GETTING IT RIGHT FIRST TIME

Adult Critical Care

GIRFT Programme National Specialty Report

by Anna Batchelor
GIRFT Clinical Lead for Adult Critical Care

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GIRFT is delivered in partnership with the Royal National Orthopaedic Hospital NHS Trust, NHS England and NHS Improvement

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Foreword from Professor Tim Briggs

I am delighted to recommend this Getting It Right First Time (GIRFT) review of adult critical care, led by Anna Batchelor.

This report comes at a time when critical care has already undergone profound change in response to the COVID-19 pandemic. From the outset, we need to acknowledge that everyone working in our intensive care units has gone above and beyond during the pandemic.

The unprecedented events of 2020 have given Anna's recommendation an additional sense of urgency, if we are to equip the NHS for future surges and to recover services.

Anna has applied the GIRFT approach to her specialty, adult critical care, which serves as a support or client service to almost all hospital-based specialties. Critical care services look after the sickest patients in our hospitals, and intensive care intervention is often a matter of life and death.

The findings and recommendations in this report are based on Anna's deep-dive visits to 62 critical care units, alongside the national data and audits and Anna's own expertise and experience in the field. Anna has found that there is substantial variation in admission rates for several key conditions and that too often patients do not have equity of access to critical care.

Implementing the 19 recommendations set out in this report would deliver substantial benefits, not just for critical care, but for almost all hospital specialties which depend on it. The recommendations include increasing the number of critical care and enhanced care beds in order to have capacity and flexibility to manage surges, such as experienced with COVID-19, and providing greater equity of access to critical care.

The report also recommends developing a multidisciplinary rehabilitation pathway for patients, starting in critical care and following through to primary care. This will ensure that sufficient rehabilitation is provided for severely ill patients when they are discharged back to the care of their GP. This will be vital to many patients recovering from COVID-19, as we increasingly realise the scale of their rehabilitation needs.

It is very encouraging to hear about the support and engagement from clinicians and managers on Anna's deep-dive visits. These relationships are crucial, as GIRFT can only succeed with the backing of clinicians, managers and all of us involved in delivering care.

I hope that with this shoulder-to-shoulder ethos, and the impetus resulting from the response to COVID-19, GIRFT can help improve equity of access and the quality of treatment and care provided in critical care services.

Professor Tim Briggs *CBE*

GIRFT Programme Chair and National Director of Clinical Improvement for the NHS.

Professor Tim Briggs is consultant orthopaedic surgeon at the Royal National Orthopaedic Hospital NHS Trust, where he is also Director of Strategy and External Affairs.
He led the first review of orthopaedic surgery that became the pilot for the GIRFT programme, which he now chairs.

Professor Briggs is also National Director of Clinical Improvement for the NHS.

Introduction from Dr Anna Batchelor

The Getting It Right First Time (GIRFT) programme uses data to benchmark units and look for variation in practice and service delivery. There were clear and remediable instances of variation found in the reviews of surgical specialties that preceded this report, but critical care is very different to surgery. What variation would we find in our specialty? Critical care supports every hospital specialty to deliver the best for its patients, but how do we do this and do we do it differently in different units? We are fortunate in having a 25-year history of national data collection in ICNARC (which formed the basis of our data packs), clear professional standards in GPICS2 and enthusiastic and responsive specialty teams who completed a questionnaire and then welcomed us with coffee and biscuits to discuss and help us interpret the findings. It has been an enormous privilege to be able to meet so many teams (and critical care is undoubtedly a team game – without nurses and many allied health professionals we could not deliver a high quality service), without whom this report would not have been possible.

We did find variation. There are some units that have everything the team could wish for, including enough beds not to have to cancel surgery, or delay or refuse admission, and enough staff to deliver 24/7 care and rehabilitation. At the other extreme we saw teams who struggle with inadequate resource in all areas, with the inevitable consequences for patients. It is of course a spectrum and many units have enough of one thing but not of another. These differences are the result of history (unsuccessful business cases, for example), geography (both of hospital estate and local roads) and ability to recruit staff. There is much written about burnout in critical care, and when I saw the pressures under which some units have to operate it was easy to understand why.

Critical care is a relatively young specialty and one that is still evolving. We have in the past focused on admitting very sick patients and trying to stop them from dying, with success measured by survival rates. As we have grown we have admitted patients who are less ill, aiming by early intervention to prevent further deterioration and organ failure. We are now coming to see that survival is not enough: we need to consider the quality and quantity of life after critical care and whether, through changes in care or in rehabilitation, we can make improvements. We need a data set fit for purpose to help us monitor progress in this and to better inform future patients about what critical care can and cannot do for them.

I hope by producing this data-driven report we can provide a focus on the improvements we need to make in our specialty.

COVID-19 pandemic

We were part way through writing the report when COVID-19 reached the UK.

The pandemic has highlighted critical care services like no other event in the last 20 years. Extra critical care capacity was created in theatres, recovery areas, normal wards and even conference centres. But the virus has not gone away and there will be a need for extra Level 3 capacity, both as a background to provide for a new disease and probably for intermittent surges. The current critical care provision was plainly inadequate for 'old normal' service and an increase in both Level 2 and Level 3 beds is required for the efficient delivery of emergency and elective services. COVID-19 will introduce an intermittent requirement for a significant increase in Level 3 capacity. However, simply to increase the number of Level 3 beds and to have them on standby awaiting a crisis is not practical. A new model is required.

While the main tenets of the report remain, the pandemic has thrown certain of our recommendations to the foreground and given them a new sense of urgency. We hope that the awful events of 20/21– and the extraordinary response we have seen across the country – will be an impetus for positive change in the key areas we discuss below.

Adult critical care transfer services have been discussed for many years, but have never been funded, unlike those for children. COVID-19 necessitated transfer services as smaller units, even when their capacity was doubled and quadrupled, became overwhelmed. 'Mutual aid' became a mantra and provided the only means of coping with demand. Now is perhaps the time to introduce properly funded regional adult critical care transfer services. These would support regional cohorting of COVID-19 patients and are also needed in more remote and rural units, where it can be difficult to provide small local services.

Cohorting of COVID-19 patients will be a pragmatic way of dealing with patients where there is a high need for PPE. As a side-effect it will also allow the development of expertise in managing this difficult disease. Regional COVID-19 centres, supported by a transfer service that allows the outlying critical care units to revert to normal service, may be a solution to the continuing requirement for care.

Current Level 3 provision, whilst probably adequate across England overall (there is significant variation) is clearly inadequate for surges.

Enhanced care provision in the form of strengthened respiratory non-invasive ventilation (NIV) and postoperative services could provide a flexible solution. An enhanced care ward equipped and staffed for postoperative care could, if appropriately commissioned, relatively easily be switched to provide critical care capacity in the event of a surge.

Staffing to meet the first surge was drawn from anywhere and everywhere. An amazing collaboration of 'can do' NHS workers, including former NHS employees who came out of retirement, prevented the service being totally overwhelmed. It would be inappropriate and inadvisable to expect this to happen again in the same way. By developing enhanced care services, and putting in place a competent workforce of doctors, nurses and allied health professionals (AHPs) to support them, a viable buffer could be created.

The COVID-19 pandemic resulted in a step-change in the way we consider whether a patient could benefit from critical care: community services, including GPs and care homes, and hospital services, including acute and respiratory physicians, discussed advanced care wishes with patients. It was important to recognise and offer appropriate palliative and comfort care to those patients whose death, rather than life, would be prolonged by admission to critical care. Recognising that a patient is approaching the end of their life and instituting end of life care accordingly is an act of kindness, not discrimination.

Post-critical care follow-up and rehabilitation services have historically been patchy and mostly inadequate. COVID-19 has highlighted the urgent need to support large numbers of patients after long critical care stays. The benefits of properly funded and supported services for pandemic and usual survivors of critical care could be another positive outcome of the COVID-19 outbreak.

The pandemic has highlighted the value, both locally and nationally, of real-time data to manage critical care resource across Operational Delivery Networks (ODNs). This is an opportunity to review and improve the critical care dataset, and in particular to collect data on post-critical care recovery.

Dr Anna Batchelor

GIRFT Clinical Lead for Adult Critical Care

Dr Batchelor is a Consultant Intensivist at Newcastle upon Tyne Hospitals NHS Foundation Trust. She is past Chair of the Critical Care Leadership Forum (2016 to 2019); past Dean of the Faculty of Intensive Care Medicine (2013 to 2016); ex-member of the Council of the Royal College of Anaesthetists; and past president of the Intensive Care Society (2005 to 2007).

Statement of support

The Faculty of Intensive Care Medicine (FICM) and Intensive Care Society (ICS) welcome the publication of the GIRFT national report on adult critical care, which rightly places the patient at the centre of its recommendations. We strongly endorse the recommendations of the report and are pleased to have been consulted and involved at all stages.

Dr Anna Batchelor, GIRFT clinical lead for adult critical care, and the whole GIRFT team have undertaken a rigorous process of visits. They are to be commended for their comprehensive evaluation of the significant issues facing critical care. The report highlights the variability in access to critical care across the nation and this has to be addressed.

It is essential that intensive care units and critical care teams are supported to deliver any improvements required and we hope the funding will follow for all the aspects of care alluded to in the recommendations.

We look forward to continue working with the GIRFT team and other national bodies to help realise the recommendations; FICM and the ICS are already engaged in developing many of the areas recommended in the report and its publication will support their timely implementation.

Dr Alison Pittard
Dean of the Faculty of Intensive Care Medicine

Dr Stephen Webb
President of the Intensive Care Society

Executive summary

The Getting It right First Time (GIRFT) review of critical care has found a significant degree of unwarranted variation both in access to the service itself and in a number of other key areas, since provision and relative capacity varies between units. After analysis and investigation we have found several important opportunities to increase equity of access and improve overall patient care and outcomes.

Insights gained from from the waves of the COVID-19 pandemic have fed into the report.

It should also be noted that the unique funding model for critical care, the specialty's demand-led nature and the fact that it provides care to but does not 'own' patients from across all hospital specialties make the notional financial opportunities less clear-cut – and arguably less relevant – than is the case for most GIRFT reports.

Getting It Right First Time (GIRFT)

The GIRFT programme is funded by the Department of Health and Social Care and jointly overseen by NHS England and NHS Improvement and the Royal National Orthopaedic Hospital NHS Trust.

GIRFT seeks to identify variation within NHS care and then learn from that variation. It is one of several workstreams designed to improve operational efficiency in NHS hospitals. In particular, it is part of the response to Lord Carter's review of productivity, and is providing vital input to the Model Hospital project.

GIRFT is closely aligned with other programmes seeking to improve standards while delivering efficiencies, such as NHS RightCare and Sustainability and Transformation Partnerships (STPs)/Integrated Care Systems (ICS's).

Under the GIRFT programme, data from many NHS sources is consolidated and analysed to provide a detailed national picture of the specialty being reviewed. This process highlights variations in care decisions, patient outcomes, costs and other factors. The data is then reviewed by a GIRFT clinical lead for the specialty – an experienced clinician who is recognised as an expert in their specialty.

The clinical leads visit each individual hospital trust to discuss the data with senior management and clinical teams. These 'deep-dive' visits provide an opportunity for both parties to learn. The individual trusts are able to understand where their performance appears to be below average and can draw on clinical expertise to identify actions targeted at addressing performance issues. At the same time, the clinical lead builds a national picture of best practice that feeds into service-wide improvement recommendations and an implementation programme to drive change and address unwarranted variation.

About critical care

Critical care provides an essential, highly specialised service without which an acute hospital cannot function. The service provides care at Levels 2 and 3, including multiple organ support where required, which means staffing and equipment requirements are beyond those of a standard acute ward. Critical care patients may come from any originating specialty and will return to the care of that specialty when discharged from the critical care unit.

Capacity and the issue of patient 'flow' (in and out of the unit and therefore in, out of and across the entire hospital) are key to safe and efficient management of patients requiring critical care. This, coupled with varying levels of provision in individual hospitals, is a long-standing difficulty for the specialty and affects local decision-making about who should be admitted to critical care.

Critical care is funded at present through a combination of specialised and local commissioning models and this funding is based broadly on numbers of organs supported.

The specialty does not, at present, have any standardised rehabilitation or follow-up pathways.

What we found

We identified 269 units providing critical care within hospitals and specialist centres. Of these we were able to visit 101 units in 59 trusts, each of which we supplied with a data pack and visited for a 'deep dive' before the COVID-19 pandemic. We also made copious use of additional data, both from a questionnaire sent to each of the 269 and from various additional

sources, as cited throughout this report. Where we found unwarranted variation we investigated this and applied data analysis to examine the situation in detail wherever possible. We grouped our findings and subsequent recommendations under the headings that follow.

Equity of access to critical care

Capacity, culture and resources affect decision-making around who is admitted to critical care. We found inequity of access to the critical care due to a combination of these factors. The ability of the service to admit patients depends upon overall capacity (number of available and appropriately staffed beds), local custom and practice and the physical infrastructure of the unit. Factors that have a notable effect on the availability of critical care beds include the extent of enhanced care provision, which can release some of the strain on critical care by caring for those patients who require more than Level 1 (acute ward) care but may not require organ support, and local arrangements for patients with specific conditions, such as those recovering from surgery, those requiring non-invasive ventilation, renal support and treatment for diabetic ketoacidosis – all of which may in theory be provided elsewhere in the hospital.

With so many variable constraints, inevitably decisions around admissions are also variable by unit. This complex situation is compounded by a lack of data about long-term outcomes for critical care patients, including mortality, readmission to hospital, quality of life, new frailty and results of rehabilitation. This means the decision-making around whether or not to admit a patient is partly based on a clinician's subjective view at the time, and in relation to the unit's capacity, without informed knowledge of likely longer-term outcomes.

Critical care outreach and early intervention

The aim of critical care outreach is to pick up patients from across the hospital whose condition is at risk of deterioration. Early recognition can improve patient outcomes and, it is believed, can reduce the strain on critical care units by reducing the number of patients requiring Level 3 care. Outreach also provides in-hospital follow-up and patient early intervention for the difficult transition from unit to ward. We found a great deal of unwarranted variation in the levels of critical care outreach between hospitals.

End of life care

A significant proportion of patients admitted to critical care will die during their admission. Communication with the patient and their family is vital to a 'good death', as is an understanding of the patient's wishes, which may have already been documented in, for example, an advance care plan (ACP). A multidisciplinary approach is needed when making the decision to stop life-prolonging treatment and move to a course of palliative care.

Organ donation

Demand for donor organs outstrips supply and so an approach that is both rapid and sensitive to the donor family's wishes is vital. The services of a Specialist Nurse – Organ Donation (SN-OD) to smooth the process and support the family is invaluable.

Discharge and transfer from critical care

Patient flow depends on patients being efficiently discharged from critical care to ensure there is capacity for new admissions. When a unit is under strain, sub-optimal discharge processes (out-of-hours, delayed and direct-to-home discharges) are apparent. Non-clinical transfers also indicate capacity issues/unit strain. Sub-optimal discharge is a widespread issue and has a profound impact on critical care. These practices are indicative of trust-wide blockages (beyond the control of critical care units) and a trust-wide approach is required in order to improve the situation.

Patient outcomes, rehabilitation and follow-up

Despite growing evidence that a critical care admission can have a lasting impact on patient health, there is limited data about individual patient outcomes, beyond readmission and mortality rates, and even these are not routinely available to clinicians. Linked to this there is no national post-critical care rehabilitation pathway and extremely limited follow-up. While

there is some in-unit rehabilitation, provision is variable and numbers of dedicated AHPs available to critical care units are generally lower than guidelines recommend. Improved support for patients after discharge is urgently required, as is well evidenced by the cohort of COVID-19 patients. Further research into long-term patient outcomes is also urgently needed.

Workforce

Around 70% of the cost of a critical care unit relates directly to staffing. The workforce is under pressure, with great variation between units in terms of the adequacy of staffing levels. To ensure a sustainable workforce in the long term we fully support the recommendations in the Faculty of Intensive Care Medicine and the Intensive Care Society's Guidelines for the Provision of Intensive Care Services (version 2, 2019, known as GPICS2). We also have particular concerns about the patchy provision of dedicated critical care pharmacists, inadequate provision of psychology services and the need to review the training/funding model for Advanced Critical Care Practitioners (ACCPs) in order to ensure they can be trained and employed more evenly across trusts. We also suggest that experience in staffing units during the COVID-19 pandemic is thoughtfully reviewed for insights that could inform future workforce models.

Quality improvement, data and research

A lack of data on patient outcomes post-critical care as well as on the value of enhanced care remains a barrier to improving services. This should be urgently addressed. We also found that many units do not take part in larger research programmes and nor do they have a culture of quality improvement in any formal sense.

Research in UK ICUs during the COVID-19 waves has produced some the best evidence in the world for treating this new disease. We need to harness and continue this model of entering patients in most units into clinical trials.

For more information on research during and following the pandemic, see:

- https://www.nihr.ac.uk/documents/best-research-for-best-health-the-next-chapter/27778
- https://sites.google.com/nihr.ac.uk/include/home#h.xixm7iewjlrg
- https://www.remapcap.org/coronavirus
- https://static1.squarespace.com/static/5cde3c7d9a69340001d79ffe/t/5e8d413e713b2d6cd799e143/1586315583723/CEM_CMO_2020_012.pdf
- https://www.gov.uk/government/publications/the-future-of-uk-clinical-research-delivery-2021-to-2022-implementation-plan for information on the future of UK clinical research.
- https://www.gov.uk/government/publications/the-future-of-uk-clinical-research-delivery

We would encourage participation in research and quality improvement (QI) programmes as a way of generating valuable data, creating a virtuous circle of research and improvement.

Litigation

It appears that trusts do not always distinguish between critical care litigation that relates to care received by patients while in the unit and litigation that reflects broader hospital- or trust-wide issues outside the unit's control. While both are important and should be learned from, this is only possible when the litigation is fed back to the source of the error. For a critical care unit this would include injury such as pressure damage and medicine errors. Where errors occurred around delayed admission or in communication between specialties, it is important that these are addressed separately at source.

Making it happen – GIRFT support

The report makes 19 recommendations and identifies owners and timelines for each one. The GIRFT team will work with NHS England and NHS Improvement regional teams to support trusts in implementing the recommendations by providing practical advice based on the research data, feedback from visits to trusts and expert input from experienced clinicians.

About critical care

Critical care provides specialised care for those patients who are, or who are at risk of becoming, seriously ill, including those experiencing failure of one or more organ systems (heart, lungs, kidneys, liver or brain). These patients, of whom there are about 200,000 per year in the UK, require closer observation and more clinical interventions than can be provided on a standard ward.

There are many reasons why people are admitted to critical care, including acute medical emergencies, surgical complications, major trauma from road traffic accidents and serious burns. People may also be admitted to critical care after major surgery or if they have co-morbidities after relatively minor procedures.

Critical illness is often unexpected and sudden, and can strike the previously fit as well as the frail. It is often life-threatening, and high levels of treatment and support may be required, especially in the early stages. Critical illness can be the end point of a slow, unrecognised progressive deterioration. Early recognition and intervention may abort this progression.

Critical care is for patients who have the capacity to recover from the current episode; it is not appropriate for all deteriorating patients.

The experience of critical care and the critical care environment can be traumatic for patients, and its effects, both physical and mental, persist beyond discharge from hospital.

Critical care is central to the running of an acute hospital, providing support to both emergency and elective surgery and to all medical specialties. It is not possible to run a hospital that accepts acute admissions, has an emergency department or conducts major surgery without a critical care unit.

Critical care is the service that supports the hospital in recognising deterioration early and supporting patients so the best possible outcomes can be achieved.

Critical care is staffed by a multidisciplinary team (MDT).

Critical care and levels of care

If patient care sits on a spectrum starting with self-care for minor and/or easily managed conditions, critical care is at the opposite end, where more intensive support is needed. As a general rule, critical care units provide Level 2 care (in high-dependency units) and Level 3 care (in intensive care units). Although Level 2 will usually require a lower nurse-to-patient ratio or reduced critical care support compared to Level 3, this may not apply in all circumstances, and the aim should be flexibility in the provision of staff to meet the needs of the patient. The level of care assigned to a patient will influence, but not determine, staffing requirements.

Historically the levels of care within hospital have been defined as follows:

- **Level 0** Patients whose needs can be met through normal ward care in an acute hospital.
- **Level 1** Patients at risk of their condition deteriorating, or those recently relocated from higher levels of care, whose needs can be met on an acute ward, possibly with additional advice and support from the critical care team.
- **Level 2** Patients requiring more detailed observation or intervention, including support for a single failing organ system or postoperative care or those 'stepping down' from Level 3 care.
- **Level 3** Patients requiring advanced respiratory support alone, or basic respiratory support together with support of at least two organ systems. This level includes all complex patients requiring support for multi-organ failure.[1]

It is important to note that the level of care classifications (particularly for Level 2) are wider than the presence or absence of organ failure.[2]

There is ongoing work into the development of enhanced care in the UK and this may lead to the modification of the levels of care in the future.[3]

[1] *www.datadictionary.nhs.uk/data_dictionary/attributes/c/cou/critical_care_level_de.asp?shownav=1*

[2] *Faculty of Intensive Care Medicine (FICM) and Intensive Care Society (ICS) (2019), Guidelines for the provision of intensive care services, edition 2, www.ficm.ac.uk/sites/default/files/gpics-v2.pdf*

[3] *FICM, Critical futures: current workstreams, enhanced care, www.ficm.ac.uk/critical-futures-current-workstreams/enhanced-care*

Enhanced care

The additional category, 'enhanced care' (also known as 'postoperative', 'post-anaesthetic', 'non-invasive ventilation', 'acute medicine units', 'HOBS' (high-observation beds)), has been adopted to varying degrees and in various models in hospitals in England. Enhanced care is appropriate for patients who can be managed in suitable ward areas with significantly enhanced nursing provision compared to normal ward care. Enhanced care also requires appropriate monitoring and the availability of a clinician who can review patients and intervene or prescribe as needed. Depending on hospital size, geography and bed provision, this may either be as part of an enlarged critical care area or on one or more wards, whichever is the most practical and efficient.

> *Enhanced Care takes place in a ward setting, by a motivated and upskilled workforce, but provides ready access to the critical care team through established communication links. It is a pragmatic approach to reducing the risk of patients falling into a service gap: patients who would benefit from higher levels of monitoring or interventions than expected on a routine ward, but who do not require admission to critical care. This type of care has grown organically, originally for peri-operative patients (elective and emergency), expanding into the fields of maternity and medicine to deliver safe care to the patient at risk of deterioration.*
>
> **Faculty of Intensive Care Medicine**[4]

The scope and effectiveness of enhanced care within a hospital can affect the demand for critical care and, where it is well managed, enhanced care can complement and support critical care, potentially reducing the demand for critical care beds.

In the following sections we explore the recent background to critical care services and cover the issues of patient flow, how units are configured, patient pathways and the current funding model. These sections describe the service before the COVID-19 pandemic took hold in England.

Developments in critical care

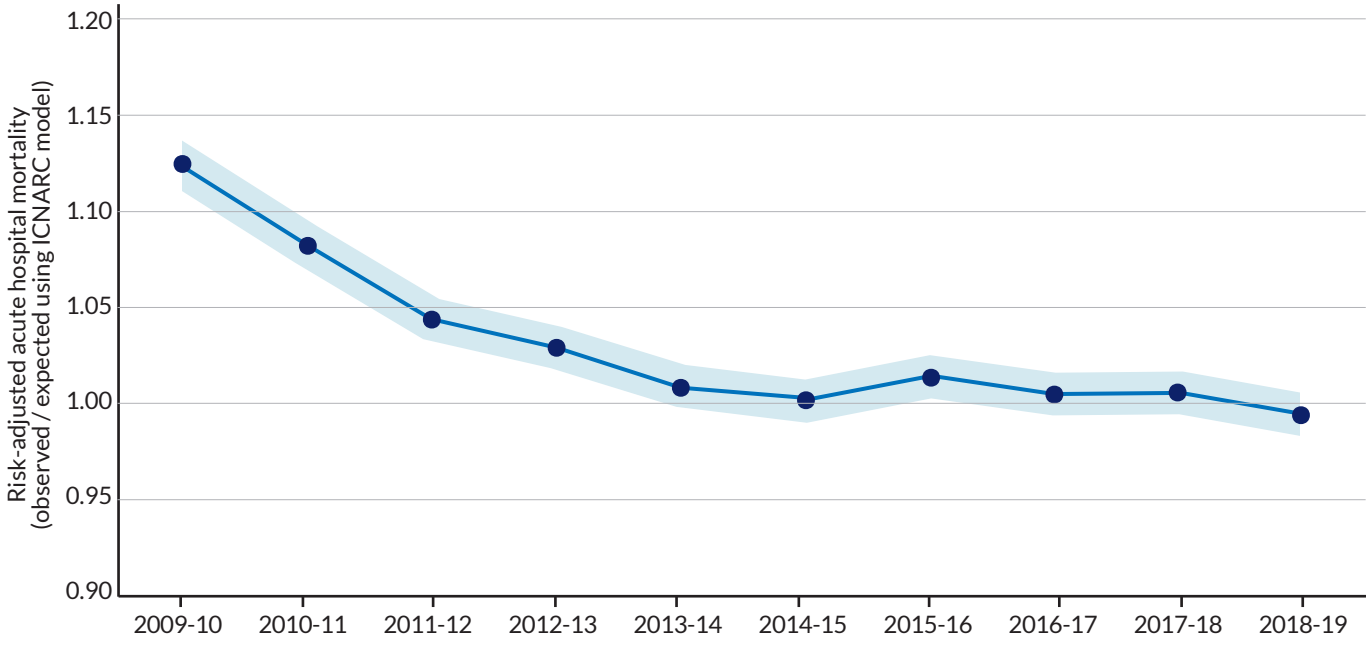
The Department of Health's *Comprehensive Critical Care (CCC)* report, published in 2000,[5] introduced the concept of 'critical care without walls', a service responding to the needs of critically ill patients throughout the hospital. It recommended more critical care beds, high-dependency units, the development of Critical Care Outreach Teams (CCOTs), and hospital-wide critical care delivery groups (CCDGs). There is no doubt that these changes were positive for the specialty. However, many trusts still do not have CCOTs, CCDGs or sufficient beds to meet the needs of patients.

Figure 1 shows the reduction in mortality rates for patients in critical care. The data used excludes specialist trusts such as transplant units, where a non-typical case mix could skew results, if the same ICNARC calibration had been in use throughout the 10 years. After the publication of CCC, an increased focus on the specialty, in terms of resources and staff training, as well as advances in technology, have seen a steady improvement in patient outcomes – something it is important to continue. It is also important to acknowledge that significant challenges remain for the specialty.

[4] *Faculty of Intensive Care Medicine (FICM) (2020), Enhanced care: guidance on service development in the hospital setting. www.ficm.ac.uk/sites/default/files/enhanced_care_guidance_final_-_may_2020-.pdf*

[5] *Department of Health (2000), Comprehensive critical care: a review of adult critical care services, https://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/publicationsandstatistics/publications/publications policy and guidance/dh_400658*

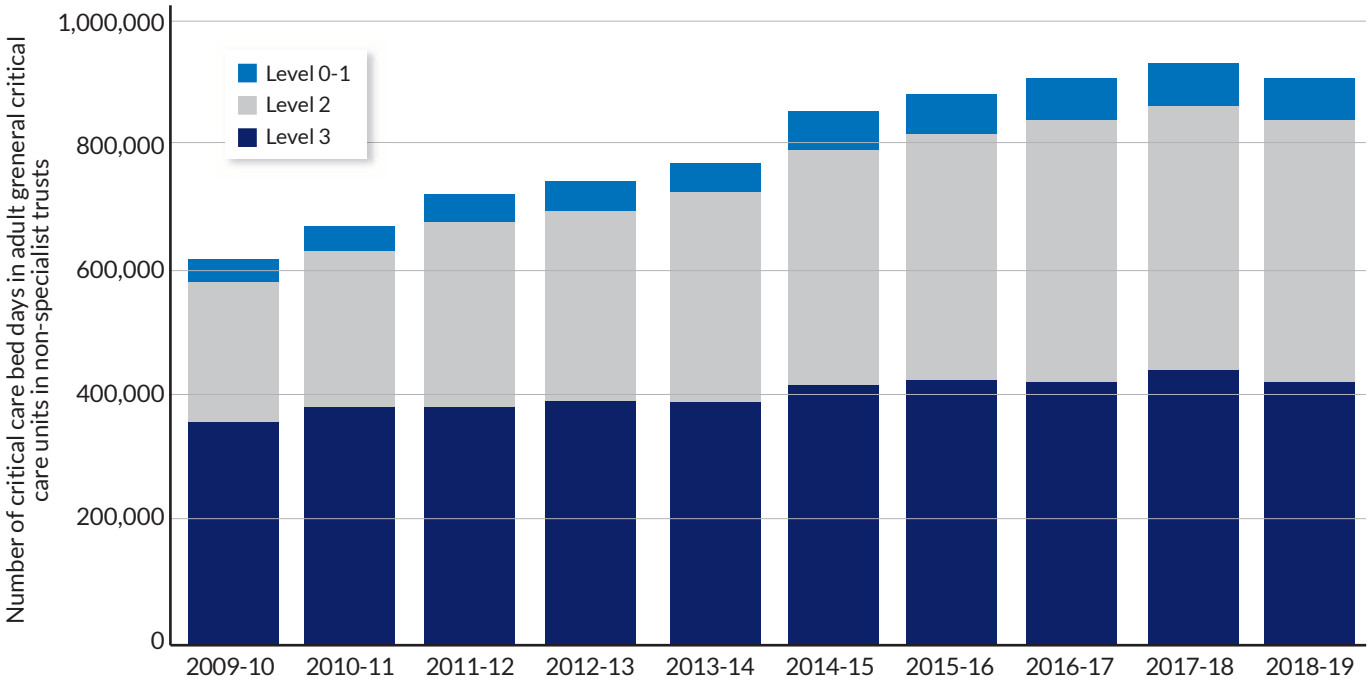
Figure 1: Risk-adjusted mortality rates in critical care 2009–2019 (non-specialist trusts)



Source: ICNARC data 2009–2019

Critical care grew steadily in England between 2009 and 2018, beginning to plateau in 2019. **Figure 2** below shows the number of critical care bed days from 2009 to 2019, split into Level 2 and Level 3 care. The growing proportion of Level 2 care for medical and surgical patients reflects an increase in elective postoperative admissions, but may also indicate that hospitals are becoming better at recognising and responding to at-risk patients on standard wards earlier, since despite significant population growth, an ageing population and increasingly high expectations of healthcare, the number of Level 3 bed days has remained essentially static over the last 10 years.

