Death Do Us Part

Stemming STEMI Mortality and Morbidity


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Chief of EMS Operations
Co-Chief in the Section on
EMS, Disaster Medicine, and
Homeland Security
UT Southwestern Medical Center

Emergency Medicine Attending Faculty,
Parkland Memorial Hospital

AVOIDING COMMON PREHOSPITAL ERRORS

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Wolters Kluwer Health | Lippincott Williams & Wilkins

The Year was 2009

- *15 hospitals, 15 PCI labs*
- *24 EMS agencies*
- *No uniform protocols*
- *No uniform data*
- *No public awareness*

The Year was 2009

- *Minimal coordination of STEMI care between EMS and receiving hospitals*
- *Inability for EMS to transmit ECG's*
- *Lack of STEMI protocol sets between EMS and receiving hospitals*
- *Minimal or no QA/QI, or STEMI feedback loops*
- *Complete lack of data accurately reflecting STEMI care in Dallas County*

We Didn't Know
What We Didn't Know

AHA and UT Southwestern

- *Spent a year writing application*
- *The W.W. Caruth Foundation and the Communities Foundation of Texas*
- *Applied for a $3.5 million grant to establish a comprehensive ACS Network in Dallas County*

AHA Caruth Project

- *$3.5 Million Grant over 2.5 years*
- *AHA led with 250 volunteers*
- *15 hospitals signed a Memorandum of Understanding (MOU)*
- *24 EMS agencies signed an MOU*
- *Research Metric: "Symptom Onset to Arterial Reperfusion"*

Education and Culture

- *4,032 - Certified EMS Personnel (70% Paramedics)*
- *875 - ED RN's*
- *398 - ED Physicians*
- *404 - ED Technicians*
- *85 - Cath Lab Technicians*
- *90 - Cath Lab RN's*
- *112 - House Supervisors*
- *187 - ICU Charge Nurses*
- *82 - Interventional Cardiologists*

Education and Culture

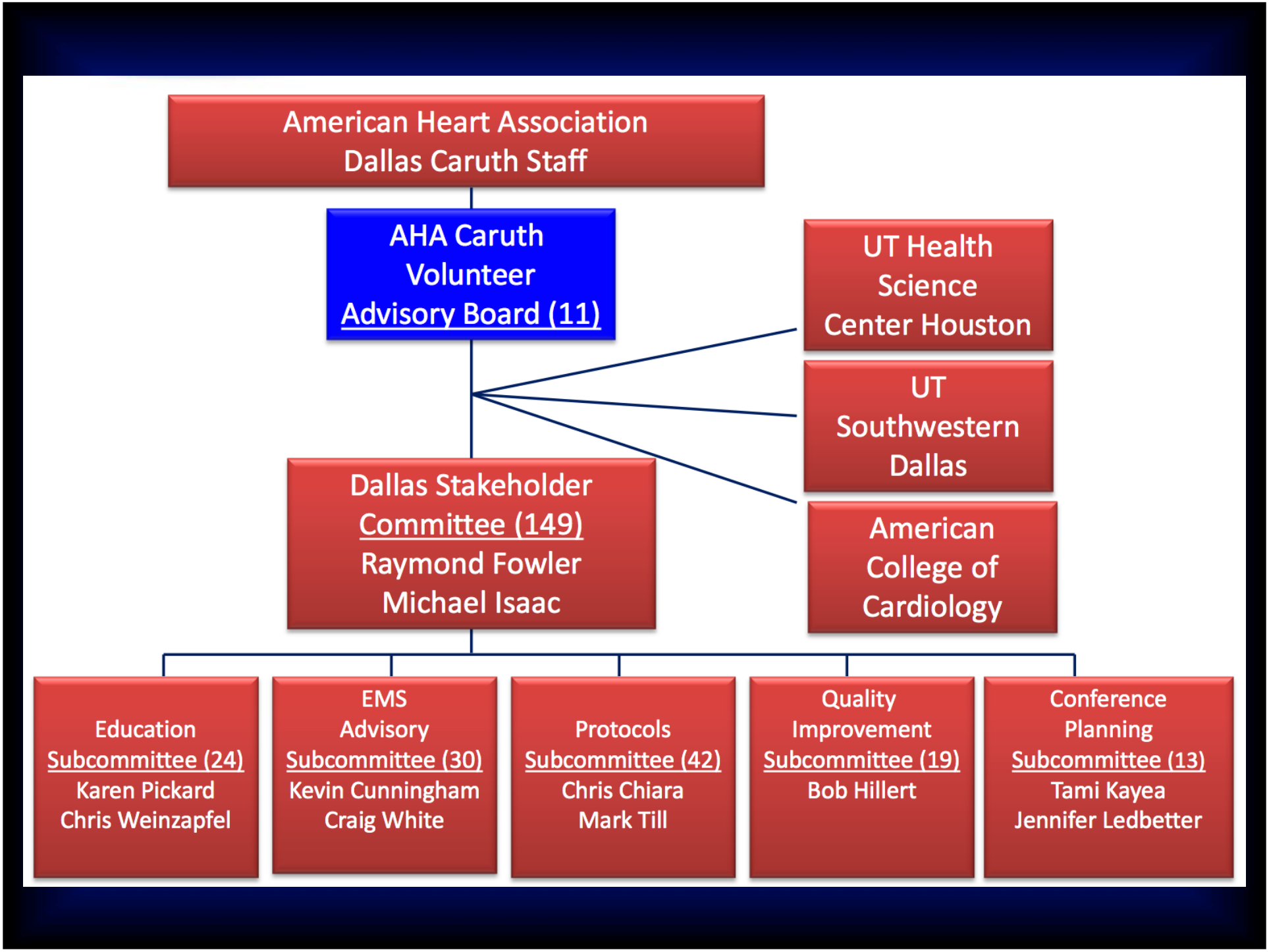
- *Through a combination of grant funding and donations provided by one hospital system, all 24 EMS providers are currently capable of transmitting 12-Lead ECG's.*
- *AHA Dallas Caruth Staff receive all transmitted ECG's in Dallas County to monitor system performance and aid in quality improvement.*

Critical Success Factors

- *Leadership & Infrastructure*
  - *Dallas Stakeholder Committee*
  - *Open lines of communication*
  - *Shared Success*
- *Created Standardized Protocols*
- *Trainined 4,273 Providers*

Critical Success Factors

- *Data, Data, Data*
- *Outstanding System Performer Award*
- *AWI Tracking (Activation Without Intervention) – NO "False Activation"*
- *Collaboration & Friendly Competition*
- *Data Sharing*
- *Field Trips*
- *EMS Equipment Upgrades*
- *ECG Transmission*


