

Management of STEMI in era of Reperfusion

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STEMI in US

ST Segment Elevation Myocardial Infarction
(STEMI) ~500 K per year



Thrombolysis

- Works best in first 1-2 hours on fresh thrombus
- Opens vessel with TIMI 3 flow 60-70 % of time
- Risk of bleed (ICH)



Primary Percutaneous Coronary Intervention (PCI)

- Definition: PCI done for STEMI
- Achieves 90% patency with TIMI 3 flow
- Not as time sensitive as thrombolysis



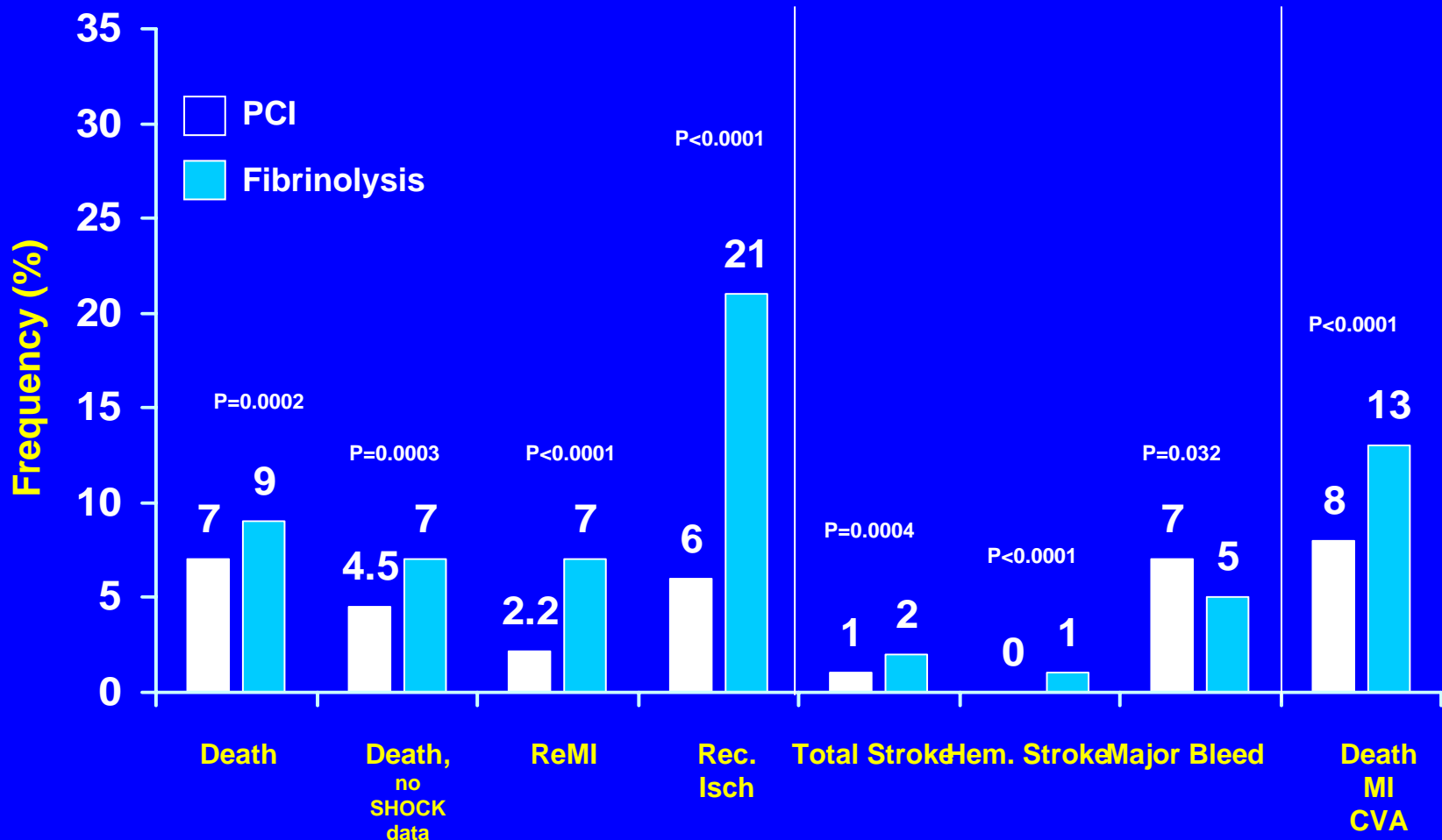
Superiority of Percutaneous Coronary Intervention (PCI) over In Hospital Thrombolysis for STEMI