Figure 2: Critical care bed days 2009–2019, split by Level 2/Level 3 (non-specialist trusts)

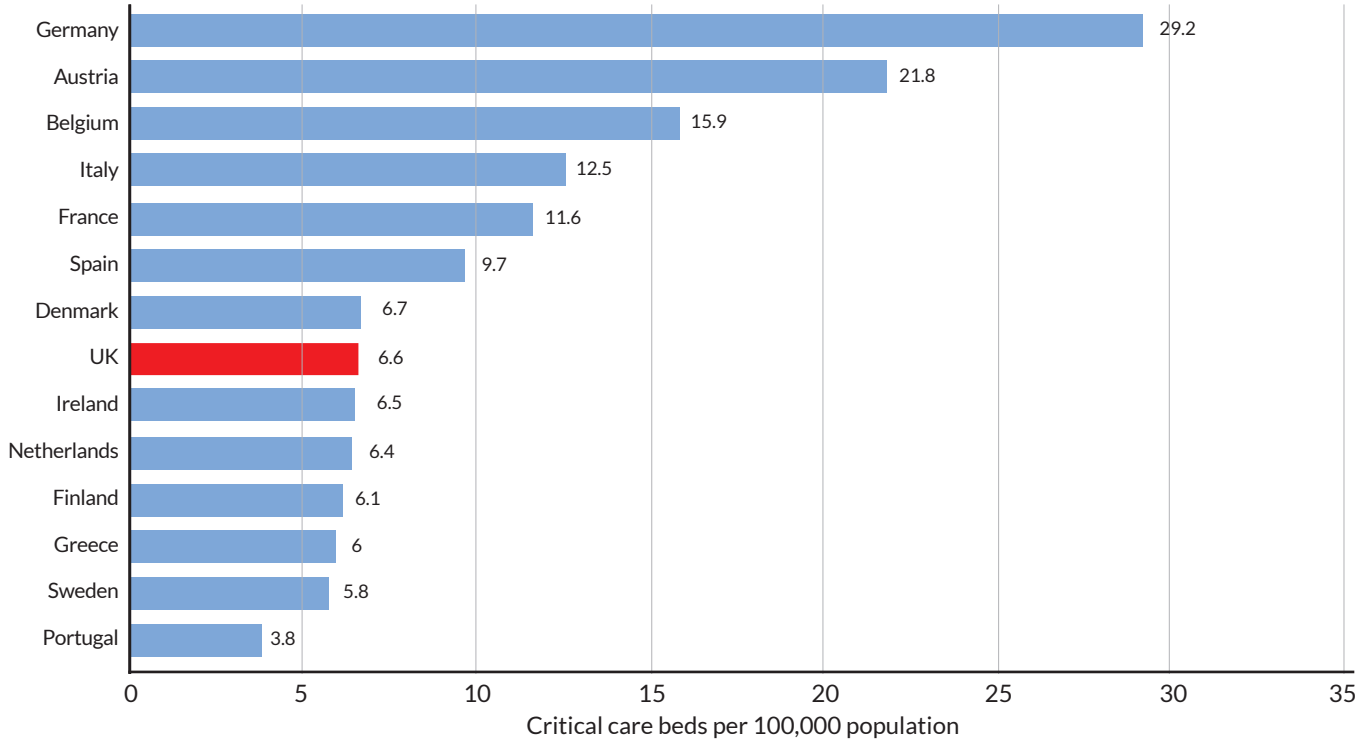


Source: ICNARC data 2009–2019

As the provision of critical care beds in relation to overall population increases, patients are able to benefit from critical care who would not have been able to in the past. However, discussion at the deep-dive visits suggests that, were more beds available, they would be filled. Many units and trusts, recognising an unmet need, have plans to expand their critical care services but struggle to secure funding. This, in combination with the variation in bed numbers by trust, suggests there is currently inequity of access to critical care. In context:

- The UK has one of the lowest proportions of critical care beds/head of population in the European Union (6.6 vs mean 11.5/100,000 population respectively)[6] (see **Figure 3** below).
- At least 280 urgent operations are cancelled each month due to lack of critical care bed capacity.
- Operating at or near maximum capacity adversely affects patient mortality, length of stay and acuity of admissions.[7]

Figure 3: International comparison of critical care bed numbers



Source: adapted from Rhodes et al. cited at www.kingsfund.org.uk/publications/critical-care-services-nhs

In 2018 the Intensive Care National Audit and Research Centre (ICNARC) reviewed research on projected Level 2 and Level 3 bed days (collecting data on adult critical care in 214 units across England, Wales and Northern Ireland). It concluded:

> *Modelling the trends in terms of age- and sex-specific bed utilization rates and then projecting forward to 2033, if the observed trends continue, then an increase in overall bed days is estimated of approximately 4% per annum – comprising an approximate increase of 7% per annum for Level 2 bed days and an approximate decrease of 2% for Level 3 bed days.*
>
> **Harrison and Rowan[8]**

[6] *Rhodes et al. (2012), The variability of critical care bed numbers in Europe, Intensive Care Medicine, cited in Anandaciva, S. (2020) Critical care services in the English NHS, The King's Fund, www.kingsfund.org.uk/publications/critical-care-services-nhs*

[7] *Faculty of Intensive Care Medicine (FICM) (2018), Critical capacity: a short research survey on critical care bed capacity, March, www.ficm.ac.uk/sites/default/files/ficm_critical_capacity.pdf*

[8] *D. Harrison and K. Rowan (2014) cited in The Faculty of Intensive Care Medicine (FICM) (2018), Workforce data bank for adult critical care, May, p. 8, www.ficm.ac.uk/sites/default/files/workforce_data_bank_2018_updated_for_website.pdf*

It should be noted that, whilst countrywide numbers of Level 3 beds may be adequate, distribution of beds between hospitals is not equitable. In some places there remains a deficit in Level 3 provision and a greater deficit in Level 2. In many others there is a need for Level 2 beds to facilitate early intervention and prevention of deterioration.

Patient flow

Patient flow refers to the movement of patients in and out of the unit. At its simplest, it means that patients must be discharged from or otherwise leave the critical care unit in order to make room for new patients.

Good patient flow is central to the provision of critical care services, but a critical care unit has very little control over this aspect of care, since the availability of ward beds is in the hands of bed managers who, in turn, have to balance the competing demands of emergency admissions, elective surgery and so on across the hospital. Where there are delayed transfers of care (for example, when discharge of patients from standard acute wards is dependent on the availability of social care) the bottleneck this causes affects the entire hospital and can impede critical care discharges and, as a result, critical care admissions.

Specialist services such as cardiac and neurology critical care, in particular, highlighted an issue with patient repatriation. Local services are generally aware of this and do their best to respond, although lack of resources means they are not always able to address the issue effectively.

A critical care unit's overall capacity (in terms of beds, equipment and also staff) is crucial to patient flow and, where overall patient flow across the hospital allows, critical care flow is maintained through efficient discharge processes, effective outreach services and adequate provision for end of life care and organ donation.

Poor patient flow is revealed by delayed admissions and also by delayed, overnight or premature discharge and by patients being discharged direct to home (see *Discharge and Transfer from Critical Care*, page 47). Poor patient flow can affect decision-making around admissions, which involves balancing competing patient needs, often against a background of 'unit strain'. Where patient flow is impeded this can result in cancelled operations for patients who are assessed as needing postoperative critical care. This is a picture with which we are all now familiar, not least from fly-on-the-wall documentaries that reflect the day-to-day pressures under which the service operates. A SNAP audit in 2017 showed planned postoperative critical care was a significant cause for cancellations. However, there is very little consistently collected reliable data on cancellations to help us understand this further.[9]

Unit strain

Unit strain is, at its most basic, a tension between supply (i.e. the availability of finite critical care resources such as beds, ventilators and staff) and demand (i.e. requests to admit and care for patients with life-limiting or life-threatening critical illness). As Sean Bagshaw has illustrated in the Canadian context, unit strain is associated with such suboptimal practices as out-of-hours discharges and also increased adverse events on general wards as well as an incremental risk of mortality.[10] Likewise, a recent large-scale study of unit strain and its effect on outcomes in England, Wales and Northern Ireland noted that critical care unit strain was associated with increased mortality on acute wards.[11] **Figure 6** (see page 26) explores levels of unit strain in relation to outcomes.

Calculated occupancy of critical care beds is not a very helpful metric, since it is affected by so many considerations and is in itself a poor measure of a unit's efficiency. Critical care units have an agreed number of nominally funded beds, which they flex between Level 2 and Level 3 care as required. However, a bed alone is not enough – each bed has to come with nursing staff (0.5:1 nurse to patient ratio for Level 2 and 1:1 for Level 3). Thus, six nurses* could staff six Level 3 beds or twelve Level 2 beds. In either case the unit is 'full', but with very different occupancy calculations. Flexibility ultimately depends on numbers of available staff and patient demand. To further complicate matters, one bed may have two occupants over a 24-hour period, possibly requiring different levels of care, necessitating a significant amount of admission and discharge activity, and yet will only be counted once in a standard occupancy analysis or may, depending on the census time-point, not be counted at all.

* *Unless otherwise stated, where we use the term 'nurses' or 'nursing' in this report we are referring to registered nurses and their practice, and not other that of colleagues within the nursing workforce, such as nursing associates.*

[9] *Wong, D. J. N., Harris, S. K. and Moonsinghe, S. R. on behalf of the SNAP-2: EPICCS collaborators (2018), Cancelled operations: a 7-day cohort study of planned adult inpatient surgery in 245 UK National Health Service hospitals, British Journal of Anaesthesia, 121 (4): 730–738, doi: 10.1016/j.bja.2018.07.002, https://bjanaesthesia.org/article/S0007-0912(18)30565-8/fulltext*

[10] *S. M. Bagshaw (2017), ICU strain: causes and impact, presentation at Critical Care Canada Forum 2017, Toronto, Canada, 4 October, https://criticalcarecanada.com/presentations/2017/icu_strain_causes_and_impact.pdf*

[11] *M. E. Wilcox, D. A. Harrison, A. Patel et al. (2020), Higher ICU capacity strain is associated with increased acute mortality in closed ICUs, Crit Care Med, May 48 (5): 709–716, https://pubmed.ncbi.nlm.nih.gov/32141924/*

It should also be noted that with a small bedstock and highly unpredictable levels of demand, in order to function efficiently a critical care unit needs to be able to admit a critically ill patient immediately and must, therefore, run with some empty beds.

Capacity is an issue in many units – and one of the difficulties of setting standards for access to critical care is how to assess an unmet need. Hospitals evolve their own standards and practices around what criteria qualify a patient for critical care, and in each instance a judgement has to be made that is both clinical and pragmatic: can a bed be made available and is critical care admission justified (a full critical care unit can result in cancelled surgeries for patients requiring critical care postoperatively). This kind of priority setting is extremely difficult and, to an extent, inevitably subjective (see Equity of Access to Critical Care, page 24). Hospital culture may also adapt – if the critical care unit is generally at capacity, fewer requests may be made to admit patients who could benefit from critical care.

As critical care continues to develop, outcomes improve. This means that what might be achievable for a patient is not always fully understood outside the critical care unit, where history and culture can colour clinician's expectations and possibly deter them from referring a patient to critical care, again indicating potentially unmet need. Of course, the opposite may also be true, and this underlines the need for an ongoing dialogue between intensivists and referring clinicians.

Organ donation is an important part of the work done by critical care units, but in some cases there are significant delays in organ retrieval, which causes both additional stress for the families involved and affects the availability of beds for new patients (see Organ Donation, page 45)

What does a unit look like?

Critical care is an expensive service, with a high requirement for staff. It is generally acknowledged that approximately 70% of the cost per bed day is spent on staffing, including medical, nursing and Allied Health Professionals (AHPs). Associated requirements for space attract capital charges, and drugs and disposables add to this.

There is no typical unit, even among similar hospitals. What has emerged is a series of local solutions to local needs. Just as all hospitals are different depending on the population they serve, the surgeries they provide and the specialties they cover, so every critical care unit will vary to some extent according to the hospital in which it is based, which could range from a small district general hospital (DGH) to a large city hospital or a specialist centre.

Historical factors such as the amount of space allocated to the critical care unit within the hospital (and the extremely high capital costs involved in building new units), the proximity of specialist centres and the extent to which enhanced care is provided all affect critical care provision.

Units are limited in size by their footprint, as expansion often requires expensive re-provision and cash-strapped commissioners are reluctant to support service expansion, even when the need is clear. This can lead to very inefficient working environments, with smaller units scattered across a hospital site.

While every unit is configured and works across its hospital in a slightly different way, the aim and ideal always is for critical care to enjoy and promote mutually supportive relationships across all the hospital specialties.

Workforce recruitment can be challenging, which has encouraged novel solutions such as the introduction of Advanced Critical Care Practitioners (ACCPs), who are being recruited and trained in part to help alleviate a shortage of trainees (see *Workforce*, page 64).

There is a workforce shortage in nursing. Critical care nursing is stressful, which leads to high turnover and recruitment issues. Some of this can alleviated by appropriate education and support for nurses, but nurse educator posts are often lost when money is tight, paradoxically leading to higher costs later when bank and agency nurses must be employed. With this in mind it is important that we learn from experience during the COVID-19 pandemic, during which, of necessity, units trialled the use of skilled critical care nurses to support nurses from other areas and other healthcare workers along with extensive packages of simulation and online training. Similar models may be helpful in developing a workforce for the future.

Critical care pathways

Critical care exists in secondary care only and patients may enter critical care in a variety of ways – there is no single standard pathway. When patients leave critical care they will generally be stepped down to a standard ward before discharge.

There is no link between critical care and the primary care pathway (although many patients will ultimately be discharged into the care of their GP). There is also no standardised follow-up, rehabilitation or review linked to critical care, since patients who remain in hospital revert to the care of the specialty that treats their primary condition, despite often having significant post-critical care problems which may not be recognised or well managed by either primary care or the referring specialty (see *Patient Outcomes, Rehabilitation and Follow-up*, page 55).

There is a notable absence of data on outcomes for critical care patients. Nothing is routinely collected beyond rates of survival. This lack has a major impact on the provision of rehabilitation pathways and support for patients post critical care (see *Patient Outcomes, Rehabilitation and Follow-up*, page 55).

Funding model

The current funding model is based on numbers of organs supported through the Critical Care Minimum Data Set (CCMDS) model. A new blended payments model is being discussed within the NHS, but it is not clear how this will address the current inadequate resource in critical care. Because critical care has not historically been viewed as a specialist service in its own right, it is commissioned through a combination of Specialised Commissioning (via the adult critical care Clinical Reference Group (CRG)) for certain surgical specialties and also locally by Clinical Commissioning Groups (CCGs), although patients are on the same units.

As stated in the service specifications for adult critical care:

> *Adult Critical Care underpins all acute specialised and non-specialised inpatient clinical pathways. Collaborative working between commissioners (NHS England Specialised Commissioning teams and CCGs) and Clinical Networks (SCNs, ODNs and STPs/ICS) is essential to the design and delivery of the service.*[12]

Since standards of care and service provision need to be the same across all patients, a unified commissioning model would be extremely helpful.

Recent guidance

The Faculty of Intensive Care Medicine (FICM) and Intensive Care Society (ICS) recently published their second set of guidance for the provision of intensive care services,[13] which sets out comprehensive standards and recommendations for the provision of critical care. We are fully supportive of this work and have found good reason to cite it throughout this report. We have noted where provision does not fall in line with this guidance and our recommendations attempt to address this as constructively as possible in order to deliver both improvements in patient care and longer-term efficiencies.

Since we quote this publication frequently, where we do so we have simply included the source (abbreviated as *GPICS2 Guidelines*) in parentheses.

In March 2020, the National Institute for Health and Care Excellence (NICE) published COVID-19 guidance on critical care in adults, which has subsequently been replaced with a new guideline.[14]

[12] *www.england.nhs.uk/wp-content/uploads/2019/05/Adult-Critical-Care-Service-Specification-FINAL.pdf section 2.2*

[13] *The Faculty of Intensive Care Medicine and the Intensive Care Society (2019), Guidelines for the provision of intensive care services, V. 2, June, www.ficm.ac.uk/sites/default/files/gpics-v2.pdf*

[14] *NICE (2021) COVID-19 rapid guideline: managing COVID-19 (NG191): https://www.nice.org.uk/guidance/ng191*

Conclusion

While the COVID-19 pandemic has highlighted the centrality of critical care services to the NHS, the way the service has historically been set up and funded, results in provision being variable between hospitals. Patient flow (the movement of patients out of critical care to enable new admissions) is largely beyond the control of intensivists, since it is reliant on smooth and timely movement of patients downstream. Critical care patients effectively 'owned' by their originating specialties (and patient data is generally tracked through and within these specialties rather than through critical care). Funding is currently managed through a dual system of CRGs and CCGs depending on the originating specialty, even for patients managed side by side in the same unit. In addition, for various historical and logistical reasons, the specialty has suffered from limited investment. These issues and others are investigated in more detail in the body of the report, where we also consider what the COVID-19 pandemic has shown by way of potential solutions to the ongoing workforce shortages in critical care.

About our analysis

We carried out our analysis following the established GIRFT model. (For more on the GIRFT programme, see the separate section in this report.)

The impact of the COVID-19 pandemic

We had completed 62 deep-dive visits (covering 101 units in 59 trusts, with 80 further trusts to visit) and collated much of the data used in this report before the pandemic took hold. However, the pressure COVID-19 put on critical care and the specialty's response during Spring 2020 has informed the writing of the report. We note the insights gained during this period wherever they are pertinent. Our overall recommendations have not been changed by the pandemic; on the contrary, we feel they have been strengthened and given a greater sense of urgency.

Identifying critical care service providers

First we set about assembling all of the relevant existing NHS data on critical care. Our key data sources were the Intensive Care National Audit and Research Centre's (ICNARC's) Case Mix Programme (CMP)[15] and Hospital Episode Statistics (HES). ICNARC's Case Mix Programme is a nationally recognised audit of patient outcomes from adult critical care units in England, Wales and Northern Ireland. Currently, 100% of these units participate in the CMP.

We identified 269 hospitals and specialist centres with a critical care unit.

Critical care units in specialist centres tend to have an atypical mix of patients. For the purposes of analyses we have excluded these units in many instances. We have stated where this is the case in all figure captions.

This report covers critical care for adults.

Collecting data

We conducted our own supplementary data collection through an extensive questionnaire to providers. Where the data allowed, we benchmarked providers on key measures and identified where there is variation.

Carrying out deep-dive visits

Deep-dive meetings with providers are a vital part of the GIRFT process. At these meetings, we review data, provide advice and gather views and opinion.

1. We provided every trust with a data pack. We then visited trusts to discuss the data in depth.
2. During these deep-dive meetings, we looked closely at the variation in clinical data. We discussed this detail at length with clinicians, senior provider management and Operational Delivery Network (ODN) leads and all those involved in delivering critical care services. Our aim is to identify, recognise and highlight those hospitals that demonstrate variation that improves patient outcomes by providing high-quality care and to help and support those hospitals with unwarranted variation that could be detrimental to patient outcomes.
3. We also discussed our findings with the Faculty of Intensive Care Medicine (FICM), the Intensive Care Society, the Intensive Care National Audit and Research Centre (ICNARC) and the Critical Care Leadership Forum.[16]

The scope of our report

The report covers adult critical care services in England. We have not discussed paediatric critical care, as this is a separate GIRFT workstream. We have also not covered the transition from paediatric to adult services as this will be covered by the paediatric critical care report.

[15] *For further information on ICNARC's CMP, see their website at www.icnarc.org/Our-Audit/Audits/Cmp/About*

[16] *For further information on the Critical Care Leadership Forum see www.ficm.ac.uk/board-committees/critical-care-leadership-forum*

Overlap with other specialties

Although a distinct specialty in itself, critical care provides care for patients across the full range of medical and surgical specialties. The relationship between certain key specialties such as renal, cardiology and respiratory, for example, and critical care can vary greatly by trust. We discuss some of the key issues pertaining to this, and the implications for delivery of care and patient outcomes, in the report.

We carried out our analysis following the established GIRFT model. (For more on the GIRFT programme, see the separate section in this report.)

List of recommendations

Recommendation	Actions	Owners	Timescale
1. Increase critical care and enhanced care beds. This should be particularly focused on Level 2 and enhanced care beds, but also more Level 3 beds in some areas where required.	**a** Trusts and Operational Delivery Networks (ODNs) should undertake a review of critical care need to reduce delayed admissions, overnight discharges, admissions with four or more organ failures and non-clinical transfers. This should include at least a 50:50 Level 2 to Level 3 bed split. **b** GIRFT will work with trusts to develop plans for enhanced care beds across medicine and surgery.	GIRFT, trusts. NHSE/I	For progress within a year of publication
2. Consider and develop national postoperative pathways for patients requiring enhanced or critical care management to ensure consistency.	**a** GIRFT will work with Faculty of Intensive Care Medicine (FICM), NHS England and NHS Improvement (NHSE/I) and ODNs to agree national standards for postoperative pathways into critical care. **b** GIRFT will support ODNs and trusts on implementing these locally.	GIRFT, FICM, NHSE/I, ODNs, Royal College of Surgeons (RCS) and Royal College of Anaesthetists (RCoA)	For progress within a year of publication
3. Promote the development of enhanced care areas, ensuring appropriate governance and staffing arrangements for patients are in place.	**a** GIRFT to support the FICM, Intensive Care Society (ICS), Royal College of Physicians (RCP), Royal College of Surgeons (RCS), UK Critical Care Nursing Alliance (UKCCNA) and Royal College of Anaesthetists (RCoA) to develop workforce plans and governance for the roll-out of comprehensive enhanced care areas.	GIRFT, ICS, RCP, RCS, UKCCNA, RCoA and FICM	For progress within a year of publication
4. Fund and develop adult critical care transfer services based on Operational Delivery Networks (ODN) or Sustainability and Transformation Partnerships (STP)/Integrated Care Systems (ICS) footprints to support equitable access and surge capacity.	**a** GIRFT to support ODN's, Intensive Care Society/STPs and NHSE/I to develop these.	GIRFT, ODNs, ICS, NHSE/I, STPs/ICSs	For progress within a year of publication
5. Implement full 24/7 outreach services in every hospital with a critical care unit. If using a Hospital at Night service as part of this provision, the team members should have sufficient critical care training	**a** GIRFT to support audit of all 24/7 outreach services across England to identify trusts for service implementation	GIRFT, National Outreach Forum, trusts	For progress a year after publication
6. Put Advance Care Planning and shared decision-making protocols in place, in order to know patient and families' wishes and help to inform appropriate referrals to critical care.	**a** All trusts should review, update and implement their protocols and referrals so they are following end of life guidance. **b** GIRFT will work with NHS England and NHS Improvement (NHSE/I) and individual trusts to ensure policies/guidance such as Advance Care Planning and shared decision-making are implemented.	Sustainability Transformation Partnerships (STPs) /Integrated Care Systems (ICSs), Primary Care Networks (PCNs), trusts and NHSE/I	For implementation a year after publication

Recommendation	Actions	Owners	Timescale
7. Ensure there is a Clinical Lead for Organ Donation (CL-OD) that links with a Specialist Nurse for Organ Donation (SN-OD) for each trust with a critical care unit to enable national pathways to be followed and for donation to occur in a timely manner.	**a** GIRFT to support NHS Blood and Transplant, Operational Delivery Networks (ODN) and individual trusts to audit national requirements for CL-ODS and SN-ODs to ensure appropriate coverage	GIRFT, NHS Blood and Transplant (NHSBT), ODNs	For significant progress a year after publication
8. Ensure critical care discharges are discussed pre-emptively at hospital-wide daily bed management meetings and given the same level of priority as hospital admissions to ensure optimal patient flow and allow for new critical care admissions to be made in a timely manner.	**a** GIRFT will support trusts to implement pathways that will facilitate optimal patient flow and timely discharges from and admission to critical care units.	GIRFT, STPs/ICSs, ODNs and trusts	For progress within a year of publication
9. Develop a patient multi-disciplinary rehabilitation pathway starting in critical care and following through to primary care after discharge. Obtain necessary funding to support this.	**a** GIRFT to work with Faculty of Intensive Care Medicine (FICM), Intensive Care Society (ICS), NICE, GPICS2 Guidelines and NHS England and NHS Improvement (NHSE/I) (people team) to secure funding for a rehabilitation pathway including investment for Allied Health professionals (AHPs).	GIRFT, NHSE/I, FICM, ICS, NICE and Chartered Society of Physiotherapists	For progress within a year of publication
10. Develop pathways for post-critical care follow-up, and consider which approach best meets patient needs.	**a** GIRFT to support trusts and Operational Deliver Networks (ODNs) to develop pathways and to ensure that they adhere to upcoming guidance from FICM.	GIRFT, trusts, ODNs and FICM	For progress within a year of publication
11. Meet *GPICS2 Guidelines* standards for the critical care workforce (where stated) and where no numbers are currently recommended, trusts should ensure all patients able to access appropriate care.	**a** GIRFT to support Faculty of Intensive Care Medicine (FICM) and Intensive Care society (ICS) on guidance that ensures the following: • chest and rehabilitative physiotherapy is available 7/7; • speech and language therapy is available 5/7; • a dietician is available 5/7; • occupational therapy is available 5/7; • psychology services are available 5/7. **b** GIRFT to support research to identify and quantify numbers and skills mix across the MDT where numbers are not currently recommended.	GIRFT, FICM and ICS	For progress within six months of publication
12. Develop national, evidence-based, costed recommendations for the employment of critical care pharmacists.	**a** GIRFT to support NHS England and NHS Improvement (NHSE/I) hospital pharmacy team and people team to invest in critical care pharmacists.	GIRFT and NHSE/I	For progress within a year of publication
13. Develop a sustainable mechanism for training more Advanced Care Critical Care Practitioners (ACCPs) and possibly develop networks, to make it easier for smaller hospitals to employ them.	**a** GIRFT to support other stakeholders in creating a new funding model for training for ACCPs. **b** GIRFT to support FICM to develop an ACCP apprencticeship	GIRFT, FICM and NHSE/I	For progress 18 months after publication

Recommendation	Actions	Owners	Timescale
14. Use learning from COVID-19 and subsequent research as a basis to develop a robust evidenced-based nursing workforce model for the future.	**a** Support research by National Institute for Health Research (NIHR) into staffing requirement and models in light of COVID-19 experience.	GIRFT, NIHR, Intensive Care National Audit Research Centre (ICNARC), FICM and ICS	For progress a year after publication
15. Ensure research and quality improvement are an integral part of the work of each critical care unit to build on the momentum of COVID-19, exemplified by the RECOVERY, RECOVERY-RS and REMAP-CAP research studies. This would include contributing to the delivery of *Best Research for Best Health: The Next Chapter** through NIHR portfolio studies, as well as national benchmarking data sets, such as ICCQUIP, and QI programmes. *see page 73.	**a** GIRFT will support trust critical care units alongside the National Institute for Health Research (NIHR) to establish: • a quality improvement lead to oversee data national collection and to support unit continuous QI; • a research lead, to establish a link with NIHR and participate in multi-centre trials; • any necessary support from trust research infrastructure.	GIRFT, NIHR and ICCQIP	Within one year of publication
16. Collect Patient Related Outcome Measures (PROMs) following critical care.	**a** Scope other data sources for linkage and look to automate data collection. **b** Research to identify whether these data sources perform sufficiently well.	GIRFT, FICM, ICS and ICNARC	Within one year of publication
17. Identify gaps in research and develop a national research strategy. This would include understanding more about outreach services.	**a** FICM, ICS, Critical Care Leadership Forum (CCLF), ICNARC and NIHR to work with patient groups to produce a national research strategy for critical care.	GIRFT, ICS, CCLF, ICNARC and NIHR	For progress within a year of publication
18. Enable improved procurement of devices and consumables through cost and pricing transparency, aggregation and consolidation, and by sharing best practice.	**a** Use sources of procurement data, such as SCS and relevant clinical data, to identify optimum value for money procurement choices, considering both outcomes and cost/price. **b** Identify opportunities for improved value for money, including the development of benchmarks and specifications. Locate sources of best practice and procurement excellence, identifying factors that lead to the most favourable procurement outcomes. **c** Use Category Towers to benchmark and evaluate products and seek to rationalise and aggregate demand with other trusts to secure lower prices and supply chain costs.	Trusts, GIRFT	Ongoing

Recommendation	Actions	Owners	Timescale
19. Reduce litigation costs by application of the GIRFT Programme's five-point plan.	**a** Clinicians and trust management to assess their benchmarked position compared to the national average when reviewing the estimated litigation cost per activity. Trusts have received this information in the GIRFT 'Litigation data pack'.	Trusts	For immediate action
	b Clinicians and trust management to discuss with the legal department or claims handler the claims submitted to NHS Resolution included in the data set to confirm correct coding to that department. Inform NHS Resolution of any claims which are not coded correctly to the appropriate specialty via CNST.Helpline@resolution.nhs.uk	Trusts	Upon completion of 19a
	c Once claims have been verified clinicians and trust management to further review claims in detail including expert witness statements, panel firm reports and counsel advice as well as medical records to determine where patient care or documentation could be improved. If the legal department or claims handler needs additional assistance with this, each trusts panel firm should be able to provide support.	Trusts	Upon completion of 19b
	d Claims should be triangulated with learning themes from complaints, inquests and serious untoward incidents (SUI)/serious incidents (SI)/Patient Safety Incidents (PSI) and where a claim has not already been reviewed as SUI/SI we would recommend that this is carried out to ensure no opportunity for learning is missed. The findings from this learning should be shared with all front-line clinical staff in a structured format at departmental/directorate meetings (including Multidisciplinary Team meetings, Morbidity and Mortality meetings where appropriate).	Trusts	Upon completion of 19c
	e Where trusts are outside the top quartile of trusts for litigation costs per activity GIRFT we will be asking national clinical leads and regional hubs to follow up and support trusts in the steps taken to learn from claims. They will also be able to share with trusts examples of good practice where it would be of benefit.	GIRFT	For continual action throughout the GIRFT Programme

Findings and recommendations

Equity of access to critical care

This section considers the variation that can lead to inequities in access to care. The key themes we identified are: -

- the complex nature of decision-making around admissions (and the cultural and historical factors that can affect this);
- capacity issues (including the provision of enhanced care alongside critical care);
- local arrangements around the management of specific conditions;
- and staffing and recruitment.

The first aim of the service, according to the adult critical care service specification is 'to ensure equity of access, equitable care and timely admission and discharge to and from adult critical care for all appropriate patients'.[17] However, our findings indicate that **patients do not have equity of access to critical care** across the country.

COVID-19 – insight

Capacity, culture and resources affect decision-making on critical care admissions. These factors have been brought into stark relief by the COVID-19 pandemic and are well described by Hannah Wunsch in her analysis of global data about rates of mechanical ventilation for COVID-19 patients. She notes that:

- Clinical decision-making has always varied, even when dealing with 'classic' acute respiratory distress syndrome (ARDS).
- Availability of resources varies and this influences thresholds for admission to critical care, perception of need for mechanical ventilation and duration of continued invasive life-supporting therapies.
- Expectations and preferences for care are often driven by cultural norms, which are inevitably linked to the availability of resources locally.[18]

The ability of critical care units to take patients in need of Level 2 and Level 3 care varies by hospital, depending primarily on the size of the critical care unit in relation to overall admissions. This affects the type of patient admitted. Unit stress (also known as unit strain) is a measure of unit capacity in relation to patient flow (see also pp. 18–19). A highly stressed critical care unit will be prone to heightened admission criteria and delays in admissions and is also potentially linked to poorer patient outcomes.[19]

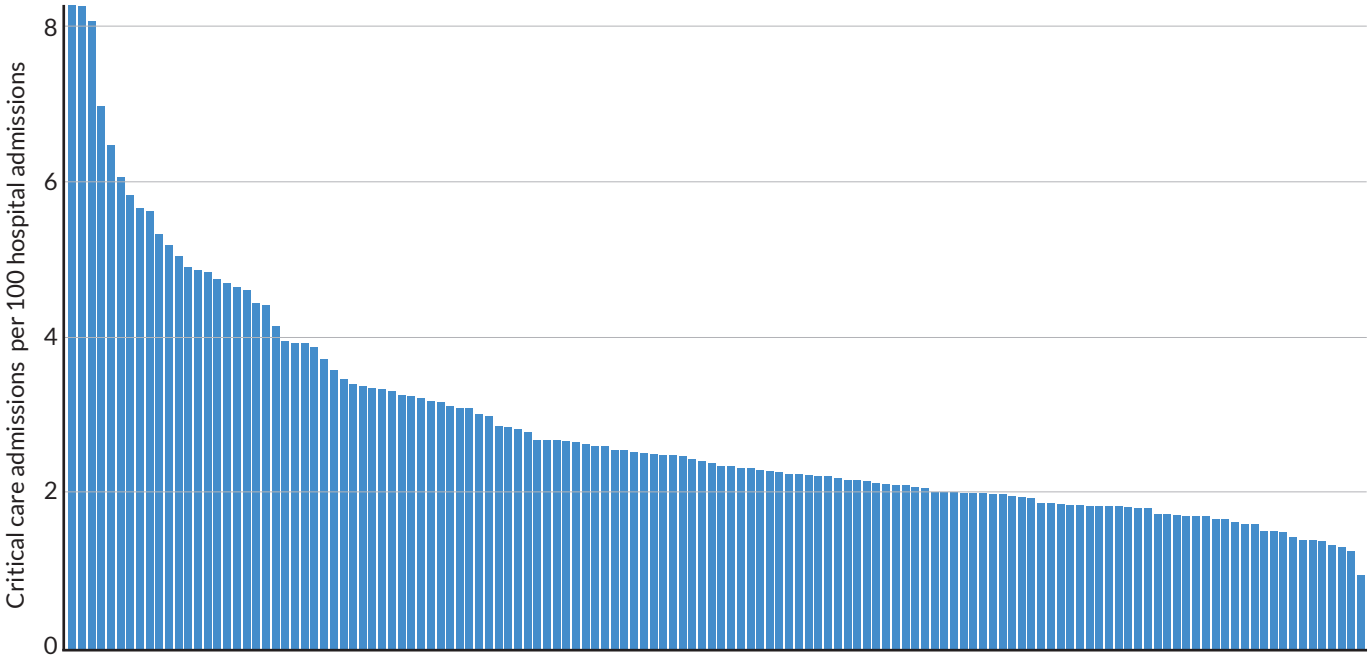
Figures 4, 5 and 6 below highlight inequity of access to critical care. **Figure 4** shows the variation in non-specialist trusts in the number of critical care admissions relative to hospital admissions, highlighting wide variations that indicate geographical inequity of access. **Figure 5** illustrates the variation in numbers of delayed admissions to critical care by (non-specialist) trust, indicating levels of unit strain. **Figure 6** illustrates the relationship between unit strain and outcomes.

