Partnering with Fire-Based Emergency Services to Reduce Hospital Utilization

Gail A Nielsen
Fellow and Faculty
Institute for Healthcare Improvement

Orlando, FL
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Learning Lab Objectives

- Identify key factors for a successful community health program and strategies to engage your local EMS agency in this model of care.
- Demonstrate how to develop a personalized care plan for each patient that addresses medical and functional needs.
- Specify the processes needed by the community health team of paramedics and physicians.
Minicourse Agenda

1:00 PM    Introductions and Overview of Minicourse
1:15 PM    Case Stories: The Problem
2:40 PM    Break
3:10 PM    Case Stories: Solutions
4:00 PM    Panel with Case Presenters and EMS
4:25 PM    Wrap-up and Adjourn
Case Study Presenters & Panelists

- **Liz Fagan, MD, FACEP**
  - Emergency Department Medical Director, Baylor Medical Center at McKinney

- **Aaron Burnett, MD**
  - Assistant EMS Medical Director, Regions Hospital EMS, and Assistant Professor of Emergency Medicine, University of Minnesota

- **Josh Salzman, M.A., EMT-B**
  - Director, Critical Care Research Center, Regions Hospital

- **Jason Hockett, FF-EMT-P**
  - EMS Chief, McKinney Fire Department

- **McKinney Fire Department Community Paramedics**
  - Dan Frey, FF-NREMT-P, Advanced Practice Paramedic
  - Brian Roether, FF-EMT-P, Advanced Practice Paramedic
  - Chris Waller, FF-NREMT-P, Advanced Practice Paramedic

Right Care at the Right Time because it’s The Right Thing to do
McKinney Texas

- Just 30 miles north of downtown Dallas, McKinney is a picturesque city with a small-town feel. Friendly charm, green spaces and the comfortable pace belie the fact that McKinney, with a population of more than 149,000, is one of the fastest-growing cities in America.

**McKinney Fire Department**

- 8 Fire Stations, 7 Total Medical Units
  - 75% of Emergency calls involve EMS
- Staffed by 151 Certified Firefighter/EMT/Paramedics-8 Advanced Practice Medics
- Specialized training and certification:
  - Hazardous Materials Technician Team
  - Swift Water Technician Team
  - High-Angle Rescue Team
  - Advanced extrication Team
  - Aircraft Fire Fighting and Rescue

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**Baylor McKinney**

- Baylor McKinney is a 143 Bed Full Service, LEED Certified Green Hospital
- Baylor Health Care System exists to serve all people through exemplary healthcare, education, research and community service.
B.E.S.T. EMS

- EMS Medical Direction Service providing on/off line medical direction, QA/QI, CME, and **Community Health Paramedicine**

- **Vision** - To be the leader in population based healthcare, integrating our services into the patients continuum of care in the setting of acute episodic care as well as in the management of post discharge care, health maintenance and wellness.

- **Mission** - To improve the health, and quality of life of the populations we serve by providing the highest level of direction, education, training and oversight to EMS providers, giving them the tools and guidance to become the leaders in acute episodic care and home based health and wellness.

McKinney Community Paramedicine Team

Logan Davis, Robert Leavitt, Dan Frey, Ronnie Taylor, Dr. Elizabeth Fagan, Chief Jason Hockett, Juan Zapata, Brian Roether, JC Stinson, Chris Waller
Discussion: Why CHP?

1. Ms. V called 911 last year—59 Times
2. Mr. T Readmitted w/COPD 3x in 2 mo
3. Ms. P: 14 Diabetic 911 calls/11 ED visits & 6 Hospital Admissions in 5 mo
4. Mr. K Readmitted for CHF 5x in 5 mo

Patient Barriers to Health/HealthCare

- Don't understand Medical Problems
- Poor Access to PCP/Followup care
- Can't afford Meds
- Unaware of community Resources

Need for Emergency Access to healthcare
- 911 calls
- ED Visits
- Hospital Readmissions
Initial State

- Patient feels sick—calls 911
- Ambulance transports patient to ED
- ED evaluates
  - Patient admitted to hospital OR
  - Patient stabilized and discharged
- Patient returns home without access to follow up, medications, DME…….
- Patient feels sick—calls 911

Community Paramedic Practice in Minnesota: Teaching Old Dogs New Tricks

Aaron Burnett, M.D.
Assistant EMS Medical Director, Regions Hospital EMS
Assistant Professor of Emergency Medicine, University of Minnesota

Josh Salzman, M.A., EMT-B
Director, Critical Care Research Center
Regions Hospital
The Current State

• 911 use for non-emergency complaints
• Emergency department use for non-emergent conditions
• Hospital readmissions due to difficulty in coordinating care after hospital discharge

The Future State
Discussion: What barriers exist to deploying community paramedics?

