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## Real-world impact of the COVID-19 pandemic on the assessment of anaesthesiology residents

Alayne Kealey<sup>1,2,\*</sup>, Fahad Alam<sup>1,2,3</sup>, Graham McCreath<sup>4</sup>, Clyde T. Matava<sup>2,4,5</sup>,  
Lisa A. Bahrey<sup>2,6</sup> and Catharine M. Walsh<sup>3,4,7,8</sup>

<sup>1</sup>Department of Anesthesia, Sunnybrook Health Sciences Centre, Toronto, ON, Canada, <sup>2</sup>Department of Anesthesiology and Pain Medicine, University of Toronto, Toronto, ON, Canada, <sup>3</sup>The Wilson Centre, Faculty of Medicine, University of Toronto, Toronto, ON, Canada, <sup>4</sup>SickKids Research Institute, Hospital for Sick Children, Toronto, ON, Canada, <sup>5</sup>Department of Anesthesia and Pain Medicine, Hospital for Sick Children, Toronto, ON, Canada, <sup>6</sup>Department of Anesthesia, Toronto General Hospital, University Health Network, Toronto, ON, Canada, <sup>7</sup>Division of Gastroenterology, Hepatology and Nutrition, Hospital for Sick Children, University of Toronto, Department of Paediatrics, Toronto, ON, Canada and <sup>8</sup>SickKids Learning Institute, Hospital for Sick Children, Toronto, ON, Canada

\*Corresponding author. E-mail: [Alayne.Kealey@sunnybrook.ca](mailto:Alayne.Kealey@sunnybrook.ca)

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Editor—The coronavirus disease 2019 (COVID-19) pandemic has forced a sudden and drastic change in anaesthesia resident training, with significantly reduced case volumes<sup>1</sup> and frequent trainee redeployment to other clinical areas. Additionally, the increased demands related to applying COVID-19 perioperative protocols and personal protective equipment recommendations, social isolation, and concerns of getting ill and infecting family members are all factors impacting the health and well-being of both residents and faculty.<sup>2</sup> Many postgraduate anaesthesia training programmes worldwide have shifted to competency-based medical education curricula, the success of which are contingent upon adequate clinical exposure and timely workplace-based assessments (i.e. ‘what doctors do in practice’) with learner feedback and with close monitoring to gauge learner progression.<sup>3</sup>

A paucity of formative assessment opportunities during this pandemic is a significant concern for competency-based programmes; however, the real-world impact of this pandemic on trainee experience and assessment has not been documented. As the largest Canadian anaesthesia residency training programme, located in one of the Canadian epicentres for COVID-19, we were interested in gauging the pandemic’s effect on learner assessment. We conducted a study that aimed to compare the quantity and quality (as determined by information richness) of resident assessments completed during the COVID-19 pandemic (March 15 to May 15, 2020) with the same time frame in 2019. The primary outcome was the number of assessments completed. Secondary outcomes included time to assessment completion and richness of information provided (entrustment ratings and comments).

Concurrent with the launch of a competency-based programme in 2017, the Anesthesiology Department at the University of Toronto created and implemented a novel ‘assessment dashboard’ that captures and visualises resident workplace-based assessments to facilitate reflective learning (i.e. assessment for learning). Assessment data related to entrustable professional activities (EPAs), essential tasks of a discipline, were extracted for residents in postgraduate years 1–2, including completion rates, time to completion,

assessment type (direct observation vs case review), entrustment rating, and faculty comments. We excluded data from postgraduate years 3 and above, as they lacked comparative EPA data for 2019. Ethical approval was obtained from the University of Toronto. Data were analysed using descriptive statistics, with continuous variables summarised using means and standard deviations, and discrete variables using proportions. Significant differences between years were examined using two-sample t-tests for continuous variables and  $\chi^2$  analyses for discrete variables ( $\alpha=0.05$ ).

