



Tomorrow's Doctors, Tomorrow's Cures®

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

Learn

Serve

Lead

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Association of
American Medical Colleges

Disclosures

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Author for Up-to-Date

Chief Medical Officer: Impathiq, Inc.

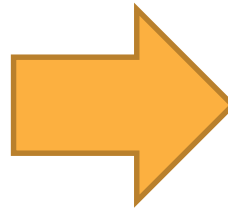
The HEART Pathway Story



- Clinical Problem
- Evidenced Based Solution
- EMR Integration
- Scalable solution

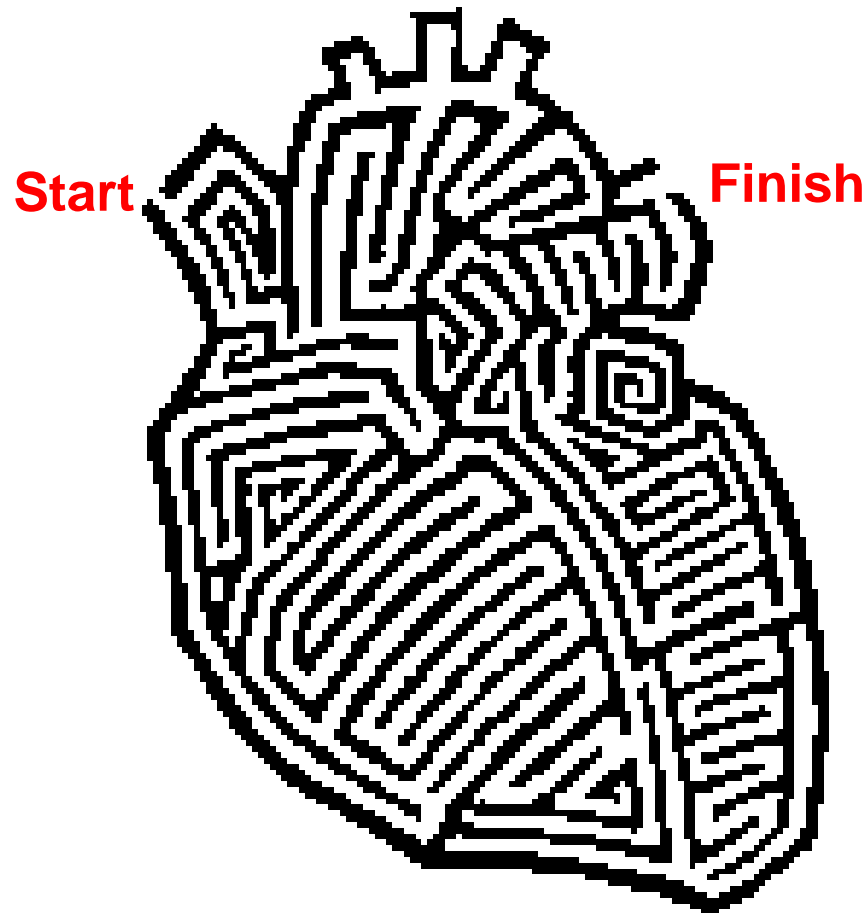


How to go from EBM to EMR???

