



more
DISRUPTION
please



CODE RED
ACEP Emergency Medicine Hackathon

2015 hackathon

#MDPhack

@athenaMDP

@ACEPBoston

mdphackathon.com

Wireless: ah-visitor / thereisabetterway



Saturday, October 26th

9:00 AM	Breakfast at athena's Watertown offices
10:00 AM	Hackathon Kickoff presentations
11:00 AM	Problem Pitches from participants
11:45 AM	Teams form and hacking begins
12:30 PM	Lunch
4:00 PM	Deadline for teams to submit team names and participants
7:00 PM	Dinner
11:00 PM	End of Day 1

#MDPhack
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Sunday, October 25th

8:30 AM

Breakfast

12:00 PM

Lunch

1:00 PM

Deadline for teams to submit presentations - **PDFs**

2-4 PM

Team presentations – “Pitchfest”

4-4:30PM

Judges deliberate

4:30 PM

Winners announced and closing remarks

5:00 PM

Wrap up

#MDPhack
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Speakers



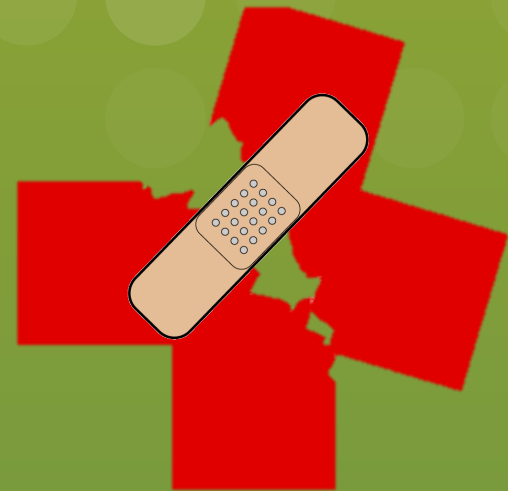
Adam Wolfberg, MD
*Director, Clinical Effectiveness
athenahealth*



Jason Shapiro, MD, FACEP
*Associate Professor of Emergency Medicine
Program Co-director, Master of Science in Biomedical
Informatics
Icahn School of Medicine at Mount Sinai*

*Chair-elect, Emergency Medicine Informatics Section
American College of Emergency Physicians*

Why are we
here?





From the
physicians office



1820

EMERGENCY
ROOM WAITING

SALA DE
EMERGENCIA
ESPERA

To the
emergency room



• **136.3M**
annual emergency room
visits

• **30%**
of healthcare spending
associated with
unnecessary tests or
care

• **#43** ↓
USA rank in global
life expectancy

Who we are


We are teachers and learners in it for the mission

We get there with humor, caring, and respect for each other

Curiosity & innovation are at our core

We expect candor, openness, and unity

We are committed to greatness

- 72,000+ providers on athenaNet®
- Clients ranging from 1 to 5,000+ providers
- 50 states and 112 medical specialties
- \$14 billion in client collections per year
-  Acquired Epocrates March, 2013
- Acquired RazorInsights & WebOMR, January 2015



2014 Best in KLAS



#1

Practice Management System

(1-10, 11-75 physicians)

#2

Practice Management System

(over 75 physicians)

#2

EHR

(over 75 physicians)

#2

Patient Portal

#2

Overall Physician Practice Vendor

**MDP is
athena's way
of investing in
solutions,
however they
might come**

More Disruption Please Program

Network

- The network consists of innovative thinkers, entrepreneurs, and startups with a shared mission to improve the state of health care
- We bring this network together through conferences, hackathons, and other events to encourage thought leadership and collaboration across the continuum of care

Marketplace

- Disruptive health IT solutions that are beta tested and integrated with athenaNet are displayed on our Marketplace
- athena's 64,000+ providers shop on the Marketplace for solutions that cater to the needs of their practice

Accelerator

- A program for early-stage, high-potential startups for joint ventures with larger companies
- athena invests in portfolio companies and provides them with access to the resources and APIs critical to their scalability and success

MDP is growing with 70+ partners
and 20+ capabilities



more
DISRUPTION
please



**Problems in
healthcare
take many,
many forms**

Background

There are many data points on patients, and providers are looking for CDS to aid them when making important decisions.

