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My Thoughts / My Surgical Practice

Implications of lack of available personal protective equipment on surgical trainees: Lessons learned from the COVID-19 pandemic

The COVID-19 pandemic prodigiously impacted the healthcare system and created an unprecedented public health emergency.^{1,2} In the United States, this crisis uncovered a brittle supply of personal protective equipment (PPE), resulting in a national shortage of masks, gowns, gloves and other PPE, putting healthcare workers at risk of occupational exposure to COVID-19.³ Surgical trainees were not spared. Resident reports of inadequate PPE and negative effects on wellbeing began to emerge early in the pandemic. In early 2021, the American College of Surgeons (ACS) Resident and Associate Society (RAS) and Young Fellows Association (YFA) published the results of a national survey that found that a third of residents reported not having adequate access to PPE; further, being asked to provide one's own PPE was an independent predictor of depression and burnout and having access to adequate PPE was protective against burnout.⁴ A subsequent qualitative study of the surgical resident's experience during the pandemic revealed a "frantic" environment, with nagging uncertainty of PPE availability.⁵

In response to these data, the ACS-RAS designed a weekly rolling survey to its membership to better characterize PPE inadequacies and identify if PPE inability still remains a challenge in the time following the initial surge of COVID-19 in the United States. Further, this survey tool was created in hopes of identifying areas of PPE shortages, which could then inform distribution of PPE resources during this current and future pandemics. An anonymous, online survey with general questions about PPE was created and disseminated to the RAS listservs using SurveyMonkey® (San Mateo, CA). The rolling survey was sent weekly over six weeks.

During the six-week period spanning December 2020 and January 2021, there were a total of 111 respondents, with a diverse geographic representation. While institutional data was not available due to anonymity of the survey, responses included location by state; respondents' states spanned across the country, with most common locations being New York (21%), California (10%), Michigan (8%), Texas (8%), Wisconsin (5%), and Florida (5%). The survey data revealed that PPE availability continued to be an issue throughout 2020 and 2021 - nearly half of respondents (48%, 53) reported experiencing or witnessing a PPE shortage, with the most common being N-95 respirators. Contextualized in the fact that the majority of residents were not vaccinated at that time, these data are alarming. Nearly a third of respondents (32, 35%) reported that PPE shortages had affected their sense of safety and/or safety of their family. Further, 49 (44%) of respondents reported encountering barriers when attempting to acquire PPE. The majority of respondents (81, 73%) reported they were asked to re-use PPE, many for up to three months. Nearly one third (31, 28%) of respondents reported that PPE shortages affected patient care.

Several themes emerged from the qualitative responses. Residents characterized the PPE inadequacies with instances of taking care of COVID-19 positive patients without PPE or inappropriate PPE, described as "falling apart." One resident reported being "... provided PPE [which] says 'not for medical use' on the packaging and when brought up to supervisors/superiors all medical staff was assured it was ok." Another recounted, "... no waterproof PPE - [I was] vomited on by COVID + patient, soaking through my scrubs and underwear." Another theme beyond PPE unavailability was lack of access, a distinct issue from supply amount. Residents reported "categorical refusals" by nursing and administrative staff to provide PPE. One resident reported, "Residents were left out of every equation. PPE were physically kept away from residents, even when a direct request was made."

Ultimately, these issues in PPE availability and access resulted in negative effects on patient care. Respondents commonly reported that PPE inadequacies affected the ability to deliver care in a standard, timely fashion, delaying the ability to run trauma assessments, implement Advanced Cardiac Life Support protocol during cardiac arrest, and perform surgical procedures in an expedited fashion. One resident reported PPE shortages "caused delay in getting to patient's bedside to perform assessment to determine whether patient required urgent intubation." Another respondent reported "We are more hesitant to go into known COVID + patients' rooms when we do not have adequate PPE or are being made to use PPE unsafely." Other respondents reported less attending physician involvement in care, loosening of contact precautions, and inadequate, limited physical exams. As a result, residents expressed a general feeling of lack of safety, feeling "exploited" and "sacrificed." One respondent reported feeling that "residents are generally treated like second class citizens."

In this national survey of surgical residents from across the United States, we identified that PPE shortages and barriers to access were still an ongoing problem for trainees throughout 2020 and 2021, which ultimately affected patient care and trainees' sense of safety. This study is limited by a small sample size and sampling bias, however we believe these data are still important and highlight cause for concern for many reasons. As previously discussed, it has been demonstrated that the working environment within hospitals can impact mental health and psychological welfare of health care workers,⁶ in addition to affecting patients and their care. In sum, these data highlight that PPE shortages are ultimately a crisis for safe patient care in the current and future settings, potentially compromising health care workers' ability to deliver care. The voices of the residents, characterizing their experience during the pandemic underscores the importance of providing PPE in future pandemics, whether via a resident-oriented taskforce created by

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the Accreditation Council for Graduate Medical Education (ACGME) or otherwise, in this current and future pandemics. This is imperative first and foremost as a patient safety issue, but equally as important, as an essential response to preserving resident wellness.

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