Diagnosis and Management of ST Segment Elevation MI
Initial Reperfusion Modalities

Jacqueline E. Tamis-Holland, MD
Program Director, Cardiology Fellowship and Mount Sinai Morningside-Bronx Care
Ludwig Hektoen
“Infarction of the Heart”

“Well cardiac infarction may be caused by embolism, it is caused much more frequently by thrombosis, and thrombosis again is usually secondary to sclerotic changes in coronaries”
PREVALENCE OF TOTAL CORONARY OCCLUSION DURING THE EARLY HOURS OF TRANSMURAL MYOCARDIAL INFARCTION

PRIORITY
Initial Assessment

• 12 lead ECG (within 10 minutes)
• Brief (but critical) history
  • How do you feel?
  • When did the symptoms begin?
  • Do you have any of the following:
    • Cancer
    • Strokes
    • Bleeding ulcers
    • Bleeding problems
    • Allergies
  • What medications do you take?
Examine the “Nature” of the ST Elevation
Reperfusion Strategies

- Primary Angioplasty
- Fibrinolytic Therapy
fibrinolysis has waned (101). The writing committee reiterates the principle highlighted in the 2004 ACC/AHA STEMI guideline, namely that “the appropriate and timely use of some form of reperfusion therapy is likely more important than the choice of therapy” (4). Greatest emphasis is to be placed on the delivery of reperfusion therapy to the individual patient as rapidly as possible.
Primary PCI
A COMPARISON OF IMMEDIATE ANGIOPLASTY WITH THROMBOLYTIC THERAPY FOR ACUTE MYOCARDIAL INFARCTION

Cindy L. Grines, M.D., Kevin F. Browne, M.D., Jean Marco, M.D., Donald Rothbaum, M.D., Gregg W. Stone, M.D., James O’Keefe, M.D., Paul Overlie, M.D., Bryan Donohue, M.D., Noah Chelliah, M.D., Gerald C. Timmis, M.D., Ronald E. Vlietstra, M.D., Michelle Strzelecki, R.N., Sylvia Puchrowicz-Ochocki, M.D., and William W. O’Neill, M.D., for the Primary Angioplasty in Myocardial Infarction Study Group*
Meta-Analysis of PCI vs Fibrinolytic Therapy

The Lancet 2003;361:13-20
60 Minute Drive Times Surrounding PCI Programs at US hospitals
Primary PCI vs Fibrinolytic Therapy for Transfer Patients

Death, Re-MI and CVA

Maastricht

PRAGUE

Air-Pami

CAPTM

DANAMI 2

PRAGUE 2

Total

Relative Risk 0.1 0.2 0.3 0.5 0.7 1.0 1.4

0.58, p<0.001
# Time From Randomization to Treatment in Trials of Transfer for PCI

<table>
<thead>
<tr>
<th>Study</th>
<th># PCI</th>
<th>Time to PCI (Minutes)</th>
<th># Lytic</th>
<th>Time to Lytic</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAASTRICHT</td>
<td>75</td>
<td>85</td>
<td>75</td>
<td>10</td>
</tr>
<tr>
<td>PRAGUE-1</td>
<td>101</td>
<td>80</td>
<td>99</td>
<td>10</td>
</tr>
<tr>
<td>AIR-PAMI</td>
<td>71</td>
<td>122</td>
<td>66</td>
<td>19</td>
</tr>
<tr>
<td>CAPTIM</td>
<td>421</td>
<td>82</td>
<td>419</td>
<td>20</td>
</tr>
<tr>
<td>DANAMI-2</td>
<td>790</td>
<td>*90</td>
<td>782</td>
<td>*20</td>
</tr>
<tr>
<td>PRAGUE-2</td>
<td>429</td>
<td>97</td>
<td>421</td>
<td>17</td>
</tr>
</tbody>
</table>

*Median Time of transferred patients

*Circulation 2003, 108:1809-1814*
“The Real World”

Percent of Transfer Patients meeting Guideline Directed Treatment Times

**Accelerator Data**

![Graph showing the percent of transfer patients meeting guideline-directed treatment times over different quarters and categories (Direct, EMS, Hospital transfer)]
Relative Benefit of PCI to Fibrinolytic Therapy

