



TURIN, 20TH—21ST NOVEMBER 2008

GREAT INNOVATIONS IN CARDIOLOGY

4TH JOINT MEETING WITH MAYO CLINIC

4TH TURIN CARDIOVASCULAR NURSING CONVENTION



SESSION I:
**PERSPECTIVES IN ISCHEMIC HEART DISEASE
(PART I)**

M. Bell (Rochester—MN—USA)

Update on Mayo Clinic STEMI program

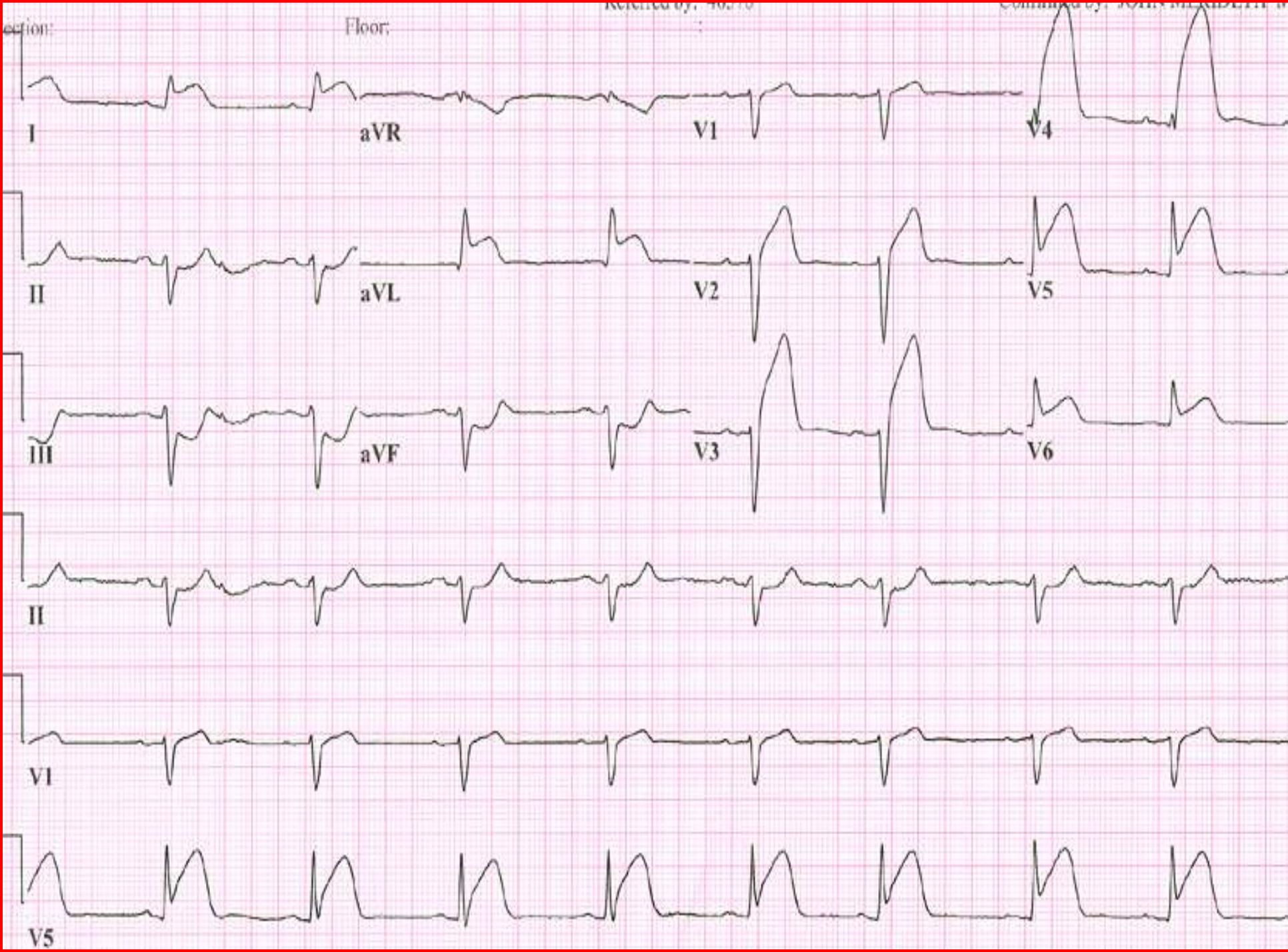
2008 Great Innovations in Cardiology

JMMC

**4th Joint Meeting with Mayo Clinic
November 2008**

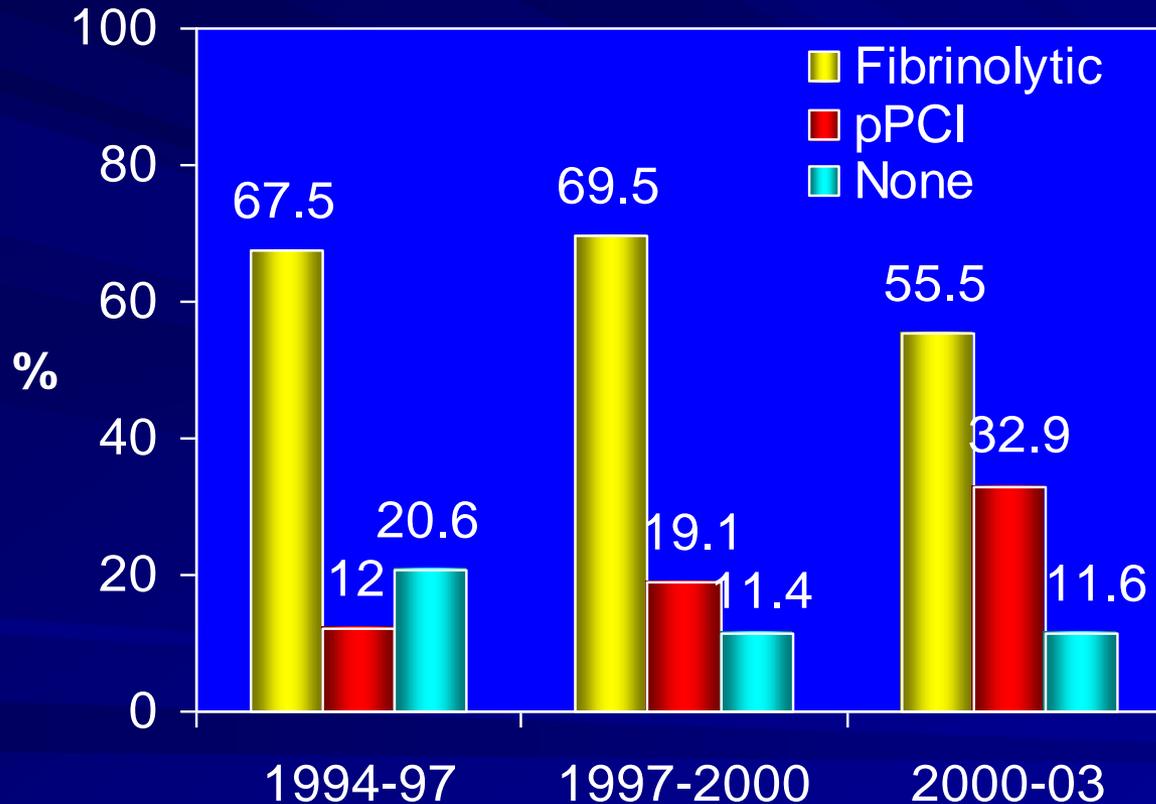
Update on Mayo Clinic STEMI Program

