STEMI Care in the Network

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The Sanford Health Network

North Dakota

Minnesota

South Dakota

Nebraska
Sanford Tracy Medical Center
Sanford Tracy’s Emergency Room (ER)
Our Start

- Sanford promoted the development of the Chest Pain Network
Sanford Chest Pain Network

• Goals:
  – Improve mortality and morbidity for STEMI patients in the region
  – Improve the overall care provided to chest pain patients
  – Initiate a “System of Care” model by standardizing care and protocols so there is no delay in treatment.
STEMI Chain of Survival
Order Sets

- Algorhythm
- Chest Pain Initial Management
- “Hot Heart”
- Fibrinolytic Therapy
- Chest Pain Observation
- High Risk
Chest Pain Algorhythm
Case Study

- 70 year old male with pmh of severe PAD, TIA, dyslipidemia, mild cognitive decline, HTN and DJD who is BIBA with declining mental status at 7:10 AM.
- Initial ER VS (7:15 AM)
  - BP: 90/70 mmHg in right arm, 105/75 mmHg in left arm.
  - HR: 110/min (on a b-blocker)
  - RR: 20/min, afebrile.
- 2 PIV’s placed, undressed, and cardiac monitor leads applied.
• Cardiac monitor shows NSR, tachycardiac.
• **PMH:** PAD, HTN, TIA, MCD and DJD
• **SH:** Smoker, 20 cigs/day, Socially drinks, no illicit drug abuse, no risk factors for HIV. Lives with wife in town. Retired farmer.
• **FH:** Do we care with the above mentioned vasculopathy?
• **ALLERGIES:** NKDA
MEDICATIONS:

1- Amlodipine 10 mg daily
2- Metoprolol tartrate 100 mg BID
3- ASA EC 81 mg daily
4- Rosuvastatin 20 mg QHS
5- Ibuprofen OTC PRN
6- Vitamin D3 1000 I.U. daily
7- Stool softener daily
8- Fish oil 1000 mg BID
9- Multivitamin daily
• **ROS:** A comprehensive ROS could not be performed due to AMS, most of the hx is obtained from wife.
Physical Examination

- 100/68 mmHg, HR: 110/min, RR: 24/min, T: 99 F

Gen: Somnolent, but easily arousable, drifts back to sleep, NAD, oriented to self, but not to date, time, place or situation

HEENT: PERRL, OP moist

Neck: Supple, JVD to 8 cm H20, no neck stiffness

Heart: Regular rhythm, tachycardiac. Hard to discern an obvious murmur due to the rate. No gallops or rubs

Chest: Bilateral bibasilar faint crackles

Abdomen: Soft, NT, no obvious hepatojugular reflux. BS+

Skin: diaphoretic

Vascular: Faint dorsalis pedis and popliteal pulses. 1+ bilateral symmetric pitting edema up to thighs
LABS:

142 102 48
-----I-------I--------
4.9 18 2.2

14.8 13 4,60,000

BNP: 3200
TSH: 2.6
Magnesium: 1.4
Troponin I (1st):
Troponin I (1st): <0.04
UA: 4-5 RBC’s, casts
Blood cx X 2, drawn

IMAGING:

Head CT: SVID
EKG: non-specific St-t wave changes lateral leads, tachycardiac, regular rhythm
CXR: increased pulmonary vasculature markings
• DDX: TIA/CVA, infection causing AMS, Drug abuse (OD?), ACS, dissection (hypotension) and others.

• PATIENT IS NOW ADMITTED TO ACUTE BED.

• Serial troponins ordered, 1st troponin (8:35 AM): < 0.04
• 2nd troponin (12:50): 1.8, EKG obtained at this time, pretty much unchanged. I was thinking this is likely type 2 MI in the setting of acute stress (infection, tachycardia and likely underlying CAD, has PAD=coronary equivalent?)
• BP stabilized, Lasix 40 mg IV given given cardio-renal component (....my thought process)
• At around 2:30 PM, nurse calls me that patient is suddenly bradycardiac in the 30’s, hypotensive again and worsened AMS.
• STAT EKG obtained, showed huge ST-T wave depressions anterior-lateral leads, troponin obtained and now 3.6
• Gave heparin bolus and heparinized, no complains of chest pain what so ever, TIMI score of 4
• Went into A-fib post- full blown NSTEMI, started on esmolol drip, given hypotension.
• BP stabilized within 10 mins.
• Called Sanford, who graciously accepted patient, air-lifted and within 1 hour 15 mins, was in the cath-lab, found to have severe 3 vessel CAD, CABG performed.
Universal Definition- ACS