Problem

Providers need solutions to connect the dots for them and provide up to date alerts when managing care plans

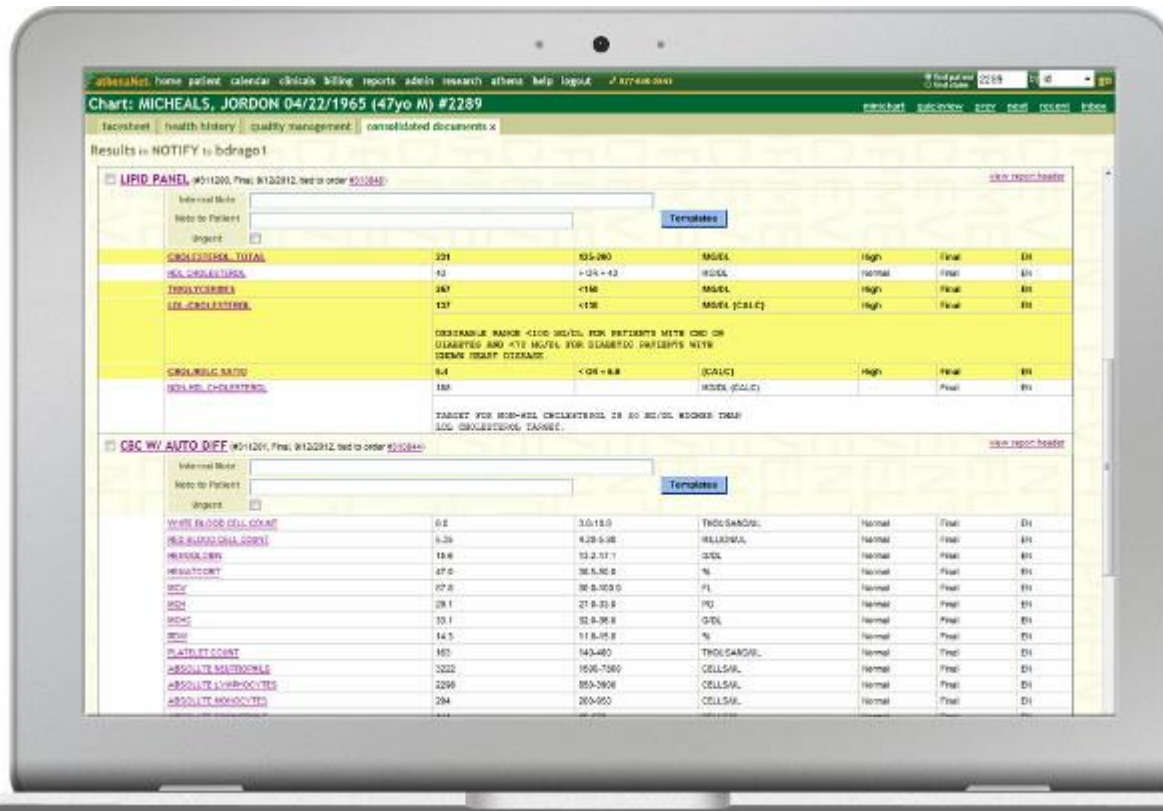


Chart: MICHEALS, JORDON 04/22/1965 (47yo M) #2289

Results in NOTIFY to bdrago1

LIPID PANEL (W/1200, Pns: W120912, tied to order #100844)

Test	Value	Reference Range	Units	Result	Final	DI
CHOLESTEROL, TOTAL	221	105-260	MG/DL	High	Final	DI
HDL CHOLESTEROL	43	>34 - 43	MG/DL	Normal	Final	DI
TRIGLYCERIDES	267	<150	MG/DL	High	Final	DI
LDL CHOLESTEROL	137	<130	MG/DL (CALC)	High	Final	DI

