

Recommendations to Improve Quality and the Measurement of Quality in New Zealand Emergency Departments

A Report from the Working Group for Achieving Quality in
Emergency Departments to the Minister of Health

December 2008

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I. Introduction

The Mandate and Scope for This Report

This report includes advice and recommendations for the Minister of Health, produced by the Working Group for Achieving Quality in Emergency Departments.

This Working Group has received endorsement from the previous Minister of Health, and represents the latest stage of a workstream which began with investigations into emergency department (ED) quality and performance requested by successive Ministers of Health.

The Working Group has a dual role. First, it has been established in order to refine and progress the recommendations that were discussed during a workshop on ED quality, co-sponsored by Counties Manukau District Health Board (DHB) and the Ministry of Health (Ministry), and held on 13 May 2008. That workshop, which was attended by about 70 sector representatives, both clinicians and managers, supported the notion that a smaller expert group should be charged with this role.

Second, both the initial workshop and the resulting Working Group are seen as the principal contribution by the sector to a service review of hospital-based emergency services being undertaken by the Ministry, which will report findings to Cabinet during 2009. The purpose of service reviews is to examine system performance in particular service areas, in order to determine if the services are being delivered in the most clinically effective and cost effective manner possible. Outcomes of service reviews have included recommendations for reconfigurations of existing services, improvements to performance monitoring and management, reducing spending on less effective services, and, in some cases, investing in new interventions that are deemed cost effective.

These dual roles for the Working Group are complementary. The key themes of the initial workshop centred on concerns over quality of services, ways in which quality could be measured, and the need for DHB accountability for ED performance, and therefore mirror the objectives of a service review.

The workshop raised a wide range of legitimate issues pertaining to ED service quality and performance, but the discussion was dominated by concerns about a set of interrelated problems that are particularly acute for large EDs in urban centres:

- overcrowded EDs
- use of informal spaces to treat and house patients
- long patient stays in ED
- long patient waits for treatment or analgesia.

This set of problems forms the main focus for this report.

Structure of the Report

Advice about the state of ED services in New Zealand, and recommendations for action, are presented in Section II of this report. Section III provides justification and further detail to substantiate the key points made in Section II.

II. Advice and Recommendations for the Minister

Advice

1. Many New Zealand EDs experience problems of patient overcrowding, long patient stays, patients kept on trolleys in corridors and treated in informal spaces, and long waits for patient assessment and treatment. These problems are interrelated.
2. International literature¹ links overcrowding and long patient stays to higher levels of patient mortality, longer inpatient length of stay, and financial losses.
3. The underlying causes of these ED problems span the whole health care system. One cause is access block, that is, an inability to admit ED patients into inpatient wards. There is a consensus in the sector that this is an important issue, and it is well attested in the international medical and nursing literature.
4. A secondary cause is likely to be increasing numbers of attendances to EDs. Further investigation is required to determine the drivers of this growth; there is some evidence that the causes of observed increases may vary by DHB or region. Attendances to EDs, and the total hours spent by patients in EDs, are increasing in almost all parts of the country. Increases are being sustained at a rate faster than the rate of population growth, the rate of medical and surgical admissions, and the rate of outpatient hospital visits. Increases are particularly apparent in mid-sized and small DHBs.
5. Solutions to ED problems will need to address the underlying causes, and therefore span not only the ED, but the whole of the hospital and indeed the whole acute care system.
6. Gains in efficiency can be applied within EDs in order to minimise overcrowding and waiting by patients, and thus mitigate the impact of access block and the growth in patient numbers on the ED.

Recommendations

Those in senior DHB management and governance positions are best placed to implement the whole-of-system and whole-of-hospital solutions required to improve ED services, and DHB Chief Executive Officers (CEO) should be encouraged to give greater priority to ED service quality. Recommendations 1 to 5 are designed to increase CEO awareness of and accountability for the performance of EDs and the wider acute care system.

1. A Health Target² should be introduced as a formal accountability measure of ED performance.
2. This Health Target, which would constitute the principal Ministry measure of ED quality and performance in New Zealand, should be based on ED length of stay. An ED length of stay measure will provide a proxy measure of access block

(refer to Key Concepts and Definitions, page 8), and is therefore closely connected with the principal barrier to ED service quality that hospitals need to resolve. The preferred form for this measure would be the percentage of patients admitted, transferred, or discharged from the ED within six hours.

3. The current triage rate measures should be retained for benchmarking purposes and extended to triage category 4 and 5 patients.
4. It is not acceptable for patients to be treated and kept in ED corridors or other informal ED spaces due to overcrowding. In order to address this, it should be mandatory for each hospital to develop a full capacity plan – that is, an escalation plan that describes how patients throughout the hospital will be dealt with once the ED reaches a point of overcrowding. Rather than retaining all patients in the ED when hospital capacity is reached, plans need to give due consideration to minimising clinical risk by best use of inpatient wards for patient care.
5. Similarly, it is not acceptable to ramp ambulances (refer to Key Concepts and Definitions, page 8) in order to address ED overcrowding.

The implementation of an integrated programme of performance management (based on the framework outlined above) and associated quality improvement activities, will require the establishment of a suitable organisational infrastructure. This is covered by Recommendations 6 and 7.

6. A locus should be established within the Ministry for the performance management of the quality of ED services, and for facilitating the recognition and sharing of good practice across the sector.
7. A corresponding clinical network within the sector is required that provides formal liaison with the Ministry locus.

Recommendations 8 and 9 indicate a direction of travel for New Zealand that will help improve quality in EDs, as they are implemented by DHBs, facilitated by the Ministry.

8. EDs should be primarily a service for dealing with emergencies. Following triage, stable GP referrals should be immediately directed to, and treated by, inpatient services.
9. EDs should be primarily a service for dealing with emergencies. Strong relationships with primary care should be developed to provide strong pathways for acute care, the management of chronic conditions, and care at end of life, outside hospital. Social marketing may be useful in minimising non-emergency attendances to EDs, but should be used with circumspection.
10. DHBs should adopt techniques of ongoing data analysis that identify pressure points within the hospital system, and assist DHB management in prioritising areas for action. One recommended possibility is 3-2-1 analysis of ED length of stay data (explained on page 54).

Future planning, research and investment in infrastructure should be consonant with the intent of the recommendations given thus far.

11. *Integrated strategic planning:* In view of the extensive interactions between EDs and other providers of acute care such as ambulances and paramedics, nursing homes, and GPs and accident & medical clinics, the development of integrated plans to deliver acute care at local, regional and national levels in New Zealand would be a natural next step following this report.
12. *Development of staffing models:* Further work is required to understand and develop appropriate workforce models for acute care both within and outside EDs, encompassing possible roles for advanced emergency nursing, and determining the right primary care workforce for the provision of strong acute care outside the hospital.
13. *Capital developments:* Bids for funding to build and upgrade EDs should be evaluated by the Ministry in light of the advice and recommendations contained in this document, such as the desire to see GP referrals streamed directly to inpatient specialties.
14. *Research:* Further knowledge about the drivers of growth in ED attendances would be particularly valuable. Integrated service planning would benefit from greater understanding of the complex mix of factors involved. The impact of overcrowding and long patient stays on mortality and hospital efficiency should also be studied in a New Zealand context.

III. Supporting Analysis and Detailed Proposals

Key Concepts and Definitions

Access Block

Describes the situation where ED patients, who are assessed as requiring an inpatient bed, are unable to be moved to an inpatient bed in a timely way and therefore experience extended waits in the ED. Access block is generally a function of inpatient ward occupancy, though inefficient admission processes can also contribute to unnecessary waits in the ED.

Acuity

This refers to the urgency with which a clinical condition should be treated. High acuity means high urgency. A hospital or ED with a high level of acuity is one with many urgent patients. High acuity is often associated with, but is not the same as, complexity.

Acute Care (Emergency Care)

Health care provided for a condition that has a sudden onset and is typically of short duration. Some clinicians distinguish this from emergency care, which can be defined as care provided to a patient experiencing a major health crisis.

Ambulance Ramping and Diversion

Ambulance ramping describes the practice of keeping ambulances with patients waiting outside an ED during busy periods. Diversion is the practice of redirecting an ambulance to another hospital because an ED is full (diversion is not practised in New Zealand).

Corridor Stays

This term is used in this report to refer to patients kept on trolleys in ED corridors. Corridor stays are the most common way in which New Zealand patients experience treatment in inappropriate or informal spaces, and generally result from overcrowding.

Overcrowding

Describes a situation where the number of patients presenting for treatment and being held within the ED exceeds the physical or staffing capacity to provide appropriate care.

Primary Care

This term is used in a broad sense in this report to refer to all health care services provided in the community, i.e. outside the hospital.

Role Delineation Model

A system used in New Zealand to describe the complexity of a hospital or its ED. The most complex ED level is six, the lowest is level two (level one refers to delivery of emergency care in primary care settings such as rural locations).

Triage

Triage refers to a process whereby a nurse (or doctor) assesses the urgency of each presentation, and on this basis assigns the patient to one of five triage categories. New Zealand EDs use the Australasian triage scale³, which is under the aegis of the Australasian College of Emergency Medicine (ACEM). Triage category 1 patients are very urgent, while triage category 5 patients are non-urgent. The *triage rate* consists of the percentage of all patients within the triage category in question who are seen within the maximum clinically acceptable treatment time for that category. The maximum treatment times are shown in Table 1, along with performance benchmarks set by ACEM for each triage category.

Table 1: Description of the Australasian triage scale, used in New Zealand EDs.

<i>Triage Category</i>	<i>Description</i>	<i>Maximum Clinically Appropriate Triage Time</i>	<i>Performance Benchmark</i>
1	Immediately life-threatening	Immediate simultaneous triage and treatment	100%
2	Imminently life-threatening, or important time-critical treatment	10 minutes	80%
3	Potentially life-threatening, or potential adverse outcomes from delay >30 min, or severe discomfort or distress	30 minutes	75%
4	Potentially serious, or potential adverse outcomes from delay >60 min, or significant complexity or severity, or discomfort and distress	60 minutes	70%
5	Less urgent, or dealing with administrative issues only	120 minutes	70%

The Need for Change

New Zealand EDs Suffer From Overcrowding and Long Patient Stays

While New Zealand has no national data collection that includes information on ED overcrowding or length of patient stays, a number of lines of evidence suggest that EDs are facing systemic issues that compromise the ability to treat patients effectively.

These systemic problems are interrelated, and can be summarised as follows.

1. EDs are sometimes overcrowded.
2. Some patients wait for extended periods in the ED before being admitted to inpatient wards for treatment. While this is undesirable in its own right, it also bears a close relationship to point 1, since overcrowding is a function both of the number of patients presenting to the ED and the time each patient spends in the department.
3. Overcrowding and long patient stays can be associated with sub-optimal care for the patient, such as corridor stays, or long waits for treatment.
4. International evidence indicates that overcrowding and long patient stays are associated both with poor clinical outcomes, and with reduced efficiency and productivity.

Medical Literature, Anecdotal Reporting and Quantitative Data Provide Evidence of Problems

The international medical literature frequently refers to a crisis or severe problems in EDs^{4,5,6} with services reporting challenges in jurisdictions such as the United Kingdom⁷, USA⁸, Canada^{9,10} and Australia¹¹. In all these developed countries the problems faced are similar, relating to overcrowding, long waits, and ambulance diversions¹¹.

This concern with overcrowding and related problems is also reflected in the New Zealand medical literature, with the nature of the problem described in the following way by Ardagh and Richardson¹².

“Emergency department overcrowding is widespread and worsening. It has a number of potential consequences that compromise patient access to care and the quality of care provided. When departments are crowded, patients wait longer for triage, medical assessment and treatment. The nursing resource is spread more thinly and nursing observations and interventions occur less frequently and less promptly than desired. Medical staff are rushed, and decisions, assessments and medical interventions may be rushed or truncated as a result. Of equal concern, and in addition to these contributors to potential adverse outcomes, are the prolonged suffering of patients and the indignity of being managed in a public corridor.”

There is strong anecdotal support for the notion that these systemic issues are significant in the New Zealand setting. This arose as a theme of discussion at the workshop held with ED workers in Wellington on 13 May 2008, and photographic evidence of patient crowding in corridors is frequently presented at national fora such

as the Improving the Patient Journey Conference held 14-16 May 2007, and the New Zealand Emergency Departments Conference held on 26 and 27 September 2008. At the latter conference Thames Hospital reported access block leading to long ED stays for the first time during this past year. Waikato Hospital reported that while they have 13 adult beds in the ED, 15 trolleys are usually kept in the corridor in order to cope with regular excess demand. Such anecdotal evidence is supported by regular reporting in the media of instances where patients have had poor experiences of EDs, or where staff feel the ED is not functioning well. Reports from the Health and Disability Commissioner have also highlighted ED issues, such as a recent report that described an elderly patient waiting for two days in an ED¹³. In this instance, expert advice requested by the Commissioner stated that a two-day wait was not unusual for patients in large hospital EDs within New Zealand.

Until recently no quantitative data has been available at a national level to support such anecdotal reporting. This has been partially addressed by research presented by Freeman¹⁴ at the New Zealand Emergency Departments Conference 2008. All 32 EDs in New Zealand of level 3 and above (as described by the ED role delineation model) were invited to participate in a survey, and 26 did so (refer to Figure 1). Of these, nine reported daily corridor stays for patients, two reported weekly corridor stays, and nine reported occasional corridor stays. Daily problems were experienced across levels 4, 5 and 6, while some level 3 hospitals also reported weekly or occasional problems.

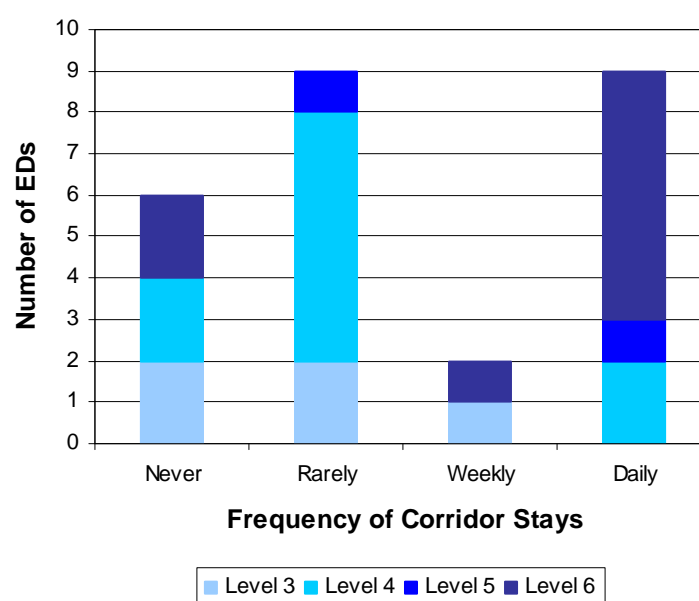


Figure 1: Numbers of ED in New Zealand experiencing corridor stays for patients, broken down by level of ED as described by the New Zealand role delineation model¹⁴.

