NEW SOUTH WALES AUDITOR-GENERAL'S REPORT

PERFORMANCE AUDIT

Code Red: Hospital Emergency Departments

Department of Health
NSW Ambulance Service

THE AUDIT OFFICE
OF NEW SOUTH WALES

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In accordance with section 38E of the *Public Finance and Audit Act 1983*, I present a report titled **Code Red: Hospital Emergency Departments.**

R J Sendt
Auditor-General

Sydney
December 2003

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Foreword

This audit follows an earlier study where we examined data on Nepean Hospital's 'code red' status. In that study we found a number of instances where the Ambulance Service records differed from hospital records. I subsequently announced my intention to carry out a wider review.

A hospital is designated 'code red' when it has reached its capacity to treat emergency patients. Going code red alerts the Ambulance Service to divert ambulances carrying patients with less serious conditions to neighbouring hospitals. This is designed to ensure that patients get faster access to care and that ambulances and their crews are not delayed at the emergency department and unavailable to respond to other calls.

The scheme can only be fully effective if neighbouring hospitals have the capacity to treat diverted patients without themselves going code red.

This audit provides a more detailed look at how code red works in practice. I saw this as an important topic as the quality of patient care may decline if the code red scheme does not ensure timely access to that care.

We have also recently commenced a more wide-ranging 'ambulance to hospital' performance audit. This will review the factors that impact on patients from initiation (usually with a 000 call for an ambulance), through treatment at the emergency department and then to discharge or admission to hospital.

R J Sendt
Auditor-General

December 2003

Executive summary

Executive summary

The Emergency Department Network Access Scheme (EDNA) was introduced by the Ambulance Service and the Department of Health to improve ambulance patients' access to hospital services by reducing ambulance delays at emergency departments.

EDNA monitors bed capacity in both the emergency department and hospital wards and alerts ambulance crews when capacity changes. The aim is to spread demand more evenly across the network by redirecting ambulance patients with less serious conditions to other hospitals.

Three standard indicators are used for hospital capacity. Green represents normal operations, orange is nearing capacity and red indicates both the hospital and the emergency department have reached full capacity and have no spare beds. Hospitals are required to expedite bed management practices in response to changes in capacity.

This audit follows an earlier study at Nepean Hospital that investigated discrepancies in the data on capacity.[1] In this audit we visited Liverpool, St Vincent's and Nepean hospitals. We wanted to find out whether they followed the Department of Health's guidelines for determining, reporting and recording hospital capacity. We also wanted to find out whether ambulances diverted.

Audit opinion

All three hospitals followed the Department of Health's guidelines for judging capacity and had systems in place to notify hospital staff and ambulance crews of changes in status.

We found discrepancies in the records kept by all three hospitals when compared to the records maintained by the Department of Health. Our view however, is that these records do not need to be a perfect match for the intended purpose, which is to guide ambulance crews to the shortest queue.

Overall, the EDNA initiative has been effective in establishing a consistent and transparent method for judging hospital capacity. It has engaged the whole hospital, rather than the emergency department alone, in responding to overcrowding and encourages hospitals to operate as a network.

[1] The Audit Office of NSW Auditor-General's Report Financial Audits Volume Two May 2003.

However since EDNA was introduced, there has not been an overall reduction in ambulance delays at hospitals. EDNA has had some impact on sharing demand but it is limited by the fact that there is very little spare capacity available in the network. Under these conditions, EDNA can not markedly improve patient access. More fundamental changes to hospital practices are required.

Key findings

- The frequency of hospitals going red is on the rise. On some days, nearly all metropolitan hospitals can be red at the same time.[2]
- It is difficult to measure the effect of EDNA as there is no data on the number of ambulance diversions that occur in response to changes in status.
- However when a hospital goes red, the number of ambulance patients presenting with less serious conditions decreases in most metropolitan hospitals.
- The impact of EDNA is diminished when alternative hospitals are simultaneously red or where there are long distances between hospitals.
- Two factors that may pressure decision makers not to go red are:
  - code red being seen as an indicator of performance by hospital staff
  - the need to provide an exception report on extended periods of code red and ambulance delays to the Department of Health.
- Not all hospitals or key staff could view EDNA data on-line and were not aware of the status of hospitals across the network.
- Being red does not mean the hospital is closed and patients will continue to present to the emergency department.

Other reviews

In July 2003, the Department of Health reformed the committee that developed EDNA to examine its effectiveness and recommend future management and development initiatives.

We have also commenced a more wide-ranging performance audit examining the strategic, environmental and operational factors that affect the timeliness and quality of emergency patient care. This audit is due to be tabled in the second quarter of 2004.

[2] The Department of Health reports that part of this increase may be due to hospitals adapting to the new system.

Recommendations

We recommend that the Department of Health:

- provide access to information via EDNA on the status of all network hospitals to key hospital staff, including the emergency department
- in order to encourage accurate reporting on capacity by hospitals:
  - advise area health services that the use of code red targets to judge performance is not appropriate
  - discontinue exception reporting on capacity and ambulance delays.

