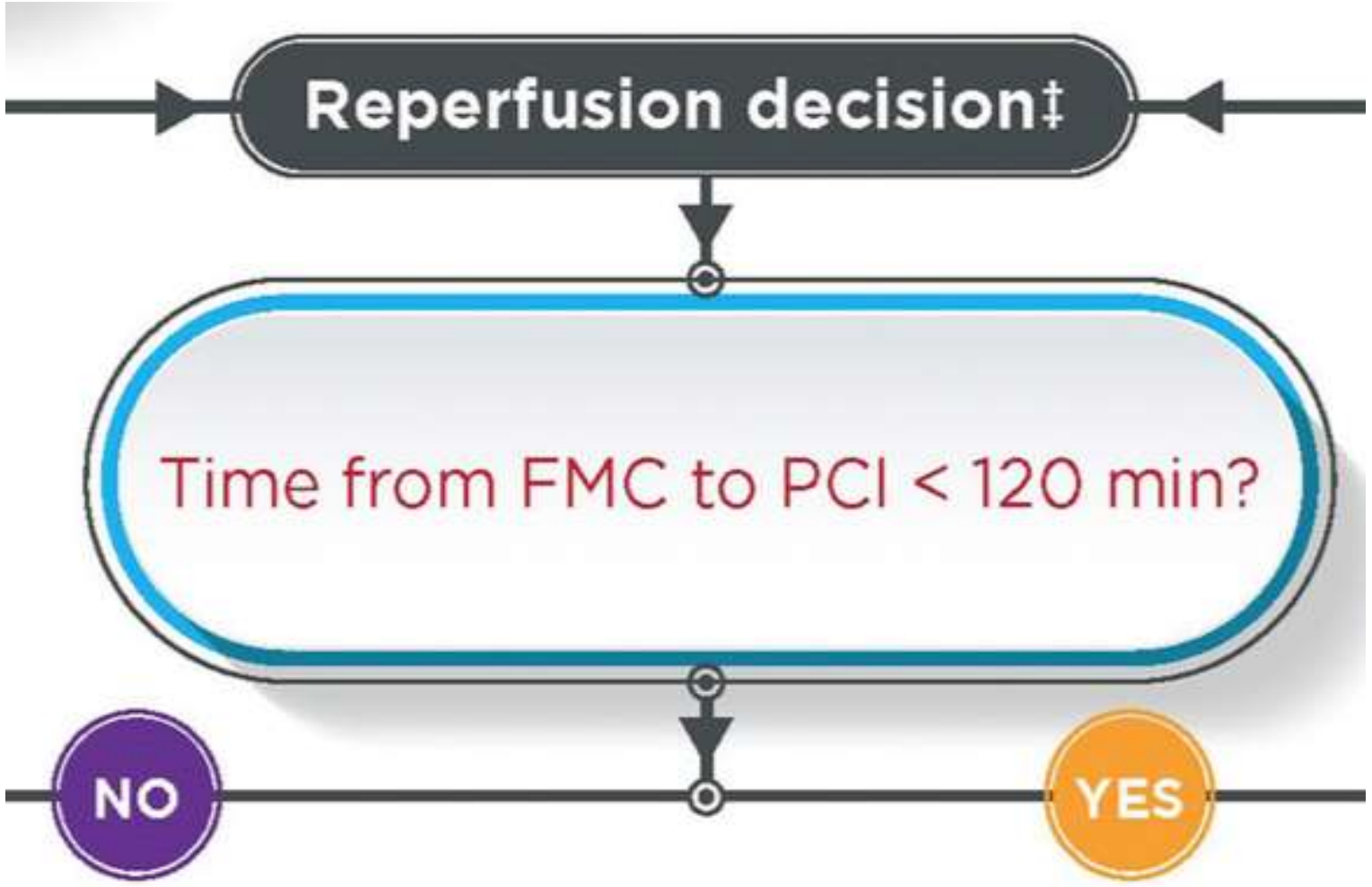


Pharmacoinvasive PCI – What is that?

- *Adjunctive PCI after* initial thrombolysis
  - ***Routine*** *rapid transfer* to PCI centre after fibrinolysis

  1. Immediate PCI for patients with *failed thrombolysis*
  2. *Routine angiography* with or *after successful fibrinolysis* without PCI *within 24 hours*

Time from FMC to PCI must be < 120 min



First medical contact

Time of EMS arrival at scene (prehospital) or hospital registration ("walk in")

Medical therapy for all STEMI patients

- Antiplatelet therapy:
  - Aspirin 162-325mg chewed
  - If fibrinolysis: Clopidogrel 300mg PO
  - If primary PCI: Ticagrelor 180mg PO or Prasugrel 60mg or Clopidogrel 600mg
- Anticoagulant therapy:
  - Unfractionated heparin (bolus +/- infusion)

  or
  - Enoxaparin (1mg/kg s/c bid)