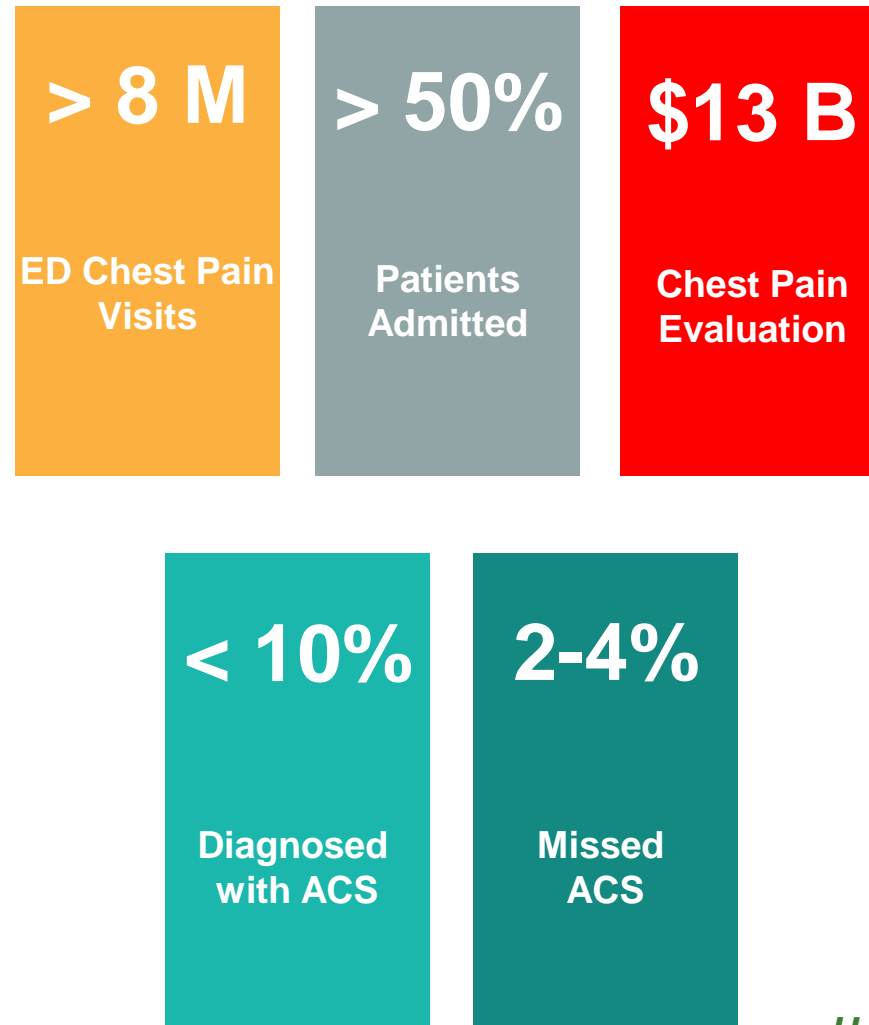


- **Validated Tool**
 - Research
 - Guidelines
- **EMR Integration**
 - Point of Care
 - Fits Work Flow
 - Clinical Decision Support

Clinical Problem



Staggering Chest Pain Numbers



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?

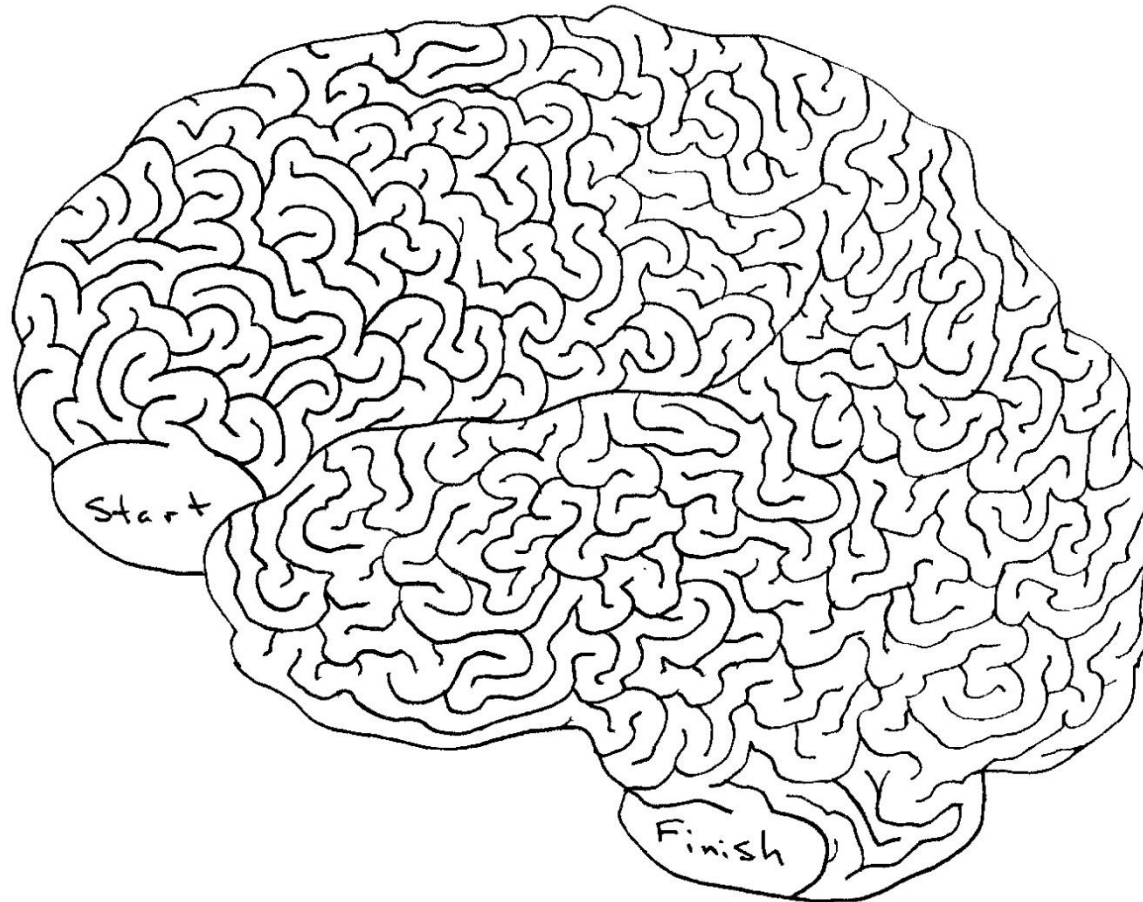
More accurate risk stratification:

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



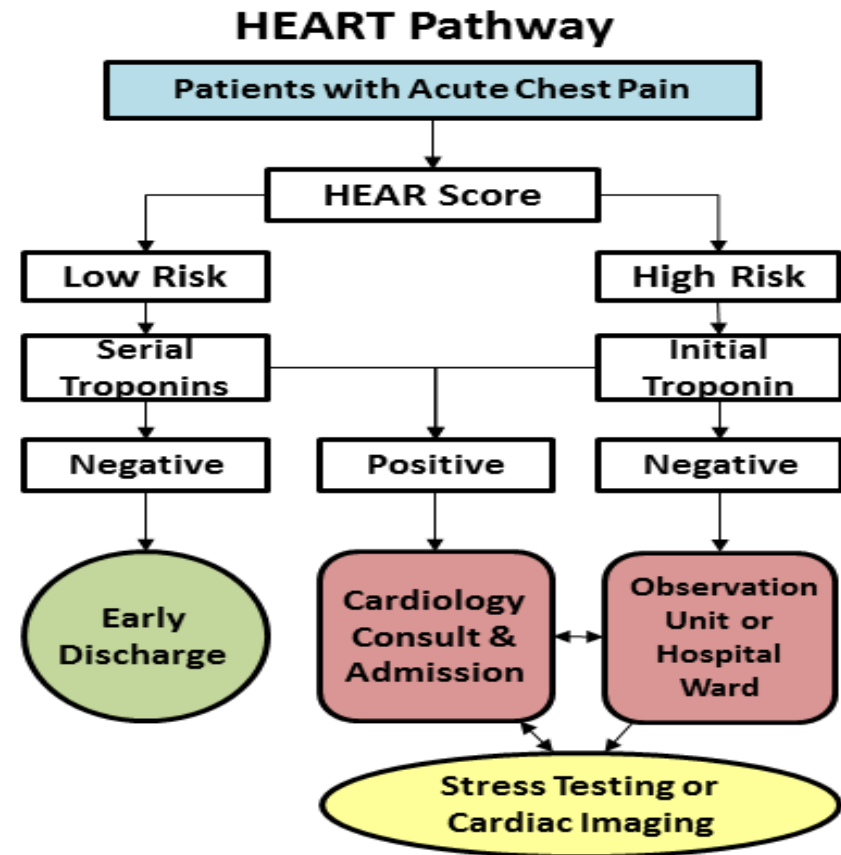
Evidence-Based Solution



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, Circ CVQO J, 2015.