- Scope of Practice
- Resistance by other healthcare provider special interests
- How do we get paid for these services?

Table Discussions

- What similar problems do you have?

- What are you already doing?
Fire Based Community
Paramedic Program Improves Health while Reducing Cost

Dr. Elizabeth Fagan, MD, FACEP
McKinney Fire CHP Director/BEST EMS
Emergency Department Medical Director, Baylor Medical Center at McKinney

Jason Hockett, FF-EMT-P
EMS Chief, McKinney Fire Department

Dan Frey, FF-NREMT-P, Advanced Practice Paramedic,
Brian Roether, FF-EMT-P, Advanced Practice Paramedic
Chris Waller, FF-NREMT-P, Advanced Practice Paramedic

McKinney Fire Department Community Paramedics

COLLIN COLLEGE-APP Course

- Paramedics know how to assess patients, identify life threats, and transport to the most appropriate facility.
  - Pathophysiology of disease is taught at a very low level in EMS education.
- Therefore the key is the understanding of each disease system and then being able to interact with the physician to provide the necessary care at home.

Dr. Sharon Malone, Associate Medical Director Collin College
Rapid Assessment
Rapid Transport
911 EMS Call
Pathophysiology of disease process is essential
Heart Failure COPD/Asthma Renal disease Diabetes Behavioral/Social Issues
Thorough patient assessment
Review care plan
Contact physician if needed
Adjust Tx as needed
Patient remains at home

COLLIN COLLEGE: APP Course

911 Call

CHP Call

1
911 EMS Call
Rapid Assessment
Rapid Transport

2
Pathophysiology of disease process is essential

3
Heart Failure COPD/Asthma Renal disease Diabetes Behavioral/Social Issues

4
Thorough patient assessment
Review care plan
Contact physician if needed
Adjust Tx as needed
Patient remains at home

CHP Education

CHP Program: Development

• Align with IHI Triple AIM
  - Improve Pt Outcomes & Health/Lower Cost
• Inclusion/Exclusion Criteria
• Informed Consent Enrollment/HIPAA release
• Referral Processes/Standard Forms
• Patient Categories/Visit Frequencies Defined
• Data Collection Tools/Dashboards
• Electronic Health Record
CHP PROGRAM

- Two FF-APP/Shift
- Fully Equipped CHP Squad Vehicle
- Patient Visits
  - Scheduled Appointment
  - Crisis/Urgent call work-ins
- Collaborative Communication with all members of Care Team
- Weekly review of ALL patients with entire team
  - Assessment/Reassignment of Category
  - Development of Weekly Work List

Patient Evaluation

- Full Set Vital Signs including weight
- Physical Exam including skin integrity
- iSTAT/EKG prn
- Medication Reconciliation Review
- Functional/Medical Needs Assessment
- Review of recent patient care/vital sign-labwork trends
- Call/Text Medical Director with any concerns-Contact patient care providers prn
**Initial Pilot Results: 911**

Calls made to 911 6 months before and 6 months after Enrollment in CHP 72% reduction

**Initial Pilot Results: ED**

Visits to ER 6 months before and 6 months after Enrollment in CHP 76% reduction
Initial Pilot Results: Admissions

![Graph showing hospital admissions before and after enrollment in CHP]

Pilot Patient #1

- 8 "911" calls/5 Hospital Admissions 180 days....