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Reperfusion for STEMI 1994-2003 (NRMI)

Non transfers <12 hours



No reperfusion:

- Delayed
- No chest pain
- Women
- >75 yrs
- Non white
- Prior CABG
- Prior CHF
- Prior angina

Inter-hospital Transfer (NRMI 3+4) Door-to-Balloon Time in USA

.....Reality check.....

<90 min 4.2%

<2 h 16.2%

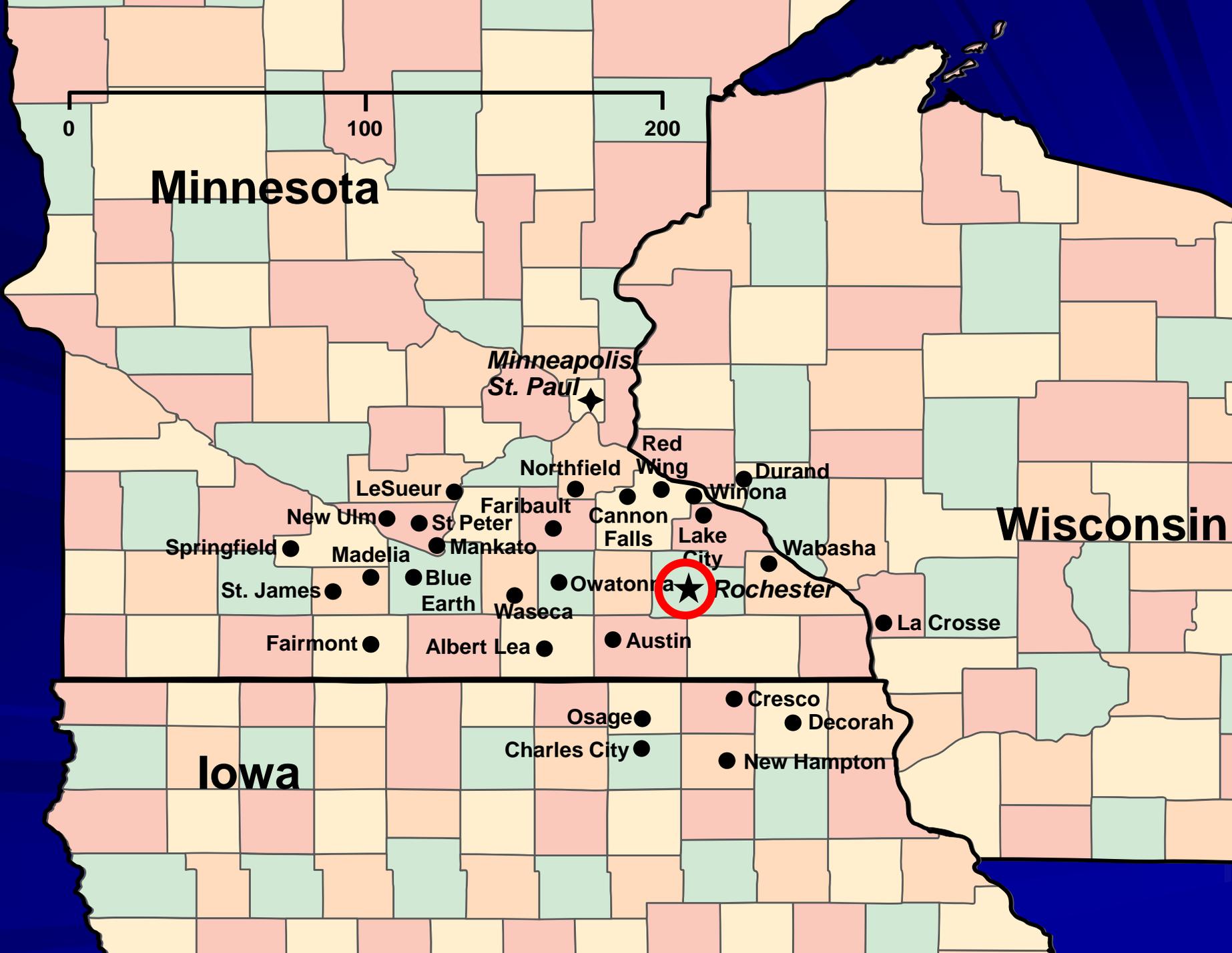
Need a reliable system of care that can deliver these reperfusion therapies to all eligible patients in a timely and consistent manner