[17] *www.england.nhs.uk/wp-content/uploads/2019/05/Adult-Critical-Care-Service-Specification-FINAL.pdf section 4.1*

[18] *H. Wunsch (2020), Mechanical ventilation in COVID-19: interpreting the current epidemiology, American Journal of Respiratory and Critical Care, May, DOI: 10.1164/rccm.202004-1385ED, www.researchgate.net/publication/341364188_Mechanical_Ventilation_in_COVID-19_Interpreting_the_Current_Epidemiology*

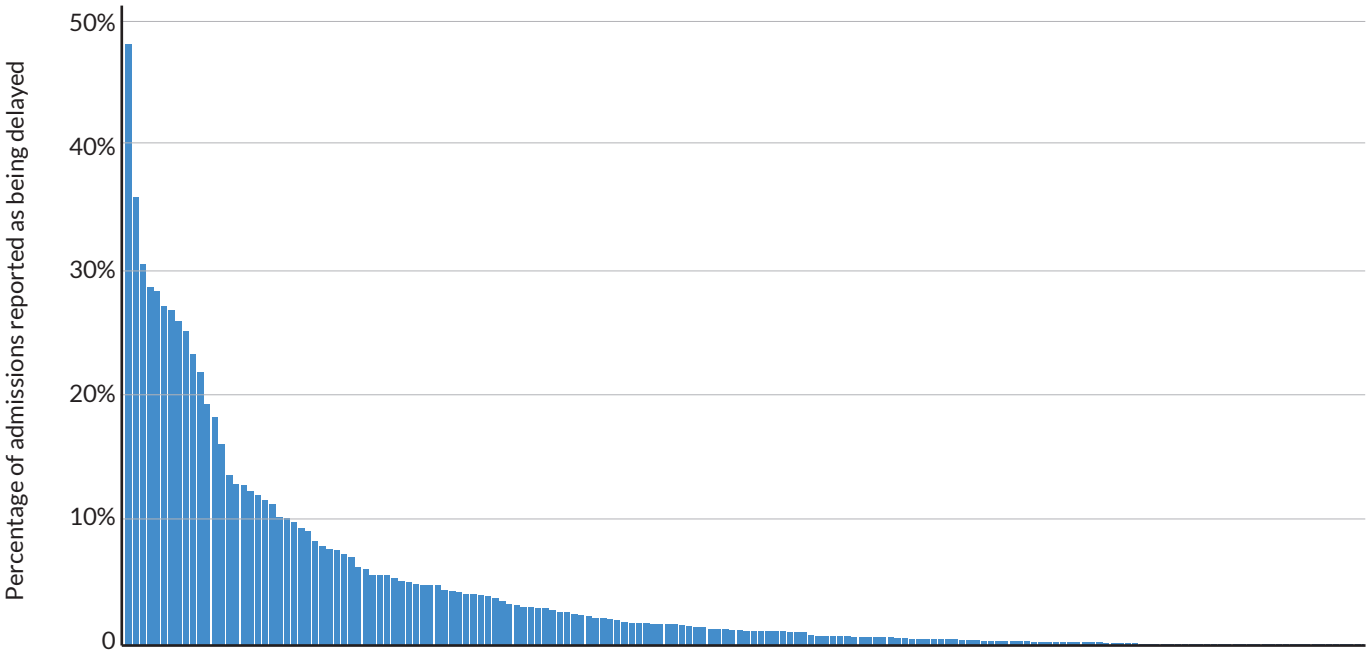
[19] *See, for example, M. E. Wilcox, D. A. Harrison, A. Patel et al. (2020), Higher ICU capacity strain is associated with increased acute mortality in closed ICUs, Crit Care Med, May, 48(5): 709–716, www.ncbi.nlm.nih.gov/pubmed/32141924 and S. M. Bagshaw (2017), ICU strain: causes and impact, presentation at Critical Care Canada Forum 2017, Toronto, Canada, 4 October, https://criticalcarecanada.com/presentations/2017/icu_strain_causes_and_impact.pdf*

Figure 4: Critical care admissions relative to hospital admissions (non-specialist trusts), April 2018–March 2019



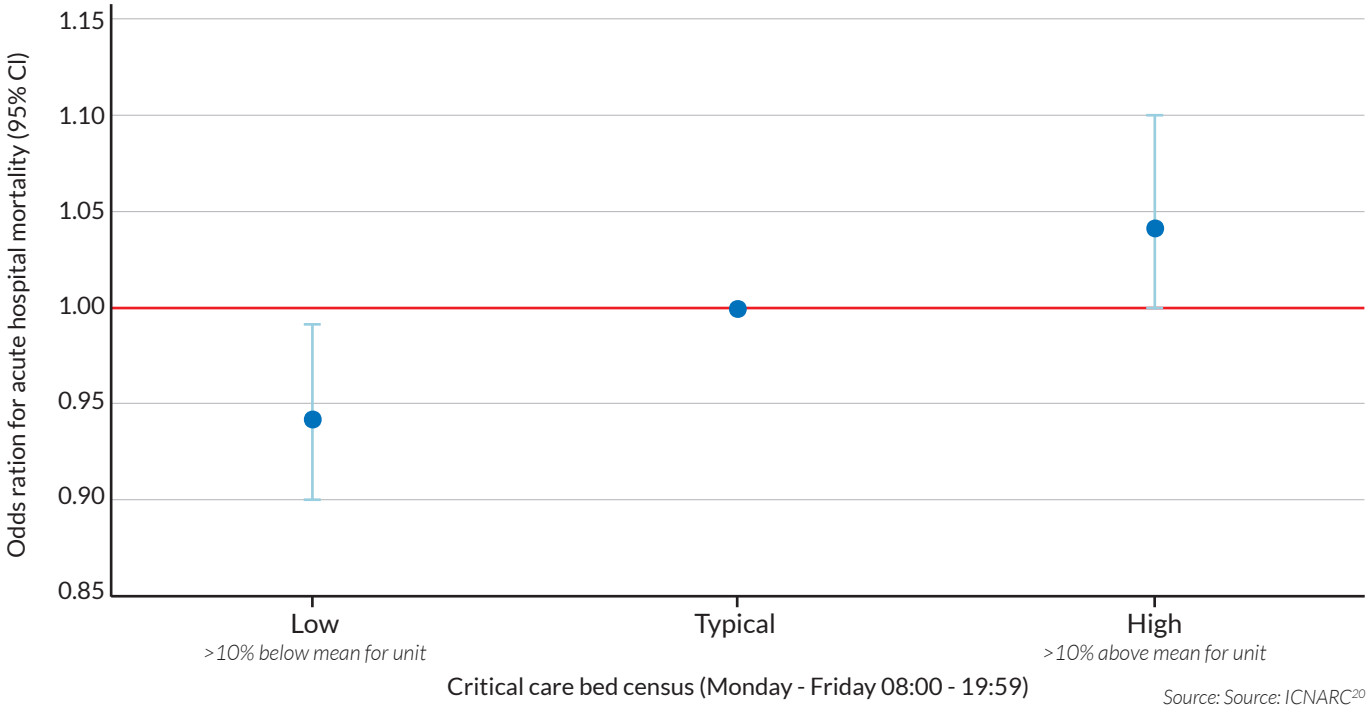
Source: ICNARC and HES data 2018/2019

Figure 5: Delayed admissions to critical care (non-specialist trusts), April 2018–March 2019



Source: ICNARC data 2018/2019

Figure 6: Association between unit strain and outcome



Source: Source: ICNARC[20]

The decision-making process around admission to critical care

> *Critical care capacity management is complex, as constant operational pressures can conflict with the needs of individual patients, and critical care teams have to balance the needs of patients referred to them, both as emergencies and planned admissions after elective major surgery, with the needs of patients already under their care.*
>
> *When units operate at capacity, it is almost inevitable that only patients requiring immediate organ support are admitted – to the possible detriment of others more likely to gain long-term benefit from critical care. These interactions are so complex that it is very difficult to write policies that can account for multiple variables and every possible scenario. Decisions regarding how to manage capacity thus have to be made clinically, taking into account individual patient need and likelihood of benefit from intensive care. Patients who are exposed to a non-clinical transfer (i.e. are moved to another critical care to make room for a new admission) have a longer critical care unit stay.*
>
> **GPICS2 Guidelines**

These comments accurately reflect the current issues with capacity and management of patients in critical care.

The situation is complex because critical care has limited capacity. There is no standard that sets out the criteria for a patient to be admitted to critical care. Decisions are made on the basis of a clinician's personal assessment, often in situations of clinical uncertainty, with limited time and with a patient who may be too ill to discuss their treatment preferences. Inevitably, the decision will be based on a combination of clinical and pragmatic grounds: how severe is the patient's need and whether a bed be justified, which will depend in part on how full the unit is at the time and what surgical admissions are anticipated.

[20] *M. Wilcox, D. A. Harrison, A. Patel and K. Rowan (2020), Higher ICU capacity strain is associated with increased acute mortality in enclosed ICUs, Critical Care Medicine, May:48(5):709–716, doi:10.1097/CCM.0000000000004283, https://pubmed.ncbi.nim.nih.gov/32141924*

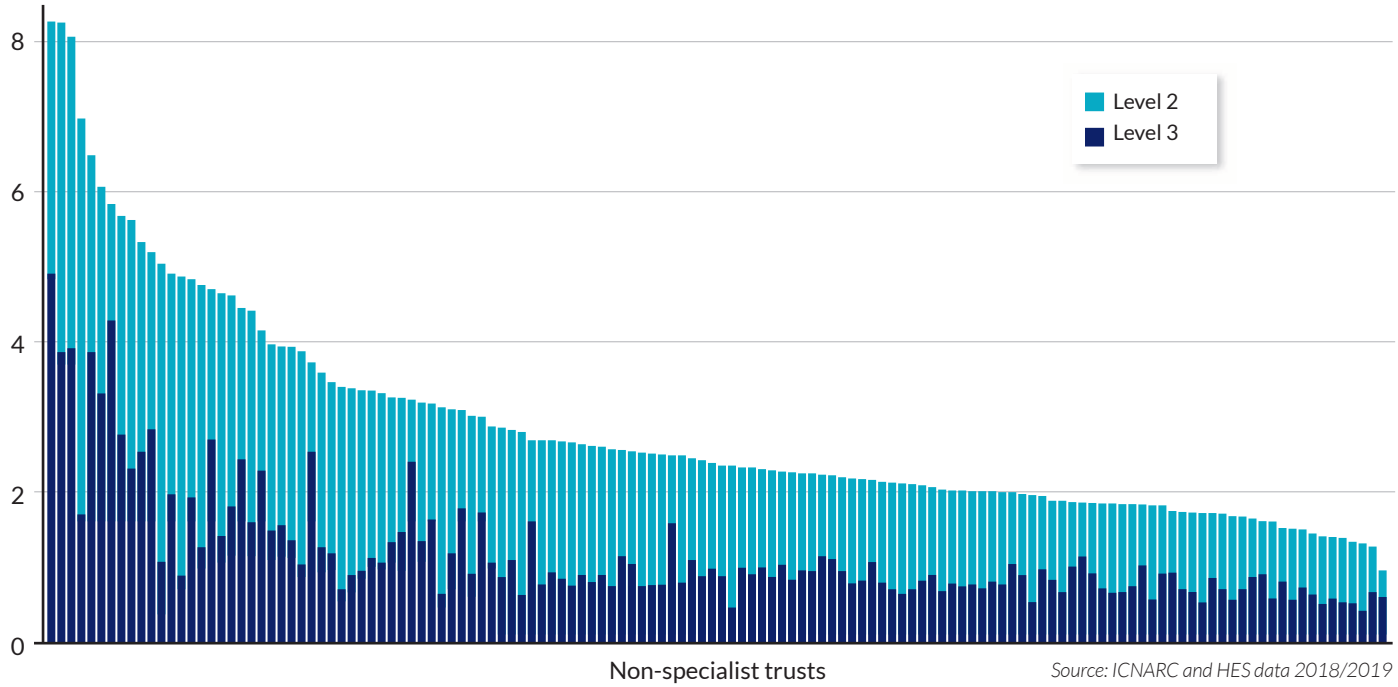
Fixed criteria are impossible because clinicians must work with what's available in a given trust – in units of different capacity, different decisions around admission will be made. Therefore, hospitals develop their own culture around admission decisions on this basis. Referring clinicians conform to that culture, making it difficult to assess unmet need, i.e. how many patients who would benefit are being denied access to critical care because they are not referred as a result of lack of capacity.

When beds are in short supply a decision might need to be made, for example, about whether to admit a frail elderly patient with pneumonia and risk delaying major elective surgery for a patient with cancer. In such cases, community information, including any end of life directives, can be helpful in decision-making, but this is not always available (see *End of Life Care*, page 41).

The many factors that influence a clinician's decision-making may include the patient's age, the number and severity of co-morbidities, their functional status (how well they function in their day-to-day life), the 'look' of the patient (inevitably there is an element of subjective/instinctive judgement) and the patient or family's views on critical care/end of life care (if known). However, there is no right answer and different consultants will prioritise different criteria and respond in different ways to the same situation.[21] Various methods have been used to predict survival rates and indicate who might benefit from a stay in critical care (including a risk predictor model developed by ICNARC[22]), but none as yet can be reliably used to develop hard and fast admission criteria, as these are inevitably influenced by issues of resourcing, capacity and culture. COVID-19 has highlighted this issue even further.[23]

One further factor to take into account, when considering the decision-making process, is the scarcity of data on patient outcomes following a stay in critical care. If more information were available this would enable clinicians to make more informed decisions about the types of patients most – and least – likely to benefit from admission and support shared decision-making with patients and families. This issue forms the basis of an important recommendation (see also *Patient Outcomes, Rehabilitation and Follow-up*, page 55).

Figure 7: Critical care admissions relative to hospital admissions (non-specialist trusts), Levels 2/3



Source: ICNARC and HES data 2018/2019

[21] *C. R. Bassford, N. Krucie, M. Ryan et al., UK intensivists' preferences for patient admission to ICU: Evidence from a choice experiment, www.ccmjournal.org 47 (11): 1522–1530, November 2019, www.ncbi.nlm.nih.gov/pmc/articles/PMC6798748/*

[22] *D. A. Harrison, G. J. Parry, J. R. Carpenter et al., A new risk prediction model for critical care: the Intensive Care National Audit & Research Centre (ICNARC) model, Crit Care Med, 2007, Apr 35(4): 1091–1098, www.ncbi.nlm.nih.gov/pubmed/17334248*

[23] *Wunsch, H. (2020), Mechanical ventilation in COVID-19: interpreting the current epidemiology, American Journal of Respiratory and Critical Care, May, DOI: 10.1164/rccm.202004-1385ED, www.researchgate.net/publication/341364188_Mechanical_Ventilation_in_COVID-19_Interpreting_the_Current_Epidemiology*

Figure 7 above shows differing ratios of Level 2 to Level 3 critical care beds available by trust in relation to hospital admissions. In England there is on average a 50/50 split between Level 2 and Level 3 beds. However, in those hospitals where there are more beds at Level 3, this may suggest a lack of capacity to admit patients at Level 2 or, conversely, a lack of early intervention, so that Level 3 support may be required for rapidly deteriorating patients. Clinical opinion and circumstantial evidence would suggest that early intervention to Level 2 care may avert some need for Level 3 care. If this Level 2 capacity is not available then admission is delayed until a patient requires Level 3 care, which leads to increased costs, longer length of stay, a greater requirement for post-ICU care, higher rates of long-term morbidity and increased mortality.

COVID-19 – insight

One of the many lessons learned during the COVID-19 pandemic has concerned flexibility of care. Since the majority of patients admitted to critical care during this period have required mechanical ventilation (Level 3 care), the ability to flex Level 2 and 3 beds has been key. This underlines the need, wherever possible, to locate Level 2 and Level 3 beds in the same area, so that nursing teams can provide the care needed across the service without having to work across separate sites.

Enhanced care arrangements

The enhanced care set up within a hospital also affects decisions about who needs to be admitted to critical care.

Many hospitals have non-invasive ventilation (NIV) enhanced care areas attached to respiratory wards. If these are well run with 24-hour respiratory consultant support, they may reduce the burden on critical care units and offer a better environment for those patients for whom critical care interventions may not be appropriate. In some cases, often where there are only small numbers of such patients, a 'flexible nursing' area in the critical care unit can be used, i.e. using a bed but with an appropriate level of nursing support, which may or may not be less than Level 2 care. On the issue of NIV we support the recommendations of the GIRFT respiratory workstream.

A similar level of enhanced care for post-surgical patients may be provided in post-anaesthetic care units (PACUs) or enhanced care areas on a surgical ward. Again, these vary in size, location and management in different hospitals.

Many hospitals have no enhanced care areas for postoperative high-risk surgical care and patients are admitted either to HDU or sent straight back to the ward. There is great variability in practice across the country. We did not include data on postoperative care for particular surgical procedures in our data packs, but we did look at admissions for elective or emergency surgery and found significant variation between units, with between 0% and 91% of total admissions being after elective surgery. We recently extracted data from HES on a selection of procedures, such as major colorectal or carotid endarterectomy. We have not had the opportunity to discuss this data with units, but it is clear that culture and practice varies significantly. For example, a patient after carotid endarterectomy may spend four hours in a post anaesthetic theatre recovery area before returning to the surgical ward in one hospital or spend two days in HDU (level 2 care) in another. National surgical and anaesthetic groups should define default pathways for procedures, highlighting where the expectation is for the patient to return to the ward, to spend a longer period (e.g. four to six hours) in a recovery unit, be admitted to an enhanced care area or be admitted to critical care.

While models will vary, the aim of enhanced care should be to intervene earlier and deliver optimal care to prevent the patient, where possible, from falling under the care of critical care teams. All enhanced care areas, such as PACU and NIV units, need appropriate 24-hour cover from surgeons and anaesthetists or respiratory physicians respectively, or else expectations (unfunded) may fall on critical care.

> *Enhanced care is a service provided to adults in an area identified as capable of providing a higher level of observation, monitoring and interventions than a general ward but not requiring organ support. It describes an intermediate level of care between that provided within HDU and the ward, where enhanced advice and support from the critical care team can be accessed. Under normal circumstances enhanced care would not be delivered by the critical care team.*
>
> **Faculty of Intensive Care Medicine**[24]

Equity of access for specific conditions

Certain key conditions and procedures highlight inequities of access with regard to critical care admissions. We noted significant variations, for example, in admissions both following emergency laparotomies (the National Emergency Laparotomy Audit, NELA, recommends that patients with predicted mortality risk of 5% or greater should be admitted to critical care postoperatively) and for patients with chronic obstructive pulmonary disease (COPD). Similarly, for patients with diabetic ketoacidosis (DKA) and those with renal failure there was widespread variation. We explore the variations and what they mean for patients with these conditions, and for equity of access to critical care more broadly, below.

Critical care admission following emergency laparotomy

Some units have low critical care admissions following emergency laparotomies, usually because of bed capacity. Again there is wide variation. Low levels of admissions for these patients usually indicate capacity issues in critical care and/or related to this, a more systemic effect of unit strain and a culture that has grown up around this of not requesting patients be admitted to critical care unless they are in organ failure, despite NELA guidelines. The latest NELA report highlights this as a key message:

> *Patients assessed before their operation as having a ≥5% risk of death should be admitted directly to critical care postoperatively to increase their chance of survival. However, 23% of such patients in NELA were instead admitted to a general ward, and this has remained static over the last three years. Institutional, cultural and organisational change is required to ensure patients consistently receive this standard of care*
>
> **National Emergency Laparotomy Audit**[25]

A proportion of these patients later came from an acute ward as an unplanned critical care admission, indicating a combination of poor pathway planning/risk assessment and unit strain. **Table 1** shows unplanned admissions to critical care after an emergency laparotomy (unplanned admission to critical care resulted in a longer median duration of stay of 21 days (IQR 12–38) compared with ten days if there was no unplanned admission; mortality was 16.8% if an unplanned admission to critical care occurred). [26]

[24] *Wilcox ME, Harrison DA, Patel A, Rowan KM. Higher ICU Capacity Strain Is Associated With Increased Acute Mortality in Closed ICUs. Crit Care Med 2020; 48:709-16. https://dx.doi.org/10.1097/CCM.0000000000004283*

[25] *NELA Project Team (2019), Fifth patient report of the National Emergency Laparotomy Audit, December 2017–November 2018, RCoA London, www.nela.org.uk/downloads/The%20Fifth%20Patient%20Report%20of%20the%20NELA%20-%20Highlight%20Report.pdf*

[26] *NELA Project Team (2019), Fifth patient report of the National Emergency Laparotomy Audit, December 2017–November 2018, RCoA London, www.nela.org.uk/downloads/The%20Fifth%20Patient%20Report%20of%20the%20NELA%20-%20Highlight%20Report.pdf*

Table 1: Original postoperative discharge destination of patients after emergency laparotomy who required a subsequent unplanned admission to critical care

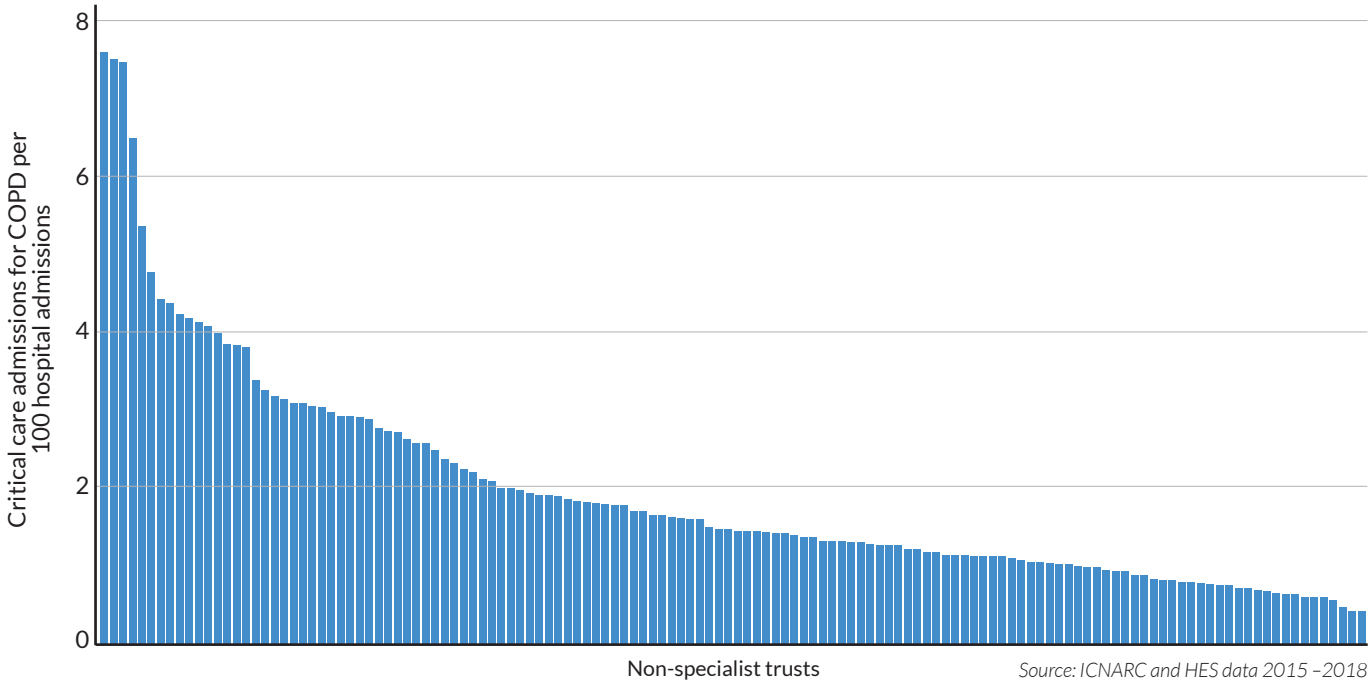
Postoperative destination following original laparotomy for patients with an unplanned admission to critical care	Total number of patients [n (%)]
Critical care	606 (73.7%)
Enhanced care area	45 (5.5%)
Ward	171 (20.8%)

Source: NELA Project Team (2019), Fifth patient report of the National Emergency Laparotomy Audit, December 2017–November 2018[27]

Critical care admissions for chronic obstructive pulmonary disease (COPD)

Figure 8 shows significant variation in admissions to critical care for patients with COPD. In some cases it is likely that greater provision of enhanced care areas offering non-invasive ventilation (NIV) is leading to lower critical care admissions for COPD patients, but in other cases there are likely to be cultural reasons related to persisting but unfounded beliefs that patients with acute exacerbations of COPD will fail to wean from ventilation. It is important that respiratory and critical care teams develop a service that works best for patients and do not work in silos. Treatment escalation plans, adequate 24/7 staffing in NIV units and sharing of expertise could improve patient care and possibly free up critical care capacity. An unexpected and positive outcome of the COVID-19 patient surges has been team-working of acute, respiratory and critical care physicians and greater understanding of the services each provides.

Figure 8: Critical care COPD admissions relative to hospital admissions for COPD (non-specialist trusts)



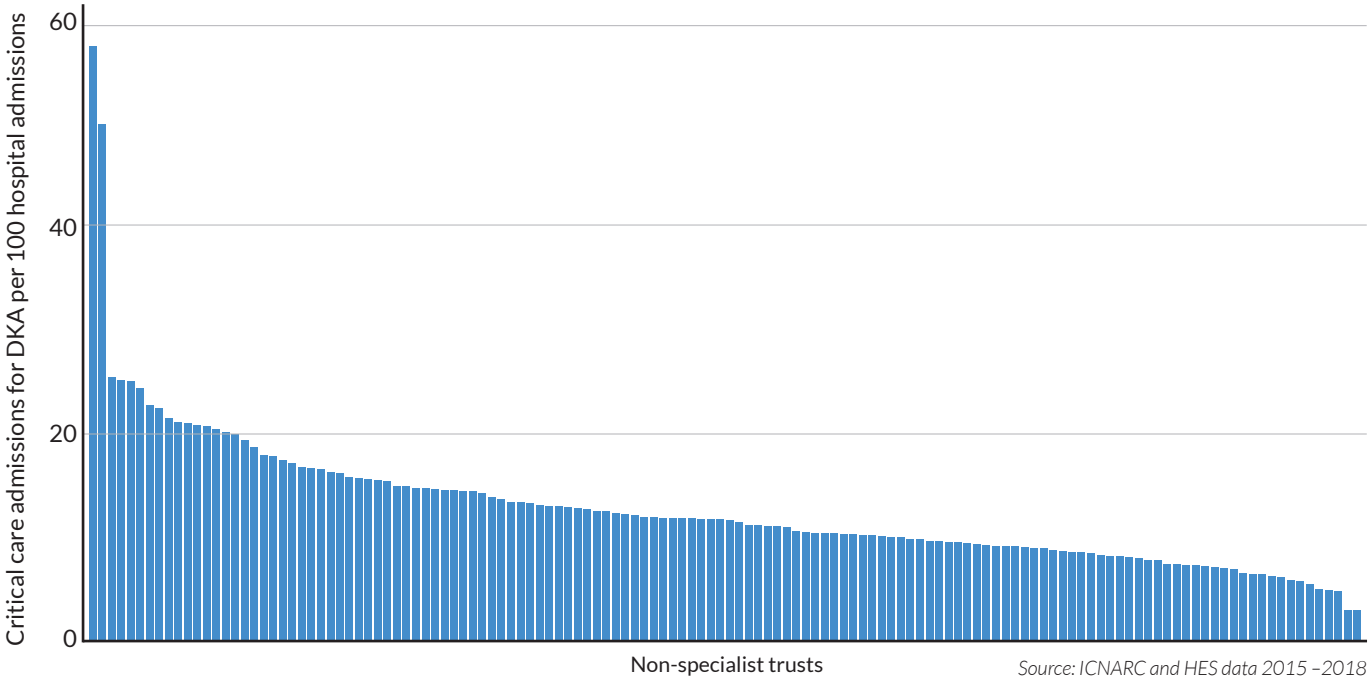
Source: ICNARC and HES data 2015 –2018

[27] *NELA Project Team (2019), Fifth patient report of the National Emergency Laparotomy Audit, December 2017–November 2018 Royal College of anaesthetists, London, www.nela.org.uk/downloads/The%20Fifth%20Patient%20Report%20of%20the%20NELA%20-%20Highlight%20Report.pdf*

Critical care admission for diabetic ketoacidosis (DKA)

Many patients with DKA can be and are managed on a diabetic ward or an acute care area with the appropriate resources, including nursing and prescriber availability with suitable protocols in place. Where this resource is not available, critical care can be a valuable backstop delivering safe patient care, but this will compromise critical care capacity, potentially limiting access to critical care for other patients. Again, **Figure 9** below shows variation between trusts in terms of the admission to critical care for these patients. As with COPD, cross-team working and the implementation of integrated trust-wide plans will result in good patient outcomes and efficient use of resources.

Figure 9: Critical care admissions for DKA relative to hospital admissions for DKA (non-specialist trusts)



Source: ICNARC and HES data 2015 –2018

Critical care admission for patients requiring renal support

Patients with single organ renal failure who require dialysis are frequently admitted to critical care because there is no other suitable place in the hospital, although this may not always be a cost-effective or efficient option. In addition it can be difficult to discharge these patients back to renal services, with the result that they stay on in critical care and are discharged direct to home. Often these patients could be managed in an acute renal unit, but not every hospital has this on site. If not, or if it is at capacity, critical care becomes the backstop.

The role of enhanced care and the models currently in use

As previously stated, the amount of enhanced care offered and the models used to provide this care vary by hospital, and a pragmatic approach is appropriate. However, given the degree of variation we have seen, it is not certain that the system is working as it should in all trusts. In this section we discuss various models to explore how enhanced care provision can offer realistic support to critical care units and thereby improve access to critical care for those patients most in need.

The case study example below shows the impact of introducing enhanced care in York. We visited this unit during our deep-dive visits and although it offers excellent care, it should be noted that the unit is severely limited in the number of patients to whom it can offer this service. A relatively small extra investment to increase the service would further free up critical care and allow the trust to offer better care with shorter lengths of stay to more patients.

CASE STUDY

The impact of introducing enhanced care

York Teaching Hospital NHS Foundation Trust[28]

Drivers for change:

- Limited HDU access/high critical care occupancy rates/on day cancellations
- Delayed discharges and long length of stay
- Potential harm to patients with excessive fluid therapy in the perioperative period
- Junior staff managing patients at their most vulnerable point in the surgical journey and subsequent variation in postoperative management
- Failure to rescue deteriorating patients
- Postoperative functional decline/increased dependency.

Intervention:

The Perioperative Medicine Service (POMS), established in 2015, introduced pathways and treatment algorithms for the immediate postoperative management of patients undergoing major, elective colorectal surgery on a pre-existing Enhanced Care Unit – the 'Nurse Enhanced Unit'. Our management plans and pathways were designed to move patients out of Critical Care and onto the 1:4 nursed Enhanced Care Unit whilst still providing them with optimal postoperative care with regards haemodynamic and medical management.

Outcome:

Data from 106 patients managed by POMS was compared with data from 202 control patients undergoing similar surgery prior to introduction of the service. There has been a steady reduction in hospital length of stay, critical care utilisation and complication rates.

- length of hospital stay (mean) – Control 12.2 days vs POMS 7.3days;
- length of hospital stay (median) – Control 8 days (6–12) vs POMS 5 (5–9);
- reduced variation in length of stay.
- Interquartile ranges for length of stay:
  - control group – 6–12 days
  - year 1: 5–8 days
  - year 2: 5–8.5 days
  - year 3: 4–8 days
- Major complications: control 225 vs poms 16.25

Dr David Yates, Consultant in Anaesthesia and Critical Care Medicine, York Teaching Hospital NHS Foundation Trust

[28] *This case study has been reproduced from FICM (2020), Enhanced care: guidance on service development in the hospital setting, https://www.ficm.ac.uk/critical-futures-initiative/enhanced-care*

As the FICM states in its most recent guidance:

> *Demands on the [critical care] service are constantly growing as patients' needs vary and the importance of anticipatory care is increasingly recognised. Development of enhanced care is part of the essential modernisation of effective, safe and efficient services. It carries the necessary hallmarks of success – developed by clinical staff to meet patient need; collaborative, being multi-specialty and inter-disciplinary; flexible and non-prescriptive; promoting staff development at all levels through education and training and developed specifically to improve patient centred care.*
>
> **Faculty of Intensive Care Medicine**[29]

For these reasons we believe that support and guidance for hospitals initiating or expanding enhanced care are vital if we are to develop a critical care service that is fit for the future and we understand guidance will be forthcoming from NHS England and NHS Improvement.

Enhanced care models include an enhanced care area (which could simply be a designated area within an acute care ward) attached to a single specialty, where the surgeon/s rather than a critical care team has oversight. Another model might be to combine major surgical specialties and provide an enhanced care ward. In either case it is important not only that there is sufficient nursing support, in the form of ward nurses with enhanced skills, and AHPs (for example, physiotherapists) to support mobilisation, but that there is a clear line of leadership and access to senior clinicians. In some cases, we would expect postoperative care in these areas to be managed by a perioperative anaesthetist-led team, with surgical input available as needed. We would also expect nursing and AHP staff could take a large role in managing and running enhanced care areas. In any model, it is important that all staff are supported to develop the necessary skills and competences.

The key is to establish from the outset clear and appropriate governance arrangements so all staff involved are fully aware of their own responsibilities and the structure and roles of the clinical leadership team.

Practicalities, such as the space needed, are often limiting factors for increasing enhanced care provision. Building a new addition represents a very significant capital cost and this, along with staffing considerations, often prevents trusts from increasing their enhanced care capacity unless there are very clear demonstrable links to improved outcomes and pressure from referring commissioners. For these reasons it is of paramount importance to collect full and systematic data around enhanced care provision to illustrate the benefits of rolling out the service.

Capital investment in critical care services

Critical care unit design in the past has often overlooked the need for isolation facilities and positive and negative pressure cubicles. Health building notes give best practice guidance on the design and planning of new healthcare buildings and on the adaptation or extension of existing facilities. They provide information to support the briefing and design processes for individual projects in the NHS building programme. Critical care facilities are governed by HBN 04-02 Critical Care Units building note.[30] Any critical care expansion should conform to this and new units should co-locate Level 2 and 3 beds and possibly enhanced care facilities.

