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WHERE THE  
**BRIGHTEST**  
**MINDS**  
IN HEALTH AND IT MEET

HIMSS ANNUAL CONFERENCE & EXHIBITION | FEB 19-23, 2017  
ORLANDO | ORANGE COUNTY CONVENTION CENTER

## **Mobile Innovations and Telehealth in Emergency Care**

Session 123. February 21, 2017

Michael G. Gonzalez, MD and James Langabeer, PhD FHIMSS

# Speaker Introduction

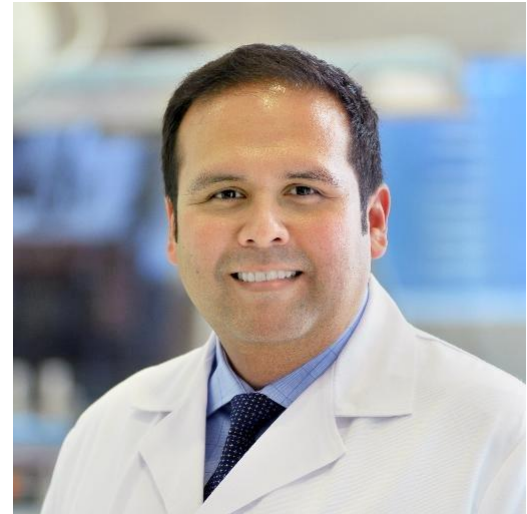
Michael Gonzalez, MD

Associate Medical Director

Houston Fire Department

Asst. Professor, Emergency Medicine

Baylor College of Medicine



# Speaker Introduction

James Langabeer, PhD, FHIMSS  
Professor, Emergency Medicine and Informatics  
The University of Texas Health Science Center



# 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

David Persse, MD, FACEP	Houston Fire Department
Tiffany Champagne-Langabeer, PhD, RD	UT Health Science Center
Diaa Alqusairi, PhD	UT Health Science Center
Adria Jackson, PhD, RN	Houston Health Department



# 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

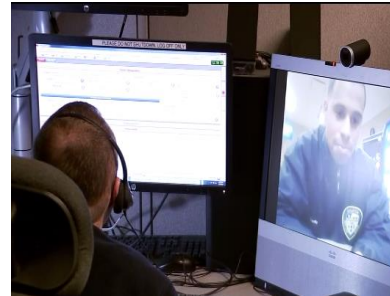


# ETHAN Goals

- 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



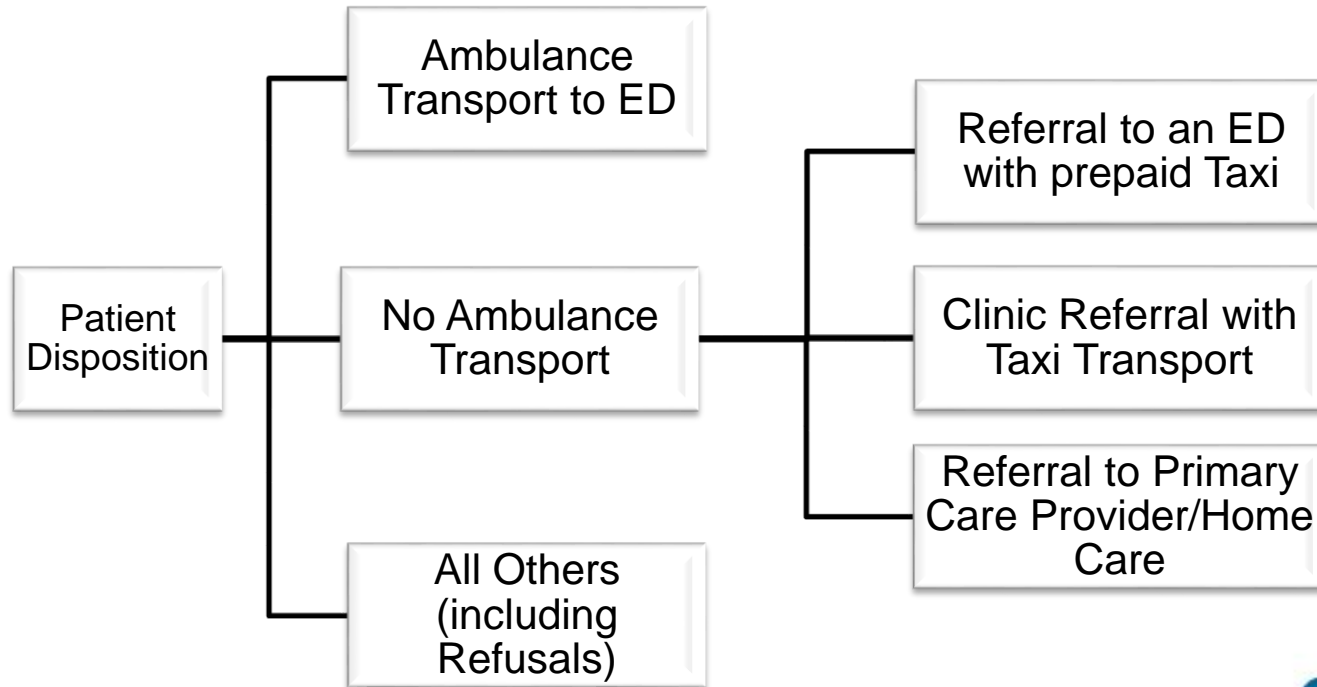
# The Process: How Does it Work?



