We can do better

Improving Asthma Outcomes in America

Final Report

A Report Summarizing Quality Improvement Demonstration Projects in Knoxville, Tennessee
Prepared by the Public Health Foundation

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PREFACE

About PHF

The Public Health Foundation (PHF) is dedicated to achieving healthy communities through research, training, and technical assistance. For more than 40 years, this national, non-profit organization has been creating new information and helping health agencies and other community health organizations connect to and more effectively use information to manage and improve performance, understand and use data, and strengthen the workforce. The mission of PHF is to improve the public's health by strengthening the quality and performance of public health practice.

PHF, in its commitment to help public health systems save lives, cut costs, and achieve their goals, provides a comprehensive set of performance management and quality improvement services. Through training, technical assistance, and coaching and collaborations with partners in quality improvement and public health, PHF helps public health organizations harness proven quality improvement techniques to benefit the public's health, drawing on the best available research, resources, and expertise from the private, public, and academic sectors. PHF's team of public health and quality improvement professionals has decades of experience.

PHF is incorporated in the District of Columbia as a private non-profit 501(c)(3) organization. PHF is an independent, non-membership organization, governed by an eleven-member Board of Directors comprised of two state health officers, two local health officers, one local board of health member, and six individuals from academic, private sector, and other public health agency settings.

PHF Staff

Jackie Carden and Lynne Stauff, both formally with PHF, initiated the *We Can Do Better* Phase II asthma project and oversaw project design. Ron Bialek, President, and John W. (Jack) Moran, Senior Quality Advisor to PHF and Senior Fellow, University of Minnesota School of Public Health, assisted in program design, developed program materials, and facilitated meetings with four Knoxville demonstration sites. Leslie (Les) Beitsch, a Quality Improvement (QI) Expert for PHF, assisted in facilitating the Public Health Asthma Advisory Group meeting. Julia Gray, Project Manager for Performance Management and Quality Improvement, led report design, development and promotion of project results. Margaret Beaudry, Director for Performance Management and Quality Improvement, and Emily Reineke, Communications and Operations Coordinator, assisted with the report design, development and promotion of project results (all biographies can be found in Appendix A).

Acknowledgements

We deeply appreciate the support of the thirteen-member national ad-hoc group that served as a Public Health Asthma Advisory Group, and provided input on the community site selection and elements of successful, sustainable gains in health outcomes for asthmatics. This project could not have been completed without leadership from the Knox County Health Department and Summit Medical Group: Kathleen C. Brown, PhD, MPH, CHES, Director, Community Assessment and Health Promotion, Knox County Health Department, Lisa Wagoner, BSN, HCSN, Supervisor, Health Services, Knox County School System, Lorraine Larrance, BSN, MHS, CCM, CCP, CPHQ, Quality Director, Summit Medical Group; Warren Sayre, MD, Summit Medical Group (All available biographies can be found in Appendix A).

PHF wishes to thank Dyan Alexander of AstraZeneca who shared with us her goal of helping states coordinate and implement quality asthma plans.

The work described in this report was supported by a generous charitable contribution from AstraZeneca. The opinions expressed in this report do not necessarily reflect the views of the PHF Board of Directors or the collective views of the public health and health professionals devoted to the prevention and control of asthma.

We improve the public's health by strengthening the quality and performance of public health practice.

EXECUTIVE SUMMARY

We thank the Public Health Foundation and AstraZeneca for cultivating a culture of process improvement in our organization that will bear fruit for years to come.

— Summit Medical Group

The Public Health Foundation (PHF) worked with four teams that serve demographically diverse communities in Knoxville, Tennessee, to achieve improvements in the management and control of asthma through use of quality improvement (QI) tools and techniques. The four teams, along with several subgroups, met over nine months and participated in the rapid cycle Plan-Do-Check-Act (PDCA) problem-solving model. John W. (Jack) Moran, Senior Quality Advisor to PHF and Senior Fellow, University of Minnesota School of Public Health, facilitated the teams' learning and evolution through the PDCA cycle.

PHF engaged asthma professionals in a Public Health Asthma Advisory Group to inform the selection of community sites and to define elements of successful, sustainable gains in health outcomes of asthmatics. Knoxville, Tennessee was chosen as the site for the Asthma Demonstration Project due to several factors, including that it was rated by the Asthma and Allergy Foundation of America as one of the top ten worst Asthma capitals since 2004. PHF partnered with the Knox County Health Department (KCHD) to champion the project locally and determine four community-based sites in the Knoxville area. The KCHD and Knox County Schools (KCS) and the Summit Medical Group (Summit) agreed to undertake QI activities, including developing AIM statements and undergoing a rapid PDCA problem-solving process, and to be more efficient and effective in assuring that populations with asthma can better manage and control asthmatic episodes.

The goal of the KCS system asthma project in collaboration with KCHD was to reduce the negative impact of asthma on the staff and students through protocols, education, and an informed system. Based on QI process undertaken and four surveys completed by key stakeholder groups, several products were developed to improve the quality of asthma education and increase parents' understanding of asthma policies and protocols. Some products developed include a teacher reference card, an online learning module for teachers, revised Asthma teaching materials for K-5 students, and fact sheets detailing school Asthma policies and protocols for parents. The updated policies and forms will be a part of the nurses' resource guide and available to parents online.

Under the direction of the Summit Leadership Team, with facilitation by PHF, the three Summit teams participated in a rapid PDCA process to improve the quality of asthma care provided to adults. The City of Knoxville (COK) team had the goal of creating a set of specific markers for successful health coaching using a care management plan and the chronic disease protocols. The COK systematically implemented actionable changes to the workflow that improved communication with treating physicians, which was paramount to the success in improving patient self-management. The Statcare Pulmonary Consultants and the Tennessee Valley Primary Care teams had the goal of developing a systematic way to measure guideline utilization or healthcare outcomes in asthmatic patients. The Statcare team designed office posters and handouts with a "Go With The Flow" heading that described how improved workflow equals improved airflow. All Summit teams saw improvement in workflow changes, better communication between the health care teams that interact with asthmatic patients and improved documentation of patient visits.

This project brought together diverse organizations with a common interest in improving asthma management and control in Knoxville communities and across the state of Tennessee. Activities were undertaken to support this effort in 2010-2011. Upon further evalution, over a longer time frame, these improvement initiatives may lead to refined strategies and processes that can be expanded nationally to communities and states trying to achieve better results in asthma prevention and control. The promise of improving asthma management care in America will be realized with continued review of evidence-based interventions, such as the Guide to Community Preventive Services, the development of road-maps explaining how to implement evidence-based interventions among different communities, and the support to document and share best practices, products and processes that are proven to be effective in improving asthma management care. The continual application of performance management and quality improvement can help yield great gains in improving asthma management care outcomes.

PHF Vision: Healthy Practices. Healthy People. Healthy Places.

INTRODUCTION

"Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives." —William Foster

Project Overview

In 2008, the Public Health Foundation (PHF) received an educational grant from AstraZeneca for a project that sought to identify the following with respect to asthma prevention and control:

- strategies that have achieved desired results;
- strategies that have failed to achieve desired results;
- characteristics contributing to and/or facilitating success, and
- characteristics confounding desired results and/or success.

In the three regional meetings held, asthma professionals were eager to learn from each other, particularly from elements of each other's asthma plans, policies, and practices. The attendees represented different disciplines, and each had a limited perspective on root causes of problems (e.g., the fundamental reason why asthma plans are not followed). Although time was built-in for networking, the participants never seemed to have enough time to learn from each other. Such exchanges support the notion of ongoing mini-collaboratives that involve an interdisciplinary team approach. The regional meetings represented the first step toward understanding and developing protocols that can be used in any setting to prevent and control asthma episodes. The results were identified in the Phase I paper *We Can Do Better: Improving Asthma Outcomes in America*.[1]

In 2010, PHF received a second contribution from AstraZeneca to fund a Phase II of this asthma prevention and control initiative. PHF built on what was learned from the first phase of the project: consider application of a mini-collaborative structure and use quality improvement (QI) methods to help communities achieve measurable improvement in the control of asthma. PHF shares a commitment with AstraZeneca to achieve meaningful outcomes that add value to the current knowledge base and will propel community leaders to implement proven intervention strategies in their communities, which can make a difference in the lives of asthmatics. If proven successful, these improvement initiatives can lead to refined strategies and processes that can be expanded nationally in communities and states trying to achieve better results in asthma prevention and control.

Photo by bobistraveling

Background of Asthma in America, Tennessee and Knoxville

Asthma is one of the most common and costly diseases in the United States. An estimated 20 million Americans (1 in 15) suffers from asthma at a cost of $18 billion annually.[2] At the initiation of Phase II, asthma's influence on cost and quality of life continued to be

substantial. PHF selected Knoxville, Tennessee as the site for the demonstration projects after considering a number of factors, including its readiness to initiate QI demonstration projects and because it was rated by the Asthma and Allergy Foundation of America (AAFA) as one of the top ten worst Asthma capitals since 2004. In 2011, AAFA rated Knoxville as the second most challenging place in America to live with asthma (Figure 1).[3] The AAFA acknowledges that people cannot move away from their asthma since every city in America has a variety of risk factors, but individuals should work with an asthma specialist to improve their overall asthma management plan no matter where they live. Asthma has been documented nationally, across the state of Tennessee, and particularly in the East Tennessee region, to be a high risk, high cost, and problem prone condition to diagnose, treat, and manage.

Demonstration Project Objective

Phase II of *We Can Do Better* was a demonstration initiative with the objective to assist communities in achieving measurable improvements in the management and control of asthma. PHF QI Experts provided training on proven improvement tools and techniques to determine communities' unique needs. QI Experts and the communities then designed improvement processes that addressed community-specific "root causes" that have served as barriers to achieving measurable improvement in asthma management and control. In this demonstration project, each participant group was charged with unique roles and responsibilities:

PHF Role

PHF was charged with the following roles and responsibilities: provide QI training, consultation and coaching as required; coordinate with health department and demonstration sites; provide health department with menu of potential target communities, outcomes and indicators of success; provide access to Public Health Asthma Advisory Group members; provide distance support with webinars and/or teleconferences, as required; provide project management support; evaluate and document process and outcomes; communicate and report to AstraZeneca; and analyze practice-based evidence and evidence of outcomes to develop and/or adapt approach that could be replicated elsewhere.

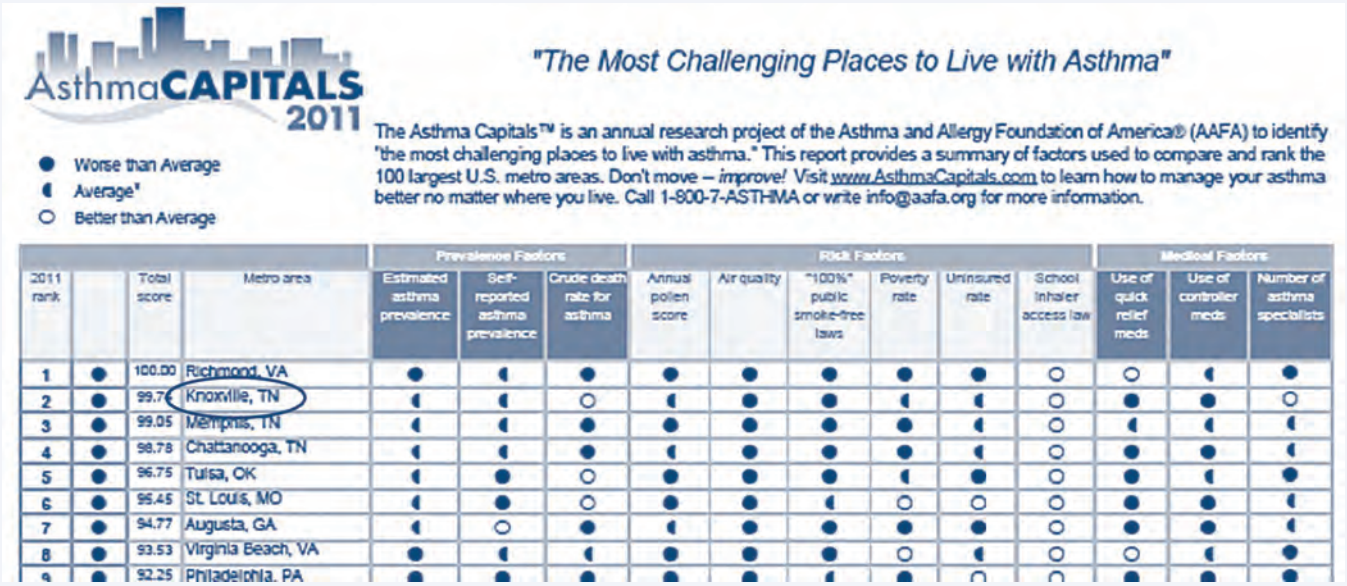
Health Department Role

The Health Department was charged with the following roles and responsibilities: develop approach with communities and PHF to choose target communities, choose outcome and identify indicators of success from menu provided by PHF; engage and convene demonstration site partners; participate in QI skills developments; collect data, provide advice and/or assist with community intervention(s); advise and assist QI Experts and project staff; contribute to evaluation, documentation and tools development processes.

Demonstration Site Role

The Demonstration Site was charged with the following roles and responsibilities: participate in meetings, trainings, webinars or other skills development sessions (e.g., determine intervention, etc.); work toward achieving improvement outcome; share strategies and contextual characteristics related to community interventions; implement improvement strategy to achieve objective; and collect data and share with health department.

Figure 1: 2011 Asthma and Allergy Foundation of America Asthma Capitals



METHODS

"To solve a problem or to reach a goal, you don't need to know all the answers in advance. But you must have a clear idea of the problem or the goal you want to reach." —W. Clement Stone

Expert Panel Meeting

PHF convened the Public Health Asthma Advisory Group (PHAAG) on March 16, 2010 to provide input on *We Can Do Better* Phase II. The thirteen-member national ad-hoc advisory group was comprised of experts from asthma and allergy management, community asthma programs, evaluation, asthma epidemiology and innovative asthma programs, and asthma primary care. The charge to PHAAG was to advise project staff on how to determine:

- What community-based asthma strategies/interventions have been used to achieve short-term sustainable gains in health outcomes of asthmatics
- Key elements of a successful community-based intervention for asthma
- A set of achievable and measurable outcomes that translate to short-term sustainable gains
- Helpful tools for communities as they develop their community-based asthma inventions

A summary document (Appendix B) was compiled, which was used to inform the selection of community sites and define the elements of successful sustainable gains in health outcomes for asthmatics.

