



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: A 5-year prospective study in infants with atopic dermatitis to determine risk factors, with a focus on pets and pests, on the development of asthma and allergic diseases

Principal Investigator: Wanda Phipatanakul, MD

Researchers Involved: Jonathan Gaffin, MD – Lynda Schneider, MD

Abstract: This is a substudy of a multicenter trial of Pimecrolimus to alter the progression of atopic diseases in children. We will evaluate 350 patients with atopic dermatitis for risk factors for developing other allergic diseases. Periodic questionnaire data will be obtained on each subject to ascertain allergic exposures, specifically looking at pet and pest exposure, and the presence of allergic outcome measures, such as asthma, allergic rhinitis, allergic conjunctivitis and food allergy. Our objective will be to determine risk factors (such as parents' atopic history, smoking during pregnancy, perinatal factors, sex, race, maternal age at birth, breast-feeding, family income, existence of siblings, pets [dogs, cats] in the household, signs of pests [mice, rats, cockroaches], attendance of day-care, smoke exposure) on the development of asthma, allergic rhinitis, food allergy, and allergic conjunctivitis in infants with atopic dermatitis. We will particularly focus on the role of pets and pests.

Funding Sources: Novartis Pharmaceuticals

Contact Information:

Jon Gaffin, MD
Fegan 6
Children's Hospital Boston
300 Longwood Ave
Boston, MA 02115
Jonathan.Gaffin@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: A Randomized, Double-Blind, Parallel Trial on the Effect of Budesonide/Formoterol and Inhaled Budesonide Alone on Exercise-Induces Asthma

Principal Investigator: Wanda Phipatanakul, MD

Researchers Involved: Jon Gaffin, MD

Abstract: Budesonide/Formoterol (Symbicort) is a relatively new combination inhaled corticosteroid (ICS)/Long Acting Beta Agonist (LABA) used in the treatment of persistent asthma. There is some evidence that combination ICS/LABAs improve bronchoreactivity associated with exercise induced asthma. The aim of this study is to evaluate the effect of Budesonide/Formoterol vs Budesonide alone in improving exercised induced asthma as measured by change in FEV-1 during a routine exercise-induced asthma challenge. Secondary outcomes will be morning peak flow measurements and asthma symptoms recorded in a daily asthma diary. Data on exhaled nitric oxide and beta adrenergic gene polymorphisms will also be collected in this population.

Funding Sources: Astra Zeneca

Contact Information:

Jon Gaffin, MD

Fegan 6

Children's Hospital Boston

300 Longwood Ave

Boston, MA 02115

Jonathan.Gaffin@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Allergens in Inner-City Schools and Childhood Asthma

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: Lynda Schneider, MD - William Sheehan, MD - Diane Gold, MD, MPH - Michael Muilenberg, MA - Jonathan Gaffin, MD - Christine Rogers

Abstract: Allergic asthma is the most common chronic disease of childhood in the United States. Asthma is also the number one cause of school absences in America. The role of indoor allergen exposure in homes and asthma development and morbidity has been extensively studied. Because children spend a significant amount of time in school, the school classroom environment may be as significant a source of allergen exposure and consequent asthma morbidity as allergen exposure in the home. However, little is known about the role of allergen exposure in schools and asthma morbidity. We hypothesize that exposure to common indoor allergens in the classroom will increase the risk of asthma morbidity in inner-city children with asthma, even after controlling for home allergen exposures. In a longitudinal study of 600 elementary school-aged children with asthma from multiple classrooms in 25 Boston inner-city schools, we will examine the following specific aims: 1) to test whether elevated levels of allergens in the classroom increase the risk of asthma morbidity, even after controlling for allergen exposure in the home; and 2) to test whether the risk of increased asthma morbidity in relation to elevated classroom levels of a specific allergen will be highest for those specifically sensitized to that allergen. An understanding of exposure risk factors specific to the school classroom is critical, because the school classroom environment could potentially be considered as an effective target for prevention of inner-city asthma morbidity by reducing exposures to many symptomatic children through school-based interventions. While the potential importance of the classroom environment to the health of asthmatic children has been recognized nationally, study of this area has lacking. This unique proposal will build on important collaborations between the Channing Laboratory at the Brigham and Women's Hospital, Children's Hospital Boston, the Harvard School of Public Health, the University of Massachusetts Amherst, and the Boston Public School System. Our multidisciplinary research group has significant expertise in asthma epidemiology and environmental epidemiology (Drs. Phipatanakul and Gold), environmental assessment (Drs. Phipatanakul, Gold, Muilenberg, and Rogers), and statistics (Drs. Ryan, Hoffman, and Sankaranarayanan [Subramanian]). In addition to its