  Others: Bivalirudin, Fondaparinux (Not available in many centers)

Primary PCI

- Patients who then undergo interhospital transfer for Primary PCI *often have treatment times that exceed acceptable reperfusion goals*
  - Local geography
  - Weather constraints
  - Delays in diagnosis
  - Prolonged time spent in the non-PCI centre ED

Primary PCI

- To achieve the ≤ 120-minute target for PPCI transfers, studies have shown that referral hospital
  - **Door-in-door-out times should routinely be ≤ 30 minutes**
  - **Interhospital transport times ≤ 60 minutes**

Reperfusion strategies for suspected STEMI patients managed in a non PCI-capable hospital - Primary PCI

RECOMMENDATION

14. For patients with STEMI identified at a non–PCI-capable centre, if primary PCI is used as the default reperfusion strategy, we recommend that STEMI networks target a total FMC-to-device time (including interfacility transfer) of ≤ 120 minutes. Fibrinolytic therapy should be considered if this timeline cannot be achieved (Strong Recommendation, Low-Quality Evidence).
15. If primary PCI is used as a default reperfusion strategy, we recommend a target door-in-door-out time at the transferring hospital of ≤ 30 minutes (Strong Recommendation, Low-Quality Evidence).

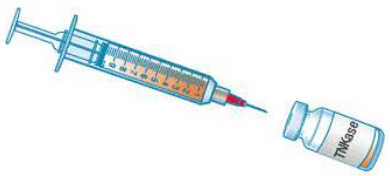
Fibrinolysis

- Fibrinolytic agents that have been used as reperfusion therapy for STEMI include **streptokinase, tenecteplase, reteplase, and alteplase**
  - **Lower mortality rates associated with fibrin-specific agents** (tenecteplase, reteplase, and accelerated infusion alteplase).
- Fibrinolysis given **within 12 hours of symptom-onset** significantly **reduces mortality** for STEMI

Fibrinolysis

- Guidelines recommend a goal of **FMC to needle time of ≤ 30 minutes**
- Fibrinolytic therapy is particularly suited for STEMI patients who present *early* in the course of their infarct, with the greatest benefit seen **within the first 2-3 hours after symptom onset**

Reperfusion strategies for suspected STEMI patients managed in a non PCI-capable hospital
Fibrinolysis/Pharmacoinvasive strategy



RECOMMENDATION

16. If fibrinolysis is used as a default reperfusion strategy, we recommend that STEMI networks target a total FMC-to-needle time of $\leq$ 30 minutes (Strong Recommendation, Low-Quality Evidence).
17. We suggest that a pharmacoinvasive strategy could be considered as an alternative to primary PCI for patients who are early presenters (symptom onset $<$ 3 hours), who are at low risk of bleeding, and who cannot undergo rapid primary PCI (Weak recommendation, Moderate-Quality Evidence).

Reperfusion strategies for suspected STEMI patients managed in a non PCI-capable hospital - **Pharmacoinvasive Strategy**

RECOMMENDATION

19. We recommend routine rapid transfer to PCI centres after fibrinolysis, immediate PCI for patients with failed reperfusion, and routine angiography with or without PCI within 24 hours after successful fibrinolysis (Strong Recommendation, Moderate-Quality Evidence).

Values and preferences. This recommendation is on the basis of the established benefits such as reduced short-term reinfarction, recurrent ischemia, and heart failure and the absence of any increase in major bleeding. However, some regions might not have the resources required to transfer all STEMI patients early after fibrinolysis and might need to transfer only high-risk patients.