We recommend that the Department of Health and the Ambulance Service assess the impact of EDNA by reviewing a sample of:

- ambulance diversions in response to hospital status including the usefulness of ambulance diversion protocols
- patient flow strategies to determine whether they return the hospital to normal operations.

Response from the Department of Health

I refer to the draft performance audit report about the Emergency Department Network Access Scheme, forwarded to me on 7th November 2003 for comment.

I enclose comments by the NSW Department of Health on the specific recommendations in the Report.

There are, however, some general comments that I would like to make to ensure that readers of your Report understand the context in which the Emergency Department Network Access (EDNA) operates in NSW public hospitals.

The primary purpose of EDNA is to support ambulance and hospital staff in making the best use of resources available across Sydney metropolitan hospitals. EDNA is only one strategy for improving the access of patients to emergency services. Other initiatives that have been taken in the last year include new teams of staff in Emergency Departments to assess patients and the establishment of Emergency Medical Units and Rapid Assessment Emergency Teams in major hospitals. These initiatives have resulted in significant improvements in the waiting times for patients in Emergency Departments.

The Report provides figures on the increase in "off stretcher time" being experienced by ambulances. This increase needs to be considered in the context of significant growth in demand for emergency ambulance services and within the hospital system. There are many factors driving this increase in demand.

Factors such as the Commonwealth Government's Private Health Insurance Initiative and up to 900 patients in acute hospital beds on any given day awaiting places in Commonwealth aged care facilities emergency care constrain acute public hospital capacity. Some of the important issues impacting on rising demand and access to hospitals include:

- *Ambulance transports to hospitals are rising at 4% per annum.*
- *Currently, 95% of emergency admissions in NSW are provided by public hospitals, and this share has increased as private hospitals focus on elective admissions for privately insured patients.*
- *Declining access to affordable and timely primary health care through GPs.*

In 2004 a range of strategies to address the needs of older people including the Pathways Home Joint Australian Government-State initiative should start to address this issue.

However, EDNA is not intended to address these issues and will not in itself resolve demand pressures. EDNA is intended to assist staff to get the most urgent patients to appropriate care in the shortest time. The audit shows that EDNA is effective in directing less acute ambulance patients away from hospitals on code red to assist those hospitals to attend to patients with more urgent clinical needs. The Report also states that not all less critical patients are redirected and this is appropriate given many of these patients have significant clinical history at a particular hospital and need care where the doctors know the patients and their medical records are available.

I am pleased that the Report recognises that EDNA has been effective in encouraging hospitals to operate as a network. Establishing clinical networks has been a core strategy of the NSW Department of Health. Like any system, there are small improvements that can be made. This is particularly the case with the EDNA, which has been in place for less than 18 months. The Audit recommendations are consistent with the deliberations of an internal expert committee that guided the implementation of EDNA and is currently undertaking a review of its operations.

The recommendations in the Report are accepted and will be implemented. That EDNA code red hours are now used as a communication tool and not as a performance indicator and this is core to the structure of the EDNA system. As the system becomes more established and the culture changes to more open reporting of this indicator it is expected that the number of code red hours reported may increase. This is a major factor in the comparison between EDNA hours in July-August 2002 with July-August 2003.

Thank you for the opportunity to provide these comments and I would appreciate if they could be included in the final published report.

(signed)

Robyn Kruk
Director-General

Dated: 5 December 2003

A response to each of the recommendations is set out below:

Recommendation

Provide access to information via EDNA on the status of all network hospitals to key hospital staff, including the Emergency Department.

Agree

This issue is proposed to be in the final recommendations to the NSW Department of Health by the EDNA Steering Committee. The recommendation is supported.

Recommendation

In order to encourage accurate reporting on capacity by hospitals:

- ***advise area health services that the use of code red targets to judge performance is not appropriate***
- ***discontinue exception reporting on capacity and ambulance delays.***

Agree

Exception reporting has already ceased. Notification to Area Health Services not to use EDNA hours as a performance target will be implemented.

Recommendation

Department of Health and the Ambulance Service assess the impact of EDNA by reviewing a sample of:

- ***ambulance diversions in response to hospital status including the usefulness of ambulance diversion protocols.***
- ***patient flow strategies to determine whether they return the hospital to normal operations.***

Agree

This is being done linking the Ambulance Data Set with the Hospital Data Sets (Emergency Department and inpatient).

Response from the NSW Ambulance Service

Introduction

This submission has been prepared for the Audit Office of New South Wales by the Ambulance Service of New South Wales to provide a response to the Performance Audit - Code Red: Hospital Emergency Departments.

The Ambulance Service was a participant in the audit process in conjunction with the New South Wales Department of Health. This submission examines the relevant factual information and analyses the recommendations as outlined in the report.

Recommendation 1

"That the Department of Health provide access to information via EDNA on the status of all network hospitals to key hospital staff, including the emergency departments".

The Ambulance Service as a principle stake holder in the EDNA system requires timely access to accurate information in regard to the status of the networks of emergency departments. Any decision to broaden the access to information via EDNA should consider Ambulance Service operational value in having broader access to EDNA information. Currently access to EDNA information is contained to selected executive members and at the point of contact of the NAC within the Sydney Operations Centre.

