

The College of Emergency Medicine

# Crowding in Emergency Departments



Revised June 2014



## Summary of recommendations

1. Emergency Department capacity should be capable of meeting demand.
2. Non-Emergency Department staff should not 'gatekeep' access to the Emergency Department.
3. A patient who attends an Emergency Department is entitled to an assessment by a clinician.
4. Emergency Departments should have systems that can monitor the degree and impact of crowding.
5. Streaming patients does not help with Emergency Department crowding if the cause of crowding is inadequate hospital capacity.
6. Investigations should be 'front loaded' to reduce delay to disposition decisions.
7. Senior doctors of all specialities should be involved with rapid assessment and treatment.
8. Hospitals with Emergency Departments should have a hospital wide escalation policy for when the Emergency Department becomes crowded with locally agreed triggers.

## Scope

This guideline is to assist managers and clinicians who are trying to reduce crowding in their hospital Emergency Departments. The guideline explains the causes and consequences of crowding. This guideline offers suggestions to reduce the effects of crowding and improve the safety of an Emergency Department.

## Reason for development

Patients suffer in a crowded Emergency Department. Crowding, where an Emergency Department becomes gridlocked, occurs in all Emergency Departments from time to time. Crowding is associated with increased mortality.<sup>1-5</sup>

Crowding is also important because it reduces the quality of care that patients receive; the length of stay for non-elective admissions rises, and the number of serious incidents rise.<sup>6</sup> Crowding also causes elective hospital activity to be cancelled or postponed. Patient privacy, dignity and the ability to deliver basic nursing care are compromised. The effects of Emergency Department crowding are most severe for the most sick and vulnerable patients.

Crowding also contributes to staff burnout. This creates a vicious cycle as experienced staff leave and departmental efficiency and quality is reduced further. A crowded Emergency Department also has implications for other services. The ability of the ambulance service to respond promptly to emergency calls for service is compromised if ambulances are waiting to offload at the Emergency Department.

However, it should be recognised that the degree of crowding forms a continuum and lower levels of crowding, short of that which causes gridlock, may have an adverse effect upon Emergency Department safety and efficiency. Patients waiting in a crowded Emergency Department suffer increased anxiety, as dignity, privacy and timeliness of care is less good.

## Definitions

The College of Emergency Medicine does not support the term 'overcrowding' as this implies that some crowding is beneficial, any degree of crowding harms patients.

Definitions vary, but an Emergency Department is crowded if ambulances cannot offload, there are long delays for high acuity patients to see a doctor, there are high rates of patients with a 'Left before being seen' code, there are more trolley

patients in the ED than there are cubicle spaces, or if patients are waiting more than two hours for an in-patient bed after a decision to admit has been made.<sup>7-10</sup>

'Access block' and 'exit block' are used interchangeably and refer to the situation where patients in the Emergency Department (ED) requiring inpatient care are unable to gain access to appropriate hospital beds within a reasonable time frame.

## Measuring crowding

Emergency Departments should be able to measure, in real time, how crowded they are. There are a number of scales reported in the literature, though none are adequately validated.<sup>7;11-15</sup> At a minimum, the following items should be measured. Measures need to be simple and easy to collect.

1. **Ambulance offload times.** A department is crowded if this takes longer than 15 minutes.
2. **Occupancy of trolley patients** (number of patients requiring trolleys / number of trolley spaces) A department is crowded if the number of patients on trolleys exceeds the number of designated assessment spaces.
3. **Waiting for admission.** A department is crowded when more than 10% of patients awaiting admission wait more than two hours from decision to admit before leaving the Emergency Department.

## Causes of crowding

A crowded Emergency Department is usually the result of a crowded emergency care system. Crowding is rarely due to large numbers of patients who could be treated elsewhere in the healthcare system.

It is helpful to breakdown the causes of crowding into input, throughput and output factors.<sup>16</sup> The causes of crowding vary between departments, but not so much that useful generalisations cannot be made. The degree of crowding varies between departments, indicating that this is not inevitable.