American Heart Association
Dallas Caruth Staff
AHA Caruth
Volunteer
Advisory Board (11)
UT Health
Science
Center Houston
UT
Southwestern
Dallas
American
College of
Cardiology
Dallas Stakeholder
Committee (149)
Raymond Fowler
Michael Isaac
Education
Subcommittee (24)
Karen Pickard
Chris Weinzapfel
EMS
Advisory
Subcommittee (30)
Kevin Cunningham
Craig White
Protocols
Subcommittee (42)
Chris Chiara
Mark Till
Quality
Improvement
Subcommittee (19)
Bob Hillert
Conference
Planning
Subcommittee (13)
Tami Kayea
Jennifer Ledbetter

EMS Chest Pain / ACS Guidelines

American Heart Association. | COMMUNITIES FOUNDATION of TEXAS

ACS Signs & Symptoms

Chest pain- any non-traumatic pain between the jaw & umbilicus
Chest pressure, discomfort or tightness
Complaints of "heart racing" or palpitations
Bradycardia
Syncope
Weakness in patients > 45 years old
New onset stroke symptoms
Difficulty breathing (without obvious cause i.e. asthma or CHF)

STEMI Criteria

ST segment elevation of ≥ 1 mm in 2 contiguous leads with or without signs & symptoms of ACS

12 Lead EMS ECG Criteria

Patients > 20 years old experiencing any ACS signs & symptoms

OR

Any age patient with ACS signs & symptoms AND a history of:

HTN — Cardiac disease
Smoking — Diabetes mellitus
Severe Obesity — High Cholesterol
Recent recreational drug use

When in Doubt, Obtain an ECG

Approved by the Dallas Stakeholder Committee

F	Minimize patient exertion	F
F	Apply Oxygen to maintain SPO2 ≥ 94%	F
B	324 mg Aspirin PO Chewed, not swallowed	B
B	Obtain 12 Lead ECG within 10 minutes of patient contact	B
P	**If STEMI Criteria met, activate CATH LAB, transmit ECG & immediately initiate transport to appropriate PCI capable hospital.**	P
I	Establish IV access at TKO rate or saline lock	I
	SBP > 110 mmHg	
P	0.4 mg nitroglycerin SL tablet or SL spray q 5 minutes until pain is gone or max 3 doses. Maintain SBP > 110 mmHg	P
P	Pain unrelieved by Nitro: Morphine 2-4mg slow IVP max 20mg OR Fentanyl 1mcg/kg q 15 minutes max 200 mcg	P
	SBP < 110 mmHg	
F	Shock position	F
I	250ml NS bolus to achieve SBP≥110mmHg. Max 1 L NS, monitoring breath sounds	I
M	Morphine or Fentanyl analgesic per medical control	M

Legend		
F	First Responder	F
B	EMT-Basic	B
I	EMT-Intermediate	I
P	Paramedic	P
M	Medical Control	M

Approved by the Dallas Stakeholder Committee

Code STEMI Considerations:

1) Keep patient connected to monitor & 12 lead cables when brought into ED for physician evaluation
2) If possible, remain on EMS stretcher and monitor in ED
3) Prepare to be escorted to CATH Lab on EMS stretcher and monitor to expedite transfer of care to CATH LAB nurse/physician.

If SBP falls < 110 mmHg in response to treatment:

P — Discontinue standing nitroglycerin & analgesic treatments — P

If C/P is thought to be stimulant induced:

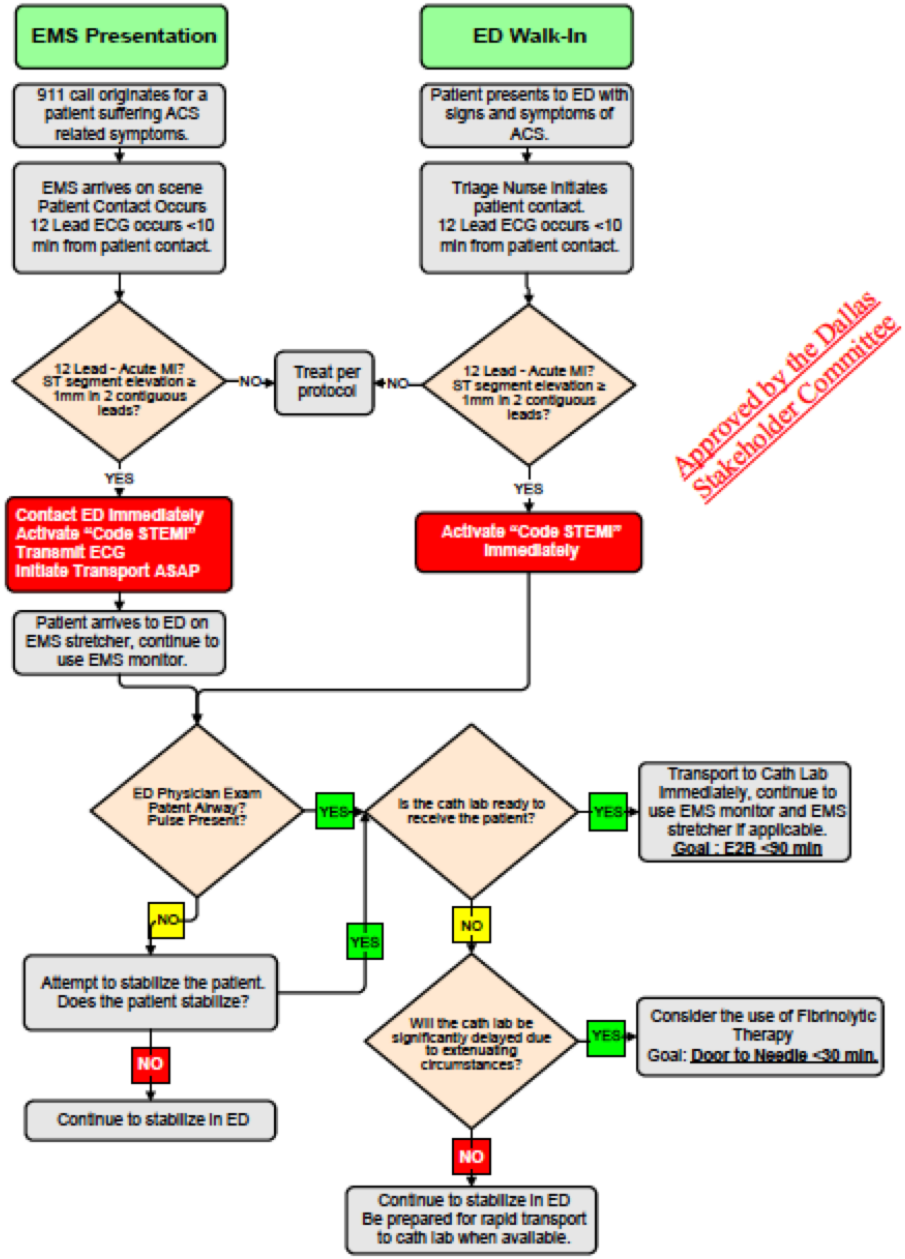
P — Diazepam 2.5-5mg slow IVP max 10mg OR Midazolam 2.5-5mg slow IVP max 5mg or IN max 10mg — P

