Five Bullets for the Heart: Ensuring Systems of Care for STEMI

Eagles X, February 2008
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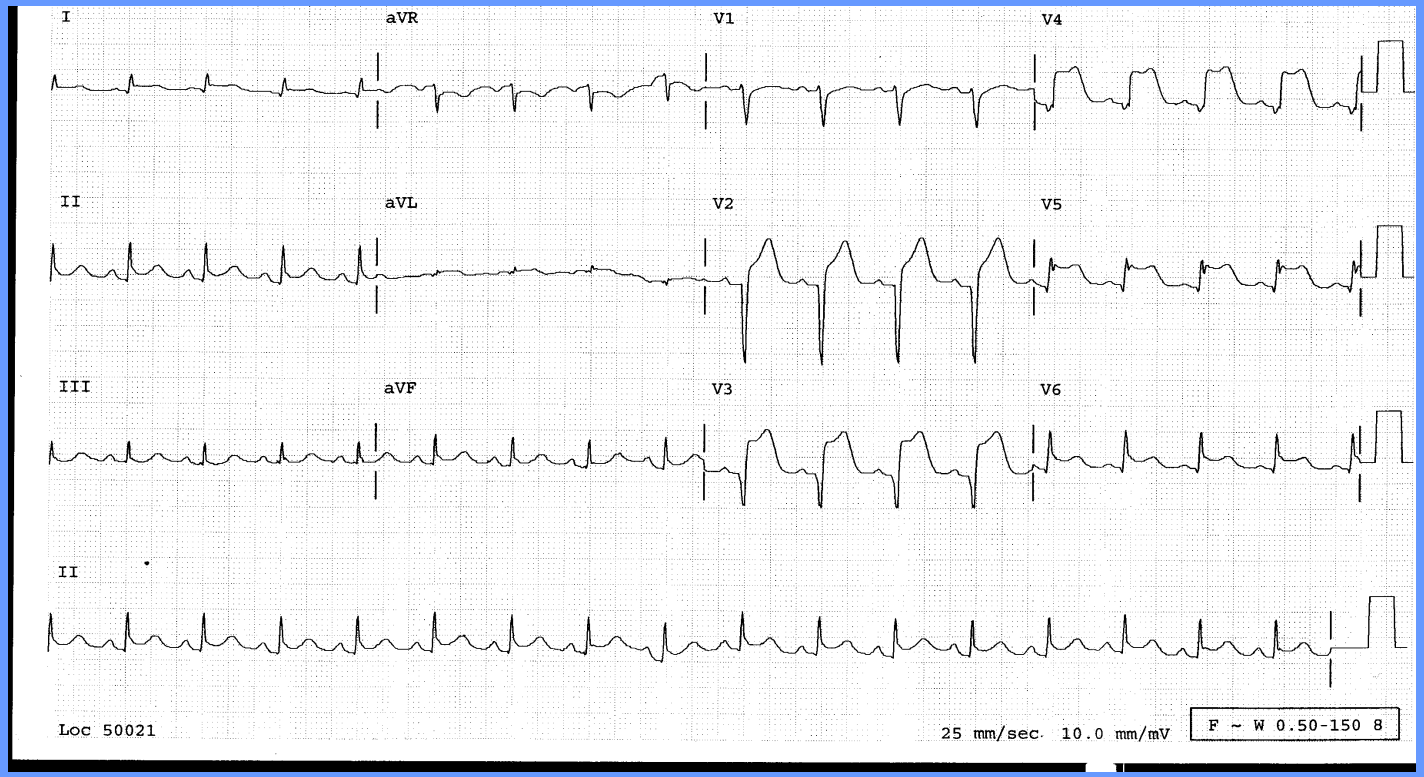
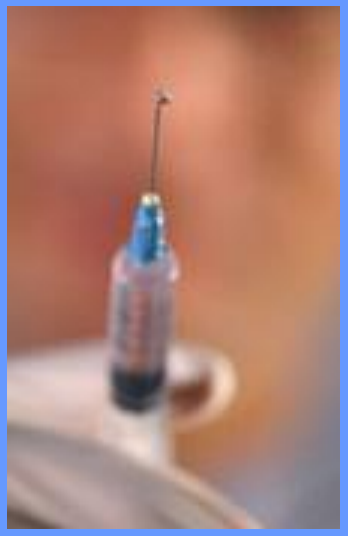
ST-Elevation Heart Attack (STEMI)

- **54 year-old patient with 2 hours of severe sub-sternal chest pain**



Treatment Strategies for STEMI

Pharmacologic = "clot buster"



