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# Health Care Team Training and Simulation-Based Education in Obstetrics During the COVID-19 Pandemic



D.J. Kiely

Daniel J. Kiely, MDCM, MSc;<sup>1</sup> Glenn D. Posner, MDCM, MEd;<sup>2</sup>  
Andrée Sansregret, MDCM, MAEd<sup>3</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Hôpital du Centre-de-la-Mauricie, Shawinigan, QC

<sup>2</sup>Department of Obstetrics and Gynecology, University of Ottawa, Ottawa, ON

<sup>3</sup>Department of Obstetrics and Gynecology, CHU Ste-Justine, Université de Montréal, Montréal, QC

## Abstract

Health care team training and simulation-based education are important for preparing obstetrical services to meet the challenges of the COVID-19 pandemic. Priorities for training are identified in two key areas. First, the impact of infection prevention and control protocols on processes of care (e.g., appropriate and correct use of personal protective equipment, patient transport, preparation for emergency cesarean delivery with the potential for emergency intubation, management of simultaneous obstetric emergencies, delivery in alternate locations in the hospital, potential for increased decision-to-delivery intervals, and communication with patients). And second, the effects of COVID-19 pathophysiology on obstetrical patients (e.g., testing and diagnosis, best use of modified obstetric early warning systems, approach to maternal respiratory compromise, collaboration with critical care teams, and potential need for cardiopulmonary resuscitation). However, such training is more challenging during the COVID-19 pandemic because of the requirements for social distancing. This article outlines strategies (spatial, temporal, video-recording, video-conferencing, and virtual) to effectively engage in health care team training and simulation-based education while maintaining social distancing during the COVID-19 pandemic.

## Résumé

La formation des équipes de soins et la formation par simulation sont importantes pour préparer les services d'obstétrique à relever les

défis de la pandémie de COVID-19. Les priorités de formation sont définies dans deux domaines principaux : premièrement, les effets des protocoles de prévention et de contrôle des infections sur les procédures de soins (p. ex. utilisation adéquate de l'équipement de protection individuelle, transport des patientes, préparation des césariennes d'urgence en tenant compte du potentiel d'intubation d'urgence, gestion des urgences obstétricales simultanées, accouchement dans d'autres lieux à l'hôpital, augmentation potentielle du délai décision-extraction et communication avec les patientes) et deuxièmement, les effets de la physiopathologie de la COVID-19 sur les patientes obstétricales (p. ex. examens, analyses et diagnostics; utilisation optimale des systèmes modifiés d'avertissement précoce en obstétrique; stratégie de prise en charge de la gêne respiratoire maternelle; collaboration avec l'équipe de réanimation; risque de réanimation cardiopulmonaire). Toutefois, ce genre de formation est particulièrement difficile en temps de pandémie de COVID-19 en raison des exigences de distanciation physique. Cet article souligne des stratégies (spatiales, temporelles et virtuelles; enregistrement vidéo et vidéoconférence) pour se lancer efficacement dans la formation des équipes de soins et la formation par simulation tout en respectant la distanciation physique pendant la pandémie de COVID-19.

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**Corresponding author:** Daniel J. Kiely,  
[danieljameskiely@gmail.com](mailto:danieljameskiely@gmail.com)

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## INTRODUCTION

The COVID-19 pandemic presents unprecedented challenges to health care teams.<sup>1</sup> There is an urgent need to effectively implement new and rapidly evolving protocols for clinical care and infection prevention and control (IPAC). There is accumulating evidence that simulation training in health care improves patient outcomes.<sup>2</sup> However, such training is more challenging during a

pandemic owing to the requirements for social distancing and the need for thoughtful utilization of scarce personal protective equipment (PPE). The stakes are high: Breaks in IPAC protocol pose a risk of spreading COVID-19. Although pregnant patients do not appear to have a more severe disease course than the general population, the spectrum of disease in pregnancy is still concerning, with some patients requiring critical care.<sup>3</sup> On balance, we believe that health care team training through simulation is important in the response to the COVID-19 pandemic. That being said, the training itself needs to be adapted to minimize risk of occupational spread of the virus.

### **WHAT TO SIMULATE: THE IMPACT OF IPAC PROCEDURES ON PATIENT CARE**

The necessity of preventing occupational spread of infection has many effects on the processes of care. Simulation training to practise these new processes may help to optimize care delivery. In situ training in the clinical environment has the advantage of allowing for potentially complex logistical considerations of patient flow within the hospital and between teams.<sup>4</sup> Simulated “walk-throughs” are thus being used both to train health care providers and inform processes. If feasible, “just-in-time” training is another useful tool that involves an educational rehearsal a short time before an actual clinical event.<sup>4</sup>

We propose training in the following areas:

