PEDIATRIC INSIGNTS WINTER 2022 • An Update From the Division of Pediatric Pulmonary Medicine



New Specialty Multidisciplinary Clinics in the Division of Pediatric Pulmonary Medicine

The Division of Pediatric Pulmonary Medicine at UPMC Children's Hospital of Pittsburgh has recently expanded its specialty clinic presence for patients with sickle cell disease (SCD), complex airway disorders, and patients with neuromuscular conditions.

These patient-centered, multidisciplinary clinics bring to bear the combined expertise of multiple Divisions and clinicians with clinical and research emphasis in these complex and challenging conditions.

The integrated, multidisciplinary approach to these clinics affords patients and families with cohesive and comprehensive follow-up care across their spectrum of needs.

Sickle Cell Disease Clinic

Lung or pulmonary complications from sickle cell disease are common and contribute significantly to much of the morbidity and even mortalities associated with the disease. Often these complications begin in childhood, making screening and interventions for pulmonary complications and identifying risk factors in SCD patients critical to long-term health and disease management. Complications such as acute chest syndrome are common. Sickle cell

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disease patients are more prone to obstructive sleep apnea, which can trigger a sickle cell crisis due to reduced oxygen levels. These patients also are more prone to recurrent wheezing than healthy children. All of these complications can devolve into a repetitive cycle that leads to poor outcomes if not well-managed. In adult sickle cell disease patients, pulmonary hypertension is a significant morbidity, and the processes for this manifestation later in life likely have their origins during childhood. Early interventions and optimal disease management may forestall or lessen the manifestation or future impacts of pulmonary hypertension as patients age.



Leading clinical pulmonary medicine efforts in the new multidisciplinary sickle cell disease clinic is Division clinical director **Mark Dovey, MD**. Dr. Dovey is joined by a pulmonary medicine nurse practitioner, John Broyles, and

a respiratory therapist who assists with lung function testing and educational efforts. Dr. Dovey modeled this program on a similar clinic at St. Christopher's Hospital for Children in Philadelphia, where he practiced before joining UPMC Children's.

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New Study Links Violence-Related Stress and Decreased Lung Function and Quality of Life in Children With Asthma

A new study¹ led by UPMC Children's Hospital of Pittsburgh Division of Pediatric Pulmonary Medicine researchers has uncovered an association between chronic stress as a result of witnessing or experiencing violence and decreased lung function and lower quality of life in children with asthma.



Division fellow **Kristina Gaietto**, **MD**, (left) and Division faculty, **Yueh-Ying Han**, **PhD**, (center) were the lead authors of the study. Division chief **Juan C. Celedón**, **MD**, **DrPH**, **ATSF**, (right) was the senior author of the investigation.

The study was published in September in the *European Respiratory Journal* and represents the first prospective investigation to assess lung function in children with asthma in the setting of violence-related stress. The study is also the first prospective research to analyze low-dose corticosteroid treatment data related to lung function and the experience of violence-induced stress.

Research Highlights and Clinical Implications

The first part of the examination was a secondary analysis of data from the Vitamin D Kids Asthma Study (VDKA) randomized trial.² In brief, the participants in the VDKA all

had mild persistent asthma and represented a racially and ethnically diverse U.S. cohort. Results from this secondary analysis were then replicated in the "Prospective Study of Puerto Rican Youth and Asthma Study" (PROPRA), which followed a cohort of 232 children with and without asthma who reside in Puerto Rico.

Measures of violence-related stress were captured and scored using the Checklist of Children's Distress Symptoms.

Not only did violence-related stress lead to decreases in lung function and quality of life in the participants, but those individuals being treated for asthma with low-dose corticosteroid therapy also experienced decreases in lung function and quality of life of a similar nature.

Data from the prospective study in Puerto Ricans corroborated the findings of the secondary analysis of the VDKA data in that for every 1 point increase in the CCDS score, participants were found to have an associated 3.27% decrease in forced expiratory volume1 (FEV1) and a 2.65% decrease in forced vital capacity.

The analysis also found that even individuals being treated with a low-dose corticosteroid for their asthma experienced decreased lung function and lower quality of life related to violence-associated stress. The mechanisms for this reduced sensitivity to corticosteroids could be a result of

Erick Forno, MD, MPH, Receives Gale and Ira Drukier Prize in Children's Health Research Award

Erick Forno, MD, MPH, ATSF, Associate Professor in the Division of Pediatric Pulmonary Medicine and Director of the Pediatric Asthma Center at UPMC Children's Hospital of Pittsburgh, was awarded the 2021 Gale and Ira Drukier Prize in Children's Health Research.



