“TREAT THE STREETS”: PARAMEDIC HOME VISITS

Nadia Krupp, MD
Indiana University School of Medicine
Riley Hospital for Children
Indianapolis, IN
Asthma: The Problem

- Most common reason for hospitalization in children
- Hospitalization is itself the strongest predictor of future hospitalizations
- Missed school/work days
- **Cost**: direct and indirect
Asthma: Hospital Readmissions

• 30 day Inpatient readmission rate
  • Reached peak of 7.98% in 2012
  • National average 2.8%

• Hospital-wide change in approach:
  • View every asthma hospital admission as treatment failure
  • Provide individualized, wraparound care
  • Multiple interventions
  • **Goal**: Include home visits
Existing Home Visit Workforce

- Public Health Nurses
  - Limited primarily to Marion County
  - Visit ~110 asthmatics per year throughout county
  - Riley Hospital asthma patient volume 400-650 patients per year
Expanding Workforce - Options

• Expansion of public health capability
  • MCPHD lacked funding/capacity
• Hospital system provide service
  • Lack of personnel/experience in home visitation

• Existing personnel visiting homes?
  • Skilled nursing agencies
  • Paramedics
Community Paramedicine

- Clinical assessment
- Problem solving
- Aid in navigating the healthcare system
- Coordinate resources
- Help address obstacles to self-care
Establishing Partnership

• Indianapolis Emergency Medical Service (IEMS)

Assets

• Experience: Community Paramedicine
  • Frequent 911 callers
  • CHF/COPD adult program

• Capacity
• Transportation
• Support personnel
Development: Multidisciplinary Team

- IUSOM Department of Pediatrics, Pulmonary Division
- Riley Children’s Hospital
- IUSOM Department of Emergency Medicine
- Social Work
- Marion County Public Health
- Asthma Educators
- IEMS Pharmacist
- IEMS Logistics Chief
- Pulmonary Asthma Coordinator
- Information Technology
- IEMS/Hospital/State
- Pediatric Primary Care Community
Grant Funding: “Treat the Streets”

• US Dept. of Health and Human Services/ Health Resources and Services Administration (HRSA)

• Emergency Medical Services for Children-Targeted Issues (EMSC-TI) Category II Grant

• Sept 2013- Sept 2016
Creating the Workforce

- Three paramedics
- Sept 2013-Dec 2013 training
  - Riley ED
  - Riley Pulmonary Inpatient Wards
  - Riley Pediatric ICU
  - Riley Pulmonary Outpatient
  - Home Visits: Public Health RN
  - Practice Run

<table>
<thead>
<tr>
<th>Component</th>
<th>Objectives</th>
<th>Training Method</th>
<th>Training Location</th>
<th>Training Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTHMA GUIDELINES</td>
<td>Understand core concepts of EPR 3 asthma guidelines; quick relief medications; long term control medications; define asthma control; understand role of pulmonary function testing</td>
<td>Didactic; Self review of EPR 3</td>
<td>Orientation; Didactics; PFT lab</td>
<td>October</td>
</tr>
<tr>
<td>ASTHMA HISTORY</td>
<td>Obtain detailed and complete asthma history</td>
<td>Didactic; Observation; Ongoing feedback</td>
<td>Inpatient; HRA; New Pt</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>PHYSICAL EXAMINATION</td>
<td>Perform reliable asthma physical examination; recognize air exchange, work of breathing, wheezes, distress</td>
<td>Didactic; Observation; Ongoing feedback</td>
<td>ED; ICU; Inpatient; HRA</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>ASTHMA MEDICATIONS</td>
<td>Provide correct education in use of asthma medications and devices</td>
<td>Didactic; Observation</td>
<td>HRA; Inpatient</td>
<td>Oct-Dec</td>
</tr>
</tbody>
</table>
Pre-implementation

- Protocols
  - Sick/urgent
  - Duonebs
  - Steroid extension
  - Outpatient appt ≤ 48 hours
  - Emergent
- Guidelines
  - Referrals

- EMR
  - Report structure
  - Data collection
  - Information sharing

- Outreach
  - PCP offices
  - Asthma specialists
Implementation

• All patients discharged from Riley Hospital for asthma:
  • Marion County
  • Age 2yo and older
• Visits 3-5 days after discharge
• Scheduled by asthma educator
• Extra capacity on evenings/weekends
Visit Structure