- 33% Reduction in death,
Reinfarction
and stroke

(*Keeley ,Lancet 2003*)



PCI vs Fibrinolysis: Short Term Clinical Outcomes (23 RCTs)



N = 7,739

Keeley E. et al., *Lancet* 2003; 361:13-20.



Swedish STEMI Registry

- >26,000 STEMI's between 1999-2004
Stenstrand-JAMA October 11,2006

Superiority of PCI over prehospital and inhospital thrombolysis-lower mortality and reinfarction rate at 30 days and 1 year



Swedish Registry (cont)

- PCI superior even in first hour after symptom onset
- PCI superior with delay between potential thrombolysis and PCI up to 4 hours



Problems in US STEMI Care

- Currently 30% of Recognized STEMI's receive no form of Reperfusion
- Currently only 25% of hospitals are PCI capable



Systematic Approach to STEMI

- Patients
- EMS
- PCI and non PCI Hospitals
- Emergency Physicians
- Cardiologists
- Payors
- Public Health
- AHA
- Local, Regional & National plans with registries & QI



Urban STEMI Care Systems

Urban-tertiary hospitals become PCI centers (much like trauma centers)





Boston

population

600,000 at night ;1.2 million by day

nine 911 receiving hospitals
six are PCI centers





Boston Pre hospital Care

Fire first responders
1600 firefighters

3rd service EMS
215 EMT B's
65 EMT P's





Boston STEMI Program

- STEMI's transported only to PCI hospitals (since 7/2003)
- Hospitals' Performance Data kept in Registry-
goals: D2B < 90 min 75 %
PCI > 90%
- EMS lead committee follows data q 6 months
- Tracking of non STEMI cardiac patients to ensure they go to PCI & non PCI hospitals



Boston EMS Recognition and Triage of STEMI's

Categorize cardiac patients into-

STEMI: cath lab readies on EMS entry note, patient bypasses emergency department

Possible STEMI: EP/Cards reviews ekg before contacting cath lab

In both cases EMS goes to STEMI center

Non-STEMI:to nearest hospital





Name: WILSON,INDIA 12-Lead 2
ID: 2005032711421900 3/27/2005 11:48:14
Patient ID:
Incident ID: 050860110
Age: 57 Sex: F