Recommendation 2

"In order to encourage accurate reporting on capacity by hospitals, the Department of Health advise Area Health Services that the use of Code Red targets to judge performance is not appropriate".

The Ambulance Service is committed to assisting the periodic diversion process that is fundamental when hospitals notify of Code Red situations. For the diversion process to be effective the underlying principles of Code Red must be clearly understood and activated appropriately. It is the Ambulance Service of New South Wales opinion that the notification of a Code Red situation is a normal part of demand management. Therefore the Service supports the recommendation that Code Red targets not be used as a performance criteria.

Recommendation 3

"That the Department of Health, Area Health Services, and the Ambulance Service discontinue exception reporting on capacity and ambulance delays".

A key component of EDNA is a systematic approach to the management of emergency department demand in line with the principles of quality review. Likewise the EDNA system has been beneficial in enhancing both formal and informal communication amongst stakeholders. One of the recognised benefits of exception reporting is the ability for peer review to be undertaken. In this way the EDNA system becomes an evolutionary process benefiting from continuing stakeholder evaluation.

The Service would encourage that some form of exception reporting be continued so as to assist the quality framework on which EDNA is based.

Recommendation 4

"That the Department of Health and the Ambulance Service assess the impact of EDNA by reviewing a sample of ambulance diversions in response to hospital status including the usefulness of ambulance diversions protocols".

The Service is currently working with the Department of Health to develop data collection tools that would assist in gauging the number of ambulance diversions and subsequently the effectiveness of ambulance diversions protocols. The Service maintains its position that the decision to divert remains that of the treating ambulance officer. Given the dynamic nature of pre-hospital care in line with the environmental factors facing ambulance officers it is not deemed appropriate that a simple number of diversions be a true indicator of the effectiveness of EDNA.

Recommendation 5

"That the Department of Health review a sample of patient flow strategies to determine whether they return a hospital to normal operations".

In reviewing patient flow strategies reference should be made to the documents that were formulated at the commencement of EDNA. The work carried out as part of the formation of EDNA has as an underlying principle that the management of emergency department demand was a whole of hospital matter.

Summation

The Auditor-General's Report - Code Red: Hospital Emergency Departments covers the need to have a process to manage peaks in demand on emergency departments. The impact of such processes on ambulance operations as a whole must continually be a point of reference.

The report details the reporting and coding of network statusing and makes recommendations of improving processes. EDNA to a large degree is a process by which to inform ambulance officers of the status of a network of emergency departments. Whilst the report adequately deals with the reporting framework of EDNA, further reference or recommendation to the systematic use of the information available would assist in the development of the EDNA scheme.

(signed)

Steve Whinfield
A/Chief Executive Officer

Dated: 8 December 2003

1. What is EDNA?

1.1 Introduction

Hospital diversion in various forms has been used to alleviate overcrowding in emergency departments since 1989.

What is EDNA?

The Emergency Department Network Access Scheme (EDNA) was introduced in July 2002 to prevent ambulance crews from being delayed at emergency departments and to improve ambulance patients' access to hospital services. It provides a consistent framework for making decisions and standard definitions of hospital capacity.

The system monitors bed capacity and alerts ambulance staff when the hospital is busy and may have to redirect patients. There are three capacity levels:

- Green: within capacity (normal operations)
- Orange: nearing capacity (divert if possible)
- Red: full capacity (divert appropriate patients).

The decision to go red can be made by the hospital executive, usually the Director of Nursing and/or Medicine or the General Manager. The decision is based on three key factors:

- bed capacity in the emergency department and hospital
- bed capacity in the emergency department only
- ambulance delays.

In addition, the Ambulance Service can override a hospital's status if ambulances experience lengthy delays, regardless of the hospital capacity. Hospitals are also required to expedite bed management practices in response to changes in capacity.

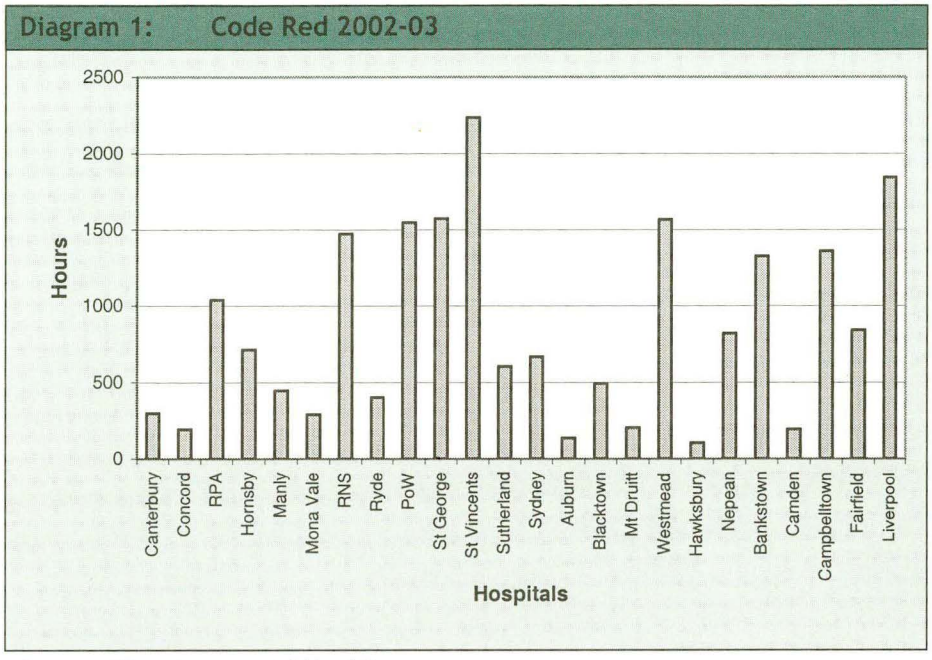
Hospitals need to notify the Network Access Coordinator (NAC) at the Ambulance Service of their capacity status. Ambulances can only redirect patients with less serious conditions. Redirection is intended to prevent overcrowding, minimise delays to ambulances and assist the bypassed hospital to return to normal.