Clinical Trial Data
Relative Benefit of PCI to Fibrinolytic Therapy

National Registry of Myocardial Infarction

Circulation 2011;124:2512-2521
Data From the CAPTIM Trial

5 Year Follow-up:
Mortality in Patients Presenting Early Lytic vs PCI
5.8% vs. 11.1%
(RR 0.50; 95% CI 0.25–0.97; P = 0.04)

Circulation 2003;108:2851-2856  
Eur Heart J 2009;30:1598-606
Considerations in the Use of Reperfusion Therapies

- Mortality risk
- Bleeding risk from fibrinolytic therapy
- Risk of Cath (Renal insufficiency)
- Time from onset of symptoms to presentation
- Time difference between fibrinolytic vs transfer for PCI
Primary PCI should be performed in patients with STEMI and ischemic symptoms of less than 12 hours’ duration.

Immediate transfer to a PCI-capable hospital for primary PCI is the recommended triage strategy for patients with STEMI who initially arrive at or are transported to a non–PCI-capable hospital, with an FMC-to-device time system goal of 120 minutes or less.

Primary PCI is reasonable in patients with STEMI if there is clinical and/or ECG evidence of ongoing ischemia between 12 and 24 hours after symptom onset.

Am Coll Cardiol. 2013 61: e78-140
Thrombolytic Therapy
Reperfusion Therapy and Time-to-Treatment Goals

In the absence of contraindications, fibrinolytic therapy should be administered to patients with STEMI at non–PCI-capable hospitals when the anticipated FMC-to-device time at a PCI-capable hospital exceeds 120 minutes because of unavoidable delays.

When fibrinolytic therapy is indicated or chosen as the primary reperfusion strategy, it should be administered within 30 minutes of hospital arrival.

In the absence of contraindications and when PCI is not available, fibrinolytic therapy is reasonable for patients with STEMI if there is clinical and/or ECG evidence of ongoing ischemia within 12 to 24 hours of symptom onset and a large area of myocardium at risk or hemodynamic instability.

Am Coll Cardiol. 2013 61: e78-140
RANDOMISED TRIAL OF INTRAVENOUS STREPTOKINASE, ORAL ASPIRIN, BOTH, OR NEITHER AMONG 17 187 CASES OF SUSPECTED ACUTE MYOCARDIAL INFARCTION: ISIS-2

ISIS-2 (SECOND INTERNATIONAL STUDY OF INFARCT SURVIVAL) COLLABORATIVE GROUP*
**Vascular mortality at 35 days**

<table>
<thead>
<tr>
<th></th>
<th>Aspirin</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Streptokinase</strong></td>
<td>8.0</td>
<td>10.4*</td>
</tr>
<tr>
<td><strong>Placebo</strong></td>
<td>10.7*</td>
<td>13.2</td>
</tr>
</tbody>
</table>

*Significantly higher than combination therapy: 2P<0.0001

Odds reduction: 42%, SD 5

2P<0.00001

**Graph:**
- Cumulative no. of vascular deaths
- Days after randomization
- Placebo infusion and tablets
- SK and aspirin

*Lancet* 1988;i:349-60
## Major Clinical Trials of Thrombolysis

<table>
<thead>
<tr>
<th>Trial</th>
<th>Primary Comparison</th>
<th>Principal Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>GISSI-1, 1986</td>
<td>Streptokinase vs. control</td>
<td>Reduced mortality with streptokinase</td>
</tr>
<tr>
<td>ISIS-2, 1988</td>
<td>Streptokinase ± aspirin vs. placebo</td>
<td>Reduced mortality with streptokinase, reduced mortality with aspirin, additive benefit of aspirin and streptokinase</td>
</tr>
<tr>
<td>GUSTO-1, 1994</td>
<td>Alteplase (tPA) vs. streptokinase vs. combination of tPA and streptokinase</td>
<td>Reduced mortality with alteplase, no benefit with combination</td>
</tr>
<tr>
<td>GUSTO-3, 1999</td>
<td>Alteplase vs. reteplase</td>
<td>Similar mortality</td>
</tr>
<tr>
<td>ASSENT 2, 2000</td>
<td>Alteplase vs. tenecteplase</td>
<td>Similar mortality, equivalence demonstrated</td>
</tr>
</tbody>
</table>
Limitations of Thrombolytic Therapy

- Intra-cranial hemorrhage (0.6%)
- Other serious bleeding (1.8%)
- Failure to achieve reperfusion (20%)
- Recurrent MI (4%)
Risk Factors for Major Bleeding with Thrombolytic Therapy