**Assistance Provided:**
- **Education**
  - Meals on Wheels
  - Transportation (Public) access
- Social service/Medicaid enrollment
- Medication assistance

**Results:**
- 2 "911" calls, 1 transport
- 1 Hospitalization
- Better Quality of Life..................Priceless

Hosp"180"days"before" enrollment"  
Hosp"180"days"after" enrollment"
EMS Cost Pilot Patient #1

- **EMS Cost Patient # 1**

- **$8,000** 180 days Pre-enrollment
- **$16,000** Projected cost w/o CHP

- **Actual 180 day cost W/CHP−$800**

Hospital Cost Pilot Patient #1

- **Hospital Cost Patient # 1 Pre/Post Enrollment MFD-CHP**

- **$95,307** Pre-Enrollment
- **$11,432** Post-Enrollment
Program Expansion

- Three additional Paramedics attend Collin College APP Course
- Referrals expanded to patients from hospital Case Management/weekly readmission mtg
- Day Squad expanded to 24/7
- Partnership with Case Management to match resources to need
- Education on Palliative Care/Hospice
- Chronic Disease Protocols established

Medication Reconciliation

- Weekly documentation of all meds patient has access to (directly from the bottles) and which meds pt has taken
  - Pill counts performed when overuse or diversion are possibilities
- Partnership with Pharmacy to evaluate Med Rec for duplications/interactions
- Medical Director reaches out to prescribing physicians when concerns identified
Biggest “Wins”

- Home Safety Evaluation identified risks corrected—Decrease in Falls
- Weekly Med Rec—Reduction in medication duplications/interactions
- Weekly reinforcement of patient education—Change in patient behavior
- 24/7 Availability by phone—Reduction in unnecessary 911 calls/ED Visits/Readmits
- Collaborative communication—Patient/Family trust in the healthcare system increased

Is CHP Effective in McKinney?

YES!

1. Ms. V called 911 9x/12 mo
2. Mr. T Readmitted w/COPD 1x/6 mo
3. Ms. P One 911 call, No ED/Admits/6 mo
4. Mr. K Readmitted for CHF 1x in 6 mo
First Year's Results

• Significant Reduction in 911 calls, ED Visits, and Hospital admissions
• 911 Calls (p<0.0001)
  - 6 mo before: 7.07
  - 6 mo after: 2.14
• ED Visits (p=0.0006)
  - 6 mo before: 8.64
  - 6 mo after: 1.89
• Hospital Admissions (p=0.0002)
  - 6 mo before: 3.1
  - 6 mo after: 0.75

First Year's Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>69.22±16.91 95% CI (62.53-75.91)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male: 39.29% (11/28) Female: 60.71% (17/28) Female predominant</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>5.17±3.92 95% CI (3.65-6.70)</td>
</tr>
<tr>
<td>BMI</td>
<td>29.20 95% CI (26.79-31.61)</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married 57.14% (16/28) Majority are married</td>
</tr>
<tr>
<td>Smoker</td>
<td>No 75% (21/28) Majority do not smoke</td>
</tr>
<tr>
<td>Drug</td>
<td>0 None use drugs</td>
</tr>
<tr>
<td>Etch</td>
<td>No 89.29% (25/28) Most do not drink etch</td>
</tr>
<tr>
<td>Disabled</td>
<td>22.22% (6/27) 22.22% disabled</td>
</tr>
<tr>
<td>Insurance</td>
<td>72.73% (16/22) Medicare 72% have Medicare</td>
</tr>
<tr>
<td>Living status</td>
<td>21.43% (6/28) Live alone 39.29% (11/28) Live with wife/husband 25% (7/28) Live with other family member</td>
</tr>
<tr>
<td>Resident</td>
<td>42.86% (12/28) Live in an apartment 57.14% (16/28) Live in a house</td>
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The Community Health Paramedicine Program had 22 initial patients that completed the 26 week program.

The program decreased indigent/underinsured population gross revenue charges by $585,832.

The program saved $94,485 ($4,295 per CHP Patient) in direct costs to the Hospital and improved the lives of the 22 patients by reducing encounters from 83 pre-CHP to 19 post-CHP (77% reduction in encounters).

### CHP Program Results

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<td>$133,000 Direct Costs</td>
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*Direct Cost - Costs directly incurred in department related to patient care

Introduction/Objectives

Patients with chronic disease in stable condition who use Fire Based Emergency Medical Service (EMS) for transport to the Emergency Department (ED) for routine health care is considered inappropriate ED utilization as determined by the New York University Algorithm. When 911 is called, an ambulance as well as a Fire Engine/Truck are dispatched. While treating this routine patient, the Trucks/Engine are out of service, and their service area has to be covered by either the neighboring district in the city or a neighboring city (Mutual Aid). For emergency calls, the ambulance charges from these patients who use EMS as a safety health care network result in an increased health care budget within the Fire Department. The aim of this study is to determine the effectiveness of CHP-APP home visits in minimizing the ambulance calls and Hospital visits among these patients, while decreasing the length of those home visits. The outcome was measured for 180 days after enrollment to determine whether frequent home visits by CHP APP affected the number of Fire Engine/Truck calls.