Quality Improvement Process Followed

John W. (Jack) Moran, Senior Quality Advisor to PHF and Senior Fellow, University of Minnesota School of Public Health, provided the four Knoxville, Tennessee demonstration site teams with a total of seven days of combined quality improvement (QI) training and team technical assistance between July and September 2010 and revisited the sites in July 2011 for follow-up.

All teams were provided with an orientation on how to create AIM statements to fit communities' unique needs and how to design an improvement intervention process to address community-specific "root causes" that have served as barriers to achieving measurable improvement(s) in asthma. All teams began their QI projects by developing an AIM statement[4,5] which answered the following questions:

- What are you seeking to accomplish?
- Who is the target population?
- What is the specific, numeric improvement measure(s) you are seeking to achieve?

The improvement measure(s) are key components of the entire QI process. It's critical to quantify the improvement that is desired. Moreover, the entire AIM statement will need to be revisited and refined as each stage of the planning is completed.

All teams received training on the basic tools of QI and how they are linked in a sequence to provide a robust problem solving process (Figure 2).[6] Flowcharts and Cause-and-Effect Diagrams were two tools used most frequently by most Knoxville QI teams.

The Plan-Do-Check-Act (PDCA) process (Figure 3), a proven approach to help improve processes and eliminate inefficiencies in health

Photo by Natalie Maynor

departments, was selected as the foundation for the quality improvement projects.[7] The PDCA cycle has been embraced as an excellent foundation for, and foray into QI, as it is both simple and powerful. Its simplicity comes from its systematic, straightforward and flexible approach. Its power is derived from its reliance on the scientific method (i.e., it involves developing, testing and analyzing hypotheses). This foundation offers a means for participants to become comfortable with a host of QI methods and techniques.

Given the short timeline, each of the projects underwent Rapid Cycle PDCA[8]: the act of applying the recurring sequence of PDCA in a brief period of time to solve a problem facing a team in order to achieve breakthrough or continuous improvement results quickly. The utilization of a Rapid Cycle PDCA process helps organizations realize a quick return on their investment in QI. Some benefits include:

- Short cycles of change to accelerate quality improvement in the organization
- Holding the gains as a platform for the next level of project improvement
- Developing a broad base of QI knowledge and experience in the organization
- Helping in the establishment of an organization-wide culture of quality and excellence
- Solving many organizational problems that will promote needed organizational change and improvement
- Providing an iterative opportunity for team members to reinforce their QI knowledge quickly in the next project

Figure 2: General Approach on How to Use the Basic Tools of Quality Improvement

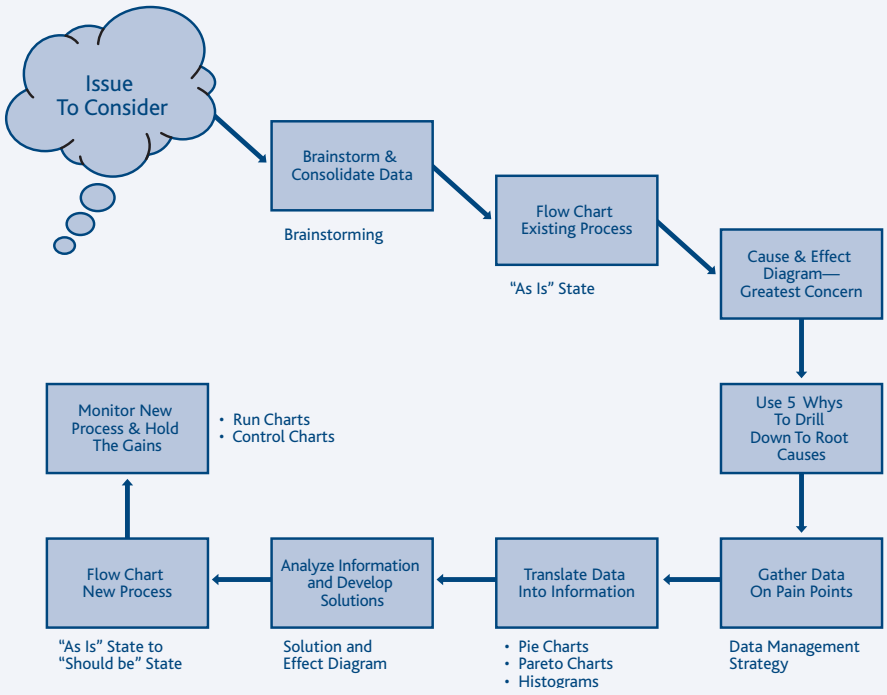
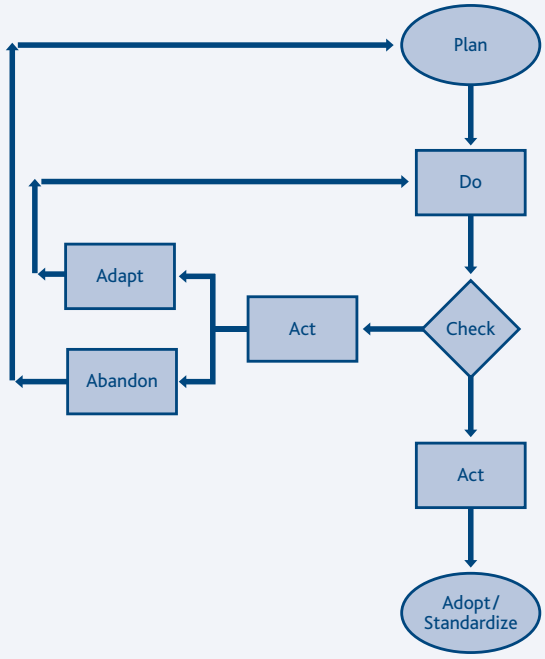


Figure 3: Flow Chart of PDCA Cycle



KNOX SCHOOLS & HEALTH DEPARTMENT QI PROCESS & RESULTS

Photo by Rupert Ganzer

The Knox County Health Department (KCHD) and Knox County Schools (KCS) enjoy a long-standing, positive, and supportive relationship. Multiple programs are conducted in the schools because of the partnership: Body Mass Index surveillance, HIV/STD education, flu vaccination, teen pregnancy prevention, health fairs and parent engagement. In addition, the KCHD Public Health Officer provides medical oversight to the school nurses. Each partner views the collaboration as a community asset which increases capacity to improve health status for all residents.

Knox County Health Department Overview

KCHD is the local public health agency serving the City of Knoxville, Knox County, and Tennessee residents. KCHD has 280 full-time employees and serves more than 50,000 persons per year. KCHD is committed to excellence and the department vision is *every person a healthy person.* The mission is *to encourage, promote and assure the development of an active, healthy community through innovative public health practices*. This asthma project is a demonstration of a commitment to innovative practice. Collaboration and advancement of best practices are germane to the core values of this health department.

Knox County School System Overview

KCS is a county-wide public school system serving the residents of Knox County. KCS has approximately 4,800 employees in 87 schools and enrolls approximately 54,000 students. Demographically, the student population is 79.4% White, 14.6% African American, 2% Asian/Pacific Islander, 3.7% Hispanic and 0.3% Native American. The KCS vision, *building on strength: excellence for all children,* and the associated Five Year Strategic Plan, *Excellence for All Children,* are organized around four major goals:

1. Focus on the Student
2. Effective Educators
3. Engaged Parents
4. Community and Infrastructure

Quality Improvement Project Overview

AREA OF FOCUS

Reduce the negative impact of asthma on the staff and students of the Knox County School System through protocols, education, and an informed system.

Quality Improvement Team

- Kathleen Brown – Director, Community Assessment and Health Promotion, KCHD
- Jennifer Johnson – Director, Accreditation and QI, KCHD
- Lisa Wagoner – Director of Health Services, KCS
- Vivian James, RN – High School
- Tonya Mershon, RN – Farragut
- Aneisa McDonald – Coordinator School Health Specialist
- Elaine Adams, RN – Central Office
- Brenda Armstrong – Covers 4 schools
- Lesley Guyot – Centers for Disease Control and Prevention Public Health Prevention Specialist

Rapid PDCA Improvement Project

Under the direction of KCHD with facilitation by PHF, the quality improvement team participated in a rapid Plan-Do-Check-Act (PDCA) process.

PLAN

The quality improvement (QI) team first described the current state of the problem, the impact on the school system, the cost to the school system, and the impact on students:

Current state of the problem

- 8.4% of adults across the United States report being told they currently have asthma.[9]
- 13% of Knox County High School students (estimated) report being told they have asthma.
- Rankings by the Asthma and Allergy Foundation of America[10] place Knoxville at number four among the worst cities for people with Asthma.
- The school system has an Asthma Action Plan for each child, kept either by the school nurse or by teachers.
- KCS has asthma protocol for teachers; reviewed with teachers who have student(s) with asthma in their classroom.

- KCS has a Peak Flow Meter form from Health Services. This is sent home to parents for the student's medical doctor to complete.

Why is minimizing the impact of asthma important to the school system?

- An unhealthy child does not learn as well.
- Asthma is a chronic disease with life-long implications. Early management of the disease may mean fewer complications or poor control of their asthma symptoms across the lifespan.
- We want to eliminate health disparities (i.e., if one is less likely to access meds, or experience an increased risk for Emergency Room visits).
- Deaths from poor control are largely preventable (actual case example: a child with poorly managed asthma, as evidenced by lack of meds, small for age, little parental involvement, resulted in the child dying prematurely).
- It is a costly disease that places added burden on low income families who may be under- or non-insured.

What is Asthma costing the school system?

- A teacher with asthma will miss work affecting quality and continuity of instruction.
- A substitute teacher costs $68/day.
- Extra demands on the school nurse's time.
- The qualitative environment of classroom is affected—either the teacher or student with asthma may be upsetting to others (and self-esteem).
- Student with asthma may have their ability to learn adversely affected.
- Student with asthma may be absent from school; especially critical for high school students with block scheduling.
- The school system may receive decreased funding based on per student funding formulas (if absenteeism above threshold).
- There is limited data that specifically quantifies the cost of asthma to the school system.

What is the impact of Asthma on the students?

- May lower self-esteem.
- May limit participation in activities such as sports.
- May elicit fear (of having attack, of being stared at, etc.) which may affect confidence.
- Affects ability to learn.
- May elicit fear/anxiety when other student or teacher has an asthma attack.
- Loss of instructional time if teacher has an attack.

The QI team then described the important aspects of the improved future state of the problem, what is driving the school to the future state, what might change, and the consequences of not moving to the future state:

Important aspects of the future state

- Having a well-developed asthma action plan for every student with asthma.
- Having a well-developed asthma action plan for every staff member with asthma.
- On-site asthma education program for students.
- Asthma is used by teachers as part of integrated curriculum.
- Reduce absenteeism attributable to asthma.
- Continuity of management beyond high school—connect with community resources before graduation.

Why should the school system move to this future state?

- It is morally and ethically right to address health disparities.
- The high prevalence of asthma in Knox County prioritizes this problem.
- Escalating healthcare costs demand the efficient use of resources and prevention.

What might change?

- Better understanding of the disease and critical aspects of management within the school staff and students.
- Improved individual health status of staff and students with implications for the general community.
- Reduced expenditures associated with asthma.

Consequences of not moving to the future state

- Classroom quality adversely affected.
- Maintain current state of situation.
- Costs remain at current or increased rate.

The QI team developed five flow charts to help them understand the various components that can impact identification of students with asthma. The flow charts also helped them to focus on potential control efforts within the school system. The five flow charts were:

1. Medical Form Flow Chart
2. Identification of Students with Asthma
3. Asthma Education
4. Student Support Services
5. Student's Physician Office Interaction with the Schools on Asthma

When the flow charts were analyzed, 12 potential causes were uncovered and prioritized for further investigation:

1. School Administrators and Staff
2. School Health Teams
3. School Nursing
4. Medical Forms
5. Materials
6. Asthma Education
7. Support Staff
8. Physicians
9. Parents
10. Environmental
11. Student
12. Competing Priorities

After all causes were reviewed, the team decided that the area they had most control over and that would have a high impact on the aim statement was school nursing. The other 11 areas were outside of their sphere of influence.

DO

Informational Surveys

KCHD facilitated distribution of surveys to gather input around the issue of asthma. Upon compilation of the survey data, the QI team would be able to make informed decisions on which areas to focus. Unique surveys were designed for four stakeholder groups: teachers, nurses, parents, and Healthy School Team Leaders.

Teacher Survey

The 15-question teacher survey was completed in fall 2010 by 685 teachers. Important results from the survey include:

- 43% believed that students with asthma have a higher absentee rate.
- 45% believed that a student's asthma sometimes affected his or her learning.
- 33% felt *not too confident* that they could provide care during an asthma attack until a nurse or a parent arrived.
- 45% miss between 1 and 6 days of work due to their own asthma.

- 15% miss at least 1 day from work to care for a family member with asthma.

Teachers expressed concern about the presence of molds and mildew and the general air quality of the buildings. They also overwhelmingly stated that the best way to improve how asthma is addressed is to education them.

Nurse Survey

A 3-question survey about asthma education was completed by the school nurses in fall 2010 (Appendix C). The results from the survey indicated:

- Nurses use multiple teaching methods, and often times more than one, to inform students about asthma:
  - 35% use a DVD
  - 30% offer a brochure
  - 30% use teaching model
- Nurses receive their teaching materials from a variety of sources including their own curriculum, the American Lung Association's Asthma 1-2-3,[11] and online resources.

Parent Survey

A 16-question survey was developed (Appendix D) for parents and more than 1,000 individuals responded. Key results from the survey indicate that:

- 25% of their children had missed at least one day of school due to asthma.
- 19% of their children had been treated in the Emergency Room for asthma.
- 4% had been hospitalized overnight due to problems with their asthma.
- 41% have an Asthma Action Plan.
- 70% would have their child attend an asthma education program and 57% of parents would also attend.

Similar to the results from the teacher survey, parents expressed concern about the physical condition of many of the classrooms and requested that more education occur.

Healthy School Team Survey

The Healthy School Team is made up of teachers, staff, students, parents and community members and established at each school. The Teams choose to focus on various components of health and implement policies and programs around them. Asthma is one of the issues a school might choose to address in a given school year. This survey was designed for team leaders to determine if their team had focused on asthma. From the 67 respondents, the most important data gathered was:

- 85% indicated they were working to establish management and support systems for students with asthma.
- 67% indicated they were working on asthma education for students and families.
- 71% indicated they were working on professional development or asthma education for staff.
- 80% requested assistance in all of the above areas.

Summary of Surveys

Consistency was seen across all the surveys. Staff and parents expressed a similar desire for increased education and standardization of process. The lack of an Asthma Action Plan by so many is a concern and prompted the QI team to engage other community resources due to the limited control the project team has over this area. The physical environment was clearly a common concern and will be addressed through a mechanism other than this project. The survey results provided invaluable information to the project members to feel confident that the interventions identified were needed and desired and thus, have a higher likelihood of success.