- Advanced Age
- Female Sex
- Low body weight
- Severe hypertension
- Prior Stroke
- High aPTT
- Procedures
Contra-Indications to Fibrinolysis

**Absolute**

- Prior ICH
- Intracranial neoplasm or AVM
- Ischemic Stroke within 3 months
- Active Internal bleeding or bleeding diathesis
- Significant closed trauma to head within 3 months
- Intracranial or spinal surgery in past 2 months
- Severe uncontrolled hypertension
Contra-Indications to Fibrinolysis

Relative

- Presenting BP >180 mm hg systolic or 110 mm hg diastolic
- History of poorly controlled BP
- Remote Ischemic stroke (>3 months)
- Traumatic or prolonged CPR (> 10 minutes)
- Major surgery < 3 weeks
- Other intracranial pathology
- Active ulcer disease or internal bleeding <2 weeks
- Non-compressible vascular puncture
- Oral anticoagulation
- Dementia
- Pregnancy
PCI Following Fibrinolytic Therapy
Defining PCI in STEMI

<table>
<thead>
<tr>
<th>PCI for STEMI</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary PCI</td>
<td>PCI performed &lt;12 hours from symptom onset</td>
</tr>
<tr>
<td>PCI for Symptoms &gt; 12 hours</td>
<td>PCI performed &gt; 12 hours from symptom onset</td>
</tr>
<tr>
<td>Facilitated PCI</td>
<td>PCI following reduced dose FT (or GPI)</td>
</tr>
<tr>
<td>Immediate PCI</td>
<td>PCI performed hours after successful lytics</td>
</tr>
<tr>
<td>Rescue PCI</td>
<td>PCI performed following failed Fibrinolysis</td>
</tr>
<tr>
<td>Delayed PCI</td>
<td>Performed within days of successful fibrinolysis</td>
</tr>
</tbody>
</table>
FACILITATED PCI
Facilitated PCI vs Primary PCI

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Facilitated intervention (n/N; %)</th>
<th>Primary intervention (n/N; %)</th>
<th>Death</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platelet glycoprotein IIb/IIIa inhibitor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>van't Hof, et al (On-TIME)²</td>
<td>9/245 (4%)</td>
<td>2/247 (1%)</td>
<td>0.032</td>
<td>1.00</td>
</tr>
<tr>
<td>Lee, et al (TIGER-PA)³</td>
<td>1/50 (2%)</td>
<td>1/50 (2%)</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>Mesquita Gabriel, et al (ERAM)⁴</td>
<td>4/36 (11%)</td>
<td>5/38 (13%)</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Amftz, et al (REOMOBILE)⁵</td>
<td>0/52</td>
<td>1/48 (2%)</td>
<td>0.067</td>
<td></td>
</tr>
<tr>
<td>Zorman, et al⁶</td>
<td>0/56</td>
<td>4/56 (7%)</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Cutlip, et al⁷</td>
<td>0/28</td>
<td>1/30 (3%)</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>Gyongyosi, et al (ReoPro- BRIDGING)⁸</td>
<td>0/28</td>
<td>2/49 (4%)</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td>Zezur, et al (INTAMI)⁹</td>
<td>2/53 (4%)</td>
<td>2/49 (4%)</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td>Bellandi, et al¹⁰</td>
<td>1/27 (4%)</td>
<td>1/28 (4%)</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>17/575 (3%)</td>
<td>17/573 (3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrombolytic therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Van de Werf, et al (ASSENT-4 PCI)¹¹</td>
<td>50/828 (6%)</td>
<td>32/836 (4%)</td>
<td>0.039</td>
<td>0.97</td>
</tr>
<tr>
<td>O’Neill, et al (SAMI)¹²</td>
<td>0/58</td>
<td>0/63</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Widimsky, et al (PRAGUE)¹³</td>
<td>12/100 (12%)</td>
<td>7/101 (7%)</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>Vermeer, et al (UMI)¹⁴</td>
<td>6/74 (8%)</td>
<td>5/75 (7%)</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td>Ross, et al (PACT)¹⁵</td>
<td>11/302 (4%)</td>
<td>10/304 (3%)</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Fernandez-Auiles, et al (GRACIA-2)¹⁶</td>
<td>3/104 (3%)</td>
<td>5/108 (5%)</td>
<td>0.042</td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>82/1466 (6%)</td>
<td>59/1487 (4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combination therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADVANCE MI¹⁷</td>
<td>5/69 (7%)</td>
<td>0/77</td>
<td>0.025</td>
<td></td>
</tr>
<tr>
<td>Kasrati, et al (BRAVE)¹⁸</td>
<td>2/125 (2%)</td>
<td>2/128 (2%)</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>7/194 (4%)</td>
<td>2/205 (1%)</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>106/2235 (5%)</td>
<td>78/2265 (3%)</td>
<td>0.04</td>
<td></td>
</tr>
</tbody>
</table>
Immediate PCI
Early Transfer Following Fibrinolytics