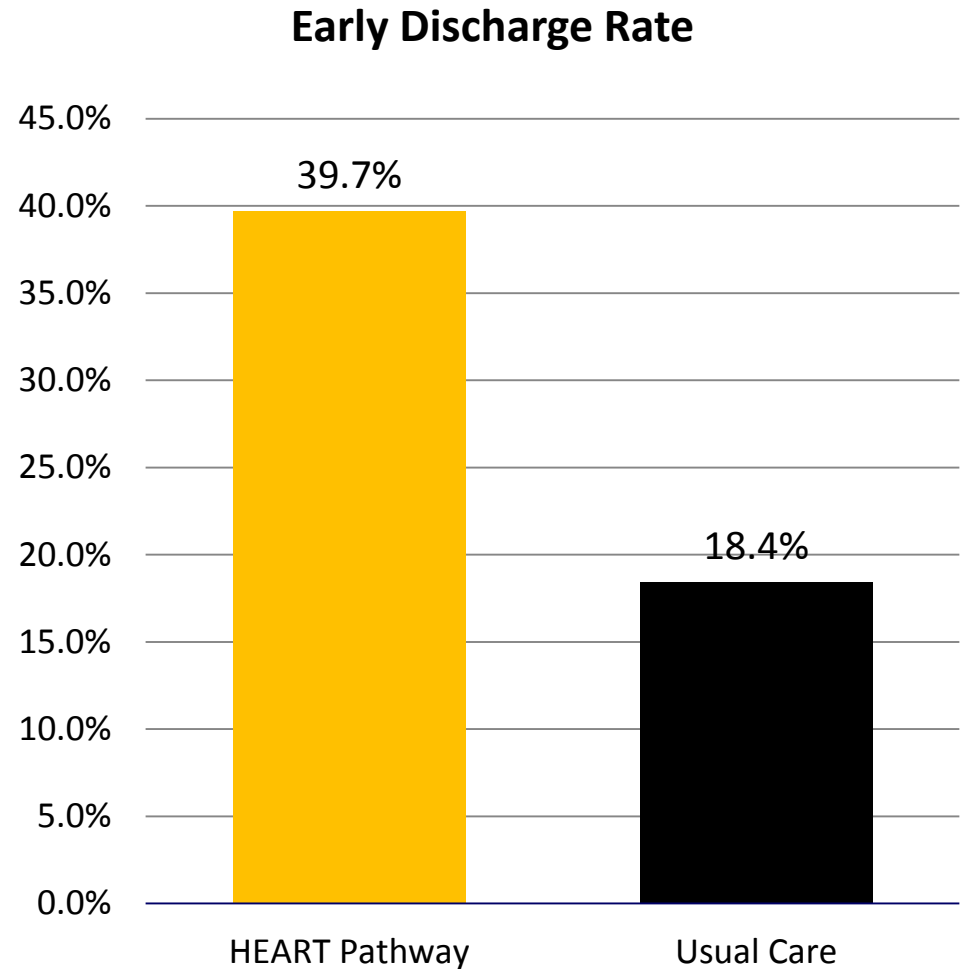
Mahler et al, JMIR, 2016

Results

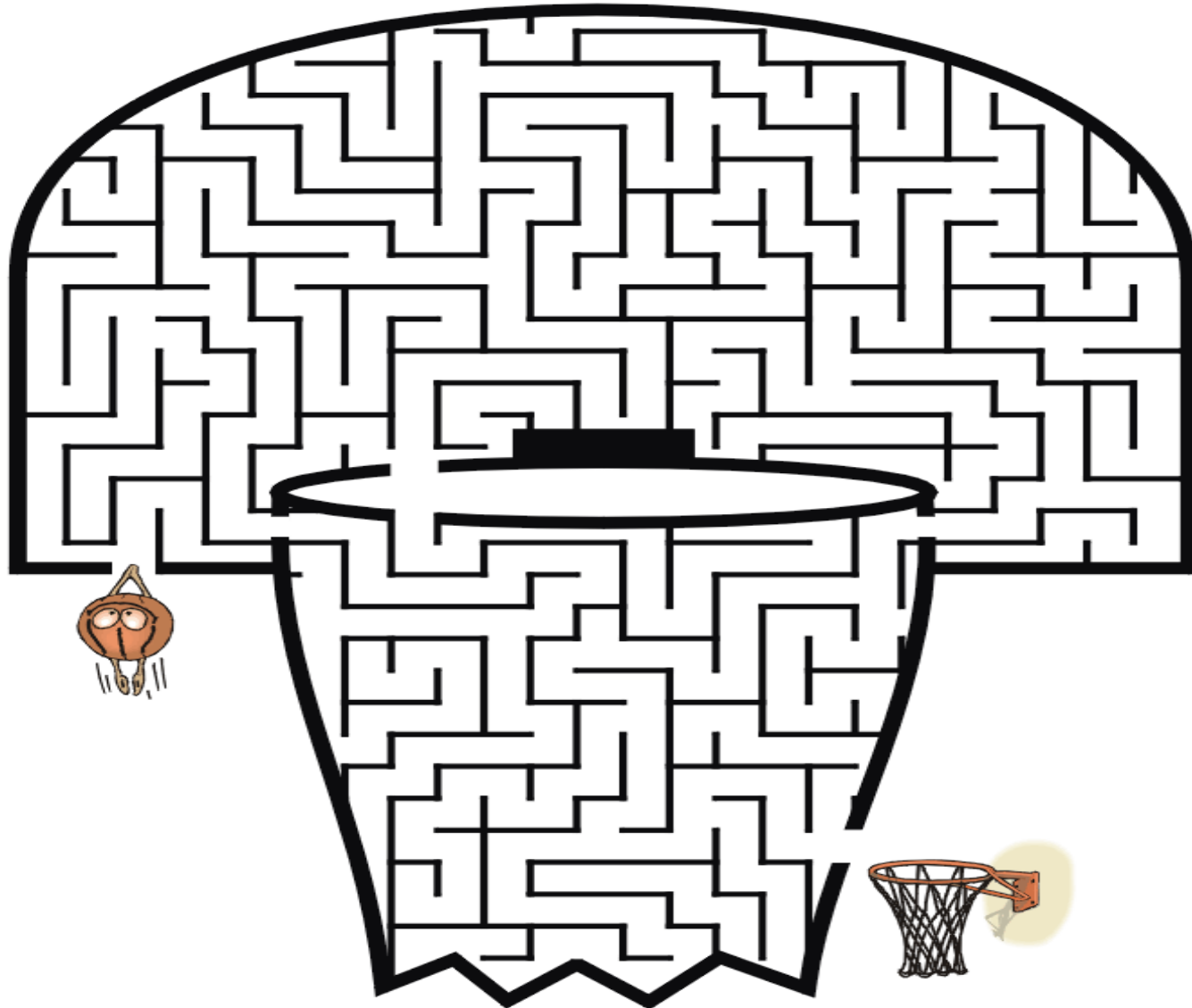
HEART Pathway increased the early discharge rate by 21% ($p=0.0002$).

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

