



CHILDREN'S OUTCOMES



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The Children's Hospital Asthma Management Program: Improving the Health of Children with Asthma

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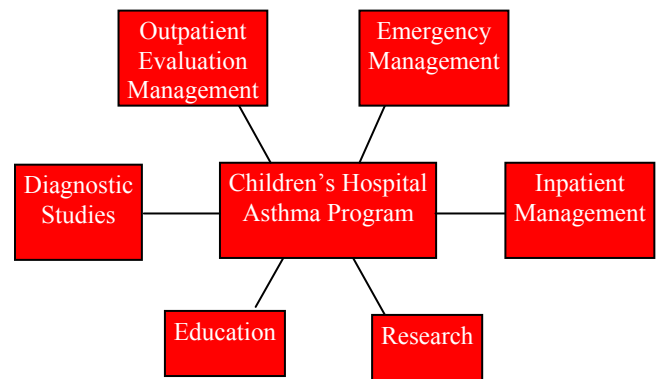
Asthma is the most common chronic disease in children and adolescents.⁽¹⁾ Children miss up to 14 million days from school every year due to asthma.⁽²⁾ In 1999, there were over 650,000 emergency room visits and close to 200,000 hospital admissions due to asthma in the United States. Recent studies show that the estimated cost of treating asthma in children under 18 years old is 3.2 billion dollars per year.⁽³⁾

At The Children's Hospital (TCH), asthma has been the leading diagnosis of children admitted to the hospital since 1997. In 2003, 4,854 children with a primary diagnosis of asthma were seen in the hospital, emergency department, or clinics.

In 2000, in response to the large number of children seen at TCH, Gwen Kerby, MD and Diane Herrick, RRT started to rethink the asthma management in the emergency room and in the hospital. They established a multidisciplinary team to develop the Children's Hospital Asthma Management Initiative with the following goals (figure 1):

- Promote improved quality of life through successful disease management of asthma.
- Provide effective education about asthma and its management to all patients and families treated for asthma at The Children's Hospital.
- Facilitate competency in medical asthma management by providing ongoing educational support to medical caregivers.
- Improve follow-up care through the TCH Asthma Clinic or other appropriate referral.
- Improve the health of children with asthma through research and advocacy.

Figure 1: TCH Asthma Management Goals of Care



Based on the work from this multidisciplinary team, Dr. Kerby and Diane Herrick, RRT launched the emergency room and inpatient asthma pathways in 2003 in an attempt to promote consistent care based on the recommendations of the National Asthma Education and Prevention Program guidelines. Dr. Kerby, Diane Herrick RRT, and Dr. Monica Federico worked with the Children's Hospital Outcomes group to create the Children's Hospital Asthma Clinical Care Guideline (CCG).

The asthma CCG was developed and approved in the format of the Children's Hospital Outcomes Committee in order to formalize the pathway for asthma care and as a basis for the ongoing analysis of data related to the care of asthma at TCH. Formalizing the asthma pathways was fostered by evidence that clinical care pathways result in improved patient outcomes. Similar CCGs have demonstrated decreased length of ED and hospital stays, improved utilization of therapies, and decreased hospital costs with no worsening in relapse or morbidity. Furthermore, the care pathways mandate evidence based care, including use of control medications, valved holding chambers, peak flow meters, and education.^(4, 5, 6)

Support for the Asthma CCG was also driven by a new disease management certification by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). Disease-specific certifications have already been designated in the adult population for stroke, congestive heart failure, and adult asthma. However, asthma is the first JCAHO pediatric disease certification. Currently TCH reports three asthma ORYX indicators to JCAHO on a quarterly basis.

Key components of the CCG are:

- Use of a bronchodilator weaning algorithm based on a validated clinical assessment score (Pediatric Asthma Score - PAS).
- Regular use of oral corticosteroids for an asthma exacerbation.
- Classification of disease severity and level of control and recommendations for long term control measures.
- Peak flow monitoring for children 5 years or older.
- Spirometry prior to discharge for patients 5 years or older.
- Comprehensive asthma education including an Asthma Action Plan for all inpatients.

