RCEM Acute Insight Series:
Crowding and its Consequences

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Introduction

Emergency Department (ED) crowding is a major threat to public health and represents a serious policy challenge that must be urgently tackled. Although it is present in health systems across the globe, it has worsened significantly in recent years in the UK due to the severe mismatch between demand and capacity in the NHS. Increasing patient demand coupled with high hospital bed occupancy has resulted in exit block - the key reason for crowded EDs. This results in long waits to be seen, breakdown of departmental processes, patients waiting or being treated in non-designated clinical areas such as corridors, and delayed ambulance offloads.

The Royal College of Emergency Medicine has campaigned for many years on this important issue¹ and have always made it clear that crowding is dangerous. It is undignified and inhumane for patients who are left waiting for treatment in precarious circumstances. Crowding is associated with increased mortality and increased hospital length of stay. As well as impairing the efficiency of hospitals, it contributes to staff burnout, moral injury, and to the loss of highly skilled emergency care professionals.

Against the backdrop of long ambulance delays² experienced across the UK, high levels of crowding in EDs, and record-breaking numbers of patients experiencing the longest waits, this instalment of RCEM’s Acute Insight Series examines crowding and its consequences, and urges Governments, NHS England and devolved equivalents, Integrated Care Systems, and Trusts to take a system wide approach to tackling the problem.

Crowding is getting worse

There are multiple performance metrics that measure levels of crowding in EDs, which demonstrate that crowding has become more widespread over the past decade.

There has been a rise in attendances to EDs over recent months; from May 2021 onwards, attendances have been the highest on record for their respective month. June 2021 saw the highest type 1 attendances since records began in 2010. An increase in attendances alone may not necessarily cause crowding in EDs as long as good patient flow is maintained throughout the rest of the hospital system. However, the deterioration of the 4-hour target and the increase in 4- and 12-hour ‘decision to admit’ (DTA) stays shows that flow is a problem. More patients are arriving and they are staying longer, inevitably resulting in crowded EDs.

²HSJ (2021). https://www.hsj.co.uk/quality-and-performance/nhse-tells-trusts-to-immediately-stop-all-ambulance-handover-delays/7031210.article?mkt_tok=OTM2LUZSWi03MTkAAAGAYJloTMTfwmmtPKknGi-WRGBGSti_3xpmr7JjwugsC79X9wmgqx6Y34yFSDx5UI7LgZTF8FcdT0N3gPw8kP3COGEBTMDwyCGSKdssedzos7Ng
September 2021 saw the lowest percentage (64%) of patients admitted, transferred, or discharged within 4 hours in English Type 1 EDs, meaning that a third of patients are staying in the ED for more than 4 hours. Similarly, 4-hour performance has hit record lows in the devolved nations with only 57.9% of patients admitted, transferred or discharged within 4 hours in Welsh Type 1 EDs and 75.4% in Scotland. Moreover, this summer in England, 12-hour DTA waits have been almost the same level as the worst winter figures on record and far surpass the number of waits from previous summers. In September, 4- and 12-hour DTA waits were the highest on record at 104,875 and 5025 respectively, surpassing the figures from winters 2019/20 and 2020/21. This means that 21% of admissions were 4+ hour DTA waits - a marked increase compared to the previous two years. These waits are also labelled as ‘trolley waits’ as they are made up of patients waiting to be admitted to wards, often on trolleys. Waiting on trolleys or in corridors can lead to suboptimal standards of care, putting patients at risk.
Whilst the figures for DTA waits are useful in terms of highlighting which part of the hospital system is responsible for crowding in EDs, they are also misleading because they conceal the actual number of patients who are staying in EDs for 12 or more hours from their time of arrival. At present, the 12-hour figure from time of arrival is published yearly in the Hospital Episode Statistics. In our Summer to Recover campaign, we called on the Government to regularly publish the 12-hour data from time of arrival as it highlights the significant flow problems that compromise the safe delivery of emergency care. We know Trusts routinely collect this data - it must be published regularly and monthly so we can gain a regular insight into the scale of patients spending such a clinically unnecessary long time in the ED.
As the graph shows, 12-hour DTA waits have increased dramatically over the past 8 years, but true 12-hour stays from the time of arrival have increased even more. The drop in 12-hour stays for 2020-21 is due to COVID and the drastic decrease in ED attendances as well as improvements in hospital flow during the first wave of the pandemic. While we do not have the time of arrival figures for 2021-22 yet, the 12-hour DTA waits figure already stands at 12,540, showing that patients are experiencing the longest waits in the ED more frequently than ever.