public health relevance, this proposal will recruit a unique school pediatric cohort that will facilitate future hypothesis testing.

Funding Sources: NIH/ NIAID

Contact Information:

Wanda Phipatanakul, MD, MS

300 Longwood Ave. Fegan 6

Boston, MA 02115

617-355-5925

wanda.phipatanakul @childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Characterizing Sesame Allergy: Role of Specific IgE and Skin Prick Testing in Predicting Food Challenge Results

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: Perdita Permaul, MD - Lisa Stutius, MD - P. Rangsithienchai, MD - Jolan Walter, MD - Michael Young, MD - Frank Twarog, MD - Lynda Schneider, MD

Abstract:

RATIONALE: Sesame is an emerging food allergen in the American pediatric population, with a significant risk of severe reaction including anaphylaxis. Little is known about the role of sesame-specific IgE levels and skin prick testing (SPT) in predicting the outcome of oral food challenges to sesame. We examined the correlation of sesame-specific IgE levels and SPT results with oral sesame challenge outcomes.

METHODS: This was a retrospective chart review of all children who received a serum sesame-specific CAP RAST IgE level, SPT, and oral sesame challenge at Children's Hospital Boston and several affiliated allergy clinics. A positive RAST was defined as > 0.35 kU/L and a positive SPT was defined as a wheal ≥ 3 mm larger than the negative control.

RESULTS: 27 oral sesame challenges were conducted from January 2004 to March 2008. Of the 27 oral sesame challenges, 18.5% (N=5) failed and 81.5% (N=22) passed. A positive RAST demonstrated: 80% sensitivity, 32% specificity, 21% PPV, and 88% NPV. A positive SPT demonstrated: 60% sensitivity, 55% specificity, 23% PPV, and 86% NPV. A sesame RAST > 3.50 kU/L and SPT wheal ≥ 6 mm both demonstrated specificity $> 90\%$.

CONCLUSIONS: Based on our sample, positive sesame-specific IgE level and positive sesame SPT are not good predictors of true sesame allergy as determined by the gold standard test of an oral sesame challenge. However, there may be certain RAST levels and SPT wheal sizes that are helpful in predicting a negative sesame food challenge.

Funding Sources: NIH Training Grant

Contact Information:

Wanda Phipatanakul, M.D.

300 Longwood Avenue

Boston, MA 02115

wanda.phipatanakul@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Characterizing the Relationship Between Peanut and Sesame Allergy in Children

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: Perdita Permaul, MD - Lisa Stutius, MD - P. Rangsitienchai, MD - Jolan Walter, MD - Michael Young, MD - Frank Twarog, MD - Lynda Schneider, MD

Summary:

Rationale: Sesame is an emerging food allergen in the US. There is hypothesized cross-reactivity between peanut and sesame, making sesame allergy a potential risk for peanut-allergic children. As a result, many allergists are screening peanut-allergic children for sesame allergy. We examined the relationship between sesame and peanut sensitization by skin prick test (SPT) and parent/guardian report of allergic reactions.

Methods: We performed a retrospective chart review of all children who underwent SPT to sesame at our program from December 2006 to March 2008. In these patients, we obtained SPT data for several other common food allergens and determined history of allergic reaction to peanut or sesame from the medical record.

