Close air support: enhancing emergency care in the COVID-19 pandemic

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ABSTRACT

The COVID-19 pandemic has taken the world by storm and overwhelmed healthcare institutions even in developed countries. In response, clinical staff and resources have been redeployed to the areas of greatest need, that is, intensive care units and emergency rooms (ER), to reinforce front-line manpower. We introduce the concept of close air support (CAS) to augment ER operations in an efficient, safe and scalable manner. Teams of five comprising two on-site junior ER physicians would be paired with two CAS doctors, who would be off-site but be in constant communication via teleconferencing to render real-time administrative support. They would be supervised by an ER attending. This reduces direct viral exposure to doctors, conserves precious personal protective equipment and allows ER physicians to focus on patient care. Medical students can also be involved in a safe and supervised manner. After 1 month, the average time to patient disposition was halved. General feedback was also positive. CAS improves efficiency and is safe, scalable and sustainable. It has also empowered a previously untapped group of junior clinicians to support front-line medical operations, while simultaneously protecting them from viral exposure. Institutions can consider adopting our novel approach, with modifications made according to their local context.

INTRODUCTION

The COVID-19 pandemic has taken the world by storm and overwhelmed healthcare institutions even in developed countries. Singapore is battling a large second wave of cases, driven mainly by returning residents and migrant dormitory workers. This has led to a surge in cases in EDs countrywide.

METHODOLOGY

To address these needs, we piloted a military concept, close air support (CAS), to augment ED operations for the fever facility (FF) at our institution. In military terms, CAS refers to the direct support of ground troops by air assets, and has been used effectively in many wars. Presently, the COVID-19 pandemic is catalysing a drive towards telemedicine for delivery of care.[1 2] We had earlier trialled a similar concept within our surgical department, which had been divided into separate teams which alternated between inpatient and outpatient duty on a rotational basis.[3] Junior staff from the outpatient team provided real-time but remote support to the inpatient team during ward rounds. This reduced junior burn-out rates by obviating the need for the inpatient team to arrive earlier to 'pre-round' the patients and increased efficiency while preserving geographical segregation between teams. Using this experience, we aimed to develop a system for the ED that would (A) increase capacity and (B) shorten the patient care journey yet (C) reduce viral overall exposure.

Junior staff from the outpatient surgical team were allocated as CAS doctors to assist front-line emergency staff during known ED surge periods. Staff were organised into teams of five, comprising an attending ED physician and two junior ED physicians, who would be physically on-site, as well as two junior surgical residents, who serve as CAS doctors and situated off-site in an office with computer access. The CAS doctors would be constantly connected to and receive direction from their paired ED physicians via teleconferencing to render real-time support. The attending ED physician would be responsible for overall supervision and coordination of the team and help with front-line tasks as required.

The FF at our institution serves all stable patients who present emergently with fever, symptoms of acute respiratory infection or risk factors for COVID-19 infection such as recent travel or contact with a known patient with COVID-19. In the typical patient journey, a patient would be triaged and informed that a doctor would contact them via cellphone. A CAS doctor would then contact and clerk the patient while they await examination by the ED physician. Next, the CAS doctor would update the patient's history to the ED physician, who would then proceed to examine the patient, perform any procedures required and direct management. The CAS doctor would facilitate this process by documenting in the electronic notes, making the appropriate referrals as well as ordering and tracing investigations. They would also process discharge medications and paperwork, leaving the ED physician free to engage the next patient. This schema is depicted in figure 1.

DISCUSSION

By harnessing the ubiquity of technology and computerisation of medical records, CAS increases ED capacity and healthcare worker safety while decreasing strain on existing ED infrastructure and resources, which might not be able to support the increased physician numbers should they all be deployed to the front lines. Reducing the number of physicians on the ground also reduces direct viral exposure, decreases healthcare worker infection rates and conserves precious personal protective equipment (PPE).

For ED physicians, CAS decreases cross-contamination by decreasing the number of times healthcare professionals switch between donning PPE and performing administrative tasks. Further, CAS improves productivity by allowing ED physicians to focus on value adding to the aspect of patient care that most requires their expertise. Finally, the unprecedented scale of the outbreak has led many countries to consider involving medical students in clinical patient care, although many reservations remain regarding their safety and independence.[4] Notably, in their latest guidance, the Association of American Medical Colleges strongly recommends that, barring a critical need in workforce, students in locales with significant or active community spread or limited availability of PPE not be involved in any direct patient care activities.[5] Unfortunately, these are often the worst-hit areas that would benefit most from additional manpower. CAS assuages many of these concerns by allowing medical students and doctors who are not yet independent practitioners to attend to patients in a safe and supervised manner.