The Ministry recently requested patient-level length of stay information from one large and two medium-sized EDs¹⁵. Data was provided for a two-week period in February 2008, considered a period of reasonably light work burden for EDs. This data indicated that the majority of patients were seen within several hours, but that a significant minority waited longer. Amongst all patients, 6, 9 and 20 percent of

patients spent longer than eight hours in the ED in these three hospitals. Amongst only those patients later admitted to hospital, 10, 15 and 37 percent of patients spent longer than eight hours in the ED in these same hospitals. Victoria and New South Wales both use a benchmark of eight hours for the counting of long stays in EDs¹⁶.

The only national ED performance measures regularly reported to the Ministry by DHBs are triage rates, which measure the speed with which patients are treated in emergency departments¹⁷. Monitoring by the Ministry over the past seven years shows that only a minority of DHBs meet the ACEM benchmarks for triage category 2 and 3 patients in any particular quarter, as shown in Figure 2. Triage category 1 compliance appears to have improved over time, though this is likely to have largely been a result of improvements in data capture by DHBs, rather than improvements in the timeliness of treatment¹⁸. The time taken from presentation to assessment and treatment, as measured by triage rates, is not directly related to overcrowding or total length of stay in the ED. However, the time from presentation to treatment is itself a valid indicator of the quality of service, particularly for time-critical conditions.

In addition, failure to meet triage rate benchmarks probably reflects a high workload within EDs; in general, small rural hospitals with a low patient throughput tend to report better compliance with triage benchmarks than large hospitals¹⁷. The medical literature asserts that overcrowding is likely to lead to delays in beginning patient treatment, and a negative impact on triage rates¹². If this is true, then poor triage rates are another example of sub-optimal treatment (like corridor stays) resulting from overcrowding.

While much more should be done to quantify the problem more precisely, there does seem to be a reasonable case for saying that New Zealand EDs face problems, to a greater or lesser degree, of overcrowding, long patient stays, treatment of patients in corridors and other informal areas, and long waits for assessment and treatment of patients.

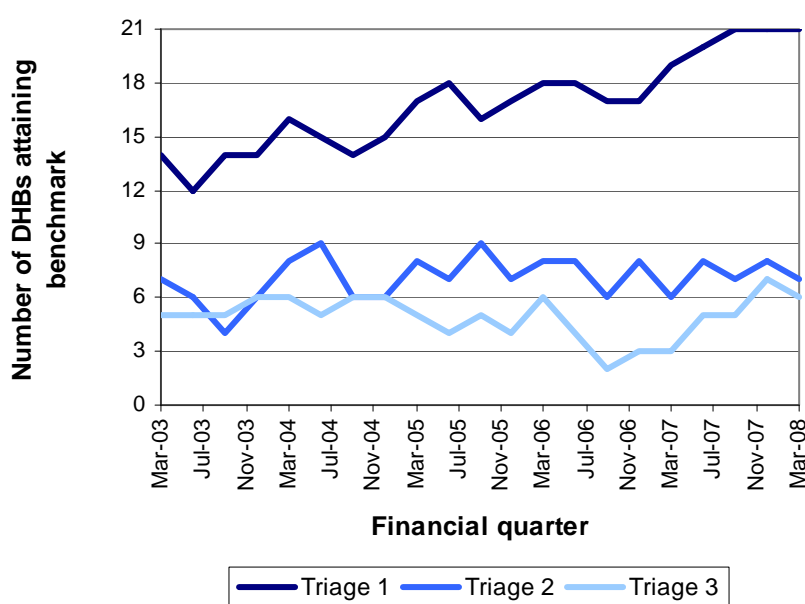


Figure 2: The number of DHBs in each quarter of the past seven years who have reported meeting ACEM benchmarks for triage categories 1, 2 and 3¹⁹.

The Medical Literature Indicates ED Problems Can Have Clinical and Financial Consequences

Overcrowding and Related Problems Have Been Linked to Negative Clinical Outcomes

Several rigorous studies have been carried out in Australia into the impact of overcrowding and long patient stays on clinical outcomes. Some of the most significant findings are surveyed below.

Overcrowding has been linked to increased mortality.

1. Richardson²⁰ found that patients who presented to an ED during a period of overcrowding (defined using ED staff shifts with highest patient occupancy) had a 34 percent greater risk of mortality at 10 days than patients presenting during a period that was not overcrowded.
2. Sprivulis *et al.*²¹ devised a hazard score based on both hospital occupancy and percentage of patients in the ED who were waiting for an inpatient bed. It was found that where hospital bed occupancy was above 90 percent and 10-19 percent of ED beds contained patients waiting for an inpatient bed, or with a similar combinations of factors giving high hazard score ratings, 2.3 additional deaths would be seen per 1,000 new patients at day 30. Overcrowding at Perth hospitals, where this study was based, was estimated to cause 120 deaths amongst 53,025 tertiary hospital presentations during 2003.

Long length of stay has been linked to an increased inpatient length of stay.

3. Richardson²² found that patients kept in the ED for longer than eight hours had an average inpatient length of stay (after leaving ED) of 4.9 days, compared to an average inpatient length of stay of 4.1 days for other patients.
4. A more complex study by Liew *et al.*²³ found that the average length of stay for inpatients ranged from 3.73 days for patients who stayed in the ED less than four hours, to 7.2 days for patients in the ED more than 12 hours. The observed correlation between ED and inpatient length of stay held true when results were adjusted for age, sex, and time of presentation to the ED.

None of this research has been replicated in the New Zealand setting, but is supported by similar research carried out in other jurisdictions²⁴, and it seems reasonable to presume the same findings will apply in New Zealand.

Additional research shows that a long time from presentation to treatment can be detrimental for patients with certain time-critical conditions²⁵. A relationship between time to treatment and clinical outcomes has been demonstrated for:

- stroke^{26,27}
- acute myocardial infarction^{28,29,30}
- fractured neck of femur^{31,32}
- compound/open and long bone fractures³³
- sepsis, pneumonia and meningitis³⁴
- penetrating trauma
- major head injury³⁵.

Overcrowding and Related Problems Have Also Been Linked to Financial Inefficiencies

The impact of ED length of stay on inpatient length of stay has already been considered in the previous section, and this has clear implications for hospital efficiency.

In the United States the financial effects of access block and overcrowding have been studied in terms of revenue foregone as a consequence of slowing patient flow. One retrospective study³⁶ found that transferring patients from an ED (a teaching hospital in Pennsylvania) to inpatient beds within two hours could result in an extra 10,397 hrs of ED treatment a year for 3175 patients, bringing in an additional \$3.9 million in revenue a year. Another study³⁷ found the financial impact of patients with unduly long stays in the ED amounted to US\$6.8 million of additional costs for a 490 bed hospital over three years, due to the costs of extended inpatient lengths of stay.

Pressures on EDs Have Been Increasing in the Past Five Years

Clinical experience suggests that the burden of patient numbers and workload in EDs has been increasing year-on-year at a faster rate than population growth. However, the Ministry holds no historic information on total numbers of presentations to New Zealand EDs, though the new National Non-Admitted Patient Collection (NNPAC) should provide this into the future. In order to verify whether presentations were indeed increasing, the Working Group requested the following information from all New Zealand DHBs:

- the number of presentations to EDs, for each of the past five financial years, broken down by triage category
- the average length of stay of all patients in EDs, for each of the past five financial years.

The intention was to look not only at trends in total presentations and length of stay, but also trends in the acuity of presentations (as measured by triage category), and total patient hours in EDs (a product of the number of presentations and the average length of stay).

The total number of hours spent by patients in the ED provides a proxy for workload in the ED, and an alternative to total patient attendances in this regard. It is possible that large increases in attendance by non-complex patients will actually have a relatively minor impact on ED workload. Alternatively, hospitals operating at, or over, total bed capacity may have difficulty admitting from the ED, leading to increases in total patient hours and workload for ED clinicians even where patient attendances are not increasing. It is unlikely that either patient attendances or patient hours correlate with resource use in a simple linear fashion.

Some findings from this survey are as follows³⁸.

1. Total presentations have grown by 20 percent over the past five years. Figure 3 shows the year-on-year growth from the 2003/04 baseline for each DHB.

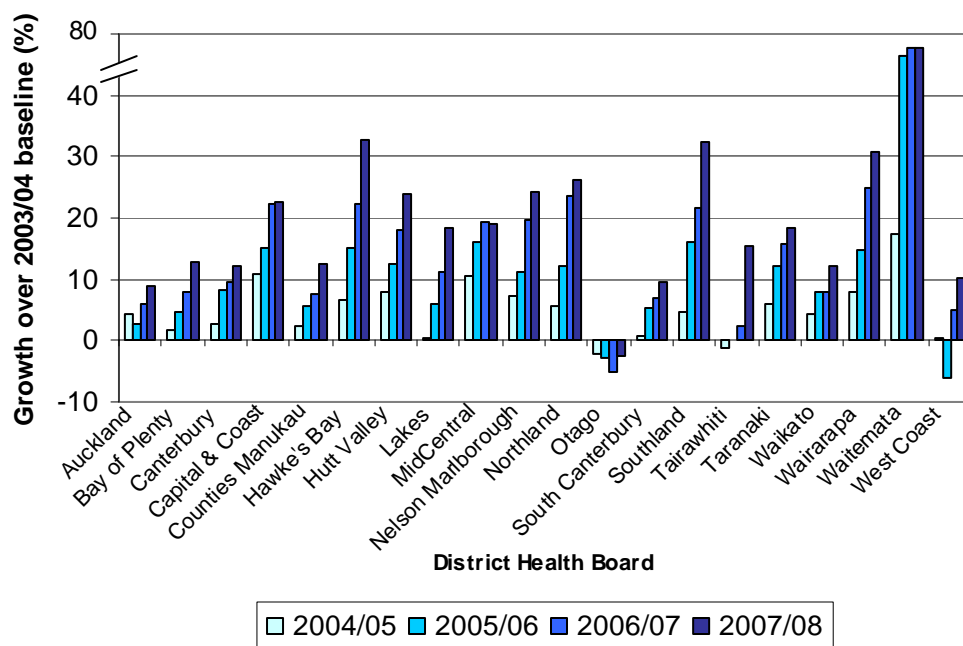


Figure 3: Percentage growth in the number of patient attendances against the 2003/04 baseline, for all New Zealand DHBs. The Y axis has been truncated because Waitemata DHB is an outlier. Growth rates in Wairarapa DHB are based on an estimated figure for total attendances in 2003/04, and Whanganui DHB has not reported data³⁹.

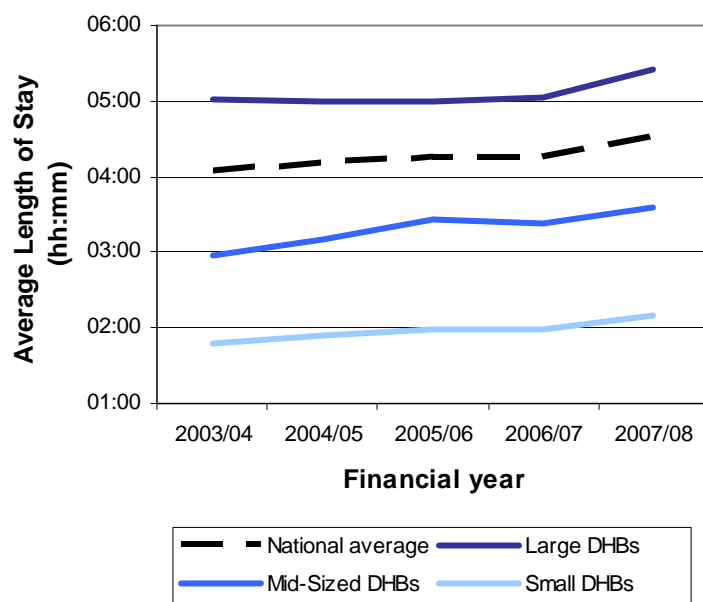


Figure 4: Trends in average length of stay of patients in EDs. The national average is shown, along with the average for large, medium and small DHBs¹⁵. Data for Hutt Valley and Whanganui³⁹ DHBs is not available.

2. Length of stay has been increasing year-on-year to an average of 4 hours 31 minutes for all patients in the 2007/08 financial year. Increasing length of stay is a reality for large, medium and small DHBs¹⁵. In large DHBs the average length of stay in 2007/08 was 5 hours 25 minutes, in small DHBs it was only 2 hours 9 minutes. Figure 4 shows trends in length of stay.
3. Total growth in the number of patient hours over the five years has been 34 percent. Figure 5 shows both the percentage increase in patient hours over the 2003/04 baseline, and gives the percentage increase in patient numbers as a comparison. It is self-evident that increases in the total patient hours in the ED will inevitably exacerbate any problems with overcrowding, assuming that the physical size of the ED has remained static.

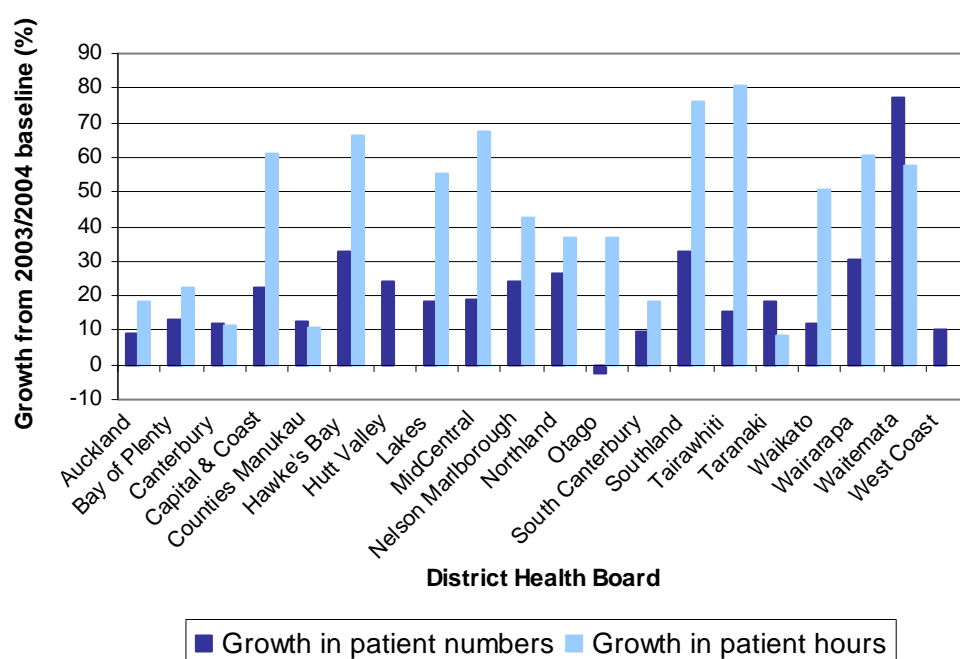


Figure 5: Growth in the patient burden by DHB. This is shown in two ways: growth in the total number of patient attendances between the 2003/04 and 2007/08 financial years; and growth in the total number of patient hours over the same time period. Total patient hours is a product of the number of attendances and the average length of stay. Since both these factors are usually increasing, a corresponding increase in patient hours is seen. Total patient hours data is not available for Hutt Valley, West Coast, and Whanganui³⁹ DHBs.