Since 2004: ED-STEMI at Mayo

- ED triage and ECG < 5 min
- Cath activated by ED staff
 - Single group page: text
 - “Hot potato” pagers
- Arrive in cath lab 30-45 min from ED door
 - Cath lab active 20 min



Non PCI Hospitals



Minnesota

Wisconsin

Iowa

Minneapolis
St. Paul

Rochester

0

100

200

Le Sueur

Northfield

Red Wing

Durand

New Ulm

St. Peter

Faribault

Cannon Falls

Winona

Springfield

Madelia

Mankato

Lake City

Wabasha

St. James

Blue Earth

Owatonna

Rochester

La Crosse

Fairmont

Albert Lea

Austin

Osage

Cresco

Decorah

Charles City

New Hampton

US Guidelines ACC/AHA – 2004 and 2007

Class I: STEMI patients presenting to a facility without the capability for expert, prompt intervention with primary PCI within 90 minutes of first medical contact should undergo fibrinolysis unless contraindicated. (Level of Evidence: A)

Rochester, Minnesota – January
and February
and March
and April....



Mayo Clinic FAST TRACK Protocol for Regional STEMI Patients

FAST TRACK PROTOCOL FOR REGIONAL STEMI

Criteria: New ST Elevation Myocardial Infarction or New LBBB

- Step 1:** STAT 12-lead electrocardiogram and brief history & physical examination
- Step 2:** Call St. Marys Emergency Dept. Referral Nurse (507-255-2910) and they will arrange transport and connect to Cardiologist
- Step 3:** Fax electrocardiogram to St. Marys Coronary Care Unit (507-255-5745)
- Aspirin** 324mg (4 chewable 81mg non-enteric coated tablets)
- Nitroglycerin** SL or IV as needed for pain
- Cardiac Monitor
- Minimum of (2) peripheral IV's TKO/saline lock

Please Document:

- _____ Hospital Arrival
- _____ Chest Pain Onset
- _____ Initial ECG Time
- _____ 2nd ECG Time (If first ECG is not diagnostic)
- _____ Thrombolysis Time (If indicated)
- _____ Fast Track Activation

Choose One Pathway

If Onset of Symptoms < 3 Hours,

Thrombolysis

Give full dose **TNK** or **rPA**

Unfractionated Heparin loading dose, 60 Units/kg IV (maximum 4,000 Units)

Heparin infusion, 12 Units/kg/hour IV (maximum 1000 Units/hour)

Metoprolol 25mg or 50mg orally x1

*Do not give metoprolol if any of the following: signs of heart failure or shock, heart rate < 60 or > 110, systolic blood pressure < 120, 2nd or 3rd degree heart block, asthma or reactive airway disease.

Give **Clopidogrel (Plavix)** 75mg x 1

Patient transferred to St. Mary's CCU. Cath Lab is **not** activated, unless patient arrives at CCU and failed to reperfuse with thrombolytic.

Do **not** give **Eptifibatide (Integrilin)**

If Onset of Symptoms > 3 Hours,

Percutaneous Coronary Intervention

Do **not** give **TNK** or **rPA**

Unfractionated Heparin loading dose, 60 Units/kg IV (maximum 4,000 Units)

Heparin infusion, 12 Units/kg/hour IV (maximum 1000 Units/hour)

Metoprolol 25mg or 50mg orally x1

*Do not give metoprolol if any of the following: signs of heart failure or shock, heart rate < 60 or > 110, systolic blood pressure < 120, 2nd or 3rd degree heart block, asthma or reactive airway disease.

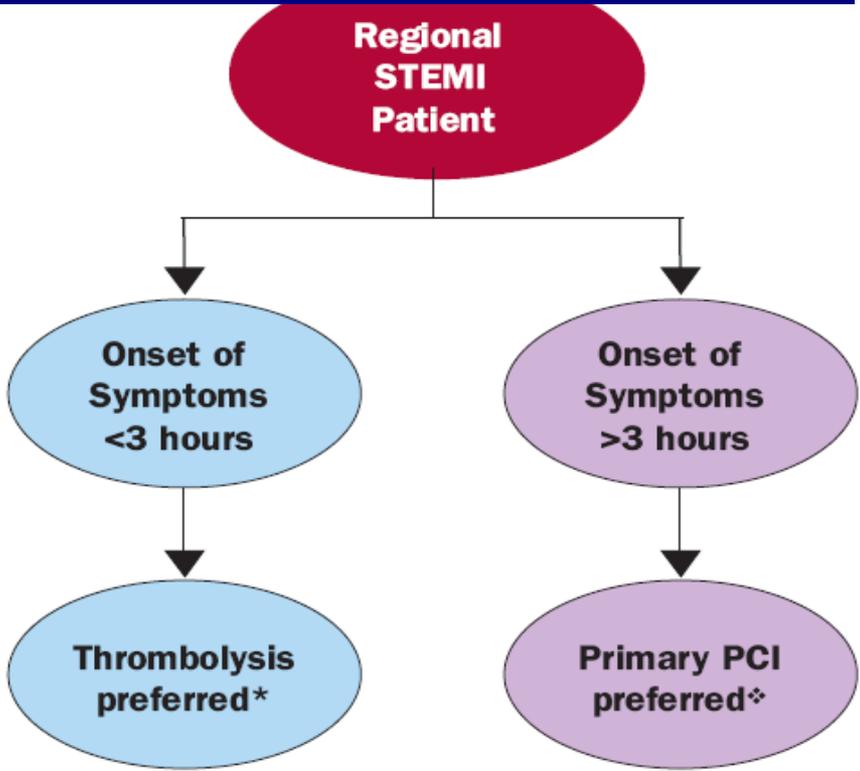
Do **not** give **Clopidogrel (Plavix)**

Patient will be transferred to St. Mary's Cath Lab directly. Cath Lab is activated.