Troponin > 99th centile of reference range
   – (Locally agreed at Trop T > 0.1)

PLUS:
• Ischaemic symptoms
• ECG changes
• Regional wall motion abnormality
• Loss of viable myocardium on imaging

Acute coronary syndrome — The term acute coronary syndrome (ACS) is applied to patients in whom there is a suspicion of myocardial ischemia. There are three types of ACS: ST elevation (formerly Q-wave) MI (STEMI), non-ST elevation (formerly non-Q wave) MI (NSTEMI), and unstable angina (UA). The first two are characterized by a typical rise and/or fall in biomarkers of myocyte injury
Challenges to Chest Pain Care in the Sanford Tracy Region
Challenges

• Geography of the region/distance
• Weather
• Transport by air/ground
• Minimal Staffing
• Pharmacy coverage
• Timely EKG (5 min.)
• Timing of TNK-Ase (30 min.)
Challenge #1

• Geography of the region
Challenge #2

• Weather Challenges
Challenge #3

- Transport by air/ground
Challenge #4

- Minimal staffing at a rural facility
  - Nursing
  - Providers
  - Lab
  - X-Ray
  - Registration
Challenge #5

- Pharmacy Coverage
Challenge #6

• Timely EKG (5 min.)
Challenge #7

• Timing of TNK-Ase (30 min.)
Improvements

- Tele ED
- New EKG machine
- EKG’s in ambulance (SD)
Quality Outcomes

• Sanford Chest Pain Network
  – All STEMI cases are reviewed by the Medical Director and Chest Pain Team
    • Physicians (ER, Cardiologists)
    • Representation from all SMC Cardiac Units, Quality Department and from Sanford Health Network
  – Letters are generated to referring ED physicians, primary care physicians and EMS
    • Contains case data
  – STEMI D2B Feedback Form to all departments associated with this patient's care (referring hospital, administration)
### Hot Heart D2b Feedback

<table>
<thead>
<tr>
<th>Date:</th>
<th></th>
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<tbody>
<tr>
<td>Referral PCP Name:</td>
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<tr>
<td>Referring Facility:</td>
<td></td>
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<tr>
<td>Sanford ED Physicians Name:</td>
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<tr>
<td>Arrival Time to Referring Facility ER:</td>
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<tr>
<td>Time Left Referring Facility ER:</td>
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<tr>
<td>Arrival Time to SMC:</td>
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<tr>
<td>Door to ECG (First EKG):</td>
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<tr>
<td>Lytic Therapy (within 30 min of arrival)</td>
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<td>Door to Cath Lab:</td>
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<td>Door to Balloon:</td>
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Quality Outcomes

• Processes have been changed
  – Initiated standard Chest Pain Order set to 36 Network Facilities (Sanford and Independent Hospitals)
  – Instead of on-call person getting 1st EKG all RNs have been trained to obtain upon pt arrival to ED within 10 minutes
  – New core group of ER Managers for Sanford Health Network
  – SIM training available to all Sanford Network Sites
  – Physician to Physician and Staff Training
  – SharePoint site for connection to all Sanford Health Affiliates
Non-STEMI

Encounters
Avg Time At
Outside Facility
Avg Door To
ECG
Went To
Cath Lab
% Went To
Cath Lab
Avg Outside Fac Door To Cath Lab
Avg SMC Door To Cath Lab
Avg Outside Fac Door To Balloon
Avg SMC Door To Balloon

Tracy
Other Sanford
Other Not Sanford
STEMI Program Based On

- Time is muscle!
- Best practice model
- Standardized protocol
- Early recognition of STEMI
  - Pre-hospital EMS
  - Non PCI Hospital—Emergency Department
  - PCI Receiving Center
The resources provided by Sanford are significant and alignment with Sanford protocols will only prove a great benefit in our provision of patient-centered care.
Teamwork = Success

Teamwork has produced a successful initiative that we believe could be the basis for saving lives and lifestyles.
Questions
Thank You

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