### Materials/Methods

Patients who had more than four “911” calls in the previous 6 months were enrolled in this study. After patients were discharged from the hospital, frequent home visits by fire based advance practice paramedics were arranged in a step-wise manner. Patient general characteristics, the number of 911 calls, number of ED visits/hospital readmissions, the number of Fire Engine/Truck calls disregarded, Time of Engine/Truck in-service time, total CHP-APP home visits, and the length of those home visits were collected. Data were analyzed using STATA 12.0 statistical software.

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### Results

From June 2013 till present, a total of 23 patients were enrolled in this study. The average age of the patients was 65.65 ± 2.97 (95% CI 59.49-71.81). 65.52% (15/23) of patients was female. The average length of each EMS home visit was 44.57 ± 7.95 min (95% CI 27.39-61.75 min). The total number of ambulance calls before EMS home visits was 9.14 ± 2.88 times, and 5.17 ± 1.91 times after EMS home visits (p=0.0412). Furthermore, the number of ambulance calls after EMS visit for over 120 days were 0.8 ± 0.5 times compared with those of before EMS visits (4.6 ± 0.8 times, p=0.0045). The odds ratio of the number of ambulance calls 30 days after ED discharge among these patients was 1.82 (95% CI 0.66-4.98, p=0.24) by logistic regression analysis. The average number of hospital admissions/patient pre-enrollment was 2.83 and 1.16 after enrollment. The average number of ED visits/patient pre-enrollment was 8.87 and 2.16 after. The number of hospital admissions/reduction 59% and the ED visits 75% after enrollment in the program. The Fire Engine/Truck was disregarded by the squad on 50% of the 911 medical calls during the pilot study. This resulted in a more than an 8 hour increase in In-Service Time for one engine during the 200 hours of the pilot.

Conclusion

Frequent home visits by CHP-APP after patients were enrolled in the McKinney Fire Dept CHP program decreased the number of ambulance calls/hospital readmissions especially after 120 days. Among these patients, the potential risk identified that affected the frequent ambulance calls was the number of calls within 30 days after discharge though no statistical significant difference reached due to relatively small sample size. It is suggested that home visits by CHP-APP should be emphasized heavily during the first month of patient discharge from the hospital. The reduction in Fire Engine/Truck calls resulted in an increase in the In-Service Time for the Fire Equipment. The pilot has been determined to be a success, and will be continued with the addition of CHF/COPD protocols.
Readmission Project included CHP Referrals

Bill Aston Quality Summit Award Winner at Baylor McKinney

Reduced readmission by 40% in 1 year
Questions?

- A Really Big Thank you to:
  - Fire Chief **Danny Kistner** for introducing me to the idea of CHP
  - **Collin College** and **Dr. Sharon Malone** for superior APP education
  - **Leigh Humphrey**, Director of Health Care Improvement/Pt Safety & Risk Mgt for believing in CHP and encouraging us to publish
  - Baylor McKinney **Case Management Team**, especially director **Kim Morris** for patiently teaching us how to access community resources and **Mary Ann Primacio** for referring us patients
  - Baylor McKinney CFO **Steve Roussel** and Senior Financial Analyst **Kim Bones** for researching and interpreting the data
  - **Dr. Nick Zenarosa** for believing in/supporting our dream when no one else had developed this model yet
  - **Dr. Larry Bean** from BEST EMS for extending his medical direction and EMS mentorship to me so the program could be developed.
  - EMS Chief **Jason Hockett** whose leadership and support of the program have ensured it’s success
  - Councilman **Ray Ricchi** and his Meals on Wheels program who make sure no one in McKinney goes hungry
  - CNO **Melissa Winter** who has encouraged the CHP team and all of our patients every step of the way
  - CEO **Scott Peek** who has supported the McKinney Fire CHP program from the beginning with donated iSTAT machine and cartridges, provision of a room and meals for weekly meetings with the team, and support in the community
  - The **Entire MFD CHP Team** because they work harder than anyone I know and have compassion for the patients that everyone else has given up on—thank you for letting me be a part of the team,