Consider giving **Eptifibatide (Integrilin)**

Fax Labs and ECG to St. Mary's Coronary Care Unit (507-255-5745)

CK-MB, Troponin, CBC, Electrolytes, BUN, Cr, Glucose, Magnesium, INR, PTT, Portable CXR



***If No Contraindications**

***If Rapid Transport Available**

Target Time Metrics: Regional Door – to – Balloon: Total Time < 120 min

Regional Door – to – ECG < 5 min

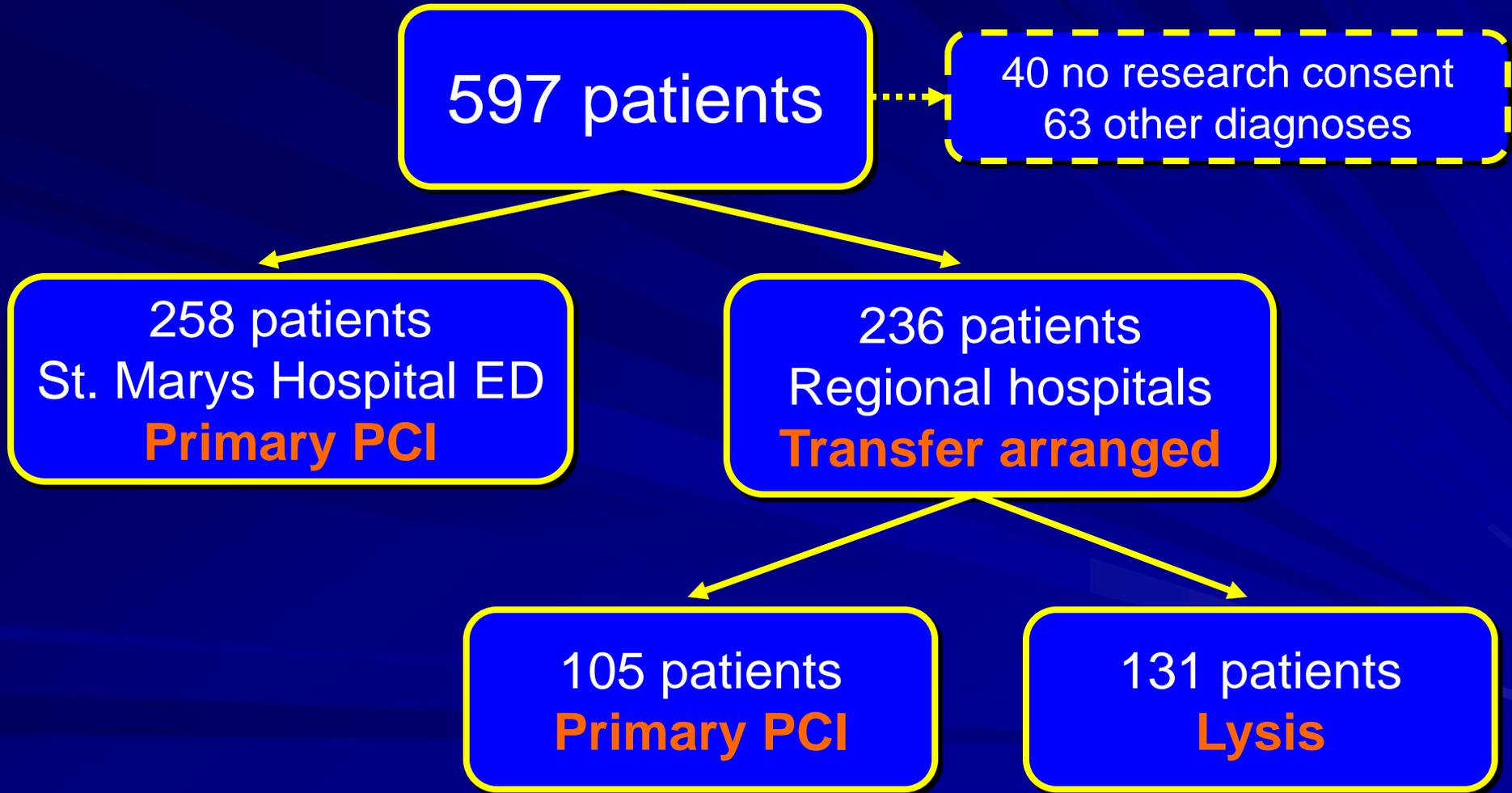
ECG – to – Mayo One Activation < 15 min