Ambulance handover times provide another useful insight into the extent of crowding in EDs. As of July 2021, the average median time to initial assessment has been 10 minutes; in other words, roughly half of ambulance arrivals receive an initial assessment within 10 minutes. Although this may not seem like a very long time, this is the highest figure on record; prior to this the median time has fluctuated between 6 and 9 minutes. Moreover, the 95\textsuperscript{th} percentile for September 2021 stood at 104 minutes, higher than the waits from winter 2019, implying that ED capacity and crowding are already worse than one of the most difficult winters on record.
Similarly, the median amount of time that patients wait from arrival at an ED to treatment has also increased. In September 2021, the median time to treatment was at an all-time high, at 79 minutes. The time for the 95th percentile was also the highest on record during this month at 5.4 hours. Patients waiting longer for treatment is both a consequence of and a contributor towards crowding in EDs. It is a vicious and dangerous cycle whereby crowding causes longer waits to treatment for patients, and consequently these longer waits further contribute to crowding in EDs. This is also a serious safety concern for patients who may initially appear well, but have a serious underlying cause for their presentation.
Additionally, the total time that patients spend in the ED provides a good indicator of the level of crowding. As of September 2021, the median length of time that all types of patients spent in the ED was 3.1 hours, whilst the 95th centile stood at 11.7 hours. However, when splitting these times according to admitted and non-admitted patients, there is clear divergence. For the non-admitted patient, total time spent in the ED has increased considerably over recent months, with the most recent median figure standing at 2.8 hours and the 95th percentile figure at 8.9 hours. It is expected that non-admitted patients will spend less time in the ED than admitted patients, yet these figures are one of the highest on record, implying that there are a greater number of lower acuity patients attending EDs or that there are a greater number of higher acuity patients and therefore lower acuity patients are having to wait longer. Longer length of stay for non-admitted patients results in more crowded EDs. To increase capacity in the Urgent and Emergency Care (UEC) system, progress must be made in ensuring Same Day Emergency Care (SDEC) is available in all hospitals 12 hours a day, seven days a week. SDEC is cost-effective, avoids unnecessary admissions, and benefits both admitted and non-admitted patients.

Similarly, total time in the ED has increased for admitted patients, although these figures have long been above the recommended figures. In September 2021, the median time spent in an ED was 5.2 hours, and the 95th percentile stood at 16.6 hours. According to these figures, it can be assumed that less than half of admitted patients complete their ED pathway within the designated 4-hour standard. Moreover, there is rarely any clinical need for any patient to stay
in the ED for more than 6 hours\textsuperscript{3}, yet a sizable proportion of patients exceed this timeframe. Since there is no clinical need for a patient to be in a department for this long, we can assume that these long stays in the ED are a result of crowding.

**Median Total Time Patients Spend in EDs**

<table>
<thead>
<tr>
<th>Median Total Time</th>
<th>Data Description</th>
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<tbody>
<tr>
<td>Blue</td>
<td>Median Total Time in EDs for All Patients</td>
</tr>
<tr>
<td>Red</td>
<td>Median Total Time in EDs for Non-admitted Patients</td>
</tr>
<tr>
<td>Green</td>
<td>Median Total Time in EDs for Admitted Patients only</td>
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</tbody>
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![Median Total Time Patients Spend in EDs](image)

Crowding causes ambulance handover delays

When EDs become crowded, they are no longer able to accept patients who arrive by ambulance, and the ambulances containing these patients are forced to wait outside. As the above data has shown, the high occurrence of ambulance handover delays is worsening in the UK.

The current national target for ambulance handovers is 15 minutes, and any waits beyond this are considered to be a delay. As the graph below highlights, the number of ambulance handover delays of over 15 minutes - and particularly over an hour - have increased dramatically over recent months.

\textsuperscript{3} Getting It Right First Time (2021). Emergency Medicine GIRFT Programme National Specialty Report
The detrimental effects that corridor care in EDs can have on patients as a result of crowding is well established, but patients waiting in ambulances are likely to suffer the same harm from their waits as patients receiving care in corridors. Additionally, when ambulances cannot offload patients into the department in a timely manner, they are unable to return to the community where patients may be waiting for emergency care. Two patients are at risk for every ambulance unable to offload: the patient in the ambulance and a further patient waiting for an ambulance. Ambulance handover delays are not only a visible consequence of crowding in EDs but they also contribute to crowding by further delaying care for patients.