Trials of Early Cath Following FT vs Routine Care

- Early Cath
- Routine Care

P-values:
- P=0.001
- P=0.04
- P=NS
- P=0.0008
- P=0.004
- P=0.19

Studies:
- SIAM-3 (195)
- GRACIA (500)
- CAPITAL-AMI (170)
- CARESS (600)
- WEST (304)
- TRANSFER-AMI
- NORSDEMI (276)
Transfer-AMI Study

30 Day Death, re-MI, worsening CHF, or Shock

RR: 0.64; 95 CI, 0.47 to 0.87; P=0.004
Meta-Analysis of Transfer Following Fibrinolytic Therapy

Death or Re-MI

Odds Ratio 0.65, 95% CI 0.49, 0.88

Eur Heart J 2010:31, 2156–216
Meta-Regression Analysis of Transfer Trials Following Fibrinolytic Therapy

Favors Early PCI

Eur Heart J 2010:31, 2156–216
Transfer of Patients With STEMI After Fibrinolytic Therapy

Transfer to a PCI-capable hospital for coronary angiography is reasonable for patients with STEMI who have received fibrinolytic therapy even when hemodynamically stable and with clinical evidence of successful reperfusion. Angiography can be performed as soon as logistically feasible at the receiving hospital, and ideally within 24 hours, but should not be performed within the first 2 to 3 hours after administration of fibrinolytic therapy.

J Am Coll Cardiol. 2013 61: e78-140
STREAM Trial

The graph shows the probability of the primary endpoint over days since randomization for Fibrinolysis and Primary PCI.

- **Fibrinolysis**: Decreases rapidly initially and stabilizes around 5% by day 30.
- **Primary PCI**: The curve remains lower than Fibrinolysis, suggesting a lower probability of the primary endpoint.

<table>
<thead>
<tr>
<th>Days since Randomization</th>
<th>No. at Risk Fibrinolysis</th>
<th>No. at Risk Primary PCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>943</td>
<td>948</td>
</tr>
<tr>
<td>5</td>
<td>848</td>
<td>836</td>
</tr>
<tr>
<td>10</td>
<td>837</td>
<td>824</td>
</tr>
<tr>
<td>15</td>
<td>829</td>
<td>818</td>
</tr>
<tr>
<td>20</td>
<td>827</td>
<td>815</td>
</tr>
<tr>
<td>25</td>
<td>825</td>
<td>811</td>
</tr>
<tr>
<td>30</td>
<td>823</td>
<td>811</td>
</tr>
</tbody>
</table>

N Eng J Med 2013;368;1379-87
### Table 3. Strokes and Nonintracranial Bleeding Events within 30 Days.

<table>
<thead>
<tr>
<th>Event</th>
<th>Fibrinolysis (N = 944)</th>
<th>Primary PCI (N = 948)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total strokes</td>
<td>15/939 (1.6)</td>
<td>5/946 (0.5)</td>
<td>0.03</td>
</tr>
<tr>
<td>Intracranial hemorrhage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>9/939 (1.0)</td>
<td>2/946 (0.2)</td>
<td>0.04</td>
</tr>
<tr>
<td>After protocol amendment*</td>
<td>4/747 (0.5)</td>
<td>2/758 (0.3)</td>
<td>0.45</td>
</tr>
<tr>
<td>Primary ischemic stroke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without hemorrhagic conversion</td>
<td>5/939 (0.5)</td>
<td>3/946 (0.3)</td>
<td>0.51</td>
</tr>
<tr>
<td>With hemorrhagic conversion</td>
<td>1/939 (0.1)</td>
<td>0/946</td>
<td>0.50</td>
</tr>
<tr>
<td>Nonintracranial bleeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>61/939 (6.5)</td>
<td>45/944 (4.8)</td>
<td>0.11</td>
</tr>
<tr>
<td>Minor</td>
<td>205/939 (21.8)</td>
<td>191/944 (20.2)</td>
<td>0.40</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>27/937 (2.9)</td>
<td>22/943 (2.3)</td>
<td>0.47</td>
</tr>
</tbody>
</table>
Fibrinolyisis with Immediate Cath vs Primary PCI