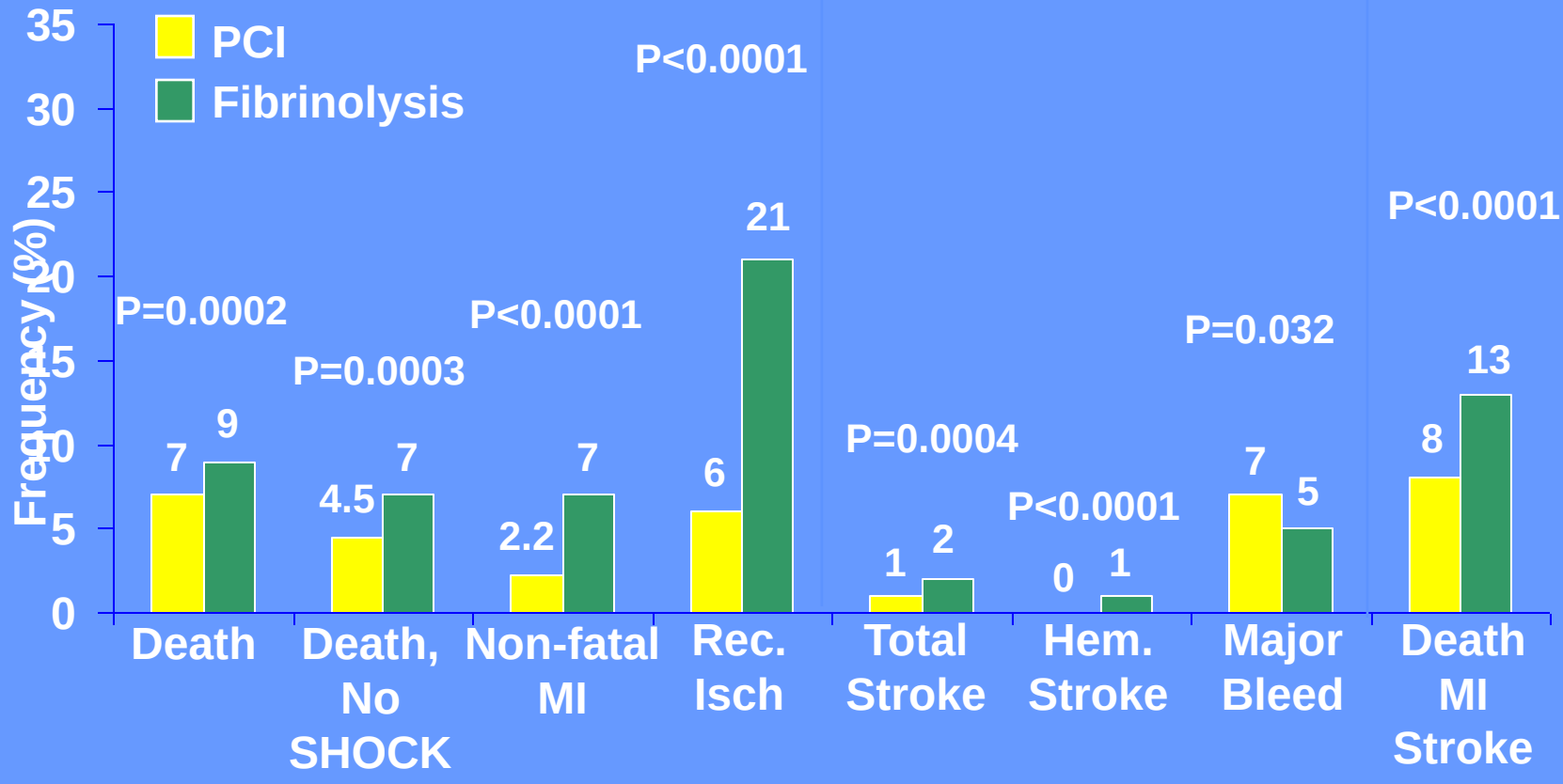
Widely available
Quickly administered
Less effective
Bleeding risk

Reperfusion or re-opening of the artery

Mechanical = Percutaneous Coronary Intervention (Primary PCI)

Limited availability
Treatment delay
More effective
Bleeding risk lower

PCI vs Fibrinolysis:
Short Term Clinical Outcomes



N=7739
(23RCT)

Keeley. Lancet 2003;361:13-20.

State of the System

One of the biggest challenges to developing an ideal system of care for STEMI patients is the inadequate recognition by patients and bystanders of STEMI symptoms and the urgency of activating EMS and calling 911.