No adverse events in low-risk group



EMR Integration



HEART Pathway Implementation

Donaghue Foundation Award 9/2013

Goals:

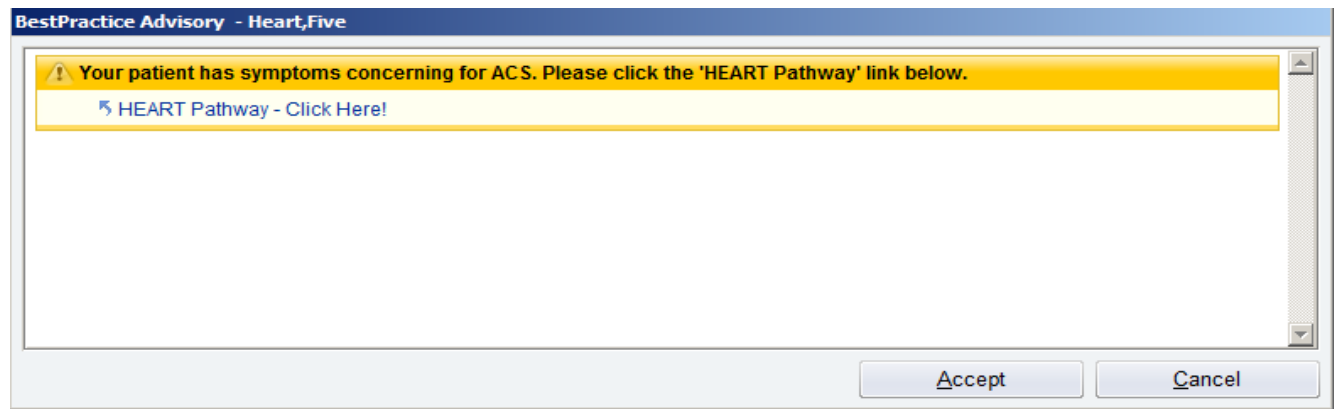
- Make HEART Pathway the standard risk stratification method
- Fully integrate HEART Pathway into EMR