PEARLS:

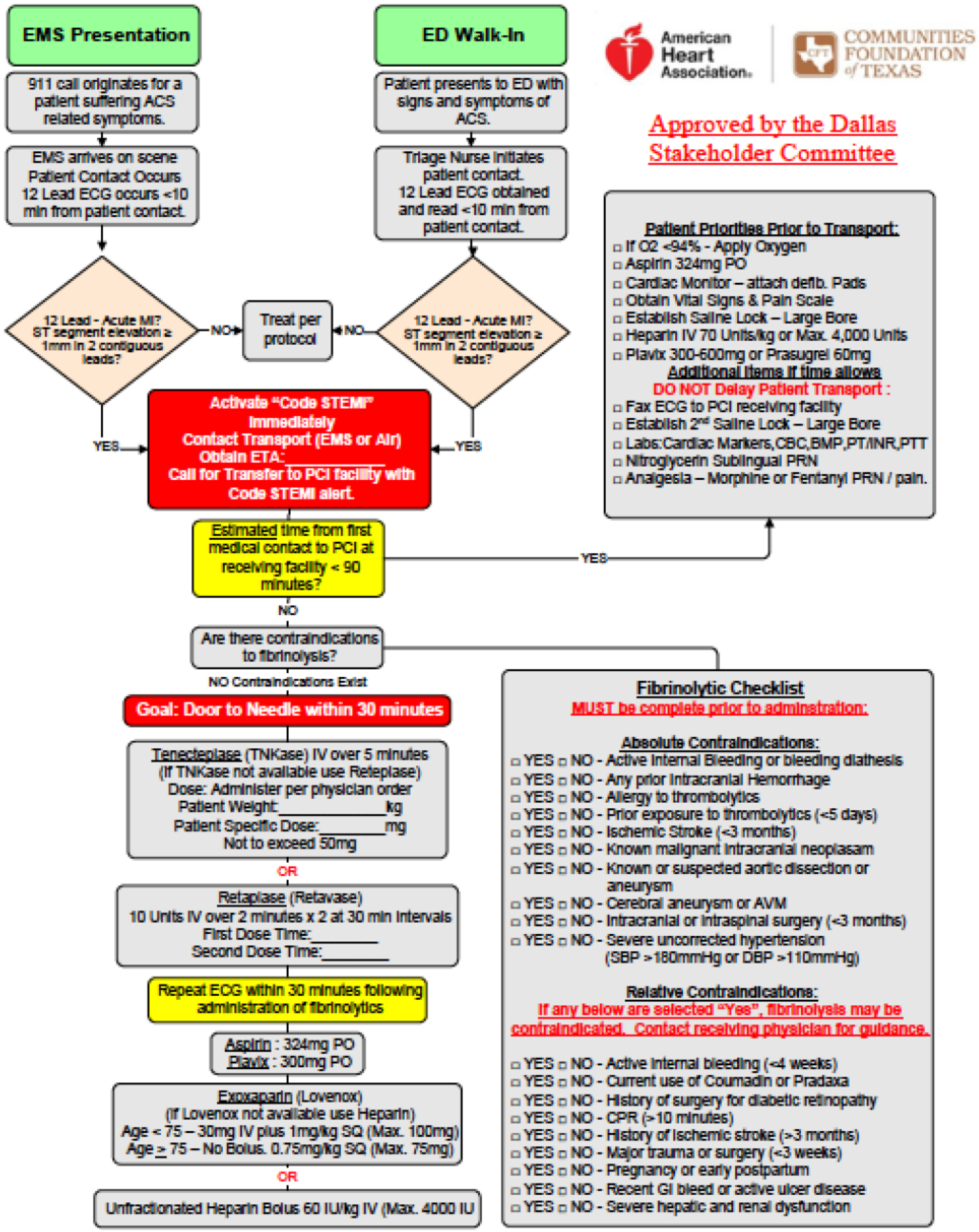
- Females, diabetics and geriatric patients often have atypical signs/symptoms, or only generalized complaints
- Remember Erectile Dysfunction drugs are now being used to treat pulmonary hypertension
- Do not administer Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension
- If possible, establish a second IV on STEMI patients DURING TRANSPORT ONLY

AHA Dallas Caruth STEMI Guideline

American Heart Association. | COMMUNITIES FOUNDATION of TEXAS



AHA Dallas Caruth Non-PCI STEMI Guideline



Dallas Caruth Update

JULY 2011

American Heart Association | American Stroke Association

STEMI Reminders:

1) Early ECG in patients with chest pain.

2) Early notification to ED and activation of cardiac cath labs.

3) Early transmission of ECG by EMS to receiving hospital.

4) Early and rapid transport to an appropriate receiving hospital.

Thank you!
For those who attended the 2011 Caruth AMI Symposium we are grateful for your participation. If you missed 2011, we hope you are able attend the AMI symposium in 2012!

Dallas Caruth Committee Co-Chairs

Stakeholder Co-Chairs:
Ray Fowler
Michael Taylor

EMS Resources:
Kevin Cunningham
Craig White

Conference Planning:
Tami Kayea
Jennifer Ledbetter

Education:
Karen Pickard
Chris Weinzapfel

Quality Improvement:
Bob Hillert
Thomas Tierney

Protocols:
Chris Chiara
Mark Till

Making an Impact on Heart Disease

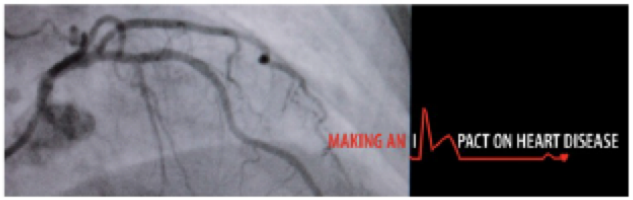
What is the Dallas Caruth Initiative?