4. Many large DHBs have shown relatively low growth in the number of presentations, total patient hours in the department, or both. Auckland, Bay of Plenty, Canterbury, and Counties Manukau DHBs have shown limited growth in both. Waikato DHB reports low growth in presentations even though total patient hours have grown by 51 percent. On the other hand, Waitemata DHB presentations have grown by 77 percent, easily the largest rate of growth in the country, but the growth in patient hours has nevertheless been limited to 58 percent. The growth of patient numbers in Waitemata DHB appears to be related to the opening of a new facility at Waitakere⁴⁰.
5. In contrast, most of the small and medium-sized DHBs around the country appear to be experiencing large rates of growth for patient attendances and

especially for total patient hours in the department. Growth rates of the latter over five years are typically in the range 35-70 percent.

6. Trends in acuity are mixed and vary from DHB to DHB (Figure 6). Nevertheless, the national trend is towards lower acuity, as measured by looking at the average triage category for all patients (Figure 7). Highest acuity is seen in large DHBs, lowest acuity in small DHBs.

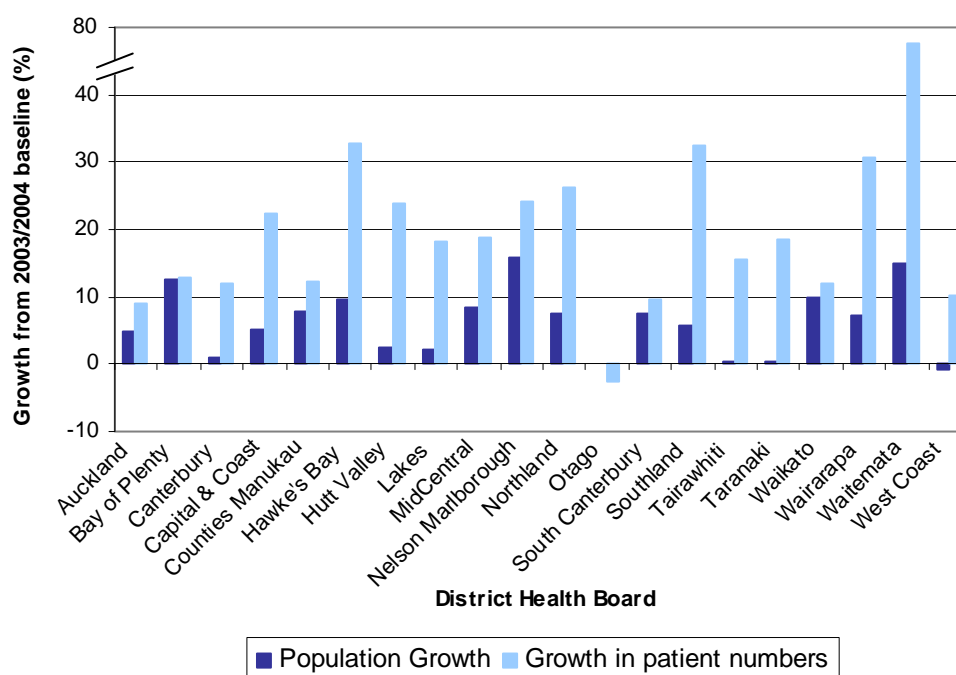


Figure 6: Comparison of the growth in population and patient attendances at ED, shown by DHB. As can be seen, growth in patient numbers is almost always greater than population growth. The Y axis has been truncated because Waitemata DHB is an outlier. Baseline for Wairarapa DHB ED attendances in 2003/04 is estimated, and ED data for Whanganui DHB was not reported³⁹.

The national rates of growth in patient attendances (19.9 percent over five years from 2003/04) and hours (34.4 percent) are considerably larger than the national population growth rate (6.7 percent), and national increases in inpatient acute discharges (11.5 percent). Rates of growth against these two comparators over five years are shown at DHB level in Figures 8 and 9. Information on ED workforce growth would also be of interest for comparison, but while the Health Workforce Information Programme (HWIP)⁴¹ has begun collecting relevant data, it is not yet possible to say whether workforce is growing at a comparable rate to the ED patient burden.

Accounting for the observed pattern, whereby the largest DHBs demonstrate the lowest rates of growth in the patient burden, is not straightforward. It is likely that because problems of overcrowding in large centres are relatively long-standing, many of the large centres were already actively managing this growth by 2003/04. Similar problems resulting from overcrowding and access block may now be emerging in smaller centres that have not yet moved to contain growth in the patient burden. It is also possible that patients in major centres recognise that visits to EDs may require long waits, and increasingly self-select other treatment options.

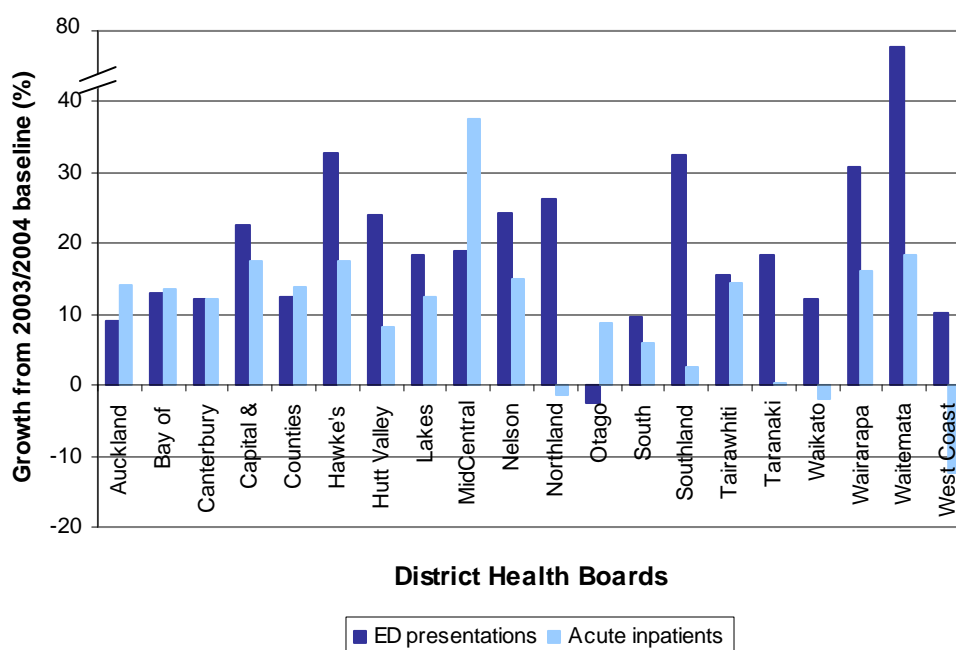


Figure 7: Comparison of growth in ED presentations against all inpatient acute admissions as measured in the National Minimum Dataset. The Y axis has been truncated because Waitemata DHB is an outlier. Wairarapa DHB baseline in 2003/04 is estimated, and Whanganui DHB did not report ED data³⁹.

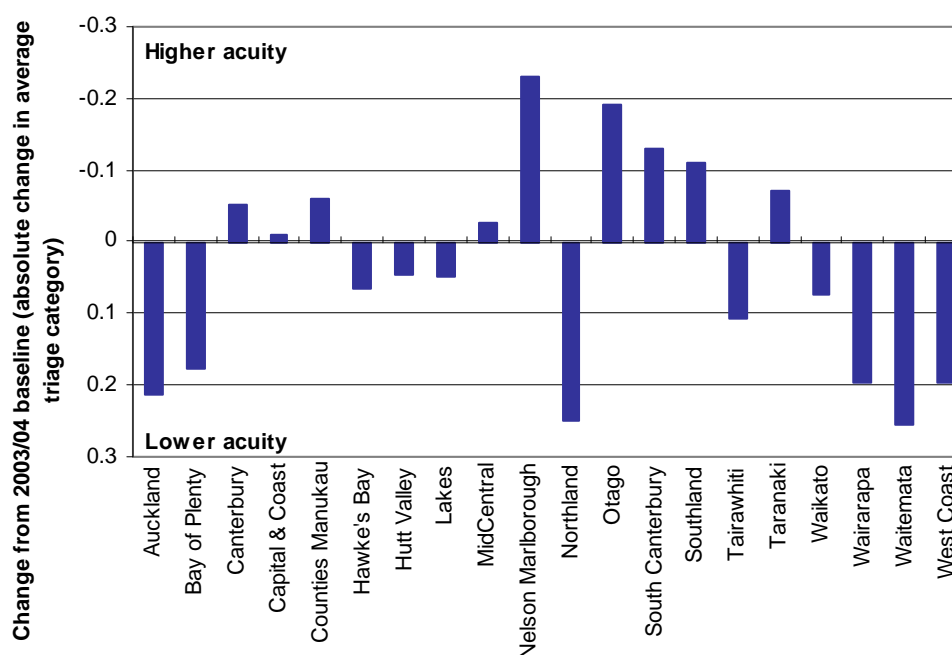


Figure 8: Change in acuity over five years from the 2003/04 baseline, as measured by average triage category per patient. This graph does not highlight the range of acuity across DHBs, but rather the trend within each DHB over time. The 2003/04 baseline for Wairarapa DHB has been estimated, and Whanganui DHB did not report data³⁹.

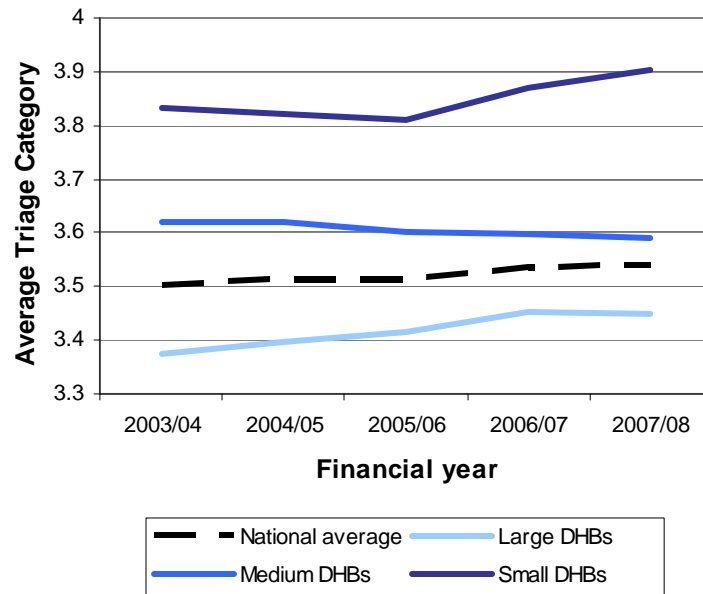


Figure 9: The average patient triage category against financial year, shown for all patients nationally, and for large, mid-sized, and small DHBs¹⁵. A lower average triage category implies greater acuity in the patient population, and a higher average triage category implies lower acuity.

In summary, it is reasonable to conclude that the patient burden placed on EDs is growing at a rate faster than population growth. In the absence of any corresponding commitment to ensuring the ongoing quality and sustainability of ED services, these pressures will increasingly lead to negative outcomes in the provision of services.

The numbers reported in this survey have been validated by comparing the results against the planned ED volumes reported through the District Annual Plan (DAP) process. In the case of some individual DHBs there are large discrepancies, but at a national level the disparity between planned volumes and volumes as reported through the survey are small.

Causes of, and Solutions to, ED Problems

It is a simple reality that ED occupancy is a function of the rate of presenting patients; and the speed with which patients can be treated and either discharged or admitted to inpatient wards. EDs are a link between the community, and inpatient hospital treatment.

EDs traditionally function as a health care safety net, and the current ED Service Specification states that EDs should not deny treatment to any patient presenting for treatment⁴². At the same time, traditional hospital practice makes each ward the 'gatekeeper' for admissions. EDs therefore do not have full control over either entry or exit from the department.

A corollary arising from this is that growing pressures at a variety of points in the health care system can first become 'symptomatic' in the local ED. For instance, the failure of primary care to provide for chronic care management, or hospital wards running at full capacity and refusing to accept ED patients, can both result in problems that become evident in the ED before they are noticed elsewhere. Failures in aged residential care and associated support services can be problematic, when care facilities are not able to accept discharged hospital inpatients – with a knock-on effect on the movement of ED patients to wards.

Whole-of-system problems require whole-of-system solutions. Implementing such solutions requires engagement and co-ordination from the highest levels of the health system, including the Ministry and DHB CEOs. This is why the report advocates an approach based around targets and senior management accountability, facilitated by the Ministry of Health. There are similarities to the approach taken in the English National Health Service (NHS). Aspects of the United Kingdom experience of ED reform are presented in Case Study 1.

The Working Group advises that the key issues leading to the observed set of problems in EDs, listed according to their order in the patient journey, are:

- growth in presentations and workload (input)
- sub-optimal patient pathways within EDs (throughput)
- access block (output).

These subjects are treated below in turn, looking at how problems arise, and their potential solutions. While access block is treated last in this list, it should be emphasised that a number of significant reports and reviews in the international literature have described access block as the most significant cause of overcrowding⁴³, and this is therefore likely to be a high priority for action.

Case Study 1: Emergency Care in the United Kingdom

The English Experience

Like other developed countries England has faced increasing demand for ED services over the past few decades. In 1992 the attendance figure for new and follow up attendances was 13 million. By 1999 this had risen to 14.6 million and to 16.5 million in 2003/04⁴⁴.

As a consequence of this burgeoning demand long ED waiting times became common place during the 1990s. In 2000 the *NHS Plan* proposed a radical target that 'by 2004 no patient should wait more than four hours from arrival to admission, transfer or discharge'⁴⁵. The target was subsequently revised in 2004 by the Department of Health to a 98% operational standard which took into account the issue of those patients who might have to remain in ED for clinical reasons, e.g. severely ill patients needing continued resuscitation⁴⁴. These targets were associated with financial incentives.

The English NHS has reported significant success in reducing waiting times in EDs.

- In the second quarter of 2002/03, 77 percent of patients spent four hours or less in EDs (measured from time of arrival to time of admission, discharge or transfer)⁴⁴.
- By the first quarter of 2004/05 this had gone up to 94.7 percent. Since then the trend has continued to improve, and is now over 97 percent⁴⁶.
- Furthermore, whilst performance has improved across the board, the gap between the best and worst performing EDs has narrowed⁴⁷.

Commenting on the lessons learnt from their success in reducing ED waiting times, the Department of Health put forward two pertinent lessons⁴⁴:

- The first is that improvements in emergency care must start with the challenge and not the solution. Each health and social care community faces its own set of issues, and each needs to tailor solutions to meet its own specific set of needs.
- The second is that improvements must not be limited to the ED, but made across the whole hospital and social care community.

The Northern Ireland Experience

The Northern Ireland NHS has provided a natural experimental control for the English regime. In 2001/02 Northern Ireland was outperforming England and Wales on the 'four hour wait'⁴⁶. However, Northern Ireland did not adopt the four hour target, and ED waiting times progressively deteriorated. Between 2001/02 and 2006/07 patients waiting longer than two hours increased from 3,943 to 32,545⁴⁶.

In June 2006 the Northern Ireland NHS adopted a target whereby 95 percent of patients should be treated or discharged within four hours. The Department of Health expected to reach its 95 percent target by March 2008⁴⁶.