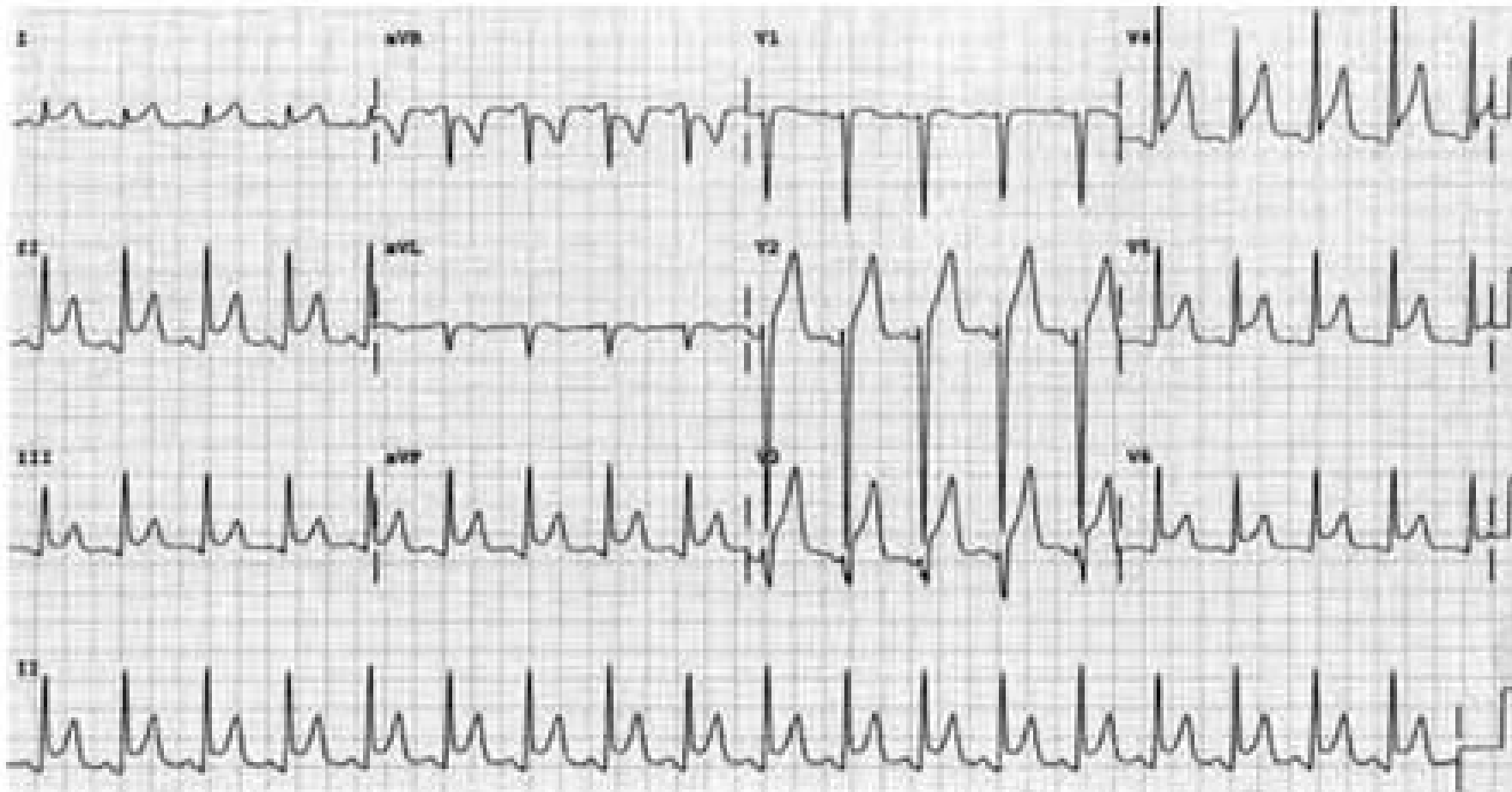
ECG override: Data quality prohibits interpretation.



x1.0 .05-150Hz 25mm/sec
Medtronic Physio-Control Comments:

BOSTON EMS RT# 301 1371-095 LP1212443813





Boston STEMI Demographics

- Age, median: 61 (197)
- Sex, % female: 31.5% (64/203)



Catheterization/Revascularization

Immediate catheterization: 89.4% (177/198)