The aim is to distribute demand more evenly through effective networking of resources.

How often do hospitals go red?

During 2002-03 each metropolitan hospital went red for an average of 850 hours or 10 per cent of the year. Principal referral hospitals each averaged over 1,000 hours.

Diagram 1 illustrates total code red hours during 2002-03 for each metropolitan hospital.



Source: Department of Health

Metropolitan hospitals went red an average of 431 hours this winter (July - August 2003) or 7 hours a day. This is nearly three times more than the same period in 2002 where hospitals went red an average of 155 hours or 2.5 hours a day. However, the Department of Health reports that the difference may be due in part to EDNA just being introduced and hospitals coming to terms with the new system.

Why are we examining EDNA?

In early 2003 we examined data on code red at Nepean Hospital. We found a number of instances where the Ambulance Service records differed from hospital records. We subsequently announced our intention to carry out a wider review.

Audit scope and focus

This audit examined how EDNA operates in three metropolitan hospitals and the Ambulance Service. The hospitals included:

- Liverpool Hospital
- St Vincent's Public Hospital
- Nepean Hospital.

We focused on compliance with the Department of Health guidelines. We wanted to find out whether there are adequate systems in place to determine, report and record hospital capacity. In particular, we examined the:

- decision-making process
- accuracy of records and timeliness of EDNA notifications.

And although we did not test the effectiveness of EDNA in terms of improving patient outcomes, we wanted to find out whether the system works. That is, whether ambulances divert and hospitals expedite patient flow strategies preventing long delays in the emergency department.

Further details of the audit sample and criteria are provided in Appendix 1.

2. Deciding when to go red

2.1 The guidelines

The Department of Health issued guidelines in June 2002 to area health services on how to measure hospital capacity to support the EDNA initiative.

The guidelines established a consistent definition of emergency department and hospital capacity (ie green, orange or red). The guidelines also list actions to be initiated by hospitals to prevent an escalation in status and to facilitate a return to normal operations as soon as possible.[3]

When to go red

The reasons for going red are:

- the staffed available capacity in the emergency department is zero and there are no vacant beds in the hospital, or
- the emergency department has a sudden and overwhelming influx of patients resulting in zero bed capacity, or
- there are significant delays in off loading patients from ambulance trolleys (60 minutes or more).

Do they follow the guidelines?

We found that all three hospitals had:

- followed the guidelines for judging capacity
- assigned responsibility for decisions to a member(s) of the hospital executive
- centralised the point of authority and accountability for the allocation of beds and judging capacity with the hospital bed manager(s)
- implemented practices to assist patient flow in the emergency department and the hospital in response to changes in status
- collected data on capacity at the time of going orange or red, who authorised the change and in some cases, the reasons for going red.

However in deciding when to go red, emergency department capacity would be judged at zero when:

- the emergency department was full but not necessarily as a result of a sudden influx of patients, or
- there were limited resuscitation beds.

Modelling demand

The hospital activity projection model (HAPM) was designed to predict bed availability in 24 to 48 hour blocks and was piloted in six hospitals as part of the EDNA initiative. The Department reports that the effectiveness of HAPM was examined as part of the EDNA post-implementation review.

[3] Revised Framework for Standard Measurement of Hospital Capacity Department of Health August 2002.

2.2 Judging capacity

In both Liverpool and St Vincent's hospitals, available capacity was judged real time by visual inspections (rounds) and reports from hospital wards (in some cases electronic updates).

We found the most common factors considered when judging capacity in the hospital to be:

- the number of beds
- patient acuity (ie the severity of illness or injury)
- staff number, skill, experience and mix.

These factors will impact on the ability of the emergency department to absorb demand therefore requiring decision makers to exercise discretion in deciding whether to divert ambulances.

In both Liverpool and St Vincent's hospitals, decision makers reported that they relied on the advice of senior staff in the emergency department when deciding whether or not to go red. Whenever staff considered patient safety to be compromised due to overcrowding, the hospital would go red.

Case study 1: The need to go red
Emergency department staff to patient ratios can vary throughout the day. In Liverpool Hospital, not all beds in the emergency department were occupied however, a psychiatric patient awaiting assessment became violent and staff were redirected to provide assistance. Staffing capacity in the department was severely diminished and the emergency specialist requested a code red. The executive agreed due to the unusual circumstances. The patient was eventually restrained and the hospital returned to green.