1. Practising selection of appropriate PPE for the clinical circumstance (eg, droplet vs. airborne precautions).
2. Practicing donning and doffing of PPE. Of note, PPE and certain types of medical equipment are currently in actual or anticipated short supply. Given this reality, using potentially scarce equipment for simulation may not be justifiable unless it is reusable (which poses its own transmission risks). Simulation scenarios need to take this into account, but there are many ways to practise during simulation: stating how PPE will be applied and where it is located in the facility, using PPE stickers that participants apply at appropriate moments, or using props or simulated PPE such as cloths with elastic bands to represent masks.
3. Transport of patients with suspected or confirmed COVID-19 infection to and from key areas within the hospital, including labour and delivery, the operating room, the intensive care unit, the emergency department, radiology, and, if applicable, alternative sites where delivery may occur under certain circumstances (eg, negative pressure rooms on other units). Pathways should be predetermined to minimize delays in transport and risks of cross-contamination. Ideally, the hospital should be mapped into hot, intermediate, and cold zones corresponding to different levels of COVID-19 prevalence. Furthermore, designated personnel to lead the way during transport should be trained, with attention to such details as clearing corridors, ensuring adequate space for the transport bed, accessing elevators promptly, and contacting surfaces (opening doors, pressing elevator buttons) without contaminating them.
4. Preparation for emergency cesarean delivery including possible intubation. Effective communication among anaesthesiologists and obstetric and operating room teams with an emphasis on crisis resource management is an important theme.<sup>5</sup>
5. Management of a second obstetric emergency when an obstetric team is already managing the delivery (cesarean or vaginal) of a patient with suspected or confirmed COVID-19 infection, with consideration of the best methods to communicate with the outside unit when wearing PPE in such a setting. The logistical difficulties of communicating across a window in settings in which doors should ideally not be opened should be considered.
6. Delivery in locations other than labour and delivery (e.g., emergency department, intensive care unit, operating room, alternative delivery rooms on other units if applicable).
7. Delays to emergency cesarean delivery due to enhanced IPAC procedures are important to simulate and to be aware of; they are key in obstetric decision-making and have implications for all health care professionals involved in the intrapartum management of the pregnant patient.<sup>6</sup> An increased decision-to-delivery interval affects communication with the patient as well as best management of intrapartum fetal monitoring and dystocia. The required recalibration is important to simulate and practice as a team. Both the health care team and the patient must understand that ensuring patient and occupational safety may require an earlier decision to proceed with cesarean delivery than in usual circumstances.
8. Communication with patients. Precautions for preventing the spread of COVID-19 create the potential for a number of difficult conversations regarding visitor policies, care of the newborn, encouragement of early epidural, and possibly early decision for cesarean delivery (see point 7). Simulation allows these conversations to be explicitly practised before they are faced in reality.

### **WHAT TO SIMULATE: DIRECT IMPACT OF COVID-19 PATHOPHYSIOLOGY ON THE OBSTETRIC PATIENT**

Beyond simulation of the impact of augmented infection control on processes of care, there is a need to simulate the

direct impact of this novel pathogen in obstetrics. Although the disease course does not appear to be more severe in the pregnant population than in the general population, the possibility of severe disease remains.<sup>3</sup> Thus, key considerations for simulation include the following:

1. Recognition of symptoms of COVID-19 and appropriate diagnosis and workup
2. Best use of a modified obstetric early warning system to detect maternal deterioration<sup>7</sup>
3. Approach to cases of maternal respiratory compromise
4. Collaboration with intensive care teams in the event of the need for critical care
5. Simulation of advanced cardiac life support protocols in the pregnant patient

Any of these themes lends itself to the development of simulation exercises with several variations that may be practised repeatedly.

## **HOW TO TRAIN WHILE MAINTAINING SOCIAL DISTANCING**

Experiential learning followed by debriefing is essential in simulation-based education, but how can we gather teams and learn from our simulated experiences without risking occupational spread of the virus? We propose four broad categories of social distancing that, alone or in combination, may allow health care team simulation training to continue.

### **Spatial Social Distancing**

Spatial social distancing involves maintaining a 2-metre separation between participants. A person-free zone can be marked out (e.g., with masking tape) on the floor of the room where simulation is occurring. A participant can be confined to a zone and not allowed to cross into the person-free zone. An obvious disadvantage of this technique is the prevention of physical contact or equipment transfers between participants, but this is offset by the ability of team members to communicate freely and in real time.

### **Videoconferencing Technologies for Social Distancing**

Videoconferencing technologies allow for simulation scenarios with participants in different locations, thereby decreasing the number of participants at any one site. Experiential learning is limited with this approach, but opportunities for others to participate in the debriefing are maximized.

### **Temporal Social Distancing and Video-Recording**

Temporal social distancing involves having team members participate in training one by one in a sequential manner.

Handwashing or sanitizing before and after participation is always best practice. Without team members, participants are forced to anticipate and state what they expect other team members would do. By video recording the individual scenarios and then having team leaders review all scenarios, an overview of potential problems and a combined debrief can be created, thereby helping to create a shared mental model. Another option is to video record exemplar scenarios of rehearsed teams managing complex situations and disseminate these videos to the department for review. Virtual reality 360-degree videos are available online to demonstrate transfer of a patient with suspected COVID-19 to the operating room for an urgent cesarean delivery, as well as logistical considerations in neonatal resuscitation.<sup>8</sup> By sharing lessons learned and video recordings online, there is a real possibility of maximizing the impact of simulation training across institutions and best coordinating a large-scale response to the pandemic over wide geographic areas.

### **Virtual Training**

Virtual training allows participants to interact with computer-based simulation exercises, often available online, allowing training off-site or from home.<sup>9</sup> Although this modality has great promise, the time needed to develop such simulations (in the absence of significant investment of acceleratory resources) may not allow realization of its full potential in the context of a rapidly evolving pandemic.

## **CONCLUSION**

Health care team-based simulation training is important during the COVID-19 pandemic. The value of this training is not limited to the acute phase of the pandemic but will likely also apply to second waves, chronic phases, and future outbreaks of other infectious diseases. However, how to maintain social distancing while doing such training requires careful thought. By using strategies to maintain social distancing during training, such as spatial separation, temporal separation, video recording, videoconferencing technologies, and virtual training, safe and effective team simulations can continue and help to optimize the health care team response to this critical pandemic. As new recommendations are rapidly produced and updated at the national, international, and hospital-leadership levels, simulation provides an opportunity to practise these directives on the ground, to work out potential problems of implementation, and to give feedback on lessons learned to inform possible fine-tuning of guidelines.

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