Advance Data
From Vital and Health Statistics

Number 386 • June 29, 2007

National Hospital Ambulatory Medical Care Survey: 2005 Emergency Department Summary

by Eric W. Nawar, M.H.S.; Richard W. Niska, M.D., F.A.C.E.P.;
and Jianmin Xu, M.S., Division of Health Care Statistics

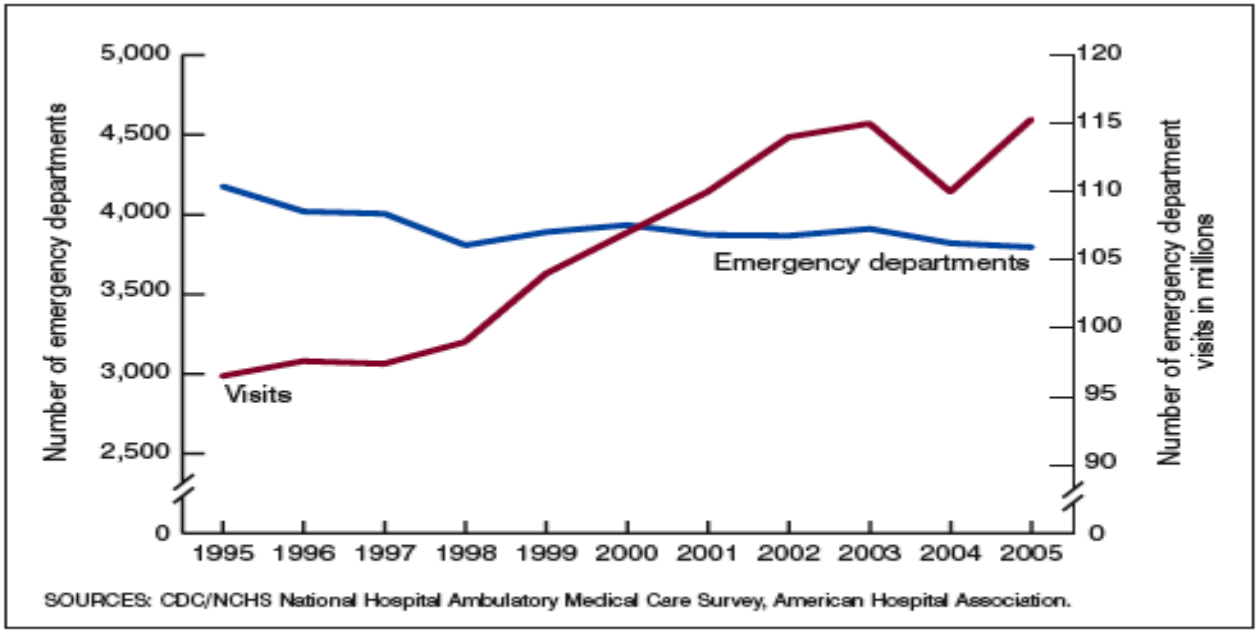


Figure 1. Trends in numbers of emergency departments and related visits: United States, 1995–2005

State of the System

- Approximately 30% of STEMI patients do not receive any reperfusion therapy (with clot busting drugs or PCI)

State of the System

- Of the 70% of STEMI patients who are treated with reperfusion therapy, less than half are treated within the guideline recommended times frames.

Five bullets of STEMI care

- Regional systems of care-AHA Mission Lifeline
- 12 lead: acquisition, interpretation, transmission
- Access to PCI :

  Diversion to PCI centers

  Interhospital transfer (IHT) from non-PCI to PCI hospital

  - PCI Hospitals
  - Fibrinolysis

Improving the System of Care for STEMI Patients

What is Mission Lifeline?

An AHA national initiative launched in May 30/07 Circulation to improve quality of care and outcomes in STEMI patients by improving the health care system readiness and response

Mission Lifeline

- EMS System Assessment and Improvement
- Establish local/regional systems of care
- Explore possibility of National STEMI Certification Program