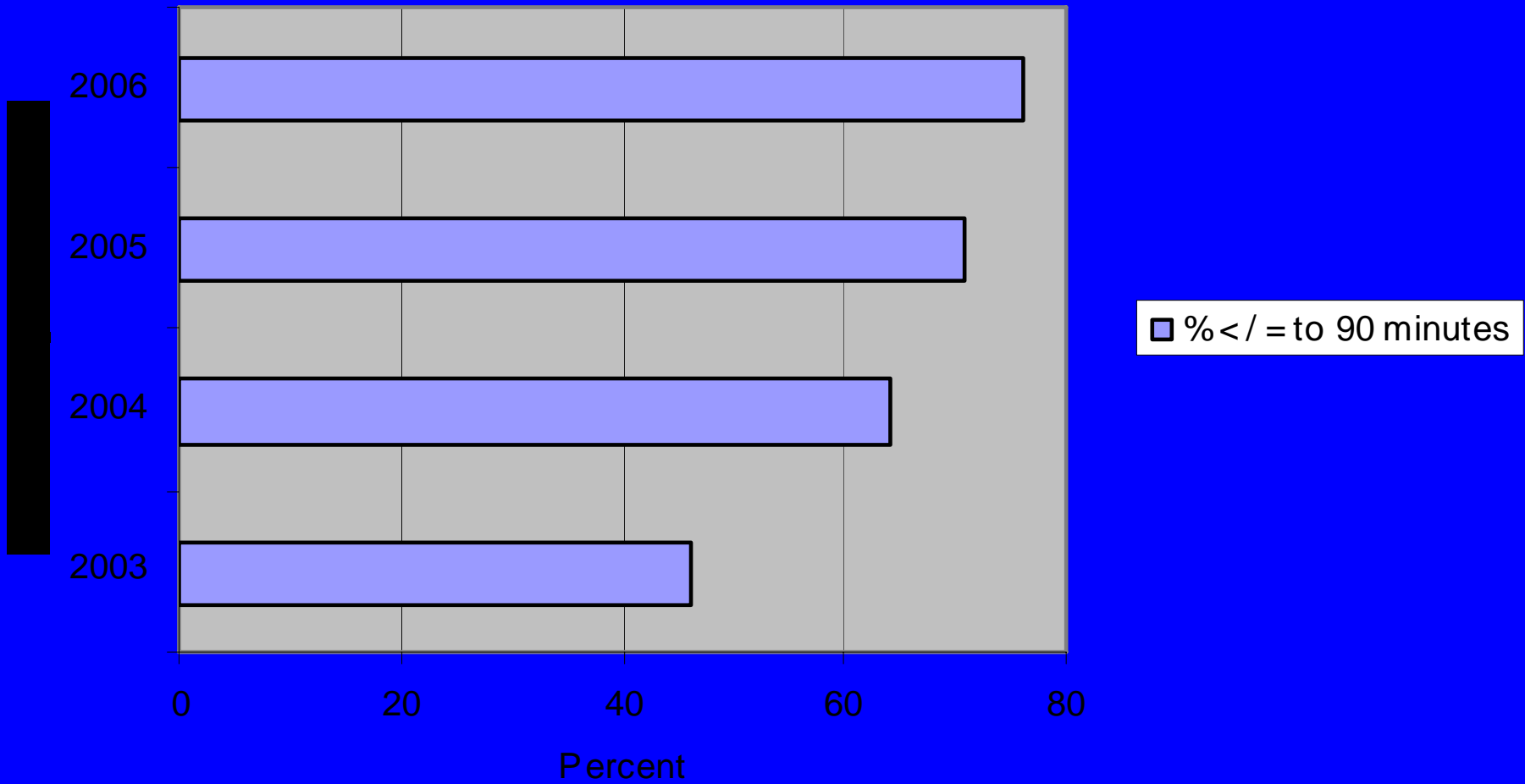
Primary PCI: 84.3% (167/198)

Early CABG: 3.0% (6/197)