DESIRABLE RANGE <100 MG/DL FOR PATIENTS WITH CHD OR DIABETES AND <75 MG/DL FOR DIABETIC PATIENTS WITH OTHER HEART DISEASE

CRITICAL VALUE: 150

TARGET FOR HDL-CHOLESTEROL IS 50 MG/DL (BETTER THAN 100 MG/DL) TARGET

CBC W/ AUTO DIFF (W/1200, Pns: W120912, tied to order #100844)

Test	Value	Reference Range	Units	Result	Final	DI
WHITE BLOOD CELL COUNT	6.2	3.0-11.0	THOUSANDS	Normal	Final	DI
HEMOGLOBIN	5.26	4.29-5.26	GRAMS/DL	Normal	Final	DI
HEMATOCRIT	18.6	13.2-31.7	%	Normal	Final	DI
HEMOGLOBIN A1C	17.0	5.0-7.0	%	High	Final	DI
PLATELET COUNT	153	143-400	THOUSANDS	Normal	Final	DI
ERYTHROCYTE SEDIMENTATION RATE	2022	150-200	MM/HOUR	High	Final	DI
ERYTHROCYTE SEDIMENTATION RATE	2296	80-200	MM/HOUR	High	Final	DI
ERYTHROCYTE SEDIMENTATION RATE	294	200-250	MM/HOUR	High	Final	DI

Faxing remains prominent in healthcare, how certain can we be information goes where it belongs?

Background

Athena receives over 200M faxes for our clients each year, and none can be lost or miscategorized – 100 pages per provider per day

Problem

Faxes end up in the wrong chart, or take time to assign. We Need an algorithm to identify improve assignment.

2 pak if fever / pain

Quest Diagnostics 000-000-0000 Fax Server 3/17/2006 9:27 PAGE 001/002 Fax Server

MAR. 17, 2006 9:06AM E CONSTANTINOU MD LLC NO.514 P. 2

Eugene C. Constantinou, MD, LLC
MAR. 17, 2006 9:59AM E CONSTANTINOU MD LLC NO.514 P. 3
Date: 3-17-06
7 March, 2006

Summary of Deductibles and Copayments
Totals for: FAMILY 01.01.05 to 12.31.05 Totals for: SUS
Deductible required for year: \$ 200.00 Deductible req
Copayment for year: \$ 200.00 Copayment req
Copayment for year: \$ 2,000.00 Copayment req
Copayment for year: \$ 408.68 Copayment req

Explanation of Benefits (EOB)
1-800-555-1212
Visit your local plan website:

Member Name: John Smith
Group No.: 11111111
Identification No.: 1212221212
Claim No.: 1212221212
Patient Name: John Smith

Summary
Total Billed: \$45.00
Total Benefits Approved: \$16.20
Amount You May Owe Provider: \$1.80

Service Information
Service Description Service Date Amount Billed Not Covered Covered
IMAGING RADIOLOGISTS S.L.L.C. 11-14-01 42.00 27.80 (1) 18.00
Medical Emergency X-Ray
Totals: \$42.00 \$27.80 \$18.00

Coverage Information
Totals: \$45.00 \$27.80 \$18.00
PARTICIPATING PROVIDER OPTION (PRODUCTION) -\$27.00
Deductibles:
Year 100% Coinsurance Amount: LBO
Total Deductible: -\$1.80
Total Benefits Approved: \$16.20
Amount You May Owe Provider: \$1.80
Total covered benefits approved for this claim: \$16.20 to IMAGING RADIOLOGISTS S.L.L.C on 2/24/2011

Medical Assistant work performed

Addendum:
03/17/2006 9:07 AM (Dobki)