The SouthWest Affiliate of the American Heart Association was awarded grant funding from the W.W. Caruth Jr. Foundation to create a seamless and integrated heart attack emergency care system in Dallas County. The two-year project, which will be managed by AHA staff, will allow the AHA to work closely with 15 hospitals and 25 EMS agencies in Dallas County to coordinate and streamline protocols and to reduce the amount of time it takes for heart attack patients to receive lifesaving treatment. This innovative regional collaboration will work to ensure equipment compatibility, consistent training and uniform protocols for both transporting and treating heart attack patients across the region.

www.heart.org/caruth

2011 Caruth AMI Symposium

The inaugural AHA Dallas Caruth AMI Advisory Symposium provided many best practices from across the country for patients who experience cardiovascular events. Concentration was from the first point of care with Emergency Medical Services through hospital interventions, while leveraging these insights to improve the quality of care for those who suffer from an acute myocardial infarction (AMI). The conference fostered informal interaction over 280 attendees and provided networking opportunities for all persons who attended. Speakers from across the United States joined us with attendees from as far as Russia for the 2011 symposium. The meeting focused on processes, initiatives, policies and research relevant to measuring and improving quality of care and outcomes for persons experiencing an AMI. As we prepare for the 2012 Dallas Caruth AMI Symposium we hope that you will return or attend this wonderful opportunity to learn new insight and understanding to the advanced world of acute cardiac care.



'The Importance of the Early ECG'

The primary step of STEMI recognition and treatment is the importance of achieving the early ECG in patients who have symptoms of acute coronary syndrome. When treating medical emergencies or known chest discomfort calls ensure you have your 12-Lead ECG monitor with you upon initial patient contact. Have your partner or first responder assist you in applying the ECG electrodes to capture the 12-Lead ECG as soon as possible. The 12-Lead ECG should not be delayed except for lifesaving patient treatments and completed if possible where you find your patient. Ensure pads are secured in the proper anatomic locations and ask your patient to remain as still as possible during the capture of the 12-Lead ECG. Consider the importance of the early ECG and proper lead placement as your best opportunity to identify a STEMI.

Dallas Caruth Update

American Heart Association | American Stroke Association

STEMI Reminders:

1) Early ECG in patients with chest pain.

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3) Early transmission of ECG by EMS to receiving hospital.

4) Early and rapid transport to an appropriate receiving hospital.

Register Today
AHA/Caruth AMI Advisory Symposium
June 3rd and 4th, 2011
Westin Park Central, Dallas
EMS - Nursing - Cath Lab Staff - Physicians
CE will be available

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Mark Till

AHA Dallas Caruth Staff
Wendy Segrest
Dawn Kregel
Russell Griffin
Leilani Stuart
Diana Ramirez

Making an Im

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www.heart.org/caruth

Imp

- May 9th -
- May 10th -
- May 11th -
- May 12th -
- May 18th -
- May 23rd -
- May 25th -

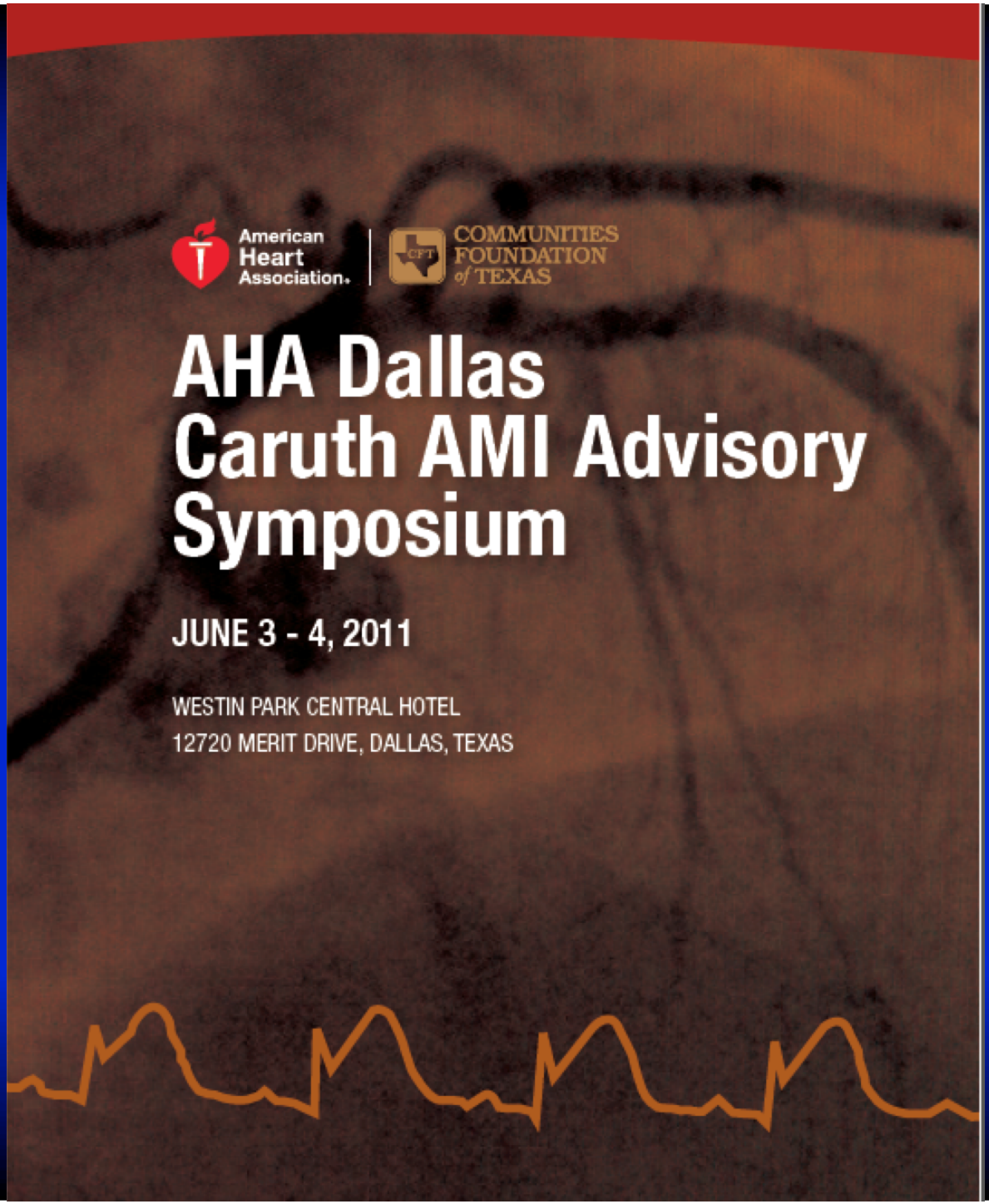
(866-854-6779 - Code: 7929798)

American Heart Association | COMMUNITIES FOUNDATION of TEXAS

Important Meetings to Remember

AHA Dallas Office - 8200 Brookriver Drive, Classroom A
Conference Call - 1-866-506-5191 - Code: 335721#

- May 9th - 0730-0900 Conference Planning Meeting - Dallas AHA
- May 10th - 0730-0900 Protocols Meeting - Dallas AHA
- May 11th - 0730-0900 Education Meeting - Dallas AHA
- May 12th - 0730-0900 EMS Resources Meeting - Dallas AHA
- May 18th - 0730-0900 QI Meeting - Dallas AHA
- May 23rd - 0730-0900 Conference Planning Meeting - Dallas AHA
- May 25th - 1200-1300 AR-G Site Manager/User Conference Call
  (866-854-6779 - Code: 7929798)