Heart 2015;101:692–698
RESCUE PCI
Signs of Reperfusion

(Tissue Level)

• Relief of chest pain
• Improvement in ST segment elevation >50% reduction
• AIVR
• Rapid rise and rapid fall of enzymes
RESCUE PCI

Death, Re-MI, CVA or CHF at 6 months

NEJM 2005;353:2758-68
Transfer of Patients With STEMI After Fibrinolytic Therapy

Urgent transfer to a PCI-capable hospital for coronary angiography is reasonable for patients with STEMI who demonstrate evidence of failed reperfusion or reocclusion after fibrinolytic therapy.

J Am Coll Cardiol. 2013 61: e78-140
PCI of a non-infarct artery may be considered in selected patients with STEMI and multivessel disease who are hemodynamically stable, either at the time of primary PCI or as a planned staged procedure.
Evidence to Support the Guidelines

**DANAMI-3 PRIMULTI**

**Primary Endpoint:** Composite of Death, re-MI and Ischemia driven revasc of non-IRA

Hazard Ratio

P = 0.009

HR 0.56 (95% CI 0.38-0.83), p = 0.004
COMPARE ACUTE Trial

Primary Endpoint:
Composte of Death, re-MI, Revasc or Cerebrovascular events:

N Engl J Med 2017; 376:1234-1244
On the basis of these findings (17,18,24,27), the prior Class III (Harm) recommendation with regard to multi-

with STEMI and multivessel disease. Rather, when considering the indications for and timing of multivessel PCI, physicians should integrate clinical data, lesion severity/complexity, and risk of contrast nephropathy to determine the optimal strategy.
than multivessel primary PCI, there are insufficient observational data and no randomized data at this time to inform a recommendation with regard to the optimal timing of nonculprit vessel PCI. Additional trial data that will help further clarify this issue are awaited. Issues related to the optimal method of evaluating nonculprit lesions (e.g., percent diameter stenosis, fractional flow reserve) are beyond the scope of this focused update.
The Complete Trial

A First Coprimary Outcome

Hazard ratio, 0.74 (95% CI, 0.60–0.91)
P=0.004

Culprit-lesion-only PCI

Complete revascularization

<table>
<thead>
<tr>
<th>No. at Risk</th>
<th>2025</th>
<th>1897</th>
<th>1666</th>
<th>933</th>
<th>310</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culprit-lesion-only PCI</td>
<td>2016</td>
<td>1904</td>
<td>1677</td>
<td>938</td>
<td>337</td>
</tr>
<tr>
<td>Complete revascularization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B Second Coprimary Outcome

Hazard ratio, 0.51 (95% CI, 0.43–0.61)
P<0.001

Culprit-lesion-only PCI

Complete revascularization

<table>
<thead>
<tr>
<th>No. at Risk</th>
<th>2025</th>
<th>1808</th>
<th>1559</th>
<th>865</th>
<th>294</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culprit-lesion-only PCI</td>
<td>2016</td>
<td>1886</td>
<td>1659</td>
<td>925</td>
<td>329</td>
</tr>
<tr>
<td>Complete revascularization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N Engl J Med 2019; 381:1411-1421
Systems of Care for STEMI
Regional Systems of STEMI Care

All communities should create and maintain a regional system of STEMI care that includes assessment and continuous quality improvement of EMS and hospital-based activities. Performance can be facilitated by participating in programs such as Mission: Lifeline and the D2B Alliance.
2004-2008 Acute Myocardial Infarction (ICD10 I21 & I22)
35+ Age Adjusted Death Rate per 100,000

Death Rate per 100,000
- Insufficient Data
- Class 1 (20.4 - 96.2)
- Class 2 (96.3 - 127.6)
- Class 3 (127.7 - 162.5)
- Class 4 (162.8 - 219.1)
- Class 5 (219.3 - 468.8)