Awarded by Weill Cornell Medicine, the Drukier Prize honors an early-career pediatrician whose research has made important contributions toward improving the health of children and adolescents. Dr. Forno was recognized for research

innovations in the discovery of genomic and epigenomic markers linked to childhood asthma, and the identification of a mismatch between lung volume and airway size in children with asthma and obesity. Both discoveries have strong potential to lead to new asthma treatment approaches and diagnostic tests for children.

"I'm very thankful and humbled to receive this prestigious award," says Dr. Forno. "It is an important recognition of the work we do, and the great mentorship and support I have received. It also honors the contributions of all of the patients and families that agreed to participate in this research so that we can hopefully one day improve the lives of other children affected by asthma and other respiratory diseases. I would like to thank the Drukier family and Institute, as well as **Dr. Juan C. Celedón** and **Dr. Terry Dermody** for their support."

"Dr. Forno is an outstanding physician-scientist whose work has substantially improved our understanding of pediatric asthma. He is richly deserving of the Drukier Prize, and a true asset to our Division and our Department," says Dr. Celedón.

More About Dr. Forno

Erick Forno, MD, MPH, ATSF, is an associate professor of pediatrics in the Division of Pediatric Pulmonary Medicine and the newly appointed director of the Pediatric Asthma Center. After obtaining his medical degree from Cayetano Heredia University in Lima, Perú, he completed his residency in pediatrics at Children's Hospital Colorado, followed by a fellowship in pulmonary medicine at Boston Children's Hospital. During his time in Boston, he also earned a Master's of Public Health degree from the Harvard School of Public Health while simultaneously completing a research fellowship at the Channing Laboratory at Brigham and Women's Hospital. Dr. Forno joined UPMC Children's Hospital and the Department of Pediatrics at the University of Pittsburgh School of Medicine in 2012.

Dr. Forno's main research interests are the epidemiology and genomics of childhood asthma, and the effects of obesity on asthma severity. His work has been supported by a departmental K12 grant, a K08 award from the National Institutes of Health National Heart, Lung, and Blood Institute (NHLBI), and an R01 grant from the NHLBI to study the role of adipose tissue in obesity-related asthma. Dr. Forno has authored or co-authored more than 150 publications. In recognition of his work, he has previously received the Robert Mellins Outstanding Achievement Award from the Pediatrics Assembly of the American Thoracic Society (ATS) and the international Klosterfrau Award for his research in asthma.

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Dr. Dovey's team joins the hematology team, which runs the Comprehensive Pediatric Sickle Cell Program in the Division of Pediatric

Hematology/Oncology, led by **Cheryl A. Hillery, MD**, and **Ramasubramanian Kalpatthi, MD**.

"The average life span for sickle cell patients is significantly less than the general population, and direct lung complications or associated morbidities account for many of these mortalities. By integrating focused pulmonary care into the sickle cell clinic, we can capture more of these patients earlier in the disease process and work to optimize their lung function and long-term health as best as possible," says Dr. Dovey.

The clinic operates two days each month, and the pulmonary team component officially launched earlier in 2021.

Multidisciplinary Care for Neuromuscular Patients



Jane B. Taylor, MD, MsCR, FAAP, is the pulmonary medicine liaison for the UPMC Children's multidisciplinary pediatric Muscular Dystrophy Association clinic (MDA Clinic). Dr. Taylor joined the Division in late-2019 and subsequently launched

the pulmonary component of the MDA clinic in 2020. Dr. Taylor has a passion for pulmonary management in children with neuromuscular disorders and participated as the pulmonary medical director in the multidisciplinary muscular dystrophy clinic in Kansas City prior to her joining UPMC Children's. Dr. Taylor currently sits on the medical advisory council for CureSMA and is an active participant with the Parent Project Muscular Dystrophy (PPMD).

Airway Disorders Clinic



The updated Airway Disorders Clinic combines specialists from otolaryngology, speech-language pathology, and pulmonary medicine to care for patients with complex congenital anomalies or diseases of the airway. These patients

often exhibit problems with feeding and swallowing issues, and at times issues with speech, in addition to their surgical and pulmonary medicine needs.