Mayo One Activation – to – Door 2 < 60 min

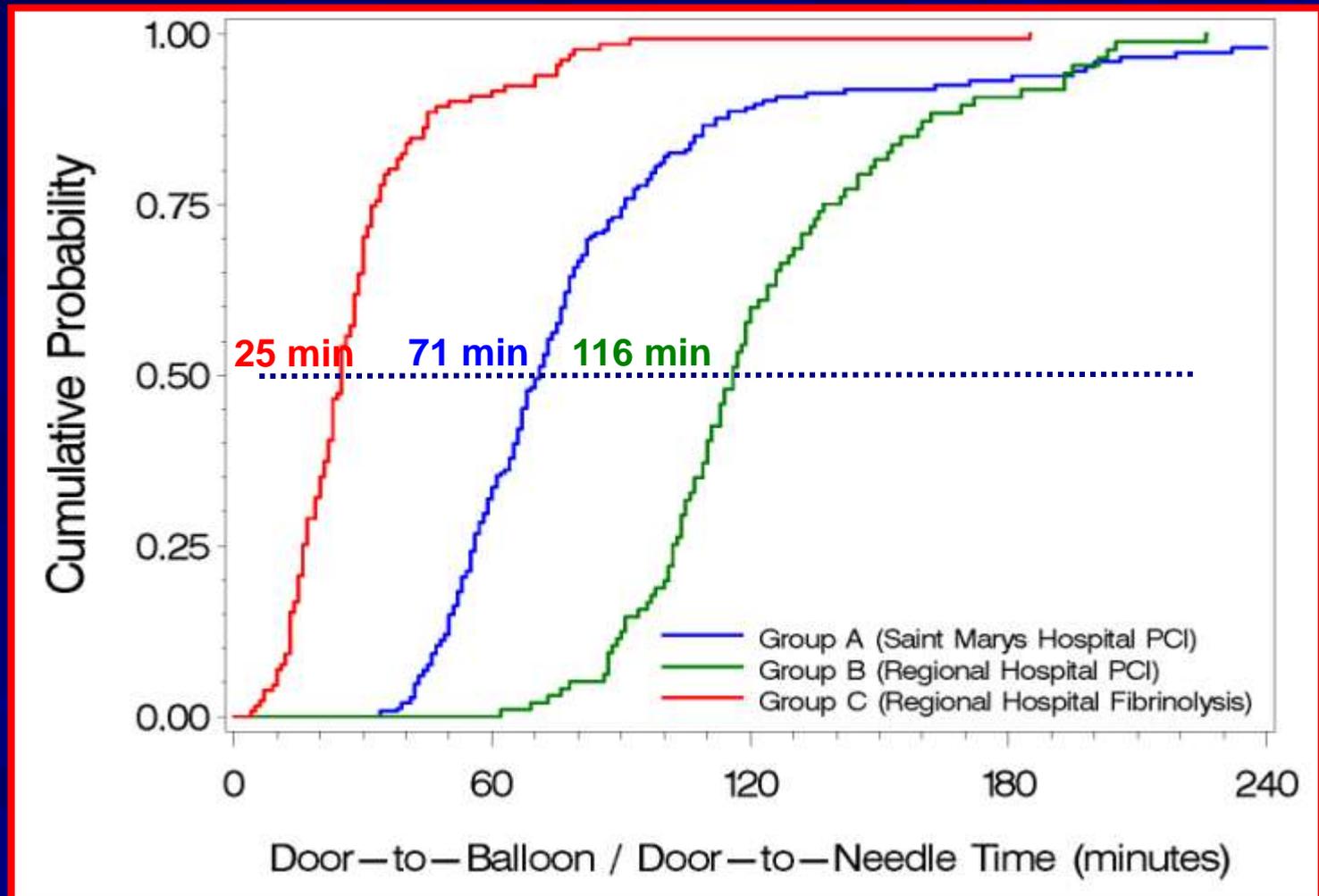
Door 2 – to – Balloon < 30 min

MD Signature: _____ Date: _____

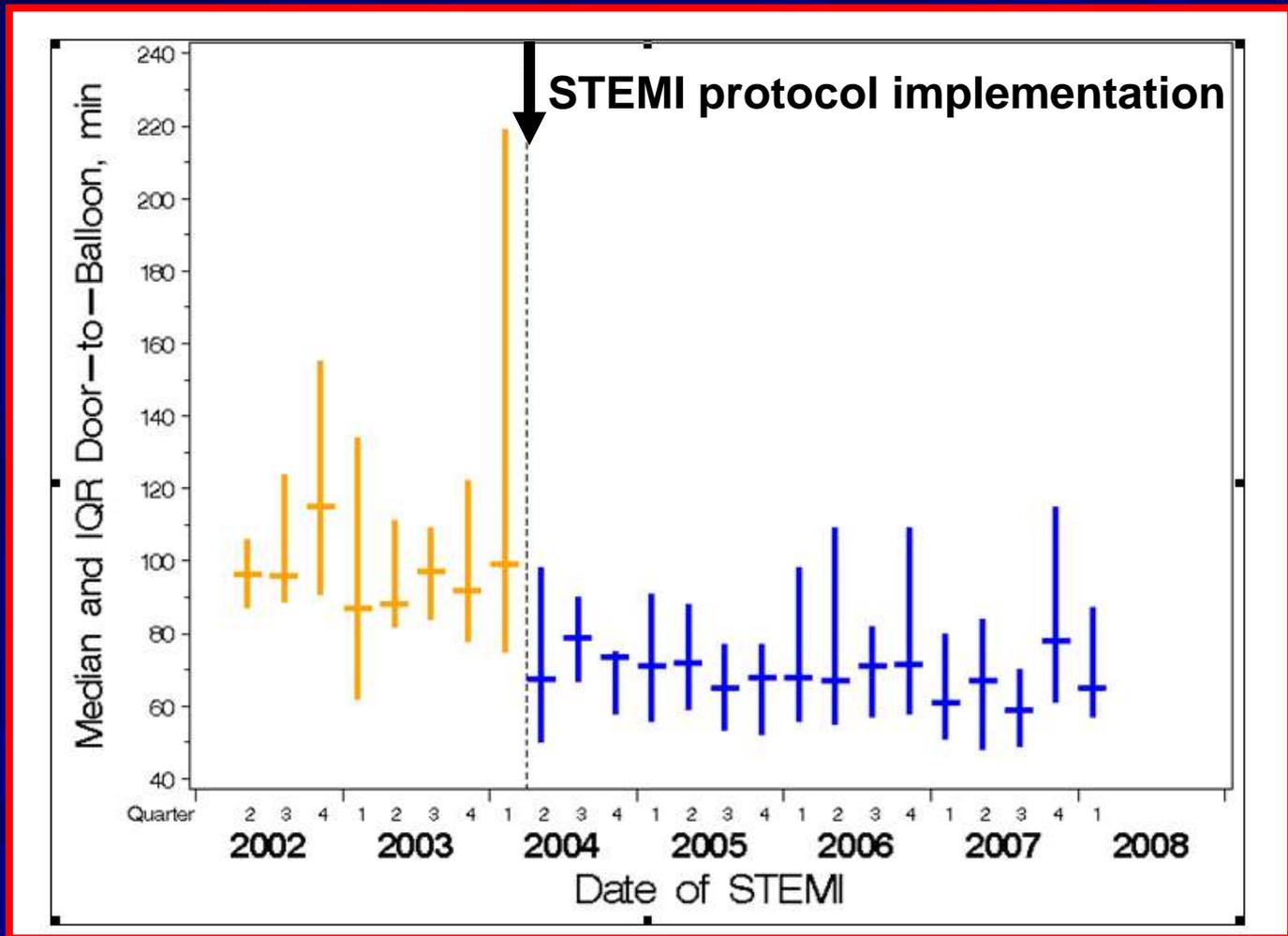
Mayo Clinic STEMI: 2004-07



Regional STEMI Patients Treated with Primary PCI or Fibrinolysis



Sustained Door-to-balloon Times



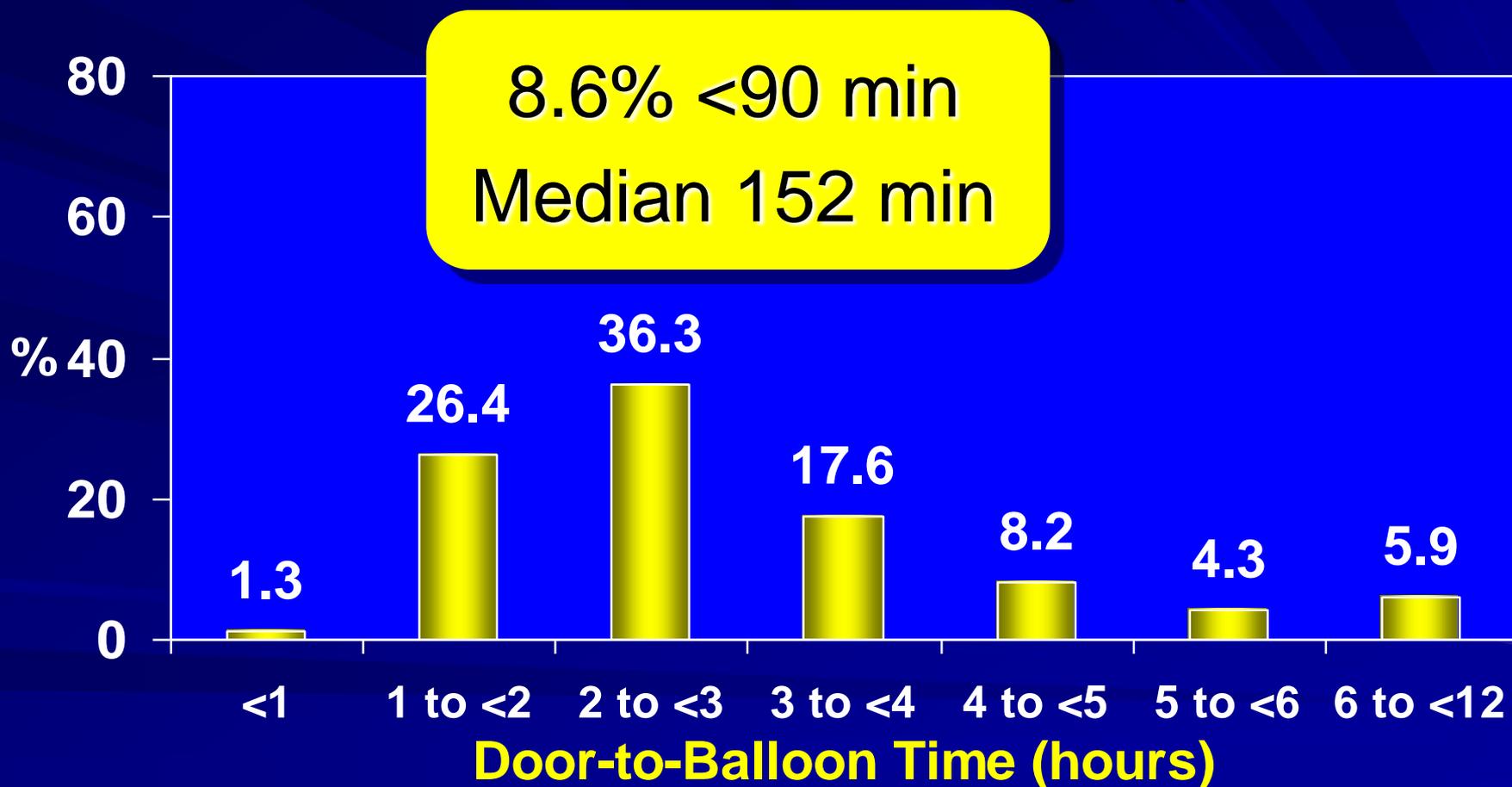
Mayo Clinic STEMI Experience

Through November 2008

	DTB/DTN	Hospital Death	6-month Death/MI
St Marys PCI (484)	68 min <i>75% <90</i>	7.4%	15.3%
Regional PCI (246)	119 min <i>14% <90</i>	6.5%	14.5%
Regional Lysis (248)	27 min <i>65% <30</i>	3.2%	14.5%

Time-to-Reperfusion with Inter hospital Transfer

ACC National CV Data Registry



Keys to Success

- Team work – every step
- Communication
 - Emergency department and Cardiology
 - Regional hospitals
- Standardized care (evidence-based)
 - and.....keep it simple
- Continuous improvement
 - QI oversight
 - Routine feedback