Possible Weaknesses of the English NHS approach

Considerable criticism has been directed at the English approach, both for emphasising time-based targets at the potential expense of clinical safety⁴⁸, and for gaming of the target by health care providers^{49,50}. Other potential difficulties are that the target may drive some undesirable developments, such as a straightforward shift of overcrowding problems into other parts of the system, or the simplification of emergency medicine and consequent loss of skills from the hospital system.

On page 45 some similar potential weaknesses are considered within the context of the recommendations made in this report.

The Growth in Presentations, and Any Potential Solutions, Are Only Partially Understood

The Drivers of Growing Presentations, and the Impact on EDs

Growth in attendances to ED services is an international phenomenon^{43,51} not limited only to New Zealand. The situation in the United Kingdom has already been described in Case Study 1. Recent data from the United States, where emergency care presentations have increased significantly⁵², attributes 75 percent of the increase to increased use per person, with the remainder predominantly due to increased population size⁵³.

The reasons for the observed growth in attendances at EDs in New Zealand have not been definitively studied, and are likely to be complex and multi-factorial⁴³. The fact that some DHBs are observing growing acuity, while others see decreasing acuity, suggests that local factors may be important.

While EDs in New Zealand have not been subject to specific study of this issue, there are well established reasons for increased health care demand which may also apply to ED services. Established reasons for increasing demand for healthcare include: population aging, increasing incidence of long-term conditions, technological change, and economic growth. These reasons are discussed in detail in the Long Term System Framework Environmental Scan.⁵⁴

Population ageing is expected to increase demand for aged residential care and community support services. If this demand is not met with sufficient supply more costly hospital inpatient beds may be used to meet demand. Declining nursing home capacity in Australia has resulted in older people waiting longer in inpatient beds for nursing home placements⁴³, and one Australian study⁵⁵ found increases between 1993 and 2002 in the proportion of hospital beds used by those over 75. Access block in ED could result if inpatient beds become congested. There have been few studies on the impact of aging populations on ED care.

The increasing incidence of long-term conditions is a well publicised phenomenon in developed and some developing countries. People with long-term conditions can have difficulty accessing adequate management in the community for their multiple problems, leading to frequent ED and hospital attendances⁴³. A study of ED attendances to Rotorua Hospital⁵⁶, carried out by Health Rotorua Primary Health Organisation (PHO), showed 1415 individuals registered with the PHO presented 1649 times to the ED during August 2008. Of these presentations, 418 (25 percent) were made by 186 individuals (13 percent), and 120 presentations (7 percent) were made by 36 individuals (2.5 percent) who presented three times or more.

The specific demand side effects of technological change and economic growth on emergency care are not known. However, their effects have been extensively researched for healthcare in general.⁵⁷

The Great Debate Over Primary Care

One particularly contentious question associated with the internationally observed growth in ED presentations is the significance of 'GP appropriate patients', or more

generally speaking, patients who could be seen in primary care. A review recently commissioned by ACEM strongly dismisses the notion that GP appropriate patients are the cause of overcrowding:

“It has been proven that GP patients do not cause access block or ED overcrowding and persistence of this belief is detrimental to finding real solutions.”⁴³

This view is based on studies showing that while a proportion of ED attenders could have been seen in primary care, these patients typically present with low complexity. Removal of the 20 percent of patients with lowest complexity in an ED may only reduce the workload on the department by 3.5 percent – removing such patients would therefore have a marginal impact⁵⁸. This perception that GP or primary care appropriate patients are a relatively unimportant contributor to ED problems is shared by many, though not all, clinical leaders in New Zealand EDs.

The grounds of this debate appear to have shifted over time. For instance, in 1993 the American General Accounting Office attributed growing volumes of ED presentations to uninsured and non-urgent patients. Revising this work in 2003 the Office reported that the single biggest cause of overcrowding was in fact access block⁵⁹. This message has been reinforced with a recent study that reviewed the United States literature between 1950 and 2008. The authors found that current data does not support the long and widely held assumption that uninsured patients with minor illness are significant contributors to ED overcrowding⁵³. The same conceptual shift has occurred in Australia, Canada and other countries⁴³.

Nevertheless, a number of studies have been carried out concluding that significant numbers of primary care appropriate patients do present to EDs and that these would be better cared for elsewhere. A sample of such finding are given below:

- the US National Hospital Ambulatory Medical Care Survey found the proportion of non-urgent ED visits has risen from 1997 to 2005⁵³
- the Northern Ireland Audit Office found that 24 percent of patient attendances were regarded by ED staff as primary care appropriate, and better treated elsewhere⁴⁶
- several New Zealand EDs have studied this question with respect to their local service and some of these studies have suggested high numbers of primary care appropriate attendances^{60,61,62,63}.

It should be borne in mind that much of the research in this area contains significant methodological limitations. Importantly, most studies showing large numbers of primary care appropriate patients presenting to ED are retrospective, and in practice it is harder to prospectively determine which attenders to an ED are primary care appropriate and which are not.

Furthermore, the debate is confounded by variation in the definition of primary care appropriate patients. Clinicians^{64,65}, patients^{66,67}, administrators and society^{68,69,70} will have different perceptions of who is suitable for ED care. According to a New Zealand literature review⁷¹, between 5 and 82 percent of ED visits are judged to be primary care appropriate depending on the study chosen, while a UK review can to a very similar finding that between 6 and 80 percent of visits are judged to be non-urgent or primary care appropriate⁷². The UK study ascribed the observed variation to implicit and subjective judgement rather than a reflection of genuine variability⁷².

Ways of Addressing the Growth in Presentations

The art of controlling the number of presentations to EDs is generally termed acute demand management. A variety of approaches to acute demand management have been tried, with mixed results.

Strengthened primary care, walk in centres, and minor injury units

In the UK walk in centres and minor injury units, which are typically staffed by nurses, were set up at the beginning of the decade. Such units deal with only minor illness and injuries and are sometimes attached to EDs. Early evidence suggested that despite delivering 20 percent of overall emergency care provision, they have mainly addressed a previously unmet need rather than taking pressure off existing services for emergency departments^{73,74,72}.

Similar results have emerged from Spain, where a substantial investment in 1,000 primary care centers providing acute care, allowing improving opening hours and greater geographical spread, has not reduced the number of attendances to ED services⁷⁵.

It is possible that similar dynamics are at work in the New Zealand setting, where the government investment in primary care does not appear to show any clear negative correlation with the number of ED presentations.

Nevertheless, this does not mean that primary care intervention cannot work in principle. Case Study 2, drawn from the experience of Canterbury DHB, appears to show an instance where a strong interface between primary care services and hospital services has produced an integrated acute care service, which in turn has influenced the number, acuity and complexity of presentations to the ED.

Relevant to any discussion of primary care and acute demand management is the question of ambulatory sensitive hospitalisations (ASH). Broadly speaking, a hospitalisation event is ambulatory sensitive if it could have been prevented by effective primary care that stopped the patient's condition developing to the acute stage. Asthma, chronic heart failure, and diabetes are conditions commonly considered to be ambulatory sensitive. A recent comprehensive review carried out for the Ministry has investigated the relative effectiveness of a variety of measures in reducing ambulatory sensitive hospitalisations⁷⁶. The review found good evidence that increased access to health services for minorities, comprehensive disease management programmes, good discharge planning, and a number of other interventions were likely to reduce ASH. At the same time, not all interventions were judged to be effective.

It may be that management of long-term conditions, and support services for the elderly, are key areas where primary care intervention can make a difference to ED workloads. In addition, there is good evidence that some specific preventative care interventions - such as smoking cessation, valuable for stroke prevention - are useful⁷⁷. However, a recent review of preventative support services concluded that the quantitative evidence base for the value of many other preventative interventions was poor and further research is required⁷⁷.

Case Study 2: Acute Care Outside the Hospital – Canterbury Community Care Trust

Origins

Following development of an acute care strategy, Canterbury DHB has contracted with primary care partners in order to develop an innovative model for the delivery of acute care in Christchurch. The initiative is intended to promote a collaborative and patient-centred approach between primary and secondary care, provide care close to home where appropriate, and avoid duplication of care. GP consultations in Christchurch number approximately 50,000 per week (compared with over 70,000 presentation a year to ED), and it was recognised that this provided an opportunity to treat many in the community that might otherwise be referred to the ED.

The contract is held between the DHB and the Canterbury Community Care Trust (CCCT), the parties to which are Nurse Maude Association, South Link Health and Pegasus Health, to provide acute care services.

Description

The CCCT has developed a range of acute care services:

- two teams of rapid response nurses providing acute community nursing, with some specialised services, and a 60-90 minute response time
- a five-bed observation unit associated with a 24 hour surgery, offering a suitable venue for 3-4 hour periods of observation and treatment, including after-hours care
- education and training of staff in order to ensure they are equipped to provide safe and effective acute services, with a focus on clinical areas like anaphylaxis, electrocardiogram interpretation, and acute infections
- rapid diagnostics in primary care, such as tests for deep vein thrombosis or pulmonary embolism with a needle-to-result time of 40-60 minutes.

The DHB has agreed to funding up to \$300 in additional funding for patients if enhanced primary care treatment will keep them from a hospital stay. This additional funding is often tied to clinical pathways of care agreed between primary care and ED specialists. Examples include the treatment of deep vein thrombosis in primary care, which is estimated to prevent approximately 1,000 visits per year to ED, and treatment of cellulitis, with an estimated 700 visits to ED prevented per year.

Patients may first come into contact with the range of acute services through contact with a GP or the ED. In either case, ongoing care is managed by an acute care co-ordinator, with this role contracted to St John's ambulances. Christchurch Hospital ED and primary care work closely together in situations such as the management of elderly patients, who present at the ED and then need assistance in going home.

Outcomes

This initiative has demonstrated that primary acute care can successfully provide services to certain groups of patients that would otherwise need a hospital visit or stay. The combination of additional funding, pathways of care, and services appropriately geared for an acute response, works to prevent significant numbers of GP referrals to the ED each year, with some specific examples given above.

This model of primary care has been credited with helping stem the growth in presentations to the Christchurch Hospital ED for several years, and with driving the profile of presenting patients towards a more acute case mix – the average acuity of patients (as measured by

triage category) is the highest of any DHB in the country. The high acuity and complexity of the patient population contributes to an admission rate from the ED to inpatient wards that is also one of the highest in the country, at 48 percent of all presenting patients. Since EDs are designed primarily to provide a service for serious emergencies, this is viewed as a positive development.

Patients referred away from the ED to primary care

A review of the literature⁷² has found that between 15 and 27 percent of patients can be 'triaged out' (i.e. referred from the ED triage desk to primary care). However:

- only a third may be willing when asked and one percent will be dissatisfied
- up to a third of patients may be triaged out inappropriately, although many studies report no adverse outcomes
- one percent may subsequently be admitted to hospital.

The Working Group does not condone the notion of triage as a tool for determining suitability for primary care, since triage is not a clinical assessment, but an estimate of urgency. There may be scope to refer patients to appropriate primary care options, but only after a patient has received a clinical assessment in the ED.

In the New Zealand context, a Sector Disposition Tool is in the process of development under a contract held by the Ministry with District Health Boards New Zealand (DHBNZ)⁷⁸. Part of the intent of the Tool is to determine when it would be appropriate to refer patients away from ED back to primary care. Any such pathways for referral will need a coordinated approach between secondary and primary care so that patients are not lost to the health care system⁷⁹, and will ideally be based on a stronger evidence base than is currently available in New Zealand⁸⁰.

Patient Education and Social Marketing

The literature indicates patient education has had limited success in reducing ED admissions for persons with chronic conditions⁷², and that telephone service advice does not decrease the number of presentations to ED⁴³.

There is some anecdotal evidence from within New Zealand that advertising campaigns and telephone services can be successful in reducing ED attendance, and further investigation of the benefits may be worthwhile⁸¹. If social marketing of this kind can be justified in terms of benefits, the judgement of the Working Group is that good practice would involve educating the public about the options available for acute care, rather than simply discouraging the population from seeking health care in EDs – this may create clinical risks.

Ambulance ramping

The ramping of ambulances can be viewed as a perverse form of acute demand management, and anecdotal evidence exists that some hospitals in New Zealand ramp ambulances to deal with ED overcrowding. Ambulance ramping is not endorsed by any group in the health care sector, as it slows time to treatment for the patient, leaves the patient in the care of unregistered practitioners (paramedics) for

longer than appropriate, and has been shown to have negative health outcomes. The experience of the United Kingdom has been that ramping of ambulances can be used to game ED length of stay targets.

Furthermore, while ambulance services are not the subject of this report, ambulance ramping is clearly detrimental to ambulance services, particularly as it prevents ambulances responding to new emergency call-outs, thus presenting an additional hazard to the public. New Zealand has a draft ambulance strategy currently out for consultation⁸². Development of this strategy will involve the establishment of performance standards and measures, and ambulance ramping will clearly influence performance against standards. Simply shifting issues of service quality out of EDs and into ambulances in this way is not good for patients, and it would be preferable to address the root causes behind ED congestion.

Is Acute Demand Management Worthwhile?

Some approaches to acute demand management have proven ineffective. In addition, much of the literature and professional opinion is inclined to suggest that primary care appropriate patients do not constitute a large part of the ED burden, and therefore acute demand management is largely irrelevant to finding solutions for ED problems⁵⁸. This raises questions about the validity of acute demand management as an approach to resolving the current issues in EDs.

Nevertheless, acute demand management remains a reasonable aspiration, for several reasons:

- patient attendances are growing faster than population and faster than the Forecast Funding Track (according to which DHBs are funded for cost growth); at some stage this growth rate must become unsustainable
- acute demand is part of a dynamic system; if timeliness and quality of ED services are significantly improved, it is reasonable to assume this will actually stimulate further acute demand
- some clinical leaders have reported to the Working Group that, due to local factors, primary care appropriate patients form a large and potentially preventable part of the ED workload⁸³
- a few DHBs report success with acute demand management.

It may be worth noting that the debate over acute demand management has traditionally been based around notions of 'stopping patients coming through the front door'. A whole-of-system view requires moving beyond this, and instead seeking an integrated approach to providing the best possible acute care across the primary/secondary spectrum in the interests of the patient, as exemplified by Case Study 2.

The emerging picture is that the reasons for ED attendance are complex, and similarly, the influence of primary care on ED attendance is complex. Primary care appropriate patients may not be significant factors in the workload of many or even most EDs, but the Working Group nevertheless affirms that:

- there is potential for doing acute care well in a primary care setting, broadening the capacity of primary care, in a way that will influence ED attendances

- primary care has an important role to play in overall population health and prevention of ASH.

Problems Can Be Alleviated By Improving ED Performance

ED Inefficiencies Exist That Can Be Addressed

A variety of factors influence the efficiency with which patients are seen, treated and discharged from EDs. In the language of economics these are known as throughput factors, affecting the technical efficiency or productivity of EDs.

The following throughput factors can be the cause of delays or overcrowding in an ED:

- inadequate staffing, including a lack of senior staffing
- inaccessibility or inefficiency of diagnostic testing
- insufficient ED beds
- triage processes.