Team Action Plan

At the September meeting, based on the staff and nurse survey results, the QI team decided to form two sub-committees: policy and forms, and education. Immediate committee tasks included conducting the parent survey, taking an inventory of training materials, and analyzing student absentee data. Significant crossover and shared responsibility occurred between the subcommittees. The committee as a whole decided to base all education materials on the Asthma 1-2-3 curriculum to assure continuity across tools and materials.

Policy and Forms Team

The three goals of the Policy and Forms Subcommittee:

1. To review and revise forms germane to asthma in Knox County Schools.
2. To develop an asthma toolkit for KCS nurses.
3. To institute policy change around training for the KCS nurses.

The Policy and Forms sub-committee met separately from the full committee and reviewed each form associated with a student who has asthma in KCS. The review process revealed that the form containing the critical information regarding the student's specific needs was confusing and redundant. The sub-committee revised the form and developed an evaluation tool to pilot-test the form among teachers and nurses in at least three schools: one elementary school, one middle school, and one high school.

The sub-committee also developed an asthma toolkit for the school system (Appendix E). The desire for a standardized approach to asthma and the lack of understanding of school protocol by parents and staff provided compelling rationale for this effort. A toolkit/resource guide would address each of these concerns. It contains policy, protocols, forms, teaching materials and community resources. An associated evaluation tool was developed to secure feedback and provide direction for revisions. The toolkit will be piloted among the same group indicated above.

The third goal will be implemented for the 2011-2012 academic year using the Asthma 1-2-3 curriculum and conducted annually thereafter.

Education Sub-committee

The goal of the education team was to standardize asthma education for the KCS system. The sub-committee took a comprehensive approach to educational needs, considering the needs of nurses, teachers, parents and students. The initial plan included developing fact sheets for parents, refining the student curriculum, developing an on-line learning module for teachers, and collaborating with coordinated Healthy School Teams for other activities. Staff from the East Tennessee Children's Hospital Respiratory Therapy Department and The University of Tennessee College of Nursing faculty was engaged to provide input around the materials. The concept of a community coalition to address asthma came from this expanded

group. The concept, *"It takes a village to control asthma,"* crystallized and became the theme for the branding the initiative. The KCHD graphic artist developed a graphic reflecting the theme (Figure 4).

Teacher and Staff Resources

A Teacher Reference Card (Appendix F) was modeled after the emergency response card, distributed to all KCHD employees. The card contains the bulleted steps for response to an asthma attack based on severity of symptoms. It was distributed to all KCS teachers and staff before the 2011-2012 academic year began.

A PowerPoint training module is being developed for teachers. The content will be consistent with the Asthma 1-2-3 curriculum and estimated to take between 30-45 minutes to complete. The module will meet all requirements for professional development credit and will be piloted in spring 2011. A pre- and post-test will accompany the module and learners will receive professional development hours upon completion. The module will be offered through the KCS electronic staff resource and communication system.

Student Resources

The majority of student resources focus on grades K-5. The materials are being revised and updated to be consistent with the Asthma 1-2-3 curriculum. Materials for use in the classroom (activity sheets, word-search and matching exercises) from the curriculum developed by Dr. Tami Wyatt (UT College of Nursing) will also be included in the student resource section. They will be offered for grades K-3 and grades 4-5.

Parent Resources

A fact sheet detailing the policies and protocols for asthma will be prepared for parents and available online and will also be part of the nurses' resource guide. An education module will also be developed for use as necessary. The team would like to facilitate securing the required KCS form from the child's Primary Care Physician (PCP) which details the care the individual child needs. At present, it often means a second trip back to the PCP office causing more time missed from work (for the parent), frustration, and delay in getting the information to the school nurse. The expectation is that in the future when a child is diagnosed with asthma, the form is immediately completed and sent with the parent for the school nurse.

CHECK

Pilot tests were completed during spring 2011 to determine the utility of the teacher reference card, asthma learning module, and the revised parent informational asthma forms. Evaluations and adjustments were made as necessary.

ACT

The KCHD and KCS QI team will continue efforts around improving the lives of children with asthma. To sustain the momentum of this project, the school system's Health Services group will initiate dialogue with other stakeholders, including the East Tennessee Children's Hospital and the University of Tennessee, Knoxville College of Nursing, the state of Tennessee Asthma Task Force. Drs. Brown and Sayre are planning a presentation to submit to the 2012 Regional Tennessee Public Health Association Meeting and the American Public Health Association 2012 Annual Meeting & Exposition. Furthermore, the current project will be presented at an upcoming monthly Tennessee State Asthma Coalition.

The long-term goal is to have all asthma related materials fully implemented for 2011-2012 academic year. The committees will continue to meet monthly.

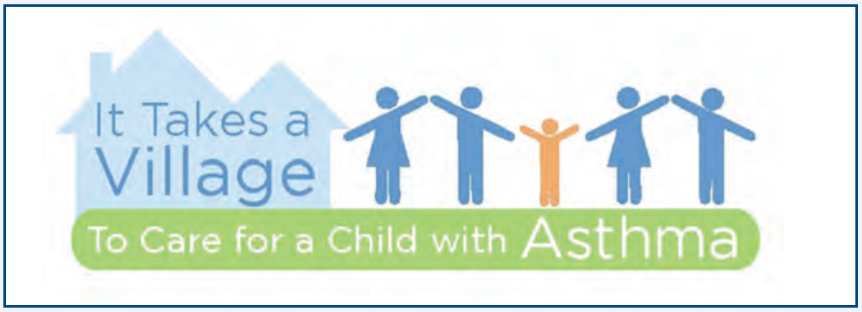
Conclusion

Knox County schools were closed for numerous days due to inclement weather. Thus, time for projects was minimized and some group members stopped attending meetings. Additionally, the nurses had to prioritize the immediate student needs and they were not always able to attend meetings.

While the KCHD enjoys a very positive relationship with the KCS, the most significant challenge will be to keep the group together. The separate organizations with unique approval processes and areas of control often inhibit timely progress. A major factor for working with the school system is the calendar, which places personnel off-contract for 8 to 10 weeks in the summer.

Several plans are in the making for continuing the work that began with this project. Through the incorporation of annual training and implementation of the Toolkit, the system personnel (teachers, nurses, and support staff) should experience increased comfort and confidence when managing an asthma episode. In order to determine impact, KCHD will administer additional surveys to nurses, teachers and parents to conduct long-term follow-up next year. These surveys will be similar to ones already conducted and expanded to capture satisfaction with the final products. Moreover, the community brand, *"It takes a village to care for a child with asthma,"* will be maintained by KCS, KCHD and other community partners.

Figure 4



"It takes a village to control asthma" branding

SUMMIT MEDICAL GROUP QI PROCESS & RESULTS

Summit's dedication to service and excellence remains a prime motivation in providing for the needs of those who entrust their health to its physicians.

Summit Medical Group Overview

Summit Medical Group (Summit) was formed in 1995 by 37 Knoxville physicians who had been practicing internal and family practice medicine for up to 40 years. These physicians had similar ideals, practice standards, and a desire to improve their service ability and be successful in the practice of medicine. With the framework of this common vision and the strength of pooled resources, Summit has become the largest and most widespread organization providing primary care in the East Tennessee region. Currently, Summit serves 10 Eastern Tennessee counties with 220 physicians in 50 office locations and 10 hospitals.

Summit's dedication to service and excellence remains a prime motivation in providing for the needs of those who entrust their health to its physicians.

Quality Improvement Project Overview

Leadership Team: Overall Direction and Coordination based at Summit

- Warren Sayre, MD, Director of Integrated Health Services
- Ed McBride, MD, Associate Medical Director of Informatics
- Lorraine Larrance, Quality Director
- Valerie Hensley, Quality Specialist

Under the direction of the Summit Leadership Team with facilitation by PHF, three groups participated in a rapid Plan-Do-Check-Act (PDCA) process to improve the quality of asthma care provided to adults:

- The City of Knoxville (COK) team aimed to create a set of specific markers for successful health coaching using a care management plan and the chronic disease protocols.
- Statcare Pulmonary Consultants (Statcare) team aimed to create a systematic way to measure EPR-3 guideline utilization or healthcare outcomes in asthmatic patients.
- The Tennessee Valley Primary Care (TVPC) team aimed to create a systematic way

Photo by Deidre Woollard

to measure EPR-3 guideline utilization or healthcare outcomes in asthmatic patients.

All groups began the QI process by brainstorming system improvements and designing a flow-chart of their AIM statements to identify areas of improvement.

The City of Knoxville

Background

The City of Knoxville (COK) has served as the Summit corporate wellness vendor since 2007. As it relates to the corporate wellness business line, Summit's concern is making the primary care physician and/or specialist intimately involved in the care management plan for each patient.

In addition to providing traditional occupational medicine services, the COK and Summit provide a health coaching program for Registered Nurses (RNs) to meet face-to-face with city employees to reduce gaps in care, to improve general understanding of diseases and the associated co-morbidities, and to implement self-management plans in collaboration with the employee. Asthma is one of nine chronic diseases for which health coaching is available because of its high prevalence in COK employees and the East Tennessee region as well as the high cost of the disease related to pharmaceutical and other claims.

The asthma health coaching program begins with either a self-reported or a claims reported diagnosis of asthma. After a health screening and related tests to determine the severity of the disease, a patient or employee is placed into a group that would then define the frequency of visits with the health coach. As part of the coaching curriculum, the health coach will educate on peak flow meter usage, the Asthma Action Plan (Appendix G), the definitions of asthma terms, triggers of asthma (Appendix H), medication usage and compliance with the treatment plan. In addition, gaps in care related to medication use and adherence to the primary care or specialists plan may be addressed if available.

While this program was developed by Summit physicians, the concern is that the self-management education and implementation of each individual patient was not well-coordinated with the patient's physician. Moreover, care was inconsistent amongst primary care physicians (PCPs), pulmonologists and health coaches.

Rapid Cycle PDCA Improvement Project

AREA OF FOCUS

Chronic disease protocols for health coaches are available, but there are no set care management plans for specific markers of successful coaching.

Quality Improvement Team

- Linda Burnette, RN, Wellness Coach
- Sage Brashears, Office Coordinator
- Sherry Allen, RN, Program Director
- Warren Sayre, MD, Director of Integrated Health Services

PLAN

Summit's goal was to develop and maintain a patient-centered, physician-directed, value-driven healthcare system in East Tennessee. To that end, Summit began a partnership with PHF to develop a best practice model for the treatment of asthma in the corporate wellness arena with integration into primary care practices as well as pulmonary specialist practices in the region. A team of individuals from Summit's Integrated Health Services and Summit's Quality Department met to embark on a rapid cycle improvement project.

The COK's AIM statement for this rapid PDCA improvement project was to "have a systematic care management plan for treatment of asthma in the acute and chronic settings." As part of this systematic care management plan, another goal was to find ways to discretely capture data on the aspects of health coaching and care management to show that closing gaps and improving self-management leads to reduction in absenteeism, increased productivity, and reductions in claims related to emergency department and inpatient care. An additional goal is to involve the treating physician with individual patient plan development.

DO

The five areas identified for potential improvement steps during the training included:

1. Document that every asthma patient was given a peak flow meter and instructions for use.
2. Document the patient's understanding of triggers for asthma.
3. Discover the most effective way to communicate information back to the treating physician.
4. Educate the patient on medication usage.
5. Educate each patient on the importance of having an Asthma Action Plan.

CHECK

In the fourth quarter of 2010, the COK implemented a benefit's structure redesign to encourage greater participation than in the prior year. Midway through the project, more than 1,000 new patients entered the program and the COK encountered some system changes and project barriers. As a result, the project focus was changed to increase enrollment and screening.

ACT

To manage the system changes, additional staff was hired, including a new director, an exercise specialist, and a new care manager. The COK also began collecting information from PCPs related to the use of asthma action plans and other resources to augment care.

Conclusion

The combination of brainstorming and systematically implementing actionable changes to the COK workflow and communication with treating physicians was paramount to the success in improving patient self-management. The COK is exploring other ways to document the electronic medical records to confidentially demonstrate internal quality measures are being attained. The COK will examine claims data related to the emergency department, pharmacy, and inpatient care for the cohort of asthmatic patients served in the COK. Importantly, the COK intends to use the skills and exercises from this QI experience to expand the model of integrated care to the eight other chronic diseases managed by its care managers and health educators.

Statcare Pulmonary Consultants

Background

Statcare Pulmonary Consultants (Statcare) is a division of the Summit Medical Group, and is one of Tennessee's leaders in pulmonary care services. Supported by Summit's strategic focus to develop chronic care improvement

programs, Statcare is in a key position to impact outcomes of asthma clinical care in East Tennessee. The Summit Integrated Health Services division compiled care guidelines using evidenced-based guidelines from the Institute for Clinical Systems Improvements and the Expert Panel Report-3 Guidelines (EPR-3)[12] from the National Asthma Education and Prevention Program.[13] A primary goal of the initiative was to apply concepts of the Chronic Care Model and rapid cycle improvement strategies to Statcare's asthma management process, and to create system redesign that supports the asthma patient's self-management skills, leading to improved clinical outcomes. A Chronic Care Model[14] advocates for more productive interactions between the patient and his/her care team.

Rapid Cycle PDCA Improvement Project

AREA OF FOCUS

Develop a systematic way to measure guideline utilization or healthcare outcomes in our asthmatic patients.

Quality Improvement Team

- Dr. John Prince, MD, Pulmonologist
- Shannon Polson, Office Manager
- Regina Overton-Barnes, NP

PLAN

Information was gathered from chart audits, as well as interviews with staff and providers. In addition, Shannon Polson's team performed workflow analysis on patients entering the office for care. The workflow review showed inconsistency between providers and pods in the implementation of the EPR-3 guidelines. Certain essentials to asthma care such as performing pulmonary function tests and educating on disease and medications varied by provider rather than being uniformly deployed.

The AIM statement of this project was to establish workflows that are systematically performed to document essential, evidenced-based standards in the care of asthma patients. The development of office-wide education materials were also of interest.

DO

An asthma patient knowledge survey (Appendix I) was designed and completed to capture data related to physician care and patient comfort with self-management of their asthma. In addition, chart audits were performed on pulmonary patients in the electronic medical record. Preliminary results showed that patients who had a documented Asthma Action Plan and pulmonary function tests in the chart scored highest on the questionnaire in all categories.