Results: We identified 190 children who underwent SPT to sesame. Of these, 122 underwent SPT to peanut. The prevalence of sesame sensitivity in our cohort was 36.3% (N=69). Children sensitized to sesame had a high prevalence of sensitization to other foods, with peanut being the most common: peanut 84.8%, hazelnut 82.9%, egg 81.5%, walnut 80.6%, almond 76.3%. Further, 52.7% of children sensitized to peanut were sensitized to sesame. Children sensitized to peanut were significantly more likely to be sensitized to sesame (OR 6.53, 95% CI 2.59-16.42, $p < 0.001$). Children with reported history of peanut reaction were not more likely to have reported history of sesame reaction (OR 1.37, 95% CI 0.54-3.51, $p = 0.5$).

Conclusions: Children with peanut sensitivity are more likely to be sensitized to sesame. However, there does not appear to be a significant relationship between reported history of clinical reaction to peanut and sesame.

Funding Sources: NIH

Contact Information:

Wanda Phipatanakul, M.D. M.S.

300 Longwood Avenue

Boston, MA 02115

Wanda.Phipatanakul@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Higher Incidence of Pediatric Anaphylaxis in Southern Areas of the United States

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: William Sheehan, MD - Dionne Graham, MD - Lin Ma, MD

Abstract:

Rationale: Previous studies have suggested a north-south gradient of anaphylaxis with increased rates further from the equator. We examined the rates of pediatric anaphylaxis in the US, focusing on a north-south comparison.

Methods:

We searched the Pediatric Health Information System (PHIS), a billing database of US free-standing pediatric hospitals, for all cases of anaphylaxis. All hospitals providing inpatient and ED information from 2003-2007 were studied and divided at the 39° longitude creating 12 northern and 13 southern pediatric hospitals. Anaphylaxis rates (per 1,000 visits) were analyzed for north-south differences.

Results: There were 16,629 anaphylaxis cases (56.7% male, median age 6.2 years) among 8.5 million patient encounters. Anaphylaxis incidence was 1.96 per 1,000 encounters. Sting anaphylaxis was five times more common than food anaphylaxis (1.13 vs. 0.20 per 1,000; OR=5.79; 95% CI = 5.49-6.09; $p < 0.001$). Southern pediatric hospitals had higher anaphylaxis rates in the ED (2.08 vs. 1.87 per 1,000; $p < 0.001$) and admissions (2.13 vs. 1.60 per 1,000; $p < 0.001$) compared to northern hospitals. Sting anaphylaxis was more common in the south (1.44 vs. 0.83 per 1,000; $p < 0.001$). In contrast, food anaphylaxis was twice as likely in the north (0.26 vs. 0.13 per 1,000; OR=2.02; 95% CI=1.82-2.23; $p < 0.001$), although this represented a small proportion of the total cases.

Conclusion: The incidence of anaphylaxis was 0.2% of all pediatric hospital visits. Overall anaphylaxis and sting specific anaphylaxis were higher in southern US cities. Food anaphylaxis was much less common overall, but occurred more frequently in northern US cities.

Funding Sources:

Phipatanakul: NIH

Sheehan: NIH NRSA

Contact Information:

Wanda Phipatanakul

wanda.phipatanakul@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Mouse Allergen And Asthma Intervention Trial (MAAIT)

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: Irene Borrás Coughlin, CCRC

Abstract: The study is a randomized, controlled trial of a mouse-targeted integrated pest management (IPM) intervention in childhood asthma. There will be two parallel arms; one arm will receive IPM, education, and room air filters (IPM Group) and the other arm will receive IPM education alone (Education Group). The IPM Group will receive two IPM visits 4 weeks apart after randomization and subsequent IPM visits will be driven by continuing or recurring evidence of mouse infestation. The Education Group will receive one intensive education visit within 4 weeks of randomization. Clinical outcomes will be assessed every three months and followed for a total of 12 months in both groups. Home environments will be assessed every three months for a total of 12 months in both groups. Mouse-specific IgG levels will be quantified at baseline and 12 months as a biomarker of mouse allergen exposure. At the end of the 12 month period, the Education Group will receive IPM and room air filters.

