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Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Novel Educational Responses to COVID-19: What is Here to Stay?



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IN THIS ISSUE of *Academic Pediatrics*, we feature 10 innovations that highlight novel educational responses to the COVID-19 pandemic. Our recent call for educational innovations resulted in 172 submitted manuscripts from 82 institutions in four countries (97% from the United States). Submissions were reviewed for innovation, outcome, and sustainability after the COVID-19 pandemic by 3 educational researchers blinded to author name and institution. The innovations encompassed the pediatric medical education continuum, with the majority (n = 96; 56%) targeting residents, followed by medical students (n = 42; 24%), fellows (n = 13; 8%), and faculty (n = 3; 2%). Several papers (n = 18; 10%) described approaches targeting multiple levels of learners. As expected, given the urgency to respond, many outcomes related to feasibility, participation and completion rates, and perceptions of learning.

Four themes emerged from submissions 1) virtual learning (n = 118; 68%); 2) telehealth/telerounding (n = 27; 16%); 3) administrative responses (n = 18; 10%); and 4) wellness (n = 9; 5%). Papers describing virtual learning included modifications to existing conferences (e.g., morning report, grand rounds, and boot camp) (n = 55; 47%), conversion of electives (n = 22; 19%) or clerkships (n = 16; 14%), virtual simulation (n = 18; 15%), and approaches to equip learners to advocate for patients and populations during the COVID-19 pandemic (n = 7; 4%). Submissions describing remote patient care via telehealth included the rapid implementation of outpatient telehealth (n = 16; 59%), inpatient telerounding (n = 8; 30%), and inpatient teleconsultation by specialists (n = 3; 11%). Administrative responses included staffing modifications or clinic management (n = 8; 44%), development of clinical practice guidelines (n = 6; 33%), and leveraging economies of scale via cross-institutional sharing of resources (n = 4; 22%). Submissions describing

approaches to learner wellness described initiatives aimed at coming together virtually for support, with storytelling events (n = 5; 56%) being the most common approach.

PUNCTUATED EQUILIBRIUM — INNOVATIONS THAT WILL OUTLAST THE COVID-19 PANDEMIC

While all submissions originated in response to the unique circumstance of COVID-19, papers selected for publication highlight modifications to pediatric education which we believe may change future educational practice. Here, we highlight innovations that we think will have long-lasting impact.

TEACHING AND LEARNING FROM HOME — APPROACH TO VIRTUAL EDUCATION

The COVID-19 pandemic has made the corporate world realize that not all meetings need to be in person to return to business as usual.¹ Similarly, COVID-19 affords us an opportunity to decide which elements of medical education should continue in virtual or hybrid formats. Virtual learning can overcome the barrier of travel and increase attendance. While next steps must evaluate educational outcomes associated with virtual learning, we suspect that some conferences (e.g., grand rounds) may continue to offer an easily accessible, virtual option.

Virtual learning also provides opportunities for cross-institutional collaboration. Blankenburg et al described how to leverage a national organization (Association of Pediatric Program Directors) as a platform for real-time collaboration, sharing evolving approaches to administrative and educational challenges.² Lang et al described creation of a novel website to curate multi-institutional standardized resources for pediatric providers caring for adults.³ Both papers showcased the ability to use virtual

platforms to rapidly leverage networks and disseminate information. Beer et al described converting an open source flipped classroom model, previously available for educators within their institutions, to a nationwide flipped classroom where fellows from multiple institutions could learn from each other.⁴ The ability for programs to leverage expertise beyond their institutional faculty provides a replicable model to standardize learners' exposure to experts regardless of institutional faculty size.

Some traditionally in-person educational experiences have demonstrated feasibility when converted to a virtual format. Huang et al described transitioning their interdisciplinary primary care clinic mock code training to online simulations.⁵ Programs with remote clinical sites may opt to trial virtual simulation in the post-COVID-19 era. Lara et al described standardized patient encounters via teleconferencing to accommodate remote assessment of learners using a virtual observed structured clinical encounter.⁶ Their results suggest a comparable ability to assess students, making virtual observed structured clinical encounters a potentially feasible option for institutions with learners at distant sites or limited access to simulation centers. Babal et al described addressing wellness via a remote storytelling activity with faculty sharing vulnerable narratives with learners.⁷ This work highlighted the ability to convey powerful emotions and form connections despite the virtual format, suggesting that future sessions need not occur via an in-person format.

STUDENTS AS AGENTS OF CHANGE

As medical students were barred from direct patient care, educators developed meaningful strategies to engage students. From outside medical centers, students were empowered to tackle disinformation. Quadri et al shared a curriculum to equip students as advocates for science at the virtual frontlines via their social media presence.⁸ Reardon et al described how students created a virtual COVID-19 classroom to teach school-aged children age-appropriate and accurate information about the pandemic.⁹ Both showcase the impact of tapping into students' experience and skill with social media to develop future pediatric advocates, more critical now, post-COVID-19, than ever.

TELEHEALTH AS AN ADJUNCT TO CARE

Our ability to connect with patients virtually will undoubtedly be an enduring element of the COVID-19 pandemic. As educators, we will need to determine the competencies necessary to provide effective care via telehealth. Huffman et al described one approach of how to teach and observe fellows providing outpatient telehealth encounters.¹⁰ Patients, institutions, accrediting bodies, and insurance providers have rapidly adopted telehealth, providing future opportunities to evaluate care provision, supervision, and outcome comparison.

While inpatient telerounding was developed to minimize personal protective equipment usage, a critical, but short-term necessity, this innovation has accelerated

incorporation of teleconsultation, which may be useful for smaller programs to provide subspecialty advice when a specialist is not locally available. In addition, as Rogers et al describe, the ability to conference in family members who are not available during inpatient rounds may serve as a key strategy to keep families at the center of family-centered rounds.¹¹

COVID-19 presented unprecedented challenges, requiring educational innovations to ensure trainees continue to learn to provide high-quality, evidence-based care, advocate for patients and populations, and maintain wellness. We believe the papers featured in this issue highlight innovative educational responses to the COVID-19 pandemic and serve as a foundation for shaping future medical education. Next steps will need to include expanded evaluation to determine which innovations have greatest effectiveness necessitating their continuation.

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