

December 2015

Happy Holidays from the NAECB!

Asthma in the News

Asthma in Women

Why does the disease present unique challenges in these patients?

Advance for NPs and PAs

Women with poorly controlled asthma report more symptoms and worse overall quality of life despite having similar or better lung function than men. This article reviews various theories which have been proposed to explain these differences including the impact of hormones. As women often deal with more severe symptoms, providers must consider nontraditional approaches to asthma care as well as addressing comorbidities in this population.

<http://nurse-practitioners-and-physician-assistants.advanceweb.com/Features/Articles/Asthma-in-Women.aspx>

The feasibility of text reminders to improve medication adherence in adolescents with asthma.

Journal of the American Medical Information Association

Johnson KB, Patterson BL, Ho YX, Chen Q, Nian H, Davison CL, Slagle K, Mulvancy SA.

Objective:

Personal health applications have the potential to help patients with chronic disease by improving medication adherence, self-efficacy, and quality of life. The goal of this study was to assess the impact of MyMediHealth (MMH) - a website and a short messaging service (SMS)-based reminder system - on medication adherence and perceived self-efficacy in adolescents with asthma.

Methods:

We conducted a block-randomized controlled study in academic pediatric outpatient settings. There were 98 adolescents enrolled. Subjects who were randomized to use MMH were asked to create a medication schedule and receive SMS reminders at designated medication administration times for 3 weeks. Control subjects received action lists as a part of their usual care. Primary outcome measures included MMH usage patterns and self-reports of system usability, medication adherence, asthma control, self-efficacy, and quality of life.

Results:

Eighty-nine subjects completed the study, of whom 46 were randomized to the intervention arm. Compared to controls, we found improvements in self-reported medication adherence, quality of life, and self-efficacy. Subjects reported high satisfaction with MMH; however, the level of system usage varied widely, with lower use among African American patients.

Conclusions:

MMH was associated with improved medication adherence, perceived quality of life, and self-efficacy.

Trial Registration:

This project was registered under <http://clinicaltrials.gov/> identifier NCT01730235.

<http://jamia.oxfordjournals.org/content/early/2015/12/11/jamia.ocv158>

**Pathogenesis and prevention strategies of severe asthma exacerbations in children.
*Current Opinion in Pulmonary Medicine***

Cook J., & Saglani S.

Abstract:

Exacerbations of asthma in children are most frequently precipitated by respiratory infections with a seasonal pattern. However, management takes little account of the underlying infective or other precipitant abnormality. Recent findings of interactions between environmental triggers, the airway microbiome and innate immune responses are key determinants of exacerbations. Elevated innate cytokines interleukin (IL)-33 and IL-25, and abnormal molecular responses in the interferon pathway are associated with rhinoviral infections.

Exacerbations caused by fungal allergens also induce IL-33, highlighting this as an attractive therapeutic target. An equal contribution of bacterial and viral infection during exacerbations, particularly in preschool children, has become increasingly apparent, but some organisms may be protective. Investigation of mechanisms underlying infection-related exacerbations especially in

preschool children is needed.

Progressive loss of lung function from exacerbations is most pronounced in children aged 6-11 years, and low FEV1 is now recognized as a key predictor for the development of chronic obstructive pulmonary disease and premature death. Although prevention of exacerbations is critical, suboptimal patient education, prescription and adherence to maintenance therapy, and a lack of predictive biomarkers, remain key unaddressed issues in children.

Summary:

Precipitants and predictors of exacerbations, together with the child's age and clinical phenotype, need to be used to achieve individualized management in preference to the current uniform approach for all.

<http://www.ncbi.nlm.nih.gov/pubmed/26574720>

Asthma and obesity: Is weight reduction the key to achieve asthma control?
Current Opinion in Pulmonary Medicine

Ulrik C.S.

Purpose of review:

Obesity has significant negative impact on asthma control and risk of exacerbations. The purpose of this review is to discuss recent studies evaluating the effects of weight reduction on asthma control in obese adults. Recent findings in clinical studies have shown that weight reduction in obese patients is associated with improvements in symptoms, use of controller medication, and asthma-related quality of life together with a reduction in the risk for severe exacerbations.

Furthermore, several studies have also revealed improvements in lung function and airway responsiveness, and more recently it has been shown that weight reduction following bariatric surgery has positive impact on small airway function, systemic inflammation and bronchial inflammation in this group of patients, which may explain the observed improvements in symptom control and lung function.