As of a result of the survey data, five changes were implemented in the workflow prior to the physician entering the room to see the patient:

1. Add peak flow to vital signs collected on all asthma patients
2. Complete the Asthma Control Test (ACT) Questionnaire on all asthma patients (Appendix J)
3. Document training with peak flow meters
4. Document the frequency of use for each inhaler on the patient's medication list
5. Place an Asthma Action Plan on the chart if not already present (Appendix G)

In addition, the pulmonologists and nurse practitioners confirmed that the respiratory techs were checking pulmonary function on all new patients.

Posters and handouts were designed with "Go With The Flow" heading (Appendix K). Educational information for staff members describing how improved workflow equals improved airflow was distributed throughout the office.

CHECK AND ACT

Certain physicians in Statcare now schedule all new asthma patients with the nurse practitioner for an educational visit that includes diagnosis and establishment of the Asthma Action Plan. They are utilizing tools in the electronic medical record to improve workflow and documentation of visit.

Conclusion

Several roadblocks delayed project implementation. The largest challenge was that Statcare relocated to a larger facility which improved the office workflow. In addition, the week before process improvement implementation, Statcare underwent a major electronic medical record upgrade that caused tremendous changes in the workflow of patients through their system.

The PDCA process has opened a dialogue between the pulmonologists and the primary care specialists in Summit to establish a seamless referral system, whereby both physician groups have clear expectations about the referral process and who will be managing the care of the asthmatic patient.

Statcare hopes to springboard off the asthma project to develop an asthma clinic to further stream-lines the process of asthma care. The future goal is to implement concepts to all the pods in the clinic as well, including expansion to an asthma clinic within the pulmonology group. If this occurs, many of the other workflow tools will be revisited and implemented at that time. In addition, the same process and exercises will be applied to develop a Chronic Obstructive Pulmonary Disease clinic.

Tennessee Valley Primary Care

Background

Tennessee Valley Primary Care (TVPC) is a Family Medicine and Internal Medicine base practice of Summit located in Jefferson County, Tennessee. As one of the State's leaders in primary care services, and supported by Summit's strategic focus on the development of chronic care improvement programs and a "culture of quality and service," TVPC is in a key position to impact clinical outcomes of asthma care in East Tennessee.

Rapid Cycle PDCA Improvement Project

AREA OF FOCUS

Develop a systematic way to measure guideline utilization or healthcare outcomes in our asthmatic patients.

Quality Improvement Team

- Marcia Kelly, Site Administrator
- Lynda Morelli, APN
- Norma Prizer, RN
- Lorraine Larrance, Quality Director

PLAN

TVPC's primary goals were to apply concepts of the Chronic Care Model and rapid cycle improvement strategies to the current asthma management process and to create system redesign that would support asthma self-management skills in our asthma patients and

lead to improved clinical outcomes. In developing the AIM statement, to establish workflows that are systematically performed to document essential, evidenced-based standards in the care of asthma patients, the TVPC staff identified that the outcome goals would be focused on care components associated with decision support, delivery system design, and self-management support to improve asthma related quality of life issues and clinical outcomes.

The providers and staff formed an improvement team with the focus on the aspects of asthma care related to the nationally recognized process of care measures. The Institute for Healthcare Improvement's "Model for Improvement" approach[15] was used to conduct small-scale Plan-Do-Check-Act (PDCA) cycles with a limited number of staff/providers initially, and subsequently spreading the successful change strategies to the remainder of the practice/physicians.

The performance goal was to achieve 80% compliance with best clinical practice for all measures and for all eligible patients. TVPC anticipates that the provision of asthma care to patients will be more timely and efficient, and meet the following target performance levels and measurement categories:

- Physician adherence to EPR-3 Guidelines.
- Completed ACT Questionnaire at the time of office visit (Appendix J).
- Completed Asthma Control Plan and review at time of office visit.
- Routine assessment of flow meters usage for patients with ACT scores ≤ 19.
- Patient satisfaction level with patient-physician communications.

DO

TVPC embarked on the PDCA process by evaluating the asthma population and key factors related to asthma care and patient flow. The project team began defining current asthma care processes, including gathering information from staff and physicians on internal variations in systems. The team also reviewed external resources and information to begin analysis of evidence-based best practices. The results of this effort lead to the current state and pre-implementation findings:

- 76% of the asthma patients in the practice were at least 18 years old.
- Clinical staff knowledge and workflow practices related to asthma care were inconsistent across the practice.
- The practice had inconsistent use of an asthma questionnaire and Asthma Action Plan.
- The practice lacked processes to monitor and/or measure patient asthma outcomes.

During this phase, the practice staff compared the "current state" to the desired "future state" by identifying the important aspects, as well as necessary changes, possible costs, and the potential benefits of a rapid cycle improvement process. The staff identified that the "current state" practice lacked a systematic guideline utilization or healthcare outcomes in asthmatic patients. They established new goals that defined opportunities to improve measurable healthcare outcomes for this patient population, as well as gaps in the patient's knowledge of self-care management skills and distribution of the written asthma management plan to asthmatic patients. These observations challenged the coordination of care among the practice staff, the patient, and the provider, while clearly demonstrating opportunities for improvement.

Also included in the "future state" was the goal to focus on patient-centered care and the ability to demonstrate measurable value to patients and current/potential stakeholders. In a focused effort, the team narrowed the problem list and identified the desired "future state" in a discrete, measurable and time bound AIM statement. Through this activity, a redesign of the clinical workflow for the desired "future state" was established, including workflow changes for both "new" and "established" patients, the incorporation of staff level clinical interventions to support and achieve the AIM goal.

Staff education and training on best practice asthma care was presented to the clinical staff team, with special emphasis on the team's role in "teeing up" asthma care for both the patient and the provider during an episode of care. Workflow and documentation enhancements were presented, along with re-training on peak-flow measurement and spirometery testing. TVPC providers also participated in an educational session focused on National Heart Lung and Blood Institute's EPR-3 Asthma Guidelines.

In an effort to identify and benchmark the asthma patient's overall perception of care and management, a patient knowledge survey (Appendix I) of 67 asthma patients was conducted to examine the relationships between different aspects of asthma treatment: patient's knowledge and personal experience with their asthma management plan, patient-provider communication, and overall asthma severity following use of an asthma management plan. The Patient survey showed that that majority of patients that responded understand and are able to follow their Asthma Action Plan and their asthma symptoms are improved as a result. The survey results were as demonstrated in the Figures 4a and b.

CHECK

To ensure a successful rollout of the asthma project, the team chose one patient care area for the PDCA rapid cycle pilot. Patient Care Area A (PCA-A) included three physicians, one advanced nurse practitioner, and four clinical staff members. All clinical workflow was contained within this care area, including the patient check-out process and scheduling of future follow-up visits. The team conducted a medical record audit for all adult asthma patients seen in PCA-A in the two weeks prior to the pilot period. There were six adult asthma patients seen by the PCA-A providers, but one was eliminated because of a different treating physician. Of the five remaining patients, two had completed both the patient asthma questionnaire prior to the patient-provider visit, and the completed Asthma Action Plan by the provider, thus revealing the baseline of 40% for the respective measures.

The measurement step was repeated within a two-week period of the initial medical record review with similar data noted. Although identified follow-up actions included a review of findings with all PCA-A care team members to identify barriers and/or gaps in the identified process, the scheduled meeting was delayed due to a system-wide electronic medical record upgrade and unexpected conversion challenges. This meeting and review of processes was re-scheduled. Following this additional data collection and evaluation, TVPC providers and staff in the two remaining patient care areas are initiating the PDCA process within their care area and with their asthma patients.

ACT

TVPC continues to utilize the workflow changes described and implemented in the program. Ongoing education and reminders on utilization of the workflow tools are handled by onsite staff. The greatest challenge for the site administrator is to maintain focus on the new workflow when the number of asthma patients is not high. Following rollout to the other care areas, the team is exploring expansion to the Chronic Obstructive Pulmonary Disease program and a process improvement project related to diabetes care.

This project was presented at Emory University, Rollins School for Public Health and as a result will be used to fulfill student practicum hours. Summit is coordinating a study to see if physicians are getting more time with the patient on asthma education.

Conclusion

The TVPC identified the need for a focused partnership among the provider, practice staff, and asthma patient to achieve effective asthma management. The team approach enables the patient to learn techniques for self-monitoring asthma triggers and managing their disease effectively. Involving all members of the health care team that come in contact with the asthma patient during an episode of care also allows multiple opportunities for the patient to report asthma symptoms, discuss their self-management techniques, and their perceived control of their asthma based on their individual asthma management plan. In turn, this increases the patient's self-confidence in their ability to self-monitor symptoms and triggers, effectively implement the asthma management plan, and/or seek additional medical interventions. TVPC anticipates that this QI project will lead to improved asthma outcomes including reduction in urgent care visits, and hospitalizations, as well as improved health outcomes and quality of life for asthma patients.

Figure 4(a). TVPC Asthma Patient Survey Results Baseline Data

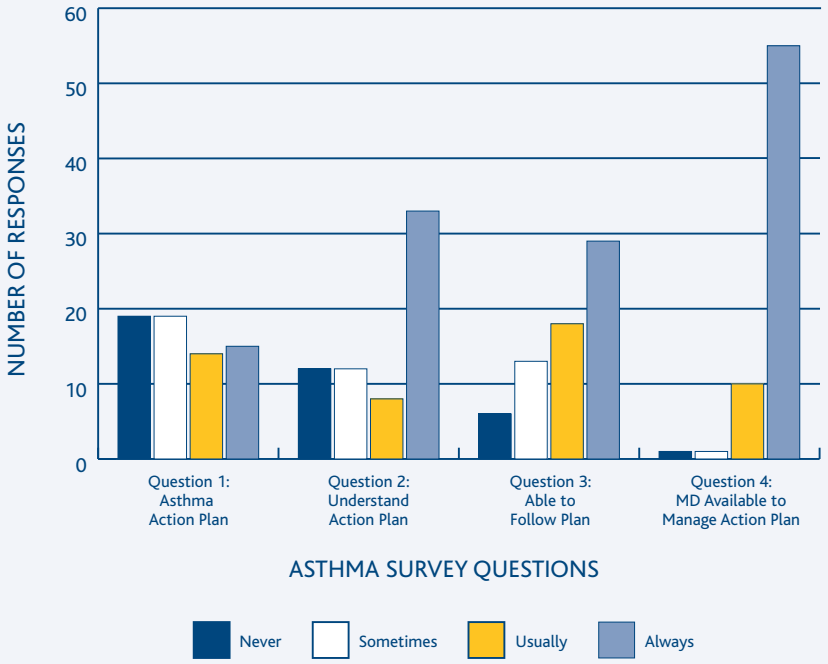
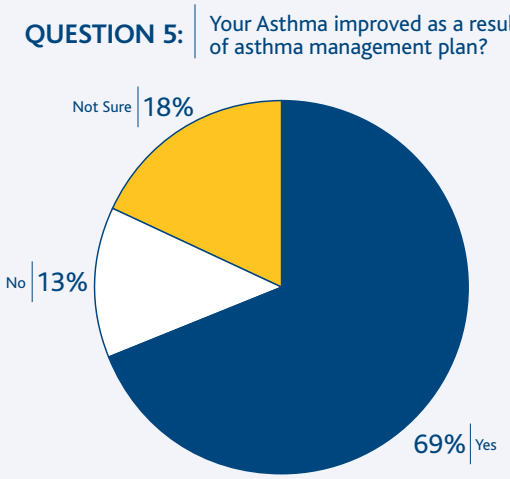


Figure 4(b). TVPC Asthma Patient Survey Results Baseline Data



CONCLUSION

Representatives from the Knox County School Nurse and Health Teams

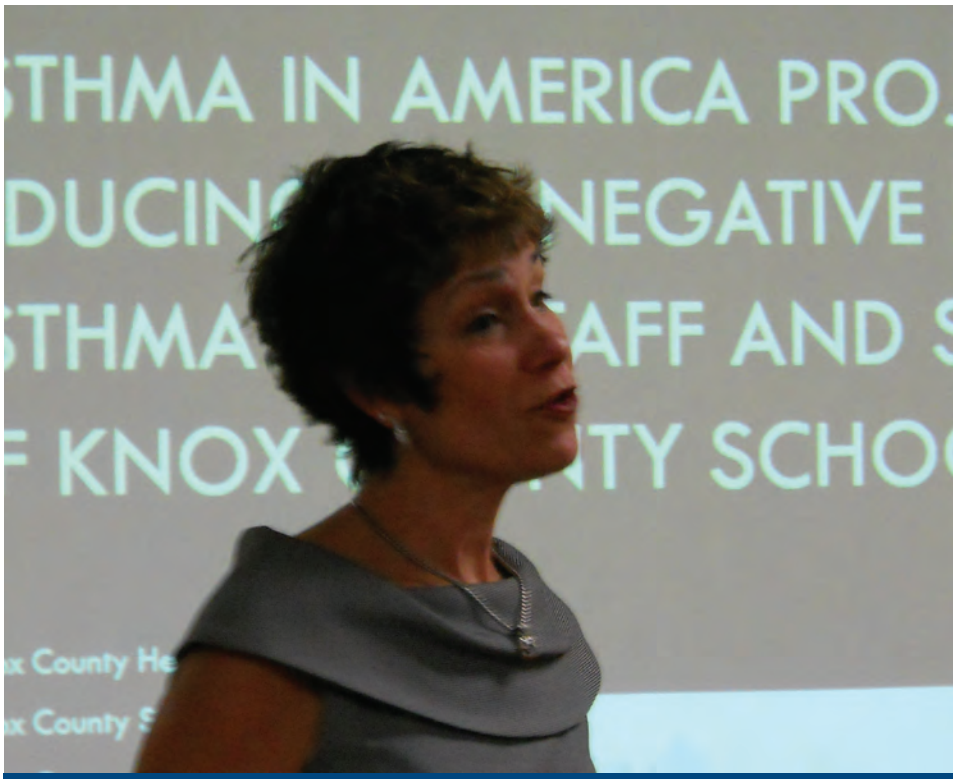
Lessons Learned

In addition to the individual lessons learned about treatment and control of asthma, the teaming approach utilized in the asthma projects highlighted a broader lesson about collaboration. PHF and the Public Health Asthma Advisory Group (PHAAG) expert panel meeting participants learned that an interdisciplinary group was necessary to address such a far reaching and complex problem such as asthma. By tackling this problem together, each partner shared their individual insights, knowledge, and background to make conversations deeper and richer. These meaningful change conversations might not have occurred if the individuals were not regularly communicating about the same goal. This study highlighted the importance of organizations learning from each other and it could lead to future interdisciplinary work around creating new and promising practices.

