Multidisciplinary teams unite and form new collaborations to address SARS-CoV-2

By Claudia R. Morris MD, FAAP and Miriam Vos MD, MSPH, for the Longitudinal Pediatric Healthcare Workers SARS-CoV-2 Antibody Surveillance team

In March 2020, a mysterious new coronavirus spread across the world, prompting a historical shutdown of life as we knew it. In their role as Co-Directors of the Emory-Children’s Center for Clinical and Translational Research (CCTR), Drs. Miriam Vos MD and Claudia Morris MD worked diligently with Department of Pediatrics leadership to safely ramp down research efforts in order to protect the health of patients and faculty alike.

With limited Personal Protection Equipment (PPE) early in the pandemic, limited access to testing and early rumors across the nation that children don’t get sick with COVID-19, frontline workers wondered what risks they may be bringing home to their families. Since the prevalence and incidence of COVID-19 infection among pediatric Healthcare Workers was unknown, Drs. Morris and Vos responded to this gap in knowledge by initiating the Longitudinal Pediatric Healthcare Workers SARS-CoV-2 Antibody Surveillance project to determine the prevalence and incidence of SARS-CoV-2 antibody seropositivity in pediatric healthcare workers together with potential associated risks for infection, comparing frontline workers in the emergency department (ED) to those working outside the ED. This was a time-sensitive initiative requiring immediate attention to collect seropositivity data early on in the pandemic, however the typical path to funding can often take 12-18 months or longer. The situation called for a creative approach that brought together a unique and innovative team of new collaborators from emergency medicine, CCTR, Epidemiology, Infectious Disease, Vaccine Development, Pediatric Operations, research volunteers and the Children’s Clinical and Translational Discovery Core. New friendships and fast partnerships rapidly formed to rise to this occasion.

The cost of initiating a new longitudinal cohort is high; to do so without guaranteed funding seemed impractical if not crazy. Yet waiting for funding to be awarded would result in a missed opportunity to collect time-sensitive data on important research questions early in the pandemic. In response, this new band of collaborators made a commitment to immediately address the work at hand, and worry about the finances later. Despite the financial risks of such an undertaking, Jens Wrammert PhD and Mehul Suthar PhD (Division of Infectious Disease and Emory Vaccine Center) educated Drs. Morris and Vos on novel serology methods to accurately detect SARS-CoV-2 spike protein antibodies and committed to running samples, while Patrick Sullivan DVM, PhD and Travis Sanchez DVM, MPH (Epidemiology) assisted with protocol methods design. Drs. Andres Camacho-Gonzalez MD, Andi Shane MD, Kristy Rostad MD and Evan Anderson MD provided expert infectious disease guidance and pediatric COVID-19 samples when needed. Essential to this new operation, the Children’s Clinical and Translational Discovery Core (Brad Hanberry PhD, Mimi Le PhD, and Jianing Li PhD) worked diligently to receive and process the influx of
a large number of biological samples in a short period of time. The Institutional Review Boards of Emory and Children’s accelerated their review processes for COVID-19 related projects.

With clinical trials temporarily halted, the Vos/Morris research team pivoted their efforts to the healthcare worker study which translated to enrollment of the first participant in early April 2020, and over 640 participants within a 4-month period. Stacy Heilman PhD (Associate Vice Chair for Research), Wendy Little MD, and Srikanth Iyer (Pediatric Emergency Medicine) provided critical guidance to project development. Pediatric residents Christie Chen MD and Rachel Krieger MD joined the team as part of the Pediatric Residency Investigative Scholars at Emory program to get a hands-on research experience enrolling patients and performing phlebotomy.

It was an amazing feat of teamwork that makes one proud to be a member of Pediatric Institute. In addition to answering important questions related to the pandemic for healthcare workers, this cohort also provided samples to Rapid Acceleration of Diagnostics (RADx), helped validate use of dried blood spot card self-collected specimens led by Drs. Sullivan and Sanchez, and help support Biomedical Advanced Research and Development Authority (BARDA) grant applications by faculty at Emory and Georgia Tech.

In the sense of “if you build it, they will come”…funding to initiate the study was provided in part through the Wilbur Fisk Glenn Jr. Distinguished Faculty Chair for Clinical & Translational Research. This was followed by a successful Synergy award from Emory University’s Woodruff Health Sciences Center to Dr. Vos and the team, and shared support from an Emory COVID-19 CURE award made possible by philanthropic support from the O. Wayne Rollins Foundation and the William Randolph Hearst Foundation, and ultimately through generous donations by Michael and Natalia Beinenson and the Scott Hudgens Family Foundation.

To date, multiple publications and presentations have resulted from this work that came to life only 16 months ago: the original hypothesis related to exposure risk of frontline workers in the ED was confirmed and recently published (Morris et al 2021, Int J Infect Dis), supporting the need for ongoing universal PPE use. Investigators from NIH/NCI have reached out to include the data in an important national COVID-19 surveillance project (SeroHub--https://covid19serohub.nih.gov/). Additional high impact papers have published utilizing the cohort describing novel mechanisms of disease related to secretory phospholipase A2 (Kuypers et al 2021, Exp Biol Med), and arginine dysregulation (Rees et al 2021, PNAS). Several additional manuscripts are under review or in development. These publications were made possible in part as a result of the Children’s Clinical and Translational Discovery Core for maintaining a valuable biorepository resource that promises to test additional COVID-19 related hypotheses and lead to future grant submissions over the next year(s). This project is a perfect example of how successful research takes a village. It is also an ideal representation of the resilience of our research faculty to find opportunity among adversity as we all learn to live with this new pandemic-reality.