American Heart Association.
COMMUNITIES FOUNDATION of TEXAS
AHA Dallas Caruth AMI Advisory Symposium
JUNE 3 - 4, 2011
WESTIN PARK CENTRAL HOTEL
12720 MERIT DRIVE, DALLAS, TEXAS

AHA DALLAS CARUTH AMI ADVISORY SYMPOSIUM

FRIDAY, JUNE 3, 2011

12:00PM	Registration, Posters and Exhibits				
1:00PM	Welcome and Introductions	Todd Gray and Ray Fowler			
1:10PM	Transport & Transfers from the rural region	Tim Henry	or	"What You Don't Know, Might Hurt Them!"	Bob Page
2:00PM	ACLS Update	Dawn Kregel	or	ACTION Registry-GWTG	Loni Denne
2:55PM	Break, Poster and Exhibits				
3:05PM	The Challenge Within: Overcoming Hospital Barriers	Eva Kine Rogers	or	"Wide and Tachy" In Lead II, You Got No Clue!	Bob Page
4:00PM	Mission Lifeline	Chris Bjerke	or	STEMI-OUR system of care: A Big Town Perspective with a Small Town Compassion	Todd Gray
5:00PM	Networking Reception, Posters & Exhibits				
5:30PM	Caruth Overview and special presentation by James Jollis, Executive Director of the RACE				

Education Plan 4,273 – Completed Workbooks!

American Heart Association. | COMMUNITIES FOUNDATION of TEXAS

Dallas Caruth

EMS Education

STEMI Workbook

EMS Education Workbook Endorsed by:

Dr. Ray Fowler M.D.

Dr. Robert Simonson D.O.

Dr. Suresh Chavda M.D.

American Heart Association. | COMMUNITIES FOUNDATION of TEXAS

Dallas Caruth

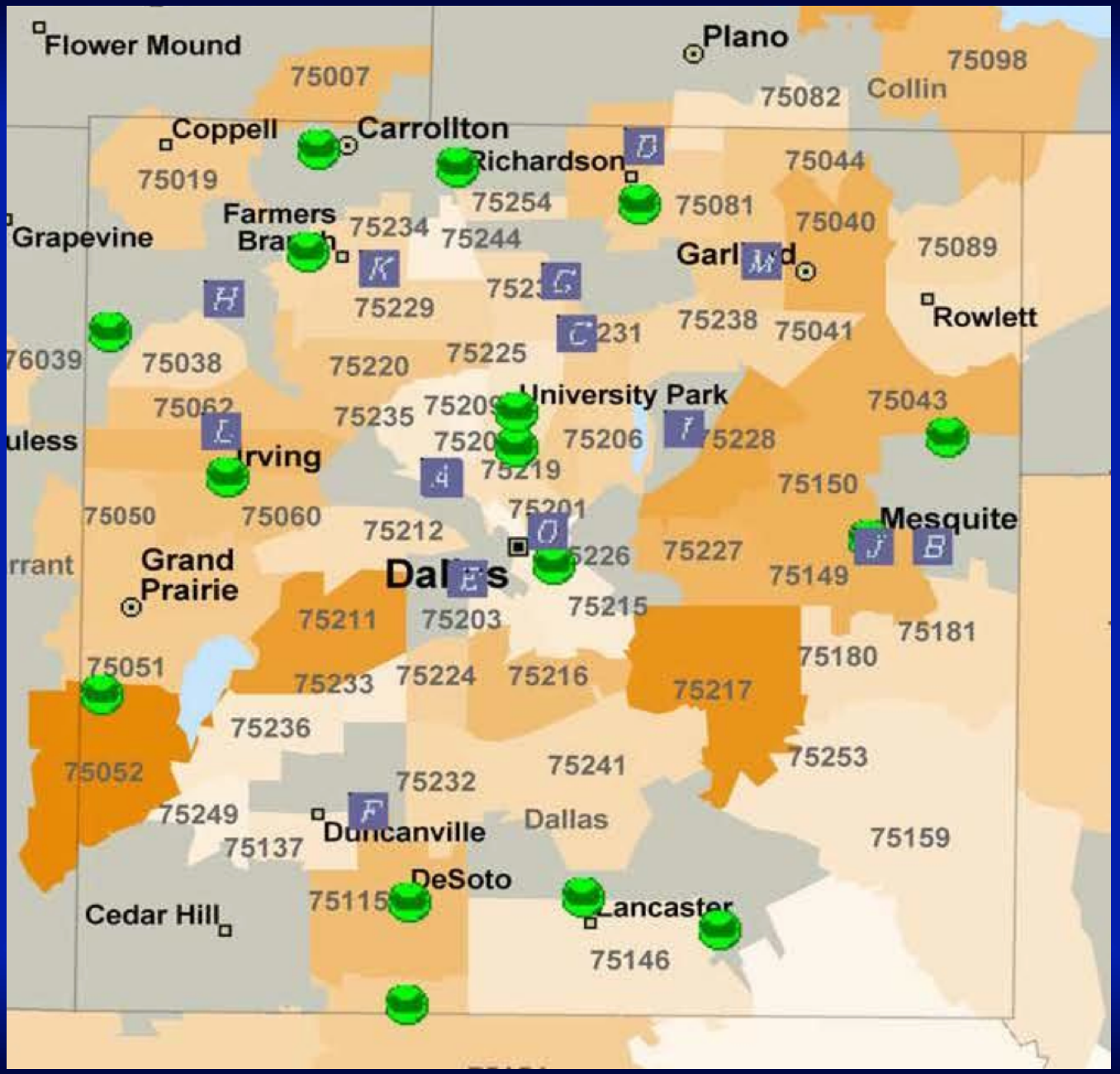
Hospital Education

STEMI Workbook

Dallas Caruth Initiative

Presented on behalf of the American Heart Association and the Communities Foundation of Texas