Overall, by reallocating manpower and resources, CAS enhances efficiency and builds in flexibility, scalability and sustainability into ED operations—important attributes as the COVID-19 pandemic is likely to be a drawn-out war. Indeed, after more than a month of implementation, we managed to substantially improve the time to patient disposition during surge periods with less than double the supplementary

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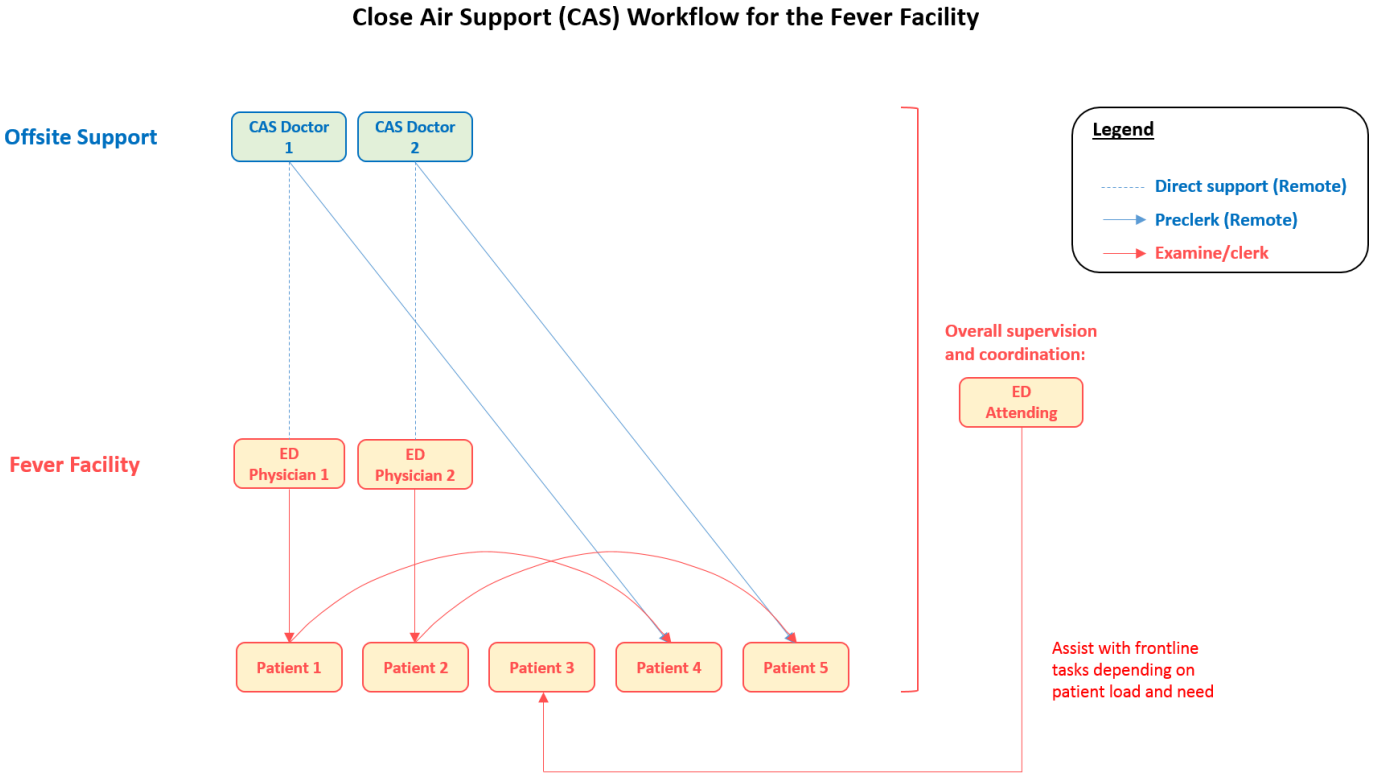

Figure 1 Workflow of Close Air Support (CAS) in the emergency service.

manpower. Feedback was also positive especially once staff familiarised themselves with the process.

Limitations

As in CAS employed by the military, proper coordination and communication between front-line physicians and supporting personnel are critical for mission success. Clear instructions also need to be given by the front-line physician to ensure accurate documentation and execution of orders. As CAS is technologically heavy, it would only be feasible in institutions with computerised medical records and high-speed internet access.

CONCLUSION

CAS is effective in improving the operational efficiency of ED operations and is scalable according to demand. By reimagining the current paradigm of patient care, we have empowered a previously untapped group of junior clinicians to support front-line medical operations, while simultaneously protecting them from viral exposure. Institutions can consider adopting our novel approach, with modifications made according to their local context.

Contributors TYL was responsible for writing the manuscript, creation of the figure and literature search, and was involved in the trial as a CAS doctor. IM was responsible for vetting the manuscript and study design, and was involved in the trial as the attending/representative from the ED. JWLL was involved in the development of the workflow process as well as in the trial as a CAS doctor. KYN was responsible for conceptualising this approach, study design, as well as providing direction on writing and vetting the manuscript.

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