  Liz
Minicourse Agenda

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Community Paramedic Practice in Minnesota: Teaching Old Dogs New Tricks

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Regions Hospital

The Minnesota Solution

• Legislation

• Licensure and Education Requirements

• Reimbursement
Community Paramedic Legislation

• Benefits of Legislation:
  ➢ Define consistent scope of practice
  ➢ Outline training, certification and recertification requirements
  ➢ Improve career development of EMS professionals
  ➢ Set the foundation for reimbursement legislation
MN Statues 144E.28 Subd (9)

• To be eligible for certification by the board as an EMT-CP the individual shall:
  ➢ Be currently certified as an EMT-P with 2 years experience
  ➢ Successfully complete a training program at a college of university ...The training program must offer clinical experience under the supervision of an ambulance medical director
  ➢ Must complete a board approved application form

Scope of Practice
MN Statues 144E.28 Subd (9)

• A CP must practice...with protocols...established by an ambulance medical director

• A CP may provide services as directed by a patient care plan...developed by the patient’s primary care provider (MD, APRN, PA) in conjunction with the ambulance medical director

Teamwork!
MN Statues 144E.28 Subd (9)

“Successfully complete a training program at a college or university …”

Didactic Courses

EMS 2900: Role of the CP
• CP scope of practice
• Public health & Primary Care
• Social and environmental determinants of health
Didactic Courses

EMS 2910: Community Assessment
• 48 hours
• Conduct needs gap analysis as relates to CP
• Community resource map
• Integration of CP into healthcare system

Didactic Courses

EMS 2020 Pathophysiology and Chronic Disease Management for the CP:
• 32 Hrs
• Epidemiology
• Lab and imagining testing
Didactic Courses
EMS 2930: Patient Care Experience
• 16 hours, hands on
• Simulated patient encounters (H&P)
• Procedures

The Problem: Bob
• 56 year old male, Chief Complaint: Shortness of breath
  • Medicaid recipient; not homebound; hx depression and anxiety
  • Recently discharged 14 days ago after 3-day hospital stay for same complaint due to congestive heart failure
  • Seen in ED 6 times in the last 12 months
  • Lives in St. Paul
National Context

- “With respect to payment for discharges from an applicable hospital...in order to account for excess readmissions in the hospital, the Secretary shall reduce the payments that would otherwise be made to such hospital.”
- Readmission defined as within 30 days
- Effective October 2014, a maximum of 3% of a hospital’s base payment from CMS can be withheld.
- Penalties dependent on how high above the expected readmissions rate the actual rate of readmissions are over the last 3 years.
- Conditions included: AMI, CHF, Pneumonia (COPD, Total Hip, and Total Knee will be added in 2015)

Local Context

- Hospitals
  - No current penalty for Medicaid fee-for-service patients
- Health Plans
  - MN Department of Health started withholding payments for Medicaid patients (ED visits = 2011; Hospital admissions and readmissions = 2012).
- Targets:
  - Hospital admission (all cause) reduction by 5% per year
  - Hospital readmissions (all cause) by 5% per year
  - ED visits (all cause) by 10% per year
How do we help Bob?

- Home healthcare
  - Doesn’t qualify because he is not homebound
- Patient activation
  - Resource intensive and difficult to continue in the outpatient setting
- Community resources
  - Requires social work involvement at discharge and #2

Organizational Affiliations
CHF Readmission Reduction Pilot

**Patient Identification**
- Daily workbench report
- Consult with care team
- Approach patient

**Patient Enrollment**
- Registered in SPF ePCR
- Upload d/c summary and med reconciliation
- Notify SPF to schedule visit

**Visit Scheduling**
- Contact patient to schedule first or all 4 visits
- 24-hour confirmation call
- Enter visit in CP schedule
- Assign patient to CP in ePCR

**Patient Visit**
- CP to confirm visit time window
- Complete visit tasks, including pre-survey
- Confirm / schedule next visit

**Visit Follow-up**
- Documentation in ePCR
- Assess communication needs to care team

**Program Completion**
- Consult with care team regarding completion or continuation
- Patient completes post-survey

Questions?
Table Discussions

- How might you adopt/adapt these methods and models to be of use at home?
- What will be hard to do?
- What else do they need to know from these programs?

Panel Discussion

Your questions for our presenters and McKinney Fire Department
Thanks for Joining Us!

Enjoy the Forum