Pediatric pulmonary medicine specialist **Geoffrey Kurland, MD**, leads the pulmonary medicine efforts in the Airway Disorders Clinic. In addition to general pulmonary medicine consultation work, Dr. Kurland performs flexible bronchoscopy procedures as part of the multidisciplinary care approach.

For children born with complex congenital airway anomalies, this combined approach to follow-up care is the most efficient and effective form of care, as is the case for patients who manifest and must overcome feeding struggles as a consequence of their pulmonary or breathing comorbidities. The clinic currently operates twice per month to provide comprehensive patient care for a diverse group of patients.

Learn more about the UPMC Children's pediatric pulmonary medicine specialty clinics and attending faculty by visiting **CHP.edu**.

About The Division of Pediatric Pulmonary Medicine

The Division of Pediatric Pulmonary Medicine provides consultative services for the diagnosis, evaluation and management of diseases of the respiratory tract and sleep disorders. A multidisciplinary team of physicians, certified registered nurse practitioners, registered nurses, registered respiratory therapists, registered dieticians, and social workers offers patient management, patient/ family education, and support services.

Comprehensive programs are provided for patients with:

- Asthma
- Bronchopulmonary dysplasia
- Complex airway disorders
- Cystic fibrosis

- Home mechanical ventilation
- Interstitial lung disease
- Lung transplantation
- Neuromuscular diseases with respiratory complications
- Sickle cell disease
- Sleep disorders (sleep apnea, narcolepsy, behavioral sleep problems)

Study Examines Childhood Asthma in Hispanics Using Multi-omics Approach



UPMC Children's Hospital of Pittsburgh Division of Pediatric Pulmonary Medicine researchers **Wei Chen, PhD**, and Division Chief **Juan C.**

Celedón, MD, DrPH, ATSF, are conducting a study using a multi-omics analysis to identify genetic markers and epigenetic variants that may influence pulmonary function and asthma in the high-risk population of Puerto Rican children and adolescents.

The study is an R21 investigation funded by the National Institutes of Health National Heart, Lung, and Blood Institute. It builds upon data from numerous studies conducted by the research team during the past 15 years that have collected population level and genome-wide genotypic data from Puerto Rican children and adolescents who participated in the Epigenetic Variation and Childhood Asthma in Puerto Ricans study, among other investigations.

Preliminary studies led by Drs. Chen and Celedón have led them to hypothesize that an understanding of the complex relationships among multi-omics data in the nasal epithelium will further reveal epigenomic and transcriptomic profiles associated with asthma and lung function in Puerto Rican children and in other ethnic groups.

The aims of the current study are twofold. First, the team will perform admixture mapping and integrate association signals for asthma and lung function measures with analyses of GW genotypic data, and GW DNA methylation and GW gene expression data from the nasal epithelium. Next, the study will examine the interplay among multiomics data and quantify their relative contributions to asthma and lung function measures.

The outcomes from the investigation should provide additional clarity around the genetic, epigenetic variations, and transcriptomic markers which may influence asthma and lung function in the study cohort. This data will be beneficial in more clearly understanding the pathogenesis of asthma and potential targets for treatment or preventive measures.

Reference

Multi-omics Analysis of Childhood Asthma in Hispanics. 1R21HL150431. Principal Investigators: Wei Chen, PhD, and Juan C. Celedón, MD, DrPh, ATSF.

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"dysregulation of the HPA and sympathetic-adrenalmedullary (SAM) system," and that other factors, such as epigenetic changes, may also contribute to the reduced sensitivity, but the exact nature of this interplay is unknown and yet to be studied.

"Violence-related stress can negatively affect lung function and quality of life for individuals with asthma. It can do so over time, and our findings suggest that this stress may reduce an individual's sensitivity to low-dose corticosteroid therapy, making it less effective for treating and managing asthma," says Dr. Gaietto. "As we study a range of social determinants of health, stress, and other outside influences on the health and quality of life of individuals with asthma, it is becoming increasingly clear just how important these factors are to the physical well-being and disease state of the individual." As the research team concludes, reducing the experience of violence and its accompanying stress, apart from its broader sociologic implications and effects on the individual, may present a modifiable factor in improving lung function and maintaining the efficacy of steroid therapy in children with asthma.

