

Parental COVID-19 Testing of Hospitalized Children: Rethinking Infection Control in a
Pandemic

Ameer Hassoun, MD¹; Nishant Prasad, MD²; Suzanne Pugh, RN¹; Indira Merced, RN¹; Joseph
Abularrage, MD³; Manish Sharma, DO¹

¹New York-Presbyterian Queens Hospital, Department of Emergency Medicine, Division of
Pediatric Emergency Medicine. Flushing, New York

²New York-Presbyterian Queens Hospital, Department of Medicine, The Dr. James J. Rahal
Jr. Division of Infectious Diseases. Flushing, New York

³New York-Presbyterian Queens Hospital, Department of Pediatrics. Flushing, New York

Address correspondence to: Ameer Hassoun, Division of Pediatric Emergency Medicine,
Department of Emergency Medicine, New York-Presbyterian Queens, 5645 Main Street,
Flushing NY, 11355, [amh9019@nyp.org], 917-257-7157.

Novel coronavirus disease 2019 (COVID-19) changed the way we practice medicine. Children and their caretakers pose the unique challenge of exposing healthcare workers or other patients within hospital units (e.g., the pediatric emergency department (PED), pediatric inpatient units, operating rooms) if they happen to be infectious. Denine et al. explored this challenge by testing parents and asymptomatic hospitalized children. Yet, the report did not stratify the risks of parental symptomatology before hospitalization.ⁱ The questionable test accuracy, paired with asymptomatic COVID-19 positivity, raises the uncertainty of transmission within this specific group.ⁱⁱ

Objectives: Examine SARS-CoV-2 Real-Time Polymerase Chain Reaction (SARS-CoV-2 RT-PCR) results of hospitalized children, their asymptomatic caretakers, and assess caretaker-child test concordance.

Methods: We conducted a point-prevalence study to assess the rate of COVID-19 in hospitalized children (0-21 years of age) and their asymptomatic caretakers at a major community hospital in New York City. We asked children and caretakers to don surgical masks at the entrance to the PED. We screened children and caretakers with temperature measurements and the presence of COVID-19 symptoms (fever, cough, shortness of breath, sore throat, myalgia, or diarrhea). An alternative asymptomatic caretaker is imperative if the parent screens positive. If the child requires hospitalization, the caretaker-child pair will undergo nasopharyngeal swabs for SARS-CoV-2 RT-PCR. Once resulted, children will be assigned a room in the appropriate unit (institutional isolation policy is available in the supplementary appendix table 2). Caretakers who tested positive were asked to provide an alternate caretaker. Our institutional review board (IRB) evaluated this quality improvement de-identified project and determined that it does not constitute human subjects research. Therefore, neither IRB approval nor a notice of exemption is required.

Results: From May 28th to June 22nd, 2020, we tested forty asymptomatic consecutive caretaker-child pairs. The children had 1:1 male to female ratio and a median age of 8 years. Medical cases represented 65% of hospitalized children (26/40), none of which tested positive for COVID-19 (Table 1). Fourteen children had surgical emergencies (35% of the cohort) requiring hospital admission. One child with acute appendicitis tested positive for COVID-19. All other pediatric surgical cases were SARS-CoV-2 RT-PCR negative.

In our series, the caretaker-child SARS-CoV-2 RT-PCR test concordance was evident in 95% (38/40) of the cohort. The hospitalized children and caretakers had an asymptomatic COVID-19 rate of 2.5% (1/40) and 7.5% (3/40), respectively. All SARS-CoV-2 RT-PCR positive results in caretaker-child pairs (whether concordant or discordant) were in children with appendicitis.

Discussion: This study highlights an uncharted territory of caretaker-child SARS-CoV-2 RT-PCR test concordance and its utility in hospital infection control measures. The high frequency of caretaker-child test concordance and low children to asymptomatic parental rates could reflect the strict social distancing regulations in New York City or caretaker's concern of children's exposure to COVID-19.ⁱⁱⁱ

As droplet precautions were applied universally for both caretakers and children, the high frequency of caretaker-child test concordance and the low positivity rate of asymptomatic caretakers, the utility of caretaker testing was questioned. After this pilot project, we revisited our admission policy and aligned it to the American Academy of Pediatrics recommendations.^{iv} The high concordance rates between asymptomatic pediatric patients and their caregiver's SARS-CoV-2 PCR results in a community subject to strict public health distancing and masking policies. It suggests that in facilities where admission screening is performed, the pediatric patient's result is likely to correspond to the result of the accompanying caregiver.

ⁱ Denina M, Aguzzi S, Versace A, *et al* Testing strategy for SARS-CoV-2 in the paediatric emergency department *Archives of Disease in Childhood* Published Online First: 25 June 2020. doi: 10.1136/archdischild-2020-319806

ⁱⁱ Centers for Disease Control and Prevention. Discontinuation of Transmission-Based Precautions and Disposition of Patients with COVID-19 in Healthcare Settings (Interim Guidance): <https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html> ; Accessed 7/9/2020.

ⁱⁱⁱ Centers for Disease Control and Prevention COVID-19 Response Team: Coronavirus Disease 2019 in Children – United States, February 12 – April 2, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:422-426. DOI: <http://dx.doi.org/10.15585/mmwr.mm6914e4>

^{iv} The American Academy of Pediatrics. Family Presence Policies for Pediatric Inpatient Settings During the COVID-19 Pandemic. <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/family-presence-policies-for-pediatric-inpatient-settings-during-the-covid-19-pandemic/> . Accessed: 7/1/2020.

Table 1

Table 1: Asymptomatic Parent-Child SARS-CoV-2 RT-PCR test results by service

Medical Admission:	Parent PCR Negative	Parent PCR Positive	Total
Child PCR Negative	26	0	26
Child PCR Positive	0	0	0
Surgical Admission:			
Child PCR Negative	11	2	13
Child PCR Positive	0	1	1
Total	37	3	40

Accepted Manuscript