Summary:

Weight reduction in obese adults with asthma leads to an overall improvement in asthma control, including airway hyperresponsiveness and inflammation. Weight reduction should be a cornerstone in the management of obese patients with asthma.

<http://www.ncbi.nlm.nih.gov/pubmed/26574719>

Update on the current methods for the diagnosis and treatment of severe childhood asthma.

Expert Review of Respiratory Medicine

Konradsen J.R., Caffrey Osvald E., & Hedlin G.

The level of asthma control is the key outcome towards which asthma management is evaluated. The majority of children with asthma can obtain adequate control of symptoms through avoidance of triggering factors and/or with the help of low to moderate doses of current available medications. However, there is still a group of children with poor symptom control despite intensive treatment.

The current review will provide an overview of a standardized approach to characterize this heterogeneous group of severely sick children. Factors that attenuate the effect of the prescribed treatment and make asthma difficult to treat are discussed. In addition, the usefulness of current methods of assessing asthma severity, pulmonary function, allergy and airway inflammation is also described. Finally, an overview of therapeutic options for children with severe asthma is provided.

<http://www.ncbi.nlm.nih.gov/pubmed/26414277>

Predicting asthma control deterioration in children.
BMC Medical Informatics and Decision Making

Luo G., Stone B.L., Fassi B., Maloney C.G., Gesteland P.H., Yerram S.R., & Nkoy F.L.

Background:

Pediatric asthma affects 7.1 million American children incurring an annual total direct healthcare cost around 9.3 billion dollars. Asthma control in children is suboptimal, leading to frequent asthma exacerbations, excess costs, and decreased quality of life. Successful prediction of risk for asthma control deterioration at the individual patient level would enhance self-management and enable early interventions to reduce asthma exacerbations. We developed and tested the first set of models for predicting a child's asthma control deterioration one week prior to occurrence.

Methods:

We previously reported validation of the Asthma Symptom Tracker, a weekly asthma self-monitoring tool. Over a period of two years, we used this tool to collect a total of 2912 weekly assessments of asthma control on 210 children. We combined the asthma control data set with

patient attributes and environmental variables to develop machine learning models to predict a child's asthma control deterioration one week ahead.

Results:

Our best model achieved an accuracy of 71.8 %, a sensitivity of 73.8 %, a specificity of 71.4 %, and an area under the receiver operating characteristic curve of 0.757. We also identified potential improvements to our models to stimulate future research on this topic.

Conclusions:

Our best model successfully predicted a child's asthma control level one week ahead. With adequate accuracy, the model could be integrated into electronic asthma self-monitoring systems to provide real-time decision support and personalized early warnings of potential asthma control deteriorations.

http://download.springer.com/static/pdf/646/art%253A10.1186%252Fs12911-015-0208-9.pdf?originUrl=http%3A%2F%2Fbmcmmedinformdecismak.biomedcentral.com%2Farticle%2F10.1186%2Fs12911-015-0208-9&token2=exp=1450366358~acl=%2Fstatic%2Fpdf%2F646%2Fart%25253A10.1186%25252Fs12911-015-0208-9.pdf*~hmac=c82940d3bd9492d7f93cbf3474fd43784a184b582284452352ab115bbacc055f

Barriers to Asthma Management for School Nurses: An Integrated Review.
Journal of School Nursing

Hanley NE, Toronto CE

Childhood asthma is a growing health concern. Asthma is the most common chronic illness of childhood and a leading cause of emergency room visits, hospitalizations, and school absenteeism. School nurses play a valuable role in asthma management. The purpose of this integrative review is to examine barriers to asthma management for school nurses in the school setting.

Findings revealed multiple barriers school nurses encounter in managing asthma. Six themes emerged that included lack of resources and support, insufficient time, communication challenges, limited knowledge, and lack of awareness of school nurses' expertise. Students, parents, primary care physicians, school administration, staff, and school nurses themselves all play a role in constructing barriers to asthma management. There is a need for school nurses and school nurse leaders to focus efforts to develop strategies to overcome barriers to ensure evidence-based, best practice management of asthma in the school setting.

<http://jsn.sagepub.com/content/early/2015/12/09/1059840515621607.abstract>

Development and validation of asthma questionnaire for assessing and achieving best control in preschool-age children.