In 2019, 32 residents requested 350 EPA assessments, whereas 36 residents requested 276 assessments in 2020 (Table 1). Whilst the number of assessments requested per resident declined from 2019 to 2020 ( $P=0.046$ ), the number of assessments completed per resident did not change ( $P=0.069$ ) significantly. The number of assessments completed in the moment, as opposed to after the learning encounter, decreased by 17% from 2019 to 2020 ( $P<0.001$ ). However, the mean time to assessment completion for those completed after the learning encounter also decreased by nearly 2 days from 2019 to 2020 ( $P=0.013$ ). Whilst there was no change in the assessment type (direct observation vs case review), there was a reduction in the proportion of anaesthesia vs acute care EPAs assessed (2019: 78.7% anaesthesia; 2020: 66.9%;  $P=0.003$ ). There was no difference in the overall number of assessments rated as ‘entrusted’ between years ( $P=0.56$ ), nor in the overall entrustment categories assigned ( $P=0.30$ ). The number of responses to open-ended questions seeking resident strengths and weaknesses was unchanged between 2019 and 2020 ( $P=0.072$ ). Similarly, the word counts for these responses were unchanged ( $P=0.10$ ).

The COVID-19 pandemic has led to considerably decreased anaesthesia clinical volumes (65–80% decrease across educational sites based on data from a survey of anaesthesia department chiefs across academic sites in Toronto, ON, Canada) and, based on our data, has negatively impacted residents’ requests for assessments and the variety of workplace-based assessment data obtained, with fewer anaesthesia and more acute care EPAs being completed. A decrease in one to two EPA assessments requested per month,

**Table 1** Overview of assessment data. Data presented as n (%), or mean [SD].

Variable	2019	2020	P-value
Number of assessments requested, n (%)	350	276	—
Postgraduate year 1	244 (69.7)	151 (54.7)	
Postgraduate year 2	106 (30.3)	125 (45.3)	
Number of assessments completed, n (%)	301 (86.0)	242 (87.7)	—
Postgraduate year 1	212 (86.9)	141 (93.4)	
Postgraduate year 2	89 (84.0)	101 (80.8)	
Number of assessments requested per resident	10.94 [8.11]	7.67 [4.93]	0.046
Number of assessments completed per resident	9.41 [7.21]	6.72 [4.61]	0.069
Number of faculty completing assessments, n (assessments/faculty)	147 (2.05 [1.72] assessments/faculty)	131 (1.85 [1.36] assessments/faculty)	0.29
Assessment type, n (%)			0.77
Direct observation	196/301 (65.1)	172/242 (71.1)	
Case review	74/301 (24.6)	70/242 (28.9)	
Not specified	31/301 (10.3)	0/242 (0)	
Timing of the assessment, n (%)			<0.001
In the moment	214/301 (71.1)	131/242 (54.1)	
After the learning encounter	87/301 (28.9)	111/242 (45.9)	
Mean time to completion (for assessments completed after the learning encounter)	4.27 [6.81] days	2.34 [3.76] days	0.013

particularly if primarily anaesthesia based, could have an educational impact should the pandemic period be prolonged. However, despite fewer assessment requests and less EPAs completed ‘in the moment’ of the learning activity, the number of assessments completed per residents remained stable and the time to completion improved. This is important, as studies have shown that prompt documentation of clinical performance improves the accuracy and effectiveness of feedback.<sup>4</sup> Additionally, despite the decreased anaesthesia clinical exposure and correspondingly decreased assessment requests, our data suggest that the qualitative feedback provided did not deteriorate. This was shown by the consistency of written comments pertaining to strengths and weaknesses in the EPAs completed. Formative assessments are more meaningful to residents when they provide rich narrative feedback.<sup>5</sup>

The results of this study highlight the importance for learners and residency programmes to monitor closely formative assessment data. For residents, a learner performance dashboard that analyses current assessment data in a visual format can be a powerful metacognitive tool, as it makes them aware of their performance and behaviour, supporting critical reflection.<sup>6</sup> Assessment data can also serve to shape learning behaviours and encourage residents to direct their own learning and develop goal-directed learning actions, which can be collaboratively supported by an academic coach or advisor, for a successful educational outcome.<sup>7</sup> In a disruptive environment, longitudinal coaching relationships can stimulate reflective dialogue and help residents generate personalised learning plans.<sup>8</sup> For programmes, an assessment dashboard can facilitate identification of missing evidence of competence and identify clinical gaps and changing trends in learning curves,<sup>9</sup> which can be targeted with individualised rotation or curriculum changes as restrictions ease.