In this area, and in several others where we have made recommendations, the Centre for Perioperative Care (CPOC), a new cross-organisational, multidisciplinary initiative led by the Royal College of Anaesthetists (RCoA) is also undertaking valuable work.[31]

[29] *FICM (2020), Enhanced care: guidance on service development in the hospital setting, www.ficm.ac.uk/critical-futures-initiative/enhanced-care*

[30] *Department of Health (2013), Health building note 04-02: critical care units, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/147865/HBN_04-02_Final.pdf*

[31] *https://cpoc.org.uk/about-cpoc*

Conclusions

There is undoubtedly a problem with access to critical care across England and it is related primarily to capacity. Unit strain has become a fact of life; so much so that the FICM includes in its guidance information on developing a system to cancel major surgery:

> *Decisions to proceed with major elective surgery should take into account current occupancy, provision of emergency capacity over the next 24 hours and, at times or regional; network escalation, the emergency capacity in neighbouring units.*
>
> *Critical care units may find it useful to develop a statistical model locally that provides predictable data on the number of emergency admissions they should plan to accommodate in each 24-hour period, and use this model to aid decision making on when it is safe to proceed with planned elective work.*
>
> **GPICS2 Guidelines**

There is not, at present, equity of access to critical care across all trusts and all parts of the country. Capacity, culture and resources vary widely and all three aspects must be addressed if we are to ensure that the service is able to provide care fairly on the basis of clinical need. The recommendations below focus on developing more consistent and consistently applied pathways and developing appropriate governance for enhanced care to ensure that it works as effectively as possible to support critical care units by caring for those patients who need care that falls between the current Levels 1 and 2.

We also recommend that trusts pay close attention to the balance of Level 2 and Level 3 beds in critical care units. At least 50% of critical care beds should be Level 2 to permit early intervention. This should be brought about through increasing the availability of Level 2 and not at the expense of Level 3 care. Where the proportion of Level 3 beds is high, this may indicate an unmet need resulting in delayed admission or inappropriate transfers. The ability to flex beds between Levels 2 and 3 (i.e. not locating them separately) allows for the most responsive service, as was borne out during the COVID-19 pandemic, where the urgent and almost overwhelming need was for Level 3 care.

Recommendations

Recommendation	Actions	Owners	Timescale
1. Increase critical care and enhanced care beds. This should be particularly focused on Level 2 and enhanced care beds, but also more Level 3 beds in some areas where required.	**a** Trusts and Operational Delivery Networks (ODNs) should undertake a review of critical care need to reduce delayed admissions, overnight discharges, admissions with four or more organ failures and non-clinical transfers. This should include at least a 50:50 Level 2 to Level 3 bed split.	GIRFT, trusts. NHSE/I	For progress within a year of publication
	b GIRFT will work with trusts to develop plans for enhanced care beds across medicine and surgery.		
2. Consider and develop national postoperative pathways for patients requiring enhanced or critical care management to ensure consistency.	**a** GIRFT will work with Faculty of Intensive Care Medicine (FICM), NHS England and NHS Improvement (NHSE/I) and ODNs to agree national standards for postoperative pathways into critical care.	GIRFT, FICM, NHSE/I, ODNs, Royal College of Surgeons (RCS) and Royal College of Anaesthetists (RCoA)	For progress within a year of publication
	b GIRFT will support ODNs and trusts on implementing these locally.		

Recommendation	Actions	Owners	Timescale
3. Promote the development of enhanced care areas, ensuring appropriate governance and staffing arrangements for patients are in place.	**a** GIRFT to support the FICM, Intensive Care Society (ICS), Royal College of Physicians (RCP), Royal College of Surgeons (RCS), UK Critical Care Nursing Alliance (UKCCNA) and Royal College of Anaesthetists (RCoA) to develop workforce plans and governance for the roll-out of comprehensive enhanced care areas.	GIRFT, ICS, RCP, RCS, UKCCNA, RCoA and FICM	For progress within a year of publication
4. Fund and develop adult critical care transfer services based on Operational Delivery Networks (ODN) or Sustainability and Transformation Partnerships (STP)/Integrated Care Systems (ICS) footprints to support equitable access and surge capacity.	**a** GIRFT to support ODN's, Intensive Care Society/STPs and NHSE/I to develop these.	GIRFT, ODNs, ICS, NHSE/I, STPs/ICSs	For progress within a year of publication

Critical care outreach and early intervention

This section considers different models for critical care outreach services and assesses the variations in provision across the country and the impact this has on patient care.

Critical Care Outreach Teams (CCOT) were developed in response to the publication in 2000 of *Comprehensive Critical Care (CCC)*.[32] Subsequent recommendations for the implementation of CCOT have been endorsed by the Intensive Care Society, the National Outreach Forum, the National Confidential Enquiries into Patient Outcome and Death and Critical Care Stakeholder Forum. NICE has also published guidance on recognising and responding to acutely ill adults in hospital.[33]

From our deep dives visits it became clear that CCOT, where they work well, establish strong relationships and networks across the hospital between the emergency department, surgeons, physicians and critical care units. The aim is to intervene beyond the boundaries of critical care units to prevent unnecessary mortality and morbidity of seriously ill ward patients by responding early to the signs of physiological deterioration, allowing for timely admission to critical care. In effect this often means admitting patients to Level 2 beds to prevent a later admission to Level 3.

This approach aims to improve patient outcomes and experience and optimise use of resources, since Level 2 beds are less expensive than Level 3 care. However, the effect of CCOT is hard to evidence through data at present. CCOT and configurations have developed on an ad-hoc basis according to local need and resources available. This has led to a wide variety in the provision of these services. For example, daytime-only outreach services are common, as are five-day services (see **Figure 10** below), and such services may have arrangements that tie in with 'hospital at night' protocols. However, ideally, for CCOT to offer effective support to patients there needs to be:

- daily 24-hour availability of clinicians who are trained to recognise critical illness
- enough consultants attached to the team – too much reliance on short-term staff and/or trainee roles can lead to a skills gap
- provision by the CCOT of support to patients, ward teams and relatives after a critical care admission.

Another benefit of a good outreach team is that outreach nurses function as a supportive peer group for ward nurses around critical care admissions and admissions criteria.

When outreach works well, there is an appropriately skilled team (which could include not just nurses but also AHPs, such as operating department practitioners and physiotherapists) providing 24-hour coverage for patients whose condition is in danger of deteriorating. In addition, effective escalation plans are in place that take into account end of life directives and patient choice.

The National Outreach Forum has developed operational standards and recommendations for CCOT practitioner competencies in the absence of any other national guidance.[34] This document provides an operational framework of standards for CCOT, while recognising the need for organisational links with other hospital services, for instance Hospital at Night teams, to facilitate provision of a robust 24-hour service.

[32] *Department of Health. Comprehensive Critical Care: a review of adult critical care services, 2000. Available from: https://webarchive.nationalarchives.gov.uk/+/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4006585*

[33] *NICE CG50 (27 July 2007), Acute adults in hospital: recognising and responding to deterioration, www.nice.org.uk/guidance/cg50/chapter/1-Guidance#identifying-patients-whose-clinical-condition-is-deteriorating-or-is-at-risk-of-deterioration*

[34] *The National Outreach Forum (NOrF), Operational standards and competencies for critical care outreach services, 2012, www.norf.org.uk/Resources/Documents/NOrF%20CCCO%20and%20standards/NOrF%20Operational%20Standards%20and%20Competencies%201%20August%202012.pdf*

CASE STUDY

Critical care outreach in action

South Tees NHS Foundation Trust

This case study illustrates the value (to patients and their families and to staff in acute care wards) of comprehensive CCO throughout the acute patient pathway. Appropriately trained and knowledgeable CCO staff provide a rapid response to patients whose condition is recognised as deteriorating. Skilful assessment in situ and appropriate and timely interventions are administered and care is escalated swiftly when required. CCO practitioners also support and empower members of the multi-professional team and provide an invaluable educational resource for those less familiar with the management of acutely ill or critically unwell patients.

CCO can also play a vital role in 'post ICU follow-up' and is increasingly a formal part of rehabilitation after critical illness services, delivering post-critical care discharge liaison care, including step-down provision. Undoubtedly, CCO teams are the 'safety engines of the hospital' and an intrinsic part of the acute hospital care system, delivering high-level skills at the patient's bedside, wherever and whenever they are needed.

In one case, an asthmatic patient, but otherwise fit and well, had been admitted to the medical floor two days previously with difficulty in breathing and a cough. The patient was diagnosed with community-acquired pneumonia and treated with antibiotics. A COVID swab on admission was negative. The patient had been stable throughout the day but overnight become distressed with an increased respiratory rate and increased oxygen requirements and was tachycardic with a NEWS score of 8. The ward nurse contacted the critical care outreach (CCO) practitioner immediately and informed the ward doctor.

The CCO practitioner attended the ward within five minutes and on identifying deterioration in the patient liaised with the ward nurse to increase the oxygen to 15 L/min and attach continuous monitoring and asked the ward doctor to establish additional IV access whilst she obtained an arterial blood gas (ABG) reading.

The CCO practitioner phoned the critical care registrar and relayed the patient's history and presenting complaint. The registrar concurred that the patient required admission to critical care and transfer arrangements were made accordingly.

Within 30 minutes of the CCO practitioner's attendance, the patient was safely transferred to the critical care unit and immediately received high-flow oxygen and IV fluids. The critical care team was ready to initiate organ support.

After nine days, the patient had improved and was discharged to the ward, where he was followed up by a CCO practitioner.

The CCO team continued to follow-up, monitor and reassure the patient and family until assessed as fit for discharge from CCO care and into the care of the critical care rehabilitation team.

Provision of outreach services

We have found as a result of our deep-dive visits that not all critical care units have 24/7 outreach services. It is possible, of course, to supplement 12/7 outreach services with an appropriately skilled Hospital at Night team (with critical care training and support and governance linked to critical care), especially in smaller hospitals. However, there should always be seven-day-a-week provision, as round-the-clock coverage is important to ensure deterioration is recognised as early as possible. In 14.3% of units there was no CCOT, and a further 28.5% had outreach for less than seven days a week.

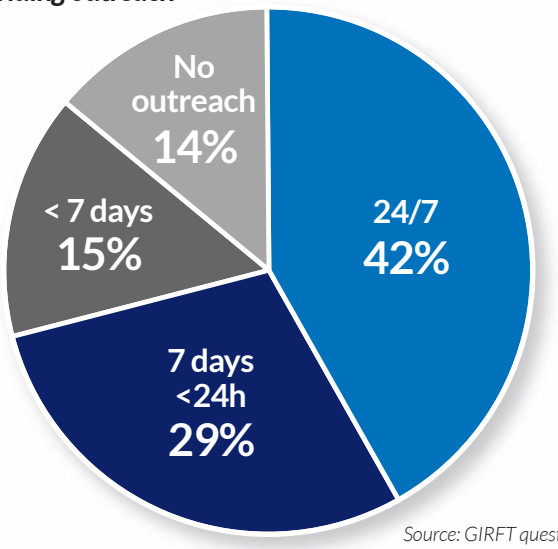
There is also variation between trusts around the use of National Early Warning Score systems NEWS and NEWS2 (NEWS2 has been endorsed by NHS England/Improvement [35]), systems that track key health parameters and give early warning of deterioration, and paper or electronic scoring/track-and-trigger systems. Whilst NEWS/NEWS2 enables ward staff to recognise deteriorating patients, this does not always result in appropriate actions, i.e. an escalation of care.[36]

This variation in provision of outreach services to critical care units is illustrated in **Figures 10 and 11. Figure 10** illustrates the variation in current provision of outreach teams.

[35] *NICE CG50 (27 July 2007), Acute adults in hospital: recognising and responding to deterioration. www.nice.org.uk/guidance/cg50/chapter/1-Guidance#identifying-patients-whose-clinical-condition-is-deteriorating-or-is-at-risk-of-deterioration section 1.4*

[36] *Ede, J., Jeffs, E. and Vollam, S. et al. (2019) A qualitative exploration of escalation of care in the acute ward setting, Nurs Crit Care, 2019: 1–8, DOI: 10.1111/nicc.12479, https://pubmed.ncbi.nlm.nih.gov/31833178/*

Figure 10: Breakdown of units providing outreach



Source: GIRFT questionnaire data

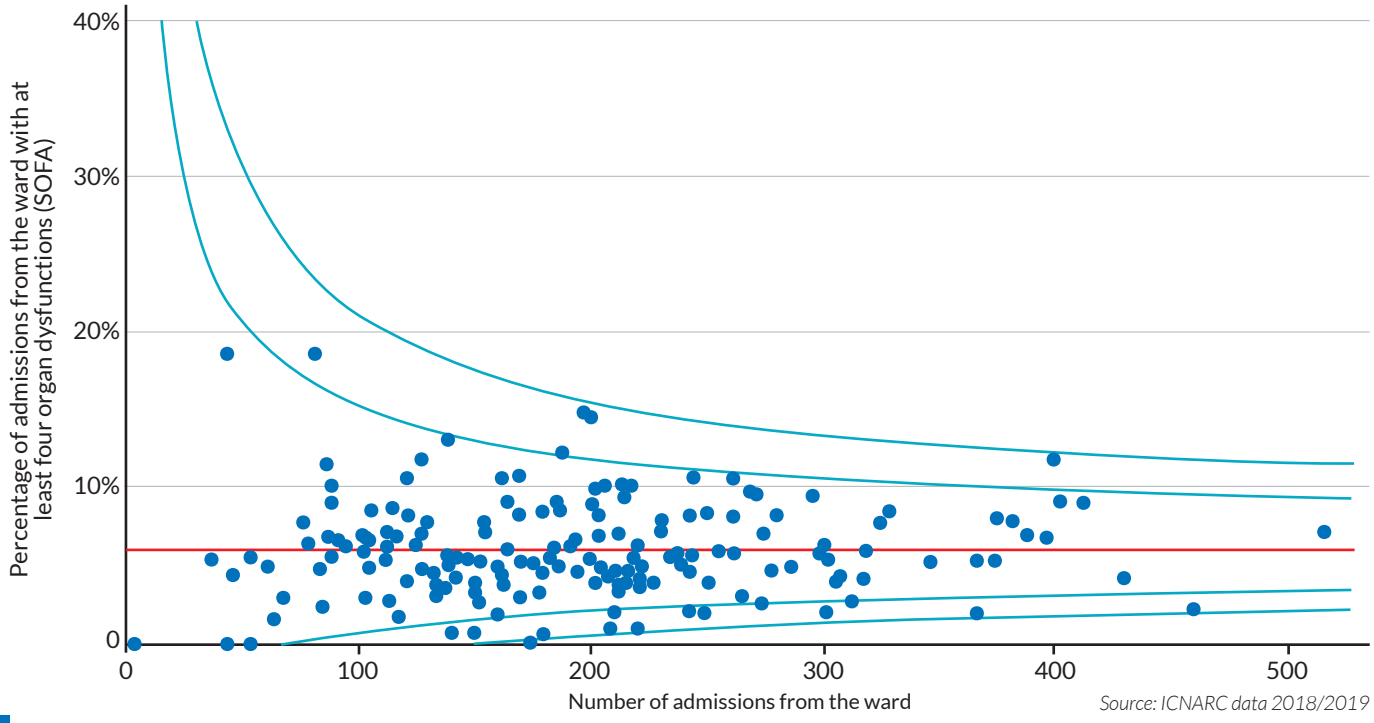
Outreach models work in different ways, but the results should be similar across all trusts:

1. spotting patients who would benefit from critical care at an earlier stage;
2. intervening with appropriate treatment, which could be ward-based or involve a critical care admission;
3. educating ward staff on signs of a potentially rapid deterioration to facilitate earlier critical care referrals.

Effectiveness of outreach services

As shown in **Figure 11** below, there is wide variation between trusts in numbers of patients being admitted from the wards with four or more organ dysfunctions, suggesting deterioration is not being recognised rapidly enough. The situation is complex and good practice is informed by such factors as appropriate use of early warning scores, a culture of responding to deterioration, willingness to refer to critical care and willingness (and capacity) to accept patients into critical care.

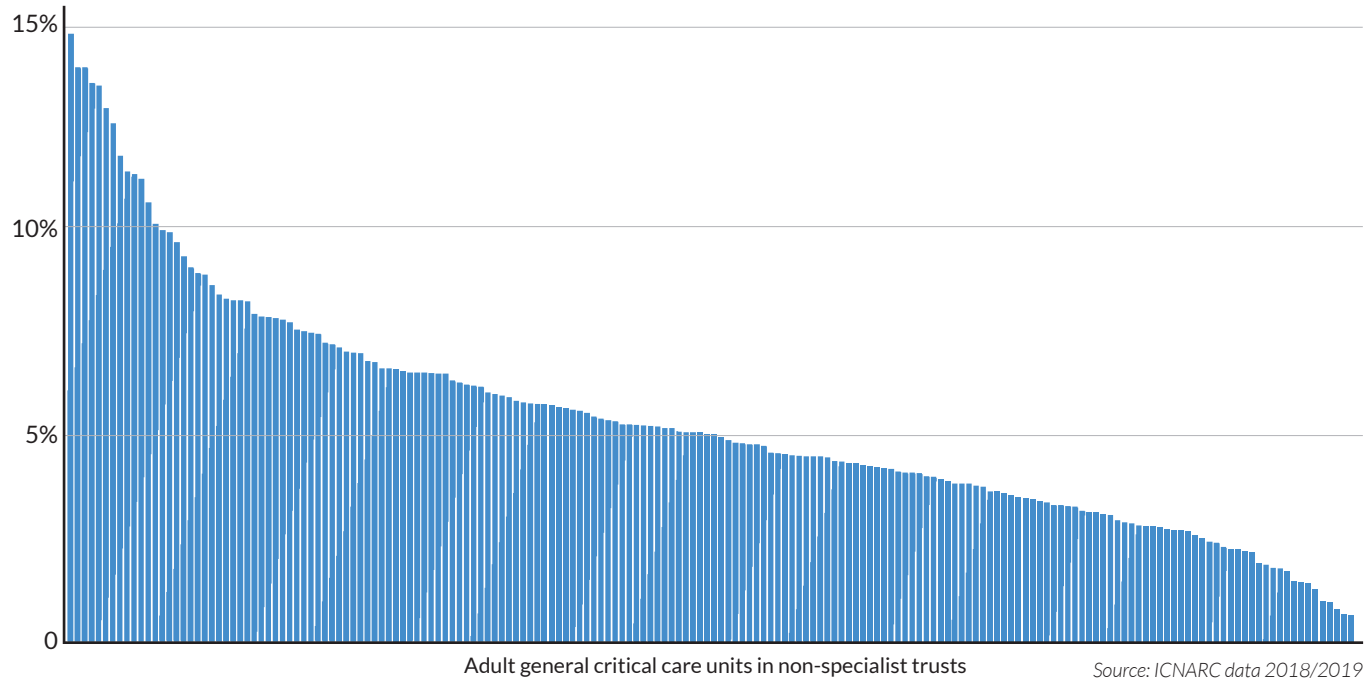
Figure 11: percentage of admissions from wards with at least four organ dysfunctions (non-specialist trusts)



Source: ICNARC data 2018/2019

Figure 12 shows the percentage of critical care admissions from the wards following in-hospital CPR. In-hospital CPR is generally indicative of poor patient outcomes; fewer than 20% of adult patients having an in-hospital cardiac arrest will survive to discharge.[37] Where rates are high, this may indicate that deteriorating patients are not being recognised early enough and/or that dying patients are not being recognised and appropriate end of life care put in place, resulting in inappropriate resuscitation.[38]

Figure 12: Percentage of critical care admissions from wards following in-hospital CPR (non-specialist trusts)



Source: ICNARC data 2018/2019

Since their introduction, patient opinion of critical care outreach services has gone largely unreported, although, in a 2016 anonymised network-wide patient satisfaction survey conducted by the North of England Critical Care Network, patients reported feelings of reassurance, safety and support that care was being delivered by individuals who were perceived as knowledgeable, helpful and caring. Typical comments included:[39]

> *They were prompt, informative and got things done. I felt very reassured by their checks.*

> *Every detail was explained in a professional way … very calming and reassuring. It helps in every possible way.*

[37] *P.A. Meaney, V.M. Nadkarni, K.B. Kern et al. (2010), Rythms and outcomes of adult in-hospital cardiac arrest, Crit Care Med (38): 101–108, www.ncbi.nlm.nih.gov/pubmed/19770741*

[38] *NCEPOD (2012), Time to intervene? A review of patients who underwent cardiopulmonary resuscitation as a result of in-hospital cardiorespiratory arrest, www.ncepod.org.uk/2012report1/downloads/CAP_fullreport.pdf*

[39] *North of England Critical Care Network Outreach Group (2016), critical care outreach teams help patients feel safe and reassured, presentation to National outreach Forum Annual Conference 2016 and 10th AGM, 6 May, Belfast.*

Conclusions

Full 24/7 outreach services build the strongest relationship between critical care and the wards, supporting education, early recognition of deterioration in patients and embedding critical care within the whole hospital. For this reason we recommend that 24/7 outreach be made standard wherever possible, and that where this is not feasible, i.e, in some of the smaller hospitals, there are appropriately trained Hospital at Night teams to ensure continuous cover.

Many in-hospital cardiac arrests are avoidable, either through early detection of deterioration or through recognition of a patient who is nearing the end of life (see also *End of Life Care*, page 41). All trusts are striving to reduce in-hospital cardiac arrests, with varying success. A full-time outreach service can aid communication between the wards and critical care, improve the implementation of NEWS/NEWS2 scoring and assist in making decisions regarding escalation of care.

While the value of outreach is perceived by those who work with it, and there is some evidence of the benefits of the effectiveness of this approach in detecting and preventing medical errors and misdiagnoses,[40] further research is required in order to fully understand how it benefits patients and improves the provision of care, so this can be understood on terms of the wider hospital process. This requires in-depth analysis (including qualitative analysis) beyond what we can currently examine using ICNARC data.

Recommendation

Recommendation	Actions	Owners	Timescale
5. Implement full 24/7 outreach services in every hospital with a critical care unit. If using a Hospital at Night service as part of this provision, the team members should have sufficient critical care training	**a** GIRFT to support audit of all 24/7 outreach services across England to identify trusts for service implementation	GIRFT, National Outreach Forum, trusts	For progress a year after publication

[40] *Braithwaite, R. S., DeVita, M. A., Mahidhara, R. et al. (2004), Use of medical emergency team (MET) responses to detect medical errors, Qual Saf Health Care 13:225–259, doi: 10.1136/qshc.2003.009324, https://pubmed.ncbi.nlm.nih.gov/15289627/*

End of life care

> *Two weeks in the ICU can save you one hour of difficult conversation.*
>
> **Dr Will Cairns**

Although intensive care survival has improved significantly, nevertheless 15–20% of patients admitted to UK intensive care units die in hospital.[41] This section covers the need to discuss care with patients and their families if they are approaching the end of life. Such conversations are not easy, but without them there is a risk that a life is prolonged against the patient's wishes and without giving them the option of a 'good death', which, to many people, is a death free from unnecessary and potentially distressing medical interventions.

> *This report suggests that today we stand at a crossroads. To the left lies a destiny familiar from America where 60% of us will die in an ICU and we will spend 50% of NHS expenditure in the last six months of life, much of it seeking to postpone the inevitable. This will happen, not because the patient has asked for it or because someone has taken a calculated decision that it is in the patient's interest to make the attempt, but because the doctors think that they have a duty to do everything that they can to prolong the process of dying.*
>
> **NCEPOD, Time to intervene?[42]**

The usual situation is that over 80% of critical care patients lack capacity to make important decisions about their care and management at a time when consideration is being given to withholding or withdrawing life-sustaining treatments, and only 13% of patients dying on critical care have made any pre-emptive statement.[43] Where the patient's condition precludes a conversation about ongoing care, clinicians are often unable to locate or access end of life directives or community-based information that would help in the decision-making process. Despite the target of a paperless NHS at point of care by 2020, with patient records all digital, updated in real time and interoperable,[44] we found this was not the case in many trusts we visited.

Advance care planning (ACP) can help patients, relatives and clinical teams better utilise shared decision-making when planning care.[45]

[41] *BFICM, Care at the end of life: a guide to best practice, discussion and decision making in and around critical care, July 2017, www.ficm.ac.uk/sites/default/files/ficm_care_end_of_life.pdf*

[42] *NCEPOD (2019) Time to intervene? A review of patients who underwent resuscitation as a result of in-hospital cardiopulmonary arrest, www.ncepod.org.uk/2012report1/downloads/CAP_fullreport.pdf*

[43] *C.L. Sprung, M.A. Somerville, L. Radbruch et al. (2018). Physician-Assisted Suicide and Euthanasia: Emerging Issues From a Global Perspective. J Palliat Care, 33(4), 197-203, https://journals.sagepub.com/doi/abs/10.1177/0825859718777325*

[44] *E. Parkin, Briefing paper. A paperless NHS: electronic health records, UK Parliament, No. 07572, 25 April 2016, p. 20. https://researchbriefings.files.parliament.uk/documents/CBP-7572/CBP-7572.pdf*

[45] *FICM (2017), Care at the end of life: a guide to best practice, discussion and decision making in and around critical care. www.ficm.ac.uk/sites/default/files/ficm_care_end_of_life.pdf. See also FICM (2020) How to have urgent conversations about withdrawing and withholding life-sustaining treatments in critical care, www.ficm.ac.uk/news-events-education/news/how-have-urgent-conversations-about-withdrawing-and-withholding-life (produced in response to the COVID-19 pandemic).*

Advance care planning (ACP)

ACP is a broad term for communicating one's wishes and values about future care. It refers to a discussion of the type of treatment and care a patient would like to receive in the event they lose capacity, and seeks to create a record of these wishes. ACP is a process that should take place within primary care. Like shared decision making, ACP aims to bring together health professionals' expertise and patient values and goals.

COVID-19 insight

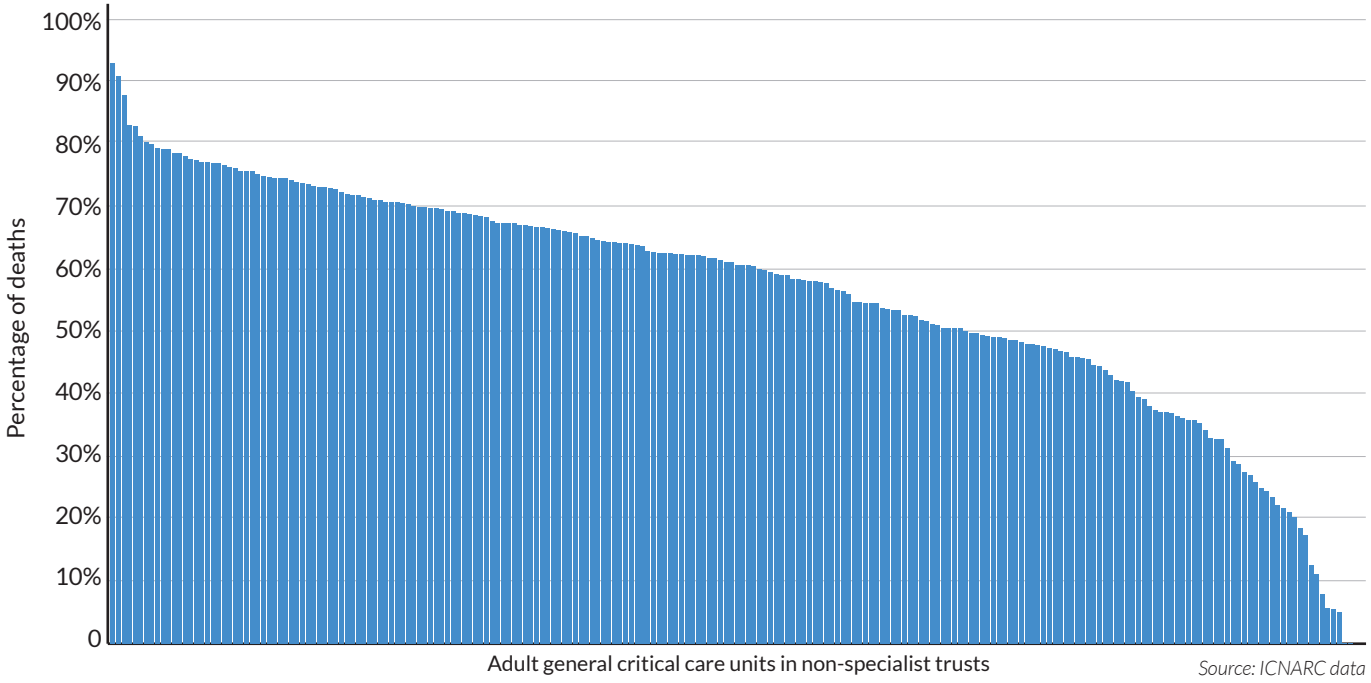
The COVID-19 pandemic has highlighted the value of ACP (where such information was available it has facilitated the decision-making of doctors on acute wards regarding whether or not to refer a patient to critical care, for example). There are now a number of programmes under way to help individuals consider and record their wishes regarding treatment at or near the end of life. This is a positive step and one we would like to see built on to ensure a co-ordinated approach implemented throughout primary, secondary and social care. Many of these programmes are driven by voluntary sector organisations.

The pandemic has had a positive effect on accelerating digital health care initiatives. It would be of great benefit if this acceleration could be extended to the roll-out of electronic patient records, which are not yet implemented in all areas, and which would be the natural home of any advance care directives or similar information.

It is not always possible to be certain whether any particular patient is retrievable. In this situation, with agreement from the patient, their relatives and the referring clinician, a trial of treatment escalation with planned review of patient response and a willingness to change to a palliative course if it becomes clear that improvement is unlikely, is a reasonable approach. This allows time for a response to treatment whilst avoiding needlessly prolonging dying.

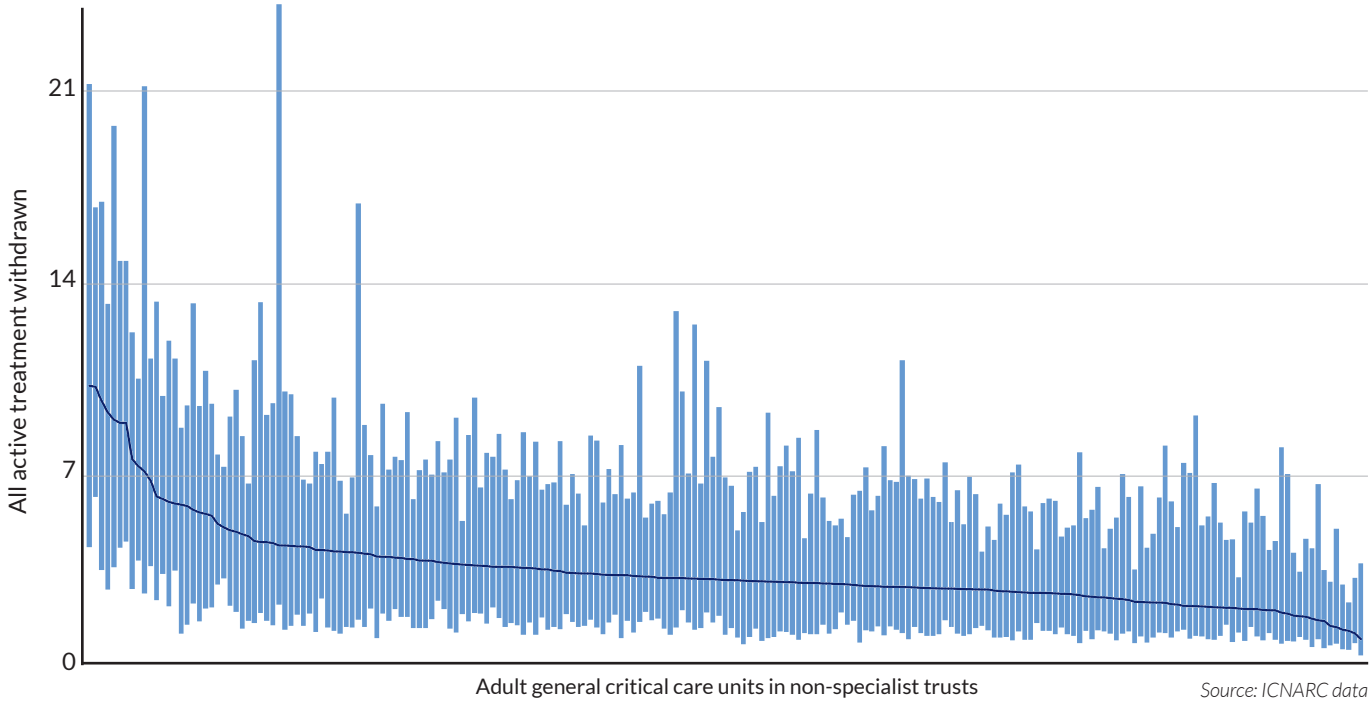
We know that the majority of deaths in critical care happen because active treatment is discontinued. We looked at treatment withdrawal in critical care and the point at which that decision was made. **Figure 13a** shows the percentage of patients where all active treatment was withdrawn (as opposed to limitations where further escalation of treatment is not offered but no treatments are discontinued). **Figure 13b** shows at what point is that decision made. This is a complex area and only in discussion during a deep dive is it possible to unpick the culture and attitudes behind these decisions. Some units are confident that one or two days is sufficient to make withdrawal decision; others wait longer. The COVID-19 pandemic has challenged decision-making on the time to treatment withdrawal. This unusual disease has resulted in very long durations of ventilation and extra-corporeal membrane oxygenation in some patients, but with ultimate good outcomes. This has highlighted the value of shared data with rapid feedback to support decision-making in action.