However, the processes followed in Nepean Hospital to determine capacity were problematic and reportedly led to disputes between emergency department staff and decision makers.

Case study 2: At Nepean Hospital we found ...

There were a number of factors which may have contributed to problems in deciding when to go red:

- the spreadsheet used in the emergency department to assess capacity and alert staff when the department was full did not necessarily capture real time data on bed availability in the hospital
- the use of this spreadsheet alone to judge capacity was simplistic and did not take into account professional opinion
- the monthly performance target of 30 hours code red established for the hospital by the area health service. The existence of this target may have pressured the bed/nurse manager into inappropriately declining requests by the emergency department staff to go red.

These factors may have lead to discrepancies between code reds recorded by the hospital and the emergency department being full. However, there is no record of the circumstances surrounding decisions not to go red thus preventing us from drawing conclusions.

Since April 2003, the hospital has changed its processes to take account of the opinion of emergency department staff in deciding whether or not to go red. This seems to have improved the situation and there is now greater consistency between the emergency department indicating it is full and the hospital going red. As a result, the frequency of code reds at Nepean Hospital has increased.

2.3 What influences decisions?

Apart from capacity measures, two factors were reported to influence whether or not to go red:

- code red being seen as an indicator of performance by hospital staff
- the need to provide an exception report on extended periods of code red and ambulance delays to the Department of Health.

External influences

In Liverpool and St Vincent's hospitals, the use of code red hours as an indicator of performance was less explicit than at Nepean Hospital. Although there were no performance targets for code red at these hospitals, staff reported that it was perceived as a measure of performance and that going red should be avoided.

This may be due in part to the Department of Health requirement that area CEOs notify the Department whenever there are:

- multiple back to back occurrences of code red
- delays to off load an ambulance patient greater than two hours. [4]

In each of the hospitals, a daily report was prepared for the CEO where the hospital had been red continuously for more than four hours (or in the case of Nepean for more than six hours) or ambulances had been delayed.

Staff reported that these requirements could lead to:

- periods of red being interrupted by a short break to avoid the need for an exception report
- ambulance patients waiting the longest being treated before those most in need.

The perception that code red is still an indicator of performance may be due to the fact that time spent on bypass was included in past performance agreements for area CEOs. It was removed with the introduction of EDNA.

2.4 The consequences of not going red

Ambulance crews require hospitals to honestly report capacity.

If an emergency department does not go red when it should, two key problems arise:

- the hospital does not implement patient flow strategies designed to help the emergency department return to normal
- ambulance crews will not know to divert.

Recommendation

In order to encourage accurate reporting on capacity by hospitals, the Department of Health:

- advise area health services that the use of code red targets to judge performance is not appropriate
- discontinue exception reporting on capacity and ambulance delays.

However, this should not remove the need to monitor how hospitals respond when they reach or are nearing full capacity.

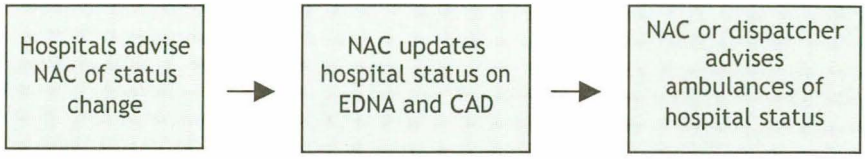
[4] The Department of Health requirements differ from one area to the next. For the Area Health Services that include Liverpool and St Vincent's Hospitals, CEOs must complete an exception report when three hospitals are red simultaneously or continuously for more than four hours. For Nepean Hospital, any continuous period of code red of more than six hours must be reported to the Department.

3. Reporting hospital status

3.1 Reporting status

Current arrangements for reporting and recording hospital status may affect the accuracy and timeliness of EDNA.

Advising ambulance crews



The system is updated manually and requires the Network Access Coordinator (NAC) to monitor ambulance delays and liaise with 24 hospitals. As a result EDNA is not always real time as there may be delays in updating EDNA or the Computer Aided Dispatch system (CAD), particularly if the NAC is busy.

Discrepancies in records

A review of hospital and EDNA records confirmed this. We found discrepancies in the start time, duration and frequency of code red (refer Appendix 2).

All hospitals recorded fewer instances of red than recorded in EDNA. This ranged from about 23 hours at Liverpool Hospital to 107 hours at St Vincent's Hospital. This may be due to:

- the Ambulance Service calling red and overriding a hospital's status
- hospital records differing from the advice they gave the Ambulance Service eg hospitals did not update their records at the time.

This is a problem only if the ambulance service calls red and they do not advise the hospital of the change. Hospitals may not then initiate patient flow strategies as required.

About 80 per cent of the decisions to go red were updated in EDNA within 10 minutes. However, in the remaining cases there were delays of more than 10 minutes, the longest ranging from 12 to 39 minutes. Delays of this extent could result in ambulances taking patients with less serious conditions to hospitals that are red.

Although EDNA should be representative, we believe that these records do not need to match perfectly for its intended purpose, which is to guide ambulance crews to the shortest queue.

