Setting up an emergency medical task force to manage the demands of COVID-19: experiences of a London teaching hospital

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INTRODUCTION

The WHO declared COVID-19 a pandemic on 12 March 2020.[1] Within 2 weeks of the first identified case in the UK, the number of confirmed cases had increased from 20 to 1500.[2 3] By 12 May 2020, the UK had the fourth highest number of cases in the world, and the second highest number of deaths due to COVID-19 infection, with 225 000 positive cases and over 32 000 deaths. London had the highest incidence in the UK with 25 980 confirmed cases,[4] which was especially concerning given the population density in the capital.[5 6] Hospitals in London, therefore, saw an exponential rise in patients presenting with COVID-19 pneumonitis, necessitating the formation of new wards and an urgent need to support those responsible for them in General Medicine and Intensive Care.

The arrival of COVID-19 caused huge disruption to the regular workflow of hospitals throughout the UK.[7–9] Most specialties cancelled elective activities in mid-March 2020, and the Royal Colleges suspended training[10] to permit redeployment of trainees. Doctors were transferred from both medical and surgical disciplines to maximise the total workforce pool.[11] For many, this was a very stressful time, faced with demanding work outside their chosen specialty, placed on schedules at very short notice with no annual-leave permitted and with no clear endpoint.[12] Research posts and placements integral to individuals' training were suspended.

The Royal Free Hospital is a major university teaching hospital, and hosts the only high-level isolation containment unit in London. It provides healthcare services to a wide catchment population in excess of one million people. Additionally, it is a tertiary referral centre for centralised services such as cancer immunology, rheumatology, liver and kidney disease, transplantation, complex vascular surgery and other specialist disciplines. In anticipation of the added pressures from the COVID-19 outbreak, many services were cancelled or diverted to other centralised units.

A centralised COVID-19 team was established on 16 March within the postgraduate medical education (PME) centre to address varied facets of the redeployment response. The 'COVID-19 PME task force' consisted of doctors from multiple specialties and different levels of training. Initially tasked with leading the design of COVID-19 rotas for over 400 junior doctors, it became apparent that the group could lead on many aspects of the hospital's response. The task force developed a comprehensive, collaborative and adaptable leadership approach, aiming to empower each member to realise solutions to matters arising in real-time regardless of seniority.

Nine domains were identified as being fundamental to the response, and task-force leadership was assigned to each of these domains depending on individual strengths, experience and preferences—workforce/rota, well-being, handover, clinical guidance, education, medical school, infection control, information technology (IT) and operations (figure 1).

WORKFORCE

> ► >400+ doctors redeployed according to skillset, training specialty and grade. Doctors redeployed to Intensive Care Unit (ICU), emergency department or acute medicine, drawing up new rotas within short timeframe.
> ► Identifying sickness and rota gaps to ensure timely replacement found.
> ► Liaising with human resources to fast-track locum staff onto hospital temporary staffing bank and arrange their induction.
> ► Communicating with doctors regarding rotas, terms and conditions of employment and annual leave.

