The roles of a pediatric pulmonologist during the COVID-19 pandemic

Mikhail Kazachkov MD,1 ❑ Prof. | Terry L. Noah MD,2 ❑ Prof. | Thomas M. Murphy,3,4,5 ❑ Prof.

1Division of Pulmonology, Department of Pediatrics, NYU Grossman School of Medicine, NYU Langone Health, New York, New York
2Division of Pulmonology, Department of Pediatrics, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina
3Department of Pediatrics, Mass General Hospital for Children, Boston, Massachusetts
4Department of Pediatrics, Harvard Medical School, Boston, Massachusetts
5Department of Pediatrics, Duke University, Durham, North Carolina

Correspondence
Mikhail Kazachkov, MD, NYU Langone Health, Pediatric Ambulatory Fink Center, NYU Grossman School of Medicine, 160 E 32nd Street, New York, NY 10016.
Email: Mikhail.Kazachkov@nyulangone.org

INTRODUCTION

The COVID-19 pandemic has resulted in high morbidity and mortality among older adults, particularly those with underlying medical conditions including hypertension, diabetes, obesity, and COPD.1,2 Data relevant to optimizing or improving care for these patients have emerged rapidly, and the shared anecdotal experience of care teams in high-prevalence areas has been extremely helpful for other centers preparing for possible surges in cases. Fortunately, to date, the incidence of severe COVID-19 disease among children has remained relatively low.

While the brunt of caring for patients infected with COVID-19 has clearly been shouldered by physicians, nurses, and respiratory therapists in emergency medicine, internal medicine, adult critical care, and adult pulmonology services, in some locations the scale of the problem has required the direct involvement of other specialists, including pediatric pulmonologists. Dr Mikhail Kazachkov, Division Chief of Pediatric Pulmonology Division at New York University’s Langone Medical Center, is one such physician. We posed a series of questions to Dr Kazachkov about his experiences to date and his thoughts about how other pediatric pulmonologists facing this situation can best support their colleagues.

1 | DESCRIBE THE ROLES YOU HAVE HAD IN YOUR CENTER’S RESPONSE TO COVID-19

When NYU was hit with COVID pandemics, it became clear that with the increasing volume of admissions, rapid increase in number of intensive care unit (ICU) patients, and the need for multiple hospitals to expand staffing, our adult pulmonary physicians would be spread thin very quickly. I offered to help and was assigned to Langone Orthopedic Hospital (LOH) in March of 2020. By that time, all elective orthopedic surgeries had been canceled and the decision was made to open this hospital to COVID-19 patients. Most of the admitted patients were transferred from other NYU Hospital sites and had moderate disease; many of them had significant comorbidities and often required extensive rehabilitation services which were in
place at this orthopedic hospital. There was only one adult pulmo-
nology/ICU physician left on staff at LOH because everybody else
was deployed to ICUs on main campus.

I joined a pulmonary consultation and ICU service. My main role
was to round with medical teams to identify sicker patients who
could require ICU care due to rapid disease progression, and provide
pulmonary consultation to them. If an ICU transfer was deemed
necessary, I, together with my pulmonary/ICU team, would assume
their intensive care. Simultaneously, I was a member of a rapid re-
sponse team and therefore had to be readily available during codes
and emergencies.

2 | WHAT HAVE BEEN THE MOST
IMPORTANT ASPECTS OF TEAMWORK,
AND WHAT WOULD YOU SAY HAS BEEN
THE MOST VALUABLE SKILL YOU BRING,
AS A PEDIATRIC PULMONOLOGIST
FUNCTIONING AS PART OF A TEAM
PROVIDING ADULT COVID-19 CARE?

First of all, I would like to say that it was very challenging experience for
me. I have been a pediatric pulmonologist for many years and have a
decent amount of experience as a PICU physician. However, my
expertise in adult medicine was limited before this assignment. Luckily,
I had great mentors there; Dr Ezra Dweck, Director of Pulmonary and
Critical Care at LOH, and his team quickly adopted me as their "junior
" team member, and provided valuable education and supervision.