3.2 Notifying stakeholders

All three hospitals had systems in place to advise relevant stakeholders of changes in a hospital's status. Stakeholders included hospital executive, bed managers, emergency department staff, nursing or medical divisions, and ambulance staff.

Case study 3: Best practice
Nepean Hospital had extended its notification procedures to include other hospital services and ensure a whole-of-hospital response to changes in status. Other services notified of status changes were transport services, domestic staff, medical imaging, pharmacy and allied health.

An Ambulance Liaison Officer (ALO) has also been appointed to each area by the Ambulance Service to assist communication and provide a link between emergency departments, hospitals and the Service. The ALO, NAC or after-hours Operational Manager are required to monitor ambulance delays and advise the hospital of any changes in status arising from extended periods of delay.

3.3 Access to EDNA

Access to EDNA, showing the status of all hospitals in the network was available to key staff at Nepean Hospital only.

Being able to view EDNA on-line would be advantageous. If hospitals know the status of hospitals in neighbouring areas they can better prepare for busy periods. Hospital staff would also be able to verify that changes to hospital status have been updated on the EDNA database.

Recommendation The Department of Health provide access to information via EDNA on the status of all network hospitals to key hospital staff, including the emergency department.

4. Does EDNA work?

4.1 Introduction

There are two key actions that must occur in response to changes in hospital capacity:

- ambulance crews divert less acute patients
- hospitals expedite bed management practices.

Both are intended to prevent ambulance crews from being delayed at hospital emergency departments.

4.2 Do ambulances divert?

There is currently no data on the number of ambulance diversions in response to changes in status. Although this was intended as part of the reporting framework, data on the number of ambulances redirected is not collected by the Ambulance Service. The Service advised that this data is difficult to collect from ambulance crews.

Presentations by ambulance

An indirect measure of diversion is changes in the number of ambulance patients presenting with less serious conditions. When a hospital goes red, these numbers should decline.

Preliminary work by the Department of Health indicates that decreases occur in most metropolitan hospitals.

Table 1: Change in the number of ambulance patients presenting with less serious conditions while red 2002-03

St George	-12.0%	Ryde	-3.2%
Prince of Wales	-9.9%	Sydney	-2.8%
Auburn	-9.6%	Sutherland	-2.6%
Canterbury	-9.4%	Manly	-1.8%
Royal Prince Alfred	-8.9%	Campbelltown	-1.8%
Blacktown	-8.8%	Concord	-1.4%
Westmead	-8.8%	Fairfield	-0.2%
Liverpool	-7.2%	Nepean	+0.8%
Royal North Shore	-6.8%	Hornsby / KuRingGai	+1.6%
Bankstown / Lidcombe	-4.6%	Mona Vale	+1.8%
St Vincent's	-4.2%	Camden	Note 1
Hawkesbury	-3.7%	Mt Druitt	Note 2

Source: Department of Health EDIS and EDNA data

Notes:
The table shows the difference in ambulance presentations while on green and red for Triage Categories 4 and 5.
Note 1: The Department of Health advises that the number of ambulance patients presenting in these categories to Camden Hospital is too small to be meaningful.
Note 2: The Department of Health advises that data is not available for Mt Druitt due to discrepancies in records during this period.

The most significant decreases occur in the principal referral hospitals. However, in some hospitals the proportion of less serious patients increased while on red. The Department of Health advised that this is because these hospitals are geographically isolated.

Factors affecting diversion

Ambulance officers and hospital staff report that the decision to divert will be influenced by:

- patient acuity
- patient choice
- patient treatment history
- patient age
- the type of services required
- transport time
- the status of nearby hospitals.

This means that patients with less serious conditions will still present by ambulance even when a hospital is red.

Diversion also has little effect when all nearby hospitals are red. Ambulance officers must then decide which hospital is the 'least red'. In these circumstances they generally go to the hospital with the shortest ambulance delays.

Likewise, EDNA is less effective where there are few alternative hospitals in the area that provide suitable levels of emergency care, such as hospitals on the outskirts of Sydney. These hospitals are more likely to continue to receive less acute patients even when they are red.

Although all of these factors may affect diversions, the final decision on where to transport patients still remains with ambulance crews.

4.3 Bed management practices

Preliminary work by the Department of Health shows that hospitals expedite bed management practices to improve patient flow in response to changes in status.

Analysis indicates that the rate of hospital admissions from the emergency department increases within four hours of going red.[5] However the increase is marginal, an average of 0.25 patients per hour. One hospital's admission rate decreased after going red.

[5] Department of Health analysis of ward admissions and EDNA data from October 2002 to June 2003.

4.4 Impact on ambulance delays

There are two measures of ambulance delays at hospitals:

- off-stretcher time (from arrival at hospital to patient handover to emergency department staff)
- turnaround time (from arrival at hospital to the time ambulance crews are ready to respond to other incidents).