Four Knoxville, Tennessee teams participated in a rapid cycle Plan-Do-Check-Act (PDCA) process that produced a number of short-term outcomes and mobilized asthma stakeholders in East Tennessee to work together on improving targeted asthma outcomes. The KCHD and KCS team benefited from improved asthma protocols that advanced the KCS teacher's ability to react during an asthma attack, improve the quality of asthma education, and increase parents' understanding of asthma policies and protocols—all of which will improve the quality of life for asthmatics. The Summit teams saw improvements in workflow, better communication between the health care teams that interact with asthmatic patients, and improved documentation of patient visits. Upon further evaluation over a longer time frame, these initiatives may lead to further refined strategies and processes that can be expanded nationally in communities trying to achieve better results in asthma prevention and control.

Several lessons learned from this process were expressed by all teams:

- Clearly defining goals and objectives need to be done early in the process and revisiting these goals through the process is vital to focusing efforts.
- Establishing frequent lines of communication helps streamline the process and reduces the risk of alienating key stakeholders.



Kathleen C. Brown, Director, Community Assessment and Health Promotion, Knox County Health Department

- Keeping organizational partnerships together can be a significant challenge because their unique structures, approval processes and areas of control can inhibit timely progress.
- Low engagement and commitment results in minimal contribution from team members.
- Unexpected events can reduce the importance of QI.
- The strength and skills of the facilitator are key project progression.
- Daily life occurrences continue to happen during process improvement initiatives (e.g., moving offices, staff turnover, and leadership buy-in).
- In a true process improvement environment, there is no end to the cycle.

Sustainability

One of the main benefits of interdisciplinary teams in Tennessee working together is the promise of keeping the project sustainable. This project brought together a diverse group of organizations and individuals with a common interest in improving asthma management and control in Knoxville communities and the state of Tennessee. Tennessee asthma stakeholders identified in Phase II included:

- Knox County Health Department
- Knox County Schools
- KCS Healthy School Teams
- KCS Nurses
- East Tennessee Children's Hospital Respiratory Therapy Department
- The University of Tennessee College of Nursing Faculty
- State of Tennessee Asthma Task Force
- Tennessee State Asthma Coalition
- Summit Medical Group
- City of Knoxville ~ Statcare Pulmonary Consultants
- Tennessee Valley Primary Care

On March 22, 2011, representatives from the QI teams met at the KCHD to present interim findings. This meeting served as an opportunity to share lessons learned and discuss ideas for promoting the products developed and highlighting process improvements.

The teams are focused on promoting the products and lessons learned on the national platform and targeting the information to stakeholders for partnership and continued sponsorship. A number of activities will be undertaken to support this effort in beginning in August 2011:

- In August 2011, PHF submitted an abstract highlighting the applications of QI in this project to the Health Resources and Services Administration National Institute on Minority Health and Health Disparities at the National Institutes of Health (NIMHD/NIH) and the Journal of Health Care for the Poor and Underserved (JHCPU) special theme issue on Evidence for Informing the Next Generation of Quality Improvement Initiatives: Models, Methods, Measures and Outcomes.
- KCS printed 7,600 asthma emergency cards for distribution the week prior to start of school in August 2011. A survey will be distributed to school staff in October 2011 to assess initial usefulness.
- The Asthma Toolkit is scheduled to be placed in each KCS school in January 2012 after it is piloted in one elementary school during the month of October 2011 and adjustments are made accordingly after an evaluation.
- KCHD will conduct a long-term evaluation during late fall of 2012 to assess perception of time spend on asthma emergencies, resources savings, and general comfort with managing asthma episodes.
- Summit plans to look at a qualitative survey with physicians to see if they are getting more time with the patient on asthma education and determine other cost savings.
- The TVPC is rolling out workflow changes to other pods that work on asthma and in other chronic care areas.

Challenges and Future Vision

There were two major constraints that delayed initial project initiation. First, due to increased activity with H1N1 influenza from fall 2009 to spring 2010, it was difficult to gain commitment from public health departments to participate in this project. Most available resources were being shifted to H1N1 and seasonal influenza response and vaccinations. Second, PHF found little to no community-based evidence proving how or why some asthma interventions make a difference in health status and others do not. Based on the plethora of ideas derived from

"We thank the Public Health Foundation and AstraZeneca for cultivating a culture of process improvement in our organization that will bear fruit for years to come." —Summit Medical Group

Phase I, the Guides to Clinical and Community and Preventative Services and data from years of government and non-governmental asthma prevention and control initiatives, PHF presumed there would be evidence upon which to test population-based interventions. The project's most far reaching goal was to reveal a potential approach to improve the health status of asthmatics that could be replicated in other communities. These two challenges led PHF to revisit the design of the project. This resulted in the application of QI to guide one community to be more efficient and effective in assuring that its population with asthma can better manage and control asthmatic episodes.

The public health community faces an ongoing challenge to build a library of evidence-based interventions that inform and guide effective practice. Recently, the Guide to Community Preventive Services came out with evidence-based recommendations regarding home environmental conditions and asthma. The promise of improving asthma management care in America will be realized with continued review of evidence-based interventions, such as the Guide to Community Preventive Services, the development of road-maps explaining how to implement evidence-based interventions among different communities, and the support to document and share best practices, products and processes that are proven to be effective in improving asthma management care.

The reality may be that there will never be enough evidence available or the tools and resources for communities to be able to confidently implement interventions that reduce the burdens of poor asthma control and management. Despite this reality, the continual application of performance management and QI can help yield great gains in improving asthma management care outcomes. PHF believes that investing in performance management and QI can yield great results:

- improves effectiveness and increases efficiencies.
- identifies promising and really great practices.
- leverages resources (e.g., employees, teams, partners, community, funder).
- creates culture of quality in the workplace.
- achieves improvements in quality, cost, service delivery, and other measures.
- increases organization's ability to be more nimble—adapting to change rapidly.
- builds practice-based evidence for QI.
- results ultimately in better population outcomes.

The greater application of quality improvement in public health can lead to more examples of how it can result ultimately in improved health outcomes as mentioned above. For more information on how PHF can help serve your community to improve the quality of your public health organization or system, visit the PHF training and consultation services website at http://www.phf.org/consulting.

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APPENDICES

APPENDIX A: BIOGRAPHIES

Public Health Foundation Staff Biographies

Margaret Beaudry, MA is Director of Performance Management and Quality Improvement (PMQI) at the Public Health Foundation. She joined PHF in March 2011, and is responsible for managing the daily operations, business development, and PHF-wide activities that involve the PMQI business unit. Ms. Beaudry has 25 years professional experience in health sciences research, project management, psychometrics, social marketing, and change leadership, and a diverse work background including government, corporate, not-for-profit, and academic settings. Prior to joining PHF, Ms. Beaudry led change management and communications initiatives at the National Institutes of Health. She has designed leadership development studies on some 16,000 hospital managers and executives, and is a subject matter expert in 360° feedback, drug abuse, psychopathology, psychometrics, and survey methodology. Ms. Beaudry has authored numerous peer-reviewed articles, public education reports, and state and national studies of health trends, public policies, and best practices in prevention and treatment. She is a public speaker, workshop facilitator and expert translator of scientific data for diverse audiences. She holds a bachelor's degree in psychology and English from Bowdoin College, and a master's degree in clinical psychology from the University of Virginia.

Leslie M. Beitsch, MD, JD is a QI Expert for PHF and is the Florida State University College of Medicine, Center for Medicine and Public Health Director. From June 2001 until November 2003, Dr. Beitsch was the commissioner of the Oklahoma State Department of Health. Dr. Beitsch served as deputy secretary and assistant state health officer for the Florida Department of Health from 1997 through 2001. He provided guidance and direction for public health programs, the county health departments, and the state laboratory and pharmacy. Prior to this appointment, Dr. Beitsch served as assistant state health officer and division director for family health services from October 1991 through August 1997, focusing on maternal and child health. From October 1989 through October 1991, Dr. Beitsch was medical director of the Broward County Health Department in Ft. Lauderdale, Florida.

Ron Bialek, MPP began serving as President of the Public Health Foundation in June of 1999 after having served as its Executive Director since 1996. Mr. Bialek serves on a variety of government advisory groups and co-chaired the Managed Care and Public Health sub-committee of the Public Health Functions Working Group. He works closely with the PHF Board of Directors and public health professionals to develop and implement research, training, and technical assistance activities to benefit public health agencies in their performance of public health services. Before joining PHF, Mr. Bialek was on the faculty of the Johns Hopkins University School of Public Health for nine years and served as Director of the Johns Hopkins Health Program Alliance. In his faculty role and as Director of the Health Program Alliance, Mr. Bialek took the theory of public health practice into the field, developing a reputation locally and nationally for his efforts in facilitating linkages between academic institutions and public health agencies. At the national level, he has directed such projects as the Public Health Faculty/Agency Forum and the Council on Linkages Between Academia and Public Health Practice. The Forum project resulted in the development of recommendations for improving the relevance of public health education to practice and spelled out the various competencies that are desirable for practicing public health. Still serving as Director of the Council on Linkages, Mr. Bialek continues to play a key role in developing strategies and programs to implement Forum recommendations throughout the country. In addition, Mr. Bialek is co-directing a national effort to develop public health practice guidelines for use by public and private organizations with population-based responsibilities.

Jacalyn L. Carden, MS, CAE was the Associate Director for Performance Improvement for the Public Health Foundation. Ms. Carden served as the Associate Executive Director for Policy and Programs with the Association of State and Territorial Health Officials (ASTHO) for twelve years, functioning as a senior administrative liaison with senior officials of the Department of Health and Human Services agencies. Prior to ASTHO, Ms. Carden did development and grants management work for the Association of Professionals in Infection Control and Epidemiology (APIC) Research Foundation. She also spent over fifteen years in the U.S. Air Force with responsibilities for infection control and epidemiology, quality assurance and improvement, and strategic planning.

Julia Gray, MPH joined PHF staff in December 2007 as the Program Administrator for the National Public Health Performance Standards Program (NPHPSP). In June 2011, she assumed the role of Project Manager where she is responsible for managing the NPHPSP data reporting system, the NPHPSP Online Resource Center, the Public Health Improvement Resource Center, the Quality Improvement Quick Guide, and other PMQI projects. In this role, Ms. Gray provides technical assistance and training to public health systems that utilize the NPHPSP data reporting system, updates and improves the content and infrastructure of PHF's online resource centers, contributes to PMQI publications and online content, and assists with other PHF projects. Prior to PHF, Ms. Gray worked at the Environmental Protection Agency in the Office of Radiation and Indoor Air in Washington, DC, as an Association of Schools of Public Health Fellow from July 2006 to August 2007. She assisted with the coordination of the Partnership for Clean Indoor Air, an international public-private partnership, and provided assistance with other national indoor environment initiatives on asthma and school health. Ms. Gray also spent a summer working at the National Cancer Institute in the Division of Cancer Epidemiology and Genetics in Rockville, MD, where she completed a retrospective data assessment of an environmental exposure to DDT to a rural population in Alabama in the 1950s. Ms. Gray earned a M.P.H. in occupational environmental epidemiology from the University of Michigan-Ann Arbor and a B.S. in biology from the University of Wisconsin-Madison.

John W. (Jack) Moran, MBA, PhD, CMC, CQM, CQIA is a senior quality advisor to the Public Health Foundation. He offers 30 years of quality improvement expertise in developing quality improvement tools and training programs, implementing and evaluating quality improvement programs, and writing articles and books on quality improvement methods. Dr. Moran is a retired senior vice president of information systems, administrative and diagnostic services at New England Baptist Hospital. He was previously chief operating officer of Changing Healthcare, Incorporated, specializing in management consulting and educational

support to healthcare organizations. For 21 years, Dr. Moran was employed at Polaroid Corporation where he worked in various senior management capacities in manufacturing, engineering, and quality. His last position was as the director of Worldwide Quality and Systems. Dr. Moran has been active in the American Society for Quality (ASQ) as a fellow of the society and division chair, vice chair of technology, chair of the ASQ Certification Committee, and a member of the Standing Review Board of Quality Press. He is a 1993-2001 RIT/USA Today Quality Cup judge in healthcare and a member of the Malcolm Baldrige board of examiners. For 20 years, Dr. Moran was an adjunct professor in the graduate and undergraduate school of engineering at the University of Massachusetts at Lowell.

Emily Reineke, MA joined the Public Health Foundation in July 2011 as the Communications and Operations Coordinator. In this role she coordinates technical assistance, supports contract development, edits publications, and develops marketing materials. Prior to coming to PHF, Ms. Reineke worked at Virginia Tech as the Threat Assessment Team Coordinator from January 2009 to June 2011. This was a newly formed position to advance the mission of school safety and reduce the likelihood of campus violence, as a response to the shooting tragedy in April 2007. For the Threat Assessment Team, she created information management solutions, marketing strategies, and initiated process improvements. Ms. Reineke earned her M.A. in Educational Leadership and Policy Studies from Virginia Tech in Blacksburg, Virginia, and her B.A. in Family and Consumer Sciences Education from Marywood University in Scranton, Pennsylvania.

Lynne Stauff, MPA, CQIA was a Quality Improvement Project Manager for Performance Management (PM) and Quality Improvement (QI) at the Public Health Foundation. Prior to joining PHF, Ms. Stauff worked at the Michigan Department of Community Health (MDCH) for fourteen years. She has extensive experience in contract management, project planning and implementation, and policy development. Her most recent role at MDCH was with the Division of Local Health Services (LHS) as organizational development specialist where she assisted in the administration of Michigan's Local Public Health Accreditation Program. She served as an on-site reviewer, evaluating the capability and capacity of local health departments and led local/state leadership teams to develop policy and review accreditation standards. Ms. Stauff authored *Michigan's Guide to Public Health for Local Governing Entities* (2006) and was a collaborating author of *Embracing Quality in Local Public Health: Michigan's Quality Improvement Guidebook* (2008).

Public Health Asthma Advisory Group (PHAAG) Participants

Bruce S. Bochner, MD is currently Professor of Medicine at the Johns Hopkins University School of Medicine in Baltimore, Maryland. He joined the Division of Allergy and Clinical Immunology of the Department of Medicine in 1988 and became the Division Director in January, 2003. He is a Fellow of the American Academy of Allergy, Asthma and Immunology and the American College of Physicians and a member of the American College of Allergy, Asthma and Immunology, the Association of American Physicians, American Association of Immunologists, the American Society for Clinical Investigation, and the Collegium Internationale Allergologicum. He has been an Associate Editor for the *Journal of Allergy and Clinical Immunology* since 1993, is the Associate Editor for *Clinical and Translational Medicine,* and is an editor of the *Middleton's Allergy: Principles and Practice* textbook. He is on the Board of Directors of the American Board of Allergy and Immunology and formerly served as a member of the Immunological Sciences Study Section (now the Hypersensitivity, Autoimmune and Immune-Mediated Diseases Study Section) of the National Institutes of Allergy and Infectious Diseases. He is the author of more than 180 peer-reviewed publications, reviews, and book chapters. He lectures extensively on a variety of topics, including both clinical and experimental aspects of allergic diseases.