Mission Lifeline

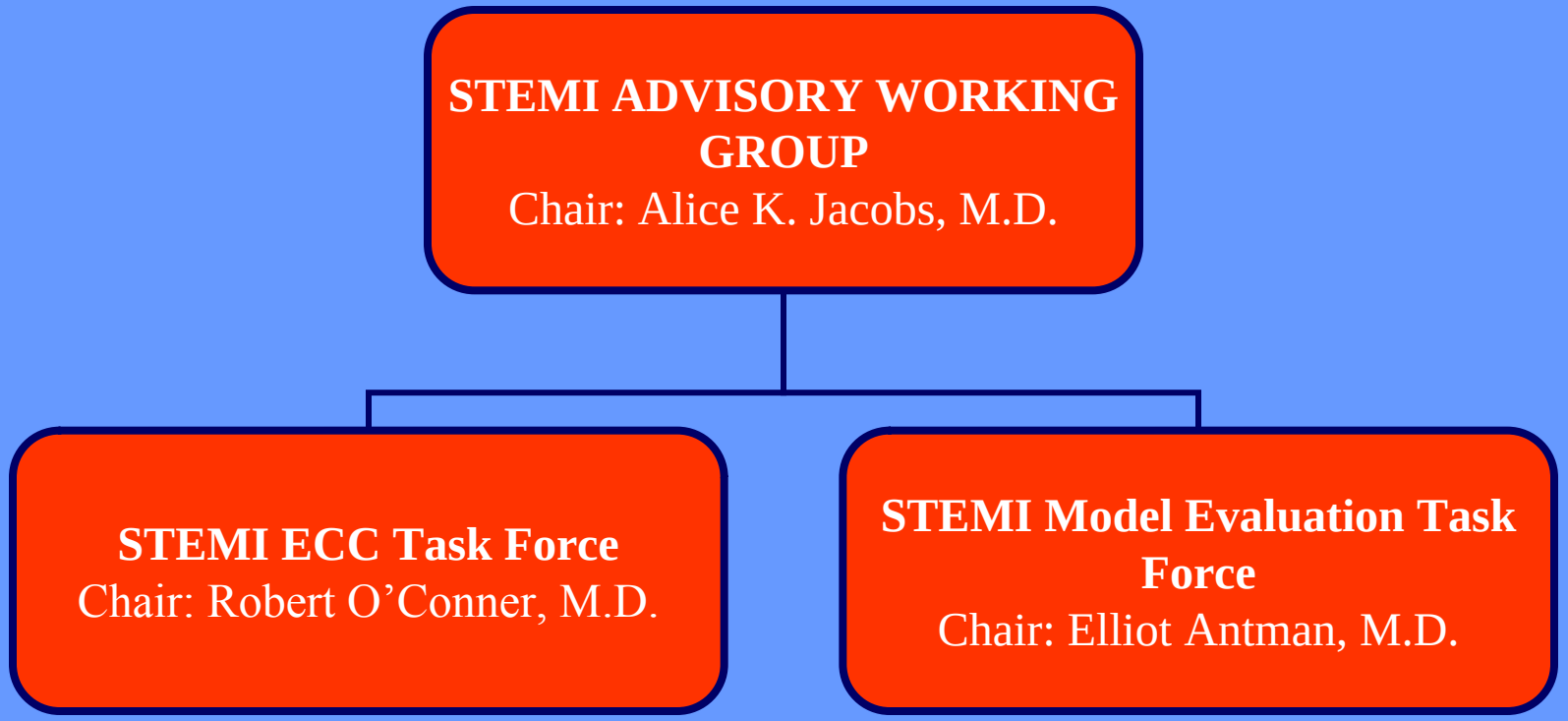
- Focus on increasing the number of patients with **timely access** to primary PCI

Establishing Local Initiatives

Recommended task force members include but are not limited to:

- Payers
- PCI capable hospitals and non-PCI capable hospitals
- EMS
- Physicians, nurses and other providers
- Department of Health
- EMS regulatory authority/ Office of EMS
- Rural health association
- Patients and care givers
- Quality improvement organizations
- State and local policymakers

Volunteer Oversight



EKG acquisition ,interpretation & transmission

- "An under-utilized but **effective strategy** for improving systems for care… is to expand the use of **PH-ECG's by EMS**."

  2007 ACC/AHA guidelines

Access to PCI: Diversion to PCI center bypassing non-PCI center

- LeMay (NEJM Jan 17,2008):
  Ottawa- field recognized STEMI

direct to PCI center		vs	transferred from non PCI hospital
median D-B (minutes)	69		123
D-B< 90	79%		11.9%

Access to PCI via Interhospital transfer

25% of hospitals are PCI capable

but…

Interhospital Transfer (IHT) to PCI hospitals

-median time to closest PCI center: 11.4 minutes

-80% of adult patients live within 60 minutes of PCI center

(Nallamothu, Circulation ,2006)

Interhospital Transfer(IHT) from Non PCI to PCI hospital: D1B2

- Done well in Europe
- US(NRMI) D1B2

  4.2 % <90

  median D1B2 180 min

>50 of time spent in interfacility transfer

Nallamothu, Circulation,Feb,2005

Strategies for IHT

- Early recognition of STEMI
- "STEMI Alert" from first contact with patient
- Parallel processing (EMS/ED/cath lab)
- Standardize meds at non PCI hospitals-
  no drips
- IHT or 911 ambulance
- Air and ground ambulances

Regional STEMI systems

- Henry. Circulation, August,2007
- Ting. Circulation , August 2007
- Jollis. JAMA ,November 2007

PCI Hospital Strategies

- Activation of Cath lab by:
  - EMS
  - EP
  - single call

Bradley. NEJM Nov 2006

PCI hospital strategies

- EMS bypassing ED

Fibrinolysis

- Works best in first 2-3 hours after sx onset
- If sx onset to medical contact <3hrs & anticipated D2B minus D2N > 60 min, give lytic unless contraindications to lytics, shock or CHF,
- Underutilized