In addition to longitudinal coaching, this study draws attention to the need for programmes to adapt effectively and efficiently residents’ day-to-day curricula to maximise their learning and their ability to acquire necessary competencies. Whilst some training experiences could be replaced with simulation sessions during the pandemic,<sup>9</sup> workplace-based

assessment requires authentic clinical scenarios. Approaches to assessments could be more intentional and clinical experiences purposefully organised to facilitate evidence of achievement of competencies. Many competency-based programmes, including ours, use assessment tools that quantify a faculty member’s entrustment of the resident in patient-care-related tasks. Because meaningful supervisor–trainee relationships have been shown to increase the likelihood of entrustment,<sup>10</sup> strategic pairing of residents and faculty could potentially enable determination of entrustment over a shorter time period.

The COVID-19 pandemic has impacted anaesthesia residents’ clinical experience and their workplace-based assessments intended to support learning. As such, programmes and residents will have to be more deliberate to create a bespoke learner experience.

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## Declarations of interest

The authors declare that they have no conflicts of interest.

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## Maintaining education and professional development for anaesthesia trainees during the COVID-19 pandemic: the Self-isolating Virtual Education (SAVEd) project

Danielle V. Eusuf<sup>1,\*</sup>, Emma L. England<sup>1</sup>, Mike Charlesworth<sup>2</sup>, Clifford L. Shelton<sup>2,3</sup> and Sarah J. Thornton<sup>4</sup>

<sup>1</sup>North West School of Anaesthesia, Health Education North West, UK, <sup>2</sup>Wythenshawe Hospital, Manchester University NHS Foundation Trust, Manchester, UK, <sup>3</sup>Lancaster Medical School, Faculty of Health and Medicine, Lancaster University, Lancaster, UK and <sup>4</sup>Royal Bolton Hospital, Bolton NHS Foundation Trust, Bolton, UK

\*Corresponding author. E-mail: [danikirk@doctors.org.uk](mailto:danikirk@doctors.org.uk)

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Editor—In early 2020, anaesthetists across the world adopted frontline roles in the fight against coronavirus disease 2019 (COVID-19).<sup>1</sup> However, those who were deemed vulnerable to the complications of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection were asked to ‘shield’ and so self-isolated at home to avoid exposure.<sup>2</sup> Likewise, those who tested positive for SARS-CoV-2 or whose household members had experienced symptoms were asked to self-isolate. Many of these colleagues began to work from home, a challenge considering the ‘hands-on’ nature of anaesthesia.<sup>3</sup> Motivated by a wish to make a meaningful contribution during the pandemic, and in response to the ongoing educational need despite the postponement of face-to-face tutorials, the Self-isolating Virtual Education (SAVEd) project was created by self-isolating trainees based in the North West School of Anaesthesia, UK. In this report, we describe the design of this online educational intervention, and present its impact in terms of uptake and educational evaluation. The Health Education England Research Governance Group granted permission to collect and present this data (date of approval: May 19, 2020).

Based on the Royal College of Anaesthetists’ training curriculum, with a focus on preparation for examinations, self-isolating trainees designed and hosted a combination of pre-recorded and live online tutorials. These were delivered

using a combination of videoconferencing (Zoom Version 5.0.2; Zoom Video Communications Inc., San Jose, CA, USA) and video-sharing (Vimeo Pro; Vimeo Inc., New York, NY, USA). At the time of writing, 24 live tutorials and two live study days had been delivered, and more than 80 pre-recorded tutorials had been made available through the North West School of Anaesthesia website ([www.mmacc.uk](http://www.mmacc.uk)). The tutorials were predominantly delivered by trainees, with some taught by consultants; topics were appropriately matched to clinical experience and expertise. All recorded tutorials were peer-reviewed by a senior trainee or a consultant before being published online. The resources were promoted through existing trainee e-mail contact lists, social media, and by sharing resources with other deaneries.

We were able to quantify the reach of SAVEd using social media platform analytics and website metrics.<sup>4</sup> Between March 27 and June 27, 2020, we recorded 4881 visits to the [www.mmacc.uk](http://www.mmacc.uk) website; the video tutorials received 8304 impressions (number of times the video web page was visited) and 3720 views (number of times the video was played) (Fig. 1). Content was accessed from 50 cities within the UK and 27 countries outside the UK. By June 27, 2020, the @SAVEd\_anaes Twitter account, which was established on April 8, recorded ~54 000 impressions, 1528 profile visits, 270 followers, 245 retweets, 382 likes, 763 link clicks, and a 6.6% engagement rate.