References

- ¹ Gaietto K, Han Y-Y, Forno E, et al. Violence-related Distress and Lung Function in Two Longitudinal Studies of Youth. *Eur Respir J.* 2021 Sep 29: 2102329. Online ahead of print.
- ² Forno E, Bacharier LB, Phipatanakul W, Guilbert TW, Cabana MD, Ross K, Covar R, Gern JE, Rosser FJ, Blatter J, Durrani S, Han YY, Wisniewski SR, Celedón JC. Effect of Vitamin D3 Supplementation on Severe Asthma Exacerbations in Children With Asthma and Low Vitamin D Levels: The VDKA Randomized Clinical Trial. *JAMA*. 2020 Aug 25; 324(8): 752-760.

DIVISION NEWS AND NOTES

Pediatric Pulmonary Medicine Clinical Director Receives Patient Experience Award

Mark E. Dovey, MD, was honored with a 2020 Excellence in Patient Experience Award. Dr. Dovey was only one of 48 recipients of the award out of 7,600 physicians and advanced practice providers across all specialties at UPMC.

Dr. Dovey's award was presented at the 2021 Dr. Loren Roth Quality and Patient Safety Awards Celebration held virtually on September 29, 2021.

More About Dr. Dovey



Dr. Dovey is an associate professor of pediatrics in the Division of Pediatric Pulmonary Medicine at the University of Pittsburgh School of Medicine. Dr. Dovey is the clinical director of the Division. He also serves as associate director of the

Antonio J. and Janet Palumbo Cystic Fibrosis Center at UPMC Children's Hospital of Pittsburgh, and is co-director of the Pulmonary Advanced Practice Provider Fellowship.

Throughout his career, Dr. Dovey has demonstrated excellence in clinical care and leadership at nationally distinguished tertiary medical centers. At each of these institutions, his skill at designing and leading multidisciplinary programs has transformed the care of children with complex conditions and grown the capacity of the institution to care for patients with compassion and efficiency.

More recently, in 2021 at UPMC Children's, Dr. Dovey led the creation of a multidisciplinary clinic for pediatric patients with sickle cell disease (SSD). The new clinic works to address the complex and challenging needs of the SSD patient population with special emphasis on the pulmonary and lung health of these young patients.

In addition to his leadership roles at UPMC Children's, Dr. Dovey has continued his involvement in clinical research as site investigator on multicenter clinical trials for novel cystic fibrosis therapeutic agents for the Cystic Fibrosis Foundation Therapeutic Development Network.

UPMC Children's Pulmonary Medicine Division Receives Cystic Fibrosis Foundation Outstanding Care Center Partnership Award



In October 2021, the Antonio J. and Janet Palumbo Cystic Fibrosis Center (CF Center) in the Division of Pediatric Pulmonary Medicine at UPMC Children's Hospital of Pittsburgh was recognized by the Cystic Fibrosis Foundation with

a 2021 Outstanding Care Center Partnership Award. The CF Center at UPMC Children's is led by director **Daniel J. Weiner, MD, FAAP, FCCP, ATSF**.

The award from the Cystic Fibrosis Foundation recognizes care centers and teams that have collaborated with their local Cystic Fibrosis Foundation chapters to serve the needs of the greater cystic fibrosis community of patients, families, and communities. Recipients of the award are selected based on various criteria, including local collaboration efforts, engagement with local chapter programs and events, involvement of chapter staff in center-directed initiatives, and others.

"The CF Center care team at UPMC is so fortunate to have engaged partners at the Western PA Chapter of the Cystic Fibrosis Foundation. They have worked hand-in-hand with us over the years as we work together towards a cure for Cystic Fibrosis — as we say, "Until It Is Done," says Dr. Weiner.

The award will be presented during the 2021 North American Cystic Fibrosis Conference in November.

"I extend my congratulations and that of our Division and Hospital to our CF Center director Daniel Weiner, MD, and all of the dedicated team members for their ongoing exemplary care and devotion to our patients living and thriving with CF, and to their continuing collaboration with the local chapter and national Cystic Fibrosis Foundation," says **Juan C. Celedón, MD, DrPH, ATSF**, division chief of Pediatric Pulmonary Medicine at UPMC Children's.

New Director Appointed to Lead Pediatric Asthma Center



UPMC Children's Hospital of Pittsburgh Division of Pediatric Pulmonary Medicine is pleased to announce that faculty member **Erick Forno, MD, MPH, ATSF**, has been appointed as the new director of the Pediatric Asthma Center.