RCEM has produced guidance regarding the options available when delayed handovers become a problem for systems. It is important to note that handover delays are not solely an ED issue - but a system-wide problem which requires strategies designed to alleviate exit block. Integrated Care Systems must work collaboratively with providers to improve patient flow within their localities. Trust and Hospital specialties can also play an important role: rapid response and management plans for specialty referrals can minimise unnecessary admission. This will enable us to quickly move patients from ambulances to be managed in safe areas.

Crowding is related to insufficient bed stock

Crowding is directly related to bed capacity in the hospital system. When there are fewer beds available on wards, it is difficult or even impossible to admit patients. Patients therefore remain in the ED until a bed is available for them. This is known as exit block, whereby an ED is unable to transfer patients to other departments or wards because those departments are not in a position to receive additional patients. This results in patients experiencing delays to their

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treatment and often left waiting on trolleys or receiving care in corridors, which is unsuitable and stressful for both patients and staff.

Bed availability is dependent on a variety of factors, including the number of physical beds, staffing levels in the hospital, and the efficiency of the discharge process. Between Q1 2010/11 and Q1 2021/22, there has been a loss of 13,570 general and acute (G&A) overnight beds across the NHS. While there has been a substantial loss of beds due to infection prevention control (IPC) measures as a result of the pandemic, this can not be solely to blame for the massive decrease. There was a loss of 8374 beds between Q1 2010/11 and Q1 2019/2020.

Furthermore, the UK has one of the lowest number of beds per 1000 inhabitants of all the OECD countries. As of 2020, the UK had only 2.4 beds per 1000 inhabitants. This figure has consistently decreased each year, standing at 2.9 in 2010 and 4.1 in 2000. The lack of physical beds within the UK means that hospitals are less able to handle surges in demand and can become overwhelmed more easily, leading to patients staying in the ED for longer and consequently more crowded departments.
Alongside the reduction of beds, bed occupancy rates have risen, highlighting that hospitals have less capacity to meet patient demand. It is recommended that bed occupancy levels remain below 85% to ensure good flow throughout the hospital system. Since current records began in 2010 until the start of the pandemic, quarterly G&A bed occupancy across England had never been below 85%. While bed occupancy levels have been recorded as lower since the pandemic, hospitals have had to reorganise their bed capacity to allow for IPC measures and therefore are experiencing capacity issues at lower levels of bed occupancy. The most recent percentage of 85.4% occupancy for Q1 2021/22 poses a worry for what is to come this winter, as occupancy levels are already creeping past recommended levels whilst IPC measures are still in place. The daily NHS Covid bed data confirms this; as of 19th October 2021, G&A bed capacity stood at 90.9%.

While demand has an effect on the number of hospital beds available, one of the main factors behind exit block and poor flow is inefficient discharge processes. In particular, there is a lack of integration, and funding, between the hospital system and social care sector, which often leads to delayed discharges for many patients. While medically fit to leave, patients may need help to recover in the form of a social care package, which may not be immediately available. This decreases hospital capacity as it means that the hospital bed is unavailable to the next patient. This can also have detrimental effects on the patient waiting to be discharged, as their mental and physical wellbeing may deteriorate further.

As we have argued elsewhere⁵, a lack of adequate hospital beds, coupled with rising emergency demand, could hamper the elective recovery. There are 5.72 million people waiting for treatment, and current estimates⁶ predict the number of patients waiting could climb to 14

million. Studies consistently show that a lack of beds is one of the top reasons for the cancellation of elective surgery\(^7\).

The Comprehensive Spending Review (2021) allocated £1.5 billion towards improving bed capacity in surgical hubs. Although we welcomed additional investment for expanding capacity, the Review did not provide certainty over the budgets for retaining and recruiting staff. As the Nightingale initiatives proved during the pandemic, we must see an increase in *staffed* bed capacity across the NHS in order to deliver safer care.

The GIRFT Emergency Medicine report highlighted that when hospitals have insufficient numbers of senior staff but higher numbers of available beds, it creates an ED with the worst ratio of doctors to patients as there is little hospital incentive to move patients in a timely fashion as ED space is not ‘at a premium’. Therefore, there is not only a need to increase the number of available beds, but also the number of Emergency Medicine staff. In our Retain, Recruit, Recover campaign, we highlighted a shortage of 2000-2500 Whole Time Equivalent Emergency Medicine Consultants across the UK. Governments must act now to address this shortage and achieve safe staffing levels in EDs.