Rapid workforce changes were required as over 400 doctors from a wide variety of specialties, research placements and out-of-programme posts[13] were redeployed to frontline specialties, including acute medicine, emergency department (ED) and the intensive care unit (ICU). Working with human resources to acquire accurate lists of trainees and out-of-programme doctors was an essential starting point. Using the knowledge of a representative foundation trainee, core trainee and specialty registrar, each of these doctors
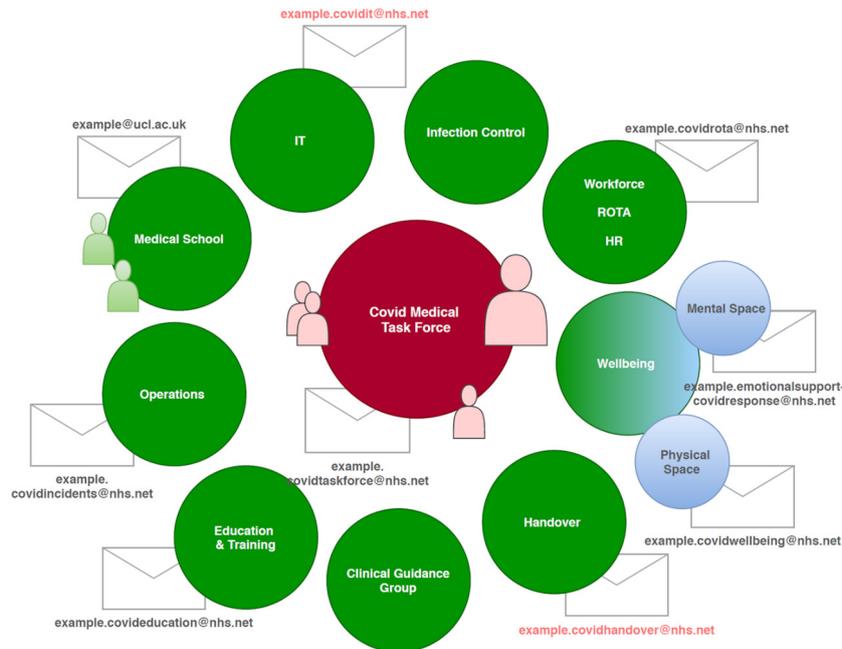
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Figure 1 Nine domains set up by the COVID-19 postgraduate medical education task force.

could be assigned to either medicine, ED or ICU. For instance, most surgical trainees were posted to ED as it was felt this would suit their skillset and allow them more exposure to any minor procedures or acute surgical presentations. Anyone with prior ICU experience or interest was assigned to their rota. The focus of the COVID-19 task force was to design the medical rota, and organise doctors covering the medical take, COVID-19 wards and any general medical wards (such as the Acute Medical Unit). The ED and ICU rotas were designed and organised separately by their respective departments. Tertiary care services (eg, hepatology and renal) retained the junior doctors already working in these departments.

Each doctor allocated to acute/general medicine was assigned a tier corresponding to their experience as a general medical SHO, registrar or consultant. For all others, length of time since completion of core medical training or foundation training was used to assign tiers, with those who had more recently completed these training programmes being assigned to a higher responsibility tier. This approach was decided after discussion among the task force members, and approved by the divisional leads for each specialty, as it was felt to be more representative than assignment based on specialty grade for those not trained in a general medical specialty (online supplemental file 1). The tiered doctors were placed into one of four 'houses', and then distributed evenly into teams to ensure an even balance of general medical experience. Individuals were to remain in their teams throughout the duration of the pandemic in order to facilitate cohesion and familiarity, and a leader for each team was nominated to communicate any difficulties to the task force, including absences due to sickness. The teams were assigned to a consistent rolling rota with 12.5-hour shifts, working 3 days/nights, followed by 3 days off, as summarised in Online supplemental file 1. Furthermore, the teams were rotated around different clinical areas known as 'firms', which included medical take, suspected COVID wards, confirmed COVID wards and 'float' as illustrated in figure 2.

The 'take' firm, who admitted patients, was split into two groups. During each shift, part of the 'take' firm would admit patients presenting with symptoms of COVID-19 or those who had been exposed (red), and the remainder would attend to patients not suspected of being COVID-19 positive (green). The number of doctors in green or red teams would be adjusted depending on changing demand. Dividing the firm into these teams in turn limited the risk of spreading the virus to patients presenting without COVID-19 infection . Due to the delay in nasopharyngeal swab results, a suspected COVID-19 team was created to manage patients with a pending result (ideally nursed in side rooms, though this was not always possible). Once a patient received a positive test result, they would be moved under the care of the confirmed COVID-19 team, iand nursed in open bays in a separate isolation ward. In addition to the designated teams, a 'float' group was established to help fill any absences due to sickness or exposure. It has been estimated that up to 20% of staff needed to remain at home during the peak in COVID-19 cases, due to infection or exposure to COVID-19. This occurred across all staffing groups, including nurses, domestic staff and allied healthcare professionals. It was, therefore, imperative that a robust communication network between team leaders and the workforce group was in place to identify sickness and staffing issues early, so that this could be relayed to HR/temporary staffing/locum agencies without delay.

