

Practicing High-Value Pediatric Care During a Pandemic: The Challenges and Opportunities

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High-value care (HVC) is a philosophy and approach to medicine that focuses on achieving the best patient outcomes through evidence-based practice while minimizing harm to patients, wasted healthcare resources, and costs. Incorporating HVC principles in pediatric clinical decision-making is particularly important owing to the harms of hospitalization, overutilization, and overdiagnosis, as well as rising costs of pediatric care.¹⁻⁴ How can we maintain these principles in the face of a global pandemic and new emerging syndrome, multisystem inflammatory syndrome in children (MIS-C), which has dramatically impacted healthcare systems for children?

In this article, we discuss the barriers and opportunities around practicing HVC in our evolving approach to novel COVID-19 management in hospitalized children. We also draw lessons from our experiences on how we can respond to future events that rapidly shift our approach to care.

BARRIERS TO PROVIDING HVC FOR HOSPITALIZED CHILDREN DURING COVID-19

As children's hospitals and pediatric providers responded to the COVID-19 pandemic, practice recommendations were implemented rapidly and changed rapidly. A major challenge with an event like this is how we respond to the unknown and uncertainty, something most healthcare workers are not comfortable doing at baseline,^{5,6} particularly trainees and early-career physicians.⁷ With the benefit of hindsight, many early clinical approaches to care may now be seen as low-value care (LVC). For example, COVID-19 test availability was initially limited, and many hospitals utilized respiratory viral panels (RVPs) to potentially eliminate COVID-19 as an etiology of symptoms. RVP use increased during this time⁸; however, studies have shown that the co-infection rate of SARS-CoV2 with other respiratory viruses varies widely, so a positive RVP was of uncertain benefit.⁹ In addition, routine RVP use is often low value and may lead to overdiagnosis, additional overtesting cascades, and, at times, false reassurance and premature closure of the diagnostic workup.¹⁰

As our understanding of COVID-19 has expanded, rapid changes in treatment have also occurred. Early data were often preliminary and based on small trials of adults, and treatments ranged from inexpensive and available (dexamethasone) to quite expensive (remdesivir, monoclonal antibodies). Pragmatic randomized controlled trials (RCTs) are an important tool that may have been underutilized in pediatrics. Similar to our adult hospitalist colleagues' experience,¹¹ the rapid rise in cases provided an opportunity to collaborate across institutions to assess which treatments were most effective. In particular, the predictable rise in rates of MIS-C after a surge in COVID-19 cases could have provided an avenue to evaluate the relative effectiveness of the various treatments used.¹² However, there were limited pediatric RCTs and thus a missed opportunity to establish an evidence-based pediatric standard of care for COVID-19 and MIS-C. This resulted in the development and dissemination of care practices before they were fully tested in children.

Similarly, the medical community has become increasingly aware of laboratory findings that may be predictive of clinical course.¹³ The outcomes of COVID and MIS-C are potentially severe, so looking for "early warning signs" with diagnostic testing is appealing. Clinicians responding to early data, and with a fear of missing something, may order a full panel of bloodwork for admitted patients to assist with decision-making and may underestimate the perceived minor harms and cost of unnecessary testing/admissions.³ However, most of the evidence regarding lab values came from the adult population. There is little understanding of how lab values impact pediatric-specific outcomes.¹⁴ Even for MIS-C, a pediatric-specific condition, early protocols emphasize broad testing approaches.¹⁵ A focus on grave (but rare) outcomes from a novel virus may also distract from more common causes of symptoms and lead to missed common diagnoses that are less severe.¹⁶ For both testing and treatment, having this early information before clear evidence on how it guided care may have caused more harm than benefit. Again, RCTs may have helped guide MIS-C therapies and protocol development.

Changing workflows may also create new barriers to HVC. One of the recommendations from *Choosing Wisely*[®] during the COVID-19 pandemic was to batch lab draws¹⁷ to reduce the risk of exposure to healthcare workers performing phlebotomy, as well as staff who transport, handle, and process bloodwork in the lab. This may inadvertently encourage the approach of getting a lab test "in case" we need it with a single daily blood draw. In trying to avoid multiple encounters

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(and conserve personal protective equipment [PPE]), we may be taking a less stepwise approach than in prepandemic times.

Finally, children's hospitals witnessed significant financial challenges and reductions in patient volume related to the pandemic.¹⁸ Reductions in patient volume could present a potential opportunity for practicing HVC (eg, more time to discuss downstream effects) or alternatively could inadvertently incentivize low-value, low-priority care via messaging around preserving financial viability.

For clinicians and healthcare systems, these examples highlight why we may be predisposed to practicing LVC during a pandemic or similar emerging threat.

