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.

A commonly cited excuse for non-inclusion of pregnant women in clinical trials is that pregnant women would be unwilling to participate. Adult women and their families should not be patronised because they are pregnant; they should be given the choice to participate. They may be willing to participate if the intervention is presented favourably, it is not available outside the trial, and when their contribution to scientific research is highlighted. As with any other patient, fulfilment of inclusion/exclusion criteria and informed consent are mandatory to safeguard the patient. On the one hand, experimental drugs are being used to treat pregnant women with COVID-19 anyway.[2,5] On the other hand, pregnant women with COVID-19 are dying, perhaps with no treatment attempted.

Declarations regarding the need to include pregnant women in clinical research and obvious concerns for the well-being of this population time and time again fail to translate to actual practice. What should we learn from this situation? Clarification of the approach to pregnant women should be mandatory during trial registration. Trials excluding pregnant women should be required to justify doing so. Referral to alternative sources with regard to risk should not be allowed. Industry should be expected to cover insurance for all patients, including pregnant women. In the specific context of the COVID-19 pandemic, experimental treatments offered to deteriorating patients within the context of a clinical trial in the hope that they may be of benefit should also be offered to pregnant women who deteriorate.

We could learn much from the management of pregnant women whose lives are at stake during this pandemic wave. This opportunity should be embraced lest we need to explain to our daughters why we have learned nothing of use to them during this pandemic wave when they are pregnant during the next pandemic.

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Declarations of interest

The authors declare that they have no conflicts of interest.

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COVID-19: novel pandemic, novel generation of medical students

Jessie J. Wang[1], Aaron Deng[2,3] and Ban C. H. Tsui[3,*]

[1]Vancouver, BC, Canada, [2]Maywood, IL, USA and [3]Palo Alto, CA, USA

*Corresponding author. E-mail: bantsui@stanford.edu

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Editor—As the novel coronavirus disease 2019 (COVID-19) pandemic continues throughout the world, and while healthcare professionals fight frontline battles and systems leaders negotiate public health measures, the needs of medical students at various stages of training cannot be forgotten. Preclinical students, removed from in-person sessions, have transitioned to rapidly adapted online curricula and assessments. Final-year students' experiences differ widely by jurisdiction, ranging from early graduation and provisional registration to entering residency despite postponed board

examinations. Clinical students not in their final year face perhaps the greatest uncertainty, with limitations to, and/or suspension of, inpatient and outpatient rotations. As the pandemic evolves, so too must strategies to address the issue it raises for medical education.

A historical perspective

Internationally, displacing medical trainees from clinical settings amidst an infectious disease outbreak has precedent in the severe acute respiratory syndrome (SARS) outbreak of 2003. Medical programmes had variable restrictions depending on the local extent of the pandemic, including interruptions to licensing examinations, human subject research, and clinical rotations.[1] In Canada, clerkship placements saw a significant reduction in quantity and scope, and adaptations to the Canadian residency application process were required even after containment of the crisis.[2] Nevertheless, even in impacted areas around the world, medical school cohorts were able to receive accreditation as usual.

Harnessing the student workforce: benefits and risks

With mounting caseloads and increasing strains on healthcare capacities, some jurisdictions have released final-year medical students into the workforce. The General Medical Council (GMC) is provisionally registering early graduates as Foundation Year 1 doctors.[3] The Association of American Medical Colleges (AAMC) allows student involvement in patient care in locales with critical healthcare workforce shortage,[4] and medical schools in several states have offered students the option to graduate early and join the frontlines. Harnessing medical students in the fight against COVID-19 has the advantage, while addressing public health needs, of providing a learning environment with authentic patient experiences for students. Many medical students deem it an obligation to contribute to the healthcare response during a pandemic and are eager to do so. Considering that today's students will be tomorrow's doctors, it is arguably counterproductive to artificially shield them from the realities of medicine in crisis times. Indeed, even off the wards, students are far from immune to the reverberations of the recently evolving medical landscape, as a profession so sought-after for reasons of security and prestige is suddenly cast as a dangerous occupation. By being proactively incorporated into the healthcare team and allowed to step into the altruistic role that inspired them to pursue medicine, students are able to experience firsthand the role their specialty of interest plays in a medical crisis and make more informed decisions for their future.

