



The Evolving COVID-19 Pandemic: An Update

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It is quiet in our neighborhood in Evanston, IL, and our neighbors and friends are all respecting social distancing as we take our daily walks. Many of us are working from home; I am no longer on the front lines in the hospital caring for sick pediatric and young adult patients on the pediatric unit or in the intensive care unit. However, my wife, Sally, is working as a nurse at Lurie Children's Hospital of Chicago; they are implementing safe and best-practice strategies about how to staff an infusion unit for children who are immunocompromised due to cancer and chronic diseases like inflammatory bowel disease and autoimmune inflammatory disease. Keeping both staff and patients healthy is critical. The clinical issues surrounding the COVID-19 pandemic are evolving every day.

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HOW IS THE PANDEMIC PROGRESSING?

At the time of this editorial, there are over 981,246 cases of coronavirus disease 2019 (COVID-19) infection in the United States and 55,258 deaths. There are cases in all 50 states, the District of Columbia, and four US territories.¹

Thus far, children, infants, and pregnant women have, in general, not gotten as sick with COVID-19 infection.¹⁻⁷ There is still concern for infants and children who are immunosuppressed or have other underlying conditions like chronic lung disease (such as asthma) or cardiovascular disease.⁵ In the series by Dong et al.⁷ categorized COVID-19 cases as the following: 94.1% as asymptomatic, mild, or moderate and 5.8% (125 of 2,135 cases) as severe or critical. They reported one death of a 14-year-old boy in Hubei province.⁷ Bialek et al.⁶ reported three deaths due to COVID-19, and there is ongoing analysis to confirm the cause of death in these patients. So far, there has been no definitive evidence of transplacental or vertical transmission of virus or transmission in breast milk, although there are two new peer-reviewed letters by Dong et al.⁸ about possible vertical transmission and by Zeng et al.⁹ about antibodies in infants born to mothers with COVID-19 in

Wuhan, China. There is an editorial by Kimberlin and Stagno¹⁰ explaining that more definitive evidence is needed regarding in-utero acquisition of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus strain that causes the respiratory illness COVID-19 infection, before medical professionals can counsel pregnant women definitively about the potential of transmission. There was no positive reverse transcriptase-polymerase chain reaction test result (RT-PCR) in infant specimens.⁸ Zeng et al.¹¹ reports on 33 neonates born to mothers with documented SARS-CoV-2 infection, three of whom were symptomatic with positive RT-PCR tests from nasopharyngeal and anal swabs. The possibility of predelivery transmission is again suggested because of the positive PCRs in these infants and the strict isolation of the mothers pre- and postdelivery.¹¹ Specifically, the authors state that vertical transmission from mother-to-infant "cannot be ruled out."¹¹

The reasons for the relative sparing of children, infants, and pregnant women are unclear, as this is a novel virus that we have not seen previously.⁸ Transmission is by respiratory droplet with close contact and after touching contaminated objects.^{1,2,12} People with COVID-19 have had a wide range of symptoms that may ap-

pear within 2 to 14 days after exposure. They can include cough, shortness of breath or difficulty breathing, fever, chills, repeated shaking with chills, muscle pain, headache, sore throat, loss of taste or smell.¹³ Children have similar symptoms to adults and generally have mild illness.¹³

WHAT ABOUT PROTECTING OURSELVES AS PROVIDERS?

Dr. Christian Rose¹⁴ and a colleague were both exposed to COVID-19 after treating a patient in an emergency department in San Francisco. Dr. Rose is married, and his mother has chronic respiratory disease, which makes her vulnerable to the effects of COVID-19. At the time of the article, the colleagues were staying together as not to expose family members. Although I am no longer a practicing clinical pediatrician and am working from home until further notice, my wife is still caring for children at a hospital. So, what can front-line providers do to protect themselves and their families? There are respiratory droplet precautions with personal protective equipment (PPE), but we are all aware of the shortage of PPE.¹⁵ Social distancing (staying 6 feet apart) is also being emphasized, but what about during patient care—examinations and procedures. Washing our hands for 20 seconds with soap or alcohol-based disinfectants cannot be emphasized enough. Coughing and sneezing into our sleeves and elbows is important as well. But what can we do if we are exposed? Should the front-line providers who are not seeing patients with confirmed COVID-19 like Sally be wearing masks during their entire shifts? This was recently suggested by Dr. Atul Gawande, an endocrine surgeon in Boston, who has become involved in several global health projects.¹⁶

ARE THE “NEW” THERAPIES EFFECTIVE THUS FAR?

The basic management of COVID-19 infections is supportive (hydration, control of fever, oxygen therapy if indicated, and nutrition). In general, children have mild illness that involves fever, congestion, cough, and mild respiratory distress.¹³ If children do have evidence of pneumonia with desaturation, they may require supplemental oxygen therapy. In adults, some patients who are at high risk may progress to the development of acute respiratory distress syndrome with a ground glass appearance on chest radiograph and chest computed tomography scan.¹⁷⁻¹⁹ These patients are admitted to the intensive care unit and require forms of assisted ventilation. Therapies for patients who are at high risk are being developed and refined on almost daily basis. They include antiviral therapies such as remdesivir, lopinvir/ritonavir, and antimalarial drugs chloroquine and hydroxychloroquine and are well summarized by McCreary and Pogue¹⁷ on behalf of the Society of Infectious Disease Pharmacists and by Devaux et al.¹⁸ Although chloroquine and hydroxychloroquine have been given expedited approval by the US Food and Drug Administration, the data for the efficacy in the management of COVID-19 pneumonia are limited.¹⁷⁻¹⁹ There are also limited data on a small number of adult patients with COVID-19 using a combination of chloroquine and azithromycin therapy.¹⁹ The very limited data are well summarized by a group of pediatric infectious disease and critical care experts.²⁰ The authors reinforce that antiviral therapy is not necessary for the great majority of pediatric patients with COVID-19 and can be reserved for the rare children who develop severe or critical disease and should be started optimally in a controlled trial after evaluating the benefits versus the risks.²⁰ If the pediatric clinician

decides an antiviral should be started, remdesivir is the preferred antiviral, with hydroxychloroquine or chloroquine as an alternative agent if the patient is not a candidate for remdesivir or if remdesivir is not available.²⁰ Clinicians should also be aware that chloroquine and/or azithromycin administration can result in prolonged corrected QT interval.²⁰ Parenthetically, there is no role for ingestion or injection of disinfectants in the treatment of COVID-19 infection as erroneously stated by President Donald Trump.^{21,22}

WHAT ABOUT THE LONG-TERM EFFECTS AND OUTCOMES ON PEDIATRIC PATIENTS AND THEIR FAMILIES?

At this point in time, to my knowledge, there is one systematic review of COVID-19 in which the authors note that most patients recover within 1 to 2 weeks.¹² In a survey of 1,784 Chinese school children, in grades 2 through 6, using the Children’s Depression Inventory-Short Form (CDI-5) and the Screen for Child Anxiety Related Emotional Disorders, Xie et al.²³ found that 22.6% of the children had depressive symptoms and 18.9% had anxiety symptoms.

Sally and I were talking with Linda Hageman, MSW, who is the administrator for The Cradle, an adoption agency in Evanston, IL, about the status of adoptions and the care of the infants during this pandemic and she relayed some interesting thoughts. The adoptive parents of a 6-week-old infant were getting ready to take their baby home and were visiting with their masks on at the nursery. According to Linda, “There might be some delay in her social smile developmental milestone as everyone who cares for her has to wear a mask.” The nurses and other caretakers at the adoption agency have actually drawn smiles on their masks.

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