STRATEGIES FOR HVC PRACTICE DURING FUTURE MAJOR EVENTS

In light of these challenging clinical scenarios and nonclinical factors that predispose us to LVC, how can we reinforce a high-value approach to care during a pandemic or similar emerging threat? The following five specific concepts may help providers and organizations optimize HVC during this pandemic and in future situations:

1. Utilize pediatric RCTs to provide evidence-based recommendations. In the face of a novel virus with unclear manifestations, treatment options were rapidly implemented without time for careful evaluation. In the future, collaboratively utilizing shared resources in the research community could help rapidly and rigorously evaluate outcomes in the pursuit of evidence-based practice.

2. Use standardization as a tool to mitigate uncertainty. Knowing that uncertainty can be a driver of overuse and that during emerging threats, evidence is scarce and rapidly changing, a structured method for standardizing practice across your institution or multiple institutions can be helpful in many ways. Electronic health record–based orders and guidelines provide a standard of care to relieve uncertainty and have been shown to reduce overtesting.¹⁹ These resources can also be adapted rapidly as evidence emerges, reducing the burden on providers to know the latest evolving best practice. Experts who have reviewed the literature should have a method to quickly disseminate these findings through standardized practice, providing a venue for rapid learning and implementation.²⁰

3. Plan for active deimplementation from the outset. It is inevitable that some practices implemented early in pandemic response may need to be deimplemented later as the evidence and situation evolve. However, there is ample evidence that deimplementation can be difficult.²¹ Building in deimplementation mechanisms, such as standing educational sessions or hospital committees dedicated to value that review practices, from the beginning may ease these changes.

4. Take advantage of novel opportunities to improve value. Early stop-gap interventions may be wasteful, but the upheaval from major events may also create novel opportunities to improve value in other ways. Some of these efforts, like PPE conservation and as-needed follow-up visits, may become useful methods to improve value even after the pandemic ends.^{22,23} The decreased pursuit of healthcare during the pan-

dem may also have given us an opportunity to better define when delayed diagnosis or even nondiagnosis for certain conditions is acceptable and when it may cause harm.

5. Highlight harms of overuse. While avoiding unnecessary costs is an important aspect of reducing overuse, often the other human-centered harms of overuse are better motivators for HVC. Especially during the response to an emerging threat, the impacts of overuse may be compounded. Laboratory resources that are strained to meet COVID-19 testing demand will be further stretched by overuse of other laboratory testing. Overuse of ineffective treatments adds stress to nurses, pharmacists, and other front-line staff taking care of ill patients. Side effects of unnecessary interventions, including those that could prolong hospitalization, would also increase strain on the system. Reducing overuse is also a way to reduce workload for hospital staff during a time of crisis. Improved efficiency of practice and less time spent on practices that do not add value to patient care can insulate staff against burnout.²⁴ Hospitalization and healthcare costs can add to the stress and financial burden of patients and families.²⁵ Clinicians can highlight harms of overuse through openly talking about it on rounds with the patients, families, and entire care team and incorporating it into health system–wide messaging.

CONCLUSION

As vaccine distribution continues, like many clinicians, we are hopeful that the worst days of the pandemic are behind us. The crucible of the COVID-19 pandemic has undoubtedly changed us as clinicians and impacted our future practice patterns. We believe there is a need to challenge ourselves to continue to think from a value mindset even in times of crisis. Furthermore, there are important opportunities to learn from our response to the COVID-19 pandemic and find strategies for minimizing LVC outside the pandemic. We believe the lessons learned around improving value during this pandemic can strengthen our response to the next novel, widespread threat and reduce waste in our care systems, with a potential to increase the resilience of systems in the future.

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References

1. Rokach A. Psychological, emotional and physical experiences of hospitalized children. *Clin Case Rep Rev*. 2016;2. <https://doi.org/10.15761/CCRR.1000227>
2. Stockwell DC, Landrigan CP, Toomey SL, et al. Adverse events in hospitalized pediatric patients. *Pediatrics*. 2018;142(2):e20173360. <https://doi.org/10.1542/peds.2017-3360>
3. Coon ER, Quinonez RA, Moyer VA, Schroeder AR. Overdiagnosis: how our compulsion for diagnosis may be harming children. *Pediatrics*. 2014;134(5):1013-1023. <https://doi.org/10.1542/peds.2014-1778>
4. Bui AL, Dieleman JL, Hamavid H, et al. Spending on children's personal health care in the United States, 1996-2013. *JAMA Pediatr*. 2017;171(2):181-189. <https://doi.org/10.1001/jamapediatrics.2016.4086>
5. Ilgen JS, Eva KW, de Bruin A, Cook DA, Regehr G. Comfort with uncer-