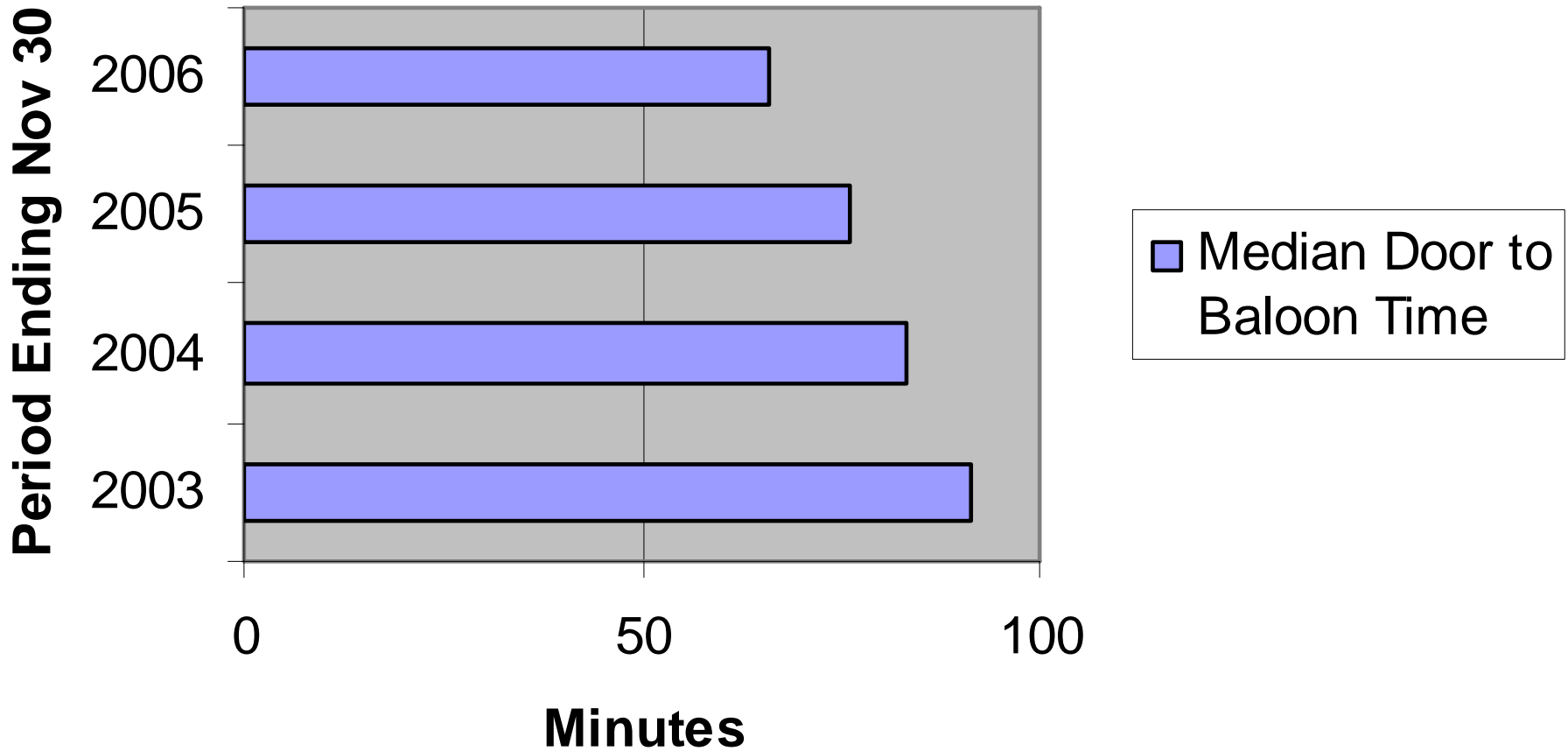
Early revascularization (PCI or CABG): 87.3%
(173/198)