Multidisciplinary collaboration

- EM, IM, FM, Hospitalists, Cardiology

HEART Pathway EMR Integration

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



Decision Support

History

Location of pain is middle or left sided. ☐ 1=Yes ☐ 0=No

The pain is pinpoint/well localized. ☐ 1=Yes ☐ 0=No

The pain is described as heavy, pressure, or tightness. ☐ 1=Yes ☐ 0=No

The pain is described as sharp. ☐ 0=Yes ☐ 1=No

The pain worsens with exertion. ☐ 1=Yes ☐ 0=No

The patient has relief from nitroglycerin. ☐ 1=Yes ☐ 0=No

The patient has pain radiation to the arms, jaw, or neck. ☐ 1=Yes ☐ 0=No

The patient has ☐ 1=Yes ☐ 0=No

Patient Age - Select appropriate range. ☐ 2=Greater than or equal to 65 ☐ 1=46 to 64 ☐ 0=Less than or equal to 45

Risk Factors

Known CAD ☐ 3=Yes ☐ 0=No

HEAR Score Total

HEAR Score

F9 F7 F8

normal?

Patient Age - Reference Age in the Header

Alerts:

- 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

Date, Time		--	--	Provider
11/3/14 1707		--	--	BRYAN
11/4/14 0733		--	--	JON
11/4/14 1027		--	--	JULIE
11/5/14 0835		--	--	ROBERT
11/5/14 1117		--	--	AARON
11/5/14 1021	No Action Taken	--	--	REBECCA
11/5/14 0746		--	--	JOHN
11/5/14 1442		--	--	SCOTT
11/6/14 1034		--	--	MATT
11/6/14 1122		--	--	DEREK
11/6/14 1912		--	--	DEREK