Figure 13a: Percentage deaths in the critical care unit preceded by withdrawal of treatment



Source: ICNARC data

Figure 13b: Median (IQR) time from admission to death (days) in the critical care unit preceded by withdrawal of treatment



Source: ICNARC data

Critical care units are often required to make complex decisions regarding which patient is most likely to benefit from admission when they are operating at or near capacity. It is possible that resource availability may influence treatment escalation decisions at times.

Inevitably, critical care units become skilled at delivering end of life care. However, in particular situations where a patient is conscious but dependent on organ support from which they cannot be weaned, they and their families may wish them to be allowed to die in the familiar surroundings of their home. Although not a common or widespread practice, some units have been successful in delivering this on occasion. For the families involved this is definitely a way of 'getting it right first time'.

Conclusions

A proportion of patients admitted to critical care die during that admission. There are no hard and fast rules to support decision-making at the end of life. ACP and frequent communication with patient and family can support clinicians in making these difficult decisions and the COVID-19 pandemic has increased public awareness of the value of ACP. Recognising when a patient is unlikely to survive and changing to a palliative course is a multidisciplinary process. In all units we heard from nurses and AHPs how they were involved and their voices heard. A good death should be seen as a positive outcome for patients who are at the end of life.

Recommendation

Recommendation	Actions	Owners	Timescale
6. Put Advance Care Planning and shared decision-making protocols in place, in order to know patient and families' wishes and help to inform appropriate referrals to critical care.	**a** All trusts should review, update and implement their protocols and referrals so they are following end of life guidance.	Sustainability Transformation Partnerships (STPs) /Integrated Care Systems (ICSs), Primary Care Networks (PCNs), trusts and NHSE/I	For implementation a year after publication
	b GIRFT will work with NHS England and NHS Improvement (NHSE/I) and individual trusts to ensure policies/guidance such as Advance Care Planning and shared decision-making are implemented.		

Organ donation

In the last few decades the demand for transplants has grown more rapidly than the number of available organs. This section considers the best ways to encourage and manage organ donation to ensure it does not impact negatively on patient flow and to maximise the number of organs available for transplantation.

Where organ donation is delayed, it causes further distress for families and can impede the admission of new patients to the critical care unit, creating inequity of access and potential loss of viable organs that could save the lives of patients with end-stage organ disease. Assessing a potential donor's past medical history is vital to ensuring that any organ donated would be safe. However, this does not always need to be a lengthy process. There is a subset of patients who, at initial assessment, will clearly be potential donors. In these circumstances there should be a rapid assessment (Enhanced Retrieval Process – ERP), followed by speedier retrieval procedures. This ERP process is a recent approach and will help to shorten the process for donor families. A more rapid process is also beneficial for critical care clinicians – clear decisions are made quickly and bed usage is more efficient. This rapid approach, supported by the National Organ Retrieval Service (NORS)[46], is likely to optimise the quality of organs that are retrieved from such donors and thereby improve organ utilisation.[47]

FICM/ICS Guidelines *(GPICS2)* are clear on the matter of organ donation, as is the NICE guidance[48], but not all hospitals are fully compliant, for various reasons.

Most units work hard to facilitate donation and all the major religious and spiritual groups in the UK support organ donation in principle. However, certain BAME populations are underrepresented as donors and this in turn reduces the likelihood of successful transplantation for patients from these same groups. Support from religious leaders has been successful in increasing donations in some units and should be considered where this is an issue.

It should also be noted that as of spring 2020, the law around organ donation changed from an 'opt-in' to an 'opt-out' system.[49] While this can be expected to increase overall organ donation, the conversations and processes around organ donation for our purposes will be largely unchanged.

For critical care to manage organ donation effectively there should be a Clinical Lead for Organ Donation (CL-OD) within every unit and a good relationship with the trust's Specialist Nurse for Organ Donation (SN-OD). Both these roles are funded by NHS Blood and Transplant.

The role of the CL-OD is to:

- provide clinical leadership within the hospital, to champion and promote the value of deceased organ donation;
- maximise donation potential, by minimising missed opportunities in deceased donation and by implementing the recommendations of national guidelines across the whole hospital, focusing on those areas with greatest potential;
- establish effective working relationships, with key stakeholders throughout the hospital.[50]

The role of the SN-OD is to support potential donor families and the operational processes of organ donation.

The SN-OD is trained in communication and family support, particularly in discussing wishes for the end of life and can supply information tailored to the needs of individuals and their families. If the SN-OD is involved in initial end of life discussions it enables them to build a relationship with the family and better support them throughout the process. Despite this, the timing of SN-OD involvement varies according to local practice in terms of when the referral is made, the confirmation of death using neurological criteria and the two sets of tests.[51]

[46] *www.odt.nhs.uk/retrieval/national-organ-retrieval-services/*

[47] *NHS Blood and Transplant (2017), Taking organ utilisation to 2020, https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/3579/odt-organ-utilisation-strategy.pdf*

[48] *National institute for Health and Care Excellence, Organ donation for transplantation: improving donor identification and consent rates for deceased organ donation (CG135), (published December 2011, updated December 2016), www.nice.org.uk/guidance/cg135*

[49] *NHS Blood and Transplant, Organ donation law in England is changing, www.organdonation.nhs.uk/uk-laws/organ-donation-law-in-england/*

[50] *NHS Blood and Transplant website at www.odt.nhs.uk/odt-structures-and-standards/clinical-leadership/clinical-lead-for-organ-donation/*

Conclusions

The way in which the possibility of donation is presented to a grieving family can have a critical impact – both positive and negative – on their decision. Families need to be approached at the right time, in the right way, and by someone with the right skills to support them. Not all critical care clinicians have specific training on how to bring organ donation into an end of life care discussion, and organ donation will always be a relatively infrequent activity for the majority of critical care clinicians. However, it is a core activity of the teams of SN-ODs who co-ordinate donation in the UK and who are available to support unit clinicians.[52]

Recommendation

Recommendation	Actions	Owners	Timescale
7. Ensure there is a Clinical Lead for Organ Donation (CL-OD) that links with a Specialist Nurse for Organ Donation (SN-OD) for each trust with a critical care unit to enable national pathways to be followed and for donation to occur in a timely manner.	**a** GIRFT to support NHS Blood and Transplant, Operational Delivery Networks (ODN) and individual trusts to audit national requirements for CL-ODS and SN-ODs to ensure appropriate coverage	GIRFT, NHS Blood and Transplant (NHSBT), ODNs	For significant progress a year after publication

[51] *NHS Blood and Transplant website at www.odt.nhs.uk/odt-structures-and-standards/organ-donation-retrieval-and-transplantation-teams/role-of-specialist-nurse/*

[52] *NHS Blood and Transplant, 2017, Taking organ transplantation to 2020: a detailed strategy. https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/1395/nhsbt_organ_donor_strategy.pdf*

Discharge and transfer from critical care

This section covers the smooth transition of patients out of critical care in order to allow new patients to be admitted and to prevent cancellation of operations. This is the mechanics of patient flow, which is critical to the optimal functioning of every critical care unit. It is important to note that the critical care unit has very little control over patient flow throughout the hospital as a whole and that delayed discharges from critical care may be the result of bottlenecks (usually delayed transfers of care) downstream. This highlights the position of critical care in a hospital: activity across acute care is interdependent and when one area becomes blocked all are affected.

When critical care operates near capacity, which is generally the case, patient admissions are contingent on there being available beds. Timely planned discharge is crucial. We have discussed the complex decision-making process around who should be admitted to critical care under *Equity of Access to Critical Care*, page 24. This section deals with the more concrete logistical factors that need to be managed in order to ensure a smooth flow of patients out.

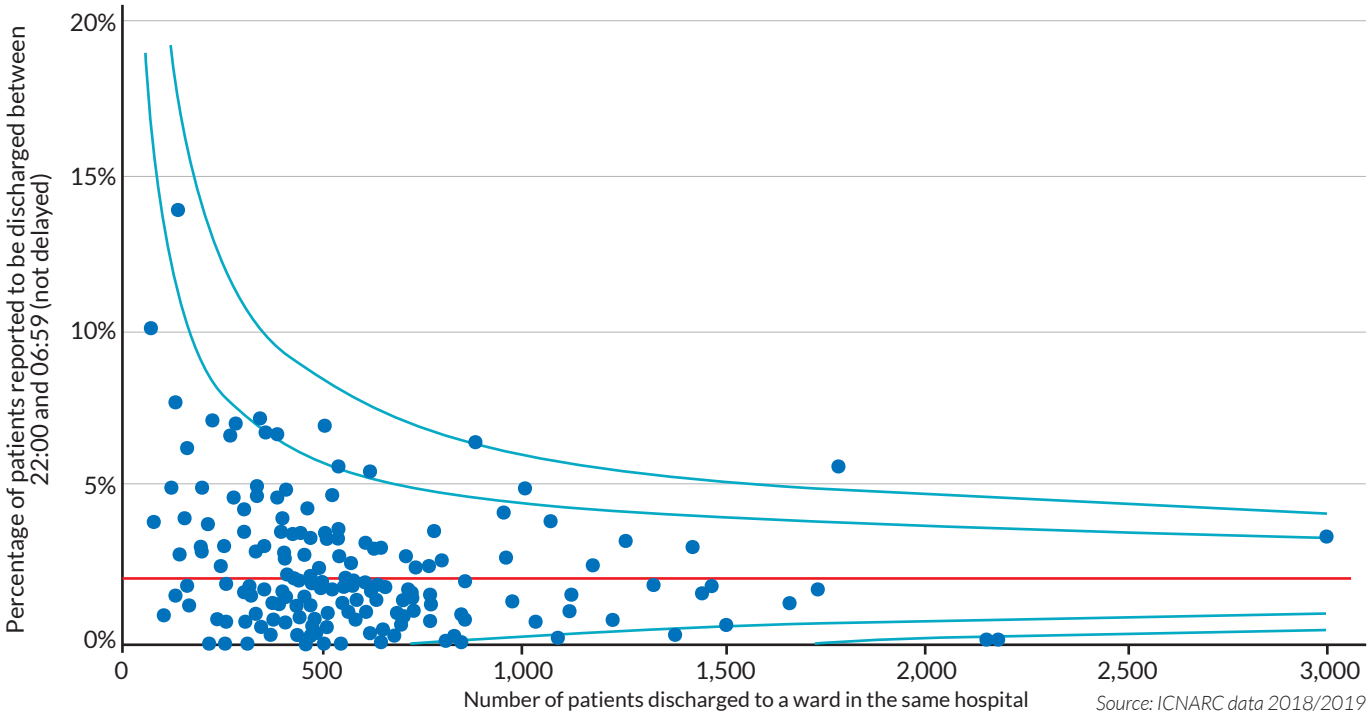
A crucial factor affecting capacity and flow in critical care units is delayed discharge. Other less than ideal discharge practices associated with inadequate capacity and flow include discharging patients at night, discharging patients directly to their homes (without stepping down to a standard ward) and transferring patients to another unit (except those requiring specialist critical care). None of these represents good practice. The exception is planned transfers, which may simply reflect a local arrangement between hospitals with different capacities and competencies.

We noted during our deep-dive discussions that several trusts have felt pressured by demands from wards and emergency departments for critical care beds to discharge a patient out of hours or at very short notice.

Out-of-hours discharges

Current standards state that discharge from critical care to a general ward must occur within four hours of the decision to discharge and must be between 7.00 a.m. and 9.59 p.m. **Figure 14** below shows the number of patients discharged out of hours (between 10.00 p.m. and 6.59 a.m.). Out-of-hours discharge is strongly associated both with in-hospital death and emergency critical care readmission[53] and should be avoided wherever possible.

Figure 14: Percentage of patients discharged out of hours (non-specialist trusts)



Source: ICNARC data 2018/2019

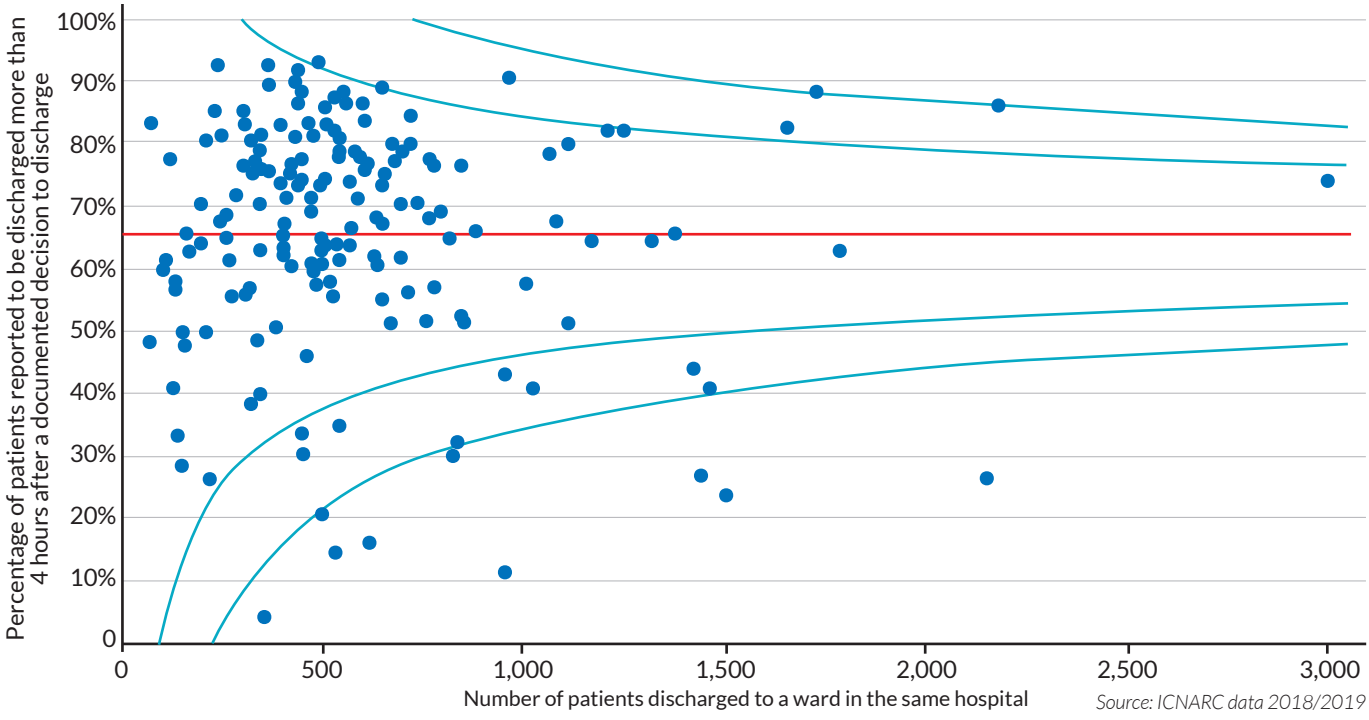
[53] *S. Vollman, S. Dutton, S. Lamb et al., Out-of-hours discharge from intensive care, in-hospital mortality and intensive care readmission rates: a systematic review and meta-analysis, Intensive Care Med (2018) 44: 1115–1129, https://cdoi.org/10.1007/s00134-018-5245-2*

Delayed discharges

Figures 15 and 16 below show the percentage of patients whose discharge is delayed by more than four and 24 hours respectively (for more on the implications of this see Notional Financial Opportunities). There is significant variation, but a baseline of more than 60% of patients being delayed by over four hours and 1 in 5 still waiting for a ward bed after 24 hours shows a systemic problem. Again these variations indicate wider capacity issues, usually when there is pressure to vacate a bed but no room on the wards for these patients.[54] A patient requiring isolation in a cubicle or single room for reasons of infection control (even though they may have been nursed in an open area in critical care) is a particular source of discharge delay. Most hospitals have a critical shortage of side rooms and the result is frequently that the patient remains in critical care. (We discuss health building notes in the section on Equity of Access to Critical Care, page 24). Such delays may also be indicative of inefficient or unsystematic joint working across the hospital. Whatever the original cause, the bottleneck is located outside of the critical care unit and remains, unfortunately and frustratingly, beyond their control.

Delayed discharges potentially prevent other patients from gaining access to critical care and mean discharged patients are having their lengths of stay (LoS) in critical care extended unnecessarily. The Clinical Reference Group (CRG) has identified this as a significant issue.

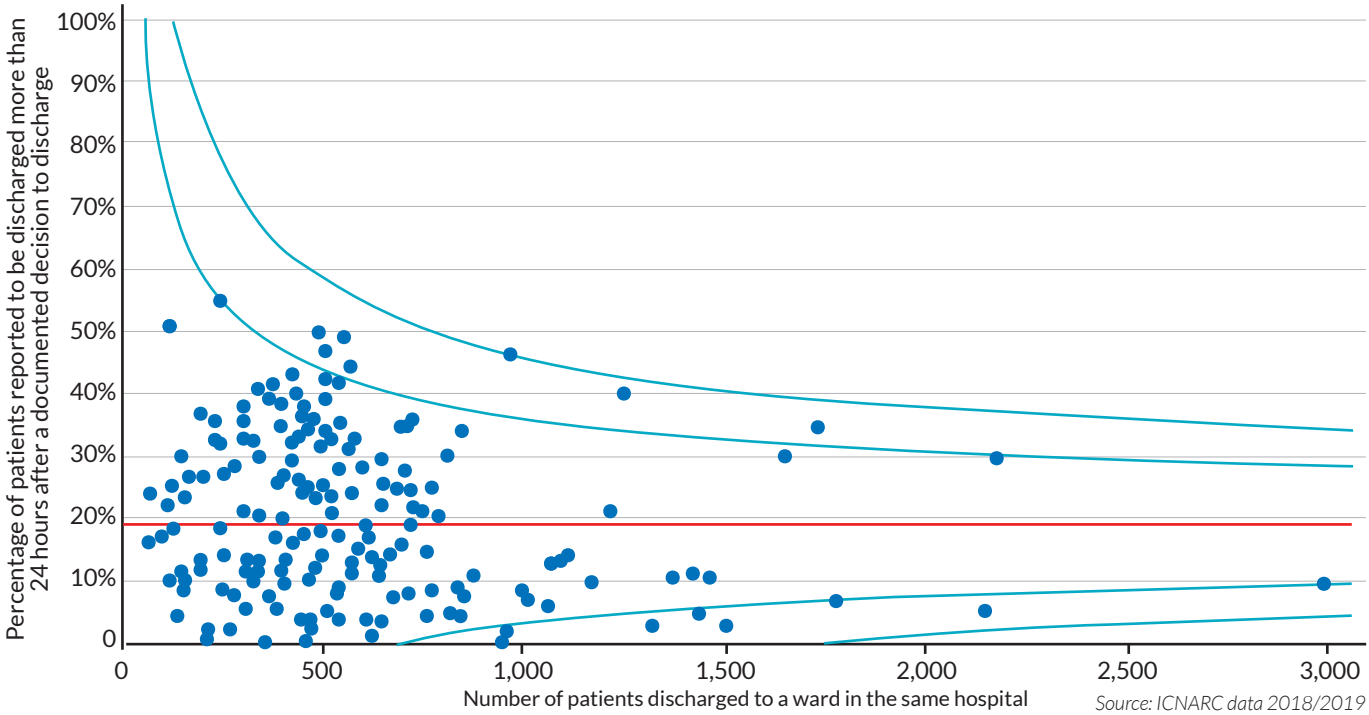
Figure 15: Percentage of patients discharged >4 hours after decision to discharge (non-specialist trusts)



Source: ICNARC data 2018/2019

[54] *S. Gillighan, Critical care delayed discharge: good or bad? JICS 2017 vol. 18(2):146–148, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5606414/*

Figure 16: Percentage of patients discharged >24 hours after decision to discharge (non-specialist trusts)

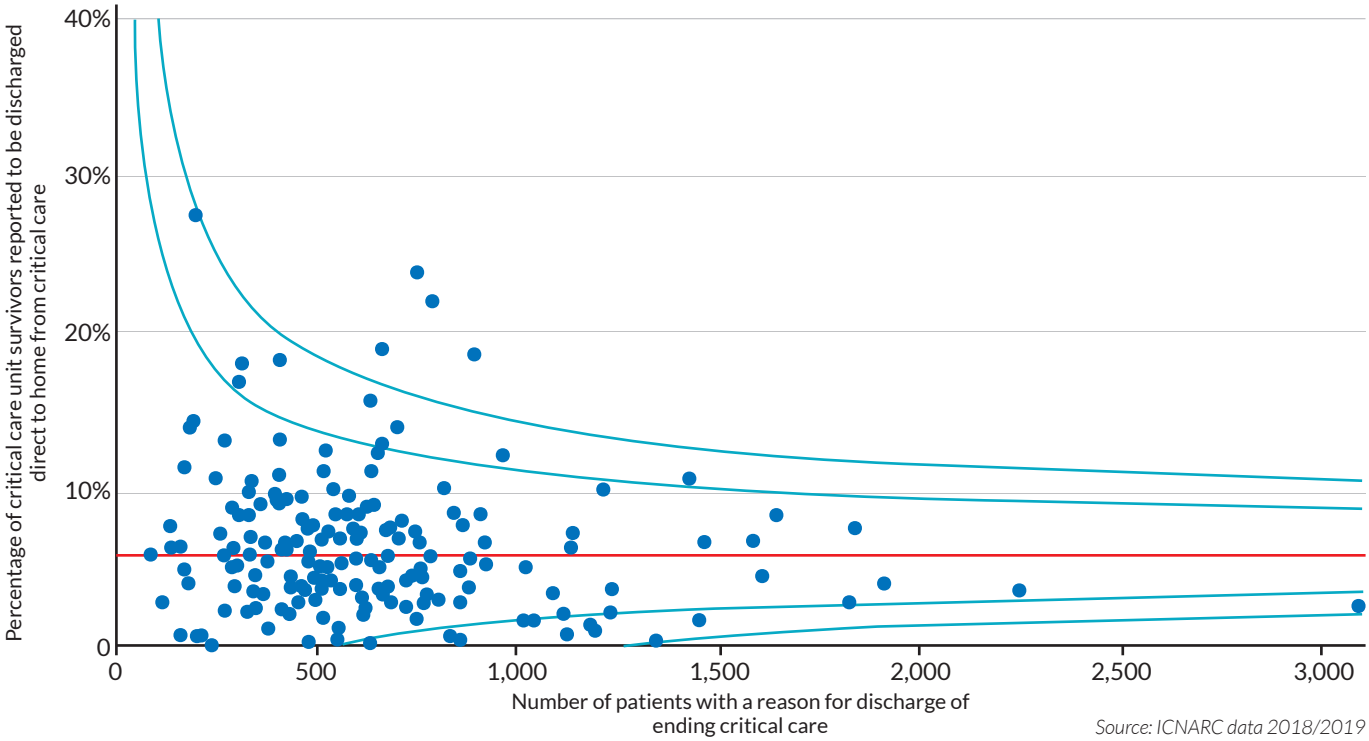


Source: ICNARC data 2018/2019

Direct-to-home discharges

Figure 17 examines the percentage of critical care survivors who are discharged directly to their homes without being stepped down to standard ward care. This practice is generally a reflection of a delay in discharge to a ward and is a response by units to try and improve flow.

Figure 17: Percentage of survivors discharged direct to home (non-specialist trusts)



Source: ICNARC data 2018/2019

Our deep-dive visits indicated that more patients than ever are being discharged directly to their homes. Most commonly these patients are recovering from overdoses, DKA or renal failure, which indicates there may be particular problems in moving them to standard diabetic, medical, psychiatric or renal wards.

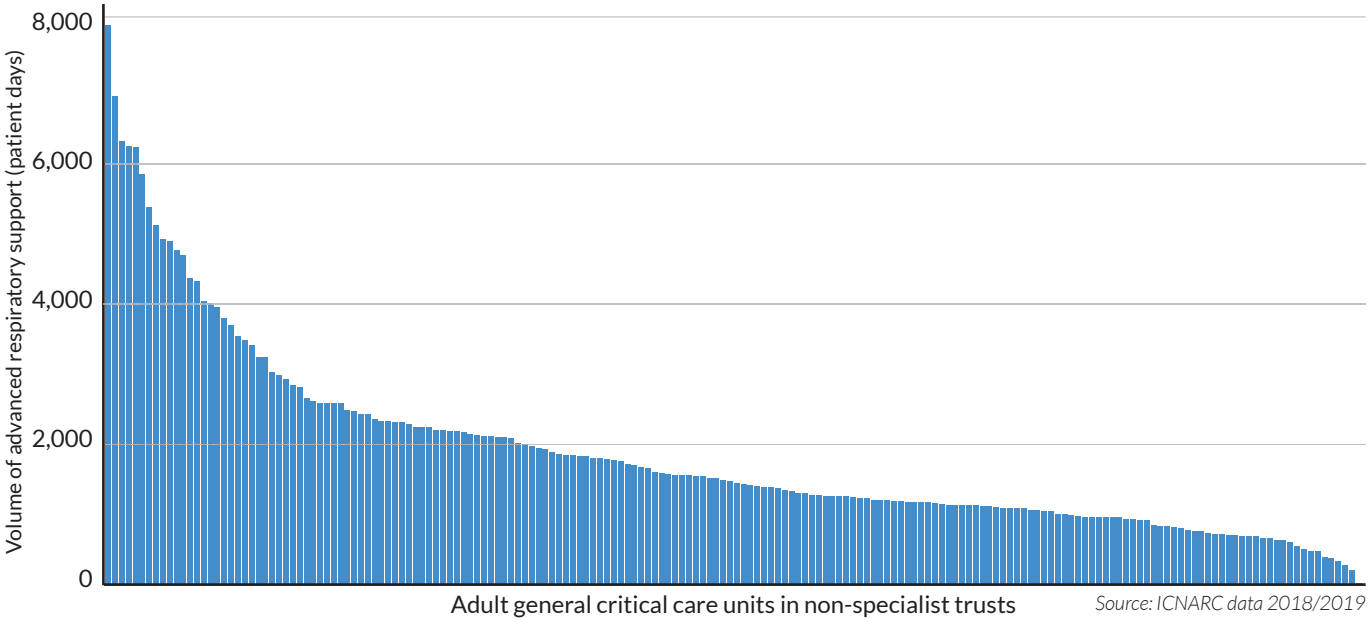
Transfers for patients requiring advanced respiratory support and continuous renal replacement therapy (CRRT)

This section considers whether it is advisable for all critical care units to care for patients who require support for acute respiratory failure and need mechanical ventilation and those with acute renal failure requiring continuous renal replacement therapy (CRRT) where they are handling particularly low caseloads of these patients. In general we suggest that transferring these patients using planned transfer protocols[55] is the best option.

These patients require complex management and may have multiple organ failures. We found a very few units with very low caseloads of patients requiring invasive mechanical ventilation and/or CRRT (see **Figure 18** below for respiratory patients) due to geography and/or particular caseload and staffing issues in these hospitals.

In general, higher volumes of such admissions are linked to better patient outcomes[56] and there is potentially a problem with skills maintenance where critical care staff are dealing with low volumes of patients.

Figure 18: Volume of advanced respiratory support provided (non-specialist trusts)



Source: ICNARC data 2018/2019

Where this is the case we recommend that trusts review numbers and consider restructuring the service and/or arrange transfer policies. We made specific recommendations along these lines to two trusts (concerning the satellite of a major DGH and a small specialist surgical hospital) following our deep-dive visits.

It should be noted, however, that in some locations, notably where the transfer journey to the nearest larger unit is long or otherwise challenging, a policy of transferring these patients may not be appropriate and it may be in patients' best interests to offer care for these conditions in a low-volume unit. In such cases it is important that trusts monitor patient outcomes carefully and act on training requirements to ensure that optimal care is provided, seeking support from network team members as needed.[57]

This is an area where telemedicine could support services in remote and rural locations, as explored by Adzhigirey et al. in the US context.[58]

[55] *See The Faculty of Intensive Care Medicine and the Intensive Care Society (2019), Guidelines for the provision of intensive care services, V. 2, pp. 73 and 107, www.ficm.ac.uk/sites/default/files/gpics-v2.pdf*

[56] *J. Shahin, D. A. Harrison and K. M. Rowan (2014), Is the volume of mechanically ventilated admissions to UK critical care units associated with improved outcomes? Intensive Care Medicine 40, 353–360), https://link.springer.com/article/10.1007%2Fs00134-013-3205-4*

[57] *The King's Fund (2020), Critical care services in the English NHS, www.kingsfund.org.uk/publications/critical-care-services-nhs*

[58] *Adzhigirey, L. A., Raikhelkar, J., Panos, R. j. et al. (2019), Building a case for tele-critical care to improve quality, Society of Critical Care Medicine, www.sccm.org/Communications/Critical-Connections/Archives/2019/Building-a-Case-for-Tele-Critical-Care-to-Improve*

COVID-19 insight

During the pandemic it was notable that there was not one 'right' solution for hospitals with smaller critical care units. In some cases patients were successfully moved out to larger units but in others they were offered critical care support on site with help and advice from intensivists in the same network of trusts, as circumstances dictated. What made both systems work was a commitment to offering mutual aid and support. The overwhelming importance of communication between sites and the ability to request and receive advice underlines the increasing value of critical care networks and the opportunity for telemedicine support in critical care.

Statement from the NHS England National Transfer Project Leads

Adult critical care transfer services

During the first wave of the COVID-19 pandemic, several regions set up temporary adult critical care (ACC) transfer services. These proved invaluable in the management of ACC capacity and have continued to do so. Following the recognition of the value of these services, investigating the continuing need for ACC transfer systems became one of the main workstreams for NHSE following the first wave. The National Transfer Project was set up and has produced a National Transfer Model with associated toolkits with the aim of supporting regions in the set-up of ACC transfer services. Whilst these services have proved invaluable for managing winter surge and capacity pressures, the need for them longer term to streamline and co-ordinate escalation of care patient transfers should been recognised. As part of the national project a data review was undertaken which for the first time has produced an accurate estimate of the number of critical care transfers undertaken within each region in England. This has demonstrated around 23,000 transfers per annum which is over twice the previous estimates.

The need for and effectiveness of ACC transfer services has been clearly demonstrated during the COVID-19 pandemic and this has laid the foundations for the development of these services. The evolution of this previously overlooked area of critical care practice should be welcomed. In the very near future, dedicated ACC transfer services must become the standard of care across the country, in the same way that paediatric critical care transfer has already achieved.

Non-clinical transfers between critical care units

Capacity or non-clinical transfers are those made necessary by local capacity shortfall.

These transfers should not be routinely used instead of investment and development in additional critical care capacity. However, they will be effectively and safely delivered by commissioned ACCTS when required to efficiently manage regional critical care capacity.

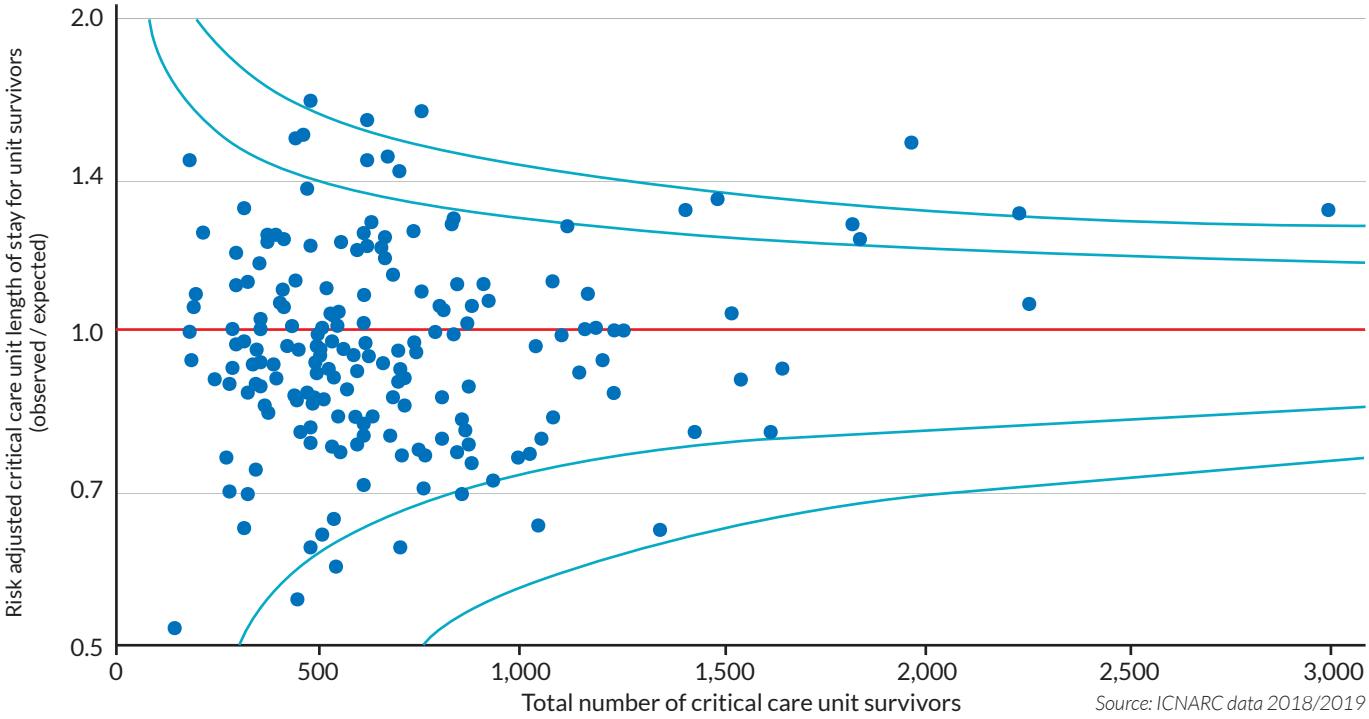
COVID-19 insight

The need for patient transfer has become apparent during the COVID-19 pandemic. Whereas larger hospitals were able to pull in teams from across the acute wards and use critical care nurses in a supervisory role, many smaller hospitals did not have the capacity to do so, necessitating transfers. The model of a regional adult critical care transfer service is an excellent one - the rapid establishment of these services in some regions during the COVID-19 pandemic was a key part of mutual aid. This success should be the catalyst to introduce regional adult critical care transfer services. Transfers will be a continuing and likely increasing feature of adult critical care, including during future COVID-19 surges. For this reason, adult critical care transfer services with dedicated staffing should be developed.