### Crowding increases hospital length of stay

Being admitted from a crowded ED is associated with an increased length of stay in hospital. The Morley review\(^8\) has identified five studies that examined the association between crowding and increased inpatient length of stay and all five found an association between the two. For example, in the US, patients admitted on days with higher crowding had a 0.8% increase in their hospital length of stay\(^9\) and Derose et al identified that a 14 hour wait to be admitted increased inpatient length of stay by a further six hours\(^10\). While this increased length of stay may not seem substantial, this compounds exit block and creates a vicious cycle of crowding.

The length of an unscheduled inpatient stay is a good measure of hospital efficiency, and as the below graph shows, the UK performs broadly the same in comparison to other OECD nations. This puts the UK in a difficult position: it has lower bed levels than other countries, but patients stay in those beds for roughly the same amount of time. This means that there is more pressure on hospitals as the bed stock is less likely to keep up with levels of demand.

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In recent months, alongside an increase in crowding, the number of hospital beds occupied by people who are medically ready to be discharged has been steadily growing. The most recent figures show that levels are worse than winter 2020\textsuperscript{11}. It is estimated that around 1 in 5 hospital beds are occupied by long-stay patients. The increasing number of long-stay patients in hospital wards highlights how flow, demand, and capacity within hospitals are dependent on the entire healthcare system. RCEM has long advocated for significant investment into community and social care in order to ensure patients are discharged safely and promptly when their medical care is complete.

The ‘Discharge to Assess’ models have proven helpful during the pandemic by freeing up beds in hospitals and reducing unnecessary long stays, but the recent increase in hospital stays shows that an expansion and greater investment in this service is needed. Timely discharges are essential to maintaining good flow in hospitals and reducing crowding.


Additional days and reasons to continue to reside: LOS 14+

Number of additional days in total that patients with LoS 14+ days have spent in hospital since the discharge decision was made

Crowding as a cause of medical error

Emergency Medicine has recently become one of the leading sources of litigation claims in the NHS, responsible for 11% of NHS liabilities. The annual cost of litigation is equivalent to 14% of the running costs of Emergency Medicine and it is estimated that nearly £20 per attendance is spent on the consequences of litigation.

In 2019/20, Emergency Medicine accounted for 8% of clinical negligence claims, equating to over £382 million. It is uncertain how much crowding contributes to litigation, as medical error has many interdependent causes and legal processes rarely consider crowding. However, it is likely that the delay and dilution of medical care will contribute to avoidable error. Overworked clinical staff are more likely to make mistakes. Our recent RCEM workforce survey found that 73% of Emergency Medicine physicians felt that workforce pressures had impacted patient safety in their department before the pandemic. Identifying serious illnesses has previously been described as finding a needle in a haystack and if the haystack becomes bigger, then the needles become progressively harder to identify.

Crowding causes poor staff experience

ED staff working in crowded conditions experience a number of ill effects. As described above, crowding may increase the risk of significant adverse events, errors, complaints and litigation - which come with associated negative effects on staff. Additionally, crowding increases the likelihood of violence and aggression towards staff. Unfortunately, recent media reports reveal that this has increased considerably in recent months.

Paramedics and Emergency Medical Technicians are also harmed by crowding. Waiting with a sick patient in an ambulance outside an ED is demoralising, especially if they are aware of long waits for further ambulance calls. If the patient is infectious with COVID or Influenza, this exposes the ambulance staff to an avoidable risk of nosocomial infection. Crowding, therefore, not only affects workers’ abilities to do their job effectively but it can also have a serious impact on their mental and physical health.

The distress and moral injury of frontline staff are becoming increasingly recognised. A BMA survey found that 81% of respondents who were Emergency Medicine doctors had experienced moral distress prior to the pandemic, compared to a cross speciality average of

15 Moral injury can arise where sustained moral distress leads to impaired function or longer-term psychological harm.
17 Moral distress refers to psychological unease generated where professionals identify an ethically correct action to take but are constrained in their ability to take that action.
Levels of burnout\textsuperscript{18} are consistently reported to be higher amongst Emergency Medicine physicians than amongst other groups of medical staff\textsuperscript{19}. This is likely to lead to increased attrition rates, for instance through mental and physical illness, voluntarily changing career, retiring early, less than full time working, or the adoption of portfolio careers. A BMA survey found that 6 out of 10 consultants intend to retire before the age of 60, whilst RCEM’s Retain, Recruit, Recover report found that in the next two years, half of respondents are considering reducing their working hours, while just over a quarter are considering taking a career break or sabbatical. When asked what prompted them to make this decision, 32% selected workload pressures and 35% selected burnout. While these clinicians are only considering changing their working patterns, attrition of this nature contributes to shortages of highly skilled staff and a vicious cycle can develop as the remaining staff suffer from increased stress and hence a greater chance of burnout.

