The Development of the Heart 1
Regional Network

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Heart Center Cardiology

To improve the health of those we serve in a spirit of love and compassion
The Development Process

- Long
- Champions
- Small steps
- Uniform yet Unique
- Measurable Outcomes
- Feedback
- Easy
- 2001
  - Disparity of care
  - Lack of uniformity
- 2005
  - Virtual Chest Pain Unit concept
  - Track system
- 2006
  - ACC D2B Initiative
- 2008
  - Heart 1 Network
  - OR ACC STEMI Summit
- 2010
  - Monthly H1 QI Meetings
Champions

- Representative from each involved specialty
  - EMS
  - Airlink
  - ER
  - Nursing
  - Cardiology
  - Interventional Cardiology
  - Administration
  - Local and Referral
Small Steps

- Standardized protocols
Track 1
STEMI

STEMI confirmed by ECG and ED review

CP < 12°

YES
NO

Consult Interventional Cardiologist

CP/ACS evaluation

Activate HEART 1 > 800-461-6049

- O2 2L/nas
- ASA 81 mg x 4 po
- IV insertion x 2
- CBC, Chem 8, PT/PTT, TROTONIN
- MS04 2-4 mg IV q 15 min pm
- NTG 0.4 mg SL/spray x 3
  followed by IV gtt
- Do not give SBP < 90 or 30 mmHg below baseline, HR < 50, > 100, suspected RV involvement, SILD/NAFIL within 24 hrs,
  TAIPA/AFIL within 48°
- METOPROLOL 25-50 mg po within first 24° in absence of contraindications
- METOPROLOL 5 mg IV x 3 if hypertension is present and in absence of contraindications
- Do not give if CHF, low output state, risk for cardiogenic shock (HR > 100, SBP < 100, age > 75), advanced conduction disease, asthma/RAD
- HEPARIN 60U/kg IV bolus; consider lower dose for age > 75, known renal insufficiency

Cath Lab available with D2B = 90 min

YES
NO

Contraindications to Fibrinolysis

- INTEGRILIN 180 ug IV bolus x 2
- HEPARIN 12U/kg IV gtt
- CLOPIDOGRREL 300 mg po
  75 mg age ≥ 75
- TNK
  30 mg < kg
  35 mg 60 kg
  40 mg 70-79 kg
  45 mg 80-89 kg
  50 mg 90 and > kg

Transfer to St. Charles Bend Emergently
Track 2
NSTEMI

ECG with ST depression > 1.0mm

OR
Elevated troponin I > 0.04 with Definite or Crescendo Angina,

OR
Prolonged > 30 min ongoing Definite Angina,

OR
Definite Angina with CHF, hypotension, worsening MR, VT

Outcome Pathway:

- Angina Resolved
  - NO: Consult interventional cardiologist
  - YES: NO

- Hemodynamically stable
  - NO: Admit to ICU/Cardiology Service
  - YES: PCP Coverage

- PCP Coverage
  - NO: Admit or transfer to Hospitalist Service
  - YES: Medical Therapy
    - NO: Consider cardiology consultation
    - YES: Admit or transfer to PCP Service

- Medical Therapy
**Track 3**
**Probable ACS**

- **Known Atherosclerosis, DM,**
  - **OR**
    - Age > 70
    - Prolonged Definite Angina, resolved,
  - **OR**
    - Atypical angina with known CAD,
  - **AND**
    - No new ECG changes,
    - Troponin not > 0.04

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**Initiate O2, ASA, MS4, BB, NTG Lovenox 1.0 mg/kg SQ**

1. **Stress test** immediately available after evaluation completed or within 48h
   - **YES**
     - Evaluate in ED
     - Serial ECGs q15–30 min. Serial Troponin:
       - Initial Troponin < 6" p onset of CP; obtain second Troponin at least 8" p onset of CP
       - Initial Troponin > 6" p onset of CP; obtain second Troponin 8–12" p onset of CP
   - **NO**
     - Admit to telemetry, PCP or Hospitalist Service
     - **Serial ECG Changes:**
       - ST Depression, deep T wave inversions or Troponin > 0.04

2. **High Risk Result?**
   - **YES**
     - Stress test prior to DC or within 48h
   - **NO**
     - FU PCP

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**ADMIT Go to Track 2**
Track 4
Possible Unstable Angina

No Known CAD, BUT Risk Factors Present, AND Atypical CP, BUT No ECG changes, Troponin not > 0.04

Initiate O2, ASA, M304

Serial ECGs q15–30 min. Serial Troponin:
- Initial Troponin < 0.04 p onset of CP; obtain second Troponin at least 8" p onset of CP
- Initial Troponin > 0.04 p onset of CP; obtain second Troponin 8–12" p onset of CP

Serial EKG Changes:
- YES: ST Depression, deep T wave inversions or Troponin > 0.04
  - ADMIT Go to Track 2
- NO: Discharge, Stress Test within 72 hrs F/U PCP
Small Steps

- One call activation
  - ER activation
  - Bypass non-interventional cardiologist
  - Assume acceptance of patient
- Infield activation/ Bypass local EDs
  - EMS transmission vs permission
  - EMS ECG training
- Identify system delays
  - Synchronize clocks
  - Transfer times
    - iv pumps
    - Loading
- Identify best practices
  - Beg, Borrow, steal
  - STEMI toolbox
  - Check lists
Uniform yet Unique

- Uniform protocols for each specific referral area
  - PCI D2B < 90”
  - Lytics and transfer protocols for D2B > 90”
Measurable Outcomes

- NCDR
  - Cath PCI Registry
Feedback

- Weekly review
- Scorecards
- Monthly QI meetings
  - Teleconference for referral hospitals
- Public education
  - Radio spots
  - TV commercials
Easy
Onset of Pain to Reperfusion All Primary PCI for STEMI Admits (SCHS-Bend primary admits + transfer patients)

- Q3-08: n=23, Median Minutes: 233, Average Minutes: 261
- Q4-08: n=23, Median Minutes: 261, Average Minutes: 243
- Q1-09: n=22, Median Minutes: 243, Average Minutes: 244
- Q2-09: n=25, Median Minutes: 309, Average Minutes: 309
- Q3-09: n=29, Median Minutes: 377, Average Minutes: 377
- Q4-09: n=30, Median Minutes: 256, Average Minutes: 256
- Q1-10: n=23, Median Minutes: 221, Average Minutes: 221
- Q2-10: n=14, Median Minutes: 169, Average Minutes: 169
Transfer Hospital ED to Reperfusion

![Graph showing transfer times from ED to reperfusion for different quarters and years, with average and median minutes represented.](image-url)