Funding Sources: NIH

Contact Information:

Wanda Phipatanakul, MD, MS
300 Longwood Ave. Fegan 6
Boston, MA 02115
617-355-6524

wanda.phipatanakul@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Preschool Children's Ability to Perform Useful Pulmonary Function Tests

Principal Investigator: Wanda Phipatanakul, MD

Researchers Involved: Jonathan Gaffin, MD - Nancy Shotola - Thomas Martin, MD

Abstract: Spirometry has been performed and standardized for children six years old and older. Recent prospective studies have shown that preschool age children, age 3-5 years old are able to produce useful spirometry maneuvers. The American Thoracic Society (ATS) has recently published suggested guidelines for establishing adequacy and reproducibility standards for this population. We aim to review our PFT experience (Pulmonary Division records) for children 3-5 years old to determine the proportion of children who fit the current criteria. We will also look at the clinical utility of PFTs to diagnose asthma and detect early changes in lung function associated with cystic fibrosis.

Funding Sources: None

Contact Information:

Jon Gaffin, MD

Fegan 6

Children's Hospital Boston

300 Longwood Ave

Boston, MA 02115

Jonathan.Gaffin@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Prevalence of Aeroallergen Sensitization in Pediatric Patients Referred for Allergy Evaluation

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: William Sheehan, MD, Pitud Rangsitienchai, MD, Sachin Baxi, MD

Abstract:

Rationale: The decision to skin test depends on the clinical history, the severity of atopic disease, and the expected yield of testing. Our study evaluates rates of sensitization to environmental inhalant allergens (aeroallergens).

Methods: Retrospectively, we reviewed skin test results for consecutive pediatric patients referred to our allergy program. Sensitization was defined by a positive skin prick test to the following aeroallergens: mouse, cockroach, dog, cat, dust mite, tree, grass, and ragweed. Prevalence of sensitization, by age, was calculated for each aeroallergen.

Results: 1394 patients were skin tested during the period and grouped by age. 57.2% of all subjects were sensitized to at least one aeroallergen with a higher rate of sensitization in males as compared to females (60.1% vs. 53.2%; $p = 0.010$). In children less than 2 years of age, 26.5% were sensitized with the most prevalent sensitizations including dog (15.5%) and cat (9.2%). Additionally, tree sensitization was demonstrated in the youngest ages (7.8% at 0-2 yrs; 17.1% at 2-4 years). Sensitization rates to dust mites and trees were the highest in all age groups above 4 years with a peak tree sensitization of 56.4% in the 10-12 yr group and a peak dust mite sensitization of 56.8% in the >12 yr group. Overall, we observed increasing sensitization rates throughout childhood for indoor and outdoor aeroallergens ($p < 0.001$; Pearson Chi-Square).

Conclusion: Sensitization rates to indoor and outdoor aeroallergens increase during childhood. In addition to the clinical history, knowledge of these sensitization rates may assist in the decision to perform skin testing.

Funding Sources:

Phipatanakul: NIH

Sheehan: NIH NRSA

Contact Information:

Wanda Phipatanakul

wanda.phipatanakul@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Prevalence of Asthma in the Food Allergic Pediatric Population

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: Gaffin JM - Sheehan WJ - Sawicki G - Twarog F - Young M - Schneider LC

Abstract: Children with food allergies often go on to develop asthma. Our objective is to determine if specific food allergies are associated with a higher prevalence of asthma. We will use the Food Allergy and Fertility study database to evaluate the association between food allergy and asthma. The database contains information on over 1300 children with food allergies who are seen in local allergy clinics.

