

# Quality Improvement in a Pandemic

Ashley A. Foster, MD; Anne M. Stack, MD

The novel coronavirus (SARS-CoV-2) has had a profound impact on care delivery across the United States. First reported on December 31, 2019, in China as a case cluster,<sup>1</sup> the United States now faces over 1.84 million reported coronavirus disease 2019 (COVID-19) cases.<sup>2</sup> As we work to understand COVID-19 and how to optimize care, recent literature suggests most pediatric patients who test positive have mild symptoms.<sup>3</sup> However, there are emerging data regarding the newly described serious Multisystem Inflammatory Syndrome in Children (MIS-C).<sup>4,5</sup> Healthcare workers are at significant risk—both from direct infection and psychological stress.<sup>6</sup> In Massachusetts, elevated transmission efficiency led the governor to issue a stay-at-home advisory on March 24, 2020.<sup>7</sup> In part due to the stay-at-home advisory, our hospital's pediatric emergency department (ED) volume dropped by >60%. Despite low volumes in an ED that usually treats 60,000 patients annually, we were faced with a new, unprecedented challenge.

Before COVID-19, our hospital's ED celebrated a robust quality improvement (QI) program with multiple ongoing efforts focused on optimizing patient care, reducing variation and resource utilization through a clinical pathways program, and enhancing safety through a frequently used safety hotline. When the local pandemic started, many active improvement efforts, such as Plan-Do-Study-Act (PDSA) cycles, were disrupted as we turned immediate attention to safely providing care for potentially COVID-19-infected patients while maintaining high

care standards for all patients. Traditional care processes required immediate restructuring to mitigate the risk to patients and staff, and involved rapid, even daily changes as our understanding of the virus evolved. With the rapid and dramatic change to our ED landscape during the pandemic, we are left asking, where does pediatric ED quality improvement go from here? How do we determine how to balance existing quality work and our new challenges? With limited data or experience to guide how to maintain focus on COVID-19 while also continuing momentum on the pre-pandemic quality efforts, we have taken our pandemic experience as an opportunity to develop a new framework. The framework guides adapting to COVID-19 while also maintaining and even advancing important QI work.

As COVID-19 impacts and science are evolving, we hypothesize 3 phases of response: acute, subacute, and chronic. We define the acute phase by new protocol development and frequent staff updates on rapidly evolving practices to optimize care during the immediate crisis. The subacute phase, where we believe we are now, is defined as less frequent changes in practice, protocols, and updates to support providers, but continued improvement-related care for all patients due to these changes. We imagine the chronic phase as a new “steady state,” our ED healthcare team adjusted to daily safe practice, allowing for familiarity around COVID-19-specific care, together with a fully reestablished QI portfolio. We believe the phases may vary in duration and intensity at each department and hospital.

Our framework has allowed quality teams to strategize about pre-existing and new quality work. First, during the acute phase, quality efforts were prioritized to front line provider safety and physical layout reconfiguration to minimize infectious risks. As an example, our ED team developed an iterative COVID-19 triage process map. We also began simulation training in newly developed, safe airway management protocols. Additionally, building on prior QI efforts at team communication, we have brought back shift-based team huddles, now via video conference, to bring front line providers together and support clinicians who may be under significantly increased stress and fatigue.<sup>8</sup> As a result, we were able to share the latest protocols reviewing protective equipment use and viral testing, and to provide a real-time opportunity for questions and concerns by all staff. We have found shift-based



From the Division of Emergency Medicine, Boston Children's Hospital, Harvard Medical School, Boston, Mass.

\*Corresponding author. Address: Ashley A. Foster, MD, Division of Emergency Medicine, Boston Children's Hospital, Department of Emergency Medicine and Pediatrics, Harvard Medical School, BCH 3066, 300 Longwood Ave, Boston, MA 02115

PH: 404-642-7207; Fax: 617-730-0335

Email: ashley.foster@childrens.harvard.edu; ashleyafoster@gmail.com

Copyright © 2020 the Author(s). Published by Wolters Kluwer Health, Inc. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

To cite: Foster AA, Stack AM. Quality Improvement in a Pandemic. *Pediatr Qual Saf* 2020;4:e321.

Received for publication May 4, 2020; Accepted June 9, 2020.

Published online 7 July 2020

DOI: 10.1097/pq9.0000000000000321

huddles have enhanced team bonding and connectivity. By observation, staff are noted to be intently engaged during these huddles. Furthermore, as part of the acute phase, focus on safety and high-quality care was maintained, but we briefly paused active PDSA cycles unrelated to safety or COVID-19.

During the current subacute phase, we have started to gently redirect energy back to PDSA cycles in the active “Do” phases before COVID-19. We are prioritizing ongoing QI interventions rather than introducing new quality efforts unrelated to COVID-19. We are continuing to analyze (“Study”) data and provide feedback regarding success in these initiatives. As an example, we have encouraged project leaders to share little victories, such as progress toward SMART aim targets. We see positive communication as an essential step to avoid losing project momentum and empower staff to focus on interventions prioritized before the pandemic. Positive feedback can function as a morale booster to a stressed staff. Also, we are drafting future PDSA cycles to initiate once we are in the chronic phase of adjustment to COVID-19. In the chronic phase, we believe we will have reestablished and added to our robust quality portfolio as we anticipate the care models will be changed for the long term.

We are in an uncertain time. As is true with all quality improvement initiatives, we are learning as we go. Right now, we have more questions than answers. What will ED pediatric QI look like in a few months? Will our acute, subacute, and chronic paradigm be effective? What health care problems have we neglected by perceived and real challenges to accessing care?

Moreover, how will EDs, safety nets for children, be affected by profound economic consequences of a

pandemic? We suggest quality work is now more critical than ever. We must be ready to jump in with skills to engender excitement, positive change, and hope for a new world.

## DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

## REFERENCES

1. Holshue ML, DeBolt C, Lindquist S, et al. First case of 2019 novel coronavirus in the United States. *N Engl J Med*. 2020;382:929–936.
2. Centers for Disease Control and Prevention. Coronavirus disease 2019 (COVID-19). Available at <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html>. Accessed June 4, 2020.
3. Castagnoli R, Votto M, Licari A, et al. Severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) infection in children and adolescents: a systematic review. *JAMA Pediatr*. Published online April 22, 2020. doi:10.1001/jamapediatrics.2020.1467. Epub ahead of print.
4. Riphagen S, Gomez X, Gonzalez-Martinez C, et al. Hyperinflammatory shock in children during COVID-19 pandemic. *Lancet*. 2020;6736:2019–2020.
5. Centers for Disease Control and Prevention. Multisystem Inflammatory Syndrome in Children (MIS-C). Available at <https://www.cdc.gov/mis-c/hcp/>. Accessed June 4, 2020.
6. Sim MR. The COVID-19 pandemic: major risks to health-care and other workers on the front line. *Occup Environ Med*. 2020;77:281–282.
7. Baker C, Polito K. Governor Charlie Baker orders all non-essential businesses to cease in person operation, directs the Department of Public Health to issue stay at home advisory for two weeks. Available at <https://www.mass.gov/news/governor-charlie-baker-orders-all-non-essential-businesses-to-cess-in-person-operation>. Accessed April 28, 2020.
8. Sasangohar F, Jones SL, Masud FN, et al. Provider burnout and fatigue during the COVID-19 pandemic: lessons learned from a high-volume intensive care unit. *Anesth Analg*. 2020;131:106–111.