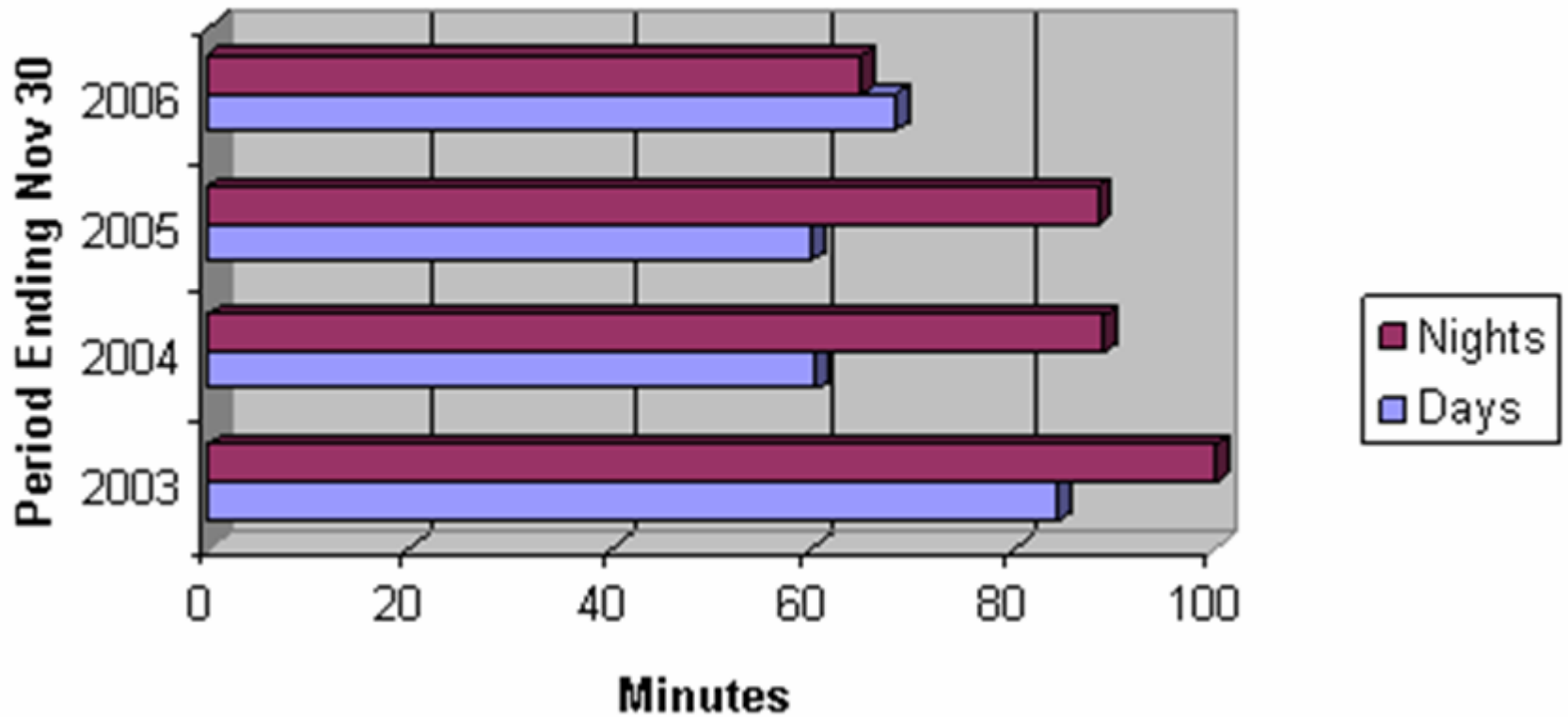
Door to Baloon Less / Equal 90 Minutes



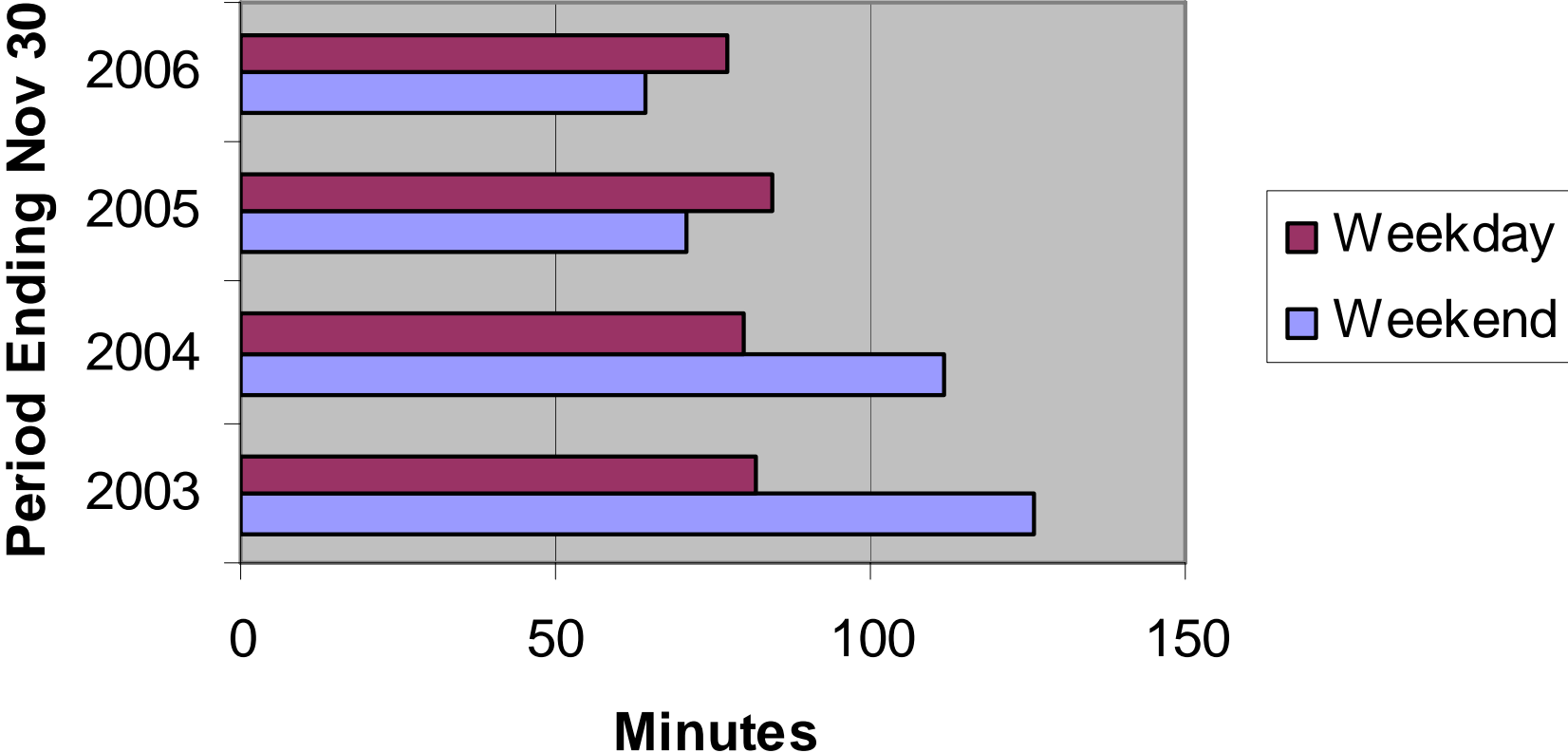
Median Door to Baloon Time



Median Door to Baloon Time Day vs Night



Median Door to Baloon Time - Minutes



Regional STEMI care systems-EMS

- 12 lead with transmission to hospital
- ASA
- NTG
- B blocker



EMS

- “STEMI Alert” to receiving hospital
- Transport to PCI center if <60 minutes away
- If PCI center > 60 minutes away:
transport to non PCI hospital
consider prehospital thrombolysis if
symptom onset < 2 hours
- Interfacility transport (ground or air)



Regional STEMI Care Systems- Hospitals

regional PCI centers

non PCI hospitals:

- timely transfer to Regional PCI hospitals
- thrombolysis if < 2 hrs after symptom onset & timely transfer to PCI facility not possible



Danami

Door of non PCI hospital to balloon at PCI hospital-

Median time: 90min



In the US...