Funding Sources: The Jordan Family Fund for Allergy Research

Contact Information:

Jon Gaffin, MD

Fegan 6

Children's Hospital Boston

300 Longwood Ave

Boston, MA 02115

Jonathan.Gaffin@childrens.harvard.edu



Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Prevalence of Coconut Allergy in Children with Tree Nut and Peanut Allergies

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: Pitud Rangsinhienchai, MD - William Sheehan, MD - Lisa Stutius, MD - Lynda Schneider, MD - Michael Young, MD

Abstract:

Rationale: The U.S. F.D.A. recently updated their tree nut allergen list to include coconut. This labeling has created confusion among tree nut allergic patients. Our objective was to examine the prevalence of coconut allergy in pediatric patients with and without tree nut and peanut allergies.

Methods: We performed a retrospective chart review of all pediatric patients who underwent coconut skin prick testing (SPT) in our allergy program from January to December, 2007. Patients were analyzed for coconut, tree nut, and peanut allergies based on SPT results and physician-diagnosed allergy.

Results: 37 subjects (7 months to 16 years old, median age 4.0 years) underwent coconut SPT. Of the 37 children skin tested to coconut, 21.6%, 37.5%, and 58.8% were sensitized and 24.3%, 67.6%, and 70.3% were diagnosed as allergic to coconut, tree nuts, and peanut, respectively. Children diagnosed as allergic to tree nuts were not more likely to be positive on SPT to coconut compared to those who were not diagnosed as tree-nut allergic (24.0% vs. 16.7%; $p=1.00$). Similar results were found comparing patients with and without diagnosed peanut allergy (23.1% vs. 18.2%; $p=1.00$). Furthermore, children with diagnosed tree nut allergy were not more likely to be diagnosed with coconut allergy compared to those who were not diagnosed as tree-nut allergic (28.0% vs. 16.7%; $p=0.69$). Again, similar results were found when comparing patients with and without diagnosed peanut allergy (30.8% vs. 9.1%; $p=0.23$).

Conclusions: Based on our study, there is no evidence of increased coconut allergy in children allergic to tree nuts or peanuts.

Funding Sources: Bunning Food Allergy Research Fund

Contact Information:

Pitud Rangsithienchai

773-398-2774

prangsi@yahoo.com

William Sheehan

william.Sheehan@childrens.harvard.edu



Children's Hospital Boston

The Hospital for Children

Division of Immunology
1 Blackfan Circle
Boston, MA 02115
(617) 919-2484

Project Inventory

Title: Skin Testing with Water Buffalo Milk in Patients Allergic to Cow Milk

Principal Investigator: Wanda Phipatanakul, MD, MS

Researchers Involved: William Sheehan, MD - Andrea Gardynski, MD - Pitud Rangsithienchai, MD

Abstract: Food allergy is one of the most common medical conditions in pediatrics, estimated to occur in approximately 8% of children. Specifically, the prevalence of food allergy to cow milk is estimated to be 2-3% of children in the first 2 years of life. Alternatives to drinking cow's milk include soy milk or rice milk. Additionally, other mammalian sources of milk have been tried in children with allergy to cow milk, such as goat milk and sheep milk. A number of studies have shown that goat milk and sheep milk are not a tolerated substitute in the majority of patients allergic to cow milk.

In this study, we will begin to test water buffalo milk as a milk substitute for patients who are allergic to cow milk. For this trial, we will only perform skin testing as a preliminary test to evaluate the possibility of allergy to water buffalo milk. We will be choosing patients (ages 6 months to 8 years) who are known to be allergic to cow milk.

The primary goal of this study is to evaluate the safety of skin testing with water buffalo milk. The secondary goal of this study is to determine percentage (prevalence) of cow milk allergic patients who have negative skin tests to water buffalo milk. This is a pilot study that will give us preliminary data on the clinical cross-reactivity between cow milk and water buffalo milk.

Funding Sources:

Phipatanakul: NIH

Sheehan: NIH NRSA

Contact Information:

Wanda Phipatanakul

wanda.phipatanakul@childrens.harvard.edu