HANDOVER

- ▶ Twice daily handover structured to ensure adequate staffing of all emergency medical areas as well as essential baseline specialist services, for example, hepatology, nephrology and cardiology.
- ▶ Representatives from each of these areas either attended or dialled in with an update on their staffing situation and request for additional staff.
- ▶ Large space provided for handover to facilitate social distancing (eg, lecture theatre).
- ▶ Handover used for important announcements and updates about policy, for example, O_2 saturation targets, information regarding staff testing and education. Also used to obtain feedback on changes proposed or implemented.

To maintain a balance of structure and emotional containment while focusing on clear communication and empathy,[14] handover was scheduled in two adjacent lecture theatres at 08:00 and 20:00. Handovers were organised at the beginning and end of each 12-hour shift, in a location with enough space to permit social distancing between at least 15–30 individuals. Microsoft teams were used to expand the number of people able to join handover, who could not be safely accommodated within the space available. Clear communication between the incoming and outgoing teams was integral to the functioning of new clinical areas and roles created to meet the demands of the pandemic. The principles of social distancing within the handover area were strictly adhered to, with attendees sitting at least 2 m apart. 'Green' (not seeing patients with COVID-19) and 'red' (seeing patients with COVID-19) teams entered and exited through separate doors, with labelled seating areas to minimise cross infection.

During handover, absences were accounted for, and staff redistributed to ensure appropriate cover in all clinical areas. Daily admission numbers were displayed on an overhead screen and key messages disseminated, for example, appropriate Venturi mask use to minimise oxygen wastage. This also provided an opportunity for announcements regarding updates to policy, practices, guidelines and protocols. Regular electronic (mentimeter) surveys were conducted to capture feedback and appropriate timely changes. Central handover was limited to 10 min, allowing an additional 15 min for individual clinical teams to handover patient-specific issues.

Physical and mental well-being

> ► Rest and eating areas were established using repurposed medical school areas, which remained open 24 hours/day with freely available meals, snacks and beverages. Quiet rooms also provided with beds.
> ► Requests for hospital accommodation and parking spaces increased dramatically, and so facilities such as unused hotels were found, and the team liaised with local councils to allow street parking for NHS staff.
> ► Each team had access to psychological support and formal debriefing sessions. Each house had an elected communicator to help to link individuals to services.
> ► Surveys of well-being were carried out at regular intervals (described by AA PMID: 33094261).
> ► Mindfulness app made available for free to all junior doctors.

Caring for the physical and mental well-being of staff was recognised as integral to success. The physical and emotional demands of the workplace were significant and most staff had concurrent anxieties about their own health and that of their families and friends.

Physical well-being

Attending to physical well-being with the constraints of social distancing and infection control principles presented several challenges. Medical school seminar rooms were rapidly repurposed into changing rooms for incoming and outgoing green and red teams (with shower facilities). Scrubs were made available throughout the day at staggered intervals. Medical student lockers were reallocated to doctors. The medical school student 'Hub' was transformed into a 'red' rest and eating area, while other tutorial rooms were fitted with on-call beds. Similarly, green areas were repurposed. Rest spaces were located close to respective clinical areas to reduce unnecessary traffic and infection risk. Free hot food and snacks with single-use packing and utensils were provided. Staff with longer commutes or vulnerable family members were offered free local accommodation (including unused hotels). The well-being team liaised with the local council to provide free parking for NHS staff.

Emotional well-being

Emotional support was critical throughout this period, where there was great uncertainty about how health services were going to cope with rapidly increasing demands, and with this an increased risk of moral injury under the strain created.[15] The task force worked with the hospital's Resilience and Emotional Support Service team (2 psychiatrists and 22 psychologists) to provide psychological support to all healthcare workers. Through this resource, emotional resilience training and mindfulness sessions were organised. In addition, the chaplaincy team provided diverse religious and non-religious support. A private enterprise offered free mindfulness sessions two times per week, that led to the creation of an online mindfulness resource specifically for healthcare workers caring for patients with COVID-19. Licenses for various mental health apps were sourced and made available.

