Mobile Innovations and Telehealth in Emergency Care

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Speaker Introduction

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Speaker Introduction

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Conflict of Interest

Michael Gonzalez and James Langabeer

Have no real or apparent conflicts of interest to report.
Agenda

• History and Overview to EMS
• Telehealth and Mobile Integrated Health
• The ETHAN Program
  • Mobile Technology Platform
  • Goals and Vision
• Program Results and Discussion
Learning Objectives

• Describe the evolution and technology components of a large-scale telehealth initiative in prehospital emergency care
• Discuss the change in results (clinical and economic outcomes) resulting from the program for the agency and community
• Analyze critical components of the program
• Share how mobile integrated health platforms can be initiated elsewhere
• Analyze the effectiveness of connected technology solutions in a prehospital environment
Benefit Realization

• This program focused on achieving these Value of Health IT STEPS below
• Our presentation will summarize the value at the conclusion

Electronic Information/Data
• Treatment/Clinical
• Savings

Patient Engagement/Population Health
• Satisfaction
## Collaborators and Project Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Persse, MD, FACEP</td>
<td>Houston Fire Department</td>
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<tr>
<td>Tiffany Champagne-Langabeer, PhD, RD</td>
<td>UT Health Science Center</td>
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<td>Diaa Alqusairi, PhD</td>
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<tr>
<td>Adria Jackson, PhD, RN</td>
<td>Houston Health Department</td>
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EMS: Treat and Transport

• Traditional Role: To “Treat and Transport”
• Immediate medical care and stabilization for trauma and emergencies
• Movement towards better utilization of highly trained resources (community paramedicine) and more mobile technologies
• Time is critical!

Source: City of Houston
History of Emergency Medical Services

- EMS: the coordinated network of prehospital care, for dispatching, treating, and transporting patients outside of the hospital
- Core component of medical care, federally directed by the Dept. of Transportation, NHTSA
- Earliest evidence of EMS: Napoleon’s Army (1790’s) by chief surgeon (Baron Larrey), with the creation of the “flying ambulance” (ambulance volante)

Source: City of Vancouver Archives
Houston Fire Department EMS

• Houston is the largest fire-based EMS crew in the nation
• Division of the Houston Fire Department
  • 85% of all incidents involved EMS; 15% fire
• 3,700 firefighters/EMS responders
  • Many of these are trained at higher levels (paramedics) which require advanced levels of clinical skills
• 63 Ambulances
• 175 engines, ladder trucks, squad and medic vehicles
Telehealth

- Telehealth: providing remote clinical and healthcare services to patients
- Provides opportunity for quicker response, lower direct costs
- EMS use began in 1970s with ECG telemetry in the field
- Late 2000s, expansion to provide trauma or acute patients visuals to receiving ED to prepare hospitals for incoming patients
- Very little overall use of telehealth to guide patient disposition in the field
Mobile Integrated Health

• Often used in conjunction with “Community Paramedicine”
• Use of paramedics/EMTs to deliver care in non-traditional ways
• “the provision of healthcare using patient-centered mobile resources in the out-of-hospital environment” (National Association of EMTs)
• Examples:
  – Sending medics to high-frequency 911 users proactively during down times
  – Using EMTs to provide vaccines
Emergency Telehealth and Navigation (ETHAN)

• Funded by DSRIP (Delivery System Reform Incentive Payment) – Medicaid waiver alternative program
• Began in 2015; Currently nearly 9,000 patients
• Based on the belief that there is a better community solution to deliver care to non-emergent
ETHAN Goals

- Reduce number of unnecessary transports to ED
- Improve unit availability
- Improve unit total turnaround times
- Improve focus on true emergencies
- Connect patients with a medical home
- Improve quality and reduce cost
The Process: How Does it Work?

911 Call → Medic Field Assessment → Video Call to EMS Physician → Patient Disposition → Navigation to Clinic or ED

Source: Houston Fire Department, ETHAN
Patient Navigation - Options

- Ambulance Transport to ED
- No Ambulance Transport
- All Others (including Refusals)
- Referral to an ED with prepaid Taxi
- Clinic Referral with Taxi Transport
- Referral to Primary Care Provider/Home Care
## Results: Changing Patient Disposition

<table>
<thead>
<tr>
<th>Patient Disposition</th>
<th>N</th>
<th>% of total</th>
</tr>
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<tbody>
<tr>
<td>Ambulance Transport to ED</td>
<td>1,393</td>
<td>16%</td>
</tr>
<tr>
<td>Clinic Referral with Taxi</td>
<td>591</td>
<td>7%</td>
</tr>
<tr>
<td>Hospital ED with Taxi</td>
<td>5,545</td>
<td>65%</td>
</tr>
<tr>
<td>Referral to PCP or Home Care</td>
<td>527</td>
<td>6%</td>
</tr>
<tr>
<td>Others (Refusals, Technical Issues; no transport or referral)</td>
<td>505</td>
<td>6%</td>
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<tr>
<td>Total N</td>
<td>8,561</td>
<td>100%</td>
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</table>
Results: Unit Productivity

ETHAN Program
- EMS Notified
- Arrive Scene
- Depart Scene
- Unit Back in Service

Control Group (traditional EMS, primary care)
- EMS Notified
- Arrive Scene
- Depart Scene
- Arrive Hospital ED
- Depart Hospital ED
- Unit Back in Service

# of Minutes
10 20 30 40 50 60 70 80

44 min savings

39
## Program Summary Results

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<th>Measure</th>
<th>Baseline</th>
<th>ETHAN</th>
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<td><strong>Unit Productivity</strong></td>
<td>Total Back in Service Time</td>
<td>83 minutes</td>
<td>39 minutes</td>
</tr>
<tr>
<td><strong>Costs</strong></td>
<td>Total cost per patient</td>
<td>$270</td>
<td>$167</td>
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<td><strong>Utilization</strong></td>
<td>Disposition to ED by ambulance (% ambulance transport)</td>
<td>74%</td>
<td>67%</td>
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<td><strong>Experience of Care</strong></td>
<td>Patient Satisfaction</td>
<td>87%</td>
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<td><strong>Return on Investment</strong></td>
<td>Net Savings – Costs</td>
<td>$928,000/year; $2,468/ED visit averted</td>
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Challenges and Opportunities

- Lack of Financial Resources (capital and training)
- Community and patient education to increase awareness
- Reimbursement and policy issues
- Patient reluctance and acceptance
- Physician and medic resistance
- Organizational resistance (Unions)
- Technological (telehealth, mobile technology)
- Training
Discussion

• Need for further expansion of telehealth into EMS
• Broader incorporation of mobile technology solutions (e.g., HIE, scheduling)
• Potential policy changes for reimbursements and policies
• Positive financial and clinical results
Benefit Realization

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Questions

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