Inadequate staffing is a commonly studied throughput factor that may cause crowding⁸⁴. The resulting evidence is mixed. Studies in Australia and the United States have pointed to workforce shortages as causes of crowding^{43,84}. By contrast, research in the United Kingdom found that when comparisons are made at individual department level, there is no association between relative increases in staff and improvements in waiting times⁷⁴. In 2004 in New Zealand a Clinical Advisory Group released a set of recommendations on ED staffing that were widely circulated amongst DHBs, though it is not apparent if any resulting changes to staffing practice have led to improvements in quality.

Possible Approaches to Improving ED Processes

A number of EDs in New Zealand have begun projects that examine internal processes in the ED and attempt to eliminate wastage and areas of inefficiency. Lean Thinking, based on techniques of the Toyota motor company, is perhaps the most prominent specific process improvement tool that has been applied in this way^{85,86}. Case Study 3 gives details of projects undertaken at Canterbury and Counties Manukau DHBs in order to improve ED efficiency and improve quality.

The literature describes many specific interventions that may improve the functioning of an ED, and some of the most significant are described below.

Workforce

One UK literature review⁷² found that:

- teams of staff available for unpredicted surges in activity may reduce delays
- rotational allocation of patients may be better than clinician self-determination
- senior staff may reduce admissions and delays, especially where they have the right to admit patients to wards. Studies suggest that the earlier a patient is seen by a senior person, the shorter their stay in the emergency department
- allowing emergency department staff to admit patients to wards will reduce delays
- nurse practitioners are safe and effective but their effect on waits is unknown.

Observation Units

Observation wards, transit lounges, short stay units and holding or transit bays have all been used with some success to reduce access block and ED crowding^{43,84}. However, results are variable and confounded by methodological issues. Studies often look at times in specific hospital areas rather than patient-focused times in hospital and 'wasted' time⁷².

Patient Streaming

Various changes in triage systems have been trailed. One of the better known is fast tracking. Fast tracking involves establishing specialist teams to deal with minor injuries on a first come first served basis, thus improving timeliness of care for non admitted patients⁴³.

Case Study 3: Improving ED Services at Christchurch and Middlemore Hospitals

A Recent History of Service Improvement

Due to pressures faced by Christchurch Hospital in recent years, driven in part by large numbers of presentations, rising acuity and complexity, and limited physical capacity, Canterbury DHB began the Improving the Patient Journey Programme in 2004. This sought to reduce levels of 'gridlock' and smooth the patient journey through the whole hospital, and included a focus on reducing ED length of stay. This was praised by then Minister of Health Hon Pete Hodgson in March 2007 as the leading project of its kind in the country.

In May 2007 an enhanced version of the ED workstream for this Programme was launched, named Rejuvenating ED, or 'Project RED'. The general characteristics of this initiative are shaped by the following ideas.

- The patient journey can be improved by borrowing from commercial manufacturing methods for improving assembly line processes, through removing waste, waiting time, and undue complexity from ED processes. Some techniques used are Lean Thinking (eliminating waste), Theory of Constraints (eliminating bottlenecks), and Six Sigma (eliminating variability).
- Improvements are possible in the areas of 'people, plant, and processes' (i.e. staffing, building and equipment, and ways of doing things). Three workstreams have been running concurrently, looking at these three areas of action.

Weekly meetings are held to progress the project's action plan, and progress towards meeting key performance targets is monitored using a comprehensive set of performance measures. The intent is to reach the stated targets by March 2009.

A similar approach to improving quality of acute care services has been undertaken at Middlemore Hospital, driven by strong commitment from executive leadership. Targets have been set for improved ED service performance, and a comprehensive programme of quality improvement has been undertaken, primarily using Lean Thinking as a tool for process improvement. Counties Manukau DHB is the lead DHB for the national Optimising the Patient Journey workstream, and through this has rolled out similar Lean Thinking approaches for quality improvement into several inpatient wards and EDs around New Zealand. While the approach taken by Middlemore Hospital does not separately consider 'people, plant, and processes', the changes that have emerged from its improvement programme can be classified this way.

Changes to Services

Some of the specific changes these quality improvement programmes have introduced to ED services at Christchurch and Middlemore Hospitals are listed in the table below, grouped according to the Project RED concept of 'people, plant, and processes'. It is evident that interrelated change to each of these areas is often required. For instance, patient streaming at Christchurch Hospital is a newly introduced process that also involves changed staffing models, and development of separate areas in the ED. A number of comparable initiatives have been introduced in both hospitals.

	Christchurch	Middlemore
People	<ul style="list-style-type: none"> strengthened numbers, including additional hospital aids to undertake some clinical tasks previously done by doctors and nurses and administrative staff to undertake clerical tasks previously done by doctors and nurses. a Pathways Co-ordinator who, in collaboration with other staff, has produced a number of clinical pathways to aid decision making and to reduce variability in care. staffing based on ED models of care, which describes the part of the ED in which the patient should receive care, and from whom. ED physiotherapists with autonomy to treat appropriate patients upon their arrival at ED 	<ul style="list-style-type: none"> strengthened staff numbers, including three clinical nurse specialists. a charge nurse for patient flow clerical assistance to nurse co-ordinator improvements to numbers of orderlies and their supervision large shift cross-over to allow continuity of care additional phlebotomy cover from 8:00 am to midnight increased security staff to protect clinicians dedicated general medical team in the ED
Plant	<ul style="list-style-type: none"> waiting room reconfigured to make triage process more straightforward rebuild of the ED in order to bring similar groups of patients into similar geographical areas and facilitate streaming of patients development of Acute Medical Assessment Unit to take patients previously treated in ED 	<ul style="list-style-type: none"> triage area is currently being redesigned development of a fast track area increased use of an existing Short Stay Unit refitting of a storage room as discharge lounge for the Short Stay Unit.
Processes	<ul style="list-style-type: none"> escalation plan to deal with overcrowding computerised systems to predict patient numbers and resource needs patients are streamed and directed to resuscitation, workup or ambulatory areas of the ED depending on their need nurse- and physiotherapist-led treatment introduced standard treatment pathways introduced to maximise efficiency and reduce variability 	<ul style="list-style-type: none"> escalation plan to deal with overcrowding computerised systems to predict patient numbers and resource needs a fast-track treatment stream for low complexity patients in triage categories 3, 4 and 5 a 'flexi ward' has been resourced to take ED overflow patients till taken to inpatient beds efficiencies gained in the use of equipment and consumables admitting rights to inpatient wards for ED staff, for some patient groups different assessment areas now run as a united system

Outcomes

Both departments have seen significant improvements in key measures. In Christchurch Hospital, triage rates for category 2 patients, and the number of patients with length of stay less than four hours have both improved. In Middlemore Hospital, triage rates for category 2 patients, median time to treatment for patients in triage categories 3 to 5, and number of patients staying less than six hours in the department, have all improved.

For both hospitals, an area that has proved relatively resistant to improvement has been the length of stay for those requiring admission to inpatient wards (at the time of writing, the relevant results for both hospitals showed little or no sustained improvement from 2007) . It might reasonably be concluded that this situation is a result of access block, which is highlighted by this report as a key barrier to improving the quality of ED services.

This observation seems to give additional support to the idea that while EDs can do some effective work to improve the timeliness and efficiency of services for patients, many of the key barriers to quality ED services lie outside the department.

Success Factors

Key components of success in both DHBs have been:

- a comprehensive methodology for quality improvement applied to the ED
- strong clinical leadership, engagement with, and commitment to, the process of quality improvement
- good management support and resourcing of clinical teams to make time for quality improvement activities.

Counties Manukau DHB has established a separate stream for certain low-complexity patients, and this is profiled in Case Study 4.

Improved Access to Diagnostic Tools

With regards to improving diagnostic systems one review⁷² found:

- Point of care testing, where laboratory tests are done in ED, or nearby satellite laboratories, produces quicker results than central laboratory models.
- Nurse ordering of x-rays may speed up processes where fast track does not operate.
- ED staff undertaking ultrasounds may reduce delays for those individuals.

The Processing of GP Referrals

One particular area where the Working Group considers improvements are possible, is in the handling of patients referred to hospital inpatient specialties by GPs. So long as these patients are stable, there is no reason why they should need any further contact with ED services once they have been assessed at triage.

Case Study 4: Patient Streaming at Middlemore Hospital

Origins

The approach to patient triage established in Australasia involves assigning a level of urgency to the patient on arrival, and then prioritising patients for treatment according to their level of urgency. In practice this system can mean that a patient in a low-urgency triage category may wait long periods for treatment, because the steady arrival of patients assessed as having greater urgency keeps pushing them down the waiting list.

At Middlemore Hospital, an analysis of ED data in October 2006 showed that amongst patients subsequently discharged from the ED back to the community, the great majority of breached triage times were caused by patients waiting for assessment.

In an effort to address the congestion this can cause, and in order to ensure all patients are seen within an appropriate time, Middlemore Hospital has introduced a separate stream for certain low-urgency patients. This formed part of the overall quality improvement drive described in Case Study 3.

Description

All patients presenting to the ED in triage categories 1 and 2 are directed immediately to the main ED treatment area and processed. However, patients assessed as appropriate for the low-acuity, low-complexity stream are directed to a separate waiting room attached to a three-bed unit where they are treated in the order of presentation, rather than according to triage category.

Outcomes and Benefits

The main treatment area of the ED is no longer congested by low-urgency patients awaiting assessment and treatment, and treatment times for both these patients and for high-urgency patients have been improved by the streaming process.

At least in principle, arrangements may allow for these patients to be treated in a satisfactory way by inpatient specialties within the physical environment of the ED. As described below, Waikato Hospital is using a Standard Operating Procedure (SOP) in order to improve the system for the timely assessment and treatment of GP referrals by inpatient specialists in the ED.

A step up from this approach is the Admission and Planning Unit (APU), an approach successfully pioneered by Auckland City Hospital, and being increasingly used around New Zealand and Australia. This is a space designated for the treatment of stable GP referrals within a short-stay unit, in a way that minimises double-handling of the patient, and contributes at the same time to overall hospital efficiencies. The Auckland APU is described in more detail in Case Study 5.

Case Study 5: Auckland City Hospital Admission and Planning Unit

Origins

The Auckland City Hospital ED was rebuilt in 2003 and this allowed the re-assessment of the physical facilities and introduction of an Admission and Planning Unit (APU).

The decision to introduce an APU was driven by several factors. Acute admissions to the hospital were increasing, with notable increases seen in medicine (compared with surgery), with trends towards older patients and multisystem disease presentations.

At the same time, the conviction of hospital staff was that the axiomatic 'right time, right place, right person' approach to the treatment of patients meant stable GP referrals should be dealt with outside the ED. These patients should be seen by inpatient specialists in a timely way in an environment that expedites their efficient treatment. Management of these patients by ED clinicians leads to double-handling.

Description

The APU is physically co-located with the ED and closely linked to it by two corridors. The process by which patients enter the APU starts with the presentation of all patients to the triage desk in the ED. All self-presenting patients, and GP referrals assigned to triage categories 1 and 2, are directed to the ED. GP referrals assessed as stable and assigned triage categories 3, 4 or 5 are directed from the triage desk to the APU and are never seen by the ED.

Within the APU patients are managed on a short-stay basis by inpatient specialists using strategies to:

- prevent double-handling of acute medical and surgical patients
- reduce unnecessary admissions to inpatient beds
- improve the assessment of chest pain patients through cardiac monitoring, blood tests and exercise tolerance tests before discharge
- care for and stabilise patients prior to transfer to wards.

Outcomes and Benefits

The APU is perceived to provide the best possible care pathway for stable GP referrals, by providing direct access from primary care to inpatient services without the need to visit ED. At the same time, the streaming of this group of patients away from the ED releases resources in the ED for dealing with emergency cases. Over five years from 2003 to 2008 approximately 17,000 patients a year were admitted to the APU, with around 12,000 directly referred to the APU. These directly referred patients would otherwise have received initial treatment in the ED.

In the case of Auckland City Hospital, the APU is credited with being instrumental in increasing efficiency across the hospital. The assessment of GP referrals by the appropriate specialties, with strong general medicine support, allows for the most appropriate ongoing treatment choices to be made, and in many cases discharge from the APU after a short stay is possible. Average length of stay for APU patients during 2006 and 2007 was 18.2 hours.

This has contributed to a downward trend in inpatient length of stay, with general medicine length of stay dropping from 4.05 days in 2002 to 3.63 days in 2007, and general surgery length of stay dropping from 4.60 to 3.84 days over the same period.

Success Factors

Key requirements for successful introduction of the APU were:

- strong leadership of the APU to ensure that over time it did not become *de facto* ED space or a *de facto* inpatient ward
- strong relationship with GPs, with referrals communicated to the APU prior to the arrival of patients
- a collaborative hospital culture in which inpatient specialties share a common understanding with ED and APU of their role in the system.

Access Block Causes Long Patient Stays and Overcrowding

A Description of Access Block

Access block is an important cause of overcrowding. Access block occurs when ED patients who require an inpatient bed are unable to get timely access, and therefore have extended stays in the ED.

The causes of, and solutions to, overcrowding are often discussed in tandem with those for access block; however, the two terms are not synonymous. Overcrowding does not necessarily follow logically from access block, if, for instance, few patients present at an ED or few patients are in need of inpatient beds. Nevertheless, access block is widely considered in the international literature to be the most significant cause of overcrowding^{43,59}, and has been described as the most significant challenge facing EDs in the western world⁸⁷.

The most obvious contributor to access block is inpatient overcrowding, with a lack of inpatient beds leading to an inability to admit ED patients onto wards. Lack of inpatient bed capacity has been identified as the major causative factor of access block in a recent major literature survey released by ACEM⁴³. Studies have shown that access block becomes increasingly likely as hospital bed occupancy exceeds 85 percent and moves toward 100 percent occupancy^{88,89}. In one study, a period of industrial action at a hospital reduced waiting times in ED, since access block diminished as inpatient beds were freed up⁸⁴. Inadequate bed supply can reflect either a simple lack of physical beds, or it can result from inadequate bed management. The UK has established a target hospital occupancy level of 85 percent in order to overcome access block and consequent overcrowding⁹⁰.

Admission processes for ED patients can also be important factors in access block. If inpatient specialists are not available to visit and admit ED patients, or if the hospital culture encourages inpatient teams to view ED as an area that can be used to hold patients indefinitely until time is available to see them, then there can be delays to admission even where beds are available. Waikato Hospital has recently been developing a SOP governing the relationship between the ED and inpatient specialties, in order to overcome issues tied to culture, custom, and practice. The SOP lays out expectations relating to how inpatient specialties will respond to patients referred by GPs or the ED, including response times.

Possible Solutions for Access Block

The major solution implicit in the recent ACEM literature review of access block and overcrowding is the provision of sufficient inpatient bed capacity to enable bed occupancy rates to be kept at or below 85 percent, either through funding an increased number of beds, or better bed management⁴³.