A 'buddy' system was instituted to ensure that sick staff members were contacted daily while unwell and timetabled debriefs were arranged for individuals and groups. Pulse oximeters were procured and made available to staff who needed to self-isolate due to COVID-19.

EDUCATION AND CLINICAL GUIDANCE GROUP

> ► Use of Microsoft teams to deliver a medical education programme during the COVID-19 pandemic was hugely successful, and is likely to continue beyond the pandemic.
> ► Daily drop-in simulated learning sessions were organised to practice procedures such as blood gas taking and chest drain insertion.

The education faculty focused on frequent updates and latest evidence regarding the management of all aspects of COVID-19. Education was underpinned by the work of the Clinical Guidance Group who developed local advice on the basis of the latest Public Health England guidance. Teaching was delivered in the form of daily lectures and discussions via live videoconferencing software, with doctors of all grades and specialties presenting. The recorded sessions were made available to watch online. The schedule was advertised to hospital staff via a shared calendar, with reminders of each day's topics provided during handover. Discussions of landmark publications directly related to COVID-19 were also streamed in weekly journal clubs. Feedback for teaching was overwhelmingly positive, with over 96% of 285 responders reporting that the sessions were relevant to their practice, and 99% of 180 responders reporting teaching sessions were good for morale.[16]

ICU had a particular requirement for those trained in proning ventilated patients, hence simulation sessions were set up for staff, medical students and volunteers to teach this.[17 18] Other simulation sessions included emergency management of patients with COVID-19, and procedure-based training. These were run daily.

MEDICAL SCHOOL

► Medical students were redeployed to areas of need according to seniority of medical school year.
► Final-year medical students who were repurposed as interim FY1s (FIY1) were induced and assigned to areas of need. Induction processes were arranged and delivered at speed and each FIY1 was integrated into a tight supportive team.
► Many medical students also worked as healthcare assistants/support staff; a 1-day induction was developed and implemented with the help of nurse educators.
► Examples of areas where medical students were deployed with good effect are ICUs, dialysis satellite units and virology laboratories.

Our hospital is closely affiliated with UCL medical school. This meant that there were many medical student volunteers, and approximately 150 students from clinical years were deployed to a wide range of paid and volunteer roles (online supplemental file 1). The programme was supported by the Trust's management and administrative teams who created accessible points of contact for students. It was crucial to ensure that students had a safe environment without being overwhelmed; hence, each student was designated a clinical supervisor, and students were encouraged to engage in educational opportunities and well-being initiatives provided for hospital staff. The COVID-19 PME team worked to provide appropriate training opportunities and upskilling of students. Feedback suggested that students were eager to help and found their experiences valuable to their professional development. Other staff valued their significant practical contribution, which they reported had a positive impact on overall workforce morale.

INFECTION CONTROL

► Signage to facilitate social distancing during day-to-day activities, for example, corridor movement flow arrows and number of people allowed to sit at each table in eating areas.
► Changing rooms and showering facilities.
► Devised method to sterilise Venturi masks.
► Personal protective equipment donning and doffing training working closely with lead Infection Control nursing group.
► Mask-fit testing for all staff early on during pandemic.

Principles of infection control were embedded into each domain described above. The taskforce worked with the hospital infection control team, which comprises several allied healthcare professionals, to ensure that high footfall areas were assigned designated cleaning staff throughout the day and that most doors were left open to minimise handle contact. Posters and other visual aids were created and displayed to serve as reminders. In-hospital production of hand gel and personal protective equipment (PPE) gowns were rapidly requisitioned and upscaled by liaising with local entrepreneurs and schools. These gestures ensured a safer work environment but were also important for staff morale.