Input refers to increased numbers and acuity of patients attending. There has been an increase in the number of patients attending Emergency Departments over the last 10 years. There has been a relative increase in elderly patients and patients from nursing and residential homes. Elderly, frail patients require more care in the Emergency Department than younger patients and contribute disproportionately to crowding.

Throughput refers to problems occurring within Emergency Departments that contribute to crowding. These include the processes in a department, the numbers and experience of staff, timely access to the results of investigations necessary to inform safe decisions regarding admission or discharge, the time to review by inpatient teams and the physical layout of the department.

Output refers to obstacles to flow through the Emergency Department. These include lack of appropriate beds within the hospital, 'access' or 'exit' block. The main reason for crowding in almost all Emergency Departments is lack of hospital capacity or poor co-ordination of capacity. This may result either from an inadequate number of inpatient beds (poor capacity) or a mismatch between the time inpatient beds become available and the time that the patients requiring those beds present to the Emergency Department (poor co-ordination).

The guideline development group noted that there was an extensive literature on the consequences of crowding, but the literature on interventions to mitigate the effect of crowding was limited and of little high quality evidence.<sup>17</sup>

## Solutions

Acute hospitals should develop local 'Full Capacity Protocols'. Emergency Department solutions are unlikely to be effective in isolation and a whole emergency care response is required. A Full Capacity Protocol should be activated in response to locally agreed triggers based on ambulance offload times, occupancy levels and proportion of boarding patients.

## Input solutions

In the major urban areas, served by multiple Emergency Departments, there have been initiatives to reduce crowding by diverting patients to avoid surges of ambulance arrivals. The guideline development group noted that this might reduce crowding, but commented that patients with long term conditions should be admitted to their usual hospital as they may have a longer hospital stay and duplication of investigations. The guideline development group was unable to make a firm recommendation about ambulance diversion, and commented this needed further evaluation.

Emergency Departments, and acute hospitals, have a responsibility to assist the ambulance service by ensuring that the turnaround time for ambulance patients is as short as possible. There is a period of time where responsibility for the care of the patient needs to be shared between the ambulance service and the clinical staff working in the Emergency Department. If a patient cannot be offloaded from an

ambulance because the Emergency Department is crowded, within an acceptable timeframe, usually 15 minutes, then the patient should be registered with that Emergency Department.

A clinician's duty of care begins when the clinician begins to assess the patient. The guideline development group acknowledged that the receiving hospital had a duty of care to all patients on the hospital premises when ambulance handover was complete, but emphasised that an emergency physician or nurse could not reasonably be expected to extend their duty of care outside a crowded Emergency Department.

The committee recognised that this was a difficult area and noted that any protocols or agreements should put the best interests of patients first. The committee also commented that emergency physicians and nurses can rarely offer a meaningful intervention to a patient in the back of ambulance, at a time where their skills are required to clear a crowded Emergency Department.

Trying to reduce inputs into Emergency Departments is largely beyond the control of Emergency Department staff and managers. However, co-location of out-of-hours primary care services adjacent to an Emergency Department is helpful as this allows low acuity cases to be diverted away from the Emergency Departments. This may not reduce crowding very effectively if the underlying cause of departmental crowding is inadequate in-patient bed capacity.

Once a patient has arrived at an Emergency Department, they are entitled to an assessment by an Emergency Department clinician. It is poor practice and potentially unsafe to send patients away without an assessment. It is also inappropriate for non-clinical and non-Emergency Department staff to 'gatekeep' access to the Emergency Department. Patients who could be more appropriately treated by a General Practitioner do not contribute very much to Emergency Department crowding.

## Throughput solutions

Processes within Emergency Departments can be reviewed to reduce admissions and improve time to key decisions. The key principles of interventions here are to; front load of key investigations and early decision making by a senior doctor. Rapid Assessment and Treatment by a senior Emergency Department clinician is helpful to achieve this, but this must be adequately resourced.<sup>18</sup> Streaming, where patients are treated in areas by clinicians allocated to that area, improves throughput for ambulatory patients, but does not help crowding.<sup>19</sup> Non-medical staff can facilitate early investigation, such as radiography and relevant blood investigations which reduce time to making a decision.