Source: Houston Fire Department, ETHAN



# Patient Navigation - Options



# Results: Changing Patient Disposition

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

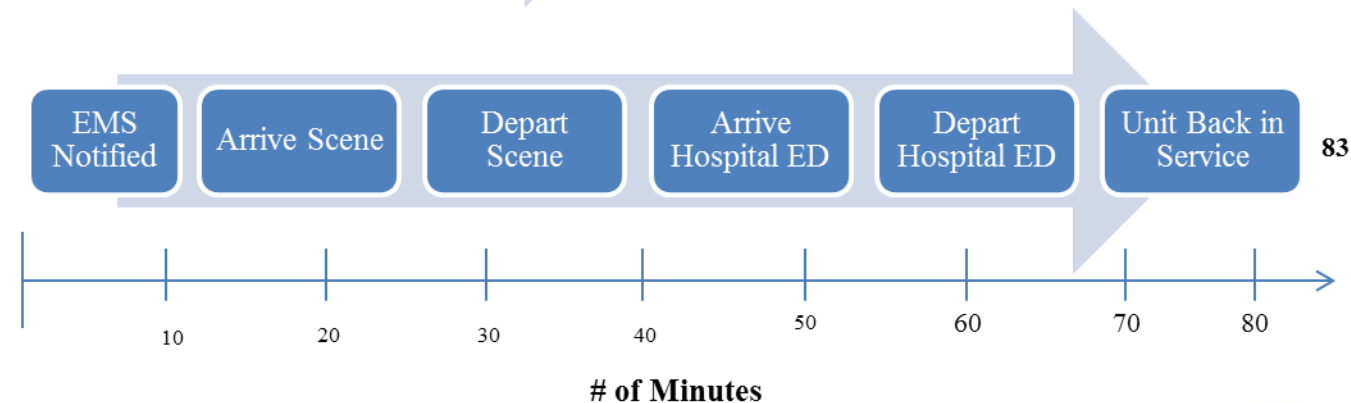
# Results: Unit Productivity

**ETHAN  
Program**



**44 min savings**

**Control  
Group  
(traditional  
EMS, primary  
care)**



# Program Summary Results



Outcome Category	Measure	Baseline	ETHAN
Unit Productivity	Total Back in Service Time	83 minutes	39 minutes
Costs	Total cost per patient	\$270	\$167
Utilization	Disposition to ED by ambulance (% ambulance transport)	74%	67%
Experience of Care	Patient Satisfaction	87%	88%
Return on Investment	Net Savings – Costs	\$928,000/year; \$2,468/ED visit averted	

# 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

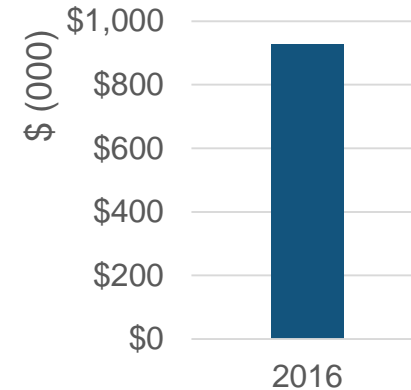
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## 1st Full Year ROI



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# Questions

Michael Gonzalez, MD

[MichaelG.Gonzalez@houstontx.gov](mailto:MichaelG.Gonzalez@houstontx.gov)

*@Zindoctor*

James Langabeer, PhD

[James.R.Langabeer@uth.tmc.edu](mailto:James.R.Langabeer@uth.tmc.edu)