The team, like everyone else around the world, was challenged
by previously unknown issues and humbled by the magnitude of
COVID-related medical problems. At the same time, we were
learning the proper interpretation of clinical signs and laboratory
tests as well as setting the principles of respiratory management
together. Several patients on our service had certain comorbidities
which were in my expertise spectrum: there were adult patients with
tracheostomies and restrictive lung disease related to neurological
disorders and chest deformities. These conditions were very familiar
to me and other pediatric pulmonologists involved in the manage-
ment of children with respiratory manifestations of neurological
diseases, so I was glad that my experience was able to help the team
provide proper care for these patients.

3 | HAVE YOU CONTINUED TO CARE
FOR CHILDREN WITH RESPIRATORY
DISORDERS AS WELL? HAS IT BEEN
IMPORTANT TO STRICTLY
COMPARTMENTALIZE YOUR ACTIVITIES
FOR INFECTION CONTROL PURPOSES?

Our Division of Pediatric Pulmonology at NYU continued to provide
care to our patients. Similar to many other pediatric pulmonary divisions
in the countries affected by COVID-19 pandemics, we adapted
telemedicine, temporarily suspended pulmonary function testing, and
clinical research studies. However, we continued with a full spectrum of
emergency services including outpatient assessments in our clinic and
inpatient service. I continued to function in the capacity of Division
Chief and also provided consultation and emergency bronchoscopy
service at our Hassenfeld Childrens' Hospital. Of course, most of the
pediatric wards were turned into adult COVID-19 units; however, we
kept several pediatric and PICU beds open. We admitted several pe-
diatric patients with severe COVID-related lower airway disease. All of
them had significant comorbidities and preexisting conditions. Similarly
to our colleagues at other COVID-19 "hot spots" we were very pleased
to find out that the majority of our patients with chronic pulmonary
diseases did very well. Many of them had a mild or moderate course,
which we were able to handle on an outpatient basis. Several of our
chronic patients with cystic fibrosis and severe restrictive lung disease
had to be admitted due to exacerbations of their pulmonary diseases
unrelated to COVID-19, and were kept in a "non-COVID" pediatric unit
completely separated from the rest of the hospital. At the end of the
pandemic outbreak, we started to see patients with multisystem in-
flammatory syndrome in children but only two of them required pul-
monary consultations and care. My adult and pediatric patients were
situated in separate hospital buildings. I used different sets of scrubs
between wards, and of course, never shared my personal protective
equipment (PPE) between pediatric and adult patients. In addition, to
improve infectious control, all hospital employees underwent manda-
tory COVID-19 PCR testing, and antibody testing. We did our best to
separate COVID Team members from the personnel working at "non-
COVID" units of the hospital, but it proved to be a very difficult thing to
do because more and more medical personnel were called to join the
"COVID Army." At the peak of the pandemic crisis, many of us worked
on the COVID-19 wards but continued taking care of children in our
direct pediatric subspecialty practices.

4 | WHAT ARE THE MOST IMPORTANT
WAYS A HEALTH CARE CENTER OR
SYSTEM CAN SUPPORT A PEDIATRIC
PULMONOLOGIST WHO IS ASKED TO
BE PART OF THE COVID-19 CARE TEAM?

When the pandemic started, many nonpulmonary physicians joined
the "COVID Army."

We were all required to go through an orientation process where
we were instructed on the logistics and organization of COVID care at
NYU (which with time became very well structured). All personnel were
divided into highly specialized teams, some of them quite unique and
devised specifically for COVID. Some examples of those teams were:

a. Medicine and ICU teams, which worked in MICU and COVID
step-down wards. They consisted of one to two senior (pulmo-
ary/ICU) and two to three junior physicians. The latter were
comprised of various specialists including orthopedic surgeons,
cardiologists, pediatricians, and many others.
b. Bronchoscopy teams which consisted mostly of thoracic surgeons. Their role was to provide emergency bronchoscopy service to prevent “loss” of endotracheal tubes due to plugging and to help with management of atelectasis related to formation of large mucus plugs.

c. Tracheostomy teams consisting mostly of interventional pulmonologists and ear, nose and throat surgeons. They performed percutaneous and standard tracheostomies on patients who required long term ventilation.

d. Rapid response teams formed from anesthesiologists. These teams responded to codes, intubated patients, and inserted central lines.

e. ECMO teams which brought together ECMO attendings and cardiothoracic surgeons. At certain time points, we had more than 20 ECMO patients at NYU’s main campus.

f. Communication teams composed mostly of medical students. Although they were not allowed to directly care for patients, they provided vital communication to family members.

