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MEDICINE

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HOME CARE GROUP

AsthME:

Remote Patient Monitoring for Children with Asthma

Developed by Pediatrics at Home, in collaboration with JH Community Physicians and Quantified Care (a Hopkins startup)

Agenda

- Background
- Results to Date
- Next Steps

Staying in School: Our Very First Patient

Patient Profile	Collaborative Intervention	Results

• 8 year-old MC, from one of inner-city Baltimore's underserved neighborhoods
• Due solely to his asthma, MC had to **repeat the first grade** because he missed so much school
  ○ During an exacerbation, MC would be out for a week, end up in the ED, and would be discharged home with steroids
• Mom willing to try anything
	• JHHCG Registered Nurse and Respiratory Therapist worked with MC and Mom to ensure the asthma action plan his pediatrician (PCP) created was adhered to
	  ○ PCP kept involved as needed
	• MC was very active during the program and even past the 90 day graduation mark
		• No ED visits or hospitalizations while enrolled
		• Built upon the underlying safety net of JHHCG clinicians being just a click away, MC and Mom took on more responsibility and action to control his asthma
		• He did have an asthma flare in September
		  ○ Mom followed his 'smart' Asthma Action Plan, got symptoms under control, avoided the ED, didn't need steroids and **did not miss school**
		• Reduced stress on MC and Mom
		Asthma is WELL CONTROLLED

Johns Hopkins Home Care Group:

A community-based provider serving Howard County and more

We are a highly specialized group providing holistic patient services, collaborating with other JHM entities and affiliates to identify needs and gaps in transitioning patients to the home and community.

We mobilize services to meet patients throughout the continuum of care, providing not only restorative therapy, but preventative and wellness care.

Johns Hopkins Home Care Group:
Our Programs and Services

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Transition Services	Johns Hopkins Pharmaquip Inc.	Johns Hopkins Pediatrics at Home Inc.	Johns Hopkins Home Health Services Inc.
• Home Care Coordination • Transition Guides • Medication Management • Home Medical Equipment (HME) Liaisons • Home Care Connections • International Services	• Respiratory and HME • Infusion Services • Community Pharmacy Services • Specialty Pharmacy Services	• Respiratory and HME • Home Health Services in Maryland • Home Health Services in D.C. • Home Infusion	• Remote Patient Monitoring • Home Health Services • Home Support

Social Impact

	National USA	State Maryland
Total Pediatric Asthma Population	6,224,400	161,003
Total Number of Patient Missed School Days	10,500,000	510,057
Missed School Days per Patient	1.69	3.17
Total Number of Caregiver Missed Work Days	84,000	4,080
Caregiver Missed Work Days per Patient	1.35	2.53
Cost of Productivity Loss per Year	$2.3B	$59.3M

*Productivity loss per patient per year: $368.34 in 2015 dollars**

2010 Data
Sources: CDC, US Census Bureau, MD Asthma Control Program,
*Wang, et al. *Prev Chronic Dis*

Aligning with the HCLHIC's Vision for Asthma

- FY 18-20 Access to Care
  - Priority 1: Reduce Emergency Department visits for diabetes, hypertension, and asthma in Howard County.
  - Goal 1.1a: Provide referral/linkage to diabetes/hypertension/asthma education and services through community partnerships and evidenced-based programs for priority populations.
  - Process Objectives:
    - By June 30, 2020, participation in evidenced based asthma education for priority populations will be increased by 10%.
    - By June 30, 2020, 20% of HCLHIC partner organizations will be engaged in Diabetes, Hypertension and Asthma awareness for priority populations by utilizing communication action alert tool.
- Momentum building through:
  - Stakeholder networking
  - Asthma action plans into Fit Family Nights' educational activities

Timeline:

From Ideation to Implementation

2018 and beyond:

- Study ends in June
- Secure funding to sustain, scale and enhance

A Comprehensive Program

Mobilization of asthma care

Home Care Clinician:

- Pre-screens to identify the primary user (patient or caregiver)
- Conducts an in-home environmental assessment and advises for asthma trigger remediation
- Onboards onto mobile application
- Securely communicates, oversees pushed education and reviews reported symptomology data
- Oversees the patient's 'smart' asthma action plan

- **In a 90-day pre and post comparison, AsthME achieved an 83% reduction in the utilization of the ED and hospital**
- **97% patient/caregiver satisfaction**

Metrics to Date

- Ages 5-21 (can likely accept 4 year-olds in the future)
- Referred from JHCP Canton Crossing, EBMC, and Remington
- Graduate at 90 days

Representative of April, 2017 through January, 2018 in an ongoing study

Measure	Amount	Description
Participants	72	98% JH Priority Partners, 1% JH Employee Health Plan, 1% Other
Engagement	86%	Users engaging at least 4 times per 30 days
Reduction in High-Cost Utilization	83%	Pre/Post 90-day Comparison for ED Visit or Hospitalization
Reduction in High-Cost Utilization	47%	Pre/Post 180-day Comparison for ED Visit or Hospitalization
Currently Enrolled	21	
Graduates	41	6 graduated but are still checking in

Pediatricians' Perspective

AsthME helps my patients by ensuring an Asthma Action Plan is up to date and on file, identifying when spacers are needed and from the additional information I receive from the Registered Nurse's notes.

Dr. Grace Gelletly, Pediatrician at JHCP Remington

I'm very excited by what Pediatrics at Home has created, as it is the most innovative program I have seen for pediatric asthma in the last twenty years. It is a scalable way to improve outcomes and have children with asthma and their caregivers take more responsibility for the management of their disease.