However, bringing students into hospitals at this time does have significant implications. Although final-year medical students are mere months from the change in status to residents and interns, they are not yet bound by contractual obligation as residents are, thus requiring official policies from regulatory bodies. The UK has organised a nationwide, unified approach to deploying early graduates on an 'opt in' basis,[3] whereas the AAMC has provided guidance on students' participation in direct patient contact activities but left decisions to individual institutions.[4] In the early weeks of the pandemic, personal protective equipment (PPE) shortage, imperfect infection control curricula and adherence, and limited availability of COVID-19 testing posed major safety concerns. Students on the wards also increase supervisory demands on physicians, adding strain to already overwhelmed staff capacities.[5] Students themselves face unprecedented pressures of high-stakes rapid training, high-acuity hospital environments, and potentially emotionally taxing patient encounters.

Options for non-graduating clinical students

Particularly for clinical students not in their final year, timely solutions to the paucity of direct patient contact are needed. Withholds on clinical rotations in place, students are left in limbo with unexplored specialties, unmet clinical learning objectives, and an uncertain outlook for the remainder of their training. Cancellation of away electives could result in missed opportunities and repercussions for residency matching processes, some of which have already adjusted their timelines. Although UK students have the option of volunteering in the NHS,[6] some jurisdictions have moved ahead didactic sessions and scholarly work meant for later in academic calendars.[5] More than ever before, medical educators are utilising e-learning modalities such as webinars, mobile apps, and interactive tutorials. Simulation-based education via virtual reality or game-like environments can enrich online curricula with synthetic clinical scenarios.[7]

There is no easy replacement for real-life patient interactions, however. Clinical students are understandably concerned about their ability to achieve the competencies tested in clinical exit examinations and, more critically, their future finesse in the postgraduate environment. One solution for keeping students involved with patients is to engage them in the telemedicine systems already in place for physician providers. Having been shown to improve equitable access to care, reduce costs, and increase patient satisfaction, telemedicine is sure to become a growing part of the futures of current medical students. Whilst 60% of US medical schools included telemedicine as a component of required or elective courses in 2018, formal telemedicine training has yet to become mainstream.[8,9] There is no better time than now to bridge the gap between medical education and the demands for telemedicine services, both to support virtual patient care during the pandemic, as one US institution is already doing,[10] and looking beyond to an increasingly technology-driven healthcare landscape.

Conclusions

As the global medical community addresses and mitigates the immediate effects of the COVID-19 pandemic, indirect impacts on medical education cannot be overlooked. Whether or not jurisdictions harness students in the healthcare workforce to care for patients directly, their clinical training should not simply be put on hold. Telemedicine can maintain a clinical learning environment through virtual interactions with patients and should be explored fully both for the present crisis and for meeting mounting demands in years ahead. Now is the time to instate novel educational experiences to equip this generation of medical students for their future as physicians, beyond the pandemic.

Declarations of interest

The authors declare that they have no conflicts of interest.

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Presenting symptoms of COVID-19 in children: a meta-analysis of published studies

Rita Assaker[1], Anne-Emmanuelle Colas[1], Florence Julien-Marsollier[1], Béatrice Bruneau[1], Lucile Marsac[1], Bruno Greff[1], Nathalie Tri[1], Charlotte Fait[1], Christopher Brasher[2] and Souhayl Dahmani[1,*]

[1]Paris, France and [2]Melbourne, VIC, Australia

*Corresponding author. E-mail: souhayl.dahmani@aphp.fr

Keywords: clinical presentation; clinical signs; COVID-19; meta-analysis; paediatrics; symptoms

Editor—The coronavirus disease 2019 (COVID-19) pandemic has led to drastic changes in the structure of clinical care worldwide.[1] During the rising phase of the epidemic spread, health systems are being overwhelmed by critically ill COVID-19 patients.[2] Once the peak of COVID-19 cases has passed, delayed medical and surgical care will become a priority. The high transmission rate of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection mandated two major organisational priorities: (i) avoid nosocomial spread of COVID-19 and (ii) minimise COVID-19 disease in healthcare staff.[3] Most guidelines recommend confirming the diagnosis of COVID-19 (using real-time quantitative polymerase chain reaction [RT–qPCR]) in suspected cases based on clinical symptoms and signs or previous contact with confirmed cases.[3] Given these and the importance of better understanding SARS-CoV-2 infection in paediatric populations, we performed a meta-analysis of COVID-19 symptoms in children with positive RT–qPCR tests.

The primary objective was to describe the proportion of paediatric patients diagnosed with SARS-CoV-2 (using RT–qPCR) presenting with general, respiratory, smell and taste (anosmia and ageusia),[3] gastrointestinal,[3] or dermatological symptoms (vesicles or pustules, other vesicular