- Medication/equipment review
- Reinforce asthma education
- Review of Asthma Action Plan
- Inhaler/spacer technique
- Home environmental assessments
- Referral to ongoing services as indicated
  - Social work
  - Legal support
  - Public health nursing
  - Indoor air quality specialist
  - Smoking cessation (QUIT-NOW)
Challenges

- Personnel turnover
- Training period
  - Streamlined training (3 months → 3 weeks)
  - Train the trainer
- Communication / EMR
- Scheduling
- No-shows
Results

- 79-84% of eligible patients scheduled for visit
- 40-59% with successful visit completed
  - Variable over time
  - Affected by volume
Admissions Based Cost Savings

- 2013 = 6.52% (44/675)
- 2014 = 1.97% (14/712)

→ 30 hospitalizations prevented

- Hospital cost:
  - Estimated $13,597 per hospitalization

→ $407,910 saved in hospitalization costs for 2014
Return on Investment

• 285 visits provided in 2014

Number Needed to Treat:
• 9.0 visits to prevent one hospitalization

• $1431 saved per visit provided
Visited versus Not Visited

- 2014-2015 combined
- Recidivism to ED or hospital
- Reductions seen up to 90 days post-discharge
<table>
<thead>
<tr>
<th>Intervention</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication review, weaning schedule, medication technique</td>
<td>138</td>
</tr>
<tr>
<td>Environmental and triggers education in home</td>
<td>86</td>
</tr>
<tr>
<td>Smoking cessation education / referral</td>
<td>22</td>
</tr>
<tr>
<td>Advise/ Assistance to schedule follow-up appointment/PCP apt</td>
<td>21</td>
</tr>
<tr>
<td>Referral to Public Health Department</td>
<td>37</td>
</tr>
<tr>
<td>Referral to Air Quality Specialist</td>
<td>3</td>
</tr>
<tr>
<td>Referral to Department of Child Services</td>
<td>2</td>
</tr>
<tr>
<td>Referral to Asthma Alliance for Daycare Education</td>
<td>3</td>
</tr>
<tr>
<td>Referral to Riley Social Work: financial barriers</td>
<td>10</td>
</tr>
<tr>
<td>Provided with a mask/spacer</td>
<td>23</td>
</tr>
<tr>
<td>Contacted clinic nurse for care coordination/concerns</td>
<td>3</td>
</tr>
<tr>
<td>Flu Shots (pt/family)</td>
<td>4</td>
</tr>
<tr>
<td>Urgent action provided/arrange care due to immediate concerns</td>
<td>3</td>
</tr>
<tr>
<td>Asthma Education Material/books and crayons provided</td>
<td>18</td>
</tr>
<tr>
<td>Vacuum provided</td>
<td>6</td>
</tr>
</tbody>
</table>
Successful Case Study 1

- 3 year old: hospitalization x2, mother lost job
- IEMS visit: water damage, mold, second-hand smoke from neighbor, broken water pipes
  - MCPHD referral, Indoor Air Program
  - Family was moved out of the old apt
  - Referral: Medical Legal Partnership - assisted with moving
  - Family was followed up by MCPHD in new apt
Successful Case Study 2

• 5 year old: ER x 3 times, hospitalization x 1 in the past 5 months
✓ IEMS visit
  • Cockroaches were seen in the apt
  • MCPHD referral → Housing order issued by MCPHD
  • MCPHD provided roach baits, gel, education
  • Property manager sprayed for cockroaches
  • MCPHD continues to follow up
Current Program Status

• Have expanded to 6 paramedics
  • Cross-trained with COPD/CHF programs
• Grant funding ending September 1, 2016
• Initial meetings with Medicaid providers
  • Data presentation
  • Negotiations

• Other options?
Future Goals

• AE-C
• Healthy Homes Training
• Expand outside Marion County
  • Central Indiana
  • Statewide
• Followup visits

• Robust bi-directional partnerships:
  • Public Health Nursing
  • Indoor Air Quality Specialists
  • Remediation Services
Special Acknowledgments

• Andrew Stevens, MD
• Elizabeth Weinstein, MD
• Cindy Fiscus, RN
• Jennifer Walthall, MD
• Daniel O’Donnell, MD
• Kay McAteer
• Sara Wallace
• Steve Schenk
• Riley Administration
• Riley Asthma Educators