Off-stretcher time

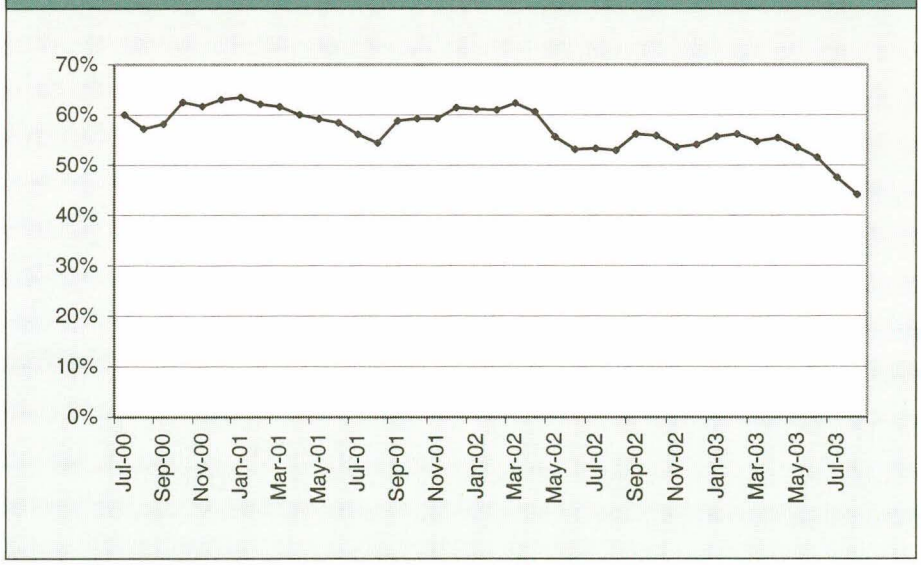
The most appropriate measure of ambulance delay is off-stretcher time. This is because it does not take into account the time taken to complete documentation or prepare the ambulance for the next call.

Off-stretcher time remained relatively stable during 2002-03, averaging 24 minutes. However in July and August 2003, average off-stretcher time increased significantly to more than 31 minutes.

Turnaround time

Off-stretcher time has only been measured since July 2002, whereas trend data is available on turnaround time. The proportion of ambulances meeting the benchmark for turnaround time has fallen since mid 2002, when EDNA was introduced.

Diagram 2: Proportion of ambulances achieving turnaround times of less than 30 minutes



Source: NSW Ambulance Service
Note: Data for Sydney Division only

Therefore there has not been an overall reduction in ambulance delays. The Ambulance Service reports that any delays are unacceptable and as a minimum, it aims to meet the benchmark for turnaround time of less than 30 minutes.

4.5 Limited capacity

Overall, EDNA appears to have had minimal impact on reducing ambulance delays and improving patient flow. This may be due to the fact that there is limited spare capacity in the network. The difference between remaining green or going red may be as little as four beds in the emergency department.

Hospitals report that it is increasingly difficult to improve patient flow when bed occupancy is high, nearing 100 per cent. They report that they frequently go beyond capacity or 'beyond red'. And going red does not necessarily relieve pressure in the emergency department as ambulance presentations represent less than a third of attendances.

The Department of Health is currently analysing data on the patterns of ambulance flow and the times and distances travelled by ambulances to hospitals. This may be useful in assessing the impact of EDNA but further work is required to gain an overall understanding of how EDNA works in practice.

Recommendation

The Department of Health and the Ambulance Service assess the impact of EDNA by reviewing a sample of:

- ambulance diversions in response to hospital status including the usefulness of ambulance diversion protocols
- patient flow strategies to determine if they return the hospital to normal operations.

Other reviews

The Department of Health is also participating in a review of patient access to hospital services by the Institute for Clinical Excellence. The review is examining access to operating theatres and diagnostic services, discharge practices and the causes of delays in the emergency department.

Appendices

Appendix 1 Audit criteria and acknowledgements

1.1 Audit criteria

Overriding hypothesis: That hospitals and the Ambulance Service follow Department of Health guidelines for determining emergency access codes and reporting hospital status.

1. The decision-making process

Assumption: Adequate systems are in place to support decisions on emergency access.

- Roles and responsibilities have been defined.
- Activity and capacity measures have been developed.
- Performance information on bed capacity is easily accessible (both in the hospital and the emergency department)
- Decisions are made in a prompt and timely manner by the appropriate authority.

2. Communication protocols

Assumption: Processes are in place to advise relevant stakeholders of a hospital's status.

- Communication protocols have been established.
- Liaison officers have been appointed.
- Relevant stakeholders are notified of changes in hospital status.
- Disagreements on hospital status are quickly and easily resolved.

3. Data accuracy

Assumption: EDNA data is accurate and complete.

- Emergency codes are routinely monitored and recorded.
- Hospital and ambulance records correlate.

1.2 Audit fieldwork

Site visits	Interviews
Liverpool Hospital	Hospital executive
St Vincent's Public Hospital	Bed managers
Nepean Hospital	Emergency Department staff
Paddington Ambulance Station	Directors of Nursing/Medicine
Randwick Ambulance Station	Ambulance Liaison Officers
Ambulance Operation Centre	Ambulance crews
	Department of Health and NSW Ambulance Service executive

1.3 Data sample

The audit reviewed a sample of hospital records from January to June 2003 to determine whether they matched EDNA records.

1.4 Acknowledgements

The Audit Office gratefully acknowledges the co-operation and assistance provided by representatives of the Department of Health, NSW Ambulance Service, and South Western Sydney, South Eastern Sydney and Wentworth Area Health Services.