HEART Pathway: Wake Forest Experience

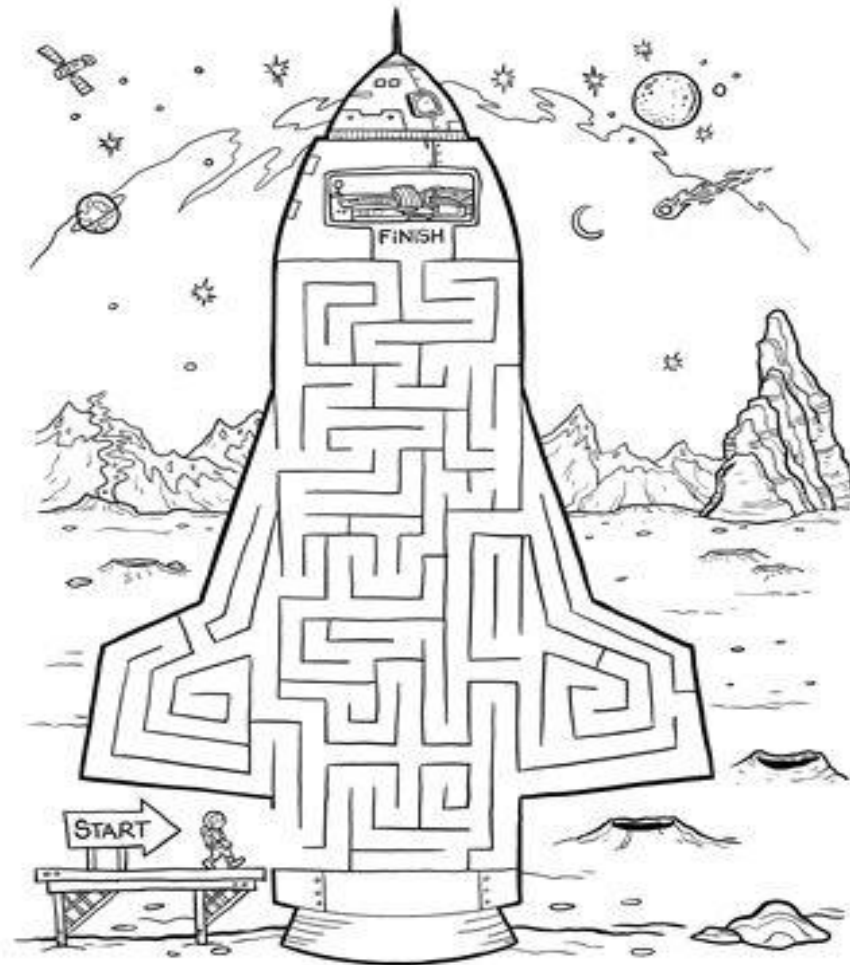
Demonstrated efficacy

High provider adoption

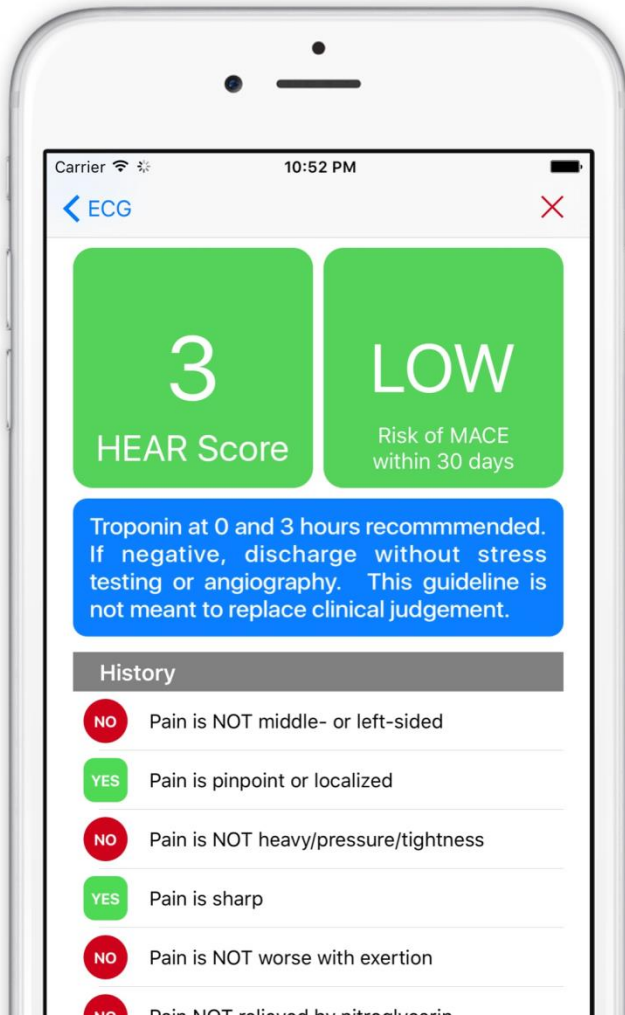
Reductions in healthcare utilization outcomes

