Children's Hospital of Philadelphia
PolicyLab

Implementing and Evaluating the Effectiveness of Single Maintenance and Reliever Therapy (SMART) in Pediatric Primary Care

Statement of Problem

Asthma is a leading cause of childhood morbidity and disparities nationwide. Yet, many providers have not adopted leading evidence-based recommendations for chronic asthma management, and many patients do not stick with their treatment plan.

In 2020, the National Heart, Lung, and Blood Institute (NHLBI) introduced single maintenance and reliever therapy (SMART) as the preferred management strategy for children older than 5 with moderate to severe asthma. The SMART strategy simplified the traditional "two inhaler" approach, where one inhaler was used daily for management and the other as needed, into a single inhaler delivering both management and relief medications simultaneously.

While SMART's efficacy, safety, and real-world effectiveness have been demonstrated internationally, the approach has not yet been widely implemented or evaluated in practice among children in the U.S.

Description

Our prior work revealed several critical barriers to successful and widespread SMART implementation, including insufficient provider training to identify and educate patients in need, a lack of post-prescription patient education on SMART, and systems-level barriers to care such as lack of insurance coverage.

This study aims to improve adoption of SMART in pediatric primary care and assess its real-world effectiveness in a large health system with similar racial demographics to U.S. asthma morbidity statistics.

In a two-phased approach, the study team will test two implementation strategies across 18 pediatric primary care clinics—the first, clinical decision support via electronic health records and education; the second, clinical decision support and education together with ongoing educational, social, and insurance support from community-health workers and/or nurse care managers.

The specific aims of the study are to:

1. Conduct a cluster randomized controlled trial to compare the two implementation strategies to standard care on the following outcomes: SMART adoption at visit, sustained adoption of SMART by patient, and incorporation of SMART throughout the clinic
2. Determine the real-world effectiveness of SMART in reducing severe asthma exacerbations among a group of mostly Black children with poorly controlled asthma
3. Assess mechanisms of successful SMART implementation and effectiveness using mixed methods

Next Steps

We anticipate that the findings of this study will inform national implementation and dissemination strategies for SMART. This work aims to establish an evidence base for the effectiveness of SMART in a racially diverse U.S. pediatric population and share effective clinical decision support enhancements or implementation manuals through existing national networks. In particular, we will share findings and strategies with state Medicaid formularies to inform policy.

Ultimately, we hope the findings will help facilitate widespread and equitable implementation of SMART in pediatric health systems nationwide.

For more information about the project partners, visit their websites: Children's Hospital of Philadelphia (CHOP) Data Science and Biostatistics Team (DBSU), and CHOP Clinical Reporting Unit Team (CRU).

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Project Leads

Chén Kenyon MD, MSHP

Faculty Member

Chén Kenyon is a pediatric hospitalist at Children's Hospital of Philadelphia (CHOP) and an Assistant Professor of Pediatrics at the University of Pennsylvania. He is also a faculty member at PolicyLab and Clinical Futures at CHOP and serves as the faculty lead for PolicyLab's Population Health Sciences Portfolio. Dr. Kenyon's research focuses on integrating care systems and reducing outcome disparities for children with asthma. His recent work focuses on developing novel interventions to enhance asthma controller medication use in the highest risk children by leveraging mobile health technology and incentives oriented to the child. He also co-leads the Asthma Population Health Workgroup at CHOP, implementing and evaluating network-wide interventions for children and families with different levels of asthma severity and risk.

Dr. Kenyon received his undergraduate degree from the University of Rochester in Mathematics and attended medical school at Boston University School of Medicine. He completed residency training in the Boston Combined Residency Program in Pediatrics, where he served as a chief resident. He then received a Masters in Health Policy Research as a Robert Wood Johnson Clinical Scholar at the University of

Pennsylvania, which he finished in 2013.

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Tyra Bryant-Stephens
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Tyra Bryant-Stephens is a faculty member at PolicyLab at Children's Hospital of Philadelphia (CHOP), senior director of the Center for Health Equity at CHOP and the medical director of the Community Asthma Prevention Program (CAPP). Her research focuses on the use of community-based interventions to improve child asthma outcomes for underserved populations.

Dr. Bryant-Stephens founded CAPP in 1997. As medical director of the program, she leads a staff of 12 that includes registered nurse clinical and educational coordinators as well as lay home visitors. CAPP was designed to improve the health and well-being of children with asthma by providing free asthma classes in the community for parents and their children with asthma. The project also supported a new way of providing education in the homes of children with asthma where parents learned about the types of environmental changes that could be made to improve their child's asthma. In offering home visits and free asthma education, CAPP satisfied a strong need in the West Philadelphia community and received tremendously positive feedback from families and class participants.

In 2000 and 2001, CAPP's success in providing asthma education in the home and community was expanded when Dr. Bryant-Stephens received grants from the U.S. Environmental Protection Agency and the National Institutes of Health (NIH). Through the NIH-funded "Community Partnerships for Asthma Prevention" CAPP was able to continue to offer free home visits to the West Philadelphia community. Free asthma education classes continued to be offered through a grant from the Pew foundation.

Also in 2001, CAPP received a grant from the Centers for Disease Control and Prevention to expand its work into the North Philadelphia area. In this project, CAPP has worked with a collaborative of partners to implement four main interventions: community asthma education classes, home visits, primary care provider training and education for school's personnel. In 2005 CAPP also began to offer free asthma education classes to children in Philadelphia public and charter schools. In another new project, as part of the Merck Company Foundation's Merck Childhood Asthma Initiative, CAPP is expanding home visiting and community classes to areas of the city that were not previously served—neighborhoods in South, Northwest and Northeast Philadelphia.

Dr. Bryant-Stephens completed her MD at the Bowman Gray School of Medicine at Wakeforest University and her residency in pediatrics at the Medical College of Georgia.

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Alexander Fiks
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Alex Fiks is a faculty member at PolicyLab at Children's Hospital of Philadelphia (CHOP), an urban primary care pediatrician at CHOP, director of Clinical Futures at CHOP and an associate professor of pediatrics at the Perelman School of Medicine at the University of Pennsylvania. He is also the director of the American Academy of Pediatrics (AAP) Pediatric Research in Office Settings (PROS), a national research network, medical director for the Pediatric Research Consortium (PeRC), CHOP's practice-based research network and co-director of the Possibilities Project, an initiative to innovate primary care delivery. Additionally, Dr. Fiks is a founding member of the hospital's Department of Biomedical and Health Informatics.

Board certified in clinical informatics, Dr. Fiks' research is aimed at improving outcomes for ambulatory pediatric patients through practice-based research with a focus on improving health and health care decision-making through health information technology. To achieve these goals, much of Dr. Fiks' research is focused on fostering shared decision making between clinicians and families, especially in the setting of behavioral health conditions. He is also especially interested in how electronic health record data may best be used to improve primary care, medication use and child health more broadly. As Director of AAP PROS, Dr. Fiks has been involved in building the Collaborative Electronic Reporting for Comparative Effectiveness Research (CER^2), an electronic health record database designed to support pharmacoepidemiologic and other comparative effectiveness studies that currently includes >2 million U.S. children from across multiple health systems.

Dr. Fiks received his medical degree from Harvard University, and received a Master's of Science in Clinical Epidemiology (MSCE) degree from the University of Pennsylvania. He has received additional training in clinical informatics.

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National Heart, Lung, and Blood Institute (NHLBI)

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Related Tools & Publications

- Improving Single Maintenance and Reliever Therapy for Patients Admitted for Asthma Exacerbation
  Article
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