GI(S) QNT BS [No massus, tenderness [N
[No hernia [N] rectal tonb. No hem
Dr/Mgmt (Minimal, Limited, Moderate, Extensive
[Minor] [Established, stable] [Established, worse t
workup [New, additional workup
DDx, clinical impression, initiation or change of tr
(incl. pt. instructions, meds); Referral/Consultation
Amt/Complexity of data that must be obtained, a
analyzed (Minimal, Limited, Moderate, Extensive)
[Mod: [1] Stable/chronic, or uncompt; OTC's, PT, OT, IVF
[Mod: [1] Stable/chronic, or uncompt; OTC's, PT, OT, IVF
w/progress][Acute illness w/systemic symptoms,
Prescription drug mgmt, Elective major surgery
[High: [1] chronic with severe exacerbation [Imaging
w/contrast [Surgical/invasive procedure planned/urgent

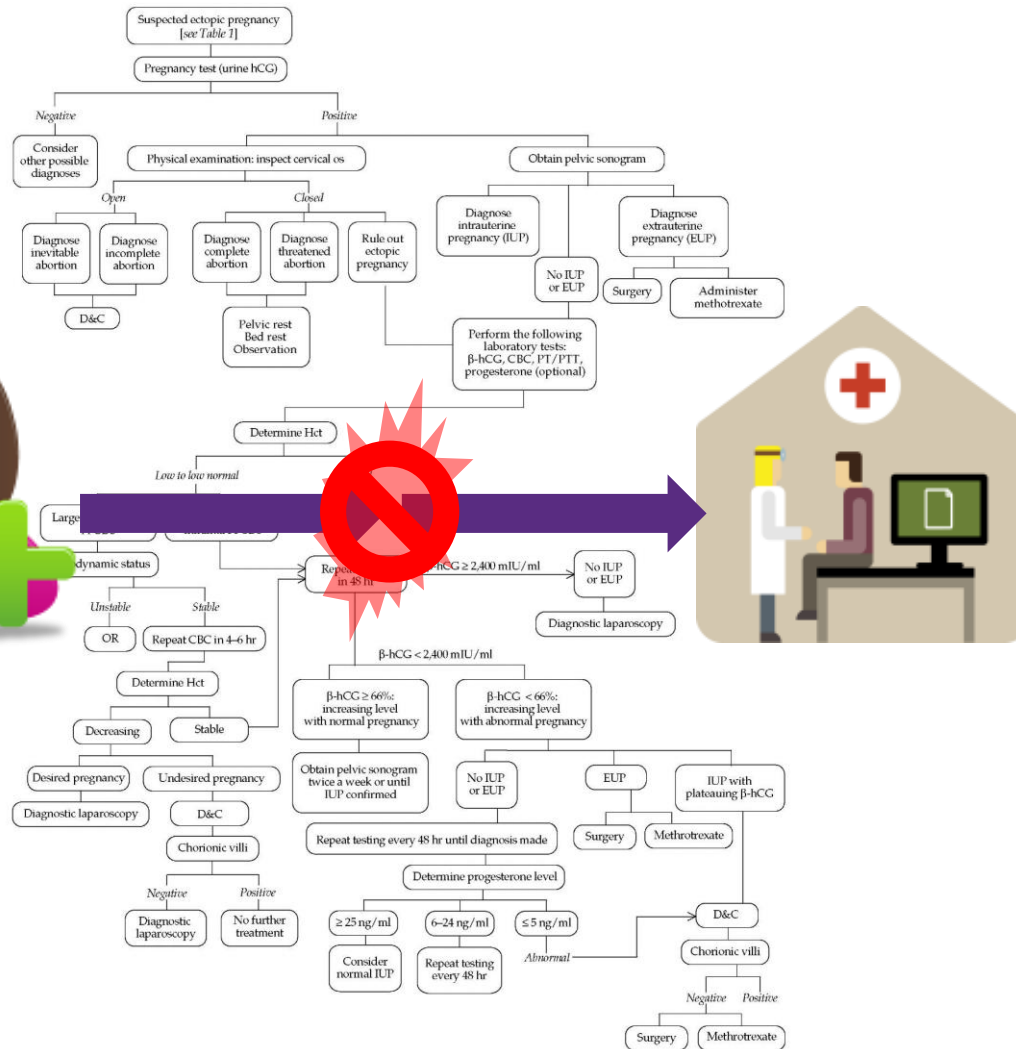
Ectopic pregnancies need to be managed from the physicians office to the emergency room (and back)