Pediatric Allergy Immunology

Sato K, Sato Y, Shimoji N, Toshihara S, Adachi Y, Kameda M, Teada A, Fukisawa T

Background:

Several patient/caregiver-completed questionnaires have been utilized for assessment of asthma control. However, due to the diversity in medical/social circumstances, they may not be optimal for use in all countries. The Japanese pediatric asthma guideline (JPGL) aims at higher levels of

control compared to other international guidelines, based on a strong social demand for best care. We developed a new control test to help meet that demand.

Methods:

A 34-item working questionnaire was developed based on input from pediatric asthma specialists and the caregivers of preschool children with asthma. The questionnaire was administered to caregivers of 565 patients aged <6 years who had physician-diagnosed asthma or β 2-agonist-responsive recurrent wheeze. Then, 6 questions for assessing JPGL-defined control levels were selected from the 34 questions by stepwise logistic regression methods using randomly selected questionnaires completed by two-thirds of the caregivers. We named that set of questions the Best Asthma Control Test for Preschoolers (Best ACT-P). Validation of Best ACT-P was performed using the remaining completed questionnaires.

Results:

The 6 questions asked about the frequency/severity of cold-induced wheeze, nighttime awakening, exercise-induced symptoms and disruption of family life due to asthma in the past 4 weeks and hospitalization in the past 12 months. The 6-item logistic model showed good statistical fit, and the scores for the physicians' ratings of the asthma control differed significantly in the hypothetical direction.

Conclusions:

Best ACT-P is a valid caregiver-completed questionnaire of asthma control in preschoolers in whom total control needs to be achieved.

<http://onlinelibrary.wiley.com/doi/10.1111/pai.12523/abstract>

Why stress may be fueling the childhood asthma epidemic

PBS NewsHour

By Karen Bouffard

12/9/2015

This story is part of a joint series by the PBS NewsHour and The Detroit News examining the latest research on the role chronic stress may play in the growing childhood asthma epidemic.

Detroit has the highest rate of asthma among young children in America's 18 largest cities, a problem that experts link to urban ills that could affect their health and learning for the rest of their lives.

In a study done exclusively for The Detroit News and PBS NewsHour, researchers from the Johns Hopkins Bloomberg School of Public Health found about 2 of every 3 Motor City children face "adverse childhood experiences," such as household substance abuse, exposure to violence and extreme economic hardship that can trigger asthma.

Studies have shown that such children are nearly twice as likely to have asthma - the disease that causes breathing difficulties - regardless of the impact of allergens, air quality and other contributing factors.

It's part of a growing trend across the nation where asthma rates have exploded since 2001, increasing by 50 percent among African-Americans. The condition has reached epidemic proportions in large urban areas including Phoenix, Philadelphia, Detroit and other major U.S. cities.

More than 24,000 of Detroit's roughly 193,800 children have asthma or about 12.4 percent. And the Johns Hopkins researchers found more than 77,000 Detroit children, or about 40 percent of all the city's kids, have experienced two or more stress-fueling conditions.

Such experiences contribute to asthma attacks and "cause lifelong health problems," said Dr. Christina Bethell, director of the Child and Adolescent Health Measurement Initiative at Johns Hopkins.

Stress results in the production of cortisol and adrenaline, chemicals that trigger the fight-or-flight response which is necessary to help us survive immediate, short-lived threat or danger.

But prolonged chronic stress leads to heightened production of these chemicals that can kick the immune system into overdrive, resulting in asthma, disrupted brain development and other health problems that have lifelong consequences, scientists say.

Children who struggle to breathe find it hard to play, learn and achieve developmental milestones.

"It feels like I'm hurting, I'm dying," said Malik Cole, a 9-year-old Detroit boy, about his breathing difficulties. His family was homeless for about a year.

Elizabeth Secord, division chief for allergy, asthma and immunology at DMC Children's Hospital of Michigan, said it's difficult to secure the mental health services or the proper medications to treat the severely asthmatic kids she sees in her clinic.

"It's almost a mandate that we have social work involved," Secord said. "The real problem is, the

kids with Medicaid (government health insurance for the poor) are the highest risk and have the most trauma, and it's very difficult to get psychological services for this. Even those with private insurance often have to pay out of pocket."

Twelve-year-old Cameron Carter of Detroit still suffers from the aftermath of her cousin's death in an Aug. 31, 2013, drive-by shooting.