Refresher courses in infection control were introduced for new and returning staff. All relevant staff attended mandatory donning/doffing training, and individual mask-fitting checks were performed to reduce COVID-19 exposure risk. Due to high turnover of PPE, mask fitting needed to be repeated according to mask style availability.

INFORMATION TECHNOLOGY

► Rapid implementation of Microsoft teams enabled many other domains to function within the constraints of social distancing rules, for example, handover, teaching and communications (PMID: 33 177 050).
► Repurposing donated iPhones and iPads for patient use and for family communications.
► Use of 'mentimeter' to rapidly obtain feedback on aspects of the COVID-19 response.

Trainee involvement in clinical informatics and IT was integral to the success of all the other domains. In-hospital communication was restructured, with curation of email lists, bulletins and mobile apps. For outpatient settings, the process of rapid digitisation and enabling remote video meetings was expedited. Non-patient facing trainees were given remote access to the electronic healthcare records to facilitate phone and video consultations. For inpatient care, use of personal devices was accelerated, allowing clinicians to use approved mobile apps to view clinical information both on-site and remotely. The coverage of a regional information sharing platform was extended to allow viewing of up-to-date patient records from primary care and other local hospitals in our area.
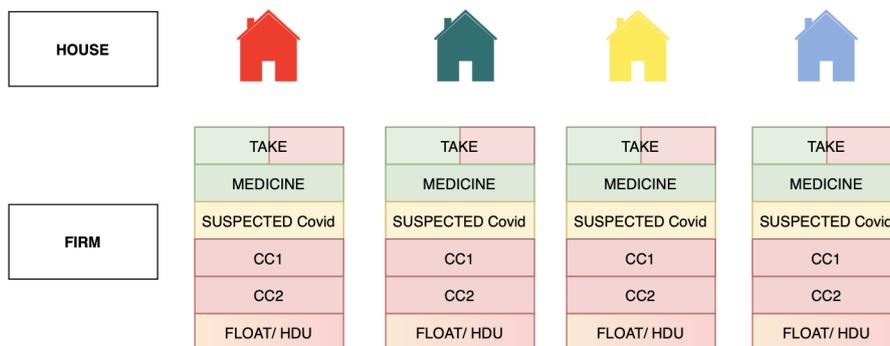

Figure 2 On-call system according to the four houses and individual firms - Take, Medicine, Suspected Covid, Confirmed Covid (CC1 and CC2) and Float/HDU.

Digital systems were improved to reduce clinician workload - automated coding of COVID-19 diagnoses with discrete data field capture standardised communications on discharge letters, new reporting tools and a live in-patient dashboard were shared real-time with staff.

OPERATIONS

> ► The hospital incident room was created as a point of contact for staff to report problems needing rapid resolution.
> ► Set up by the hospital managers early in the pandemic, made up of a multidisciplinary team, including two doctors, volunteers and other non-medical staff.
> ► The team assisted the bereavement team working with head of mortuary, designing and delivering more rapid means of death certification, release of remains, body storage and return of belongings to families of the bereaved.

Co-ordination of resources and responding to staff and other queries was orchestrated via a hospital 'incident room'. This was physically located close to senior management offices and was staffed by eight individuals, including two senior ophthalmology trainees, middle managers and a number of volunteers seconded by local business groups. This service operated for 12 hours/day, 7 days/week and allowed rapid communication between healthcare professionals and hospital management; this enabled rapid roll-out of operational solutions to numerous unforeseen issues during the crisis. The team dealt with all queries relating to supplies (including scrubs), housekeeping, the mortuary, bereavement and patient/family communications, as well as being responsible for liaising with national bodies and for reporting COVID-19-related deaths.