'Chair-centric' pathways where patients with low acuity conditions wait on chairs rather than in cubicles is recommended. Sending patients home to await investigation results which are expected to be normal is useful, if the patient is easily able to return to the hospital if a result is abnormal and there are procedures in place to ensure the results of investigations are reviewed if the patient has left the Emergency Department. Ambulatory care pathways for predetermined, low acuity conditions such as deep vein thrombosis or cellulitis are helpful if patients are directed to these areas primarily rather than entering the ED.

Increasing physical space alone in the Emergency Department is unhelpful unless this is supported by increased capacity and better co-ordination of inpatient beds within the hospital or more efficient processes in the Emergency Department.<sup>20</sup>

## Escalation policy

There must be a hospital wide escalation policy for when an Emergency Department becomes crowded. Criteria for escalation should be determined locally, but should occur exceptionally. An escalation policy should involve all specialties with responsibilities for acute care. This should involve calling all relevant staff to the ED, creating contingency areas and facilitating discharges. Emergency Department senior clinicians should have pre-agreed admitting rights to inpatient wards.

## Output solutions

### Anticipating demand

Bed managers should ensure that there is adequate capacity to meet **anticipated** demand for non-elective admissions. This may mean postponing some elective activity. The use of discharge lounges, where discharged patients can wait for transport, thereby freeing up an inpatient bed, is encouraged. The modal time of discharge from inpatient wards should be regularly monitored. The modal discharge time should match anticipated need for beds.

## Boarding

Patients who are known to need admission, but who do not have a bed to go to, are known as "boarders." Sending patients to wards where they will be admitted before a bed is available, a practice known as 'boarding,' is supported by the College.<sup>21</sup> Ideally, this should be a time limited policy, to allow a hospital to



organise its inpatient discharge process more effectively. Each additional patient that attends a crowded Emergency Department will cause an incremental decline in efficiency. Boarding all of the patients in one place means that the Emergency Department is having the maximal decline. This leads to a point where it generates significant risk or actual harm. A distributed system that shares the workload and activity between wards and the Emergency Department means that each is less likely to reach this tipping point. The harm of having unassessed patients in ambulances is greater than the harm of boarding patients who have been assessed by a Doctor on their destination ward. Boarding should be a routine activity, not solely in response to exceptional circumstances.

The guideline development group acknowledged that whilst boarding was based on weak evidence it was the option associated with least risk. Patients who are selected to board on wards should be stable, orientated and should not be receiving active treatment or require intensive monitoring. The maximum number of patients that should board on each ward should be determined locally. Factors that should be considered include the physical environment on the ward, the likely dependency of other patients in that area and the medical and nurse staffing levels in that area. The number of patients actually boarded on each ward should be determined dynamically and should aim to balance the risk of accommodating such additional patients across both the Emergency Department and the admitting wards. Once a patient is transferred from the ED to such a ward they become the responsibility of the admitting team.

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First published in February 2012

Reviewed and revised August 2012

Reviewed and revised May 2014

## **Acknowledgements (third edition)**

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## **Review**

Usually within three years or sooner if important information becomes available.

## **Conflicts of Interest**

Adrian Boyle has bid for research grants to evaluate Emergency Department crowding

## **Disclaimers**

The College recognises that patients, their situations, Emergency Departments and staff all vary. This guideline cannot cover all possible scenarios. The ultimate responsibility for the interpretation and application of this guideline, the use of current information and a patient's overall care and wellbeing resides with the treating clinician.

## **Research Recommendations**

There is a need for high quality intervention studies that reduce the severity and consequences of crowding.

## **Audit standards**

There should be a documentation and audit system in place within a system of clinical governance.

## **Key words for search**

Crowding, safety, access block, exit block, boarding, full capacity protocol

## Appendix 1

### Methodology

Where possible, appropriate evidence has been sought and appraised using standard appraisal methods. High quality evidence is not always available to inform recommendations. Best Practice Guidelines rely heavily on the consensus of senior emergency physicians and invited experts.