Kenis Green Jr. was 12 when an angry neighbor sprayed his front porch with bullets during a family birthday party. Cameron's brothers, Alexander Carter, now 14, and Christian Carter, now 16, were standing on either side of Kenis when he was shot. Though Cameron was not at the party, she was hospitalized with asthma in the chaotic days after the shooting and again during the one-year anniversary of her cousin's murder.

This is not a surprise to Johns Hopkins researchers, who have studied a host of measures associated with the health and well-being of children, such as neighborhood violence and school attendance.

They found nearly 40 percent of Detroit kids are affected by two or more traumatic or stressful experiences, more than any of the largest American cities. Philadelphia came in second with 33.1 percent of children who were similarly traumatized, followed by Phoenix with 31.1 percent.

About two-thirds of Detroit's kids live in neighborhoods considered safe, the study found, the lowest percentage among the cities studied. The city also has the highest percentage of children - 9.7 percent - who missed 11 days of school or more, according to the Johns Hopkins study.

A year of therapy helped Cameron and her brothers recover from the trauma of Kenis' death. They

attended grief therapy sessions through a St. John Providence Health System program called Open Arms.

Cameron attends weekly dance classes and is learning to better manage her asthma, Carter-Ivory said. Her brothers, Christian and Alexander, were diagnosed with asthma when they were younger but now are symptom-free. Alexander is a starting running back on the River Rouge High School football team, where he wears the No. 32 that Kenis used to wear in youth competition as a tribute to his cousin.

Experts say asthma in Detroit and other troubled urban areas must be fought on multiple fronts, from eliminating environmental triggers such as mold and cigarette smoke, to finding ways to reduce trauma in the lives of children.

<http://www.pbs.org/newshour/updates/can-stress-trigger-asthma-in-children/>

Fresno tries new approach to combatting asthma
The Bakersfield Californian

By Alice Daniel
12/11/15

FRESNO - Stephani Pineda, a program coordinator for the Central California Asthma Collaborative, has walked through dozens of homes in Fresno County making recommendations to families whose children are at risk of asthma emergencies.

Her mission is to reduce indoor environmental triggers that can cause asthma attacks. Her suggestions range from the simple to the complex, from switching cleaning products to weatherizing a house.

Over the course of a couple of years, she's gotten to know the families well.

"You try to build a relationship with the families because it's hard for someone to let you into their home," she said. "The biggest thing for us is they really start to trust us and look forward to our visits. People really do make an effort to make the changes."

It may pay off in more ways than one. The families are part of a unique two-year pilot program in Fresno County called the Asthma Impact Model.

The model focuses on families who are low income. The goal is to see if a social health program can improve care, reduce costly emergency department visits and save money. If the model is successful, it could attract investors to a social impact bond that would allow the program to expand.

The California Endowment funded the project with a \$1.1 million grant.

Fresno County's high rates of asthma

Why Fresno County? It has one of highest rates of childhood asthma in the country: one in five children. In fact, asthma is the leading cause of ED visits for kids, and it's the No. 1 health-related reason kids miss school. These numbers put a financial strain on hospitals, schools and Medi-Cal, California's Medicaid program.

Central California Asthma Collaborative and Clinica Sierra Vista, organizations with a history of asthma care and prevention, designed the intervention program.

Coordinators, like Pineda, followed 80 families for one year. They spoke with the parents monthly and made five home visits.

Making a home or an apartment environmentally safe sometimes meant writing letters to the landlord to get mold removed, or get a leak fixed in the bathroom, Pineda said.

And sometimes it was just a matter of taking the time to educate families about medication, like the difference between a rescue inhaler and a long-term inhaler, Pineda said. Some of the kids had been taking the medicine interchangeably. Even if a doctor shows a patient how to use the drugs, it can be so quick that it's hard to understand.

In other cases, Pineda said, parents would worry they were overmedicating their children and only use the inhalers during an asthma emergency, which is actually more harmful.

Children and their parents were taught to recognize asthma triggers, sometimes a hard lesson.

"One of the families had just gotten the cutest little kitten," Pineda said. "The son had been doing really well, and then he started having all these asthma episodes. We found out he was allergic to it."

Kevin Hamilton, deputy chief of programs for Clinica Sierra Vista, said the parents were already making their own efforts; it's just that sometimes they were operating on misinformation. For instance, parents were trying to keep their houses clean and what they thought was environmentally safe, but some were using scented products or strong chemicals that actually exacerbate asthma. Simple suggestions like using green products would often make a huge

difference.