Length of stay

Figure 19 below shows risk-adjusted mean lengths of stay in critical care unit for survivors. It highlights an unwarranted variation between trusts. While this is largely due to delayed discharges, it is important that trusts investigate and understand other local factors that may also have an impact.

Figure 19: Risk-adjusted mean length of critical care stay for unit survivors (non-specialist trusts)



Source: ICNARC data 2018/2019

Conclusions

As discussed previously, the key aspects of unit flow and, in particular, delayed discharges, are beyond the control of critical care and are symptomatic of blockages in the wider hospital system. As our data has shown, these are widespread – not isolated – issues and they have a profound impact on efficiency within critical care units and beyond. For this reason our recommendations look across whole-trust bed planning and ask two questions:

1. Is there enough critical care capacity?
2. Are bed managers treating critical care discharge as a priority of the same level as getting patients from the emergency department into surgery?

Question 1 is fundamental. If critical care is suffering constant unit strain this has a negative effect on equity of access and indicates an unmet need and consequently a significant risk of poorer patient outcomes for those patients who are in a critical condition or whose condition could escalate. In cases where it is not possible to increase overall critical care capacity in the short term, it is important that serious consideration be given to expanding appropriate enhanced care arrangements as part of whole-trust bed-planning.

Question 2 addresses the need to pre-empt further unit strain by including intended discharges from critical care at daily trust-wide bed-planning meetings in order to ensure that the unit – and the trust as a whole – is working as efficiently as possible.

In a COVID-19 rapid guideline,[59] NICE recommends data sharing around critical care capacity (i.e. between critical care decision-makers and operational management) in order to improve communication and co-ordination. This represents a positive step forward.

[59] *NICE (2020), COVID-19 rapid guideline: critical care in adults (NG159), 20 March 2020, www.nice.org.uk/guidance/ng159*

Recommendation

Recommendation	Actions	Owners	Timescale
8. Ensure critical care discharges are discussed pre-emptively at hospital-wide daily bed management meetings and given the same level of priority as hospital admissions to ensure optimal patient flow and allow for new critical care admissions to be made in a timely manner.	**a** GIRFT will support trusts to implement pathways that will facilitate optimal patient flow and timely discharges from and admission to critical care units.	GIRFT, STPs/ICSs, ODNs and trusts	For progress within a year of publication

Patient outcomes, rehabilitation and follow-up

In this section we examine the lack of available data on patient outcomes after they have left critical care and the value of critical care-specific follow-up alongside in-unit and in-hospital rehabilitation to provide a critical care rehabilitation pathway.

Underlying this section is the lack of data, particularly on quality of life and function after critical care.

Individual units know very little about life for patients after a stay in critical care. Hospital episodes statistics (HES) and Office for National Statistics data reveal that mortality and readmission rates (to hospital, not necessarily to critical care) are high. Our analysis of ICNARC and Hospital Episode Statistics (HES) data shows, for example, readmission (to hospital, not necessarily to critical care) rates at 30, 90 and 365 days are about 20%, 33% and 50%, respectively. Mean mortality rates are also high at 15%, 17% and 23% for the same periods, but with significant variation between hospitals.

It has also been observed that:

> *The days in hospital following discharge from an intensive care unit (ICU) are high risk'. In multi-centre studies, in-hospital mortality rates after ICU discharge are between 4.0 and 13.3%, and account for one-third of all in-hospital deaths in patients treated in an ICU. … While in hospital, patients discharged from an ICU remain at high risk of requiring re-admission to an ICU. Readmission to an ICU is associated with substantially higher mortality rates than a single admission.*
>
> **Vollam, Dutton, Lamb et al., *Out of Hours Discharge*[60]**

Lack of critical care outcomes data

There is very limited understanding of what happens to the individual patient once they leave critical care. No data is routinely collected on this (although we have been able to pull together data from ICNARC and HES for the figures below) and there is in England too little critical care-specific follow-up, so we know almost nothing about the quality of survivorship. What does life look like after a spell in critical care?

Patients who come into critical care will have come from another specialty, and that specialty, rather than critical care, 'owns' them, audits their outcomes and manages follow-up, in line with the practice of the specialty.

Historically, the measure of success in critical care has been to save patients' lives and have no further involvement. This approach ignores the value of data in developing services to optimise patient care and improve outcomes. This lack of data is not in patients' best interests and does not help critical care units to improve – as an illustration it took over 40 years before it was established that how we use ventilators can have long-term effects on patient respiratory function and reserve and guidance was changed to reflect this.[61]

Having a better understanding of outcomes will help us understand which patients may benefit most from a stay in the critical care unit as well as improving the care we provide.

For the purposes of this report we were able to compare readmission and mortality rates across the country. Against these measures we noted significant variations in patient outcomes post critical care.

Figure 20 below shows emergency readmission rates for critical care patients. Readmission rates are generally high and we need to learn more about why patients are being readmitted. It is important for units to review the causes of unplanned readmissions in order to understand whether it is possible to minimise them.

[60] *S. Vollam, S. Dutton, S. Lamb et al. (2018), Out-of-hours discharge from critical care, in-hospital mortality and intensive care readmission rates: a systemic review and meta-analysis, Intensive Care Med, 44(7):115–1129, www.ncbi.nlm.nih.gov/pmc/articles/PMC6061448/*

[61] *John J. Marini (2013), Mechanical ventilation: past lessons and the near future, Critical Care, 17, S1, https://ccforum.biomedcentral.com/articles/10.1186/cc11499*

Figure 20: Emergency readmission (to hospital, not necessarily critical care) rates at 90 days

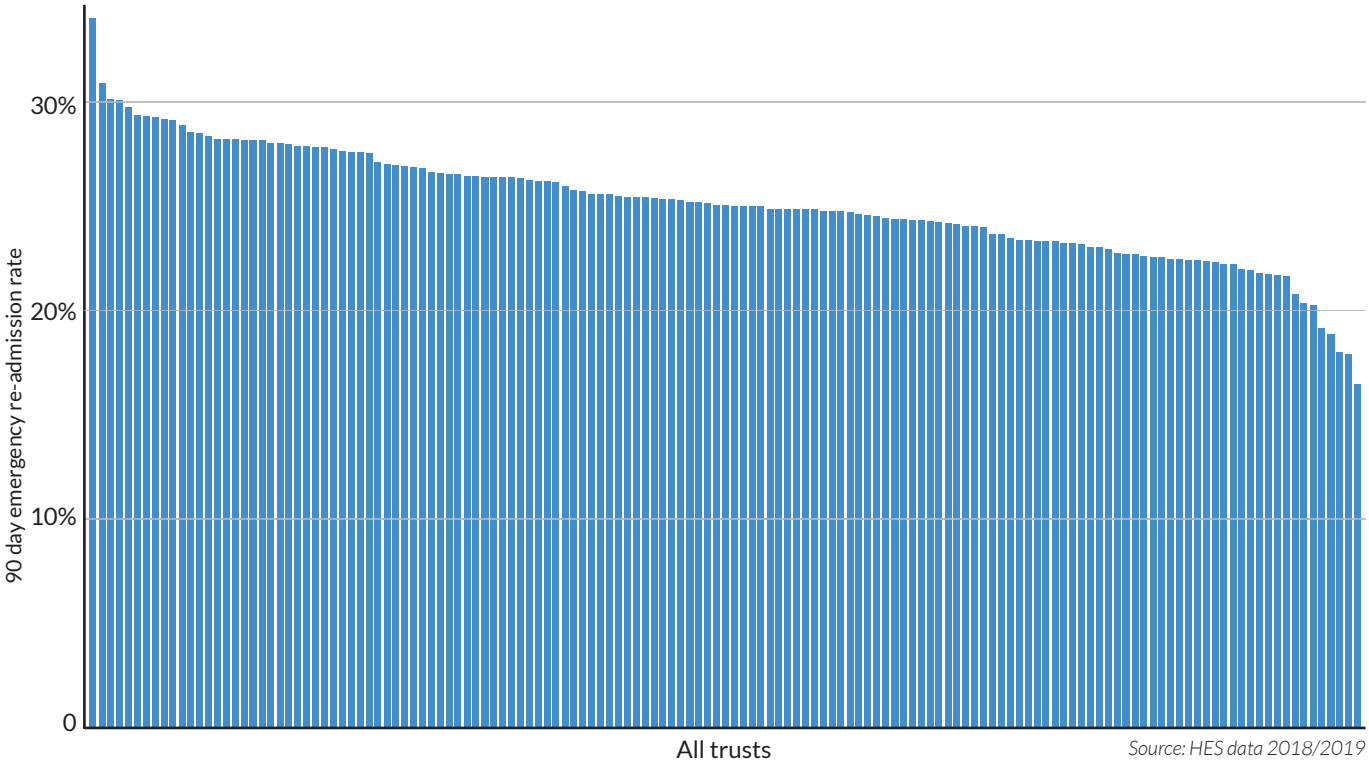
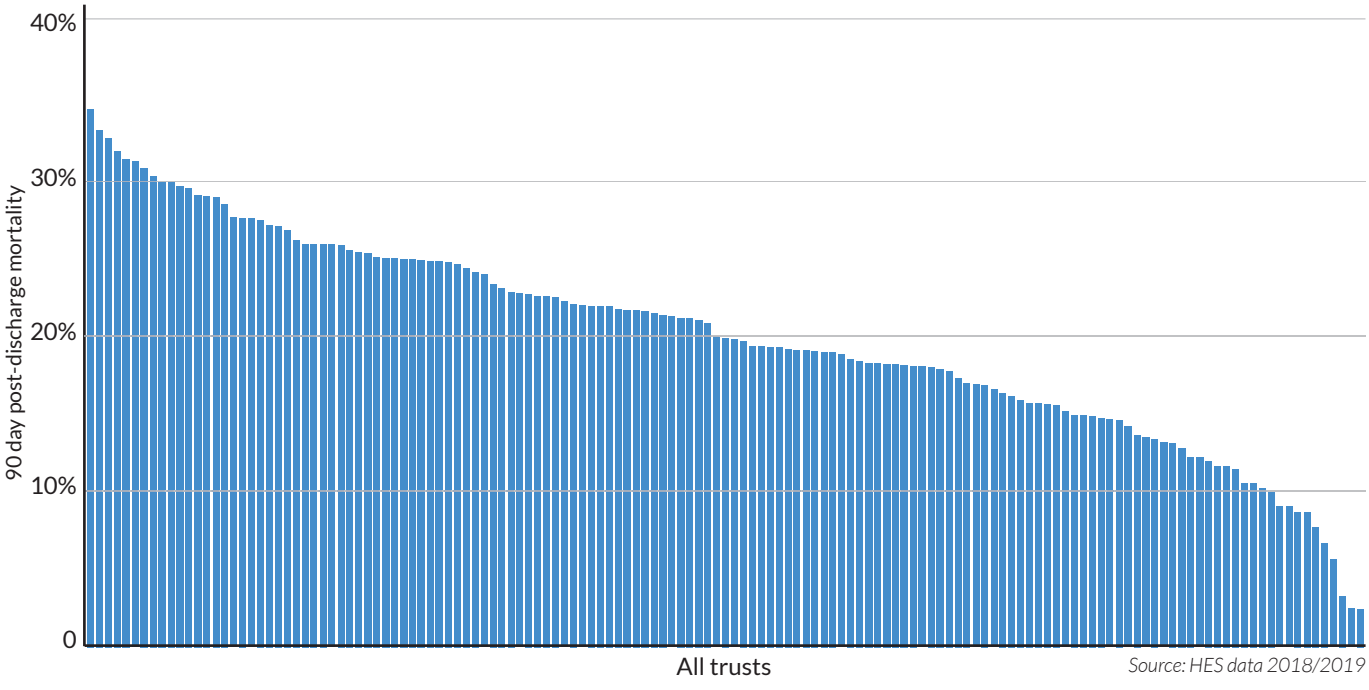


Figure 21 shows mortality rates at the same interval. Mortality rates within 30 days and a year are also high and again it is important for the specialty to understand why patients are dying after discharge and to what extent this could be prevented. Greater understanding of life after critical care could inform shared decision-making prior to critical care admission.

Figure 21: Mortality rates post critical care at 90 days



Rehabilitation pathway

The lack of and pressing need for rehabilitation for critical care patients is strongly felt within the specialty.

> *Historically, there has been no national and limited local investment in managing the aftermath of complex critical illness. This has left our patients with no clear avenue to help them with the physical, psychological, cognitive and social consequences of critical illness. It has also led to progressive inequality for patients dependent on where they happen to fall critically ill. As a result, they struggle to get back to their previous quality of life when appropriate help could have easily improved their outcome, if provided by those with an understanding of their recovery journey. This is in stark contrast to single organ disease, such as heart, respiratory, head injury or stroke, which all have well defined rehabilitation pathways.*
>
> **Dr Carl Waldmann, Chair of the Life After Critical Illness National Project**

> *It is essential that this current unmet need is recognised by the NHS centrally and that resources are appropriately set up to deal with the consequences of critical illness for all critical care patients, including the significant numbers who have survived COVID.*
>
> **FICM, *Provisional Guidance*[62]**

In 2009, NICE published guidelines entitled 'Rehabilitation after Critical Illness' (CG83)[63] that emphasised improved identification of need, access and quality of rehabilitation during the critical care admission, within the wider hospital, and upon hospital discharge into the community. In 2017, NICE produced a quality standard on rehabilitation after critical illness in adults (QS158). This sets out high-priority areas for quality improvement in relation to rehabilitation pathways for critically ill adults.[64] More recently, and in response to the COVID-19 pandemic, the Intensive Care Society (ICS) has published a framework for assessing patients' post-critical care rehabilitation needs.[65]

> *Enhancing survivorship, or the quality of survival, is now central to our management of critically patients. As such, rehabilitation should be multi-professional, interdisciplinary and co-ordinated across the recovery continuum to optimise patient outcome.*
>
> ***GPICS2 Guidelines***

In-unit rehabilitation

We noted significant variation in the rehabilitation services offered to patients and provision of support for families. Most units have completed a number of unsuccessful business cases on this topic. And, as is also the case with follow-up for critical care patients, the current lack of data collection and monitoring around this aspect of care is not in the best interests of patients or the service as a whole.

[62] *The Faculty of Intensive Care Medicine, Provisional guidance on the recovery and rehabilitation for patients following the pandemic, 13 May 2020, www.ficm.ac.uk/news-events-education/news/provisional-guidance-recovery-and-rehabilitation-patients-following*

[63] *NICE CG83, Rehabilitation after critical illness, 2009, www.nice.org.uk/guidance/cg83 (cited in FICM Guidance).*

[64] *NICE QS158, Rehabilitation after critical illness in adults, 2017, www.nice.org.uk/guidance/qs158/chapter/About-this-quality-standard (cited in FICM Guidance).*

[65] *Intensive Care Society (2020), Responding to COVID-19 and beyond: a framework for assessing early rehabilitation needs following treatment in intensive care, www.ics.ac.uk/ICS/GuidelinesAndStandards/Framework_for_assessing_early_rehab_needs_following_ICU.aspx?WebsiteKey=10967510-ae0c-4d85-8143-a62bf0ca5f3c*

It is important to develop a rehabilitation plan soon after admission to critical care. Patients often suffer from PTSD, depression, delirium and reduced cognitive function after a period in critical care.[66] Evidence is accruing that patients who are better supported in units have improved outcomes and are more able to cope. There is also evidence that early multi-professional rehabilitation can increase patient mobilisation and reduce length of stay.[67] Key factors include: a diverse set of professional skills delivered in a team approach and the use of co-ordinated, patient outcome-oriented, intensive physical therapy to achieve maximum functional improvement. This approach has been trialled successfully in the US.[68]

The critical care environment itself is often loud, harshly lit and full of unfamiliar equipment, which can be extremely stressful for patients. Anything that improves the environment (such as a view of the outside world or pet therapy, for example) reduces patient stress levels. Factors to consider include natural light levels,[69] noise levels,[70] colour and decoration schemes, privacy and dignity, and the need for staff and visitor areas. It may also be valuable, for long-stay patients who are able to, to spend some time outdoors as part of their rehabilitation.[71] This latter point was underlined by an interview on Radio 4's Today Programme with the first patient admitted to hospital with COVID-19 in the South West. Robin Hanbury-Tenison OBE, described how his 'breakthrough moment' after seven weeks in an induced coma came when his bed was wheeled out into the hospital garden.[72]

CASE STUDY

In-unit rehabilitation from COVID-19

Robin Hanbury-Tenison at at Derriford Hospital, University Hospitals Plymouth NHS Trust

Robin Hanbury-Tenison was one of the first COVID-19 patients to be admitted to Derriford Hospital. He was 83 years old and severely unwell. Within 24 hours Robin was in an induced coma, connected to a ventilator. Staff warned his family that the prognosis was poor: he had only a 20% chance of survival.

After three weeks on a ventilator, during which time he experienced multiple organ failure, followed by 10 days of kidney dialysis and a tracheostomy, Robin was well enough to be wheeled out into the hospital garden. He felt the sunlight on his face and opened his eyes. 'That was the moment when I thought, "I'm going to live!"' he recalled.

It took a team of dedicated staff to get Robin to this point and a further two weeks of intensive rehabilitation before he was able, against the odds, to leave hospital and continue his recovery at home.

While still on a ventilator, as Robin's condition had begun to stabilise, the critical care team decided to perform a tracheotomy, which meant they could reduce his sedation gradually and safely so he could begin physiotherapy. Like many ICU patients, however, Robin was suffering from delirium. The rehab team noticed a turning-point in his recovery after Robin had spent time in the fresh air and they have since used this approach with other COVID-19 patients.

Kate Tantam, specialist sister on the ICU, led the team that raised funds to create the hospital garden in a light well after she became convinced of the restorative powers of fresh air and green spaces to boost the psychological health of patients and staff.

Before leaving hospital Robin received care from a speech therapist, who helped him use the speaking valve on his breathing tube and learn to swallow again – going from sips of water to a full meal over the course of 13 days. He also received intensive physiotherapy to help him strengthen his muscles and regain movement.

Robin is currently at home training for a fundraising walk up Cornwall's highest mountain to raise money for a healing garden at a local Cornish hospital.

[66] *S. M. Parry, E. G. Kinnersley, L. Denehey et al. (2019), What are the challenges post hospitalization for ICU patients living in the community setting? A qualitative enquiry, European Respiratory Journal 54:PA1240, https://erj.ersjournals.com/content/54/suppl_63/PA1240*

[67] *D. M. Needham and R. Korupolu (2010), Rehabilitation quality improvement in an intensive care setting: Implementation of a quality improvement model, Top Stroke Rehabil,17(4): 271–281, https://pdfs.semanticscholar.org/8df8/2ea254fc537bc954b03bc4a654fec7f19e2a.pdf*

[68] *D. M. Needham and R. Korupolu (2010), Rehabilitation quality improvement in an intensive care setting: Implementation of a quality improvement model, Top Stroke Rehabil,17(4):271–281, https://pdfs.semanticscholar.org/8df8/2ea254fc537bc954b03bc4a654fec7f19e2a.pdf*

[69] *M. M. Shepley, R.P. Gerbi, A.E. Watson et al. (2012), The impact of daylight and views on ICU patients and staff, HERD, 5(2): 46–60, https://journals.sagepub.com/doi/10.1177/193758671200500205*

[70] *S. Mazer (2012), Creating a culture of safety: reducing hospital noise, Biomed Instrum Technol; Sept/Oct; 46(5): 350–355, www.semanticscholar.org/paper/Creating-a-culture-of-safety%3A-reducing-hospital-Mazer/88e2fa996afdc11aa2b0253405aa6848a35fbe97*

[71] *M. M. Shepley, R.P. Gerbi, A.E. Watson et al (2012), The impact of daylight and views on ICU patients and staff, HERD, 5(2): 46–60, https://journals.sagepub.com/doi/10.1177/193758671200500205*

[72] *See BBC News, 5 May 2020, Coronavirus: Derriford Hospital garden key to explorer's recovery, www.bbc.co.uk/news/uk-england-cornwall-52541572*

None of these insights is new. They were noted by Florence Nightingale:

> *People say the effect is only on the mind. It is no such thing. The effect is on the body, too. Little as we know about the way in which we are affected by form, by colour, and light, we do know this, that they have an actual physical effect. Variety of form and brilliancy of colour in the objects presented to patients, are actual means of recovery.*
>
> **Florence Nightingale**

In terms of more conventional therapies, recommended AHPs include physiotherapists, dietitians, speech and language therapists and occupational therapists. The input of psychologists and pharmacists is also extremely valuable as part of the MDT. The GIPCS2 Guidelines specify that 'patients receiving rehabilitation must be offered therapy by the MDT across a seven-day week and of a quantity and frequency appropriate to each therapy in order to meet the clinical need and rehabilitation plan for the individual patient', but few units currently meet these requirements due to workforce issues. This matter is further clouded by the fact that there are no recommended AHP-to-patient ratios (see final point in the 'Focus on physiotherapy' box below).

Focus on physiotherapy

- Physiotherapy is an integral component in the multidisciplinary management of critically ill patients admitted to intensive care, considering both respiratory management and early rehabilitation.
- Physical rehabilitation continues to evolve with increasing evidence supporting the delivery of early mobilisation to prevent or reduce the debilitating effects of critical illness.
- Current literature and national guidelines support the role of physiotherapy in coordinating and delivering holistic rehabilitation programmes. Recent work has shown the benefits of service remodelling and innovative interventions to place greater focus on early structured rehabilitation to improve patient outcome and length of stay.
- an AHP professional development framework has recently been published. Further work exploring clinical skills frameworks and post-registration training structure similar to that of the nursing and medical professions in intensive care, as well attention to developing advanced practice and consultant physiotherapy roles in critical care is needed.
- Across the UK, significant variance exists with how physiotherapy services are structured and provided to intensive care.
- Challenges are apparent with how physiotherapy services are commissioned and resourced. Utilisation of therapy support workers or rehabilitation assistants is an area requiring exploration as part of workforce modernisation, as well as new models of service delivery, integration and funding of physiotherapy posts.
- Further attention is required to prove the benefits of a seven-day service delivery model on improving patient outcomes and enhanced patient flow.
- A recommended staffing ratio for physiotherapists per intensive care bed is unclear. It depends upon multiple factors such as the acuity, complexity and diversity of the patient case-mix, skill mix of the physiotherapy team and service structure. *Work is recommended on this as a priority.*

(GPICS2 Guidelines)

Multidisciplinary team requirements

We noted significant variations and general shortfalls in AHPs, most notably in the availability of physiotherapists. Patients need respiratory and rehabilitation input seven days a week, but too often rehab is not available at weekends, and in some cases respiratory input is only available as an emergency on-call service at weekends, with staff covering many wards in addition to critical care.

Very few units have access to occupational therapists, Occupational therapists can reduce sedation use, potentially decrease delirium, support rehabilitation and potentially decrease critical care and hospital lengths of stay, but business cases are declined year after year.

Data collected as follows by the FICM Work Force Data Bank supports our view:[73]

- 86% (145/169) of critical care environments have access to a **dietitian**;
- only 30% (43/145) of critical care environments can identify support of a **speech and language therapist**;
- funded staffing for **occupational therapy** in critical care is very low with only 14% (20/146) of units reporting any form of Occupational Therapy input.
- only 17% (23/135) of units in the country have a service offering **psychological support** to patients and families in the unit, with the majority (65%) of these units having access to only one psychologist (15/23);
- On-going physical rehabilitation was limited, with only 29% of units reporting **physiotherapy** contributing to follow-up clinics and only 19% reporting the provision of outpatient based services when discharged.

The case for critical care-specific follow-up

> *Mortality alone is increasingly recognised to be a poor marker of good intensive care. Instead, we should be utilising patients, their family and MDT assessment of morbidity, return to work, and late mortality to best assess the true success of our intensive care intervention.*
>
> **GPICS2 Guidelines**

It has become apparent over time that patients can experience a range of significant problems following a stay in a critical care unit. 'Post-intensive care syndrome'[74] is a result of the critical care stay rather than being directly attributable to the patient's primary condition. Patients appear to be at significant risk of long-term physical, cognitive and psychological problems after critical illness and recovery may take months or years. There may also be considerable residual impacts on a patient's morbidity and life expectancy.[75] Follow-up is therefore of value both to the patient (and their family), who may have awareness of the possible long-term effects of admission to critical care,[76] and the critical care specialty as a whole, as it facilitates service evaluation and audit of the standards of care provided.

The FICM recommends follow-up appointments for critical care patients, and suggests the following, which we fully support:

- The follow-up appointments are a convenient point in time to review patients.
- Patients are typically seen two, six and twelve months after discharge; in England there is an outpatient tariff to pay for the consultations.
- Continuity of care by consultants in Intensive Care Medicine enables early diagnosis and management of intensive care related problems. Patients and relatives often need an explanation of what was wrong with them and information about their treatment. Their medication should be reviewed and rationalised.
- By organising specialist reassurance and advice, psychological recovery can be facilitated. The large investments made during intensive care are only sustained when continued support is in place following discharge.

[73] *The Faculty of Intensive Care Medicine (FICM) (2018), Workforce data bank for adult critical care, May 2018. www.ficm.ac.uk/sites/default/files/workforce_data_bank_2018_updated_for_website.pdf*

[74] *D.M. Needham, J. Davidson, H. Cohen et al. (2012), Improving long-term outcomes after discharge from intensive care unit: Report from a stakeholders' conference, Crit Med 40 (2): 502–509. www.ncbi.nlm.nih.gov/pubmed/21946660*

[75] *The Faculty of Intensive Care Medicine and the Intensive Care Society (2019), Guidelines for the provision of intensive care services, V. 2, June 2019, www.ficm.ac.uk/sites/default/files/gpics-v2.pdf*

[76] *Society of Critical Care medicine (2019) Models of peer support to remediate post-intensive care syndrome, www.sccm.org/Communications/Critical-Connections/Archives/2019/Models-of-Peer-Support-to-Remediate-Post-Intensive-Care-Syndrome*

CASE STUDY

Critical care follow-up service

Royal Berkshire NHS Foundation Trust

Reading set up its ICU follow-up programme in 1992, inspired by the service in Liverpool developed by Richard Griffiths and Christina Jones. The pilot project was successful and the clinic has become an essential part of critical care at Reading.

Initially funding was awarded under the umbrella of audit and quality improvement, the programme is now included in the budget for critical care services. The value of such a clinic is not in recording mortality statistics but rather ensuring that patients recovering from critical illness can access to an individualised recovery programme that addresses physical, psychological, cognitive and social problems.

Mr. A. N. Other was a 35-year old builder with a young family who contracted Steven-Johnson syndrome following a course of antibiotics for a throat infection. His rash worsened and he developed Toxic Epidermal Necrolysis associated with multi-organ failure.

He required multi-organ support for two months and at discharge from ICU had severe ophthalmic complications such that he was virtually blind, had a pin-hole oesophagus requiring PEG-feeding and continuous self-suctioning, suffered intractable pain from his legs and feet, had reduced mobility from stiff joints and limited respiratory reserve due to his problems in ICU with bronchial casts. He was also suffering from severe PTSD and depression.

At an ICU follow-up clinic appointment, the ICU team arranged seven separate specialists to help with his recovery. Subsequent appointments included the pain team, the upper GI surgical to assess him for oesophageal surgery and psychology services to arrange counselling for his PTSD.

Though grateful, he was adamant though that his quality of life was so poor that he wished he had not survived. To compound the situation, although he had critical illness insurance, the small print excluded claims relating to Stevens-Johnson syndrome. The burden on the family was extraordinary.

The ICU team were able to help Mr Other to sort out the insurance cover and the company eventually paid out. The follow-up team helped him through his oesophageal surgery. Unfortunately Mr Other developed pneumonia and did not survive. However, he and his family had the support of the ICU team throughout his illness in ICU and for the two years after ICU discharge until his death.

COVID-19 insight

The pandemic has increased awareness of the need for rehabilitation after a spell in critical care, particularly on the need for physiotherapy and follow-up for patients who have had a prolonged period of ventilation. It would be a missed opportunity if further longer-term research were not conducted on the effects of rehabilitation and follow-up for critical care COVID-19 survivors. The more we can learn about the effects after discharge, the better we can tailor rehabilitation to critical care patients in the future, ensuring that rehab and follow-up specifically for the critical experience become an integral part of the critical care pathway.

The FICM was halfway through defining full provision guidance for the Life After Critical Illness Project when the pandemic broke out. They have now produced a position statement and provisional guidance in response to COVID-19.[77] Dr Alison Pittard, Dean of the Faculty of Intensive Care Medicine: 'We have written to the appropriate commissioning and policy leads in the four nations of the UK asking for planning to begin on developing services that will support not only patients who have been through critical care with COVID, but all patients with critical illness.'

NHS England and NHS Improvement has recently launched an online service for the rehabilitation of patients recovering from COVID-19.[78]

[77] *FICM and ICU Steps (May 2020), Position statement and provisional guidance: recovery and rehabilitation for patients following the pandemic, www.ficm.ac.uk/sites/default/files/ficm_rehab_provisional_guidance.pdf*

[78] *See www.england.nhs.uk/2020/07/nhs-to-launch-ground-breaking-online-covid-19-rehab-service/*

A rehabilitation pathway for critical care patients might usefully follow a similar pattern to the care pathway for acute stroke patients, in that the pathway links secondary to primary care and is funded beyond the patient's initial stay in hospital. Such a pathway may be particularly important for appropriate medication review and continuity and further research should be undertaken to inform best practice. Work is currently in progress between the ICS, the FICM and CRG to develop a comprehensive rehabilitation programme.

Technology can and should play a part in rehabilitation. Simple devices such as a smart watch and phone app that records daily activity can function both as a rehab tool and a source of patient data after discharge.[79]

Longer-term follow-up is also important for many patients and their families[80] through the years following hospital discharge to minimise the risk of poor outcomes and maximise the patient's chances of returning to a good quality of life and, where appropriate, back to work. We support the FICM/ICS *(GPICS2 Guidelines)* recommendation that the specialty focuses on the development of validated measures of longer-term patient- and family-centred outcomes, including functional ability, socioeconomic consequences and carer burden and note that 'long-term, post-hospital follow-up requires a funded infrastructure, with delivery models usually centred around an intensive care follow-up clinic, although the ideal mechanism is uncertain'.[81]

COVID-19 insight

The ability of the NHS to adapt rapidly to an environment in which people were keen to avoid visiting a hospital unnecessarily during the pandemic has been impressive and has significantly advanced the case for remote consultations. Now we know how easily this can be achieved and (anecdotally) how positively it is viewed by patients, the way forward seems clear. Combined use of monitoring technology where appropriate and remote consultations would seem to be the logical next step in developing a critical care follow-up process. We recommend that this approach is implemented nationally as soon as possible.

Conclusions

Data, or lack of it, is at the heart of this section. Without routine data collection on outcomes beyond survival, we simply don't know enough about what happens to our patients after they leave. Given the rates of morbidity and readmission we have found, it is clear is that we do not support our patients well enough post discharge. There is an urgent need for post-critical care rehabilitation, which could be conducted on a regional or sub-regional basis supported by telemedicine, as well as better and more consistent provision of in-unit rehab. In addition, once we know more about quality of life after critical care this data can be used to inform decision-making around critical care admissions and ensure that those patients most likely to benefit are admitted.