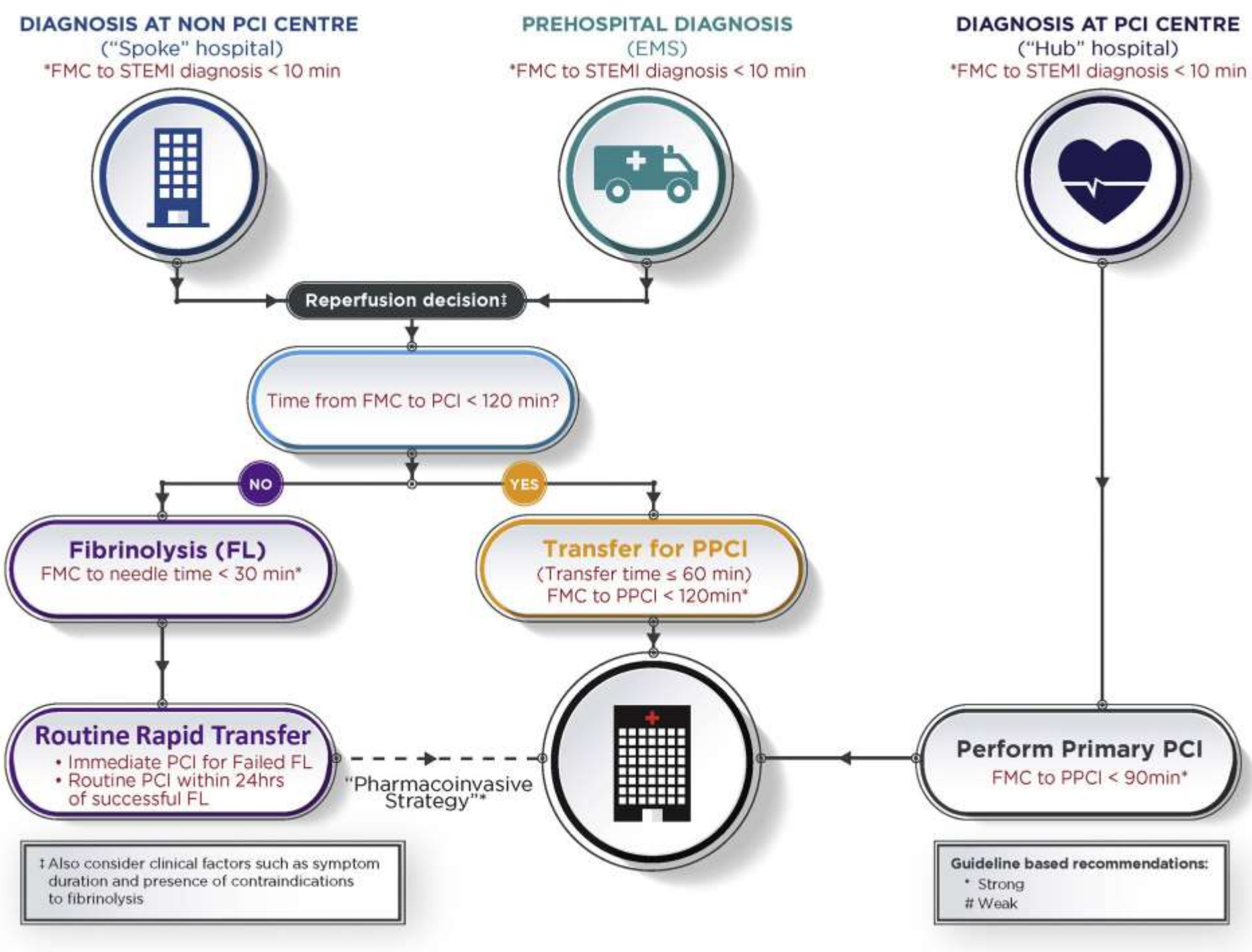
RECOMMENDED OVER FIBRINOLYSIS ALONE!

Management of the STEMI Patient at a PCI-Capable Centre

RECOMMENDATION

21. For patients with STEMI identified at a primary PCI centre, we recommend that STEMI networks target a FMC-to-device time of $\leq$ 90 minutes (Strong Recommendation, Low-Quality Evidence).

Practical tip. Fibrinolytic therapy should be considered as a viable reperfusion strategy at a PPCI centre if it is anticipated that PCI will be significantly delayed because of extenuating circumstances (eg, multiple STEMI patients arriving concurrently).


DIAGNOSIS AT NON PCI CENTRE
("Spoke" hospital)
*FMC to STEMI diagnosis < 10 min
PREHOSPITAL DIAGNOSIS
(EMS)
*FMC to STEMI diagnosis < 10 min
DIAGNOSIS AT PCI CENTRE
("Hub" hospital)
*FMC to STEMI diagnosis < 10 min
Reperfusion decision‡
Time from FMC to PCI < 120 min?
NO
YES
Fibrinolysis (FL)
FMC to needle time < 30 min*
Transfer for PPCI
(Transfer time ≤ 60 min)
FMC to PPCI < 120min*
Routine Rapid Transfer
• Immediate PCI for Failed FL
• Routine PCI within 24hrs of successful FL
"Pharmacoinvasive Strategy"*
Perform Primary PCI
FMC to PPCI < 90min*
‡ Also consider clinical factors such as symptom duration and presence of contraindications to fibrinolysis
Guideline based recommendations:
* Strong
# Weak

At the time of PCI… Culprit only versus complete revascularization?

RECOMMENDATION

22. In hemodynamically stable patients with STEMI and multivessel disease, we suggest that complete revascularization can be considered (Weak Recommendation, Moderate-Quality Evidence).

Values and preferences. This recommendation places a greater emphasis on safety than efficacy because currently only small studies with composite end points have been published.