Development of Systems of Care for ST-Elevation Myocardial Infarction Patients

Executive Summary

Endorsed by Aetna, the American Ambulance Association, the American Association of Critical-Care Nurses, the American College of Emergency Physicians, the Emergency Nurses Association, the National Association of Emergency Medical Technicians, the National Association of EMS Physicians, the National Association of State EMS Officials, the National EMS Information System Project, the National Rural Health Association, the Society for Cardiovascular Angiography and Interventions, the Society of Chest Pain Centers, and UnitedHealth Networks

Alice K. Jacobs, MD, FAHA, Chair; Elliott M. Antman, MD, FAHA; David P. Faxon, MD, FAHA; Tammy Gregory; Penelope Solis, JD

Myocardial Infarction Patients

Policy Recommendations

Penelope Solis, JD; Ezra A. Amsterdam, MD; Vincent Bufalino, MD, FAHA; Barbara J. Drew, RN, PhD, FAHA; Alice K. Jacobs, MD, FAHA

May 30, 2007

Conference Proceedings published in Circulation

Mission: Lifeline Launched
Goals of Treatment

- Door to ECG ≤10 minutes
- Door to balloon ≤90 minutes
- First medical contact to device ≤90 minutes
- First door to device for transfer patients ≤120 minutes
- Door in door out for transfer patients ≤30 minutes

J Am Coll Cardiol. 2017;70:2048–90
New York City PCI and Non-PCI Hospitals

Hospitals by Type

PCI Hospitals
1. Bellevue Hospital Center
2. Beth Israel Medical Center- Petrie Campus
3. Bronx Lebanon Hospital Center- Concourse Division
4. Brookdale University Hospital & Medical Center
5. Elmhurst Hospital Center
6. Jamaica Hospital Medical Center
7. Lenox Hill Hospital
8. Long Island Jewish Medical Center
9. Lutheran Medical Center
10. Maimonides Medical Center
11. Montefiore Medical Center Jack D. Weiler Division, Albert Einstein School of Medicine
12. Montefiore Medical Center, Henry & Lucy Moses Division
13. Mount Sinai Hospital
14. New York Hospital Medical Center of Queens
15. New York Methodist Hospital
16. New York Presbyterian Hospital- Columbia Presbyterian Center
17. New York Presbyterian Hospital- New York Weill Cornell Medical Center
18. NYU Langone Medical Center
19. St. Barnabas Hospital
21. Staten Island University Hospital- North
22. University Hospital of Brooklyn at Long Island College Hospital
23. University Hospital of Brooklyn at SUNY Downstate

Non-PCI Hospitals
24. Beth Israel Medical Center- Kings Highway Division
25. Bronx Lebanon Hospital Center – Fulton Site
26. Brooklyn Hospital Center- Downtown Campus
27. Coney Island Hospital
28. Flushing Hospital Medical Center
29. Forest Hills Hospital
30. Harlem Hospital Center
31. Interfaith Medical Center
32. Jacobi Medical Center
33. Kings County Hospital Center
34. Kingsbrook Jewish Medical Center
35. Lincoln Medical and Mental Health Center
36. Metropolitan Hospital Center
37. Montefiore Medical Center- North Division
38. Mount Sinai Hospital of Queens
39. New York Community Hospital
40. New York Downtown Hospital
41. New York Presbyterian Hospital- Allen Hospital
42. New York Westchester Square Medical Center
43. North Central Bronx Hospital
44. Queens Hospital Center
45. Richmond University Medical Center
46. St. Johns Episcopal Hospital South Shore
47. St. Luke’s Roosevelt Hospital- Roosevelt Division
48. Woodhull Medical and Mental Health Center
49. Wyckoff Heights Medical Center

VA Hospitals
50. VA: James J. Peters VA Medical Center, Bronx Campus
51. VA: NY Harbor Healthcare System, Brooklyn Campus
52. VA: NY Harbor Healthcare System, Manhattan Campus

Hospital by Status
- PCI Hospital
- Non-PCI Hospital
- VA Hospital
STEMI Accelerator Program

First medical contact to catheterization laboratory activation

- Baseline 38% Faster
- Final 22% 56%

Emergency department dwell time

- Baseline > 30 minutes 42%
- Final ≤ 30 minutes, > 20 minutes 25%
- Final ≤ 20 minutes 43%

P < 0.0001
STEMI Accelerator Program

Not in Accelerator-2
N=22,651; P=0.7*

Accelerator-2
N=6,695; P=0.019*

*Adjusted P-value for trend
Let's Fight This Problem together!