Background

Ectopic pregnancy is a high risk condition that occurs in 1.9% of pregnancies making it the leading cause of pregnancy-related 1st trimester deaths.

Problem

Coordinated follow-up with labs, imaging is needed but patients get lost between ED and outpatient office



How could it be easier for providers to stay connected with their patients outside of the office and intervene before something bad happens?

How can we make the emergency room a more efficient care delivery system?

How can we use content analytics to improve the quality of our providers templates?

Tips & tricks to get started



Focus is key – pick one well-defined problem and solve it as completely as possible.



All real-world problems are fair game – if it's keeping patients from being seen by the right caregivers at the right times, there's a market for the solution.



If you like your problem but don't like your solution, iterate – start with the bad solution and focus on how to improve pieces of that process.



Don't just think about how to solve a given problem, but also think about how to keep the problem from ever occurring.

The background is a solid purple color. It features several large, semi-transparent, abstract shapes that resemble leaves or petals, scattered across the frame. One prominent shape is a large, light purple leaf-like shape on the left side. Another is a smaller, circular shape in the upper center. The overall aesthetic is clean and modern.

**Happy
Hacking!**

Hacking the ED

Jason Shapiro, MD, FACEP

Associate Professor of Emergency Medicine

Program Co-director, Master of Science in Biomedical Informatics

Icahn School of Medicine at Mount Sinai

and

Chair-elect of the Emergency Medicine Informatics Section

American College of Emergency Physicians (ACEP)

Welcome

Welcome

Hackers



Welcome

Hackers



Doctors



Welcome

Hackers



Doctors



Hacker-Doctors



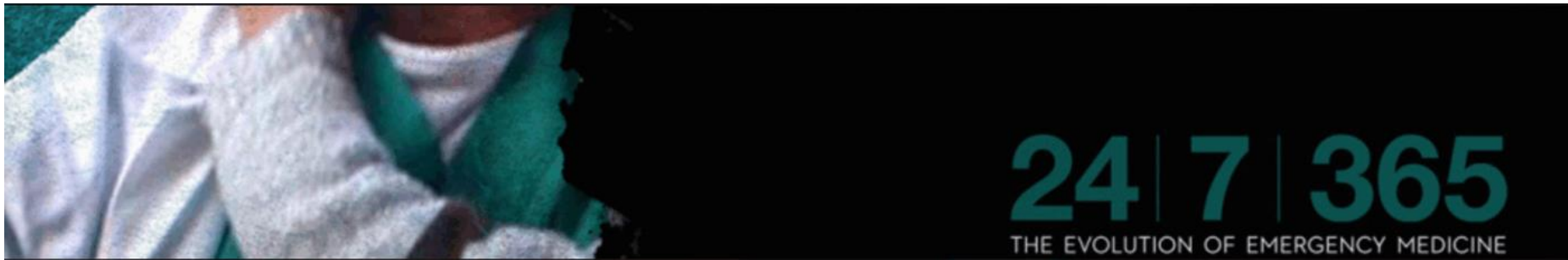
Welcome

- My background
 - ER doc
 - Informatics fellowship
 - Research on HIE and EMI
 - But I'm a hackathon "newbie"

Overview of talk

- Overview of EM
- EM challenges

Overview of EM



Overview of EM

- 136.3 million ED visits in 2011
- ED visits have been increasing
- Number of EDs have been decreasing

Overview of EM

- 136.3 million ED visits to ~ 5000 EDs in 2011
- ED visits have been increasing
- Number of EDs has been decreasing
- Almost one visit for every two people in the US
- Average of ~27,000 visits per ED
 - Range from tiny to > 200,000
- Only 12% required hospital admission, but ~50% of all admissions come through the ED

ED Crowding



Fantasy Series #1: Emergency Medicine



Nurse Johnson day dreams about a button that could instantly transport non-emergent patients directly to their PCP's office.