In the UK the Department of Health has produced a series of reports promoting best practice in bed management. The *Wait for a Bed Checklist* gives guidance to NHS hospitals in order to meet their four hour ED waiting limit target.⁹¹ It makes practical recommendations including:

- setting a discharge date for all patients
- where possible discharging patients early in the day to free up beds as most bed shortage problems occur during the day
- having on-the-day surgery admission with pre-operative assessment (rather than the day before) so patients don't need to stay an extra night
- putting patients in short stay units if they only need quick diagnosis and treatment.

Further support is offered in the *Making best use of Beds Programme* and the *Achieving timely, simple discharge from hospital* toolkit⁹².

In situations where the hospital becomes fully occupied, the transition from access block and long waits to overcrowding and ED corridor waits for patients can be prevented through the use of a full capacity plan. In 2000 a directive was issued to all acute hospitals in New York State, allowing them to move patients from the ED to corridor spaces on inpatient wards in situations of full inpatient occupancy, in order to relieve ED congestion⁵⁹. This approach, where the patient load is spread across the hospital in the best interests of the patient, rather than overcrowding being concentrated in the ED, is what is meant in this document by the term 'full capacity plan'. A subsequent study of two hospitals in New York State appeared to show that this approach had improved ED congestion without any apparent adverse clinical outcomes⁵⁹.

Auckland City Hospital has developed its own full capacity plan, highlighted in Case Study 6, and this has been an important contributor to the elimination, since 2004, of ED corridor waits at the hospital.

It should be borne in mind that a full capacity plan does not prevent access block *per se*, but rather, mitigates some of the worst effects of access block when a hospital reaches a state of full occupancy.

Case Study 6: Auckland City Hospital Full Capacity Plan

Origins

The building of a new ED in 2003 at Auckland City Hospital created the opportunity for a re-examination of operating policies within the ED. Around this time, a policy was adopted stating that corridor stays for patients in the ED was considered unacceptable – the No Corridor Policy.

The desire for such a policy stems from the conviction that corridor stays expose patients to unacceptable clinical risk and provide patients with limited privacy and dignity. Corridor stays are also a sign of departmental inefficiency and contribute negatively to staff morale.

Description

The Auckland City Hospital No Corridor Policy is an example of what is referred to more generally in this document as a full capacity plan. This is a whole-of-hospital escalation plan, which details how patients will be accommodated once the ED and hospital becomes overcrowded.

At Auckland City Hospital, when all ED and APU beds bar one are full, a ‘code purple’ is issued, and inpatient wards are required to create space for patients from the ED, by taking patients over census if necessary. This is achieved by the duty manager and charge nurse identifying the most low-risk patients to be moved into whanau rooms and procedure rooms on the wards, or discharged where appropriate, in order to accommodate new patients.

Within the emergency department, the activation of a “code purple” also instigates the recall of all ED staff on non-clinical duties (such as teaching) to assist in patient flow, and the mobilisation of the department management team (clinical director, nurse manager and general manager) to assist with unblocking bottlenecks. ED whanau and procedure rooms act as additional clinical space in order to make room for newly arriving urgent triage category 1 and 2 patients. Up to a maximum of six less urgent ambulance cases can be unloaded and held in the bay under the care of an ambulance officer for short periods until new clinical space becomes available. Ambulances are never re-directed to other facilities.

Once the “code purple” has been fully deployed, the next stage in escalation would be to invoke the full disaster management plan, with call in of off-duty staff and the conversion of non-clinical space to decant areas for less seriously ill patients as per a major incident. This stage has never been reached since implementation of the No Corridor Policy.

The view of Auckland DHB is that this policy minimises clinical risk, by ensuring patients who are potentially unstable, sick, and still awaiting assessment and treatment, are accommodated, while patients known to be stable are moved to manage overcrowding.

Outputs and Benefits

The hospital has not had a corridor patient in the ED since 2004, and in this respect is exceptional amongst tertiary hospitals in New Zealand.

Auckland DHB has also registered a significant improvement over several years in the timely treatment of triage category 2 patients, as measured by the triage rate reported to the Ministry. The rate has improved from 30.6 percent in the December 2003 quarter, to 72.6 percent in the June 2008 quarter, though this is affected by a whole range of improvements implemented in the ED and cannot be attributed solely to the No Corridors Policy.

The process has important benefits for patient flow in the hospital, as wards are conscious of the requirement to proactively manage their patient loads as they track the arrival of new patients in the ED. Wards 'share the pain' of overcrowding with the ED and are therefore incentivised to practice efficient bed management.

Success Factors

The implementation of the No Corridors Policy is an operational change rather than a change to staffing or capital. As such, strong leadership to drive cultural change within the entire hospital has been important. The policy has support from the CEO downwards, and has the support of the clinical directors.

The escalation policy has been accepted into normal practice and provides clarity of action once the ED comes close to overcrowding. The success of the escalation depends on both the emergency department re-allocating all available resources to the floor, and the wards agreeing to take over-census patients. The final point in the escalation recognises that an overcrowded ED represents a failure of normal operations and therefore sanctions the instigation of disaster plans. The magnitude of this ultimate action provides strong motivation to resolve the problem prior to this point.

Philosophy and Guiding Principles

The Working Group has proposed the following principles that follow from the discussion above, and that underlie the recommendations made in this paper.

1. The patients' best interests are the focal point for the planning of ED services.
2. Where problems with service quality are observed in EDs, this is often symptomatic of wider health system problems, which can be classified as difficulties relating to 'pre-load' (pre-hospital) or 'after-load' (inpatient services).
3. Consequently, solutions may be required spanning the whole hospital, or indeed the whole patient journey, and EDs cannot enact such changes without the involvement of executive-level DHB management.
4. Time spent waiting by patients does not have clinical benefit and indeed can lead to poorer outcomes and patient dissatisfaction. It should therefore be minimised and eliminated. This should be distinguished from time spent in patient observation.
5. The treatment and housing of patients in inappropriate spaces (such as corridor stays, or ramped ambulances) is unacceptable.
6. Across New Zealand, hospitals use a wide range of service configurations, and operate in a wide range of contexts with diverse challenges. Specific solutions to problems of quality and performance cannot be proposed on a one-size-fits-all basis.
7. Service change should balance clinical, service, and financial requirements
8. Knowledge transfer and sharing between New Zealand EDs should be encouraged.

Furthermore, a number of general principles for the planning of health services have been developed by the Ministry as part of the Long Term Systems Framework (LTSF)⁹³. Many of these principles are reflected in the statement of principles above. Other general planning principles found in the LTSF, pertinent to discussion of ED services, are these:

- standards should address the following dimensions: quality and safety, access, equity, allocative efficiency and effectiveness
- appropriate coordination at all levels (district, regional, national) should support optimal service delivery
- the design should improve population health gain and reduce health inequalities.

Detailed Description of Recommendations

Recommendations fall into three broad groups. Recommendations 1 to 7 have to do with expected national standards and the implementation of a programme of action intended to improve the quality of ED services through co-ordinated national action.

Recommendations 8 to 10 describe principles that individual DHBs should be seeking to implement; the best way to apply these principles will vary from place to place.

Recommendations 11 to 14 suggest future areas for action at a Ministry or national level, that are beyond the immediate scope of this Working Group.

Recommendation 1: An Emergency Department Health Target is Needed

A Health Target should be introduced as a formal accountability measure of ED performance.

Rationale

Since action to improve the quality of ED services often involves not only in EDs, but wider health services, the commitment of executive management and DHB Boards is required in order to implement and co-ordinate the required changes.

The perception of clinicians working in acute care services is that elective hospital services receive a disproportionate share of attention from executive management and governance, due to a national Health Target, service delivery expectations, and political pressure. Many DHB CEOs recognise the current challenges facing delivery of acute services. Nevertheless, the performance management framework for DHBs does not currently give any visibility to this aspect of DHB services.

ED triage rates published by the Ministry are explicitly intended as benchmarking data and are not used for the purpose of holding DHBs formally accountable (though admittedly, they may generate some *de facto* accountability due to public interest)¹⁷. Something more is therefore required. A Health Target relating to ED services would supply a high-level performance measure for this area of health care.

Implementation of such a Health Target is discussed under recommendation 2.

Recommendation 2: Health Target Relates to ED Length of Stay

This Health Target, which would constitute the principal Ministry measure of ED quality and performance in New Zealand, should be based on ED length of stay. An ED length of stay measure will provide a proxy measure of access block, and is therefore closely connected with the principal barrier to ED service quality that hospitals need to resolve. The preferred form for this measure would be the percentage of patients admitted, transferred, or discharged from the ED within six hours.

Rationale

A measure based on ED length of stay is the most appropriate measure available for holding DHBs to account for ED service delivery. This is because:

- long patient waits in the ED are intrinsically undesirable
- ED length of stay is closely linked to ED overcrowding
- ED length of stay is a proxy measure of access block, which is widely acknowledged as a key cause of ED quality failings
- it is technically achievable, as ED length of stay is a very common measure of performance used at a local level⁹⁴
- measures of ED length of stay are used in a similar way within a number of comparable jurisdictions, notably the United Kingdom, as a quantitative measure of ED performance.

In contrast, a measure of overcrowding would be more difficult to implement because of the wide range of practices relating to the handling of patients during periods of overcrowding, and a wide range of means by which EDs might already measure overcrowding.

Options for the Measurement of ED Length of Stay

A variety of options for measuring ED length of stay, and making comparisons between DHBs, exist.

Table 2 provides information about some possibilities. The option recommended by the Working Group is to measure the percentage of patients who are admitted (physically transferred to a ward), discharged or transferred from ED within a six hour limit. The benefits of this approach are:

- ACEM and the College of Emergency Nursing New Zealand both agree six hours is a reasonable amount of time in which to treat and admit patients, that is, long enough for good clinical care, but not unjustifiably long
- it is aligned with key performance indicators being proposed by the Optimising the Patient Journey collaborative being led by Counties Manukau DHB
- it is simple and amenable to the setting of a target percentage for all DHBs
- this measure is compatible with local hospital analysis using the 3-2-1 model to identify where delays are occurring (see Recommendation 10).

Table 2: Options for measuring and comparing patient length of stay between DHBs. Included in the last three columns are the real results based on two weeks of data collected by the Ministry, for hospitals 'A', 'B' and 'C'.

Option	Measure Description	Strengths	Weaknesses	Results		
				A	B	C
1	Percentage of patients admitted, discharged or transferred from the ED within 6 hours.	<ul style="list-style-type: none"> the Australasian College of Emergency Medicine (ACEM) agrees six hours is a reasonable amount of time in which to treat and admit patients it is aligned with KPIs being proposed by the Optimising the Patient Journey workstream being led by Counties Manukau DHB it is simple and amenable to the setting of a target percentage for all DHBs this measure will allow hospitals to implement their own analysis using the 3-2-1 model to identify where delays are occurring. the measure is applicable at the micro level (one patient) 	<ul style="list-style-type: none"> does not reflect the actual length of stay experienced by some patients above the six hour mark a six hour target is likely to be easily attained in some EDs this measure is not directly comparable to internationally published data 	86%	70%	81%
2	Percentage of all patients discharged, admitted or transferred from the ED within four hours.	<ul style="list-style-type: none"> the NHS publishes data for this measure, and some other countries have used this as a benchmark comparison percentage of patients within four hours may be a more ambitious measure the measure is applicable at the micro level (one patient) 	<ul style="list-style-type: none"> the measure does not compare directly against other initiatives in the Australasian context such as 3-2-1 and the Optimising the Patient Flow Initiative New Zealand practices a model of emergency medicine different to the UK model and requiring more time there is anecdotal reporting that the imposition of the four hour target in the UK has changed the nature of emergency medicine and shifted much of the clinical emphasis to inpatient areas 	69%	52%	65%

Option	Measure Description	Strengths	Weaknesses	Results		
				A	B	C
3	Length of stay at the 10 th , 50 th and 80 th percentile of patient population	<ul style="list-style-type: none"> previously trialled measure as part of Hospital Benchmark Information, so familiar in the sector provides some information on shape of the ED length of stay curve 	<ul style="list-style-type: none"> does not account for anyone above the 80th percentile, where a long 'tail' is located reporting requires three sets of numbers cannot be applied at the micro level (one patient) 	01:05 02:56 04:54	00:59 03:49 08:09	01:02 02:56 05:42
4	ED median length of stay – The length of stay for the 50 th percentile of patients	<ul style="list-style-type: none"> a simple measure which can be compared internationally. The U.K, Canada and Australia have all previously reported ED length of stay as median time from presentation to the time of discharge, admission or transfer 	<ul style="list-style-type: none"> the measure does not account for patients experiencing prolonged ED length of stay cannot be applied at the micro level (one patient) 	02:56	03:49	02:56
5	ED mean length of stay – The average length of stay for all ED patients	<ul style="list-style-type: none"> patients with a long length of stay are reflected in the average, c.f. median length of stay (option 4) 	<ul style="list-style-type: none"> since the data is asymmetric and not normally distributed, an average is not statistically ideal. cannot be applied at the micro level (one patient) 	03:32	05:16	03:50
6	Median access block - The median length of time from when a inpatient bed is booked until discharge from the ED for all admitted patients	<ul style="list-style-type: none"> shows the amount of time ED patients spend waiting for an inpatient bed. a good indicator of the influence of inpatient bed occupancy on ED length of stay 	<ul style="list-style-type: none"> measure only applicable for admitted patients. does not capture the ED treatment time. only 30% of hospitals which responded to a recent survey currently record and calculate access block 	00:31	02:40	01:00
7	The percentage of admitted patients who experience an access block of less than one hour.	<ul style="list-style-type: none"> shows the amount of time ED patients spend waiting for an inpatient bed. a good indicator of the influence of inpatient bed occupancy on ED length of stay 	<ul style="list-style-type: none"> measure only applicable for admitted patients. does not capture the ED treatment time. only 30% of hospitals which responded to a recent survey currently record and calculate access block 	82%	18%	49%

Included in Table 2 are real ‘demonstration’ numbers calculated from patient-level data sourced by the Ministry from three hospitals. Figure 10 shows the distribution of patient ED length of stay for these three hospitals, and demonstrates that most patients are treated and admitted within a few hours, but that a long ‘tail’ is seen caused by a minority of patients who spend an extended period in the department.

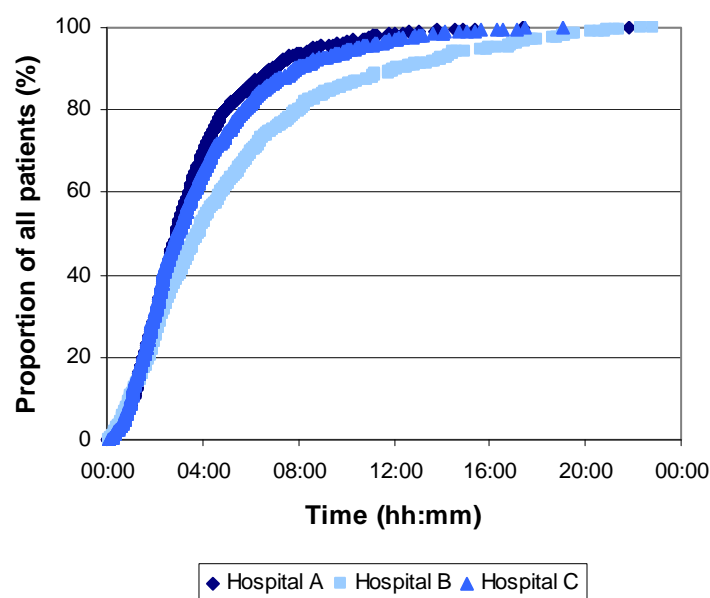


Figure 10: The percentage of all ED patients admitted, discharged or transferred, against the ED length of stay required to reach that percentage, for three hospitals. Each data point represents an individual patient, with data collected over a two-week period.