1.5 Cost of the audit

The cost of the audit was $130,411, which includes printing costs of around $6,000.

1.6 Audit team

Jane Tebbatt, Tiffany Blackett and Sandra Tomasi.

Appendix 2 Data review

Table 2:	Review of code red hospital records January - June 2003						
	% of sample matched to EDNA start times					Total hrs code red	
Hospital	Exact match	+/- 5 min	+/- 6-10 min	+/- 11 min	No record	EDNA	Hospital
Liverpool	9	53	19	9	9	847h 10m	842h 22m
St Vincent's	17	33	28	22	0	1,007h 4m	900h 0m
Nepean	33	42	17	0	8	502h 29m	440h 10m

Source: Audit Office analysis of DOH and hospital records

Notes:

Results may not add to 100% due to rounding.

Sample size for each hospital: 10% of records

- sample size for Liverpool = 43
- sample size for St Vincent's = 46
- sample size for Nepean = 24

Performance Audits by the Audit Office of New South Wales

Performance Auditing

What are performance audits?

Performance audits are reviews designed to determine how efficiently and effectively an agency is carrying out its functions.

Performance audits may review a government program, all or part of a government agency or consider particular issues which affect the whole public sector.

Where appropriate, performance audits make recommendations for improvements relating to those functions.

Why do we conduct performance audits?

Performance audits provide independent assurance to Parliament and the public that government funds are being spent efficiently and effectively, and in accordance with the law.

They seek to improve the efficiency and effectiveness of government agencies and ensure that the community receives value for money from government services.

Performance audits also assist the accountability process by holding agencies accountable for their performance.

What is the legislative basis for Performance Audits?

The legislative basis for performance audits is contained within the *Public Finance and Audit Act 1983, Part 3 Division 2A*, (the Act) which differentiates such work from the Office's financial statements audit function.

Performance audits are not entitled to question the merits of policy objectives of the Government.

Who conducts performance audits?

Performance audits are conducted by specialist performance auditors who are drawn from a wide range of professional disciplines.

How do we choose our topics?

Topics for performance audits are chosen from a variety of sources including:

- our own research on emerging issues
- suggestions from Parliamentarians, agency Chief Executive Officers (CEO) and members of the public
- complaints about waste of public money
- referrals from Parliament.

Each potential audit topic is considered and evaluated in terms of possible benefits including cost savings, impact and improvements in public administration.

The Audit Office has no jurisdiction over local government and cannot review issues relating to council activities.

If you wish to find out what performance audits are currently in progress just visit our website at www.audit@nsw.gov.au.

How do we conduct performance audits?

Performance audits are conducted in compliance with relevant Australian standards for performance auditing and operate under a quality management system certified under international quality standard ISO 9001.

Our policy is to conduct these audits on a "no surprise" basis.

Operational managers, and where necessary executive officers, are informed of the progress with the audit on a continuous basis.

What are the phases in performance auditing?

Performance audits have three key phases: planning, fieldwork and report writing.

During the planning phase, the audit team will develop audit criteria and define the audit field work.

At the completion of field work an exit interview is held with agency management to discuss all significant matters arising out of the audit. The basis for the exit interview is generally a draft performance audit report.

The exit interview serves to ensure that facts presented in the report are accurate and that recommendations are appropriate. Following the exit interview, a formal draft report is provided to the CEO for comment. The relevant Minister is also provided with a copy of the draft report. The final report, which is tabled in Parliament, includes any comment made by the CEO on the conclusion and the recommendations of the audit.

Depending on the scope of an audit, performance audits can take from several months to a year to complete.

Copies of our performance audit reports can be obtained from our website or by contacting our publications unit.

How do we measure an agency's performance?

During the planning stage of an audit the team develops the audit criteria. These are standards of performance against which an agency is assessed. Criteria may be based on government targets or benchmarks, comparative data, published guidelines, agencies corporate objectives or examples of best practice.

Performance audits look at:

- processes
- results
- costs
- due process and accountability.

Do we check to see if recommendations have been implemented?

Every few years we conduct a follow-up audit of past performance audit reports. These follow-up audits look at the extent to which recommendations have been implemented and whether problems have been addressed.

The Public Accounts Committee (PAC) may also conduct reviews or hold inquiries into matters raised in performance audit reports. Agencies are also required to report actions taken against each recommendation in their annual report.

To assist agencies to monitor and report on the implementation of recommendations, the Audit Office has prepared a Guide for that purpose. The Guide, *Monitoring and Reporting on Performance Audits Recommendations,* is on the Internet at www.audit.nsw.gov.au/guides-bp/bpglist.htm

Who audits the auditors?

Our performance audits are subject to internal and external quality reviews against relevant Australian and international standards. This includes ongoing independent certification of our ISO 9001 quality management system.

The PAC is also responsible for overseeing the activities of the Audit Office and conducts reviews of our operations every three years.

Who pays for performance audits?

No fee is charged for performance audits. Our performance audit services are funded by the NSW Parliament and from internal sources.

For further information relating to performance auditing contact:

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* Better Practice Guides

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