

Initial hospital preparation and response to fight the COVID-19 pandemic, based on the British university hospital experience

Tomasz Torlinski

Department of Anaesthetics and Critical Care, Queen Elizabeth Hospital Birmingham, University Hospitals Birmingham NHS FT, UK

Dear Editor,

Responding to the excellent initiative of Prof. Janusz Andres and the Polish Society of Anaesthesiology and Intensive Therapy, I would like to share our initial experience of the preparations and the actual hospital response to the coronavirus (COVID-19) pandemic from the British perspective.

At the time of writing of the article (03.04.2020), the number of patients diagnosed with COVID-19 has exceeded 38 000 in Great Britain, and in England and Wales alone, the number of patients with COVID-19 in intensive care units has exceeded 2200 [1]. Those numbers alone show the extent of the problems that we have been dealing with.

The University Hospitals Birmingham NHS Foundation Trust (UHB NHS FT) is one of the largest hospital organisations in England, providing specialist healthcare in the West Midlands, inclusive of Birmingham, the second biggest city in England. The largest and the leading hospital in our Trust is the Queen Elizabeth Hospital Birmingham (QEHB), where I have been working. The QEHB hospital also hosts the Royal Centre for Defence Medicine, with a significant percentage of military medical personnel with the experience in fighting past epidemics, e.g. the Ebola virus across the world. In "peaceful" times, the Critical Care Unit has the capacity to provide intensive care for almost 100 patients.

Based on the Italian experience, from the outbreak of the pandemic, it has become clear that the only

chance to deliver intensive care to all the patients requiring ventilation is to significantly increase the footprint of critical care beds across the country, even to triple the preceding number. The obvious challenge has been to provide the appropriate equipment for newly created, but fully functional critical care beds, but even more importantly, to ensure proper staffing, nursing and medical alike.

In early March, it was decided nationally to suspend any elective surgical work, which allowed us to use idle anaesthesia care stations as ventilators. In Great Britain, each operating theatre is traditionally equipped with two anaesthesia machines (one in the anaesthetic induction room, the other one in the actual operating room). Thus, in our institution, the transfer of anaesthetic equipment and beds to the ICU instantly doubled the number of available intensive care stations with fully usable ventilators. In addition to that, further ventilators have been purchased and delivered shortly afterwards [2].

NHS England, which has been coordinating the national response to the pandemic, has issued a regulation on intensive care standards during Covid-19 pandemic. The actual document assumed the multidisciplinary involvement in the case of the significant increase of ventilated patients. The national expectations were that the single critical care specialist would lead the team of physicians of other specialities, dealing with the "sector" of up to 60 ventilated patients in the

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CORRESPONDING AUTHOR:

Dr Tomasz Torlinski MD PhD FFICM, Department of Anaesthetics and Critical Care, Queen Elizabeth Hospital Birmingham, University Hospitals Birmingham NHS FT, UK, e-mail: tomasz.torlinski1@nhs.net

case of threefold increase of the critical care demand [3]. As a result, we have taken multiple steps to increase the number of staff available in the ICU. The training of the additional personnel involved: (1) training doctors and nurses who had some prior experience in intensive care or related disciplines, to work directly at the patient's bed-side, and (2) organising specialist teams, performing only streamlined procedures to relieve the workload of ICU physicians and nurses.

The training of the staff, that I have been organising from the beginning, initially focused on the anaesthesiologists not routinely working in intensive care units (traditionally in England constituting the majority of the anaesthetic workforce) as well as the anaesthetic and scrub nurses. This initiative allowed us to double the number of relatively senior staff within several days. Moreover, we started to retrain physicians of other specialities with prior experience in intensive care gained during their training (cardiology, burns and neurosurgery, pulmonology, internal diseases, etc.) to work again in the unit as residents.

The physicians without significant previous experience in intensive care were asked to ease the burden on ICU staff and to create specialist support teams, performing bed-side tracheostomies, establishing central intravenous access or proning daily multiple patients with severe Adult Respiratory Distress Syndrome (ARDS).

Furthermore, we organised two additional intra-departmental teams: the COVID Assessment Team (CAT) and the COVID Intubation Team (CIT) that included experienced specialists in anaesthesiology and intensive care [3]. The CAT team has been responsible for assessment and triage of patients based on the national guidelines, while the CIT team has been dealing exclusively with the intubations of COVID-19 patients referred to intensive care, taking utmost precautions to deliver such procedures safely and efficiently. Therefore, those patients arriving at the ICU have been

already intubated with necessary infusions well established.

Unlike the other countries where single-purpose "hot" COVID-19 hospitals have been established, in Great Britain, the decision has been made to even the workload between all hospitals, including all ICUs, across the country. This approach has been taken to prevent the situations in which some units would have been overwhelmed by a sheer number of patients, requiring critical care. In our Trust, the coordination strategy has involved the dedicated, tactical team inclusive of representatives from all four teaching hospitals, allowing for the daily transfer of patients or personnel between individual units to ensure the required capacity and resilience of the system [3].

Considering the transfer of many doctors from their routine day-to-day jobs to COVID-19 units, the medical universities across the country have decided that final-year medical students, meeting the criteria for early graduation, would be graduated and enrolled into medical register almost immediately. During the first days of April, new graduates were given the right to practice and joined the hospitals across the country. These decisions significantly increased the number of young doctors in different departments, allowing to reduce sudden staff shortages over the few initial weeks of April.

The pandemic can't be expected to finish soon, in a week or two; therefore, we have put special emphasis on safety and the well-being of the staff, both individuals and the whole teams. Our strategy has involved providing appropriate personal protective equipment (PPE), guidelines for effective and safe treatment of patients, as well as spiritual support.

In addition to providing personal protective equipment itself, proper and safe usage has been deemed crucial. Otherwise, the risk of infection could paradoxically increase, especially during the disposal of PPE. At each donning and doffing stations

where PPE has been put on and taken off, the dedicated officers have been placed with sole task to ensure that the processes there have taken place slowly, without unnecessary haste, and precisely following the guidelines. At the beginning and end of the shifts, the number of officers has been increased to ensure the proper capacity at the checkpoints.

The experience of previous epidemics clearly has shown that the 24-hour shift system while working in personal protective equipment (PPE) is unrealistic, and the 12-hour shift system should be implemented. The working in new settings of the pandemic is extremely exhausting physically and mentally stressful, hence we have prepared an additional "quiet" room outside the unit, to take breaks, allowing to avoid the turmoil of the duty-room and ensuring social distancing.

At present, most bed-side medical care in the COVID-ICU has been provided by non-intensivists. As a result, care and treatment must be strictly based on the protocols and guidelines released by learnt scientific societies, NHS England, and the special multilingual edition of Surviving Sepsis Guidelines for COVID-19. The continuous presence of an intensive care specialist in each sector of the ICU allows us to dispel any doubts of our new colleagues and guide them appropriately [2].

The new resuscitation protocol has also been introduced, fully based on the Resuscitation Council UK guidelines, inclusive of the recommendation that resuscitation of a patient suspected of COVID-19 can be initiated once personal protective equipment is applied. This required immediate training of the entire hospital staff to mitigate any doubts that immediately arose [5].

Thanks to the actions described above, the unit has been functioning relatively smoothly under critical care conditions of Covid-19 pandemic for a while, yet we know that this is only the beginning of the journey.

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