Dr. Michael Crocetti, Chief of Pediatrics, JHCP

Future Plan:
AsthME 2.0

- Sustain and scale through further funding
  - Evaluation of study population's utilization data to prove the ROI
- Continue support for current patients
- Potential for:
  - a Spanish-version for populations facing health inequities
  - Standard order sets in Epic
  - a collaboration with Breathe Easy Baltimore and other groups
- Is there anything else we should be considering?
  - Perhaps we can learn more about the HCGH home-based asthma group

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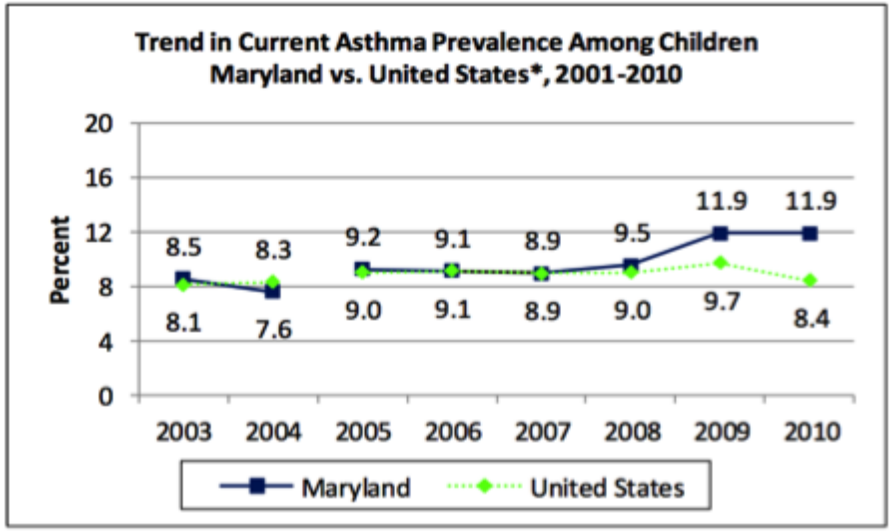
Next Steps

Appendix

Pediatric Asthma Prevalence

	National USA	State Maryland
Total Pediatric Population	74,100,000	1,352,964
Total Pediatric Asthma Population	6,224,400	161,003
Lifetime Pediatric Asthma Prevalence	12.6%	16.4%
Current Pediatric Asthma Prevalence	8.4%	11.9%



Maryland BRFSS, 2001-2010; CDC BRFSS, 2003-2010.

2010 Data
Sources: CDC, US Census Bureau, MD Asthma Control Program

Medical Impact

	National USA	State Maryland
Emergency Department Visit Rate*		136.1
Emergency Department Total Visits		18,520
Emergency Department Cost per Visit		$685
Emergency Department Total Visit Cost		$12.1M
Hospitalization Rate*		25.4
Hospitalizations Total		2,976
Hospitalization Cost per Event		$5,403
Hospitalization Total Cost		$16.1M

2009 Data
Sources: CDC, US Census Bureau, MD Asthma Control Program

Smart Device Ownership:
Validation Survey

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Details:

- Location: East Baltimore Medical Center
- Purpose: Identify mobile technology familiarity and interest in a potential program for improved pediatric asthma management
- Patient age range: 6 – 21

Findings:

72%

Pediatric patients with their own mobile device

100%

Pediatric patients without their own device who use a family member's device on a regular basis

72% Yes
28% Maybe

Pediatric patient interest in a potential program

JHCP Involvement

- Pediatricians from JHCP's 3 inner city locations identify participants during in-office visits
  - 5-21 years old
  - Diagnosed with Asthma
  - Ownership/Daily Access to a smart device (phone or tablet)
  - Ability to use the app in English
- If eligible and interested, the PCP and/or their team will offer verbal information and a Pediatrics At Home handout
- If patient (and caregiver) decides to participate, the PCP will make a referral via EPIC to Pediatrics At Home

Pediatrics at Home Involvement

- Upon receipt of referral, the Pediatrics At Home clinician conducts a welcome in-person visit
  - Written Consent
  - Determination of who will be primary user of application
  - In-home Environmental Assessment (Standard of Care)
- Participants stay with program for at least 3 months
- Care is Standard, but now mostly provided via mobile application
  - Medication Education
  - Disease Management, inclusive of Asthma Action Plan
  - Monthly Asthma Control Test and Weekly Symptomology Questions
- Pediatrics At Home clinician coordinates care and relays any critical information back to the pediatrician

Follow Up After Enrollment

- In basket message that patient is enrolled
- Asthma Action Plan needing to be updated (if necessary)
- HME order needed- spacer/neb. tubing
- Misc. issues needing assistance
  - Case Management
  - Assistance with insurance, medicine
  - Referrals for Environmental Issues
  - Social Work

Additional Insights

- Increased communication and interventions with patients with Asthma flares
- Medication refills easier
- Able to get patient's into pediatrician's appointments

Identified Clinical Trends by Pediatrics at Home

- Medications not being taken correctly
- Medications not in home
- Spacers not in home/using incorrectly
- Nebulizer tubing/parts missing
- No AAP (Asthma Action Plan) in home
- No AAP/inhalers at school
- Knowledge deficit

Program Benefits with Remote Monitoring

- Prioritize needs based upon patient status
- Communicating via patient's preference
- Increase two-way access and interaction
- Decrease response time to proactive intervention
- Reinforce age appropriate, provider-generated education
- Early patient engagement
- Patient perspective and status before visit is made

Under Evaluation:
How Program Has Been Received

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- Anecdotes from satisfaction survey given to patients/caregivers:
  - Like the ability to communicate through the app
  - Value the one on one attention
  - Appreciate the AAP and medication list on phone