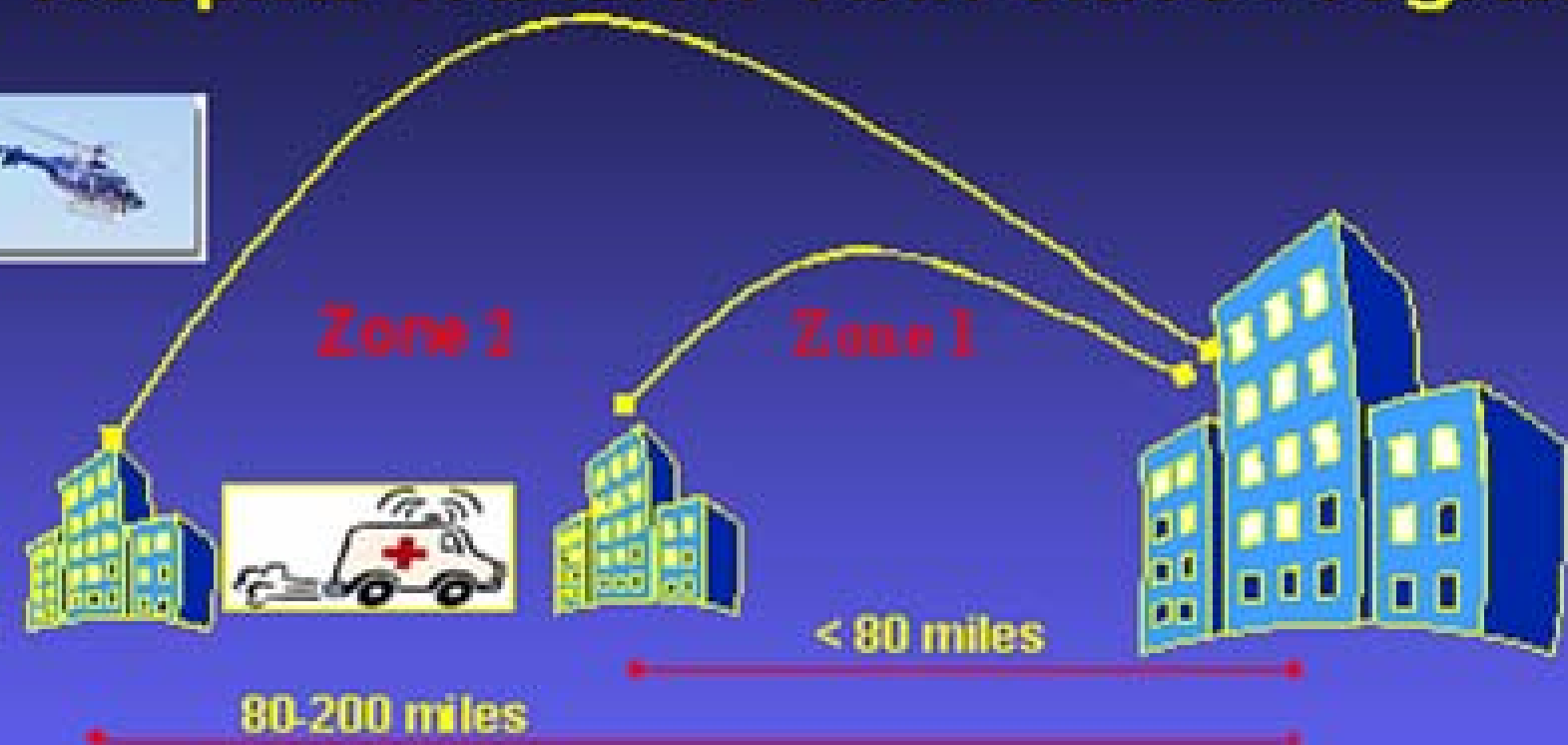
- Only 4% of STEMI patients transferred from one hospital to another for PCI have door (of first hospital) to balloon (at second hospital) of <90 min
- Median D2B time 180 min
- Bulk of time delays was long interfacility transport time

NRMI 3





Hospital Transfer: Twin Cities Program



Hospital w/o PCI

Hospital w/o PCI

Acute MI centers

Facilitated PCI:
Lytic and transfer
(ASA, clopidogrel,
heparin, 1/2 TNK)

Transfer for
Primary PCI
(ASA, clopidogrel,
heparin)

Primary PCI

PC- Tim Her