The shape of the curves in Figure 10 indicates that in order to largely eliminate long patient stays, the target percentage for patients admitted within six hours should be set high, that is, 95 percent or higher. At the same time, the data indicates these three hospitals presently process between 70 and 86 percent of patients within six hours.

Possible Variants on the Six Hour Target

Average length of stay data collected from across New Zealand suggests that for some EDs, meeting a six hour length of stay target may be achievable without radical change to current services. In the view of the Working Group, this is acceptable, since the target is a means to an end (quality care), not an end in itself. Nevertheless, if the Ministry perceives this to be problematic, and judges that all departments should face challenging targets, the Working Group would support either of the following approaches:

- set the percentage to be seen within six hours very high, e.g. 98 percent
- set a subsidiary target for non-admitted patients to be discharged within four hours (three hours for treatment and one for discharge processes). However, it should be borne in mind that this may prove technically challenging for many EDs to measure.

The Working Group would not support the following approaches:

- shortening the time limit (since this is not an arbitrary time set as a stretch target, but a reflection of sensible clinical practice)
- monitoring the achievement against target broken down by inpatient specialty (this is seen to be the role for local operational management).

Proposal for Implementation

The Working Group proposes that the Ministry introduce ED length of stay as a DHB additional reporting requirement for the 2009/10 financial year, to be reported quarterly.

In the first year of collection there would not be a performance target, but a data baseline would be established. A high-threshold trigger for escalation could be put in place. This might consist of a request for the DHB to submit and explain its full capacity plan (see recommendation 4), if the percentage of patients admitted within six hours falls below 70 percent.

In following years stretch targets could be established, moving to a benchmark of 95 percent of patients being admitted within six hours.

During the process of implementation, careful consideration needs to be given to the potential for negative outcomes as a result of implementing a target-driven approach, in particular, establishment of perverse incentives, leading to gaming and similar undesirable behaviours. This is an issue with relevance to all this report's recommendations from one to six for different reasons. Because of this, it is considered further in its own right – refer to the piece “Unintended Outcomes” on the following page.

Common Definitions are Required

The measurement of ED length of stay will require use of common definitions across the sector.

The Working Group recommends the following common definitions:

1. Time of presentation; the time of first contact between the patient and the triage nurse or clerical staff, whichever comes first.
2. Time of admission from ED; the time at which the patient is physically moved from ED to an inpatient ward (a recent survey established that 72 percent of responding EDs already use this definition).
3. ED length of stay for a patient equals the time period from time of presentation, to time of admission (or time of discharge or transfer for patients who are never admitted as inpatients).
4. All ambulatory patients are included in the measure, regardless of the specific streaming arrangements in any ED such as an APU or paediatric stream.

Unintended Outcomes - What Can be Done to Reduce Them?

This report recommends a health target (recommendations 1 and 2), the setting of some additional challenging service standards (recommendations 4 and 5), gathering of subsidiary data (Recommendation 3), and oversight of the process by central authority (Recommendation 6).

There is potential for this approach to be subverted by adverse behaviours. In particular, feedback to the Working Group from the sector has reflected concern that a length of stay target will encourage actors in the sector to shift patients out of the ED to other parts of the hospital without good clinical reasons, in a way that actually works against patients' best interests. This is compounded by the potential some see for full capacity plans to be used in a cynical and inappropriate way as a 'smokescreen' for shifting patients and meeting targets. Inclusion of recommendation 5 (no ambulance ramping) was partly driven by the English experience, where the four-hour target led to ambulance ramping as a gaming ploy (Case Study 1).

It is probably impossible to avoid all unintended outcomes, and the existence of gaming does not of itself invalidate the proposed approach (one might argue that a system with no gaming suggests incentives aren't working!). However, the Working Group wishes to make clear that if the implementation of these recommendations leads to a wave of gaming and distorted behaviour, without improvements in service quality, this will represent failure.

There exists a rich literature on the use of targets to improve organisational performance, including within the health sector⁹⁵. This repository of experience suggests numerous ways in which unintended outcomes can be minimised.

- Measures that are well-defined, comparable over organisations and time, that can be influenced by those being measured, and have their support, are likely to minimise unintended outcomes and behaviours⁹⁶.
- Measures used as tools for learning and dialogue, and applied internally within organisations, are less prone to gaming than measures used for judgement of performance with consequent reward or punishment by external parties^{97,98}.
- Enabling those being measured to succeed, though the provision of resources such as ideas and funding for innovation and change, is liable to encourage constructive change and quality improvement⁹⁹.

Recent study of the English healthcare target regime has provided strong evidence of its ability to produce rapid positive change¹⁰⁰. At the same time, lessons have been learned to the effect that "Unintended and adverse responses.... demonstrate the need to put in countervailing instruments where necessary", including strong systems for the auditing of data, and public transparency¹⁰⁰.

It is not appropriate for the Working Group to make recommendations about the wider approach taken to Health Targets beyond EDs. However, it is clear that some target-based systems will work better than others. Attention to detail during implementation, and a well-designed integrated approach across the range of recommendations included here, may in the end make the difference between real service quality improvement and something less desirable.

It is also recommended that patients under formal observation, whether they are placed in an observation unit, short stay unit, or similar, or observed within the ED, be counted as admitted patients for the purposes of measuring ED length of stay.

This last requirement is likely to present some challenges to the sector, as a survey of EDs has established that 50 percent of responding EDs already count observed patients as admitted, while the other 50 percent do not. Counting observed patients as admitted is preferred since this will remove much of the diversity between service models in different DHBs, which would otherwise subvert the comparability of any ED length of stay measure across DHBs.

Recommendation 3: Current Triage Measures Should be Retained

The current triage rate measures should be retained for benchmarking purposes and extended to triage category 4 and 5 patients.

Rationale

ED length of stay is a measure that relates ED quality of care to the wider health system, and it is appropriate that this should be the primary accountability measure for DHBs, who oversee not only EDs but other interacting services such as diagnostic and inpatient services.

This raises questions over the future for national measurement of triage rates, a measure with greater focus on internal performance of EDs.

At present, triage rate data for patients in the three most urgent triage categories is the only performance measure reported to the Ministry by DHBs. This information is not intended for formal accountability purposes, but publication of triage rates tends to generate informal public accountability.

The Working Group recommends that triage rates be retained as a benchmarking, non-accountability measure, since:

- the time from presentation to treatment for certain clinical conditions, such as stroke, acute myocardial infarction, and brain injury, is related to clinical outcomes
- patient satisfaction is related to time taken to receive treatment
- the Australasian triage system on which triage rates are based is the only standard system for prioritising and treating patients recognised across Australasia.

In addition, the Working Group recommends extending the measurement of triage rates to triage category 4 and 5 patients. This would provide national information about the overall urgency of presentations – currently not available - and about the quality of care to patients in these lower triage categories. It needs to be borne in mind that while these patients have been classified as less urgent, a large number of them still require hospitalisation as inpatients; they are a patient population with legitimate needs for hospital healthcare.

At the same time, the Working Group recognises that ongoing evolution of the Australasian triage system will take place, influenced by developments in ED service models, such as patient streaming and treatment of patients in the order of presentation. In future this may mean greater flexibility in the way patients are prioritised, and this should be reflected in the way time to treatment is measured at a national level. For instance, future national benchmarking measures could classify patients as urgent (triage categories one and two, to be seen immediately), and non-urgent (triage categories three, four and five, to be seen within one hour), and measure performance against these benchmarks.

Implementation

Extension of triage rate measures to less urgent patients could be implemented from the 2009/10 financial year.

In the longer term, the Working Group anticipates that information about triage times for ED patients will be captured at the patient level through national data collections (specifically, through the NN PAC). When this happens, it may be appropriate to move to a different system of measures for triage time, such as a simple two-level system of triage benchmarks.

Triage Rate Measurement for Triage Category 4 and 5 Patients - Difficulties

A technical issue exists with the measurement of triage rates for patients in triage categories four and five, explained below. The Working Group suggests that this issue be addressed by the Ministry's Hospital Benchmark Information team in consultation with the sector.

It is a reality that many patients in less urgent triage categories voluntarily leave ED before their assessment and treatment starts. Since such patients make up part of the numbers presenting to the department (denominator of triage rate), but never record a triage time (needed for the triage rate numerator), they present a complication in the calculation of triage rates. Two large metropolitan hospitals have estimated the proportion of patients falling into this class as 13 and 23 percent (triage category 4), and 35 and 37 percent (triage category 5). This is clearly a significant number of patients.

A number of options for addressing this complication for measurement exist; these need to form the basis for further discussion. In short, options are:

- patients who do not wait to be treated are included in the denominator, thus depressing the reported triage rate
- patients who do not wait to be treated are excluded entirely from calculations, with the risk of giving an overly positive view of quality
- against the total number of presentations, separate calculations are made of the number seen within benchmark times, the number treated late, and the number who do not wait (measures of patients who did not wait for treatment are used by many overseas jurisdictions as a measure of ED service quality).

Recommendation 4: Corridor Stays for ED Patients Should be Eliminated

It is not acceptable for patients to be treated and kept in ED corridors or other informal ED spaces due to overcrowding. In order to address this, it should be mandatory for each hospital to develop a full capacity plan – that is, an escalation plan that describes how patients throughout the hospital will be dealt with once the ED reaches a point of overcrowding. Rather than retaining all patients in the ED when hospital capacity is reached, plans need to give due consideration to minimising clinical risk by best use of inpatient wards for patient care.

Rationale

Overcrowding commonly leads to the holding of patients in informal treatment spaces, a practice exemplified by corridor stays. The evidence for negative clinical outcomes in overcrowded situations was reviewed earlier. In addition, patients kept in corridors typically suffer discomfort, and experience a lack of privacy and dignity in the delivery of care.

In view of the many negative implications of overcrowding and consequent trolley waits for patients, the Working Group recommends that it be made mandatory that all DHBs to have a full capacity plan. This should detail hospital-wide protocols for dealing with ED overcrowding in order to minimise overall patient risk. The Auckland City Hospital approach is commended as an exemplar that has contributed to a patient environment in ED in which the use of corridor stays for patients is not considered acceptable.

Implementation

The Ministry could consider mandating a full capacity plan through the ED service specification, or making submission of a full capacity plan part of the escalation process where a DHB fails to meet ED length of stay targets.

The intent of a full capacity plan is to minimise, not exacerbate, clinical risk. As such, there will need to be due attention paid to safe staffing levels within inpatient areas, including consideration of staffing guidelines developed by the Safe Staffing and Healthy Workplaces Unit (a collaborative venture between DHBNZ and the New Zealand Nurses Organisation). Nevertheless, a hospital running at greater than 100 percent occupancy is already running sub-optimally; a good full capacity plan will not transfer all risk to inpatient areas, but rather aims to spread workload and risk evenly across the available hospital-wide nursing and wider workforce resources.

Recommendation 5: Ambulance Ramping Should be Prevented

Similarly, it is not acceptable to ramp ambulances in order to address ED overcrowding.

Rationale

The negative nature of ambulance ramping, and its potential in gaming targets, have been discussed earlier in this report.

At the New Zealand Emergency Departments Conference held on 26 and 27 September 2008, delegates (by a show of hands) gave universal or near-universal assent to the notion that ambulance ramping is not an acceptable practice.

A recommendation that ambulances should not be ramped seems consistent with the principle behind Recommendation 4, that is, patients will not be kept waiting in conditions that are not in their best interests.

Implementation

No specific recommendation is made for the monitoring and enforcement of this guideline. Instead, it is recommended that the Ministry make clear that this is a fundamental service standard, and ambulance waiting times should not be manipulated in order to meet ED Health Target and full capacity plan expectations. Performance can be subsequently managed through dialogue with DHBs.

Recommendation 6: A Ministry of Health ED Locus is Required

A locus should be established within the Ministry for the performance management of the quality of ED services, and for facilitating the recognition and sharing of good practice across the sector.

Rationale

The implementation and adequate management of quality improvement and performance across New Zealand will require a locus within the Ministry, charged with the oversight of roles such as monitoring of ED length of stay, and facilitating knowledge sharing. This could be similar to the role of the 10 'Target Champions', Ministry staff (generally senior clinicians) who work directly with DHBs to achieve Health Targets. Target Champions provide information on how to make gains in the Health Target areas and disseminate this information on 'best practice' to DHBs.

Recommendation 7: A Sector Network is Required

A corresponding clinical network within the sector is required that provides formal liaison with the Ministry locus.

Rationale

The Ministry will require a sector partner for understanding quality and performance issues, and for the collaborative implementation of action to improve quality in EDs.

Implementation

A number of options are available for a suitable clinical network, and these are described in the table 3 below.

Table 3: Possible options for the development of a national clinical network for ED quality improvement and spread of best practice.

Option	Advantages	Disadvantages
<i>a small Expert Advisory Group with similar makeup to the current Working Group that authored this report</i>	<ul style="list-style-type: none"> • can be populated to provide the best range of expertise required to address pertinent issues • small enough to make internal consensus a reasonable expectation 	<ul style="list-style-type: none"> • may not be perceived within the sector as representative
<i>a larger Reference Group with representation from all DHBs or EDs</i>	<ul style="list-style-type: none"> • provides extensive representation of stakeholders 	<ul style="list-style-type: none"> • may have difficulty in reaching consensus and decisions • expenses involved in meetings of a large group may not be justifiable
<i>a network created using Emergency Care Coordination Teams (ECCT)</i>	<ul style="list-style-type: none"> • ECCTs already exist and are described by a Service Specification • each ECCT carries representation from a wide range of EDs across the ECCT region • the ECCT is based on a regional model which sits well with the current direction of movement towards clinical networks and regionally sustainable services • chairs of each ECCT would form a manageable leadership group for the network 	<ul style="list-style-type: none"> • ECCTs are currently relatively poorly resourced • not all ECCTs are currently active • ECCTs are currently mandated to deliver the Roadside to Bedside¹⁰¹ concept, and the proposed change would require widening and refocusing their role • ECCTs may not be willing to be involved • ECCTs have little focus on inpatient hospital services, which are crucial in addressing access block problems
<i>regional networks of ED clinicians that report to ECCTs</i>	<ul style="list-style-type: none"> • advantages are similar to those for ECCTs • greater specificity to ED change programmes 	

The judgement of the Working Group is that the Ministry locus would be best served by a relatively small Expert Advisory group, with wider reference to regional networks of ED clinicians.

It would seem appropriate for a Health Target Champion, or other Ministry locus, to take steps to consult with the sector and develop an appropriate network subsequent to their appointment by the Ministry.