The asthma CCG is not applicable to all patients seen in the emergency room or in the hospital. The CCG excludes children less than 2 years old and children with co-morbid conditions, including but not limited to: chronic lung disease, cystic fibrosis, cardiac disease, bronchiolitis, airways anomalies, BPD, stridor/croup, aspiration, and neurologic disorders.

Plans are under consideration to seek the new JCAHO Pediatric Asthma Disease Management certification. The Children's Hospital Asthma CCG incorporates core outcomes measures consistent with the JCAHO certification, including:

- Return to the hospital 7 and 30 days after discharge.
- Return to hospital 7 and 30 days after ED or observation stay.
- Use of bronchodilators.
- Systemic corticosteroids for exacerbations.
- Risk adjusted length of stay.
- Home management plan.
- Smoke exposure/cessation counseling.

Other outcomes we would like to follow include: ICU admissions, asthma severity assessment, use of controller medications, peak flow monitoring, spirometry, asthma education, readmission within 12 months, and use of the pathway.

In summary, the high quality, evidence-based care provided through The Children's Hospital Asthma CCG will not only improve the care of asthma at TCH, but also support the JCAHO Pediatric Disease Management certification. In the future, we also hope that the CCG will be an infrastructure which can be used for clinical research studies. Future plans also include creating a similar outpatient asthma pathway and finalizing plans to bring all of the care pathways together into a comprehensive asthma program for children at TCH.

- (1) *Pediatric Asthma: Promoting Best Practices. Guide for Managing Asthma in Children.* 1999. The American Academy of Allergy, Asthma, & Immunology, Inc.
- (2) Mannino et al. *MMWR.* 2002;51(SS-1):1-14.
- (3) Weiss KB, Sullivan SD, Lytle CS. Trends in the cost of illness for asthma in the United States, 1985-1994. *Journal of Allergy Clinical Immunology* 2000;106:493-499.
- (4) McDowell et al, Arch pediatr adolesc med, 1998
- (5) Kelly et al, Ann allergy asthma immunol, 2000
- (6) Wazeka et al, Pediatr pulmonol, 2001

Recent Outcome Abstract(s)

Hammond, L, Papadopoulos S, Johnson, CF, MaWhinney S, Nelson B, Todd JK (2002). "Use of an Internet-based community surveillance network to predict seasonal communicable disease morbidity." *Pediatrics.* 109(3): 414-8.

OBJECTIVES: We designed an Internet-based surveillance network that linked community clinic diagnoses with viral isolation rates and admission patterns at a related children's hospital. We hypothesized that community surveillance would successfully predict subsequent hospital admissions and laboratory viral isolations. Secondly, we expected the network to monitor trends in disease and that posting this information on a Web site would be useful to physicians in daily practice. **STUDY DESIGN:** Data were collected from December 1999 through August 2000. Information was summarized and posted weekly on a Web site. Active public piloting of the site took place during August 2000, after which the project was evaluated through an electronic mail survey. The predictive ability of the community surveillance data was evaluated by multivariate linear regression. **RESULTS:** Increases in the community diagnosis of most syndromes under surveillance, including lower respiratory infections (adjusted $R(2) = 0.7086$) and gastroenteritis (adjusted $R(2) = 0.6532$) successfully predicted an increase in subsequent hospital admissions. Community surveillance also successfully predicted laboratory isolation of associated viral organisms. Physicians completing the evaluation ($N = 11$) indicated that the site provided information useful in daily practice for both physician and parent education. **CONCLUSIONS:** An Internet-based surveillance network linking a hospital with community physicians is beneficial to the hospital in predicting waves of severe cases requiring admission and reciprocally provides useful information to physicians in daily practice regarding the incidence and cause of seasonal disease in the community.