Data Analyses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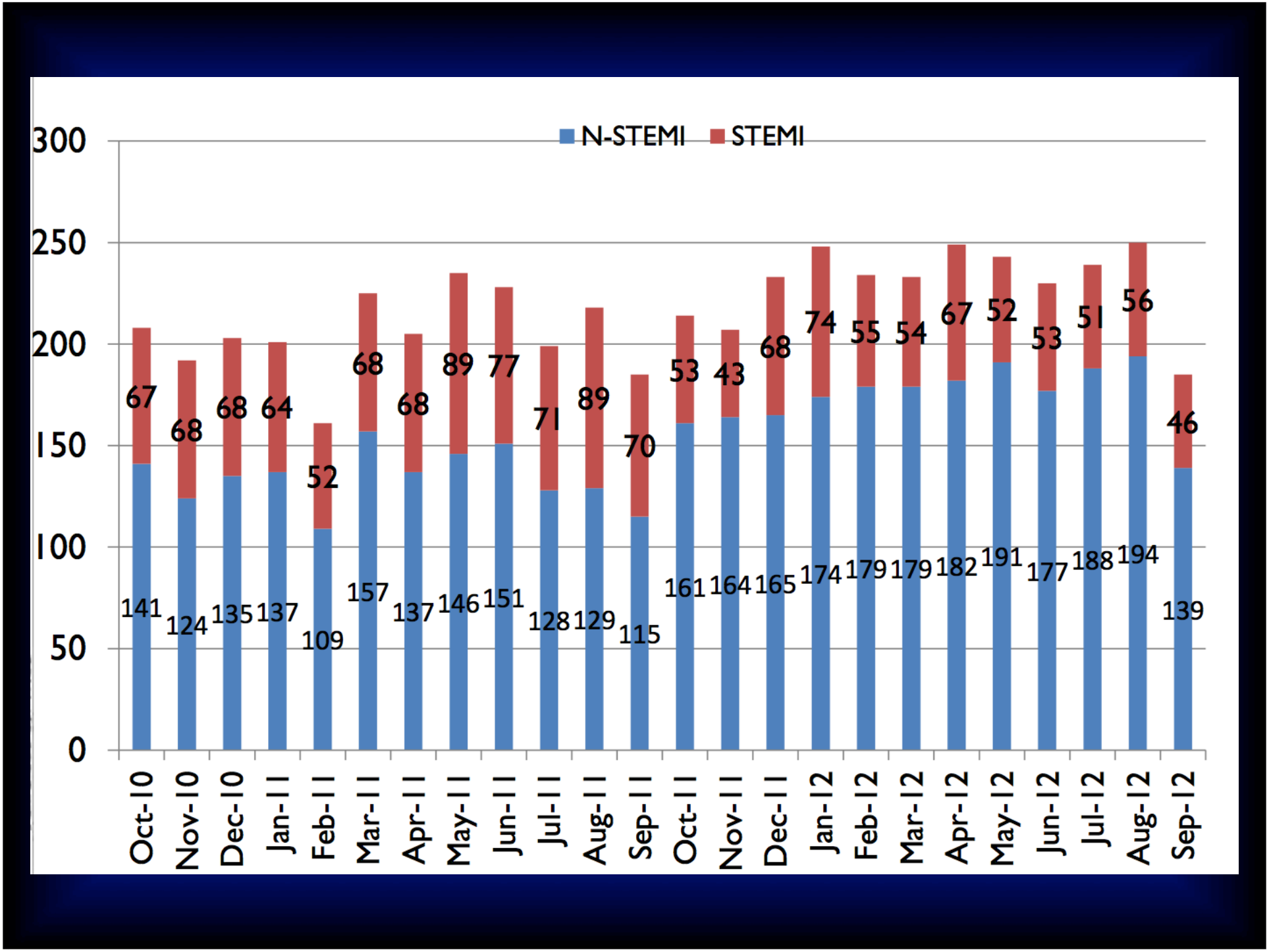
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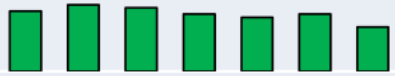
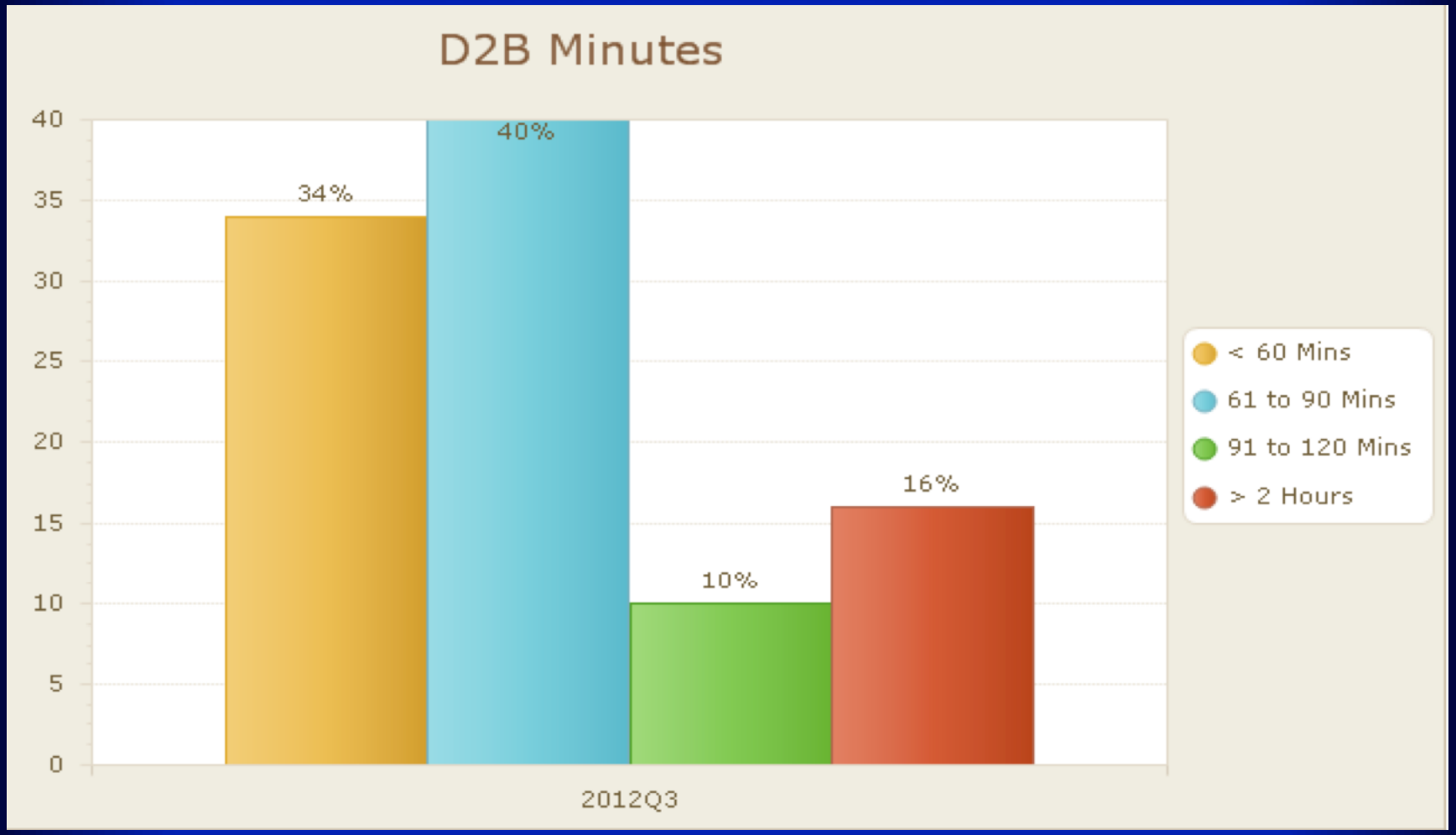
	Q4 2010	Q1 2011	Q2 2011	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Trend Lines	Trend* (+ is good)
SOAR	195	181	173	190	190	162	180	185		5%
D2B	74	77	65	70	68	64	67	75		-1%
FMC2B	133	105	83	88	93	82	86	91		31%
E2B	72	76	69	74	73	73	72	81		-13%
Cath Lab	21	19	19	20	21	19	20	20		5%
Total EMS Time	-	29.5	30.5	30	29	28.5	29	27		8%
D2B Minutes **saved** with EMS CCL Activation	5	9	10	13	23	16	18	21		260%
Median EMS Onscene Time	16	18	18	17	15	16	15	16		0%


