ADVANCES IN THE TREATMENT OF STEMI
2015 UPDATE

• GREGORY D. CHAPMAN, MD, FACC
"IF YOU FIND A MAN WITH HEART DISCOMFORT, AND PAIN IN HIS ARMS, AT THE SIDE OF HIS HEART, DEATH IS NEAR"

EBERS PAPYRUS, 2600 B.C.
STEMI

- Diagnostic ST elevation in the absence of left ventricular (LV) hypertrophy or left bundle-branch block (LBBB) is defined by the ESC/ACCF/AHA for the Universal Definition of MI as:

  - new ST elevation at the J point in at least 2 contiguous leads of 2 mm (0.2 mV) in men or 1.5 mm (0.15 mV) in women in leads V2–V3 and/or of 1 mm (0.1 mV) in other contiguous chest leads or the limb leads.
Atherothrombosis: A Generalized and Progressive Process

- Normal
- Fatty streak
- Fibrous plaque
- Atherosclerotic plaque
- Plaque rupture/fissure & thrombosis

Clinically silent
Stable angina
Intermittent claudication
Increasing age
ACS, acute coronary syndrome; TIA, transient ischemic attack
PREVALENCE OF TOTAL CORONARY OCCLUSION DURING THE EARLY HOURS OF TRANSMURAL MI. DEWOOD, ET AL; NEJM 1980; 303:897-902

---complete infarction in 6 hrs after total occlusion; cell death begins after one hour of no blood flow.
TIME IS MUSCLE
LOSS OF MUSCLE BREEDS MORBIDITY & MORTALITY

--timely reperfusion of the infarct-related artery improves survival and reduces cardiac rupture, VSD, mitral regurgitation, CHF, and arrhythmia
1980's: thrombolysis/TIMI/TAMI trials: significant improvement in survival of STEMI patients; Death rate reduced from 15% to 4-8%.

A feared complication: Intracranial bleed rate of 1%; 5% if age > 75
1990's: superiority of ptca/pci in the cardiac cath lab established if done in a timely fashion by experienced operators; death rate 1-4%; approaches 0% if the infarct-related artery is reperfused in the "golden hour" post occlusion.

Intracranial bleed rate essentially 0% with ptca/pci
LACK OF SPEED KILLS
COMMUNITY PREPAREDNESS AND SYSTEM GOALS FOR REPERFUSION THERAPY
D2B---DOOR TO BALLOON TIME
FMC---TIME FROM FIRST MEDICAL CONTACT
TIME FROM FIRST MEDICAL CONTACT (FMC) GOAL: REPERFUSE WITH PCI <120 MINUTES IF NOT POSSIBLE, THROMBOLYTIC THERAPY <30 MIN
DOOR TO BALLOON (OR DEVICE) TIME
GOAL: <90 MINUTES---NATIONAL STANDARD
<60 MINUTES: BETTER OUTCOMES
LEARNING FROM THE SWIFT
WHAT DO HOSPITALS THAT HAVE D2B TIMES OF LESS THAN 60 MINUTES DO?
1. EMS SENDS THE ECG TO ER MD FROM THE FIELD
2. ER MD IS EMPOWERED TO MAKE STEMI DIAGNOSIS AND ACTIVATE THE CATH LAB TEAM

- Significant time saved previously spent on waiting for cardiologist(s) to call back and make a decision.
- STEMI is an ER diagnosis
- If uncertain ER MD may text ECG to cardiologist for immediate review
3. IF PATIENT PRESENTS TO ER WITH CHEST PAIN AN ECG IS DONE WITHIN 5 MINUTES
4. ONE PHONE CALL ACTIVATES ALL CATH LAB STAFF IMMEDIATELY. A SINGLE CALL FROM THE OPERATOR BEEPS EVERY CALL TEAM MEMBER SIMULTANEOUSLY
5. CONTINUOUSLY MEASURE PERFORMANCE. REGULAR AND TIMELY FEEDBACK TO ALL SHAREHOLDERS

• At SBMC monthly STEMI committee meeting occurs with representatives from EMS, ER MDs, ER nurses, cardiac cath lab nurses and staff, hospital administration/quality services, cvu/cicu nurses, and the CMO. All STEMI cases are reviewed in detail including cine films of each case; cardiologists present their cases.

• This improves processes and procedures as well as accountability for all team members. It allows sharing of knowledge and review of the literature with colleagues.

• Average D2B time 2010-2015: 59 minutes (n=459).
2010-2015 STEMI D2B Time

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<th>Year</th>
<th>Minutes</th>
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<td>2010</td>
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PITFALLS TO AVOID DURING THE PITSTOP
MIMICS OF STEMI

Chapman GD, Ohman, EM, Topol EJ. Minimizing the risk of inappropriately administering thrombolytic therapy. TAMI study group. Am J Cardiol 1993:71:783-7

--hyperkalemia
--aortic dissection
--pulmonary thromboembolism
--subarachnoid hemorrhage
--myopericarditis
--left ventricular hypertrophy
--coronary vasospasm
--tako tsubo
--Brugada syndrome
--lv aneurysm
--ventricular pacemaker
STEMI CARE ADVANCES/ISSUES

• Radial artery cath for STEMI (RIVAL study; RADIAL-STEMI trial)
• Thrombectomy/ clot aspiration (1 yr TASTE trial results; no benefit)
• Treating more than just the infarct artery (PRAMI STUDY)
• Use of intra-aortic balloon pump for patients in shock (IAPB-SHOCK II trial)
MANY THANKS TO ALL OF YOU WHO GIVE SO VERY MUCH OF YOUR TIME AND EXPERTISE