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Specialty guides for patient management during the coronavirus pandemic

Clinical guide for the management of surge during the coronavirus pandemic: rapid learning

12 April 2020, Version 2 – updates highlighted

The majority of patients recover from coronavirus infection following an uncomplicated clinical course. However, a small but significant number will deteriorate due to a rapidly evolving pneumonitis. Because of the high infectivity of this virus and the scale of the population at risk, this can result in surges of patients presenting at hospitals over a short period. The rate and number of patients associated with these surges can significantly challenge hospital logisitics. A number of NHS England hospitals have already experienced a surge of this type and we must rapidly learn from their experience.

Every hospital has a unique service configuration, geographical and population context. This document describes some of the challenges faced in surge and shares experiences, innovations and adaptations employed to mitigate those challenges. These may be useful in informing preparations in other hospitals and healthcare facilities.

Key learning points

COVID-19 surge can be extremely rapid and occur over a 48 to 72-hour period. Not all hospitals in a region will surge at the same time. There will be great geographical variation.

Expansion of critical care capacity depends on many factors beyond ventilator and bed capacity. These include staff skill mix, staff absence, training and ancillary equipment (eg syringe drivers, patient monitors).

Critical care nursing workforce capacity needs to be increased to meet demands of critical care expansion using principles for increasing the nursing workforce.

CPAP use can be utilised in early patient management. Please refer to *Guidance for the role and use of non-invasive respiratory support in adult patients with coronavirus (confirmed or suspected)* https://www.england.nhs.uk/coronavirus/secondary-care/other-resources/specialty-guides/#coronavirus-treatment

NIV: see guide on NIV https://www.england.nhs.uk/coronavirus/secondary-care/other-resources/specialty-guides/#coronavirus-treatment

Proning patients early in medical management both on the ward and in critical care may reduce the requirement for more aggressive respiratory support.

Oxygen delivery within a hospital will be under strain due to increased demand during a surge. Prior planning with the hospital estates department is crucial to prevent shortages. Please see the CAS-MHRA alert on oxygen usage.

Oxygen consumption varies according to clinical use and is important to monitor as the provision of respiratory support increases during a surge. On average, a standard face mask uses 5 l/min; a ventilator 10 l/min; and CPAP/NIV can use 40-60 l/min. Please see the CAS-MHRA alert on use of high flow oxygen therapy devices.

Increased demand for medications and equipment during a surge can lead to unexpected shortages of anaesthetic drugs and consumables such as ET tubes, syringe drivers, central line insertion kits. Guidance is available on alternative drug usage in anaesthetics and critical care medicine.

Extensive training in COVID-19 procedures is needed before surge and can be achieved through online resources, simulation and hands-on drills. This includes the performance of anaesthetic induction, donning and doffing of PPE and intra-hospital patient transfer.

Regional emergency preparedness response and resilience (EPRR) teams are key to assisting hospitals in the management of acute surge. Clinicians and managers should understand how and when to communicate with and escalate concerns to EPRR. Begin dialogue with regional EPRR before the consequences of surge begin to limit the hospital's capacity to deliver care.

Early warning triggers to help anticipate the consequences of surge should be put in place. This allows the hospital to recognise impending difficulty and provides an opportunity to begin dialogue with EPRR **before** staffing issues become impossible to manage or equipment and consumables have been exhausted.

Early dialogue in the face of COVID-19 surge is useful. It gives time for an appropriately tailored responses to be put in place. These might include equipment resupply, temporary ambulance diversion and interhospital transfer to decompress the intensive care capacity.

Interhospital transfers to other hospitals in the same critical care network can reduce the impact of the peak of the surge. Ensure that inter-hospital transfer networks are properly established and reinforced.

Retrieval of COVID-19 patients should ideally be performed by staff from receiving – rather than the originating – hospitals.

An in-reach system may be useful. Where acute surge acutely challenges the local availability of anaesthetic and intensive care staff, temporary assistance using staff from neighbouring hospitals may help to manage immediate surge.

Patterns of work and **staff absences**: rotas need substantial revision, in terms of pattern and intensity, to deal with acute COVID-19 surge.

Supporting staff is essential. Consider the following:

- Placing senior (more experienced) staff on night shifts
- Encourage staff to ask questions (particularly redeployed staff)
- Psychological support for all ICU staff.
- Recognise that the work pace will be slower (lower turnaround of patients)
- More time is required for tasks. Moving between patients and rooms as you need to get dressed/undressed in PPE.
- Address issues around limited capacity for staff showers, locker rooms and break rooms

Workforce reorganisation

Challenge	Change
Principle: Flexibility and skill mix need consideration: see published guidance principles for increasing the nursing workforce.	
Workforce reorganisation Capacity will be limited by staff absence due to illness	• Converting all shifts to long day or night shifts. • Increase flexibility in rota. • Stratify potential trust staff to redeploy into ICU based on competency (for example, using postgraduate department) to expand workforce. • Incorporate extra staff who would have been on leave. • Employ any extra staff on rolling/short-term contracts not locums to provide job security and rota predictability. • Trainee-led rota design to get buy-in. • It is vital to manage staff expectations for redeployment.