D2B Minutes
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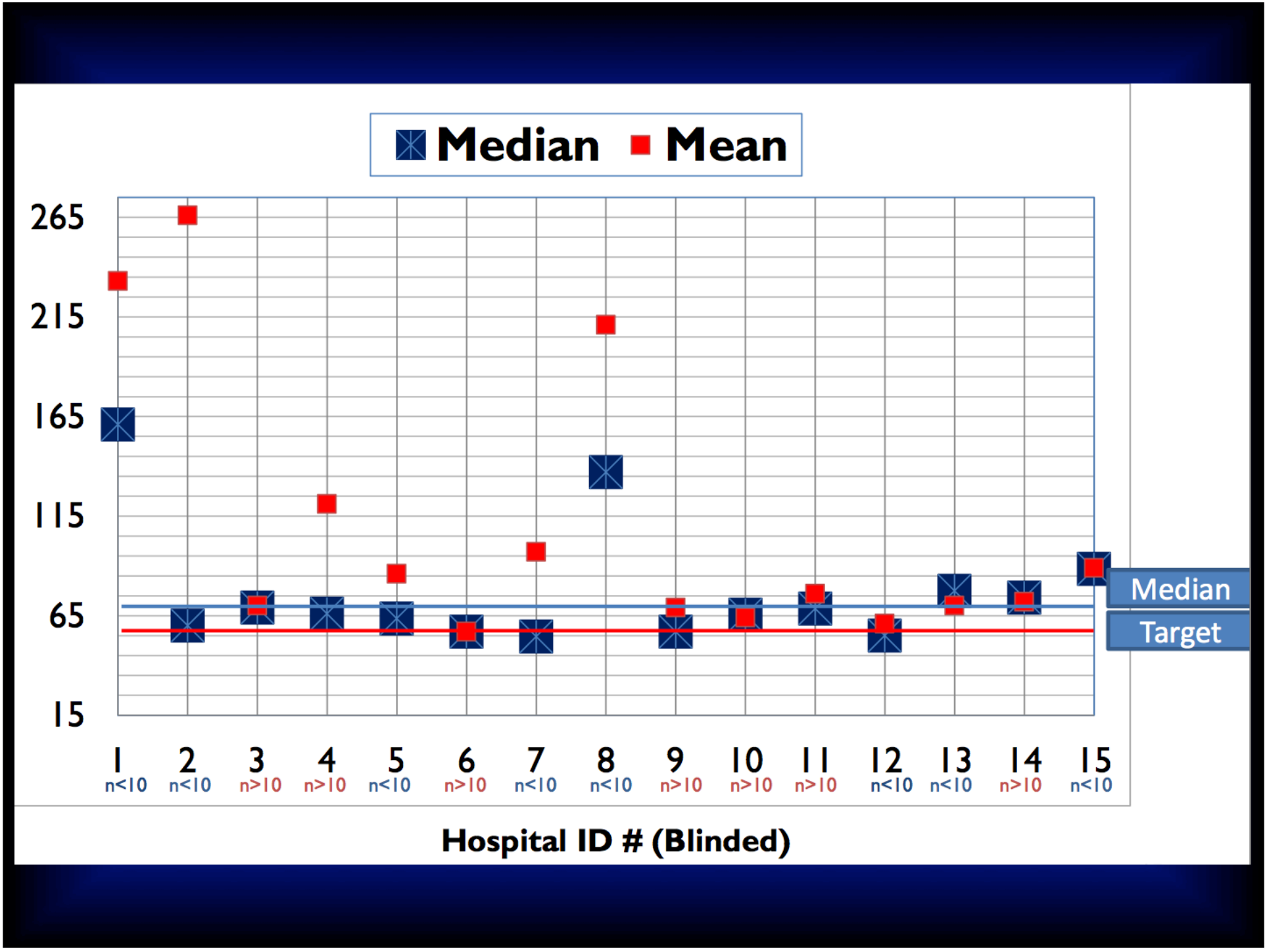
91 to 120 Mins
> 2 Hours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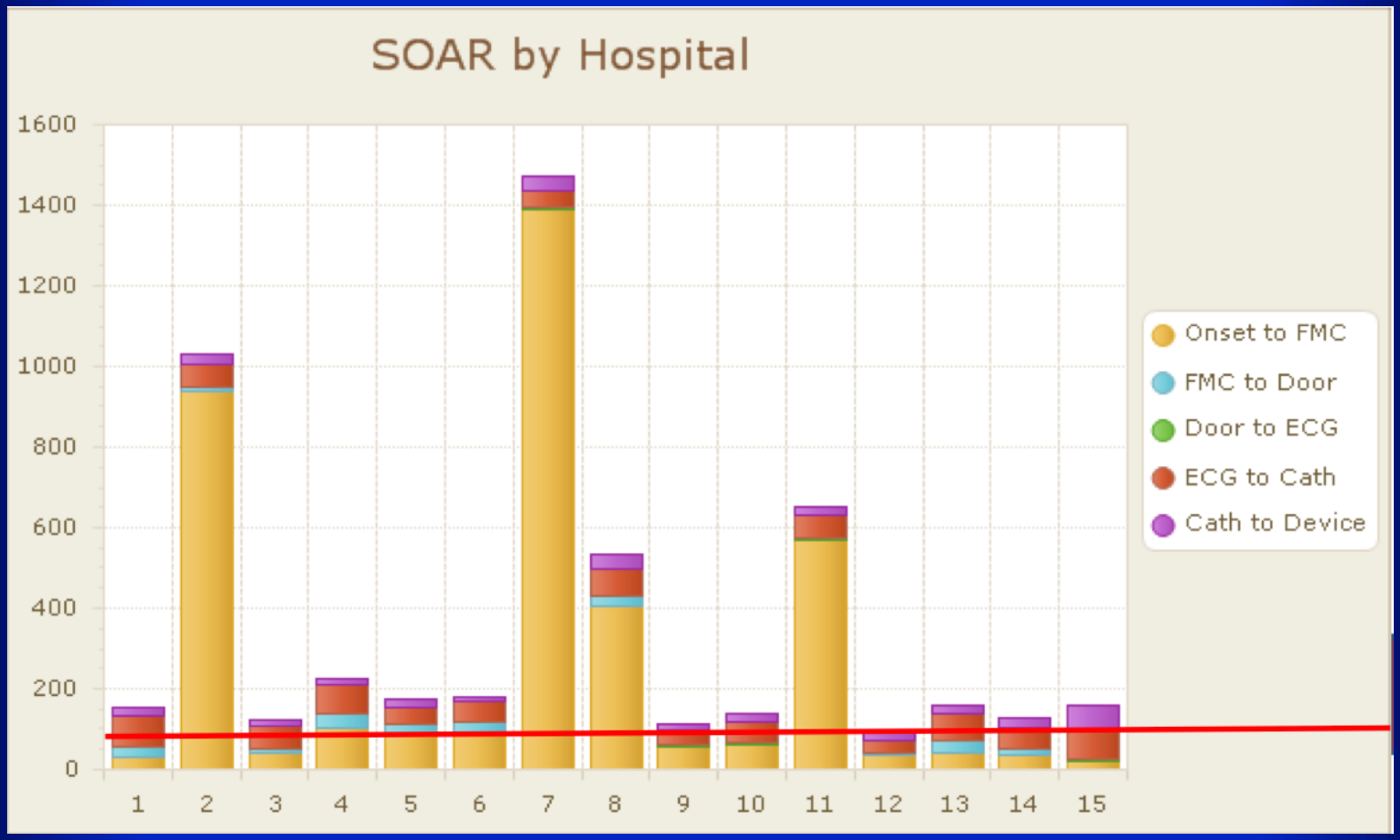
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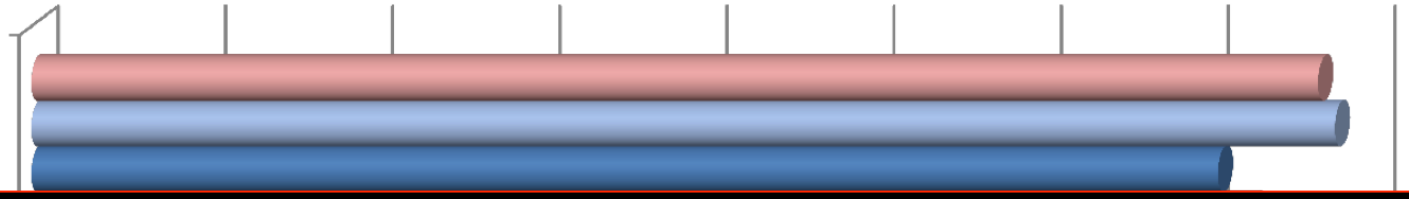
Onset to FMC
FMC to Door
Door to ECG
ECG to Cath
Cath to Device