Doctors needed

Shortage in primary care physicians is projected to continue to increase in U.S.



Source: AAMC Center
for Workforce Studies

BAY AREA NEWS GROUP





**Office
Closed**



How Does the Affordable Care Act Cover the Uninsured?

6.6 MILLION YOUNG ADULTS were enrolled in a parent's health plan in 2011 as a result of the Affordable Care Act's requirement that employers and insurers that offer dependent coverage **INCLUDE ADULT CHILDREN TO AGE 26**

30 MILLION

people will gain insurance through the Affordable Care Act by 2020



2/3 will be covered through the new health insurance exchanges

1/3 will be covered through Medicaid expansion

EM Challenges

EM Challenges

- Crowding

EM Challenges

- Crowding



EM Challenges

- Crowding

INPUT

Demographics

Health Status

Insurance Status

Availability of Alternatives

Perceptions of Quality

EM Challenges

- Crowding
 - Input
 - Improve health status
 - Avail of ED alternatives
 - UC centers
 - PCPs with walk-in hours
 - Avail of PCPs
 - Based on insurance?



EM Challenges

- Crowding



EM Challenges

- Crowding
 - Throughput
 - ED efficiency
 - registration
 - Triage
 - Door → doctor
 - Doctor → decision
 - Decision → left ED
 - Test and consult TATs
 - Staffing
 - Avail of outside data
 - EHR usability



EM Challenges

- Crowding

Death

Hospital Admission

OUTPUT

OR/ICU/CCU/MedSurg

Capacity

Bed availability/tracking

ED/Floor interaction

Transport Services

Community Discharge

OUTPUT

Availability of post-acute care, community mental health, other services, primary and specialty care

EM Challenges

- Crowding
 - Output
 - Hospital discharges
 - Smoothing OR schedule
 - Bed turnover
 - Housekeeping
 - Transport
 - Calling report ED → floor
 - Care coord for ED D/C's



EM Challenges

- Crowding
- Patient Experience

The logo for Press Ganey, featuring the words "PRESS" and "GANNEY" in a blue, serif font, separated by a blue downward-pointing triangle. A registered trademark symbol (®) is located at the end of "GANNEY".

PRESS GANNEY®

**National leader in
health care patient
satisfaction measurement
and service improvement.**

EM Challenges

- Crowding
- Patient Experience
- Communication



EM Challenges

- Crowding
- Patient Experience
- Communication
- Task Management
- Fast paced environment
- Critical decisions
- ~ 23 tasks/hour
- ~ 10 interruptions/hour
 - ~ 7 are “task altering”

Purpose

COME TOGETHER



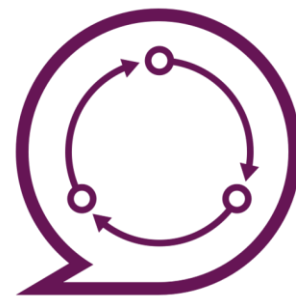


Jason.shapiro@mountsinai.org



Hack 101





Pitch

Form Teams

Hack

Iterate

1. Teachers & learners in it for the mission.
2. We are committed to greatness.
3. Curiosity & innovation are at our core
4. We expect candor, openness, and unity.
5. We get there with humor, caring, and respect for each other.