- tainty: reframing our conceptions of how clinicians navigate complex clinical situations. *Adv Health Sci Theory Pract.* 2019;24(4):797-809. <https://doi.org/10.1007/s10459-018-9859-5>
6. Allison JJ, Kiefe CI, Cook EF, Gerrity MS, Orav EJ, Centor R. The association of physician attitudes about uncertainty and risk taking with resource use in a Medicare HMO. *Med Decis Making.* 1998;18(3):320-329. <https://doi.org/10.1177/0272989X9801800310>
 7. Beck JB, Long M, Ryan MS. Into the unknown: helping learners become more comfortable with diagnostic uncertainty. *Pediatrics.* 2020;146(5):e2020027300. <https://doi.org/10.1542/peds.2020-027300>
 8. Marshall NC, Kariyawasam RM, Zelyas N, Kanji JN, Diggle MA. Broad respiratory testing to identify SARS-CoV-2 viral co-circulation and inform diagnostic stewardship in the COVID-19 pandemic. *Virol J.* 2021;18(1):93. <https://doi.org/10.1186/s12985-021-01545-9>
 9. Zimmermann P, Curtis N. Coronavirus infections in children including COVID-19: an overview of the epidemiology, clinical features, diagnosis, treatment and prevention options in children. *Pediatr Infect Dis J.* 2020;39(5):355-368. <https://doi.org/10.1097/INF.0000000000002660>
 10. Morrison JM, Dudas RA, Collins K. The power and peril of panels. *Hosp Pediatr.* 2018;8(11):729-732. <https://doi.org/10.1542/hpeds.2018-0093>
 11. Wise J, Coombes R. Covid-19: the inside story of the RECOVERY trial. *BMJ.* 2020;370:m2670. <https://doi.org/10.1136/bmj.m2670>
 12. Feldstein LR, Rose EB, Horwitz SM, et al. Multisystem inflammatory syndrome in U.S. children and adolescents. *N Engl J Med.* 2020;383(4):334-346.
 13. Pourbagheri-Sigaroodi A, Bashash D, Fateh F, Abolghasemi H. Laboratory findings in COVID-19 diagnosis and prognosis. *Clin Chim Acta.* 2020;510:475-482. <https://doi.org/10.1056/NEJMoa2021680>
 14. Henry BM, Benoit SW, de Oliveira MHS, et al. Laboratory abnormalities in children with mild and severe coronavirus disease 2019 (COVID-19): a pooled analysis and review. *Clin Biochem.* 2020;81:1-8. <https://doi.org/10.1016/j.clinbiochem.2020.05.012>
 15. Centers for Disease Control and Prevention. Information for healthcare providers about multisystem inflammatory syndrome in children (MIS-C). Accessed July 7, 2021. <https://www.cdc.gov/mis/hcp/index.html>
 16. Molloy M, Jerardi K, Marshall T. What are we missing in our search for MIS-C? *Hosp Pediatr.* 2021;11(4):e66-e69. <https://doi.org/10.1542/hpeds.2020-005579>
 17. Cho HJ, Feldman LS, Keller S, Hoffman A, Pahwa AK, Krouss M. Choosing Wisely in the COVID-19 era: preventing harm to healthcare workers. *J Hosp Med.* 2020;15(6):360-362. <https://doi.org/10.12788/jhm.3457>
 18. Synhorst DC, Bettenhausen JL, Hall M, et al. Healthcare encounter and financial impact of COVID-19 on children's hospitals. *J Hosp Med.* 2021;16(4):223-226. <https://doi.org/10.12788/jhm.3572>
 19. Algaze CA, Wood M, Pageler NM, Sharek PJ, Longhurst CA, Shin AY. Use of a checklist and clinical decision support tool reduces laboratory use and improves cost. *Pediatrics.* 2016;137(1). <https://doi.org/10.1542/peds.2014-3019>
 20. Rao S, Kwan BM, Curtis DJ, et al. Implementation of a rapid evidence assessment infrastructure during the coronavirus disease 2019 (COVID-19) pandemic to develop policies, clinical pathways, stimulate academic research, and create educational opportunities. *J Pediatr.* 2021;230:4-8.e2. <https://doi.org/10.1016/j.jpeds.2020.10.029>
 21. Gill PJ, Mahant S. Deimplementation of established medical practice without intervention: does it actually happen? *J Hosp Med.* 2020;15(12):765-766. <https://doi.org/10.12788/jhm.3467>
 22. Coon ER, Destino LA, Greene TH, Vukin E, Stoddard G, Schroeder AR. Comparison of as-needed and scheduled posthospitalization follow-up for children hospitalized for bronchiolitis: the Bronchiolitis Follow-up Intervention Trial (BeneFIT) randomized clinical trial. *JAMA Pediatr.* 2020;174(9):e201937. <https://doi.org/10.1001/jamapediatrics.2020.1937>
 23. Steuart R, Huang FS, Schaffzin JK, Thomson J. Finding the value in personal protective equipment for hospitalized patients during a pandemic and beyond. *J Hosp Med.* 2020;15(5):295-298. <https://doi.org/10.12788/jhm.3429>
 24. Pierce RG, Diaz M, Kneeland P. Optimizing well-being, practice culture, and professional thriving in an era of turbulence. *J Hosp Med.* 2019;14(2):126-128. <https://doi.org/10.12788/jhm.3101>
 25. Commodari E. Children staying in hospital: a research on psychological stress of caregivers. *Ital J Pediatr.* 2010;36:40. <https://doi.org/10.1186/1824-7288-36-40>