COMPLETE TRIAL

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 OCTOBER 10, 2019 VOL. 381 NO. 15

Complete Revascularization with Multivessel PCI for Myocardial Infarction

Shamir R. Mehta, M.D., David A. Wood, M.D., Robert F. Storey, M.D., Roxana Mehran, M.D., Kevin R. Bainey, M.D., Helen Nguyen, B.Sc., Brandi Meeks, M.Sc., Giuseppe Di Pasquale, M.D., Jose López-Sendón, M.D., David P. Faxon, M.D., Laura Mauri, M.D., Sunil V. Rao, M.D., Laurent Feldman, M.D., P. Gabriel Steg, M.D., Álvaro Avezum, M.D., Tej Sheth, M.D., Natalia Pinilla-Echeverri, M.D., Raul Moreno, M.D., Gianluca Campo, M.D., Benjamin Wrigley, M.D., Sasko Kedev, M.D., Andrew Sutton, M.D., Richard Oliver, M.D., Josep Rodés-Cabau, M.D., Goran Stanković, M.D., Robert Welsh, M.D., Shahar Lavi, M.D., Warren J. Cantor, M.D., Jia Wang, M.Sc., Juliet Nakamya, Ph.D., Shrikant I. Bangdiwala, Ph.D., and John A. Cairns, M.D., for the COMPLETE Trial Steering Committee and Investigators*

The NEW ENGLAND JOURNAL of MEDICINE

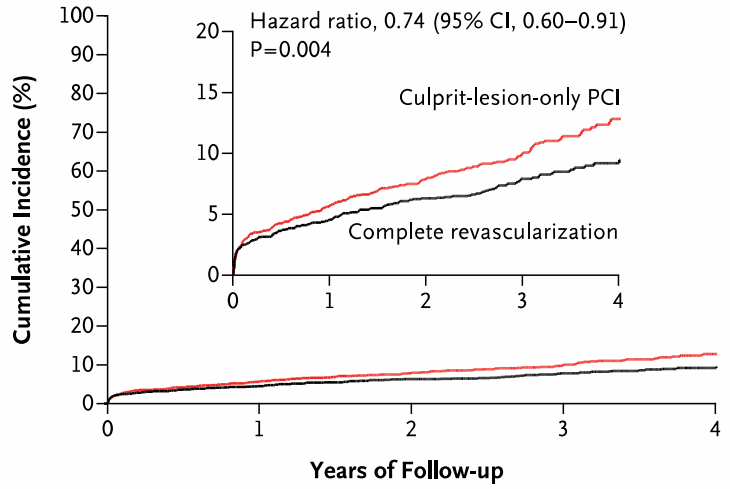
ORIGINAL ARTICLE

Complete Revascularization with Multivessel PCI for Myocardial Infarction

- Random assignment of pts with STEMI and multivessel CAD who had undergone successful culprit-lesion PCI to a strategy of EITHER
  - Complete revascularization with PCI of angiographically significant non-culprit lesions

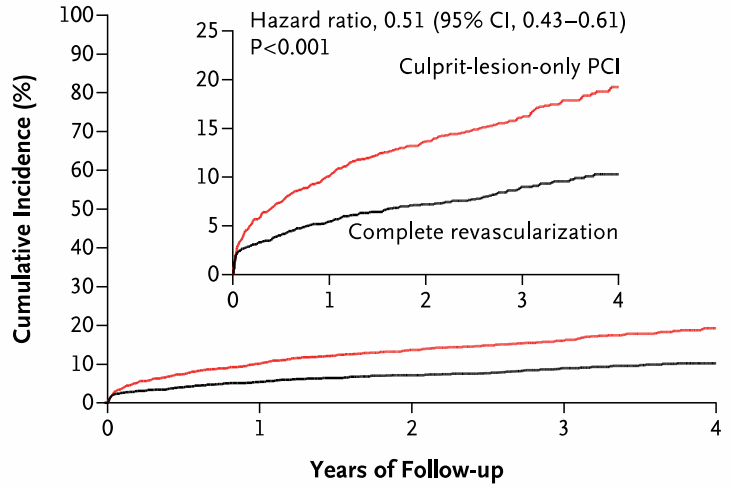
  OR
  - No further revascularization
- Coprimary outcomes
  - Composite of CV death or MI
  - Composite of CV death, MI, or ischemia driven revascularization

A First Coprimary Outcome



No. at Risk					
Culprit-lesion-only PCI	2025	1897	1666	933	310
Complete revascularization	2016	1904	1677	938	337

B Second Coprimary Outcome



No. at Risk					
Culprit-lesion-only PCI	2025	1808	1559	865	294
Complete revascularization	2016	1886	1659	925	329

Composite of CV death or MI

RESULTS

At a median follow-up of 3 years, the first coprimary outcome had occurred in 158 of the 2016 patients (7.8%) in the complete-revascularization group as compared with 213 of the 2025 patients (10.5%) in the culprit-lesion-only PCI group (hazard ratio, 0.74; 95% confidence interval [CI], 0.60 to 0.91; P=0.004). The second coprimary outcome had occurred in 179 patients (8.9%) in the complete-revascularization group as compared with 339 patients (16.7%) in the culprit-lesion-only PCI group (hazard ratio, 0.51; 95% CI, 0.43 to 0.61; P<0.001). For both coprimary outcomes, the benefit of complete revascularization was consistently observed regardless of the intended timing of nonculprit-lesion PCI (P=0.62 and P=0.27 for interaction for the first and second coprimary outcomes, respectively).