[79] *N. Panda, I. Solsky, E.J. Huang et al. (2019), Using smartphones to capture novel recovery metrics after cancer surgery, JAMA Surg. Doi:10.1001/jamasurg2019.4702 (28 October), www.ncbi.nlm.nih.gov/pubmed/31657854*

[80] *K.R. Twibell, A. Petty, A. Olynger et al. (2013), Families and post-intensive care syndrome: preventing, assessing, and treating trauma suffered by families of a hospitalized loved one, American Nurse Today, 13(4): 6–12, 4 April, www.myamericannurse.com/families-post-intensive-care-syndrome/*

[81] *The Faculty of Intensive Care Medicine and the Intensive Care Society, Guidelines for the provision of intensive care services, V. 2, June 2019, www.ficm.ac.uk/sites/default/files/gpics-v2.pdf*

Recommendations

Recommendation	Actions	Owners	Timescale
9. Develop a patient multi-disciplinary rehabilitation pathway starting in critical care and following through to primary care after discharge. Obtain necessary funding to support this.	**a** GIRFT to work with Faculty of Intensive Care Medicine (FICM), Intensive Care Society (ICS), NICE, GPICS2 Guidelines and NHS England and NHS Improvement (NHSE/I) (people team) to secure funding for a rehabilitation pathway including investment for Allied Health professionals (AHPs).	GIRFT, NHSE/I, FICM, ICS, NICE and Chartered Society of Physiotherapists	For progress within a year of publication
10. Develop pathways for post-critical care follow-up, and consider which approach best meets patient needs.	**a** GIRFT to support trusts and Operational Deliver Networks (ODNs) to develop pathways and to ensure that they adhere to upcoming guidance from FICM.	GIRFT, trusts, ODNs and FICM	For progress within a year of publication

Workforce

This section covers issues of staffing, staff training and general workforce concerns.

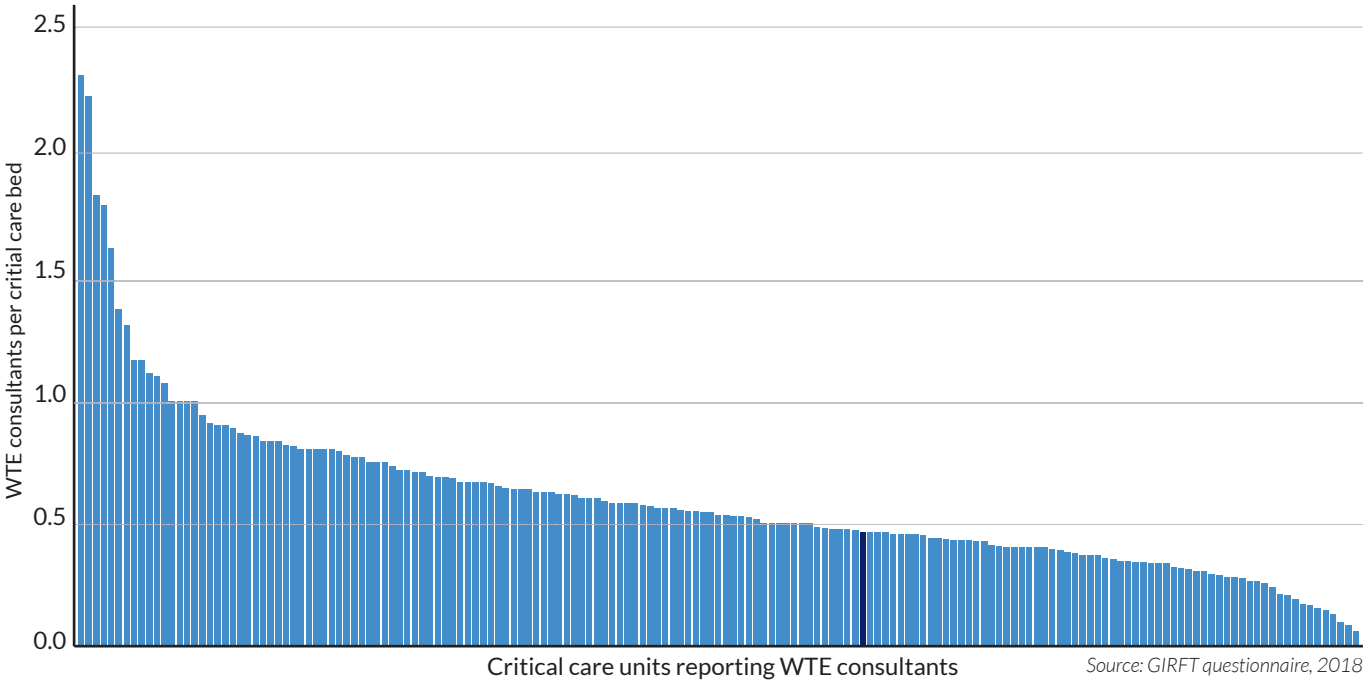
It is generally accepted that approximately 70% of the running costs of a critical care unit relate directly to staffing and we have noted considerable variation between units in adequacy of staffing levels. FICM and ICS have produced staffing standards in its *GPICS2 Guidelines*, which, in many units, are not even nearly met.

The current situation is of particular concern since there is a significant growth in the need for critical care services predicted.[82] With insufficient and variable staffing levels, we face increased inequity of access as well as related issues of patient flow and suboptimal discharge processes, all of which mitigate against the best patient outcomes.

Staffing issues

Consultants

Figure 22: Number of wholetime-equivalent consultants per critical care bed, by trust



Source: GIRFT questionnaire, 2018

Historical under-provision of trainee posts means the provision gap is widening as demand for the service grows. Our deep-dive visits revealed that while large units are generally able to recruit, smaller and more remote units struggle, which leads to a persistence of consultants in anaesthesia with no specific critical care training covering out-of-hours and weekend shifts in some places. The knock-on effects of this situation are significant and include withdrawal of training recognition for units, dependence on locums, lack of continuity and burnout, which can result in clinicians leaving the specialty.

Trainees

The number of trainee doctors required to supply consultant recruitment is far fewer than the number required to staff units 24/7 with a ratio of one doctor to 10 patients. Trainees from other specialties, e.g. anaesthesia, support critical care rotas, but the supply is less than ideal in many regions and the numbers remain insufficient, as evidenced by the high use of locums in some areas.

[82] *The Faculty of Intensive Care Medicine (FICM) (2018), Workforce data bank for adult critical care, May, www.ficm.ac.uk/sites/default/files/workforce_data_bank_2018_updated_for_website.pdf*

Advanced Critical Care Practitioners (ACCPs)

ACCPs are a relatively recent introduction to the critical care workforce and are intended to fill the skills gap that was identified in many critical care units. The National Education and Competence Framework for *Advanced Critical Care Practitioners*[83] was published in 2008, since which time more than 250 have been trained, with a further 100 currently in training. ACCPs come from a variety of backgrounds (often having been nurses, physiotherapists or paramedics, for example) and are regulated under the regulatory body for their original profession). They are required to complete two years of training. Similar roles in advanced clinical practice also exist in other clinical services within the NHS and are recognised as a priority for workforce development. Further information on the NHS Long Term Plan and the multi-professional framework for advanced clinical practice in England can be found at:
https://www.hee.nhs.uk/sites/default/files/documents/multi-professionalframeworkforadvancedclinicalpracticeinengland.pdf

By providing a long-term, highly skilled workforce, ACCPs support and enhance training, improve morale and reduce team member burnout, particularly as they ameliorate problems of trainee staffing. Barriers to further recruitment include a lack of recognition of the significant cost and risk to organisations of providing ACCP training. Since ACCPs are going to play a key role in the future of critical care, we believe there may be a case for:

- reconsidering the funding model so it is more closely aligned with the way trainees are funded;
- concentrating training in the larger hospitals with the educational capacity to train.

We note that FICM is currently working to align ACCP training more closely with the apprenticeship model, which should reduce the cost burden and allow more trusts to train ACCPs. The Faculty is also trialling a part-funded hub and spoke model allowing smaller DGH's to provide training in collaboration with larger hospitals.

CASE STUDY

Advanced Critical Care Practitioners

Newcastle upon Tyne Hospitals NHS Foundation Trust

Newcastle upon Tyne Hospitals NHS Foundation Trust currently has 17 Advanced Critical Care Practitioners (ACCP) at Band 8a and Band 7. They are trained in-house and all are accredited FICM ACCP members with backgrounds in nursing or physiotherapy.

The ACCPs rotate between four critical care units within the trust (neurology, cardiology, liver/transplant and general) and act as ICU residents on rotas alongside doctors, caring for patients at Levels 2 and 3. They operate with a system of (distant) supervised practice and the more senior ACCPs function as a 'senior tier' of Lead ACCPs.

Regionally there are three nearby trusts that also have ACCPs on staff. This enables the trusts to share ideas and development plans as well as training. There is also a regional ACCP group (ACCPs Northern Region), which arranges workshops and continuing professional development events.

Feedback within the trust on the employment of ACCPs has been positive. A recent staff survey showed that around:

- 85% feel ACCPs enhance patient care.
- 85% believe ACCPs meet the expectations of the FICM.
- 80% agree that they are safe non-medical prescribers.

In addition fewer than 5% of respondents agreed with the statement 'ACCPs have a negative impact on medical trainees' training'.

[83] *Department of Health (2008), The National Education and Competence Framework for Advanced Critical Care Practitioners, 2008, www.ficm.ac.uk/sites/default/files/National%20Education%20%26%20Competence%20Framework%20for%20ACCPs.pdf*

Nurses

The nurses-to-patient ratios for critical care units are crucial: shortfalls in nursing staff have an immediate effect on the unit's capacity and ability to provide care at Levels 2 and 3. The FICM Workforce Databank 2018 notes that the majority of critical care units do not have a full nursing complement and two out of five units have to close beds due to staffing shortages on at least a weekly basis (with four out of five having had to transfer patients due to lack of bed capacity).[84] The UK Critical Care Nursing Alliance (the umbrella organisation for critical care nursing) has expressed concern about the ability of the NHS to restore nurse-to-patient ratios post-COVID.[85]

We have noted in some hospitals that other staff such as technicians are taking on a wider role (by, for example, setting up the equipment nurses use) and in this way freeing up nurses' time to focus more on patient care. Where this has happened, it has worked well and may be worth exploring further.

CASE STUDY

Operating Department Practitioners

Sheffield Teaching Hospitals NHS Trust

Operating Department Practitioners (ODPs) are an integral part of the critical care MDT at Sheffield Teaching Hospitals NHS Trust. They provide a daytime and evening resident presence and an out-of-hours night time on-call service.

Responsibilities include managing all equipment banks, checks etc, setting up and maintaining equipment during patient use eg ventilators, LIDCO, ROTEM and assisting with procedures eg bronchoscopy, intubations, transfers. They enable the nurse to be released to provide and oversee care delivery. During the COVID-19 pandemic, ODPs have been invaluable in ensuring that interventions such as proning, intubation, and transfers for imaging have been done in a safe manner but with appropriately trained assistance, reducing risks to the patient and team. They have also been invaluable in ensuring that supplies of high use devices eg: CPAP hoods are identified and stock managed appropriately.

Nursing shortages are acknowledged as a urgent challenge in the NHS Interim People Plan and the subsequent NHS People Plan (2020).[86] These were reflected in discussions on GIRFT visits about staffing challenges. The use of bank and agency staff to fill vacancies was also raised, and we heard this can cause training and governance issues, a lack of continuity of care and increased costs.

Use of locums and agency staff

It became apparent on our deep-dive visits that, where there are gaps, trusts frequently hire locum, medical staff and nurses from agencies. This does not represent best practice and is a financial drain. We noted one trust where agency costs made up 50% of total nurse spend. As HR and cost data on locum staff split by specialty is not reported nationally, we included specific questions about the use of locum and agency staff use in our pre-visit questionnaires. During our review, we became aware of wide variation and very high use of such staff at several trusts. However, the limited availability of supporting information makes it difficult to analyse the situation in detail. Collecting locum staff data by specialty would provide a useful indicator of workforce capacity shortages at specialty level.

We have heard reports of difficulties in handover from one locum to another and that ward-based locums may sometimes avoid making difficult decisions, resulting in inappropriate referrals to critical care.

[84] *The Faculty of Intensive Care Medicine (FICM) (2018), Workforce data bank for adult critical care, May, www.ficm.ac.uk/sites/default/files/workforce_data_bank_2018_updated_for_website.pdf*

[85] *UK Critical Care Nurses Alliance (UKCCNA) (2020), UKCCNA position statement: critical care nursing workforce post COVID-19, www.ficm.ac.uk/uk-critical-care-nursing-alliance-ukccna/ukccna-workforce-news-and-statements*

[86] *NHS (2019), The NHS interim people plan, www.longtermplan.nhs.uk/wp-content/uploads/2019/05/Interim-NHS-People-Plan_June2019.pdf and NHS (2020) We are the NHS: people plan for 2020/2021 – action for us all, www.england.nhs.uk/ournhspeople/*

Flexible bed utilisation

In staffing a critical care unit the aim should be flexibility in provision of staff to meet the needs of the patient. The minimum requirements for critical care staffing vary by level of care. For example, the ratio of nurses to patients at Level 2 is 1:2, and for Level 3 care this rises to 1:1. Most units flex Level 2 and 3 beds, but this is not always easy: discharging a Level 2 patient does not make way for a Level 3 admission, and this becomes even more difficult when units are physically separate. Attempts should be made to co-locate all Level 2 and Level 3 beds to enable most efficient use of available staffing. The need for this has been underlined during the COVID-19 pandemic.

The current reality

Critical care in England tends to operate at two extremes. We have seen units with the right number of staff providing a vibrant, supportive, educational environment for doctors, nurses and AHPs and delivering outstanding patient care (see Case Study on Guy's and St Thomas' NHS Foundation Trust, page 68).

But we have also seen chronically understaffed units, struggling by with unfamiliar locums and agency staff, unable to attract senior trainees to new consultant posts and, despite everyone's best intentions, being unable to 'get it right' some of the time.

To compound these difficulties, a trust's senior management team may not always recognise that critical care has a problem with staffing, with the result that targeted support is not forthcoming. Where there is support, it is possible to turn things around. We have seen many innovative solutions. Hull, for example (see case study below), has appointed a number of Clinical Nurse Educators (CNEs). We know that staff move on when they do not feel competent or supported in their role. By recognising this and ensuring staff are suitably prepared through the provision of CNEs, they have reduced turnover, improved retention and had positive feedback from staff.

In many other units the value of CNEs is not well understood and in consequence their posts have been cut to save money. It should be noted that GPICS2 Guidelines specify for each critical care unit a dedicated CNE responsible for coordinating education, training and a continuing professional development (CPD) framework for intensive care nursing staff and students (a minimum of one whole-time equivalent per 75 nursing staff).

CASE STUDY

Clinical Nurse Educators

Hull and East Yorkshire Hospitals NHS Trust

The Hull and East Yorkshire Hospitals NHS Trust employs 3.8 whole-time equivalent Clinical Nurse Educators (CNEs) at Band 6 to provide support and education to critical care nurses. The trust is also in the process of uplifting one team member to band 7. In this new role they will be able to provide leadership to the team and oversee activities such as the postgraduate education programme that has been set up within the trust (taught in house and accredited by the local university) and also the 'boot camps' that the trust runs for all new starters.

COVID-19 insight

Recent experience during the pandemic has seen trained critical care nurses supervising and supporting other staff, such as ward nurses and HCAs, in the care of more than one patient. This is an experiment that could only have happened during a crisis and it is important that we learn from it, considering both the good and bad, as such ways of working could form the basis of a potential model for the future workforce.[87]

Also relevant here is the increasing use internationally of tele-critical care (in-unit video monitoring and consultations), not just across networks but within units themselves as a way of improving patient care, particularly when infection risks are high, and sharing expertise and oversight within clinical teams in real time.

CASE STUDY

A well-resourced and well-run unit

Guy's and St Thomas' NHS Foundation Trust

Critical care at Guy's and St Thomas' is in a very fortunate position compared to many other ICUs in the country.

The executive team recognise that critical care is one of the core support services within the trust, facilitating the complex medical and surgical pathways that provide care to patients across London and Southeast England. The size of the trust – one of the largest in the NHS – means there is a broad tertiary referral practice encompassing almost all medical/surgical disciplines. This offers a varied workload and great training opportunities for staff at all levels. Consequently, critical care is well staffed in line with current guidance, with medical, nursing and AHP staff available on site 24/7, along with a dedicated consultant cover for every unit and 24/7 consultant cover for outreach, admissions and inter-hospital retrieval, supported by 24/7 critical care registrars and trained and experienced critical care nurses.

Critical care is well supported by other departments within the trust and enjoys 24/7 access to vital support services, including endoscopy, interventional radiology, coronary intervention and emergency surgery. There is also excellent from chaplaincy and palliative care.

The broad casemix and need to accept acute patients at short notice means there is a large existing bed base, well established escalation/flexing plans and a unit approach based on accepting patients according to need rather than necessarily capacity at point of referral. This means critical care at GSTFT is in the rare and enviable position of being able to make decisions based on individual patient needs rather than resources available.

Improved resourcing ultimately results in increased referrals, both requiring and allowing for greater resourcing – creating a virtuous circle. Size, resources and the complexity of care that is undertaken allow for a greater input into the Southeast London sector, where shared teaching, guidelines and referral practices can in turn streamline patient management and improve outcomes across a wide geographical area.

Not even the most well resourced and supported service can always 'Get It Right first Time'. What they can do – and this is the case at GSTFT – is develop a strong incident reporting culture, a focus on safe practice and a willingness to learn from mistakes.

During the March–June 2020 COVID-19 surge, critical care at GSTFT was able to expand substantially because they had a high level of wider trust and executive support, and the necessary staffing, equipment and resources available. This allowed them to provide support for conventionally ventilated patients across the trust and Southeast London as well as providing severe respiratory failure/ECMO services to Southeast England, NHS Nightingale and further afield as required.

[87] *NHS (2020) Specialty guides for management during the coronavirus pandemic> Coronavirus: principles for increasing the nursing workforce in response to exceptional increased demand in adult critical care, www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/specialty-guide-critical-care-workforce-v1-25-march-2020.pdf;*
NHS (2020), Adult critical care novel coronavirus (COVID-19) staffing framework, p. 5, www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/C0087-speciality-guide-critical-care-specialty-guide-v2-.pdf ;

Multidisciplinary team requirements

With the exception of pharmacists, we cover these roles under the Rehabilitation section (see page 55).

Pharmacists

Several of the trusts we visited also reported insufficient pharmacists available to critical care units (this is borne out by recent research[88]) and we learned that not all trusts are prepared to fund a pharmacist post dedicated to critical care. This is despite evidence that clinical pharmacists, working directly with the critical care MDT and via quality improvement programmes, contribute to improved patient outcomes (including reduced mortality and shorter ICU lengths of stay). They also reduce medication errors and adverse drug events and facilitate the cost-effective use of medicines.[89] Notwithstanding the more general expectation of investment into clinical pharmacy services following the independent Carter[90] and NHS England's 7-day clinical pharmacy services reports,[91] clinical pharmacists are an essential component of critical care staffing.

The development of a pharmacy team including critical care specialist pharmacist, generalist pharmacists, pharmacy technicians and pharmacy assistants is critical to correct skill mix – as is embedding critical care exposure in junior pharmacist developmental pathways to ensure skills and competence development.

COVID-19 insight

During the first wave of the pandemic, pharmacy services in handling drug shortages and providing substitutions were vital.

The very close working between the specialist critical care pharmacists, national medicines and pharmacy team, medicines supply team, national clinical directors for critical care and the royal colleges/specialist societies (RCoA/ICS) ensured significant clinical and operational benefit for critical care patients and staff, as well ensuring the supply of essential medicines was maintained. Across the country greater numbers of pharmacy staff have been directed into supporting critical care units. This has involved rapid upskilling of pharmacy teams (and others) In order to support expanded critical care capacity.

Clinical guidance has provided staffing recommendations based on a 5/7 service, whilst recognising a need for staffing to be extended to provider 7/7 cover. Specifically, the *GPICS2 Guidelines* state that there must be a designated intensive care pharmacist for every critical care unit and recommend that there should be 0.1 whole time equivalent (WTE) pharmacist for every Level 3 and for every two Level 2 bed for a 5/7 day a week service. The guidance also states that clinical pharmacy services should be available seven days a week and, following developments including the aforementioned seven-day clinical pharmacy reports, the need for greater continuity over the weekend is well-recognised.

Conclusions

There are long-term workforce issues for critical care and these are addressed in the recommendations of the *GPICS2 Guidelines*, which we support fully. The guidance exists and should be followed with all urgency.

In addition to these recommendations, we would add three specific concerns: the provision of dedicated pharmacy services, the provision of psychology services and the funding of ACCP training.

Regarding pharmacists, we advocate a collaboration between the UK Clinical Pharmacy Association Critical Care Group, FICM, the Intensive Care Society and NHS England and NHS Improvement to develop a national evidence-based and costed workforce model for critical care pharmacists to support local adoption and implementation and to develop evidence-based guidance for dedicated critical care pharmacists.

For ACCPs, we recommend consideration of a new funding model for training to ensure the long-term viability of this new model of care, particularly for smaller hospitals.

[88] *M. Borthwick, G. Barton, R. S. Bourne et al. (2017), Critical care pharmacy workforce: UK deployment characteristics in 2015, International Journal of Pharmacy Practice, https://doi.org/10.1111/ijpp.12408*

[89] *C.R. Preslaski, I. Lat, R. McLaren et al. (2013), Pharmacist contributions as part of the multi-disciplinary ICU team, Chest, 144 (5): 1687–1695, www.ncbi.nlm.nih.gov/pubmed/24189862*

[90] *Department of Health and Social Care (2019), Lord Carter independent report: productivity in NHS hospitals, www.gov.uk/government/publications/productivity-in-nhs-hospitals*

[91] *NHS England (2016), Transformation of seven day clinical pharmacy services in acute hospitals, www.england.nhs.uk/wp-content/uploads/2016/09/7ds-clinical-pharmacy-acute-hosp.pdf*

In order to address the long-term shortage of critical care nurses, we support research into the approach adopted during the COVID-19 pandemic whereby highly skilled critical care nurses brought their expertise to supporting teams of others, such as assistant practitioners and HCAs, in managing 3–4 patients.

NICE has produced a range of guidance in response to COVID-19, some of which could form the basis of future research into workforce requirements.[92]

COVID-19 insight

The pandemic has drawn attention to a previously overlooked need for psychological support for frontline staff in critical care. While this may have been provided in the past in exceptional circumstances, COVID-19 has focused minds on the value of ensuring mental health support is available for staff as well as patients and their families.[93] This relates not just to short-term well-being but also to long-term retention of a highly skilled workforce.

Recommendations

Recommendation	Actions	Owners	Timescale
11. Meet *GPICS2 Guidelines* standards for the critical care workforce (where stated) and where no numbers are currently recommended, trusts should ensure all patients able to access appropriate care.	**a** GIRFT to support Faculty of Intensive Care Medicine (FICM) and Intensive Care society (ICS) on guidance that ensures the following: • chest and rehabilitative physiotherapy is available 7/7; • speech and language therapy is available 5/7; • a dietician is available 5/7; • occupational therapy is available 5/7; • psychology services are available 5/7.	GIRFT, FICM and ICS	For progress within six months of publication
	b GIRFT to support research to identify and quantify numbers and skills mix across the MDT where numbers are not currently recommended.		
12. Develop national, evidence-based, costed recommendations for the employment of critical care pharmacists.	**a** GIRFT to support NHS England and NHS Improvement (NHSE/I) hospital pharmacy team and people team to invest in critical care pharmacists.	GIRFT and NHSE/I	For progress within a year of publication
13. Develop a sustainable mechanism for training more Advanced Care Critical Care Practitioners (ACCPs) and possibly develop networks, to make it easier for smaller hospitals to employ them.	**a** GIRFT to support other stakeholders in creating a new funding model for training for ACCPs.	GIRFT, FICM and NHSE/I	For progress 18 months after publication
	b GIRFT to support FICM to develop an ACCP apprencticeship		
14. Use learning from COVID-19 and subsequent research as a basis to develop a robust evidenced-based nursing workforce model for the future.	**a** Support research by National Institute for Health Research (NIHR) into staffing requirement and models in light of COVID-19 experience.	GIRFT, NIHR, Intensive Care National Audit Research Centre (ICNARC), FICM and ICS	For progress a year after publication

[92] *See, for example, NICE (2020), COVID-19 rapid guideline: critical care in adults (NG159), 20 March 2020, www.nice.org.uk/guidance/ng159*

[93] *See, for example, K. Hackett (2020) COVICD-19: call for psychological support for ICU nurses as they face surge in cases, Nursing Standard, 25 March, https://rcni.com/nursing-standard/newsroom/news/covid-19-call-psychological-support-icu-nurses-they-face-surge-cases-159286*

Quality improvement, data and research

A recurring theme throughout this report has been the scarcity of quality improvement data that is collected around the work of critical care units. For example, most of the questions used on clinical reference groups' (CRGs) dashboards generally focus on throughput and processes rather than quality of care (although the CRG dashboard does include measures for a standardised mortality ratio and rate of bloodstream infections).

There is also, as has been mentioned, a dearth of available data on patient pathways (both before and after a critical care admission) as well as on outcomes post critical care, because patients 'belong' to a different originating specialty.

Contributing to audits and research projects as part of a quality improvement (QI) programme is not only a valuable way to add to national critical care-focused databases but, where these programmes are well managed, they also support continuous improvement and improved patient outcomes at trust level.

Quality improvement

CASE STUDY

Taking a networked approach to quality improvement (QI) with Local Service Improvement Leads

Cheshire and Mersey Critical Care Network (CMCCN)

CMCCN believes that service improvement activities within units are essential for sustaining and improving critical care delivery. They achieve local ownership, collaboration and momentum on specific projects by using Local Service Improvement Leads (LSILs).

The LSIL role was established in 2007 and is funded by the CMCCN, who second a senior non-medical member of each local critical care team for 0.20 WTE, thus giving the unit protected time for service improvement. Since 2007 LSILs have completed 1,226 QI projects.

LSIL responsibilities include:

- developing best practice;
- improving communication;
- improving team working;
- auditing practice against national, network and locally agreed standards;
- improving reporting of clinical incidents and sharing lessons learnt;
- implementing national, network and locally agreed standards and quality indicators.

The benefits LSILs bring to the network include:

- promoting a strong working culture across networks;
- shared expertise;
- identifying gaps in service delivery and quality agendas;
- enabling meaningful benchmarking between specialist areas and within and across units;
- reducing variation in practice
- creating a network-wide ethos of facilitating best practice and shared learning.

Our deep-dive visits revealed that, while critical care units are committed to improving patient outcomes, there is not on the whole, a culture of QI. Units tend not to view themselves as organisations that can work towards continual improvement. Any steps that can change this mindset and help cultivate a more QI-focused culture are to be encouraged.

While some units have well-established QI programmes (see Case Study on Cheshire and Mersey Critical Care Network above) for the majority their audit and QI work is not proactive but takes place only in response to problems. There are, however, persuasive arguments for addressing quality and safety challenges in an evidence-based way, for evaluation that combines the goals of research and improvement and the interests of all.[94] We would wish to encourage trusts to participate in research and quality improvement programmes wherever possible.

There are national programmes that trusts take part in, which include the Infection in Care Quality Improvement Programme (ICCQIP) and Safety thermometer, both covered below.

ICCQIP

ICCQIP participation has now been included in the new Service Specification for Adult Critical Care[95] and is a valuable aid in quality improvement.[96]

ICCQIP (https://www.ficm.ac.uk/ICCQIP) is a collaboration of professional organisations representing adult, paediatric and neonatal intensive care, microbiology, and infection control, supported by Public Health England (PHE). The group has developed a voluntary national surveillance programme designed to provide information about infections in critical care units in England, with a particular focus on anti-microbial resistant infections and bloodstream infections.

The purpose of the programme is to support local efforts to control infections through standardised web-based reporting and benchmarking. The system can link data from individual patients and units to other sources of data across the NHS, thereby helping to identify national trends and reduce infection rates in some of our most vulnerable patient groups. This represents a useful national dataset and is a project we strongly support.

Safety Thermometer

The Safety Thermometer was developed by the NHS for use as a point-of-care survey instrument. It provides a 'temperature check' that can be used alongside other measures to register local and system-wide progress in providing an environment free from harm for patients. It allows teams to measure harm and calculate the proportion of patients who are 'harm-free' throughout the working day.

However, during our deep-dive visits we found there was a great deal of variation in trust levels of participation in the Safety Thermometer[97] and in the way the data was coded. These factors affect the reliability of the measurements thus attained.

Outcome data

APACHE (Acute Physiology and Chronic Health Evaluation) and APACHE II are scoring systems designed to cope with the wide range of diagnoses and co-morbidities of patients in critical care. ICNARC collects APACHE data on every patient and this underpins everything we know about mortality rates and outcomes. It is generally acknowledged that aspects of the APACHE systems, including the Chronic Health Evaluation and assessment of prior function, are currently not particularly nuanced and thus the accuracy of these aspects of the data recorded varies between units. It is important that the data is checked by a clinician, and it appeared from our deep-dive visits that this is not always the case. ICNARC is currently updating their dataset to include more gradation in co-morbidities scoring and a frailty index to allow for a more detailed picture of a patient's pre-existing state of health. We support this, particularly in view of the pressing need to improve data on patient outcomes in order to optimise patient care both in critical care and after discharge, as well as to inform decision-making around which patients are most likely to benefit from a critical care admission.

[94] *Dixon-Woods, M. (2018), Harveian Oration 2018: Improving quality and safety in healthcare, Clin Med (Lond.), Jan 19(1): 47–56, www.ncbi.nlm.nih.gov/pmc/articles/PMC6399637/*

[95] *NHS, D05 Service specification for adult critical care, www.england.nhs.uk/publication/adult-critical-care-services/*

[96] *The Faculty of Intensive Care Medicine, Infection in critical care quality improvement programme (ICCQUIP), www.ficm.ac.uk/ICCQIP*

[97] *www.safetythermometer.nhs.uk*

Research

While not specific to critical care, there is evidence to support the theory that centres which take part in large-scale research projects (i.e. multi-centre trials) have better overall outcomes.[98]

There is an active national research programme supported by NIHR, in which many critical care clinicians would like to participate but many have too little time in their job plans to support this. It would be extremely helpful if trust executives were to allocate time and resources to enable units to contribute to research projects, particularly as this activity would result in increased funding from NIHR. Trusts should consult www.nihr.ac.uk/documents/best-research-for-best-health-thenext-chapter/27778 for more information on NIHR's current research aims, which critical care units could contribute to by participating in NIHR portfolio studies. The work of the James Lind Alliance and its Priority Setting Partnerships is also of value and has been used by the ICS to set their research targets.[99]

CASE STUDY

World-leading collaborative research in a time of global pandemic

University of Manchester and the National Institute for Health Research (NIHR)

Professor Paul Dark is NIHR Specialty Lead for Critical Care and the Chair in Critical Care Medicine at the University of Manchester.

"Building on critical care's responses to pandemic influenza in 2008–9, the UK critical care research community has developed a globally leading UK collaborative clinical research network with NIHR. Responding early in the UK's COVID-19 outbreak, we paused our established national research study portfolio and focused on the support and delivery of both pre-planned and response-mode pandemic clinical research. We worked with the Chief Medical Officers of England, Northern Ireland, Scotland and Wales to develop Urgent Public Health (UPH) research priority, a key government aim, and have led the world in coordinating the highest-priority studies for critically ill patients. In areas such as diagnosis/testing, epidemiology, genetic susceptibility and treatments, our UPH study portfolio is supported and delivered in over 200 UK critical care units. In collaboration, NHS critical care is delivering systematically researched evidence of the highest quality to bring about improvements in care internationally. Our research experience is also being shared with colleagues in low income countries and humanitarian relief settings to help mitigate the global effects of pandemic.

"We could not successfully deliver impactful research at national scale without effective local and national partnerships that support direct research as well as staff resources embedded in NHS care and patients willing to take part in research about their care. It is a testament to the critical care multidisplinry community, and the patients it serves, that this has all been achieved rapidly during a pandemic. Continued improvements in pre-pandemic investments for people and facilities will be required to sustain UK research performance beyond an international health crisis. To drive best-value NHS care, and to avoid variations in the level of care provided, we need to safeguard the continuing collection of highest-quality evidence for patients in need of critical care."

In addition to multi-centre randomised control trials, there are, as discussed in this report, many areas of critical care where qualitative research in, for example, outreach services, staffing models and staff recruitment and retention could usefully support critical care service delivery.

We note that the Care Quality Commission (CQC) has formally recognised clinical research activity in the NHS as a key component of best patient care and has incorporated research into its well led framework.

Conclusions

Once again, data is key. The collection and analysis of data at every level will help to improve the service. Quality improvement programmes, improved patient outcomes and larger-scale research are all linked and can feed in to one another. For that reason we have grouped them together here.[100]

[98] *A. Downing, E.J.A. Moss, N. Corrigan et al. (2017), High hospital research participation and improved colorectal cancer survival outcomes: a population-based study, BMJ vol. 66 (1), https://gut.bmj.com/content/66/1/89*

[99] *See www.jla.nihr.ac.uk*

[100] *See NIHR, Incorporating research into CQC assessments of patient care, www.nihr.ac.uk/health-and-care-professionals/engagement-and-participation-in-research/embedding-a-research-culture.htm*

We have also recommended that further research is dedicated to increasing our understanding of, for example, the value of critical care outreach service (see *Critical Care Outreach and Early Intervention*, page 36).

We feel there is an opportunity for a rolling QI programme, which triangulates ICNARC data to other data sources and identifies any gaps.