RCEM’s Retain, Recruit, Recover report explored what could be done to improve wellbeing at work. Responses overwhelmingly pertained to fixing operational issues, such as increasing the number of staffed beds, improving flow, and eliminating exit block, all of which link to crowding. Fixing these issues would allow for patients to receive a better standard of care and it would also contribute towards solving the staffing problem by retaining our current workforce. Capacity within hospitals and EDs need to be increased in order to meet demand, both in terms of physical space and in terms of staff. Recruitment will support retention by relieving the unnecessary burdens placed on our current workforce and letting them focus on what they do best: caring for patients.

\textsuperscript{18} Physician burnout is a long-term stress reaction characterized by depersonalization, cynical or negative attitudes toward patients, emotional exhaustion, a feeling of decreased personal achievement and a lack of empathy for patients

Crowding is associated with increased mortality

RCEM has long argued that crowding is dangerous for patients. Several primary research studies and systematic reviews have examined the link between ED crowding and subsequent death. Crowded EDs delay and dilute the quality of care, and while this may not have an immediate effect on the patient, it increases a patient’s risk of death after they have left the ED.

Morley et al recently identified 40 studies describing adverse consequences of crowding, where six studies showed an association between crowding and mortality. Further US evidence shows that when a new hospital is opened nearby, overall ED occupancy drops by 10% and there is an associated 24% drop in in-hospital mortality. Hence, when there is less demand in EDs and there is less crowding, there is a lower risk of mortality.

The GIRFT report identified an association between ED length of stay and inpatient mortality data in England, which persists after adjustment for potential confounders including age, acuity, and arrival method. As the table below shows, the Standardised Mortality Ratio (SMR) increases the longer a patient stays in the ED, standing at 1.16 for patients that stay in the ED for 8-12 hours. This means that there only need to be 67 patients waiting for this length of time for one of them to come to avoidable harm.

By applying this mortality data, we can estimate the amount of excess inpatient deaths that occur due to crowding. In 2021 so far, of those who waited 8-12 hours in an ED, there have been 303 excess deaths in Scotland and 709 excess deaths in Wales. In England and Northern Ireland, if we assume that the harm suffered between eight to twelve hours continues in patients who stay longer than 12 hours, then 4519 excess deaths occurred in England and 566 excess deaths occurred in Northern Ireland in 2020-21. This may be an underestimate, as stays longer than 12 hours would be expected to confer a greater risk of death.

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22 Excess deaths in Scotland and Wales between January and September 2021. The reporting in Northern Ireland does not allow us to present this analysis but is likely to be consistent with population numbers.
numbers compare unfavourably with the number of deaths caused in road traffic collisions: 1,827 across the UK in 2019.  

What these figures do not show is the harm that those waiting even longer may have come to, and those who did not die but nonetheless came into other harm due to the delay they experienced. While EDs constantly deliver care to people with life-threatening conditions, it is unacceptable that patients are at an increased risk of death due to crowding and long waits in the ED. Patient safety needs to remain a priority and therefore action needs to be taken to mitigate exit block. Crowding has always been unconscionable, but these figures lay bare the reality: lives are being lost due to an issue that could be eradicated for good.

Conclusion

Crowding is a serious public health challenge facing the NHS that must be tackled urgently through taking a system-wide approach. It is clear that the most effective way of eradicating it is by addressing the root causes of exit block. No matter how efficient ED staff are in providing timely care and treatment to patients, crowding will occur if admitted patients cannot be transferred to wards or other departments.

To do this, we must place patients at the heart of the UEC System. There must be a concerted, system-wide effort to tackle crowding, focusing on the need of the patients and the patient pathway, rather than service availability. This can be achieved by addressing the severe mismatch between demand and capacity in the UEC system. We call on Governments to act now to increase the staffed bed capacity in the NHS and address the shortage of Emergency Medicine staff across the UK.

The NHS Constitution states that patients have the right to be cared for in safe conditions. Unfortunately, crowding creates a precarious environment for our patients and we have demonstrated that it is not only undignified - it can be fatal. We have, for many years now, campaigned to bring an end to corridor care. We urge health leaders to work with us to improve patient safety and end crowding for good.