Work Programme

There are several items of work that suggest themselves as being a useful place to begin for the proposed clinical network. The Working Group proposes that the following workstreams be taken up by this network, in conjunction with the Ministry, in order of priority.

1. *Development of a toolkit of useful innovations for EDs:* The Optimising the Patient Journey collaborative currently being run by Counties Manukau DHB, initiated by the Quality Improvement Committee, intends to produce such a toolkit through its ongoing learning collaborative. Ongoing enhancement of this toolkit and sharing of best practice could be taken forward by the clinical network.
2. *Research into ED performance and quality in New Zealand:* More information would be useful relating to the nature of ED attendances, clinical outcomes of ED overcrowding or lack of timeliness, and the value of certain interventions in improving quality. Such questions are raised again in Recommendation 14.
3. *Revision of the Tier One Emergency Department Service Specification:* The Service Specification should be altered to allow greater flexibility to EDs in the way patients are treated. At present, the Service Specification appears to discourage streaming of patients or non-traditional approaches to prioritising patients for treatment. At the same time, it may be worthwhile considering the difference between acute care and emergency care, referring away from the ED, and other relevant issues.

A cost-benefit analysis and business case have not been produced as part of this report¹⁰², but significant benefits to the health system could accrue from aspects of this work, if it is integrated into a wider programme of improvement led by the Ministry. It is therefore likely that some financial investment into this programme of work would be justifiable.

Recommendation 8: Emergency Presentations, not Stable GP Referrals

EDs should be primarily a service for dealing with emergencies. Following triage, stable GP referrals should be immediately directed to, and treated by, inpatient services.

Rationale

EDs are optimally oriented to deal with serious emergency presentations. In the current context, where pressures on the resources of many EDs are stretched, it makes sense to ensure that the caseload of non-emergency presentations dealt with in EDs is minimised in an appropriate way.

One key way in which this can be done is to ensure that ED clinicians are not responsible for the assessment and admission planning of stable GP referrals to inpatient specialties. This is also beneficial for patients, since it avoids double handling, first by ED clinicians, then by inpatient services.

In general, the characteristics of a system for direct GP referral to inpatients would include the following:

- all patients, including GP referrals, undergo triage to ensure safe practice
- unstable GP referrals are identified and receive ED care
- protocols are in place for the efficient assessment and treatment of stable GP referrals by inpatient specialists
- these stable GP referrals are not managed by ED staff.

One way of implementing these concepts is by development of an APU, a physical unit to which stable GP referrals are streamed. Auckland City Hospital provides the prime example of an APU, though the model is increasingly being adopted elsewhere in New Zealand (refer to Case Study 5). It is important that an APU should not simply constitute a means of diverting pressure from the ED to other parts of the hospital. A functioning APU should improve whole-system efficiency by limiting admissions to long-stay inpatient wards, and therefore shorten the hospital's average inpatient length of stay.

Other models may also work well and a one-size-fits-all approach may not be appropriate for all EDs. For instance, in a small hospital it may be best to retain after-hours GP referrals in the ED, if insufficient inpatient specialist cover exists for the specialty to which the patient is referred. Nevertheless, the principle stands; that is, patients should be streamed to definitive treatment in the most efficient way possible. This principle should be applied appropriately across the whole spectrum of hospital sizes.

Implementation

This recommendation concerns an operational choice to improve the quality of services that can be offered to patients, whether these are ED patients, or patients seen within an APU or similar arrangement.

The shape this choice takes needs to be determined at a local level and not prescribed by the Ministry. This responsibility therefore devolves to DHB leadership. However, the underlying principle behind this recommendation should be promoted by the Ministry in its ongoing dialogue with the sector over the quality of ED and acute care.

Recommendation 9: Emergency Presentations, not Community Care

EDs should be primarily a service for dealing with emergencies. Strong relationships with primary care should be developed to provide strong pathways for acute care, the management of chronic conditions, and care at end of life, outside hospital. Social marketing may be useful in minimising non-emergency attendances to EDs, but should be used with circumspection.

Rationale

In view of the rapidly growing number of presentations to EDs and the likelihood that improvements to service quality will only stimulate further demand, it seems reasonable for DHBs to examine potential means of managing the demand growth, especially if some of these patients could be appropriately managed outside hospital.

A fruitful way for DHBs to approach this subject may be to reduce the focus on 'acute demand management', defined simply as a toolkit of strategies to reduce presentations to the ED, and focus instead on the 'acute care spectrum', that is, ensuring an effective range of acute care options are available in the best interests of the patient. These options would constitute an integrated approach across primary and secondary care, as exemplified by Canterbury DHB and CCCT (Case Study 2). Such an approach will have the effect of focusing the caseload of the ED on those patients for whom ED care is the most appropriate choice, primarily emergencies.

As a secondary level of intervention, DHBs may wish to use social marketing in order to discourage attendance at EDs except in cases of emergency. Some DHBs report having success with this kind of campaign. At the same time, some objections can be raised to this approach:

- it does not address the fundamental drivers of ED attendance
- the focus can be negative, on discouraging use of services
- as such, there may be clinical risks to conscientious patients reluctant to make demands on the ED service.

Implementation

The range of patients presenting to EDs, the pressures on services, and trends in patient acuity, vary from region to region around New Zealand. In addition, the drivers behind attendance are complex, multi-factorial, and in many cases they are poorly understood.

In this context, it would not be appropriate for the Ministry to make prescriptive recommendations, and the solutions will be somewhat different for different hospitals and communities. DHB Planning and Funding arms need to proactively determine how to spread acute care resources in the best interests of patients. There is a role for the Ministry locus (recommended above) in directing research into the issue of acute demand, and spreading best practice and advice to DHBs.

Recommendation 10: Use Data to Identify Pressure Points

DHBs should adopt techniques of ongoing data analysis that identify pressure points within the hospital system, and assist DHB management in prioritising areas for action. One recommended possibility is 3-2-1 analysis of ED length of stay data.

Rationale

Earlier discussion in this document has highlighted the ongoing debate about the relative importance of pre-hospital, ED, and hospital inpatient interventions in dealing with ED overcrowding, long patient waits, and other issues. As discussed, the consensus is that access block constitutes the greatest challenge to improving the quality of ED services.

However, this general conclusion needs to be tested by individual hospitals, and each locality will want to study its own data in order to determine those factors that are a priority for action.

The recommendation of the Working Group is that the 3-2-1 concept is a useful approach. This concept, which is promoted for use within its own jurisdiction by New South Wales Health¹⁰³, and is currently being used at Auckland City Hospital, begins with the notion that six hours is a reasonable amount of time to treat an admitted patient. Three hours is the benchmark time for management of the patient by ED staff, two hours is the benchmark for assessment and treatment by inpatient specialists, and one hour is the benchmark for transfer of a patient to the ward once the decision to admit has been made. The success rates achieved by a hospital for completing each stage of the patient journey within benchmark times can be used by hospital management to prioritise action. For instance, if the percentage of patients moved to a ward within one hour of the decision to admit is low, and at the same time a high percentage of patients are handed over to inpatient specialty oversight within three hours of presentation, access block may be a worthwhile focus for attention.

This method of analysis has the benefit of being compatible with a six hour target for length of stay, as recommended elsewhere in this report.

Implementation

This method of analysis requires the measurement of time of presentation, time when the patient is handed over to inpatient care, time of decision to admit, and time of patient departure from the department, for each patient.

Not all EDs will have information systems that allow for the capture of this information without a significant investment of resources, and hospital management will in each case have to make a decision about whether this is justified. This is a decision for DHBs to take.

In addition, some EDs may feel that such an analytical method does not suit because their patient stays are already largely within the six hour target, and little would be gained. This is reasonable; the intent of this recommendation is to

promote the use of data to identify priority areas for action, and 3-2-1 is only one way in which to attempt to diagnose whether issues lie with ED processes, treatment by inpatient specialties, or the process of transfer to wards.

As part of Recommendation 2, the potential for a subsidiary target of four hours for non-admitted patients has already been discussed. Similarly, an ED with short length of stay and low admission rates may choose to set targets based simply around a three-hour limit for treatment of patients by ED specialists, or a percentage of all patients to be processed within four hours.

Recommendation 11: An Integrated Acute Care Plan for New Zealand

Integrated strategic planning: In view of the extensive interactions between EDs and other providers of acute care such as ambulances and paramedics, nursing homes, and GPs and accident & medical clinics, the development of integrated plans to deliver acute care at local, regional and national levels in New Zealand would be a natural next step following this Report.

Rationale

Much that has been discussed in this report emphasises the interrelated nature of various services involved in acute health care provision. This report lays out the first steps toward addressing some of the issues observed within EDs, but good sense dictates that this would be best done in a co-ordinated fashion with other related services, in order to provide the best possible approach to the whole range of acute care.

At a national level, the Ministry should develop an integrated vision for the acute care sector, taking the agenda well beyond From Roadside to Bedside¹⁰¹, the last high-level policy document released aimed at the acute care sector. Developments in acute care would need to be co-ordinated with a variety of strategies and national programmes being led by the Ministry and other healthcare agents. These include:

- the Primary Health Care Strategy and its ongoing development¹⁰⁴
- a strategy for ambulance services, recently released for consultation⁸²
- an ongoing review of Accident Compensation Corporation arrangements for funding EDs
- the Health of Older People Strategy¹⁰⁵
- the Long-term Conditions Programme¹⁰⁶
- the Optimising the Patient Journey Collaborative led by Counties Manukau DHB
- benchmarking by DHBs through the Health Roundtable.

Implementation

It would be ideal if acute care service planning could be integrated into the work programme of the LTSF, a major piece of work currently under development by the Ministry.

The core work programme of the LTSF includes the following elements: working with DHBs to develop comprehensive regional service plans; working with DHBs to develop national long term service plans; and further developing clinical networks. It would be beneficial if one element of the LTSF work programme focused on acute care planning to deliver integrated pathways of care at local, regional and national levels, and overall improved system performance.

Recommendation 12: Determine the Best Workforce Models

Development of staffing models: Further work is required to understand and develop appropriate workforce models for acute care both within and outside EDs, encompassing possible roles for advanced emergency nursing, and determining the right primary care workforce for the provision of strong acute care outside the hospital.

Rationale

Workforce is clearly a crucial aspect of infrastructure. Various EDs in New Zealand are developing innovative approaches to the deployment of clinicians, with examples being: use of a nurse practitioner at Auckland City Hospital to deliver care to low acuity patients; use of clinical nurse specialists by Waikato Hospital to care for patients who do not have multisystem conditions; and use of allied health professionals to provide autonomous treatment to patients in Christchurch Hospital¹⁰⁷.

At the same time, delivery of effective primary acute care, in a collaborative system with EDs, may require fresh thinking about the range and roles of practitioners working in the primary care sector.

A programme for assessing the value of such roles, and development of a paradigm or framework that would help local DHBs to systematically determine the best workforce mix for their populations, would be useful.

Recommendation 13: Build EDs in Light of Best Practice

Capital developments: Bids for funding to build and upgrade EDs should be evaluated by the Ministry in light of the advice and recommendations contained in this document, such as the desire to see GP referrals streamed directly to inpatient specialties.

Rationale

Much can be accomplished through cultural change within organisations, and through process improvements at every stage of the patient journey. In fact, investment in infrastructure such as buildings or IT systems will fail to bring the desired changes if such cultural change management does not also take place.

At the same time, the physical configuration of an ED can limit or release potential gains, and can drive operating practices for better or worse. The redevelopment of

Auckland City Hospital ED to include an APU is one example highlighted in Case Study 5.

It is therefore recommended that when reviewing bids for capital funding, the Ministry ensure that the following questions are adequately answered:

- does the physical layout facilitate the efficient streaming of patient groups, such as GP referrals, to the relevant treatment areas?
- does the new building support an IT infrastructure that will facilitate the movement of patients from the ED to inpatient wards (as well as measurement of local and national targets)?
- does the building design encompass large spaces for waiting room patients, corridor stays, or other tacit accommodations for ‘failure’?
- is the building plan accompanied by a corresponding change management plan to entrench desirable practice, especially to ensure that ambulances, ED, and inpatient wards all have a common understanding and commitment to an operational system that is in the best interests of patients?

Recommendation 14: Carry Out Necessary Research

Research: Further knowledge about the drivers of growth in ED attendances would be particularly valuable. Integrated service planning would benefit from greater understanding of the complex mix of factors involved. The impact of overcrowding and long patient stays on mortality and hospital efficiency should also be studied in a New Zealand context.

Rationale

There is a great deal of scope for research into the particular environment that prevails in New Zealand and that influences the ability of EDs to function effectively. In particular, this report has noted that attendances to EDs in New Zealand are growing rapidly, but the drivers behind this growth are not understood.

The assumption that growth is a simple function of primary care appropriate patients presenting to the ED in order to avoid primary care fees is almost certainly an oversimplification. The experience across New Zealand is variable, and the factors driving increases will be complex. Understanding the drivers of growth will assist DHBs in planning services and investing appropriately.

Other possibilities are studies of the clinical and financial impact of ED inefficiency, and studies looking at the efficacy and value of ED interventions and redesign.

Implementation

It has already been suggested in Recommendation 7 that co-ordination of a research programme could be undertaken by the Ministry locus working collaboratively with the sector network.

At the same time, it is likely that some work will be undertaken by the Ministry as part of the Service Review into hospital-based emergency services, and any such work should become available in 2009.

Appendix B: Membership of the Working Group for Achieving Quality in Emergency Departments

The following are members of the Working Group for Achieving Quality in Emergency Departments and contributed to the preparation of this report.

<i>Name</i>	<i>Position</i>	<i>Organisation</i>
Dr John Henley	APU Clinical Director	Auckland DHB
Dr Tim Parke	Adult Emergency Department Clinical Director	Auckland DHB
Justin Moore	Associate Clinical Nurse Manager, ED & Chairperson, College of Emergency Nurses	Canterbury DHB
Sandra Richardson	Emergency Nurse Researcher	Canterbury DHB
Dr Peter Freeman	Emergency Department Clinical Leader	Capital & Coast DHB
Allan Cumming	General Manager of Quality Improvement	Counties Manukau DHB
Geraint Martin (Chair)	Chief Executive Officer	Counties Manukau DHB
Mark Davies	Clinical Nurse Manager	Hutt Valley DHB
Cathy Cooney	Chief Executive Officer	Lakes DHB
Jon Foley	Interim Manager	Strategy Unit, Ministry of Health
Nick Goodwin	Senior Advisor	DHB Performance, Ministry of Health
Alison Randall	Senior Advisor	Primary Care Implementation, Ministry of Health
Dr Mike Ardagh	Professor of Emergency Medicine	Otago University

References

- 1 All references are given in Section III of the report.
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patients in 2007/08. Small EDs and DHBs are those with a patient volume of less than 20,000 presentations year in 2007/08.

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- 57 Technological change has both supply and demand side effects; firstly, new technologies can reduce the cost (including time) of any particular intervention with productivity gains. This is referred to as the cost effect of new technology. However, working in the opposite direction is the volume effect of technological

change in which demand for health care increases as new technology makes more treatments available. Economic growth is commonly recognised to increase demand for health care if health care is a normal good.

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