


LETTER



Rapid establishment of a COVID-19 critical care unit in a convention centre: the Nightingale Hospital London experience

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Dear Editor,

In response to an unmet need of critical care beds in London during the first wave of the coronavirus disease 2019 (COVID-19) pandemic in late March 2020, a critical care unit was constructed over nine days in a conference center in East London. This facility, the Nightingale Hospital London (NHL, Fig. 1), had no existing infrastructure for healthcare provision.

This retrospective cohort study describes the characteristics and clinical outcomes of patients admitted to NHL compared to a national cohort of critically ill patients with confirmed COVID-19 admitted to critical care units participating in the Case Mix Programme (all NHS adult, general intensive care and combined intensive care/high dependency units in England, Wales and Northern Ireland, plus some additional specialist and non-NHS critical care units) and reported to the Intensive Care National Audit and Research Centre (ICNARC) during the first wave of the epidemic, up to 31 August 2020 ($n = 10,941$).

All patients admitted to NHL had a confirmed or suspected COVID-19 and were invasively ventilated at the time of referral/admission. Inclusion criteria for referral and admission are outlined in Figure S1.

Fifty-four patients were cared for between 7 April and 7 May with a peak of 35 patients (Figure S2). Median age was 61 years with a male bias (45/54, 83%, Table S1). The patient characteristics and severity of illness on admission to NHL were broadly similar to those reported in the national cohort with equivalent median APACHE II scores (15 vs. 15) and PaO₂/FiO₂ ratios (14.7 kPa vs. 15.8 kPa, Table S1). Median critical care length of stay prior to NHL admission was 4 days (range 2–16 days). Requirement for organ support and duration of organ support were similar between the NHL and national cohorts. Seven (13%) patients were extubated at NHL. Twenty (37%) patients died whilst an in-patient at NHL and a further 6/27 (11%) died following repatriation to their local critical care unit once critical care capacity in London was restored (Figure S3). Overall critical care mortality (including death in critical care following transfer from NHL) was 48.1% compared with 47.7% in the national dataset for patients requiring advanced respiratory support (Table S1). Duration of critical care amongst survivors was a median of 34.5 days (IQR 16–47 days) compared to 12 days (IQR 5–28 days, Table S1) nationally which may have reflected the absence of a tracheostomy service at NHL for safety reasons.

Mortality at NHL compares favorably with international case series of over 50% for those who receive mechanical ventilation [1, 2] albeit that 50% of patients were transferred out for both clinical and non-clinical reasons (Figure S3). Further, mortality nationally in mid-April, when NHL was operational, was 67% [3, 4] and declined over time as experience of both patient and systems management evolved [5]. While criteria for transfer to NHL meant that admissions may have been biased

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Fig. 1 Nightingale Hospital London

towards more clinically stable patients, these outcomes were achieved on a site with significant logistical challenges, including no pre-existing oxygen supply. NHL opened with critical care nurse:patient ratios (1:6) and consultant:patient ratios (1:30) with no pre-established governance or operating procedures specific to the environment or staffing model. NHL was also operational at a time when there was significant uncertainty regarding optimal patient management and no proven disease-modifying pharmaceutical interventions.

Whether the NHL blueprint was the optimal model of care or represented appropriate resource allocation remains moot but it was deemed necessary at a time of crisis. The operating model as originally conceived, was based on previous (influenza) pandemics. Subsequent clinical experience highlights that the clinical syndrome of COVID-19 and the spectrum and duration of multi-organ support requires comprehensive critical care capability. Future planning should account for

this. Nonetheless, the need for emergency critical care capacity remains a realistic prospect for this pandemic and future viral pandemics and whilst there are challenges in accurate comparisons with other critical care units, the data herein suggest that emergency critical care in an alternative setting can be delivered efficiently and effectively.

Supplementary Information

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Author contributions

AP conceived and designed the study. All authors contributed to the interpretation of data. AP, BoB, RS, DG, AM drafted the manuscript. All authors critically reviewed the manuscript and approved the final version.

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Compliance with ethical standards**Conflicts of interests**

The authors declare that they have no potential conflict of interest.

Ethics approval and consent

Processing of patient data without consent was approved by the Confidentiality Advisory Group of the Health Research Authority under section 251 of the NHS Act 2006 [PIAG 2- 10(f)/20059]. Approval by a research ethics committee was not required, as analysis was performed as part of service evaluation.

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