The Pediatric Asthma Center at UPMC Children's aims to improve the lives of children with asthma in western Pennsylvania and beyond through cutting-edge research, state-of-the-art clinical care, excellence in education and training, and active community involvement. In his new role as center director, Dr. Forno will collaborate closely with leadership at the Department of Pediatrics and UPMC to coordinate, oversee, and strengthen asthma research and clinical care at UPMC Children's.

Together with Allyson Larkin, MD, from the Division of Pediatric of Allergy and Immunology, Dr. Forno co-directs the Severe Asthma Program at UPMC Children's. He also leads the UPMC Children's Asthma Registry and has been instrumental in leading the Data Committee for the hospital-wide pediatric asthma stakeholder group.

Dr. Forno has mentored or co-mentored fellows, residents, and trainees interested in clinical research and qualityimprovement projects related to asthma. At a national level, he is working to establish the Severe Pediatric Asthma Consortium, which includes multidisciplinary severe asthma programs from top pediatric academic centers in the United States.

Pediatric Pulmonary Medicine Clinician Receives ATS Award



UPMC Children's Hospital of Pittsburgh Division of Pediatric Pulmonary Medicine congratulates **Jane B. Taylor, MD, MsCR, FAAP**, for receiving the 2021 Clinician Educator Award from the American Thoracic Society (ATS) Pediatrics Assembly.

Dr. Taylor joined the UPMC Children's Division of Pediatric Pulmonary Medicine in 2019. She has made a substantial impact on various clinical and educational activities, including the care of children with neuromuscular disorders and teaching and mentoring students, residents, and fellows. In 2020, Dr. Taylor was honored with the Teacher of the Year Award from the Department of Pediatrics at the University of Pittsburgh School of Medicine.

Additionally, Dr. Taylor serves as the web director for the ATS Pediatrics Assembly and has coordinated numerous educational activities such as webinars, journal club meetings, and online conferences for the organization during the COVID-19 pandemic.

Dr. Taylor earned her medical degree from the University of North Carolina School of Medicine, followed by a pediatrics residency at Vanderbilt University, and a pediatric pulmonary fellowship at the Washington University School of Medicine and St. Louis Children's Hospital. Prior to joining UPMC Children's, Dr. Taylor was a physician at Children's Mercy Kansas City where she served as the Pulmonary Medical Director of the Multidisciplinary Muscular Dystrophy Clinic.

Pediatric Pulmonary Medicine Researcher to Lead NIH Study Section



UPMC Children's Hospital of Pittsburgh Division of Pediatric Pulmonary Medicine researcher **John F. Alcorn, PhD**, has been selected to serve as the chair of the National Institutes of Health (NIH) Immunity and Host Defense Study Section.

Dr. Alcorn's two-year term as chair began on July 1, 2021.

In his role as the NIH Immunity and Host Defense Study Section chair, Dr. Alcorn will lead reviews of grant applications pertaining to innate and adaptive immune responses to many pathogens, viruses, bacteria, fungi, and parasites. In addition to his appointment as professor in the Department of Pediatrics at the University of Pittsburgh School of Medicine, Dr. Alcorn holds a secondary faculty appointment in the Department of Immunology, and he also serves as an associate director of the Richard King Mellon Foundation Institute for Pediatric Research at UPMC Children's.

Dr. Alcorn's research laboratory is focused on pulmonary immunity, host defense, epithelial cell biology, and lung physiology as it relates to pediatric disease. A primary laboratory focus is on influenza infection and host defense mechanisms in the lung.



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About UPMC Children's Hospital of Pittsburgh

Regionally, nationally, and globally, UPMC Children's Hospital of Pittsburgh is a leader in the treatment of childhood conditions and diseases, a pioneer in the development of new and improved therapies, and a top educator of the next generation of pediatricians and pediatric subspecialists. With generous community support, UPMC Children's Hospital has fulfilled this mission since its founding in 1890. UPMC Children's Hospital has fulfilled this mission since its clinical, research, educational, and advocacy-related accomplishments, including ranking 15th among children's hospitals and schools of medicine in funding for pediatric research provided by the National Institutes of Health (FY2019) and ranking on *U.S. News & World Report's* Honor Roll of Best Children's Hospitals (2021–22).