CONCLUSIONS

Among patients with STEMI and multivessel coronary artery disease, complete revascularization was superior to culprit-lesion-only PCI in reducing the risk of cardiovascular death or myocardial infarction, as well as the risk of cardiovascular death, myocardial infarction, or ischemia-driven revascularization. (Funded by the Canadian Institutes of Health Research and others; COMPLETE ClinicalTrials.gov number, NCT01740479.)

Composite of CV death, MI, or ischemia driven revascularization

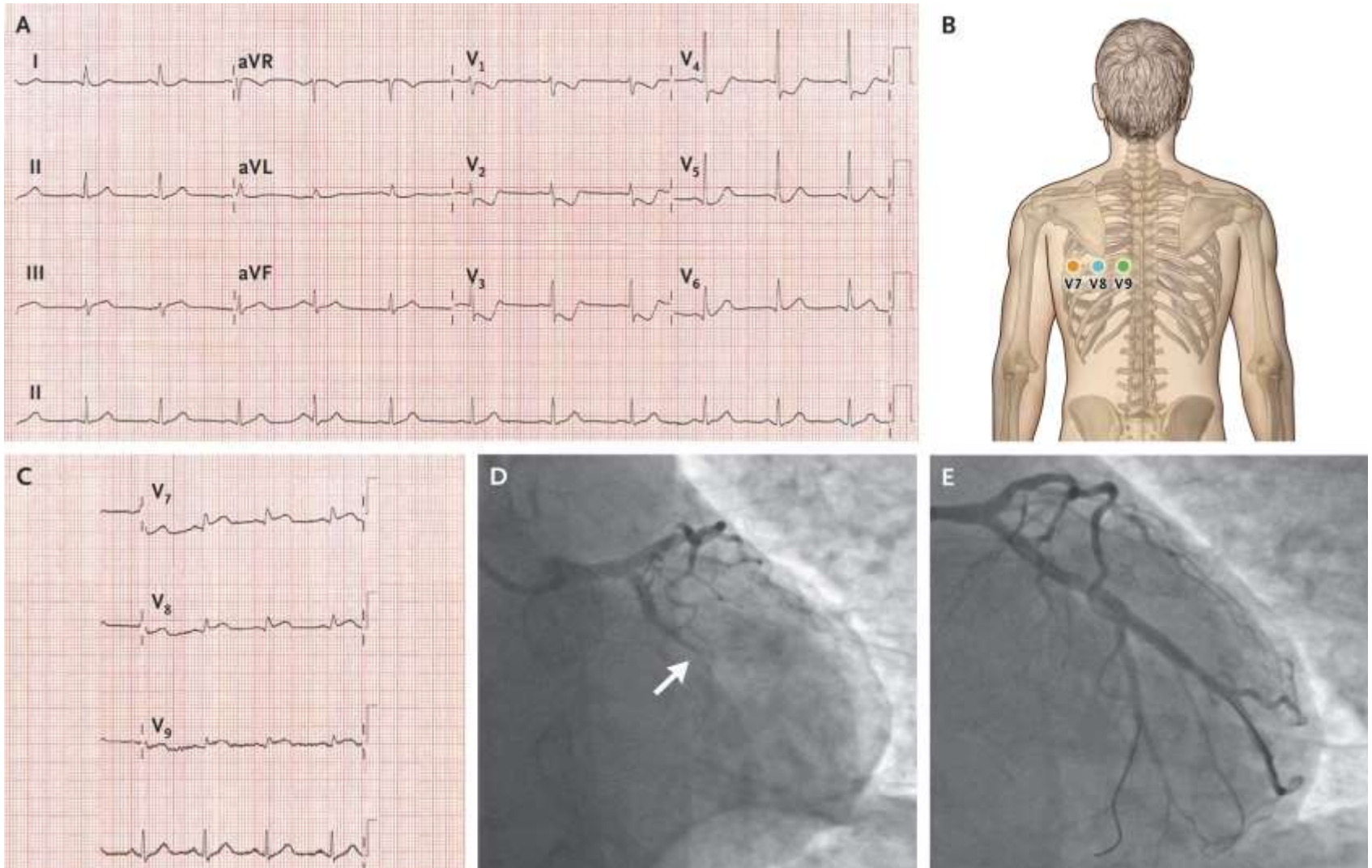
The NEW ENGLAND JOURNAL of MEDICINE

IMAGES IN CLINICAL MEDICINE

Chana A. Sacks, M.D., *Editor*

N ENGL J MED 381;17 NEJM.ORG OCTOBER 24, 2019

Posterior-Wall Myocardial Infarction



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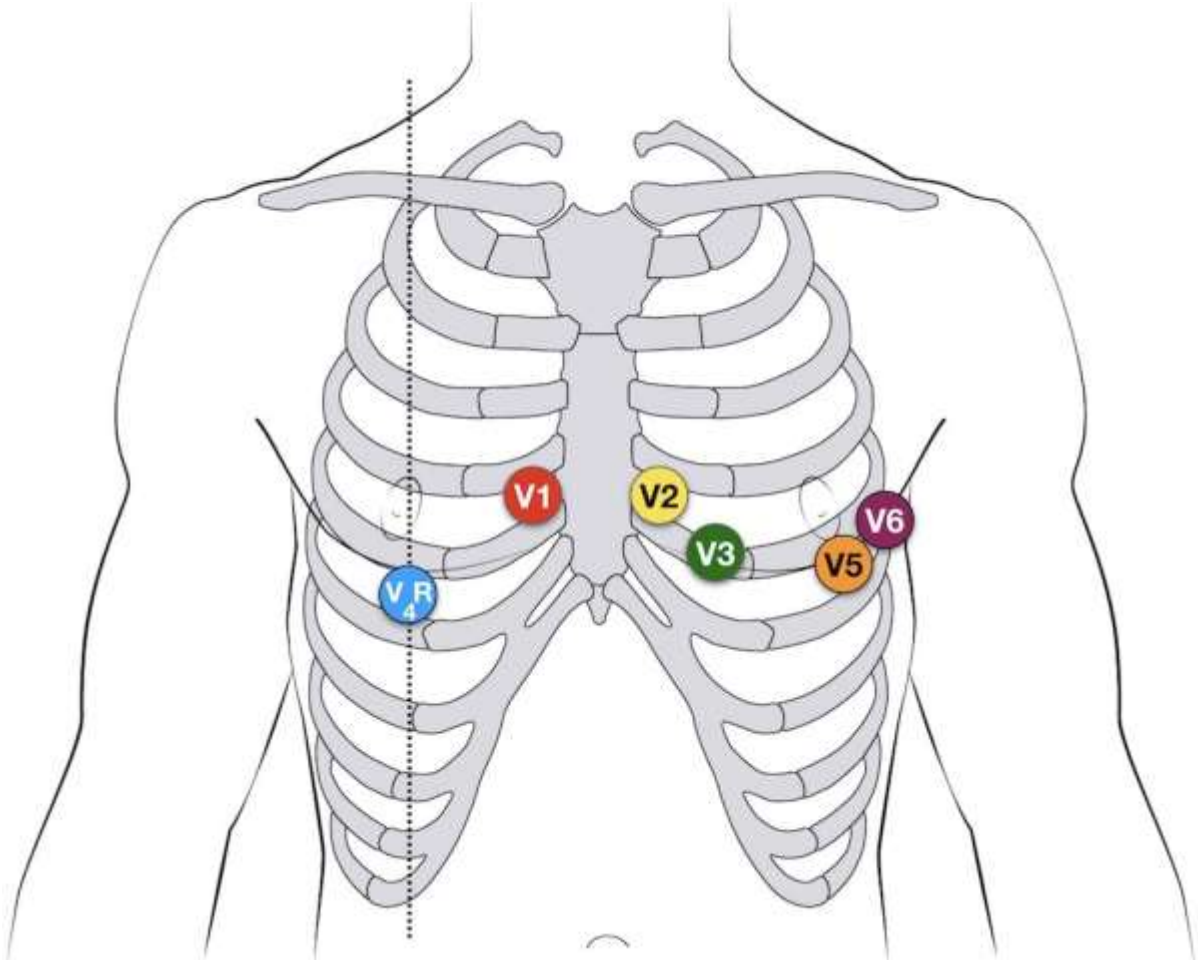
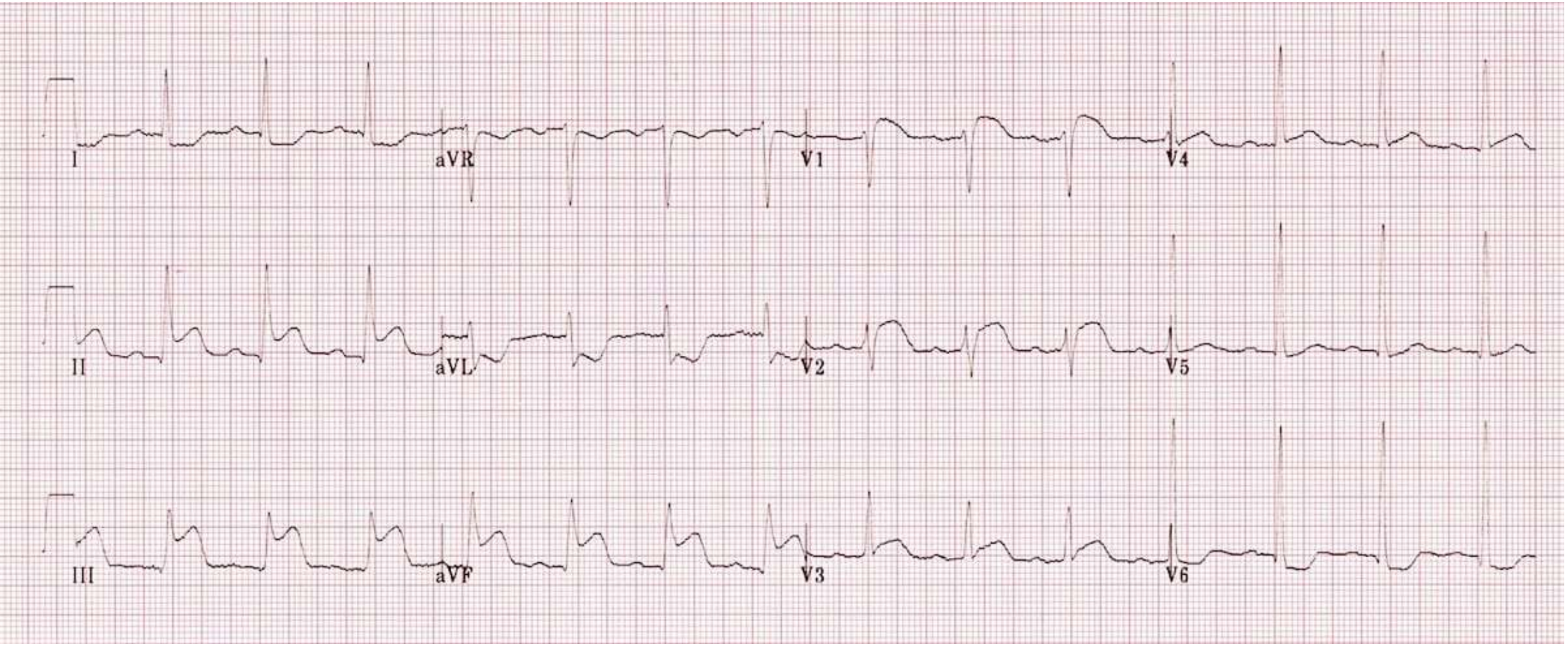
Consider the addition of a right-sided V_4 in all patients with inferior STEMI