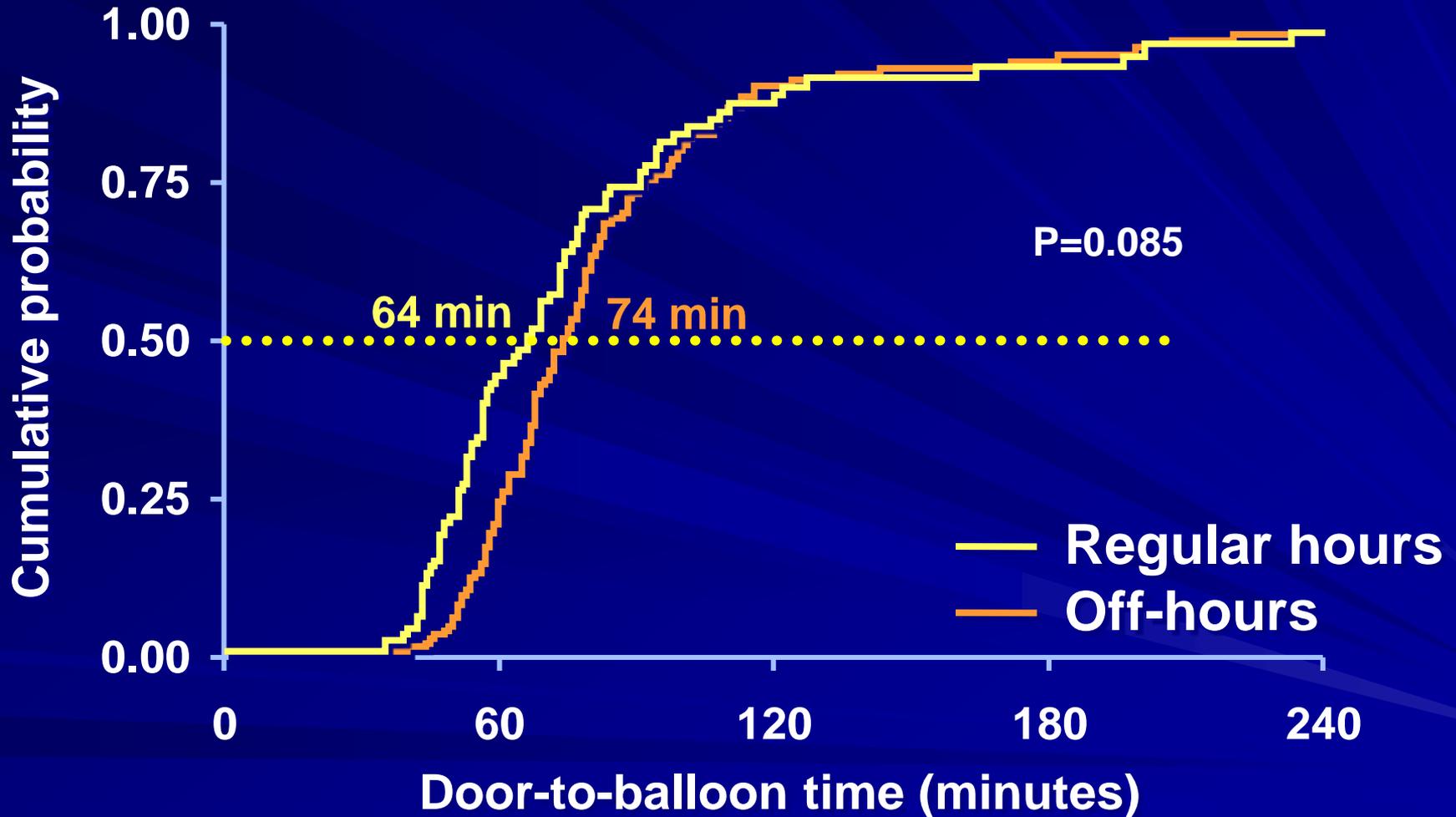
FAST TRACK STEMI Patient Feedback

	Date	Time	Time, min
Arrival Door One	1/4/2008	18:40	
Initial ECG		18:53	0:13
Fast Track Activation		19:04	0:11
Depart Regional Hospital		19:20	0:16
Door 2		19:27	0:07
Cath Lab Start		19:36	0:09
Balloon/Reperfusion		19:48	0:21
Aspirin given	1/4/2008		
Beta Blocker given	1/4/2008		