Q3 2012Top 30 Best D2B - EMS=20 of 30 top performers

Hospital	EMS Agency	D2B	FMC2B	SOAR	Total EMS Time	Arrival Mode
Medical City Dallas Hospital	Dallas Fire/Rescue	21	41	191	NA	EMS
Baylor Medical Center at Garland	Missing	22	55	390	NA	EMS
Methodist Charlton Medical Center	Cedar Hill Fire Dept	24	50	243	NA	EMS
Baylor Jack and Jane Hamilton Heart and Vascular H	Private	30	82	112	NA	EMS
Methodist Richardson Medical Center		30	30	48	NA	Self/Walk In
Methodist Charlton Medical Center	DeSoto Fire Rescue	31	51	116	NA	EMS
Methodist Dallas Medical Center	Dallas Fire/Rescue	34	71	75	NA	EMS
Methodist Charlton Medical Center	Missing	35	55	95	NA	EMS
Baylor Jack and Jane Hamilton Heart and Vascular H	Dallas Fire/Rescue	35	65	102	NA	EMS
Methodist Charlton Medical Center	Duncanville Fire Dept	35	58	73	31	EMS
Baylor Jack and Jane Hamilton Heart and Vascular H	Private	36	91	270	NA	EMS
Baylor Jack and Jane Hamilton Heart and Vascular H	Dallas Fire/Rescue	38	71	97	NA	EMS
Baylor Jack and Jane Hamilton Heart and Vascular H	Dallas Fire/Rescue	39	73	375	NA	EMS

Condition	Q2 2012 D2B > 90 minutes N = 33	Q3 2012 D2B > 90 minutes N = 40
Shock	N=6 (18.2%)	N=7 (17.5%)
Heart Failure	N=2 (6.1%)	N=9 (22.5%)
CPR	N=6 (18.2%)	N=6 (15%)
Cocaine	N=1 (3.0%)	N=0 (0%)
Death	N= 2 (6.1%)	N=5 (12.5%)



Impact on D2B When Cath Lab is Activated by EMS Q4 2010 – Q3 2012

* *Notes: Primary PCI, non-transfer, STEMI only*

* *EMS Activation taken from NCDR form Aux3 field*

EMS Stats	Q4 2010	Q1 2011	Q2 2011	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2012
Median total EMS time for STEMI patients	-	29.5 minutes	31.0	30.0	29.0	28.5	29.0	27.0
Patients Arriving by EMS	42%	41%	40%	39% (51% STEMI)	41% (56% STEMI)	42% (51% STEMI)	41% (57% STEMI)	35% (50% STEMI)
% of Incident Run #'s entered by Hospitals	40%	58%	85%	97%	80%	84%	82%	94%
Suspected EMS Matches	10%	50%	100%	100%	100%	100%	50%	14%

- *Standard EMS and Hospital Protocols*
- *ALL Hospitals on Action Registry*
- *ALL EMS Data Reported*
- *Hospital and EMS Data Joined*

What Did We Do

- *EMS Activation of PCI Labs*
- *Rules of Procedure*
- *Two Annual Conferences*
- *Tracked our Outcomes*
- *Mortality down from 4.6 to 1.9%*

What Else Have We Learned?

- *You have to have staffing to maintain the project*
- *Some 50% of ACS patients will drive themselves or be driven to the hospital: This hasn't changed*
- *Public awareness is key to improving success*
- *We haven't measured the impact of reduced congestive heart failure morbidity and mortality*

Conclusions

- *You can do this*
- *You have to bring all the players to the table*
- *Get our “rules of procedure”*
- *Steal ideas freely*


?
www.rayfowler.com
www.gatheringofeagles.us