DISCUSSION

Within 3 days of setting up the COVID-19 task force, approximately 400 trainee doctors and consultants had been redeployed to new rotas, and novel clinical teams and areas were operational. Our experience of leading the various domains within the COVID-19 task force relied on encouraging a collaborative atmosphere at all stages, as well as building a strong framework from which clinical and operational demands could be acted on. Communication networks were key to ensuring that healthcare staff could escalate problems or concerns to the task force, as well as providing feedback on experiences so that improvements could be made. Furthermore, a system of regular feedback ensured that advancements could be made through an iterative process, ensuring that all negative effects of changes could be minimised. Those leading a particular domain had to liaise and coordinate activities with a wide range of other individuals and teams within and outside the hospital. This required sound organisation and communication skills, as well as a detailed understanding of how the hospital functioned prior to the pandemic. Hence, using trainees with a range of experience within the hospital worked more effectively than simply using senior consultants with less experience of certain hospital operations such as the practicalities of out of hours cover.

A flexible approach to rotas was initially designed to ensure that staffing was equally balanced for day and night shifts, accounting for sufficient rest between shifts. Limiting the number of shift changes in a 24-hour period reduced the possibility of cross infection. Staffing levels were maintained above the perceived minimum to account for unplanned absences. Additionally, work schedules remained largely compliant and permitted safe upskilling of redeployed staff, as well as ample supervision at a time when bespoke training needs could not be met. The rolling 3-day rota was well accepted as evidenced by regular surveys, and was also sustained for the duration of time a category 4 incident had been declared.[19] On 25 April 2020, 5 weeks after its introduction, the original rota was slimmed by 25% to reflect decreased work intensity and resumption of normal services, including elective theatre lists. Trainees from these services were prioritised for replacement to previous job roles. On 12 June 2020, all COVID-19 rotas were stopped, and doctors went back to their regular job plans they had been due to undertake prior to the pandemic.

Community efforts by local restaurants, shops and non-profit groups provided food and other gifts that were welcomed, coordinated and distributed by the COVID-19 PME task force. Donations as diverse as PPE, mobile phones and bicycles reflected the care and goodwill of the local community. These all helped to bolster moral and emotional support for staff working in otherwise stressful and unstable conditions.

In mid-March 2020, there was no blueprint for how to adapt services in the face of a new pandemic. The commitment and initiative, particularly of the non-consultant grade doctors, was instrumental in reorganising the medical structure of the hospital within days. Such rapid change stretched communication between departments, and some aspects of redeployment could have been more efficient. Furthermore, it would have been preferable to give redeployed doctors more warning and information about the proposed rotas far in advance. This was challenging during the first months of the pandemic as it evolved rapidly and unpredictably but would be recommended for future waves or other national crises. The psychological journey that many healthcare professionals had to undergo, in terms of being reorganised around a new set of priorities, was more traumatic for some. In retrospect, insufficient provision remained to support certain specialties, and left consultants to run wards single-handed while supporting their wider hospital and outpatient services. Further criticisms of the task force were the relatively little engagement it had with nursing colleagues (who took responsibility for their own rotas), as well as the inadequate attention made to bespoke individual trainee needs. Attention to these areas should be added to future models.

Despite this, there are strengths and achievements that should be highlighted in terms of the function of our leadership model. Daily handover meetings and regular feedback helped to identify staffing shortfalls so that they could be propped up according to changing needs and demands as the pandemic progressed. Official training programmes were suspended, but many elements of teaching and training were maintained and enhanced with excellent reports from staff. Overall feedback on the experiences of the new rotas designed by the task force was mostly positive, with most staff feeling adequately supported during shifts and with sufficient rest between shifts.

The experiences of the COVID-19 task force created a blueprint for our own institution to use in further crises. Looking at the data from ICNARC,[20] our hospital has been shown to have performed well despite the high patient burden it faced, with above average patient survival across a range of demographics and severity indicators. Though the reason for this is likely multifactorial, the organisation and successful expansion of our frontline services is likely to have played a major role. We posit that the leadership model used by our hospital could

be further adapted in other hospitals and healthcare settings in order to facilitate rapid extension of frontline services (a factor suggested by ICNARC to be associated with superior outcomes for patients).

A key lesson for our trust was the value of looking inwards to repurpose capable talent, and to harness the leadership skills of junior doctors at any level.[8] Trusting and empowering individuals to step forward and solve problems, with the guidance and support of senior consultants and management, led to the great achievements made through this leadership model.

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