### Evidence Levels

1. Evidence from at least one systematic review of multiple well designed randomised control trials
2. Evidence from at least one published properly designed randomised control trials of appropriate size and setting
3. Evidence from well designed trials without randomisation, single group pre/post, cohort, time series or matched case control studies
4. Evidence from well designed non experimental studies from more than one centre or research group
5. Opinions, respected authority, clinical evidence, descriptive studies or consensus reports.

## References

- (1) Forero R, McCarthy S, Hillman K. Access block and Emergency Department overcrowding. *Crit Care* 2011; 15(2):216.
- (2) Sun BC, Hsia RY, Weiss RE et al. Effect of Emergency Department crowding on outcomes of admitted patients. *Ann Emerg Med* 2013; 61(6):605-611.
- (3) Johnson KD, Winkelman C. The effect of Emergency Department crowding on patient outcomes: a literature review. *Adv Emerg Nurs J* 2011; 33(1):39-54.
- (4) Johnston M. Hundreds die because of hospital crowding. *New Zealand Herald* 2008 Sep 8.
- (5) Richardson DB. Increase in patient mortality at 10 days associated with Emergency Department overcrowding. *Med J Aust* 2006; 184(5):213-216.
- (6) Morris ZS, Boyle A, Beniuk K et al. Emergency Department crowding: towards an agenda for evidence-based intervention. *Emerg Med J* 2012; 29(6):460-466.
- (7) Beniuk K, Boyle AA, Clarkson PJ. Emergency Department crowding: prioritising quantified crowding measures using a Delphi study. *Emerg Med J* 2011.
- (8) Moskop JC, Sklar DP, Geiderman JM et al. Emergency Department crowding, part 1--concept, causes, and moral consequences. *Ann Emerg Med* 2009; 53(5):605-611.
- (9) Hoot NR, Aronsky D. Systematic review of Emergency Department crowding: causes, effects, and solutions. *Ann Emerg Med* 2008; 52(2):126-136.
- (10) Weiss SJ, Derlet R, Arndahl J et al. Estimating the degree of Emergency Department overcrowding in academic medical centers: results of the National ED Overcrowding Study (NEDOCS). *Acad Emerg Med* 2004; 11(1):38-50.
- (11) Weiss SJ, Ernst AA, Nick TG. Comparison of the National Emergency Department Overcrowding Scale and the Emergency Department Work Index for quantifying Emergency Department crowding. *Acad Emerg Med* 2006; 13(5):513-518.
- (12) Reeder TJ, Garrison HG. When the safety net is unsafe: real-time assessment of the overcrowded Emergency Department. *Acad Emerg Med* 2001; 8(11):1070-1074.
- (13) Epstein SK, Tian L. Development of an Emergency Department work score to predict ambulance diversion. *Acad Emerg Med* 2006; 13(4):421-426.
- (14) Hwang U, McCarthy ML, Aronsky D et al. Measures of crowding in the Emergency Department: a systematic review. *Acad Emerg Med* 2011; 18(5):527-538.

- (15) Boyle A, Beniuk K, Higginson I et al. Emergency Department Crowding: Time for Interventions and Policy Evaluations. *Emergency Medicine International* 2012[2012], 1-8. 2012.
- (16) Asplin BR, Magid DJ, Rhodes KV et al. A conceptual model of Emergency Department crowding. *Ann Emerg Med* 2003; 42(2):173-180.
- (17) Higginson I. Emergency Department crowding. *Emerg Med J* 2012; 29(6):437-443.
- (18) Moskop JC, Sklar DP, Geiderman JM et al. Emergency Department crowding, part 2--barriers to reform and strategies to overcome them. *Ann Emerg Med* 2009; 53(5):612-617.
- (19) Castille K, Cooke M. One size does not fit all. View 2. *Emerg Med J* 2003; 20(2):120-122.
- (20) Derlet RW, Richards JR. Ten solutions for Emergency Department crowding. *West J Emerg Med* 2008; 9(1):24-27.
- (21) Viccellio A, Santora C, Singer AJ et al.. The association between transfer of Emergency Department boarders to inpatient hallways and mortality: a 4-year experience. *Ann Emerg Med* 2009; 54(4):487-491.



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Incorporated by Royal Charter, 2008

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