Total Door to Balloon

68

Saint Marys Hospital Door-to-Balloon Time Regular Hours vs. Off-hours



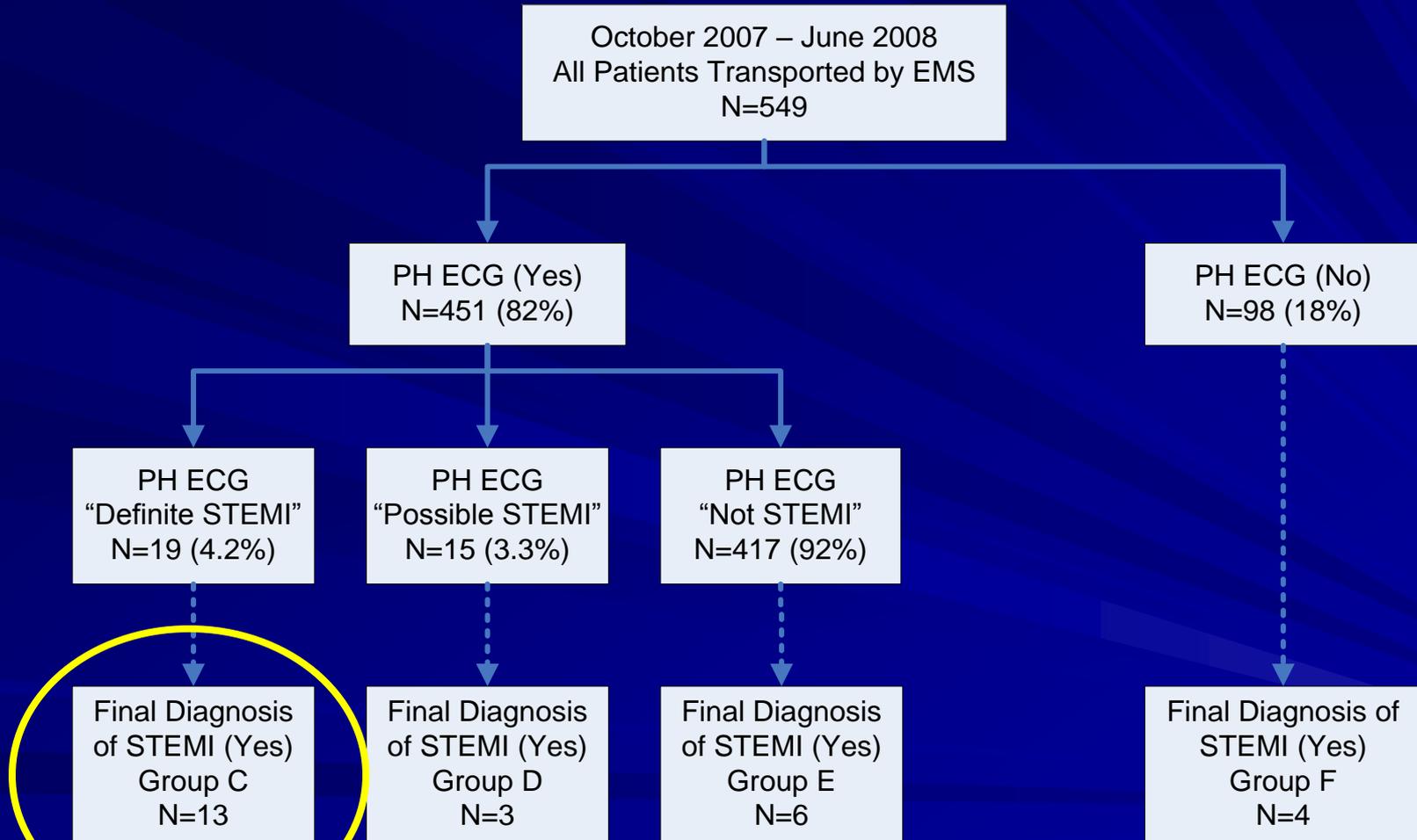
Pre-hospital ECGs



Pre-hospital Activation of Cath Lab by EMS

- 12-lead ECG at scene
- Minimize time at scene if ***STEMI***
 - “load and go!”
- No wireless transmission
- Communications notified
 - STEMI page sent out
- First clinical evaluation in cath lab

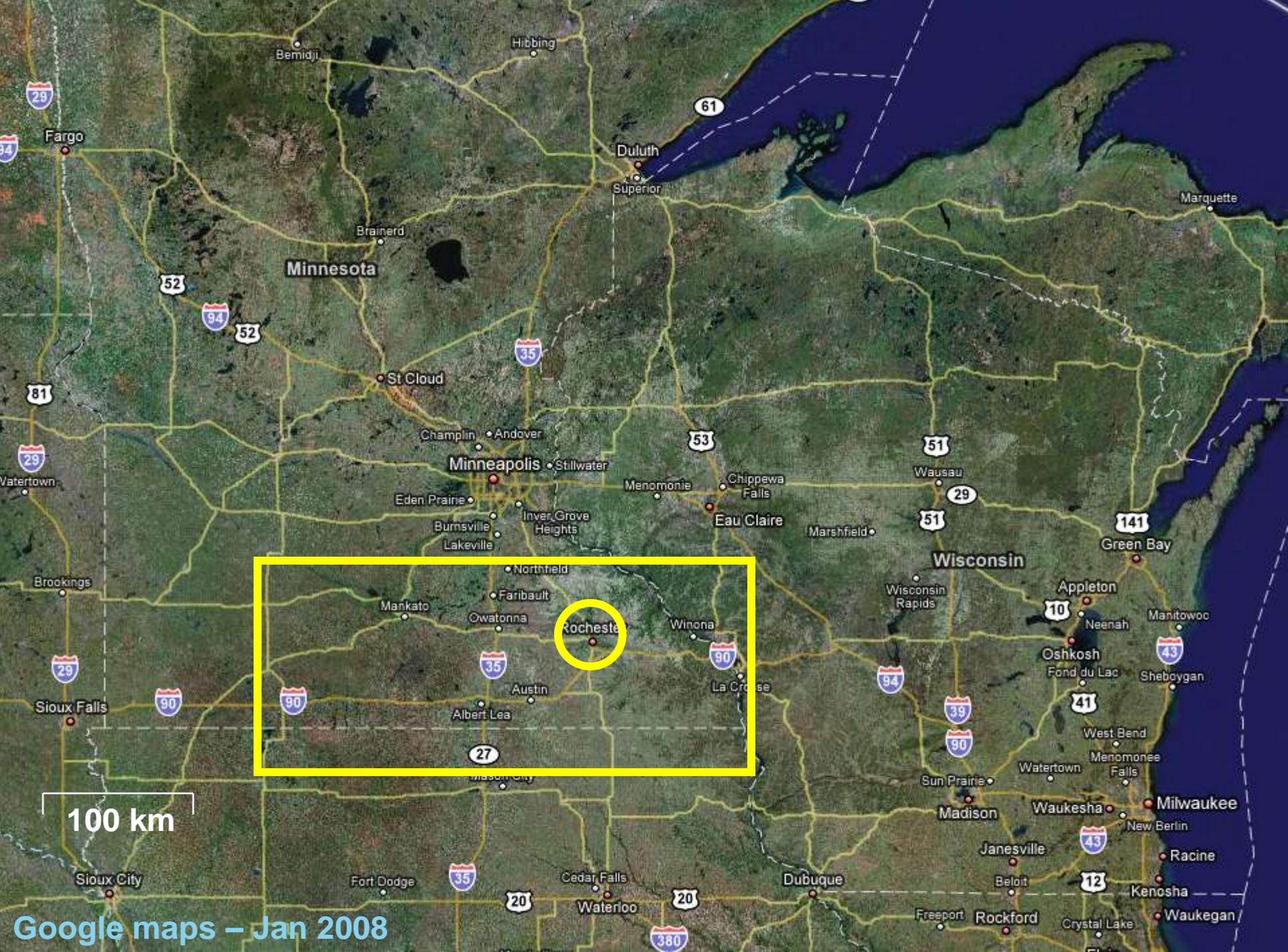
Mayo Clinic: Pre-hospital ECG



Door-to-balloon time = 30 minutes (75 min from 911 call)

Future Challenges and Issues

- Increase awareness in community
 - Avoid delays if acute chest pain
- “Heart Attack Centers”
 - Has their time come?
- Regional networks of care
 - Coordination of care and resources
 - Bypass non PCI hospitals
 - Treatment in field
- One system does not fit all



Minnesota

Wisconsin

Rochester

Minneapolis

Milwaukee

100 km

Google maps - Jan 2008



100 km

1 km from St Marys Hospital Last Winter







Thank you!