Research in UK critical care has benefited hugely from the formation of a unified data collection system in ICNARC. Cross-linking this with other datasets and quality improvement data will enable the specialty to deliver continuing patient benefit.

Recommendations

Recommendation	Actions	Owners	Timescale
15. Ensure research and quality improvement are an integral part of the work of each critical care unit to build on the momentum of COVID-19, exemplified by the RECOVERY, RECOVERY-RS and REMAP-CAP research studies. This would include contributing to the delivery of *Best Research for Best Health: The Next Chapter** through NIHR portfolio studies, as well as national benchmarking data sets, such as ICCQUIP, and QI programmes. *see page 73.	**a** GIRFT will support trust critical care units alongside the National Institute for Health Research (NIHR) to establish: • a quality improvement lead to oversee data national collection and to support unit continuous QI; • a research lead, to establish a link with NIHR and participate in multi-centre trials; • any necessary support from trust research infrastructure.	GIRFT, NIHR and ICCQIP	Within one year of publication
16. Collect Patient Related Outcome Measures (PROMs) following critical care.	**a** Scope other data sources for linkage and look to automate data collection. **b** Research to identify whether these data sources perform sufficiently well.	GIRFT, FICM, ICS and ICNARC	Within one year of publication
17. Identify gaps in research and develop a national research strategy. This would include understanding more about outreach services.	**a** FICM, ICS, Critical Care Leadership Forum (CCLF), ICNARC and NIHR to work with patient groups to produce a national research strategy for critical care.	GIRFT, ICS, CCLF, ICNARC and NIHR	For progress within a year of publication

Medicines optimisation and supply

Medicines are one of the most common interventions across the NHS, and in critical care the complexity and impact of specialist medicines has a significant effect on patient care and positive outcomes. The clinical skills of intensivists, supported by highly specialist critical care pharmacists, are well recognised. During the initial four months of the first COVID-19 surge, the importance and opportunities around standardisation of drug therapies and presentations, and also the impact of variation in equipment used (pumps, syringe drivers), became very clear. There is very limited opportunity to analyse actual medicines usage in critical care areas nationally due to the nature of critical care medicines supply processes within trusts.

Joint work between with the ICS and RCoA and national pharmacy teams (supported by critical care pharmacy groups) developed the mitigations and approaches essential to ensure stocks of specific COVID-19 related medicines were not completely depleted. This detailed work clearly demonstrated the need to increase the standardisation of parenteral products used in critical care together with the need to increase the availability of ready-to-administer products (pre-filled syringes, IV bags, and so on), thus reducing the need for nursing resource to make up parenteral products and releasing time for care. These pandemic experiences link with a major piece of work to develop the national strategy to expand aseptic capacity and provide many more ready-to-administer (ready to connect to a patient with no further manipulation) or ready-to-use (just needing drawing up) medicines presentations.

A new national focus on developing standard critical care formularies working with the Royal Colleges is planned. The impact of Personal Protective Equipment (PPE) on the critical care team's dexterity and the near-critical medicines shortages demonstrated the importance ready-to-administer standardised products.

To support the effective and safe use of medicines the NHS is introducing Electronic Prescribing and Medicines Administration (EPMA) systems across England, with an anticipated 70% of general inpatient beds having their medicines prescribed in this way by the end of 2020/21. The NHS plans to have 100% coverage by 2024. Critical care areas often have alternative specifications and solutions to provision of EPMA to general inpatient areas. There is currently no assessment of the coverage of EPMA within critical care, nor of the functionality and suitability of systems in use. EPMA provides a significant number of benefits including:

- Real-world data on actual use of critical medicines per patient. Significant work was undertaken to model use of critical medicines (neuro-muscular blocking agents (NMBAs), sedatives, analgesics, and so on) during the COVID period. This work had to be based on aggregation of clinical opinions as to the likely beneficial doses.
- Data-driven care to support this report's recommendation that 'trusts develop a method for using data collected on patient outcomes to inform decision-making and contribute this data to a national audit.' EPMA prescribing and administration data, together with Electronic Health Records, telemetry and other such data and outcomes, have the potential to support critical clinical decision-making and evidence-based practice.
- Greater potential for remote prescribing and review outside COVID-19 red areas add capacity, especially across seven-day period when staffing can be challenging.
- Greater use of Close Loop Medicines Administration (barcoding) can be used to improve medicines safety, capture of usage data (as demonstrated in the NHS Scan4Safety programme) and to improve use of smart pump technology.

Procurement

COVID-19 insight

One of the more salutary lessons to be learned from the pandemic concerns the fragility of supply chains. Essential equipment (such as PPE) as well as specialist items, both capital and consumables, are vulnerable to disruption and breakdown in the supply chain at any time. These vulnerabilities are most likely to become apparent at times of crisis, when a reliable supply chain is more important than the lowest purchase price. The need for robust audited processes has never been greater.

In 2016 NHS Improvement mandated all trusts to submit their monthly purchase order data to a central database: the HNS Spend Comparison Service (SCS). This is the first time a single national dataset of procurement information has been established for the NHS. Since that time the GIRFT programme has been analysing this data to better understand the variation in products and brands used and prices paid across NHS trusts. This analysis has been a feature of previous GIRFT reports with examples of extreme variation in the number of brands used by clinicians.

It has been noted that the variation can lead to compromises in patient safety and can add significant costs to the NHS Supply Chain. Addressing variation therefore would have the potential to improve safety and efficacy and provide a potential opportunity to secure better deals and improved value for money for trusts.

Reducing unwarranted variation and improving value for money

To help, GIRFT has established a programme to root out unwarranted variation, improve the evidence-base to enable better decision-making, accelerate adoption of new proven technologies, and improve overall value for money by reducing supply chain costs. The GIRFT Clinical Technology Optimisation programme has been working with GIRFT Clinical Leads to examine the data and evidence that support products and, in some cases, national Clinical Technology Advisory Panels (CTAPs) have been established with leading clinicians from the specialty to address safety, efficacy, innovation and value – with the objective of providing better information to clinicians and procurement professionals across the NHS.

GIRFT has also been working with the new NHS operating model for NHS procurement, including the new Category Towers, to develop plans for helping trusts and clinicians to address variation and improve value for money.

Furthermore, an issue is knowing whether different brands have clinical impacts, and to assess that NHS England and NHS Improvement has launched 'Scan4Safety'[101] (2020) in which individual products can be traced to individual clinicians. We are looking at the feasibility of creating links between the national Clinical Improvement Programme (NCIP) and Scan4Safety to assist in identifying the efficacy of different brands and, perhaps most importantly, to allow tracking of, for example, new implants or procedures across the NHS.

We recommend that providers adopt the GIRFT three point strategy to improve procurement of devices and consumables.

[101] *https://www.scan4safety.nhs.uk/*

Recommendation

Recommendation	Actions	Owners	Timescale
18. Enable improved procurement of devices and consumables through cost and pricing transparency, aggregation and consolidation, and by sharing best practice.	**a** Use sources of procurement data, such as SCS and relevant clinical data, to identify optimum value for money procurement choices, considering both outcomes and cost/price.	Trusts, GIRFT	Ongoing
	b Identify opportunities for improved value for money, including the development of benchmarks and specifications. Locate sources of best practice and procurement excellence, identifying factors that lead to the most favourable procurement outcomes.		
	c Use Category Towers to benchmark and evaluate products and seek to rationalise and aggregate demand with other trusts to secure lower prices and supply chain costs.		

Litigation

Overview from the clinical lead

The following analysis has been prepared by the GIRFT team and covers litigation related to critical care in England. While all litigation is serious and is always something we should learn from, in the case of critical care in particular it is important to distinguish between errors or oversights that occur within the unit itself, such as pressure damage or hypoxic brain injury, and more systemic problems that relate in the broadest sense to the patient pathway. In this second category we could, for example, include:

1) The process around patient admissions and transfers. Was the patient taken to the right place at the right time to receive optimal care?
2) Communication between specialties. Was the correct diagnosis made and was the patient seen by the appropriate specialty team? Was deterioration picked up early enough and was admission to critical care appropriate and timely?

Considering **Tables 2 and 3**:

- Does the litigation relate to care received by the patient while in the unit? This would cover the categories 'inadequate nursing care', 'medication errors' and 'airway'. Litigation in these categories should always be acted on by the unit concerned so lessons are learned and care improved.
- Does the litigation relate to broader hospital- or trust-wide processes? The categories 'fail/delay treatment' and 'fail/delay diagnosis' may indicate include communication and process issues beyond the scope purely of the critical care unit. Failures or delays in diagnosis and treatment may indicate more systemic issues that need to be addressed at hospital or network level, in particular, the processes around admissions and transfers that may indicate an inadequate transfer policy/network or a unit under strain because of delayed discharges out of critical care due to lack of acute beds. These are issues we have recommended be addressed as priorities in the report.

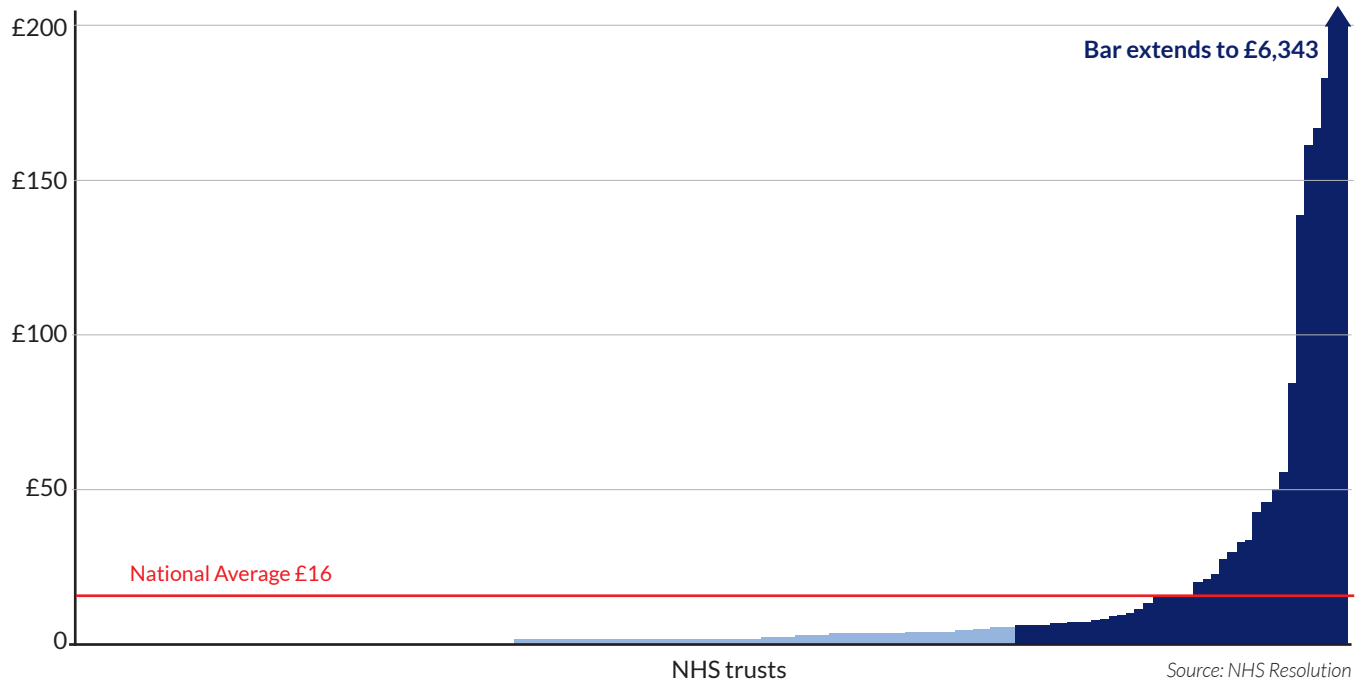
Reducing the impact of litigation

Each of the GIRFT programme teams has been asked to examine the impact and causes of litigation in their field – with a view to reducing the frequency of litigation and more importantly reducing the incidents that lead to it. Ensuring clinical staff have the opportunity to learn from claims in conjunction with learning from complaints, Serious Untoward Incidents (SUIs)/Serious Incidents (SIs)/Patient Safety Incidents (PSIs) and inquests will lead to improved patient care and reduced costs both in terms of litigation itself and the management of the resulting complications of potential incidents.

Variation in average litigation costs

Data obtained from the NHS Resolution shows that clinical negligence claim costs in critical care were estimated to have risen from £6.4 million to £18.4 million per year over the last five years. We found the national average estimated cost of litigation per critical care admission was £16. There are noticeable differences between providers: the best performing provider is estimated to cost £0 per activity, while at the other end of the scale, one provider is expected to generate an average of £6,343 of litigation costs per critical care admission.

Figure 23: Variation in England between trusts in estimated litigation costs for critical care per admission. Claims notified to NHS Resolution 2013/14 to 2017/18. (Activity denominator includes all critical care admissions



Source: NHS Resolution

Table 2: Volume and cost of medical negligence claims against critical care notified to NHS Resolution 2013/14 to 2017/18

Year of notification	No. of claims	% change in no.	Cost of claims (£)	% change in cost
2013/14	49	-	6.4 million	-
2014/15	45	-8%	8.1 million	26%
2015/16	47	4%	10.9 million	34%
2016/17	62	32%	8.9 million	-18%
2017/18	62	0%	18.4 million	106%
Grand Total	**265**	**-**	**52.7 million**	**-**

Claims trends and causes

Trends

Litigation in critical care is low compared to other specialties. Claims need to be carefully coded to identify whether a claim should be attributed to critical care or another specialty which has shared care. However, year on year, there is a general rise in the number of claims and the cost of litigation as seen in other specialties. There was a dramatic increase in the cost of claims from the notification year 2016/2017 to 2017/2018 despite there being no difference in the number of claims. This can be attributed to a small number of high cost claims totalling £12 million all involving severe adverse patient outcomes, including partial paralysis, brain injury and limb amputation.

Table 3: Top five causes for litigation in critical care

Cause of litigation	No.	% of total	Cost (£)	Mean cost per claim (£)
Inadequate Nursing Care	74	28%	8.9 million	120,821
Fail/Delay Treatment	55	21%	11.5 million	209,927
Medication errors	30	11%	6.8 million	227,286
Failure/Delay in Diagnosis	28	11%	9.2 million	328,785
Airway	24	9%	3.3 million	139,200

Causes

Due to the multifactorial nature of the claims, often more than one cause was attributed to each claim. The five most common causes for litigation in critical care included inadequate nursing care, failure/delay in treatment, medication errors, failure/delay in diagnosis and airway related care.

Severity of patient outcome

Critical care medicine is a high-cost and high-risk environment where patients can have adverse outcome despite optimal care. Fatalities and adverse patient outcomes are associated with a large proportion of litigation claims in critical care. Failure/delay in treatment and failure/delay in diagnosis accounted for the greatest litigation cost with mean cost per claim at £209,927 and £328,785 respectively. This explains the high litigation cost in both these categories. Both these categories were associated with a large proportion of claims related to patient fatality and severe adverse patient outcomes such as brain injury and limb amputation. There were 23 claims in the failure/delay treatment category and 8 claims in the failure/delay diagnosis category that were related to cases involving a patient fatality.

There were 89 claims involving a patient fatality, which accounts for over a third of all claims during this time period and cost £12 million. Claims involving severe patient outcomes resulting in permanent harm included brain damage (12) resulting in costs of £11.6 million, limb amputation (20) resulting in costs of £8.3 million and paraplegia/partial paralysis (2) resulting in costs of £6.2 million. The five claims in critical care over this time period with total claims of over £2 million had severe adverse patient outcomes resulting in permanent harm.

Nursing care

Nursing care had the highest number of claims (74) and accounted for a 17% of all claim costs. Over half of claims related to nursing care involved pressure sores (43) and resulted in claim costs of £2.7 million. Pressure sore aetiology is multifactorial but as critical care units are admitting increasing numbers of frail, comorbid and obese patients the issue of pressure sore prevention will continue to be pertinent. Pressure sores prevention has been the subject of NHS campaigns and several guidelines exist for management in all hospital wards.[102] Specific critical care multidisciplinary strategies may be required to avoid this adverse patient outcome in the future and reduce this potential area of litigation.

Airway

A total of 12 litigation cases involved intubation and a further 12 litigation cases were associated with tracheostomy care. The 4th National Audit Project (NAP 4) from the Royal College of Anaesthetists highlighted the importance of airway management in critical care with 1 in 4 major airway events occurring in critical care or the emergency department.[103,104] (2,3) Additionally, the audit found that displaced tracheostomy tubes were the greatest cause of major morbidity and mortality in critical care. This is reflected by 9% of claims being associated with intubation and tracheostomy care. The findings from NAP 4 will help units focus on these areas to improve for the future.

[102] *NHS Improvement: Stop the pressure - Helping to prevent pressure ulcers. Available from https://nhs.stopthepressure.co.uk/*

[103] *Cook, T.M, Woodal,I N., Frerk, C. (2011), Fourth National Audit Project. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1: anaesthesia. Br J Anaesth 2011;106:617-631, https://pubmed.ncbi.nlm.nih.gov/21447488/*

[104] *Cook, T.M., Woodall, N. and Harper J. et al., (2011), Fourth National Audit Project. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 2: intensive care and emergency departments. Br J Anaesth 2011;106:632-642, https://pubmed.ncbi.nlm.nih.gov/21447489/*

Recommendation

Recommendation	Actions	Owners	Timescale
19. Reduce litigation costs by application of the GIRFT Programme's five-point plan.	**a** Clinicians and trust management to assess their benchmarked position compared to the national average when reviewing the estimated litigation cost per activity. Trusts have received this information in the GIRFT 'Litigation data pack'.	Trusts	For immediate action
	b Clinicians and trust management to discuss with the legal department or claims handler the claims submitted to NHS Resolution included in the data set to confirm correct coding to that department. Inform NHS Resolution of any claims which are not coded correctly to the appropriate specialty via CNST.Helpline@resolution.nhs.uk	Trusts	Upon completion of 19a
	c Once claims have been verified clinicians and trust management to further review claims in detail including expert witness statements, panel firm reports and counsel advice as well as medical records to determine where patient care or documentation could be improved. If the legal department or claims handler needs additional assistance with this, each trusts panel firm should be able to provide support.	Trusts	Upon completion of 19b
	d Claims should be triangulated with learning themes from complaints, inquests and serious untoward incidents (SUI)/serious incidents (SI)/Patient Safety Incidents (PSI) and where a claim has not already been reviewed as SUI/SI we would recommend that this is carried out to ensure no opportunity for learning is missed. The findings from this learning should be shared with all front-line clinical staff in a structured format at departmental/directorate meetings (including Multidisciplinary Team meetings, Morbidity and Mortality meetings where appropriate).	Trusts	Upon completion of 19c
	e Where trusts are outside the top quartile of trusts for litigation costs per activity GIRFT we will be asking national clinical leads and regional hubs to follow up and support trusts in the steps taken to learn from claims. They will also be able to share with trusts examples of good practice where it would be of benefit.	GIRFT	For continual action throughout the GIRFT Programme

Notional financial opportunities

Overview from the clinical lead

This report sets out a series of recommendations to help reduce unwarranted variation in the provision and practice of critical care and to improve the delivery of critical care for all patients.

Critical care is an essential service within any hospital that has an emergency department and/or performs surgery. It provides support to all medical specialties as well as emergency and elective surgery. The value of critical care has been highlighted by the NHS response to the COVID-19 pandemic.

However, the specialty presents particular challenges when we look at financial opportunities and benefits linked to critical care activity. In particular, issues around capacity and patient flow (the movement of patients out of critical care and onto acute wards to enable new admissions) can be problematic, since critical care is essentially a supply-led service and patient flow is beyond the control of the individual unit and is reliant on the smooth and timely movement of patients downstream. Another complication is that critical care patients are effectively 'owned' by their originating specialty and patient data is generally tracked through and within these specialties rather than through critical care. This means there is a great deal less reliable data than we would wish, particularly on the patient journey after a critical care stay.

It is also important to note that the specialty has had limited investment over the years. This being the case, we would not wish to see savings identified here being re-invested elsewhere.

We have been able to identify opportunities to help increase efficiency in critical care provision and improve patient outcomes, but these remain dependent on good patient flow, which is beyond the control of the specialty. For example:

- Reducing lengths of stay in critical care units (depends on there being a bed available on the acute ward) would enable more patients to benefit from the service.
- Reducing readmission rates to critical care (depends in many cases on timely initial admission and may be affected by the manner and type of discharge from critical care).

Notional financial opportunity

The notional financial opportunity could be between £21m and £36.2m. This opportunity is in addition to the potential cost savings in procurement.

These figures provide a financial value for a wide range of efficiency opportunities, which may not be cash-releasing.

The figures are based on a selection of metrics (see **Table 4**) and provide an indication of what may be possible. The metrics do not represent a comprehensive set of all opportunities discussed in the report.

Further opportunities

The opportunity values shown are for illustration only. Individual providers and clinicians should assess their own services to determine the unwarranted variation that exists and the associated opportunity. Their assessment will help them to prioritise the service changes that they wish to deliver.

Table 4: Adult critical care – gross financial opportunity statement

Improvement (opportunities are per annum)	National average or better			Top quartile or better		
	Target	Activity opportunity	Gross notional financial opportunity	Target	Activity opportunity	Gross notional financial opportunity
Reduce length of stay in critical care units (non-specialist) by reducing delayed discharges *Activity source: ICNARC*	6.4 bed days per bed	15,964 bed days	£8.3m	2.1 bed days per bed	24,657 bed days	£12.8m
Reduce DKA admissions per 100 hospital admissions *Activity source: ICNARC*	11.8 per 100 hospital admissions	2,270 admissions 8,625 bed days	£9.4m	9.0 per 100 hospital admissions	3,991 admissions 15,165 bed days	£16.6m
Reduce renal dialysis only admissions *Activity source: ICNARC*	Reduce renal only admissions by 50%	247 admissions 1,087 bed days	£1.6m	Reduce renal only admissions by 100%	494 admissions 2,174 bed days	£3.2m
Reduce readmissions to critical care for surgical patients *Activity source: ICNARC*	Median 0.74%	259 admissions	£1.7m	Lower quartile 0%	560 admissions	£3.6m
TOTAL			**£21.0m**			**£36.2m**

About the GIRFT programme

Getting It Right First Time (GIRFT) is a national programme designed to improve medical care within the NHS.

Funded by the Department of Health and Social Care and jointly overseen by NHS England, NHS Improvement and the Royal National Orthopaedic Hospital NHS Trust, it combines wide-ranging data analysis with the input and professional knowledge of senior clinicians to examine how things are currently being done and how they could be improved.

Working to the principle that a patient should expect to receive equally timely and effective investigations, treatment and outcomes wherever care is delivered, irrespective of who delivers that care, GIRFT aims to identify approaches from across the NHS that improve outcomes and patient experience, without the need for radical change or additional investment. While the gains for each patient or procedure may appear marginal they can, when multiplied across an entire trust – and even more so across the NHS as a whole – deliver substantial cumulative benefits.

The programme was first conceived and developed by Professor Tim Briggs to review elective orthopaedic surgery to address a range of observed and undesirable variations in orthopaedics. In the 12 months after that pilot programme, it delivered an estimated £30m–£50m savings in orthopaedic care – predominantly through changes that reduced average length of stay and improved procurement.

The same model is now being applied in more than 40 different areas of clinical practice. It consists of four key strands:

- a broad data gathering and analysis exercise, performed by health data analysts, which generates a detailed picture of current national practice, outcomes and other related factors;
- a series of discussions between clinical specialists and individual hospital trusts, which are based on the data – providing an unprecedented opportunity to examine individual trust behaviour and performance in the relevant area of practice, in the context of the national picture. This then enables the trust to understand where it is performing well and what it could do better – drawing on the input of senior clinicians;
- a national report, that draws on both the data analysis and the discussions with the hospital trusts to identify opportunities for NHS-wide improvement;
- an implementation phase where the GIRFT team supports providers to deliver the improvements recommended.

Implementation

GIRFT works in partnership with NHSE/I regional teams to help trusts and their local partners to implement improvements and address the issues raised in both the trust data packs and the national specialty reports. The GIRFT team provides support at a local level, advising on how to reflect the national recommendations into local practice and supporting efforts to deliver any trust specific recommendations emerging from the GIRFT visits. GIRFT also helps to disseminate best practice across the country, matching up trusts who might benefit from collaborating in selected areas of clinical practice. Through all its efforts, local or national, the GIRFT programme strives to embody the 'shoulder to shoulder' ethos that has become GIRFT's hallmark, supporting clinicians nationwide to deliver continuous quality improvement for the benefit of their patients.

Glossary

ACC – Acute care collaboration
A group of NHS trusts working together to improve their clinical and financial viability in delivering acute care, reducing variation in care and efficiency. For example, hospitals working together as groups or chains, specialty franchises and clinical networks. Part of NHS England's new care models programme.
www.england.nhs.uk/new-care-models/about/acute-care-collaboration

ACCP – Advanced Critical Care Practitioners
Highly skilled and trained members of the MDT that cares for patients in critical care. ACCPs are currently drawn from nurses, paramedics and other related healthcare professionals.

ACP – advance care plan
A broad term for communicating one's wishes and values about future care.

AHP – allied health professional
AHPs (of which there are 14 types including physiotherapists, occupational therapists and dietitians) provide system-wide care to assess, treat and diagnose patients, aiming to improve their well-being, support rehabilitation and maximise a patient's potential to live a full life.

APACHE/APACHE II – Acute Physiology and Chronic Health Evaluation
Diagnostic codes to measure frailty when patients go to theatre.

Casemix
The type or mix of patients, categorised by a variety of measures, including: demographics, disease type and severity, and the diagnostic or therapeutic procedures performed.

Category towers
The procurement function of the NHS Supply Chain operating model. There are 11 category towers, with each one specialising in a particular area of products or services, for example medical equipment.

CCDG – Critical Care Delivery Group
A trust-wide forum for discussing the provision of critical care services and their role in supporting other specialties.

CCG – Clinical Commissioning Group
Clinically led statutory NHS bodies responsible for the planning and commissioning of healthcare services for their local area.
www.nhscc.org/ccgs/

CCMDS – Critical Care Minimum Dataset
A dataset of 34 fields collected by NHS trusts on adult patients admitted for critical care.

CNE – Clinical Nurse Educator
Practice-based nurses whose primary role is to educate the workforce.

CCOT – Critical Care Outreach Team
CCOTs are usually nurse-led, doctor-supported teams that can offer critical care expertise and assessment to patients who are, or who are at risk of becoming, critically ill and are located outside the critical care unit, usually on a general/acute ward.

CRRT – Continuous Renal Replacement Therapy
Treatment (dialysis) for people suffering from chronic kidney disease whose condition has progressed to kidney failure.

Commissioning
The various processes that identify the health needs of a population, such as a local area, and purchase services to meet those needs.

Co-morbidity
The simultaneous presence of two or more chronic (long-term) diseases or conditions in a patient.

COPD – Chronic Obstructive Pulmonary Disease
A group of lung conditions that make it progressively harder to breathe.

CQC – Care Quality Commission
The independent regulator of health and social care in England.

CRG – Clinical Reference Group
CRGs represent services that are considered too complex or specialised to be commissioned locally by Clinical Commissioning Groups. CRGs are voluntary bodies that include clinicians, commissioners and patients. They advise the NHS Commissioning Board on specialised services that are commissioned directly.

Day case
When a patient is admitted electively for care that day, without the use of a hospital bed or overnight stay.

Day of surgery admission
Admission to hospital on the same day that surgery takes place.

DGH – District General Hospital
A major secondary care facility (not a designated teaching hospital).

Elective (surgery or care)
Surgery or care that is planned rather than carried out as an emergency (non-elective).

ERP – Enhanced Retrieval Process
A rapid second assessment for patients who have been referred for organ donation and, following an initial assessment, meet the criteria for potential donors.

FICM – Faculty of Intensive Care Medicine
The UK's professional statutory body for the specialty of intensive care medicine, the intensive care doctors who lead the service, and Advanced Critical Care Practitioners.

GPICS2 Guidelines
The Faculty of Intensive Care Medicine and the Intensive Care Society (2019), Guidelines for the provision of intensive care services, V. 2, June,
www.ficm.ac.uk/sites/default/files/gpics-v2.pdf

HCA – Healthcare assistant
A health worker under the guidance of a nurse or other healthcare professional who may perform a range of tasks, generally focused on patient care.

HDU - High-Dependency Unit
Critical care unit providing predominantly Level 2 care.

HRG – Healthcare Resource Group
Standard groupings of clinically similar treatments that use common levels of healthcare resource. HRGs help organisations to understand their activity in terms of the types of patients they care for and the treatments they undertake.

Hospital Episode Statistics (HES)
Data on all admissions, out-patient appointments and A&E attendances at NHS hospitals in England. HES data aims to collect a detailed record for each 'episode' of admitted patient care commissioned by the NHS and delivered in England, by either an NHS hospital or the independent sector. HES data is used in calculating what hospitals are paid for the care they deliver.

ICCQIP – Infection in Critical Care Quality Improvement Programme
A collaboration of professional organisations supported by Public Health England, which has developed a voluntary national surveillance programme to provide information about infections in critical care units in England.
www.ficm.ac.uk/ICCQIP

ICNARC – Intensive Care National Audit and Research Centre
A registered charity dedicated to improving critical care by providing information to those who commission, deliver and receive the service through national clinical audits and research studies.
www.icnarc.org

ICS – Integrated Care Systems
NHS organisations, in partnership with local councils and others, taking collective responsibility for managing resources, delivering NHS standards, and improving the health of the population they serve.
www.england.nhs.uk/integratedcare/integrated-care-systems

LoS – Length of stay
The length of an inpatient episode of care, calculated from the day of admission to day of discharge, and based on the number of nights spent in hospital.

Model Hospital
A free digital tool provided by NHS Improvement to enable trusts to compare their productivity and identify opportunities to improve. The tool is designed to support NHS provider trusts to deliver the best patient care in the most efficient way.
https://model.nhs.uk

MDT – Multidisciplinary team
A team of healthcare professionals from different disciplines.

NCIP – National Clinical Improvement Programme
A programme to provide both team- and clinical-level activity and metrics about the whole of a clinician's practice. It aims to provide a single point of access to existing information from Hospital Episode Statistics (HES), audit and registry, and private sector. https://get-tingitrightfirsttime.co.uk/associated- projects/ncip/

NICE – National Institute for Health and Care Excellence (NICE)
Provides evidence-based guidance, advice, quality standards, performance metrics and information services for health, public health and social care.
www.nice.org.uk

NEWS/NEWS2 – National Early Warning Score systems
Tools developed by the Royal College of Physicians to assess the degree of illness of a patient and, where necessary, to prompt critical care intervention.

NHS Resolution (formerly NSH Litigation Authority)
Provides expertise to the NHS to resolve negligence concerns, share learning for improvement and preserve resources for patient care.
NHS Resolution is an 'arm's length' body of the Department of Health and Social Care. This means it is an independent body, but can be subject to ministerial direction.
www.resolution.nhs.uk

NHS Supply chain
An organisation that provides healthcare products and supply chain services to the NHS, including procurement, logistics, e-commerce, and customer and supplier support.
www.supplychain.nhs.uk

NIV – Non-invasive ventilation
Supporting a patient's breathing without the need for intubation or a tracheotomy.

Non-elective (surgery or care)
Surgery or care that is carried out as an emergency rather than being planned (elective).

ODN – Operational Delivery Network
Clinical networks, which include trusts within their footprint and focus on co-ordinating patient pathways between providers over a wide area to ensure access to specialist resources and expertise.

PACU – Post-Anaesthetic Care Unit
An area, often attached to an operating suite, designated for the care of patients after surgery.

PLICS – Patient Level Information and Costing Systems
A system of collecting and deriving costs at the patient level.

Payment by Results (PbR)
The payment system in England used by healthcare commissioners to pay healthcare providers for each patient seen or treated. The system takes account of the complexity of the patient's healthcare needs

Purchase Price Index and Benchmarking (PPIB)
A system to collect procurement data from NHS trusts that enables trusts to compare and benchmark data.

RCP – Royal College of Physicians
British professional body and registered charity dedicated to improving the practice of medicine.
www.rcplondon.ac.uk

RCS – Royal College of Surgeons
Professional body and charity, which exists to advance the care o surgical patients.
www.rcseng.ac.uk

RCN – Royal College of Nursing
UK's largest union and professional body for nursing.
www.rcn.org.uk

Reference costs
Reference costs are the average unit cost to the NHS of providing defined services to NHS patients in England in a given financial year. They show how NHS providers spend money to provide healthcare to patients. NHS providers submit reference costs annually.

SCN – Strategic Clinical Networks
Groups of health professionals supporting commissioners to improve services for a particular condition.

Spell
A period of healthcare, for example a period spent in hospital or admission to hospital.

STP – Sustainability and Transformation Partnership

Partnership between NHS providers, critical care, local authorities and other health and care services to develop proposals for how local areas will work together to improve health and care for their local population. There are 44 STPs.

www.england.nhs.uk/integratedcare/stps

UKCCNA – UK Critical Care Nursing Alliance

Umbrella organisation for all UK critical care nursing organisations.

www.ficm.ac.uk/UKCCNA

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