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## Original Contribution

## Strategic planning and recommendations for healthcare workers during the COVID-19 pandemic

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During this pandemic it is imperative to wisely allocate our healthcare workforce and resources. A strategic plan for our healthcare system must both utilize and conserve resources from other medical specialties, including surgery. Surgical teams can play an unexpectedly large role in this global crisis. On 22 March 2020, POTUS guaranteed increased output for highly demanded resources, though the delivery date of these items remains unknown [1]. Similarly, it is not a simple task to replenish our healthcare workforce. Accordingly, a creative and sensible approach must address these imminent issues.

The healthcare workforce consists of many positions within various specialties, that each has assigned duties. In light of this pandemic, those duties need to be adjusted. This means reducing the number of elective surgical staff while concurrently training these same staff in critical care. Reducing working surgical staff is beneficial for staff as the surgical theater is a high-risk area secondary to risk of transmission during procedures such as intubation, endoscopies, and airway management [2]. Elective operations could expose the care team to COVID-19, which may then spread to other patients under the team's care [3]. To reduce this risk of mass transmission, postpone elective operations effective immediately [4]. Surgeries must be limited to emergent procedures and absolutely necessary operations.

Limiting the surgical staff to decrease healthcare workers exposed to COVID-19 subsequently creates a reserve workforce. The loss of a staff member due to infection with COVID-19 produces a two-fold issue: the loss of a team member and the addition of a new patient. To combat this magnified effect, additional reserve staff should be considered in this plan. By retaining a reserve of staff, any losses due to exposure will have a decreased ripple effect. To further increase the reserve staff, newly matched fourth-year medical students must be considered.

Many programs, including Boston, Harvard and Columbia Universities are already adjusting to accelerate graduating their matched fourth-year medical students in order to increase their local healthcare workforce [5–7]. Another approach to increasing the reserve staff is to make all residents available to execute clinical duties. According to the American Board of Surgery, residency programs may utilize off-service residents, including those in research, to participate in clinical duties, thus adjusting the timing of research years for individual residents to begin or resume at a later, more appropriate date [8]. Additionally, the Accreditation Council for Graduate Medical Education (ACGME) has suspended many responsibilities including self-study activities, submissions, site surveys and interviews. Without these obligations, residency programs can solely focus on their clinical duties while most importantly decreasing exposure and unnecessary physical interactions that may, instead, be conducted via telecommunications [9,10]. Another consideration is to call upon the recently retired, an option that is already in use by other countries. Training non-ICU staff on the methods of critical care medicine is a viable option. The Society of Critical Care Medicine is offering free training for physicians not familiar with critical care medicine in light of this global crisis [11]. Therefore, an optimal course of action allows those in the “reserves” to obtain training and then relieve their peers as needed. In regard to maintaining a large and trained reserve workforce, there is durability in numbers.

With a reduction in surgeries, we can immediately begin to address the shortage of resources. Recognizing the near future rise in patients infected with COVID-19, there will be an increased need for ventilators and personal protective equipment (PPE). Currently, it is anticipated that the apex shortage of ventilators will number just under half a million [12]. Therefore, it is imperative that strict triage of all patients is followed to preserve resources. Medications, specifically antivirals and possibly the anti-malarial drug chloroquine, are also beginning to diminish as many hospitals attempt to discover an effective regimen to turn the pandemic tide. To aid in this crisis, resources can be redirected from the surgical department to the COVID-19 section of the hospital. Many companies are working to address these resource shortages and we must continue to envision a strategic plan throughout the duration of this crisis to avoid the disastrous repercussions of severe shortages which include an increase in the death toll [1]. The strategy needs to allocate resources appropriately while anticipating future supply and demand.

When considering the best strategy to handle the global pandemic ignited by COVID-19, conservation of our staff and resources is essential.

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Reducing the number of surgical staff results in a multitude of effects. These effects include the reduction in the use of hospital resources such as beds, PPE, and ventilators as well as preserving the health of the surgical staff. Though the working staff may be reduced in numbers, this creates an opportunity to strengthen and add to our reserves of healthcare workers.

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