Huey Chen, PhD is Senior Evaluation Scientist at the Centers for Disease Control and Prevention (CDC). From 2002 to 2008, he was a professor at the School of Public Health at the University of Alabama at Birmingham. Dr. Chen worked at the University of Akron until 1997, when he joined the CDC as the chief of an evaluation branch. Dr. Chen had taken a leadership role in designing and implementing a national evaluation system for assessing the CDC-funded HIV prevention programs, which are based in health departments and community organizations. Dr. Chen has contributed to the development of evaluation theory and methodology, especially in the areas of program theory, theory-driven evaluations, and evaluation taxonomy. His 1990 book, *Theory-Driven Evaluations,* has been recognized as one of the landmarks in program evaluation. His 2005 book entitled *Practical Program Evaluation: Assessing and Improving Planning, Implementation, and Effectiveness* provides a major expansion of the scope and usefulness of theory-driven evaluations. In 1993 Dr. Chen received the American Evaluation Association Paul F. Lazarsfeld Award for contributions to Evaluation Theory. In 1998 he received the CDC Senior Biomedical Research Service Award. He also received the 2001 Award for Dedication and Scientific Direction in the Development and Implementation of Program Evaluation Research Branch from CDC.

Diane Drum, RN, BSN, AE-C is a Maternal Child Community Health Nurse and a Certified Asthma Educator with over twenty years of professional experience in Multnomah County, Oregon. She is fluent in Spanish and is experienced in providing home-based public health nursing care to different immigrant populations, focusing on cultural competency, health equity, and enhancement of client self-efficacy. Since 2006 she has been the Community Health Nurse for the Multnomah County Healthy Homes Asthma Program. In 2007, the Healthy Homes Program was awarded the Environmental Protection Agency Communities in Action for Asthma-Friendly Environments National Exemplary Award. Diane has been a speaker for the ALAO, the Oregon Public Health Association, and the Oregon Nurses' Association. She has given numerous trainings to health care and educational professionals. Diane is a member of the Oregon Nurses' Association, the Oregon Environmental Council, and the Association of Asthma Educators. She is a recipient of Health Care Without Harm's Nurse Luminary Distinction for her work in Environmental Health and received Multnomah County's Public Health Nursing Service Award in 2007 for her work with the Healthy Homes Asthma Program.

Joyce D.K. Essien, MD, MBA serves as Senior Medical Advisor, Government Relations Branch, Division of Public Health Systems, Office of State and Local Support; as Commissioned Officer with the rank of Captain in the US Public

Health Service at the Centers for Disease Control and Prevention (CDC); and as the Director of the Center for Public Health Practice at the Rollins School of Public Health, Emory University. Dr. Essien previously served as Field Officer and Senior Advisor to the Office of the Director, Division of Partnerships and Strategic Alliances, National Center for Health Marketing, CDC; Deputy and Acting Directors of the Public Health Practice Program Office; Deputy Director of the Training and Laboratory Program Office and Director of the Laboratory Program Office, CDC. Dr. Essien currently leads a team supporting the Diabetes Program Branch, CDC, in collaboration with the Sustainability Institute. Dr. Essien is co-author of the Public *Health Competency Handbook—Optimizing Individual and Organizational Performance for the Public's Health*. She is a member of The Bon Secours Hospital System Board Quality Committee and served on the Biomonitoring Futures Project and the Disparity Reducing Initiative for the Institute for Alternative Futures. The ZAP Asthma Consortium, Incorporated, co-founded by Dr Essien, is the recipient of the Rosalyn and Jimmy Carter Partnership Award. For her service and contributions, Dr. Essien was a recipient in l999 of the Women in Government Award from *Good Housekeeping* magazine, The Ford Foundation, and The Center for American Women and Politics at Rutgers University. She is also the recipient of the Thomas Sellars Award from the Rollins School of Public Health and the Unsung Heroine Award from Emory University. Dr. Essien is one of three recipients of the 2008 Excellence in Medicine Award from the American Medical Association Foundation.

Barbara Kaplan, MPH, CHES is Director of Asthma Programs for the American Lung Association. She is the author of *Breathe Well, Live Well: An Asthma Management Program for Adults,* offered by the American Lung Association. It is a comprehensive asthma management program for adults developed with funding from the Centers for Disease Control and Prevention. *Breathe Well, Live Well* is based on a validated intervention developed by the University of Alabama at Birmingham Lung Health Center. The original program showed a decrease in the severity of asthma symptoms, fewer respiratory problems, and an increase in adherence to prescribed treatments. The program was adapted for community-based implementation and has been proven effective through nationwide testing.

Greg L. Ledgerwood, MD, ACAAI, AAFP, AE-C (invited; 3/16 conflict) holds the position of Head, Allergy Clinic at Brewster Medical Center in Brewster, Washington. He is also Clinical Assistant Professor in the University of Washington Department of Family Medicine, a position that he has held since 1974. Dr. Ledgerwood serves as the chairman of practitioner support for the Washington Asthma Initiative and is a certified Asthma Educator as well as a current panel member for Diagnosis and Treatment of Non-Allergic Rhinitis. In addition to his family medicine and asthma/allergy specialty experience, he has held the position of Emergency Room Physician Director. He is a national lecturer on Asthma, Allergy and Chronic Respiratory Disease for the American Academy of Family Practice. He also serves on the Primary Care Ad Board for AstraZeneca and is on the National Advisory Board for Primary Care: Asthma/Allergic Rhinitis for GlaxoWellcome. Since 2002, he has been a regional and national lecturer for the World Medical Conferences on Treatment and Diagnosis of Allergic and Non-Allergic Rhinitis. He is author of *Essentials of Family Practice* and is a current contributor to the newsletter for Primary Care: Committee for Rational Antibiotic Therapy.

Winston Liao, MPH is an epidemiologist with the North Carolina Asthma Program in the Division of Public Health of the North Carolina Department of Health and Human Services. He has over thirty years of professional experience in managing projects which evaluate pharmaceutical products, medical devices, and health programs. He has been project director or group leader of coordinating activities for disease surveillance; disease intervention/education programs; disease management; health outcomes research; HIV/AIDS multi-center trials, bioavailability, and bioequivalence studies of generic drugs and multicenter trials of female systemic and barrier contraceptives; risk assessment; observational database studies; and program evaluation. He has also developed and managed quality assurance systems for projects, including those that apply to data quality and field quality at the data collection sites. With fifteen years of research and epidemiologic experience dealing with asthma and other respiratory diseases, he is currently the epidemiologist for the North Carolina Asthma Program, overseeing surveillance activities and providing support for other programmatic activities.

Bridget McCabe, MD, MPH currently serves as the director of the Division of Quality Improvement and Public Health Accreditation for the Tennessee Department of Health. In this role, she oversees quality improvement, program evaluation, and public health accreditation efforts in the state of Tennessee, which includes 89 rural health departments, 6 metropolitan county health departments, and 13 regional health offices. She also serves as Chair of the Tennessee Department of Health Institutional Review Board and as Chair of the Tennessee Genetics Advisory Committee. She is a licensed pediatrician with fellowship training in health services research. Previously, she served as a clinical fellow at Children's Hospital Boston and the Harvard Center for Child and Adolescent Health Policy at Massachusetts General Hospital. Dr. McCabe holds a Bachelor of Arts degree in biology, a medical doctorate with distinction in a special field of neuroscience, and a master of public health in clinical effectiveness, all from Harvard University. She completed her internship and residency training at Children's Hospital Boston; in addition, she completed a Harvard Pediatric Health Services Research Fellowship in general pediatrics where she worked with members of the Institute for Health Care Improvement. Her areas of research have focused on improving care for chronic diseases affecting children and have led to publications and presentations at national meetings.

Paul Moore, MD is an Associate Professor of Pediatrics and Pharmacology as well as Director of Pediatric Allergy, Immunology and Pulmonary Medicine at the Vanderbilt University School of Medicine. He is a graduate of Vanderbilt University and Harvard Medical School. He completed training in pediatrics and pediatric pulmonary medicine at Children's Hospital Boston, where he served on the faculty prior to joining the faculty at Vanderbilt. During his time at Harvard, he also was a post-doctoral fellow in the Physiology Program of the Harvard School of Public Health. His research interests are in the

pharmacogenetics of asthma. He is focused on understanding the molecular basis of genetic variations in asthma.

Rebecca Morley, MSPP is the Executive Director of the National Center for Healthy Housing (NCHH). She has fourteen years of experience in environmental health policy and research. Before joining NCHH in 2002, Ms. Morley was a senior associate with ICF Consulting in Washington, DC where she advised federal clients on children's environmental health issues. Before joining ICF, Ms. Morley worked with the United States Department of Housing and Urban Development (HUD) in various posts, including the Office of the Secretary and the Office of Healthy Homes and Lead Hazard Control, where she worked on children's health regulations, grant programs, and educational campaigns. Ms. Morley serves on the Board of the National Disease Clusters Alliance and on the Howard County Environmental Sustainability Board.

Holly Nannis, RN, BSN is the Diabetes/Asthma Program Manager at the Sixteenth Street Community Health Center in Milwaukee, Wisconsin. Her team offers self-management education, tools, resources, and support that prepare and empower people with chronic health conditions to make informed decisions about their health. The Program is funded by numerous grants, and Ms. Nannis is responsible for the development, administration, and reporting related to them. Holly also provides leadership in the area of community partnership development. She has spent nineteen years working in public health, including ten years with the City of Milwaukee Health Department as a District Public Health Nurse, Nursing Supervisor, and Program Manager. She spent several years as a Program Analyst with the Health Resources and Services Administration in the Department of Health and Human Services in Washington, DC. While there, she worked as a liaison to ten regional offices, setting strategic direction and work plans with relevant and appropriate performance measures.

Hugh Tilson, MD, DrPH, FACPM is Adjunct Professor in the Public Health Leadership Program and has held many senior advisory roles at the Gillings School of Global Public Health at the University of North Carolina at Chapel Hill. He is an advisor to government and industry in health outcomes, drug safety, and evidence-based health policy, including, most recently, public health preparedness. Dr. Tilson is a practicing epidemiologist and outcomes researcher whose career in public health and preventive medicine spans forty-five years. While working at GlaxoWellcome, he pioneered many of the now accepted approaches to the epidemiologic monitoring of drug safety for the Company's products including pharmacoepidemiology programs in HIV, Depression, and Asthma. Upon his retirement from GlaxoWellcome in 1996, Dr. Tilson joined the clinical faculty of the University of North Carolina (UNC) School of Public Health in Chapel Hill. He was Founding Co-President of the International Society for Pharmacoepidemiology (ISPE), a Founding Member of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), and a Founding Member of the Academy of Pharmaceutical Physicians and Investigators (APPI). He has served as chair of the Committees for Bylaws and Policies for all three. Dr. Tilson is Past President of the American College of Preventive Medicine, where he has recently been appointed a member of the Committee on Ethics. Dr. Tilson serves as senior advisor and epidemiologist for several international drug safety projects and pregnancy registries, including the international Antiretrovirals in Pregnancy Registry. He was presented the 2006 Ward Hampton Frost Award of the Epidemiology Section of the American Public Health Association.

David Van Sickle, PhD is an asthma epidemiologist at the University of Wisconsin in Madison. He is also the founder and CEO of Reciprocal Sciences, a company dedicated to developing a new generation of tools for public health and epidemiological research for real time public health surveillance. He was recently a Robert Wood Johnson Foundation Health and Society Scholar at the University of Wisconsin – Madison. Dr. Van Sickle began his career studying asthma among Native Americans in Alaska, Arizona and New Mexico. With funding from the National Science Foundation he spent several years examining the rising prevalence of asthma and allergy in India. In 2004, he became an officer in the Epidemic Intelligence Service at the Centers for Disease Control and Prevention in Atlanta where he was assigned to the Air Pollution and Respiratory Health Branch. As a disease detective, he investigated the health effects of exposure to mold in New Orleans, to chlorine gas in South Carolina, to carbon monoxide in Florida, and to ambient ozone among student athletes in Georgia. He provided scientific support to the National Asthma Control Program. In addition, he helped establish emergency illness and injury surveillance in coastal Mississippi after Hurricane Katrina. He left CDC in 2006 to take a position as a Robert Wood Johnson Foundation Health and Society Scholar at the University of Wisconsin. In Madison, he continued to carry out research on the global epidemiology of chronic respiratory disease and became interested in the potential of new technologies to improve population health.

Knoxville Project Leaders

Kathleen Brown, PhD, MPH, CHES is the director for community assessment and health promotion for Knox County Health Department. Dr. Brown holds a PhD in Community Health and a Master in Public Health from the University of Tennessee. Her current position involves supervision of a professional staff of Epidemiologists, Health Educators, and outreach workers. Under her direction, the Epidemiology Program conducts surveillance, community survey and program evaluation producing related reports, briefs, and updates. The Health Promotion program areas in her department include adolescent pregnancy prevention, violence prevention, and unintentional injury prevention. The TennderCare Program (EPSDT Program) is also housed in the department. In her previous position of Instructor at the University of Tennessee, Dr. Brown was responsible for coordinating the undergraduate Community Health Education Program. She served as the primary academic advisor to the students and taught numerous health courses including Program Planning, Women's Health, Epidemiology, and Wellness. Additionally, she coordinated the undergraduate Internship Program which involved identifying and developing relationships with community agencies (locally and otherwise), placing students using a best-fit process, following student progress, and

evaluating process and quality of experience. She remains an adjunct lecturer with the department teaching graduate level courses. Dr. Brown started her career as a nurse.

Warren Sayre, MD is a fellow of the American Academy of Family Physicians and Board Certified in Family Medicine. After practicing in Anderson County for seven years, he decided to pursue a career as an executive physician to expand his sphere of impact. With the support of Summit Medical Group, Dr. Sayre is working with local corporations to extend the patient-centered care model into the workplace. His ambition is to integrate health and wellness into the everyday lives of the people in his communities.