https://litfl.com/right-ventricular-infarction-ecg-library/



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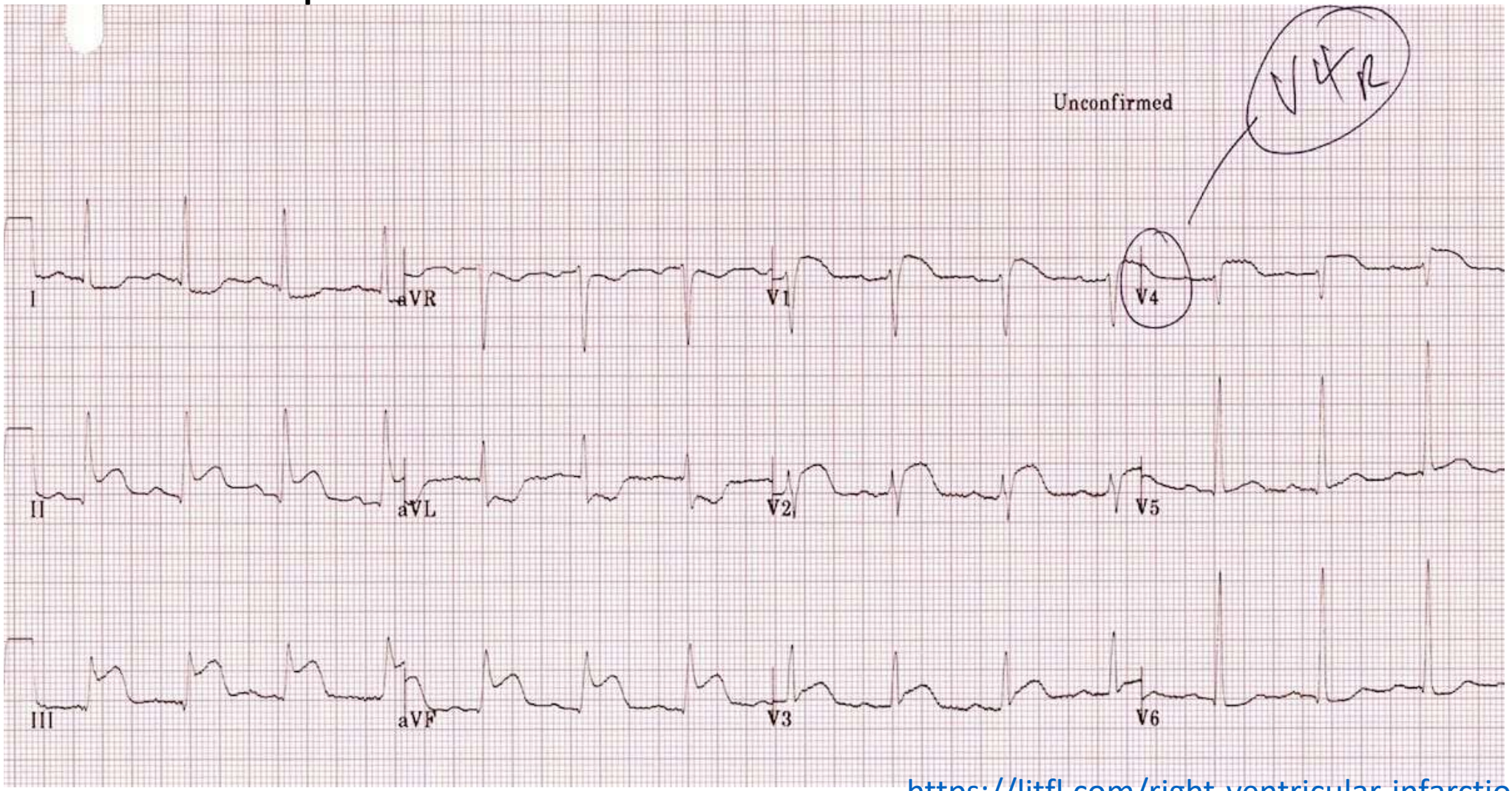
Repeat ECG of the same patient with V4R electrode position