It is very important to mention that each team also employed nurses, nurse practitioners, physician assistants, respiratory therapists, medical assistants, and many other supporting staff, which were absolutely instrumental in keeping the teams functioning. I personally would like to acknowledge the outstanding role of our pediatric, medical, and surgical residents and fellows, who functioned in various capacities on all teams and became major contributors to the process.

After the teams were established, all non-ICU physicians received a full day of training in a simulation lab. It was rather intense and included hands-on training in resuscitation and management of common acute conditions with special attention to acute respiratory distress syndrome. Our main training experience, however, started in the wards and ICUs where we began our practical learning of COVID-19.

At this stage, the situation has evolved quite a bit. Our medical community has been studying COVID-19 practically and academically for several months now, and has accumulated a vast amount of data which is summarized in guidelines, pathways, and algorithms. I think that every health care system has the responsibility to prepare appropriate educational materials and pathways, which can be used in case we have to deal with COVID-19 surges again. It seems logical to imagine that our leading medical organizations and societies would contribute to their development.

5 | FROM YOUR PERSPECTIVE, WHAT ARE THE MOST IMPORTANT THINGS CHILDREN’S HOSPITALS OR RESPIRATORY PROGRAMS SHOULD DO TO BE READY FOR WAVES OF COVID-19 OR OTHER FUTURE EPIDEMICS OF THIS TYPE?

I think many of us have considered the potential situation where the pediatric pulmonology community is faced with a new respiratory illness comparable with COVID-19 in its infectiousness and severity. I certainly hope that it never happens; however, history just taught us a severe lesson, and we, therefore, cannot deny the possibility of such an occurrence. There are several important factors, which in my opinion would define our readiness:

a. Ability to expand ICU and step-down beds. Here at NYU, we were able to increase our adult ICU bed capacity by 800% within the first 2 weeks of the pandemic-related admission surge. I think this ability was critical to our success in dealing with the gigantic wave of sick patients in an efficient and organized way.

b. Setting up a process for the rapid formation of specialized teams would define a hospital’s ability to be clinically efficient in fighting a new pandemic.

c. Thorough understanding of the epidemiology of the virus, as well as availability of clear guidelines on usage of PPE and negative pressure rooms, would be critical in preventing spread of infection to patients and personnel.

d. Availability of human resources. The NYU experience shows that respiratory therapists and nurses were in the highest of demand. Hospitals should have in place a recruitment plan which would allow for rapid expansion of medical staff.

Equally important, we all have to be mentally and emotionally ready to stay calm and be able to work efficiently under the tremendous stress of a pandemic. I witnessed my colleagues coming to work every day with an optimistic attitude and an enormous desire to win this fight. This was the most important factor of them all.

6 | WHAT EMOTIONAL IMPACT DID IT HAVE ON YOU?

It was a very trying time. The magnitude of pandemic, amount of disease, and death around resulted in recalibration of the scale of values for many of us. I think that fundamental values, such as faith, hope, and love were cherished, and certain “material” things seemed to become bleaker. The COVID-19 pandemic has left us with scars in our souls, but also, in a way, made us better physicians and better human beings, I hope.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.
2. Lighter J, Phillips M, Hochman S, et al. Obesity in patients younger than 60 years is a risk factor for Covid-19 hospital admission. Clin Infect Dis. 2020;71:896-897.

3. Griffin KM, Karas MG, Ivascu NS, Lief L. Hospital preparedness for COVID-19: a practical guide from a critical care perspective. Am J Respir Crit Care Med. 2020;201(11):1337-1344.

4. Alhazzani W, Møller MH, Arabi YM, et al. Surviving sepsis campaign: guidelines on the management of critically ill adults with coronavirus disease 2019 (COVID-19). Critical Care Med. 2020;48(6):e440-e469.

How to cite this article: Kazachkov M, Noah TL, Murphy TM. The roles of a pediatric pulmonologist during the COVID-19 pandemic. Pediatric Pulmonology. 2020;55:2592–2595. https://doi.org/10.1002/ppul.25010