- Be open to **crazy ideas** and thinking outside the box
- Build a **well-rounded, small & nimble** team (4-6 people)
- **Fail fast** and **pivot quickly**
- Tie your solution to a **real world problem** and a **real world story**
- **Make/Build** something (app, prototype, website, etc.)
- Treat others with **respect**

- Worry about **patenting** or discuss **ownership**
- Develop **too broad** a solution
- Be **shy**
- Be **bored**
- **Monopolize** the conversation
- **Only discuss** ideas or solutions – take action

- 60 seconds
- Tell a story
- No slides
- Give facts/use numbers

- [athenahealth's API](#) – [developer.athenahealth.com](#)
- [US Census](#) - census datasets, mapping tools, and numerous coding examples
- [Data.gov](#) – great resource for a variety of health and healthcare datasets.
- [National Cancer Institute's SEER data](#) – National Cancer Institute data from 1973-2012
- [openFDA](#) – access public FDA data

[Links to all on mdphackathon.com](#)

Mentors are also great resources

Developer	Designer	Clinician/Scientist	Business
JORDYN BURGER	EVA KANIASTY	SHUHAN HE	DAMIAN GILBERT
PETER KUNG		JACK ROWE	LINDSEY KEMPTON
JACKIE CROSSEN		WES WILSON	PATRICK MAHER
NIGEL DEEN		ROBERT CHEN	JIM SAUERBAUM
BRIANNA		DAVID CRAIS	ERIN TRIMBLE
GERMAIN			LEAH BACHMAN
PAUL CARROLL			JEFF SPIELBERG
BRITT DESANTI			IZZAT JARUDI
CATHERINE			
PORTER			
CHIP ACH			
ALEX KOPP			

- **3 minute** presentation which should include:
 - Problem/need
 - Demo Solution
 - Business – 1 minute
- Followed by **3 questions** from judges
- **All presentations must be PDFs and sent to mdphackathon@athenahealth.com by 1pm Sunday**

- Health Impact
- Business Model
- Team
- Technology Innovation
- Pitch

Grand prize – Best Overall \$3,000

athenahealth prizes

**Best athena API Solution
\$2,000**

**athena API Runner-up
\$1,000**

**Honorable Mention
\$500**

ACEP & EMRA prizes

**Best EM Solution
\$2,000**

**EM Runner-up
\$1,000**

**Honorable Mention & EMRA
\$500 each**

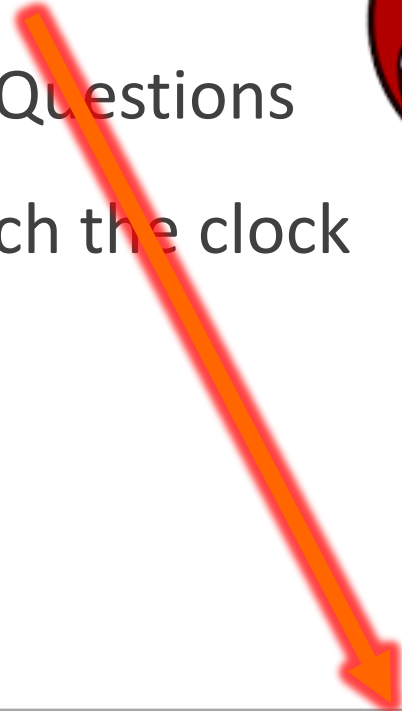
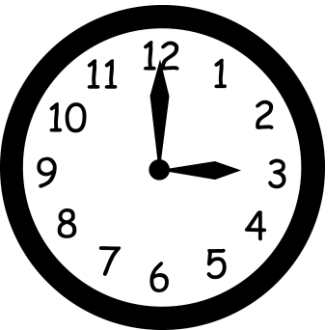
Team(s) will also be selected to present a brief overview of their winning solution during the ACEP15 show!

When: Monday, 10/26, 9:30am

Where: Boston Convention and Exhibition Center



- Bathrooms
- Badges
- WIFI
- Ask Questions
- Watch the clock



A photograph of a woman with a stethoscope around her neck, looking towards a man in a plaid shirt. The image is partially obscured by a purple overlay containing text.

Tweet

@athenaMDP

@ACEPBoston

#mdpHack