<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

Cancel

OK

Mobile App: Data Entry

◀ Back



HEART Pathway®
Clinical Decision Support

✕ Start Over

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

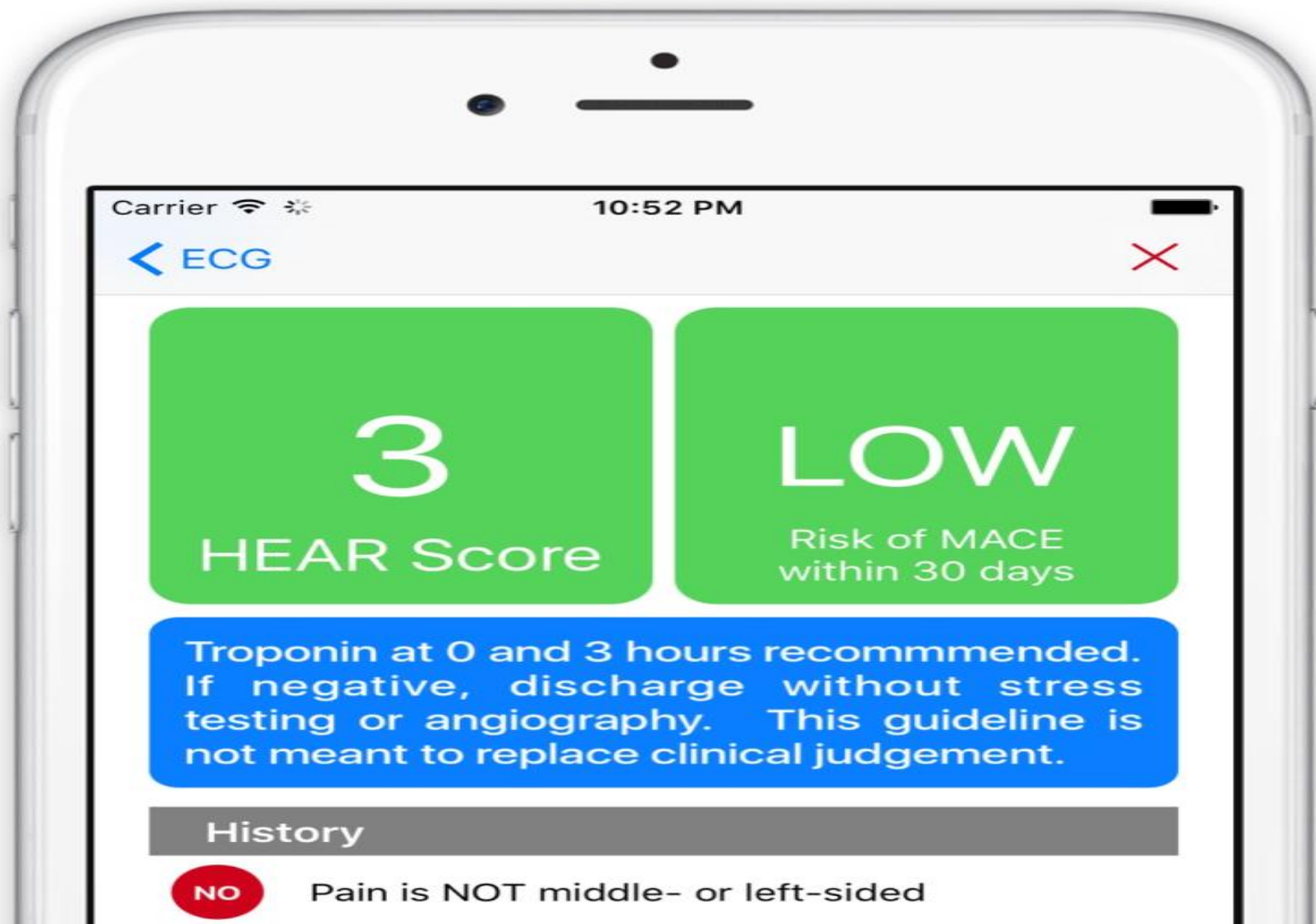
nausea or vomiting

diaphoresis

none of the above

Continue

Mobile App: Results Screen



SMART FHIR EMR Integration

Web based applications

Read and Write
Capabilities

Less IT resource
intensive

Better User Interface



EMR App Stores



EPIC APP Orchard



Explore Apps

Login ▾

← Back to apps



HEART Pathway

Version 1.0

Functional Areas

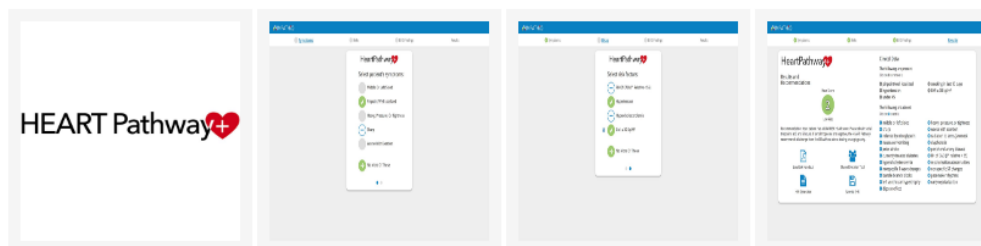
♥ Patient Care

Epic Versions

✓ Epic 2015 ✓ Epic 2017

Login

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

SMART FHIR App: Results Page

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.



Low Risk Handout



HPI Generator



Shared Decision Tool



Save to EHR

Clinical Data

The following are present

Click the - to remove it.

- middle or left sided
- sharp
- over 64

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

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 (1° relative < 55)
- + hypercholesterolemia
- + nonspecific T-wave changes
- + bundle branch blocks
- + left ventricular hypertrophy
- + digoxin effect

- + 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

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!