APPENDIX B: PUBLIC HEALTH ASTHMA ADVISORY GROUP MEETING SUMMARY

March 16, 2010

Background

The Public Health Asthma Advisory Group (PHAAG) met on March 16, 2010 to provide input on *We Can Do Better* Phase II, managed by the Public Health Foundation. The thirteen-member national ad hoc advisory group was comprised of experts from: asthma and allergy management; community asthma programs; evaluation; asthma epidemiology and innovative asthma programs; and asthma primary care. The PHAAG's charge was to advise project staff on how to determine: 1) what community-based asthma strategies/interventions have been used to achieve short-term sustainable gains in health outcomes of asthmatics; 2) key elements of a successful community-based intervention for asthma; 3) a set of achievable and measurable outcomes that translate to short-term sustainable gains; and 4) helpful tools for communities as they develop their community-based asthma interventions.

The overall Phase II project goal is to assist up to five communities in achieving measurable improvement in the management and control of asthma. PHF intends to use proven quality improvement tools and techniques with asthma improvement teams. Community lessons learned from the intervention improvements will be packaged in a toolkit and made available electronically.

Participants

Advisory Group Members: Attending - Bruce Bochner, Huey Chen, Diane Drum, Joyce Essien, Barbara Kaplan, Winston Liao, Bridget McCabe, Paul Moore, Rebecca Morley, Holly Nannis, Hugh Tilson and Dave Van Sickle; Regrets - Greg Ledgerwood.

Public Health Foundation Support: Deborah Alexander, Leslie Beitsch, Ron Bialek, Jackie Carden, John (Jack) Moran and Lynne Stauff.

Summary of Findings by Charge

1. **Determine what community-based asthma strategies/interventions have been used to achieve short-term sustainable gains in health outcomes of asthmatics.** PHAAG members were sent documents prior to the meeting, outlining promising practice interventions based on the literature. Each member shared his or her experience with and knowledge of community-based asthma programs. Some asthma programs discussed were: the 16th Street Community Health Center and Asthmapolis (Milwaukee, Wisconsin); Healthy Homes (National); Winning Against Asthma (University of Alabama at Birmingham Lung Health Center); Johns Hopkins University home follow-up program (Baltimore, Maryland); Community of Care North Carolina, Improving Performance in Practice (North Carolina Division of Public Health); Breathe Well, Live Well (American Lung Association/National); and the ZAP Asthma Project (Atlanta, Georgia). Members discussed and agreed that there are "vexing" policy and poverty issues that affect any community's ability to make sustainable long-term improvements with the growing asthma problem. There was unanimous agreement that the science is "soft" with data on interventions that is not profoundly convincing. From the hundreds of strategies and interventions that exist, the members concluded that focusing on improvement in the following five domains held the most promise for achieving short-term sustainable gains in health outcomes for asthmatics:

   a) **Education.** This domain includes education for the patient as well as for providers and caregivers. It was noted that providers often need as much content support as a patient does. Educators need to understand what barriers preclude better management and control and how to have a conversation with the patient that results in the patient feeling empowered. Also education messages are more likely to be heard when a good relationship built upon trust exists between the patient and his/her provider. Education needs to be language and culturally appropriate and targeted to the goals the patient wishes to achieve.

   b) **Medical Home.** Continuity of care for an asthmatic is important for positive health outcomes. Members thought that a medical home would help reduce the number of emergency department visits and improve the appropriateness of referrals, when needed. One community improvement model focused on a "health" home—a single identifiable, coordinated medical approach financed through Medicaid contracts with the state medical society which then contracted locally with providers who used the Medicaid data to change approaches to practice.

   c) **Care/case management.** Members thought this was so important that it deserved its own domain. It was seen as a point of leverage to improve the handoffs from the physician to community services, improve care continuity and address co-morbid conditions (e.g., diabetes, obesity, etc.).

   d) **Healthy homes.** Homes that strive to meet the healthy housing standards (e.g., well-ventilated, pest free, contaminant-free, clean, and well maintained home) in a secure neighborhood where residents were less likely to move often were noted to create the conditions for a healthier home environment. Also many asthmatics rent, and there are no U.S. federal policy requirements for rentals to meet these healthy housing standards. Although extremely important, the group remarked that this interventional approach was expensive, time-consuming and linked to policy implications outside the scope of this project.

   e) **Self-Efficacy.** Although efforts to manage and control asthma are well meaning, it was noted that improvement work ought to focus on finding the unique triggers be they personal, environmental or neighborhood and match interventions to the individual's asthma improvement goals. When patients are involved in the creation of and agree to their asthma action plan, then achieving asthma plan goals is feasible.

2. **Determine key elements of a successful community-based intervention for asthma.** There was much discussion on the elements needed for successful community-based asthma interventions, and common themes emerged through exchanging of ideas and experiences. In

essence, a good intervention is "purposeful" and gets a community to the desired goal. The challenge is working within a complex social system, and as one member indicated "not everything that can be measured matters and not everything that matters can be measured." Members agreed some interventions probably do not merit evaluation, but if "excited activity" in a community can be captured and evaluated then even where an evidence base does not exist, a place can be created to exchange insights into practice-based evidence. Key elements in determining successful community-based asthma interventions included:

a) **Using a bottom-up approach.** Asthma interventions need to be community driven. Where an intervention may not work in one community it may work in another community. The affected community needs to "purposefully" choose interventions that will work for their population.

b) **Strengthening patient and provider communication.** The relationship between the asthmatic and provider seems to have a bearing on whether the patient is successful in meeting his or her asthma improvement goals. A provider could be the physician, case manager, nurse or an asthma educator. Members agreed that the patient needed to be empowered with the knowledge, skills and abilities to self- manage the disease. Notably, electronically shared asthma action plans were a good tool for care providers.

c) **Enhancing integrated health systems.** Members agreed that the "disconnect" in the system of care for asthmatics most often seemed to be the "hand-off" between care providers in various systems including primary care and secondary and tertiary care. There were concerns that the emergency department is the safety net for those who do not have access to primary care. Conversely, in some localities patients may have greater access to specialists than primary care. Members reinforced that the electronic medical record was the single most powerful instrument for improvement. The need for better surveillance of asthma exacerbations was highlighted. In communities with asthma registries, providers are turning data into information to track asthma symptoms and medication management; to improve communication, they are then using a team approach to create a "bridge" between primary, secondary and tertiary care.

d) **Better assessment techniques.** Members urged that that public health and health care create stronger partnerships to better leverage resources and improve asthmatics' quality of life.

e) **Improving medication management.** There was general acknowledgement that reliance on medications alone in the absence of a self-management plan tied to patient-specific goals, education and follow-up in a system of care will not result in long-term sustainable improvements in asthma management and control. In communities where language and culturally appropriate asthma education helped adults understand their pathophysiology, recognize symptoms and triggers, eliminate medication sharing, and follow a written plan the medications seemed more likely to be used as prescribed and fewer errors were reported in the transition between primary care and secondary or tertiary care. Rescue inhalers with electronics could potentially be an indicator of self-management over time.

3. **Determine a set of achievable and measurable outcomes that translate to short-term sustainable gains.** Variations on the following three outcomes were discussed: a) improved health systems, b) improved primary care physician practice and c) increased patient self-management. It was acknowledged that increased patient self-management would be the most desirable outcome attesting to the health of asthmatics but also the most difficult to collect data compared to either improved health systems or primary care practice. A range of indicators to measure success was mentioned, and those indicators are highlighted as they relate to the outcomes (See Tables 1 and 2).

4. **Determine tools for communities as they develop their community-based asthma interventions.** The Advisory Group did not reach this level of discussion.

Next Steps

1. Create a logic model based on input from the Asthma Advisory Group.
2. Approach a potential local health department to coordinate effort.
3. Create a meeting summary and send to the Asthma Advisory Group.

Scenario for how potential community projects could unfold:

Assumptions:

1. Health department chooses better primary care physician practices as the outcome measure.
2. Health department chooses to work with a primary care association and one group of pharmacies at the macro level and one or more neighborhood areas (including primary care practices) at the micro level.

Partners could include:

1. Primary care physicians
2. Representative(s) of the PC association
3. Representative(s) of local asthma coalition
4. Pharmacists
5. Area hospital ED physician
6. Case managers who cover certain catchment areas, etc.

Health department convenes communities, with PHF assistance and consultation (per outline in discussion draft), to look at root causes and/or issues that are challenges to improving physician practice with asthmatics. Root causes are identified, interventions are determined, communities are engaged, data collection is determined, and projects are launched.

PHF provides distance and on-site support to communities throughout nine-month duration of project.

Health department provides regular feedback and data to PHF.

Table 1: Menu of Desired Outcomes and Indicators of Success

	Strategies Categories**		
Indicators*	**Improved Health System**	**Better Primary Care Physician Practices**	**Increased Patient Self-Management**
Reduction in ED visits for ambulatory care sensitive conditions	✔	✔	✔
Increased, timely prescribed refill	✔	✔	✔
Appropriate and timely referrals	✔	✔	
Increased access to medical home	✔		
Increased enrollment to SCHIP	✔		
Improved satisfaction of care	✔		
Availability/use of EMR	✔		
Physician adherence to EPR-3 Guidelines	✔	✔	
Completed asthma control plan		✔	✔
Increased, timely prescription refill			✔
Improved asthma control plan compliance			✔
Reduced # of missed school days			✔
Reduced work absenteeism			✔
Fewer missed doctors appointments			✔
Symptom-free days			✔

*Potential, not exhaustive, list of short-term and intermediate measures of success that can be matrixed to one or more of the outcomes.
**Select one of three potential outcomes – all communities would work toward the same outcome.

Table 2: Menu of Potential Communities

Micro-level	Macro-level
Neighborhood	Census track, zip code
School	School system
Primary care practice	Primary care association (closed panel or IPA)
Worksite	Cooperation of business sites (e.g., ALCOA, AmeriSteel Industries, etc.)
Pharmacy	Group of pharmacies (Wal-Mart, CVS, Walgreens)
Primary care patients (adults, children)	Primary care patients for entire group (insured, uninsured)
Single hospital (clinic, ER)	Hospital systems
Churches	Ministerial alliance of churches

APPENDIX C: NURSE SURVEY

Welcome

As many of you know Health Services is conducting a quality improvment process around asthma in the school system. I am gathering input from teachers, parents and the Health Services staff. Please take a few minutes to answer the following questions. Participation is voluntary and anonymous. No individual will be identified in any report from the survey.
Thank you for your time,
Lisa Wagoner
Director of Health Services

1. What materials do you use to conduct asthma education? Please provide names of materials when applicable.

DVD/Video:

Brochure:

Teaching Models:

Other:

2. What curriculum do you use to conduct asthma education? (Select all that apply.)

☐ My own

☐ American Lung Association's Asthma 1,2,3

Other (please specify)

3. What teaching materials would you like to have to conduct asthma education?

APPENDIX D: PARENT SURVEY

WELCOME to the KCS Asthma Survey

Knox County Schools Health Services is assessing our asthma protocol. We would appreciate your input. Completion of this survey is voluntary and all answers are anonymous. At no time will an individual (you or your child) be identified in any reports or discussion that may be generated from the results of the survey. If you have more than one child with asthma attending Knox County Schools you may complete a survey for each child.

1. Which grade-level school does your child attend?

- ◯ Pre-k, Primary, Elementary or Intermediate
- ◯ Middle
- ◯ High
- ◯ Alternative

2. Do you have a child with asthma currently attending Knox County Schools (KCS)?

- ◯ Yes
- ◯ No

1. How severe is your child's asthma

- ◯ Mild
- ◯ Moderate
- ◯ Severe

2. How many days of school would you estimate your child missed last year due to asthma?

- ◯ None
- ◯ 1-3 days
- ◯ 4-6 days
- ◯ 7-10 days
- ◯ More than 10 days

3. In the past year, how many times as your child been treated in the emergency room for asthma symptoms?

- ◯ None
- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ 5
- ◯ Over 5 times

4. In the past year, how many times has your child been hospitalized (overnight or longer) for asthma symptoms?

- ◯ 0
- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ 5
- ◯ Over 5 times

5. What triggers your child's asthma symptoms? (Check all that apply.)

- ☐ Exercise
- ☐ Stress
- ☐ Cold air
- ☐ Illness
- ☐ Allergies
- ☐ Smoke

Other (please specify)

6. Does your child understand what triggers his/her asthma symptoms?

- ◯ Yes
- ◯ No

7. Does your child know what to do to relieve his/her symptoms during an asthma attack?

- ◯ Yes
- ◯ No

8. Does your child have an Asthma Action Plan (a written treatment plan created by your doctor and specific to your child)?

- ◯ Yes
- ◯ No
- ◯ Don't know

9. Does your child know how to use a peak flow meter?

- ◯ Yes
- ◯ No

10. Has your child had asthma education at his/her doctor's office?

- ◯ Yes
- ◯ No

11. If asthma education was offered at your child's school, would you have your child attend?

- ◯ Yes
- ◯ No

12. If asthma education for family members was offered at your child's school, would YOU attend?

- ◯ Yes
- ◯ No

13. OPTIONAL: What is your zip code?

14. What can we do to improve the way asthma is addressed by Knox County Schools?

15. Would you like to complete the survey for another child?

◯ Yes

◯ No

Thank you for your time and willingness to share information.

Please remember all answers are voluntary and anonymous. No individual information will be reported. The information will be reported for the entire group of respondents.

Through the Quality Improvement process we hope to improve our services and decrease the impact of asthma on the school day.