Resource management

Challenge	Change
Principle: Utilisation of hospital facilities to accommodate increasing numbers of patients requiring mechanical ventilation and NIV needs to take into account local resources and regional escalation pathways.	
Expansion of critical care capacity	• A surge of COVID-19 patients will require rapid expansion of critical care capacity. • Conversion of clinical areas into critical care bed spaces needs to consider the location of ward in hospital and the ability to extend into adjacent clinical areas. Further information regarding this can be found in the Estates and facilities standard operating procedure: COVID-19 ward for intubated patients.
Resource allocation and supply	• **Oxygen delivery** within a hospital will be strained during a surge primarily due to the substantially increased proportion of patients requiring supplemental oxygen, and also increased CPAP and ventilation activity. Preparation for increasing provisions in collaboration with the estates department is essential to prevent shortages during a surge. CAS-MHRA alerts have been issued on oxygen usage and use of high flow oxygen therapy devices. • **Equipment** shortages must be escalated to the region and if necessary to the National Loan Programme.

Clinical process and equipment

Challenge	Change
Principles: Spread burden of work, efficient use of resource, drawing on prior expertise of staff and reduction of exposure to contamination. **Processes must be adapted and practiced locally.**	
Teams-based approaches See published guidance on staffing framework for adult critical care	• Designated emergency intubation teams drawing on competencies of expanded workforce. • Designated proning teams drawing on competencies of the expanded workforce (eg surgeons, theatre nurses) • Designated transfer teams – traditionally a senior anaesthetist and ICU nurse.
Communication with relatives NB: 'No visitor' policy in critical care	• Process of regular phone updates to named relative who disseminates information to the rest of the family. • Staff allocated to the conversation depending on complexity and appropriateness: can be doctor or nurse.

Locations	• Some teams have decided to use the theatre environment as a place to perform procedures and store equipment before deciding where further care is to be delivered.
Intubation teams	• All necessary equipment in single grab bags/kits. • Use of disposable grab bags. • Pre-loading an endotracheal tube onto a bougie to reduce apnoea time.

Ventilation	• **Maximise existing capacity.**
	• **Play to the existing strengths of staff**
	  ○ Considering what theatre and critical care staff are used to doing (familiarity with ventilators, managing infusions) and separating tasks accordingly.
	• **Innovative use of resource:**
	  - https://www.england.nhs.uk/coronavirus/secondary-care/other-resources/specialty-guides/#coronavirus-treatment in COVID-19 patient management.
	  - Proning patients early in management may reduce the requirement for aggressive ventilation.
	  - Sedating patients with volatile agents if using an anaesthetic machine.
	  - Using anaesthetic theatre machines for ventilating patients (Note: need to understand limitations of machines, for example, not designed for weaning of patients and may not deliver PEEP).
	  - To meet increased demand on pumps/syringe drivers: Mixing anaesthetic medications (eg morphine and midazolam) into single syringe using protocols created in collaboration with pharmacy.
	  - To meet increased demand for CPAP capacity, can utilise BiPAP machines with supplemental oxygen in non-acute phase, particularly for ventilatory weaning.

Personal protective equipment (PPE)

Challenge	**Change**
Principle: Create a single local message based upon the most recent PHE guide and teach principles rather than strict procedures.	
Multiple resources specific to multiple variants of equipment -> creates multiple versions of the truth	• Create a single locally specific message that is specific to the equipment you have available. This instils confidence in staff and ensures safety and efficient use of equipment. Staff are neither over, nor under, protected. • Teach the basic principles (rather than a strict procedure) of avoiding self-contamination with local PPE, allowing staff to modify their technique allowing for 'real life' scenarios, for example, glove breaking.

FIT testing a large number of staff in short time	• Requires flexibility and good will on behalf of health and safety team. • Train critical care and theatre senior staff to FIT test. • Ensure FIT testing strategy takes account of current and predicted stock levels of masks, and prioritises critical care staff, anaesthetists, A&E staff and arrest teams.

Training

Challenge	Change
Principles: Training takes time and therefore should commence as long as possible before clinical need increases; efficient use of time.	
Simulation training is essential but time and resource consuming, for example, using RCoA guidelines	• Preserve equipment during training due to limited resource. • Be flexible during simulation in roles to reflect real world environment.
Staff redeployed into unfamiliar roles	• Streamlined induction processes. • Buddy system at the start of redeployment and pastoral support system. • Refresher sessions and bespoke guidelines produced by critical care staff for those adapting to work in critical care environment.

Communication/information dissemination

Challenge	Change
Principles: Efficient channelling of information to save time and create single version of truth. Specific streams of communication for particular areas.	
Information overload	• Limit use of multiple email chains. • Use of technology to streamline communication, for example: - Departmental Dropbox accounts - Publication of guidelines on apps, for example, Induction and Clinibee - Bespoke WhatsApp groups for specific purposes.

Documentation regarding patient management is very difficult to maintain accurately and keep up to date during a surge	• Non-critical care clinicians can help co-ordinate documentation and administration tasks (eg make referrals to critical care network for transfers) and therefore free critical care staff for clinical work • Consider using medical students to document on ward rounds.

Connection difficulties using bleep/mobile systems due to volume, connection or answering in PPE	• Intensive care DECT/WIFI phones or walkie talkies which can be heard while in PPE.

Wellbeing

Challenge	Innovation
Principles: Ensure the health and wellbeing of staff is a priority. Provide the resources staff need to find their own local solutions.	
Ensuring adequate rest facilities exist	• Modify existing areas which are unsuitable for inpatients, for example, elective pre-assessment areas due to lack of piped oxygen, into areas for rest. • Tired staff are at more risk of PPE failure. • Tired staff removing PPE at the end of a long • shift is a particularly risky moment. Can be assisted by buddying with colleagues
PPE hinders hydration and nutrition	• Dedicated wellbeing area which provides privacy, food, hot drinks, toiletries, and access to psychological first aid and mindfulness apps.
Psychological strain	• Make psychological support available to staff.