Clinical Decision Support EMR Integration: the Path to the HEART Pathway

Simon A. Mahler MD, MS
Director of Clinical Research
Associate Professor
Department of Emergency Medicine
Wake Forest School of Medicine
Disclosures

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- Duke Endowment
- Abbott Laboratories
- Siemens Healthcare
- Roche Diagnostics

Author for Up-to-Date

Chief Medical Officer: Impathiq, Inc.
The HEART Pathway Story

- Clinical Problem
- Evidenced Based Solution
- EMR Integration
- Scalable solution
How to go from EBM to EMR???

• Validated Tool
  • Research
  • Guidelines

• EMR Integration
  • Point of Care
  • Fits Work Flow
  • Clinical Decision Support
Clinical Problem

Start

Finish
Staggering Chest Pain Numbers

> 8 M
ED Chest Pain Visits

> 50%
Patients Admitted

$13 B
Chest Pain Evaluation

< 10%
Diagnosed with ACS

2-4%
Missed ACS

U.S., per year
Negative impact of over and under triage

Crowding

False-positive and non-diagnostic tests

Increased cost

Increased malpractice risk

Not patient-centered
How can we increase the value of emergency chest pain care?

More accurate risk stratification:

Identify patients unlikely to benefit from hospitalization or stress testing/cardiac imaging for early discharge

Focus hospitalization and stress testing/cardiac imaging on patients likely to benefit
Evidence-Based Solution
HEART Pathway Care Algorithm

ADP version of the HEART score

- Low risk = HEAR(t) score: 0-3
- Negative serial troponins
- No ischemic ECG changes
- No known CAD (prior AMI, revascularization, >70% coronary stenosis)

Mahler et al, Crit Path Cardiol, 2011
Mahler et. al, Int J Cardiol, 2013
Mahler et al, JMIR, 2016
Results

HEART Pathway increased the early discharge rate by 21% ($p=0.0002$).

Decreased median length of stay by 12 hours ($p=0.013$).

No adverse events in low-risk group

Mahler et. al, Crit Path Cardiol, 2011
EMR Integration
HEART Pathway Implementation

Donaghue Foundation Award 9/2013

Goals:

- Make HEART Pathway the standard risk stratification method
- Fully integrate HEART Pathway into EMR

Multidisciplinary collaboration

- EM, IM, FM, Hospitalists, Cardiology
HEART Pathway EMR Integration

- Decision support integrated into EMR on 11/3/2014
Decision Support

Your patient has a **LOW RISK** HEAR score. Please obtain serial troponins at 0 and 3 hours. **If serial troponins are negative,** the HEART Pathway recommends discharge from the ED without stress testing or angiography.

Your patient is **AT RISK** for ACS! Further cardiac evaluation including serial troponins and stress testing or angiography is recommended.

The patient is **low risk** by the HEART Pathway - consider discharge. Go To ED MD Discharge.
## Tracking Adherence

### Weekly reports

### Corrective education

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HEART Pathway: Wake Forest Experience

Demonstrated efficacy

High provider adoption

Reductions in healthcare utilization outcomes

<1% adverse event rate among Low-Risk patients
Scalable Solutions
HEART Pathway Mobile App

- FREE download
- iTunes App Store
- Soft launch April 2016

impathiq.com
Mobile App: Landing Page

HEART Pathway®
Clinical Decision Support

The HEART Pathway should not be used for patients with:

- STEMI
- ischemic ECG changes
- coronary artery disease
Mobile App: Data Entry

Select the patient’s symptoms:

- middle or left sided
- pinpoint/well localized
- heavy, pressure, or tightness
- sharp
- worse with exertion
- relieved by nitroglycerin
- radiation to arms/jaw/neck
- nausea or vomiting
- diaphoresis
- none of the above

Continue
Mobile App: Results Screen

3
HEAR Score

LOW
Risk of MACE within 30 days

Troponin at 0 and 3 hours recommended. If negative, discharge without stress testing or angiography. This guideline is not meant to replace clinical judgement.

History

NO  Pain is NOT middle- or left-sided
SMART FHIR EMR Integration

Web based applications

Read and Write Capabilities

Less IT resource intensive

Better User Interface
EMR App Stores
HEART Pathway is a clinically validated decision support tool that improves health outcomes and reduces unnecessary healthcare costs for patients presenting to the Emergency Room with chest pain. Built on IMPATHIQ's IQ Engine, which enables health systems to easily implement clinical decision tools into their EMRs, the HEART Pathway app standardizes care across hospitals, improves clinician adherence to protocols, and provides robust auditing and compliance tools.

About this App

https://www.heartpathwayapp.com

HEART Pathway is designed for more accurate risk stratification of patients who present to the Emergency Room with chest pain, identifying patients unlikely to benefit from hospitalization or stress testing/cardiac imaging who can safely be discharged home from the ED. The underlying algorithm, validation testing and randomized control trials for HEART Pathway are the result of several years’ clinical research and informatics conducted by researchers at Wake Forest School of Medicine.

Studies have demonstrated the benefits of HEART Pathway compared to usual care. Improved hospital and patient outcomes with HEART Pathway are demonstrated in a published randomized control trial (Mahler et al., Circ CVQO J, 2015). For patients presenting to the Emergency Room, HEART Pathway has shown to reduce patient length of stay by 12 hours, reduce cost by 14% per patient, and provide accurate decision support with a miss rate of acute cardiac events over a 30 day window at < 1%.
SMART FHIR App

HEART Pathway

Select patient's symptoms:

- Middle Or Left Sided
- Pinpoint/Well Localized
- Heavy, Pressure, Or Tightness
- Sharp
- Worse With Exertion

Next
HEART Pathway+

Results and Recommendations

Hear Score

3
Low Risk

Recommendation: Your patient has a LOW RISK HEAR score. Please obtain serial troponins at 0 and 3 hours. If serial troponins are negative, the HEART Pathway recommends discharge from the ED without stress testing or angiography.

Clinical Data

The following are present
Click the x to remove it.

- middle or left sided
- sharp
- over 64

The following are absent
Click the + to add it.

- heavy, pressure, or tightness
- relieved by nitroglycerin
- nausea or vomiting
- prior stroke
- smoking in last 90 days
- FH of CAD (1st relative < 55)
- hypercholesterolemia
- nonspecific T-wave changes
- bundle branch blocks
- left ventricular hypertrophy
- digoxin effect

- pinpoint/well localized
- BMI ≥ 30 kg/m²

- worse with exertion
- radiation to arms/jaw/neck
- diaphoresis
- peripheral artery disease
- currently treated diabetes
- hypertension
- repolarization abnormalities
- nonspecific ST changes
- pacemaker rhythms
- early repolarization

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Summary

- Implementing in EMR works within the provider's workflow and is associated with high adherence.
- EMR integration of the HEART Pathway is associated with decreased hospital resource utilization without compromising safety.
- HEART Pathway Apps offer are a scalable IT solution for EMR integration.
THANK YOU!