Thank you,
Health Services

APPENDIX E: ASTHMA TOOLKIT TABLE OF CONTENTS

Asthma Toolkit Table of Contents

Forms

- Physician form for administration of medication
- Self-possession of an asthma inhaler by a student
- Asthma protocol
- Physician's medical statement/asthma action plan
- Individual health care plan
- Medication record

Asthma Basics

- Asthma
- Asthma flare-ups
- How is asthma diagnosed
- Exercise-induced asthma
- Allergy-triggered asthma
- Asthma categories
- Illustrations
  - lung
  - how to use a metered-dose inhaler with spacer
  - how to use a metered- dose inhaler
- Asthma medicines Asthma quick view symptoms→actions
- Teacher
- Parent

Educational Resources

- Elementary
  - A is for asthma (K–2)
  - Jeopardy (3–5)
  - Q and A Activity (3–5)

- Middle
  - Asthma, What Everyone Should Know

APPENDIX F: TEACHER REFERENCE CARD

(FRONT)

MILD ASTHMA SYMPTOMS

- Continuous cough
- Chest tightness
- Difficulty breathing
- Wheezing
- Restlessness, irritability

TREATMENT →

- Administer prescribed relief inhaler
- Stay calm, remain with child
- Encourage slow deep breaths
- Offer water(sips)/warm liquids
- If no improvement in 15min → **NOTIFY SCHOOL NURSE/ PARENT**
- **If improvement in 15min → child may resume activities**

(BACK)

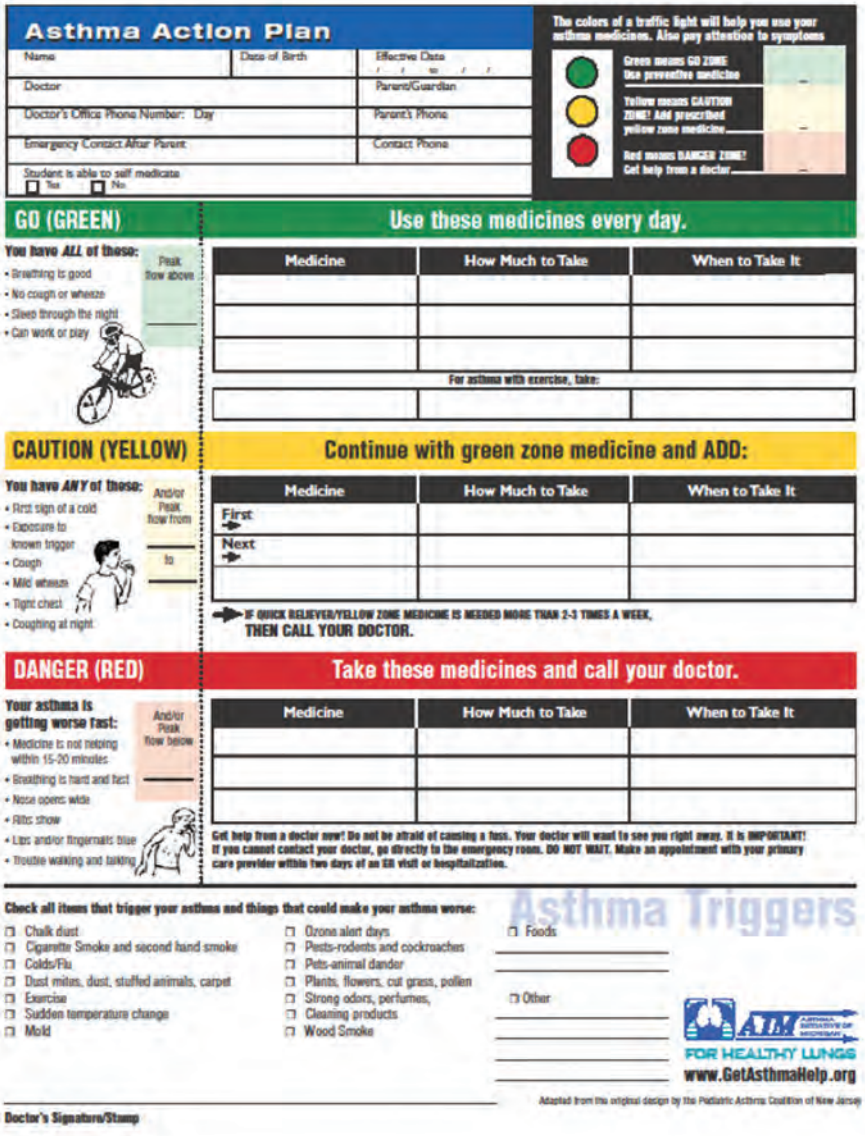
ASTHMA EMERGENCY

- Difficulty speaking full sentence
- Blue lips, nails or gums
- Severe cough
- Difficult and rapid breathing

TREATMENT →

- **CALL 911, NOTIFY SCHOOL NURSE/PARENT**
- Administer relief medications as prescribed
- Stay calm, remain with child
- Encourage slow deep breaths

APPENDIX G: SAMPLE ASTHMA ACTION PLANS



Asthma Action Plan

Name	Date of Birth	Effective Date / / to / /
Doctor		Parent/Guardian
Doctor's Office Phone Number: Day		Parent's Phone
Emergency Contact After Parent		Contact Phone
Student is able to self medicate ☐ Yes ☐ No		

The colors of a traffic light will help you use your asthma medicines. Also pay attention to symptoms

Green means GO ZONE: Use preventive medicine

Yellow means CAUTION ZONE! Add prescribed yellow zone medicine

Red means DANGER ZONE! Get help from a doctor

GO (GREEN) — Use these medicines every day.

You have *ALL* of these:
- Breathing is good
- No cough or wheeze
- Sleep through the night
- Can work or play

Peak flow above ____

Medicine	How Much to Take	When to Take It
For asthma with exercise, take:		

CAUTION (YELLOW) — Continue with green zone medicine and ADD:

You have *ANY* of these:
- First sign of a cold
- Exposure to known trigger
- Cough
- Mild wheeze
- Tight chest
- Coughing at night

And/or Peak flow from ____ to ____

Medicine	How Much to Take	When to Take It
First →		
Next →		

→ IF QUICK RELIEVER/YELLOW ZONE MEDICINE IS NEEDED MORE THAN 2-3 TIMES A WEEK, **THEN CALL YOUR DOCTOR.**

DANGER (RED) — Take these medicines and call your doctor.

Your asthma is getting worse fast:
- Medicine is not helping within 15-20 minutes
- Breathing is hard and fast
- Nose opens wide
- Ribs show
- Lips and/or fingernails blue
- Trouble walking and talking

And/or Peak flow below ____

Medicine	How Much to Take	When to Take It

Get help from a doctor now! Do not be afraid of causing a fuss. Your doctor will want to see you right away. It is IMPORTANT! If you cannot contact your doctor, go directly to the emergency room. DO NOT WAIT. Make an appointment with your primary care provider within two days of an ER visit or hospitalization.

Check all items that trigger your asthma and things that could make your asthma worse:

Asthma Triggers

- ☐ Chalk dust
- ☐ Cigarette Smoke and second hand smoke
- ☐ Colds/Flu
- ☐ Dust mites, dust, stuffed animals, carpet
- ☐ Exercise
- ☐ Sudden temperature change
- ☐ Mold
- ☐ Ozone alert days
- ☐ Pests-rodents and cockroaches
- ☐ Pets-animal dander
- ☐ Plants, flowers, cut grass, pollen
- ☐ Strong odors, perfumes,
- ☐ Cleaning products
- ☐ Wood Smoke
- ☐ Foods _____
- ☐ Other _____

AIM Asthma Initiative of Michigan

FOR HEALTHY LUNGS

www.GetAsthmaHelp.org

Adapted from the original design by the Pediatric Asthma Coalition of New Jersey

Doctor's Signature/Stamp

Asthma Action Plan

An Asthma Action Plan can help you manage your asthma from day to day. It is based on your symptoms and peak flow numbers. Your doctor can tell you when and how often you should take your peak flow reading.

Name: _____ Date: _____

Doctor's Name: _____ Doctor's Phone: _____

Controller Medicine: _____ Quick-Relief (Rescue) Medicine: _____

Personal Best Peak Flow: _____ Before Exercise Take: _____

Other: _____

How Are My Symptoms Today?

Breathing is good

Green Zone: Go

- No cough, wheeze, or shortness of breath
- Sleeping through the night
- Can do usual activities (work, play)
- Don't need quick-relief (rescue) medicine most days

or Peak Flow: _____

TAKE:
Controller medicine

Medicine: _____
How much: _____
When: _____

Medicine: _____
How much: _____
When: _____

Medicine: _____
How much: _____
When: _____

You are having a flare-up

Yellow Zone: Caution

- Cough, wheeze, or shortness of breath, chest tightness
- Waking at night due to asthma symptoms
- Can do some but not all usual activities
- Using more quick-relief (rescue) medicine

or Peak Flow: _____

Continue with Green Zone medicine:
ADD:

Medicine: _____
How much: _____
When: _____

Medicine: _____
How much: _____
When: _____

Medicine: _____
How much: _____
When: _____

You are having a serious flare-up—CALL YOUR DOCTOR NOW!

Red Zone: Danger

- Very short of breath, ribs show
- Quick-relief (rescue) medicine has not helped
- Cannot do usual activities
- Symptoms in the yellow zone are the same after 24 hours or are worse

or Peak Flow: _____

ADD ADDITIONAL:

Medicine: _____
How much: _____
When: _____

Medicine: _____
How much: _____
When: _____

Medicine: _____
How much: _____
When: _____

DANGER

CALL 911 or Go to the Hospital

IF

- You have trouble walking or talking
- Your lips or fingernails are blue
- You are feeling faint

Work with your doctor to complete this Asthma Action Plan.
Use it every day to manage your asthma symptoms.

APPENDIX H: ASTHMA TRIGGERS

Asthma Triggers

Pay attention to things that seem to make your asthma worse—these are called triggers. Avoid these triggers if you can. Talk to your doctor if you have any questions about your asthma or your triggers.

❑ Smoke

- If you smoke, get help to quit.
- Don't allow smoking in the house or car.
- Make sure wood-burning stoves and fireplaces are well ventilated.

❑ Dust Mites

- Keep mattresses and pillows in dust-proof covers.
- Wash your sheets and blankets each week. Use very hot water.
- Remove stuffed toys from the bedroom, or wash them weekly in hot water.
- Vacuuming may stir up dust. Stay out of rooms that are being vacuumed.
- Take wall-to-wall carpet out of the bedroom. Tile, vinyl, or wooden floors are better. Use throw rugs that can be washed regularly.

❑ Pets

- Keep pets with fur or feathers out of your bedroom, or home, if possible.
- Give your pets a bath to reduce dandruff triggers.

❑ Cockroaches

- Don't keep food in your bedroom.
- Keep food and garbage sealed.

❑ Mold

- Fix leaky faucets and pipes.
- Clean moldy surfaces with bleach.
- Keep shower curtains clean.

❑ Strong Odors

- Avoid perfume, talcum powder, aerosol sprays like hair spray or insect spray, and strong-smelling cleaning products.

❑ Weather

- On cold days, cover your nose and mouth with a scarf to avoid breathing in cold air.

❑ Pollen

- Stay inside and keep windows closed when pollen levels are high.

❑ Exercise

- Ask your doctor if you should take asthma medicine before you exercise.

❑ Colds

- Avoid people with colds.
- Get plenty of rest.
- Drink plenty of fluids.

❑ Stress

- Try to stay calm and breathe slowly.
- Focus on things that keep you calm or happy.

APPENDIX I: ASTHMA PATIENT KNOWLEDGE SURVEY

Asthma Patient Knowledge Survey

1. Do you and your asthma physician, Dr. (insert name), work together to improve your asthma care with an asthma action plan?
   a) never
   b) sometimes
   c) usually
   d) always

2. Do you understand the plan (how to avoid your asthma triggers, take your medication correctly, and why your asthma should be monitored)?
   a) never
   b) sometimes
   c) usually
   d) always

3. Are you able to follow the plan (avoid your asthma triggers, take your medication correctly, and have your asthma monitored)?
   a) never
   b) sometimes
   c) usually
   d) always

4. Is Dr. (insert name) or (nurse) available to answer your questions and to make adjustments to the management plan?
   a) never
   b) sometimes
   c) usually
   d) always

5. Do you think that your asthma has improved as a result of your asthma management plan?
   a) never
   b) sometimes
   c) usually
   d) always

APPENDIX J: ASTHMA CONTROL QUESTIONNAIRE

Today's Date: _____

Patient's Name: _____

FOR PATIENTS:

Take the Asthma Control Test™ (ACT) for people 12 yrs and older.

Know your score. Share your results with your doctor.

Step 1 Write the number of each answer in the score box provided.

Step 2 Add the score boxes for your total.

Step 3 Take the test to the doctor to talk about your score.

									SCORE
1. In the past **4 weeks**, how much of the time did your **asthma** keep you from getting as much done at work, school or at home?	All of the time	1	Most of the time	2	Some of the time	3	A little of the time	4	None of the time	5	
2. During the past **4 weeks**, how often have you had shortness of breath?	More than once a day	1	Once a day	2	3 to 6 times a week	3	Once or twice a week	4	Not at all	5	
3. During the past **4 weeks**, how often did your **asthma** symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?	4 or more nights a week	1	2 or 3 nights a week	2	Once a week	3	Once or twice	4	Not at all	5	
4. During the past **4 weeks**, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?	3 or more times per day	1	1 or 2 times per day	2	2 or 3 times per week	3	Once a week or less	4	Not at all	5	
5. How would you rate your **asthma** control during the **past 4 weeks**?	Not controlled at all	1	Poorly controlled	2	Somewhat controlled	3	Well controlled	4	Completely controlled	5	
									TOTAL		

If your score is 19 or less, your asthma may not be controlled as well as it could be. Talk to your doctor.

FOR PHYSICIANS:

The ACT is:

- A simple, 5-question tool that is self-administered by the patient
- Clinically validated by specialist assessment and spirometry[1]
- Recognized by the National Institutes of Health

Reference: 1. Nathan RA et al. *J Allergy Clin Immunol.* 2004;113:59-65.

APPENDIX K: POSTER AND HANDOUT: GO WITH THE FLOW

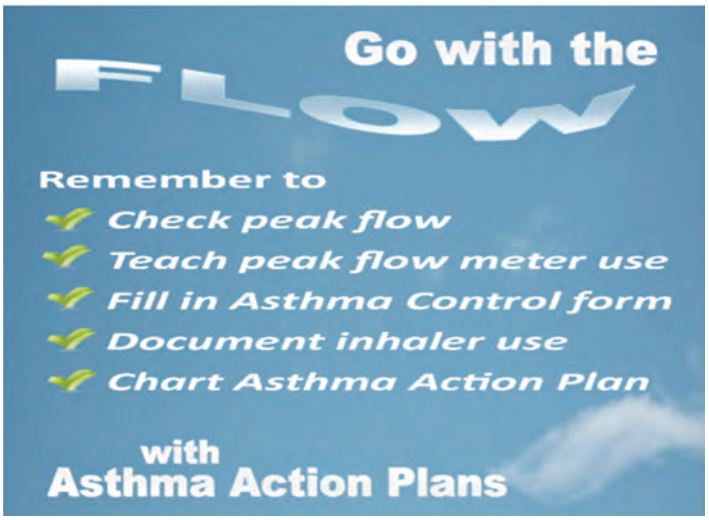
GO WITH THE FLOW

Redesigning Workflow to Improve Airflow

The goal of GO WITH THE FLOW is to improve the health and well-being of our patients who suffer from asthma by systematically improving how we treat these patients. We believe we have the best doctors in the business and the most qualified staff to do this.

Improving healthcare outcomes requires:				
Great systems (equipment, materials, providers, clinicians)	+	**Well-developed processes** (workflow, training, etc.)	=	**Good Patient Outcomes** (self-management, reduced ER visits, improved quality of life)

Summit Medical Group designed the following graphics to display throughout the clinical environment as a tool for education, reinforcement, and as a visual prompt for the patient and staff during each asthma care encounter.



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