Families were also provided with supplies known to improve the household environment like vacuums with HEPA filters and hypoallergenic pillowcases, said Hamilton.

Anecdotal evidence shows huge improvements

Many of the families enrolled in the Asthma Impact Model had previously made visits to an ED several times a year, using it as a source of primary care. "We're now getting families to build a relationship with a primary care physician and to go in for well care visits," Pineda said.

Pineda has seen significant improvements.

"I had one child who always wanted to play soccer when he was little, and he never made it through the whole season. He always ended up in the ED," she said. "Last year, he got to play the whole winter, and also be part of the band."

Hamilton said the program has worked well. "The preliminary results are very good," Hamilton said. "We did see a dramatic improvement in kids' health. School attendance was dramatically improved. Students who were literally failing out of elementary school are now actively participating."

Parents have reported that ED visits fell by about 80 percent, Hamilton said. Asthma-related hospitalizations dropped by approximately 70 percent.

Data may lead to social impact bond

Now it's time to crunch the numbers. With the intervention phase completed, the next phase is an

evaluation of Medi-Cal claims data. The Fresno program is the first to use such information to analyze the effect of an in-home asthma intervention program in terms of outcomes and costs.

Connecticut-based Collective Health, which specializes in innovative solutions to health problems, will calculate net savings from the project. The not-for-profit financial intermediary Social Finance will also help determine the feasibility of a social impact bond.

"Once the report happens, the decision is what's next? Does this pencil out?" said Hamilton. "It has huge policy implications."

If the program pans out and banks, individuals and foundations are willing to invest, the program could expand from about 200 children to 3,000. Returns could come from insurers or the state.

The program could "really change the way we look at funding and the expense related to chronic health management, and disease care," Hamilton said.

"I really believe that a fairly small investment on the front end doing work at the person's home in their living room and kitchen is a game changer."

Still, Hamilton said, what really excites him is seeing how the intervention program has positively impacted families.

"The thing that gets to me is hearing these moms tell these stories," Hamilton said. "It just goes to show you, when kids are healthy and in school, good things happen."

This story was originally published by <http://www.californiahealthline.org>.

<http://www.bakersfield.com/news/2015/12/11/fresno-tries-new-approach-to-combatting-asthma.html>

Children With Allergy, Asthma Have Higher Risk For Heart Disease, Study Says *Allergic Living*

By Allergic Living Staff

Children who live with allergic diseases, in particular asthma and hay fever, have approximately twice the rate of high cholesterol and high blood pressure as their non-allergic peers, a new study says.

The study author warns that higher rates for two key cardiovascular risk factors mean that these kids could be on a course for heart disease from a surprisingly early age. But testing in these areas sooner when children are diagnosed with allergies or asthma could lead to earlier lifestyle interventions, which can reduce the cardiovascular risks.

"Given how common these allergic diseases are in childhood, it suggests we need to screen these children more aggressively to make sure we are not missing high cholesterol and high blood pressure," said study author Dr. Jonathan Silverberg, an associate professor of dermatology at Northwestern University. "There may be an opportunity to modify their lifestyles and turn this risk around."

Examining asthma, hay fever and eczema in the United States, as well as other cardiovascular risk factors, Silverberg analyzed data on 13,275 children in the 2012 National Health Interview Survey,

who were representative of the population of all 50 states. Asthma occurred in 14 percent of children, eczema in 12 percent and hay fever in 16.6 percent. Asthma, hay fever and eczema were all associated with higher rates of being overweight or obesity, but even after adjusting for that risk factor, children with allergic disease had a much higher risk for high blood pressure and high cholesterol.

Silverberg said inflammation occurring in asthma and hay fever might contribute to the higher rates of cardiovascular disease. "This study shows that cardiovascular risk starts far earlier in life than we ever realized," he says.

The study was published Dec. 8, 2015 in the *Journal of Allergy & Clinical Immunology*.

<http://allergicliving.com/2015/12/15/children-with-allergy-asthma-have-higher-risk-for-heart-disease-study-says/>

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NAECB Newsletter Editors:

**Kimberly Byrne, RN, BSN, CPN, AE-C
Karen Meyerson, MSN, APRN, FNP-C, AE-C**

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4001 E. Baseline Suite 206, Gilbert AZ 85234
Telephone No: 877.408.0072 | Email Address: info@naecb.org