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Additional Slides

Table 2. Definitions

Term	Definition
Time point definitions	
First medical contact	Time of EMS arrival at scene (prehospital) or hospital registration ("walk in")
Time of STEMI diagnosis	Time of performance and interpretation of first electrocardiogram diagnostic of STEMI
First device deployment	Deployment of first PCI device (balloon or direct stent)
DIDO	Time between registration of patient at non−PCI-capable hospital and patient leaving non−PCI-capable hospital via EMS
Interfacility transport time	Time on the road between leaving non−PCI-capable hospital and arrival at PCI-capable hospital
Reperfusion strategy definitions	
PPCI	Mechanical reperfusion techniques aimed at restoring flow to the culprit vessel in acute STEMI. May include balloon angioplasty, coronary stenting, or thrombectomy
Pharmacoinvasive strategy	A reperfusion strategy using adjunctive PCI after initial pharmacological reperfusion with fibrinolysis. Consists of: (1) routine rapid transfer to PCI centres after fibrinolysis; (2) immediate PCI for patients with failed fibrinolysis; and (3) routine angiography with or without PCI within 24 hours after successful fibrinolysis
Facilitated PCI	A reperfusion strategy in which adjuvant therapies such as fibrinolysis or glycoprotein IIb/IIIa inhibitors are administered while in transit to immediate diagnostic angiography with the intent to perform immediate PPCI

Clinical end points are considered as: MI, STEMI, MACE, and NACE.

DIDO, door-in door-out; EMS, emergency medical services; MACE, major adverse cardiovascular events; MI, myocardial infarction; NACE, net adverse clinical events; PCI, percutaneous coronary intervention; PPCI, primary PCI; STEMI, ST-elevation myocardial infarction.

Table 3. Reperfusion treatment goals

Metric	Goal*
FMC to diagnosis (ECG acquisition and interpretation)	≤ 10 minutes
Diagnosis to catheterization lab activation	≤ 10 minutes
Door-in to door-out time for emergency departments	≤ 30 minutes
Transport times for interfacility transfers or STEMI patients diagnosed in the field	≤ 60 minutes
Time from arrival at catheterization lab to first device activation	≤ 30 minutes
Total time from FMC to first device activation (for primary PCI); for non-PCI centres or patients diagnosed in the field	≤ 120 minutes
Total time from FMC to first device activation (for primary PCI); for patients presenting to PCI centres	≤ 90 minutes
Time from FMC to fibrinolysis	≤ 30 minutes
Time from fibrinolysis to coronary angiography	< 24 hours

ECG, electrocardiogram; FMC, first medical contact; PCI, percutaneous coronary intervention; STEMI, ST-elevation myocardial infarction.

*Regional goal: ≥ 75% of cases to achieve each target metric.

Reperfusion strategies for suspected STEMI patients managed in a non PCI-capable hospital Fibrinolysis for Cardiogenic Shock

RECOMMENDATION

18. We suggest that fibrinolysis before transfer to a PCI centre be considered in patients with STEMI complicated by CS when excessive delays to cardiac catheterization are anticipated (Weak Recommendation, Very Low-Quality Evidence).

Values and preferences. The writing group recognizes that Canada's unique geography and climate might contribute to very long transport times to PCI-capable hospitals for patients who present to nonurban hospitals or remote nursing stations. We valued the potential benefits of fibrinolysis reperfusion in such a setting for the treatment of this time-sensitive condition that is associated with a high mortality rate.