

*ACT Health
Directorate
Emergency
Department
Information
System Data
Integrity
Summary
Report*

ACT Health Directorate

Emergency
Department
Information System
Data Integrity Review

29 June 2012

Private & Confidential

Dr Peggy Brown
Director-General
ACT Health Directorate
11 Moore Street
Canberra City

29 June 2012

Dear Dr Brown

Emergency Department Information System Data Integrity Review

Please find enclosed our report in relation to our Emergency Department Information System Data Integrity review.

Thank you to you and your staff for their assistance and cooperation in this matter.

If you have any questions in relation to the above please do not hesitate to contact me on 8266 2774.



Cassandra Michie
Partner
Forensic Services

Contents

1	Executive Summary	2
2	Background	2
3	Approach	2
4	Summary of key Findings	3
5	Recommendations	6
	Appendix A Steering Committee membership	

Disclaimer

This report has been prepared pursuant to our letter of engagement dated 1 May 2012 which fully sets out the scope of our review and nothing within this report is intended to imply that we have carried out any work beyond that scope.

For the purposes of preparing this report, reliance has been placed on the representations, information and instructions provided to us. We have not sought to verify the accuracy or completeness of the information made available to us, nor have we conducted any procedures in the nature of an audit of the information or assumptions therein in any way, other than has been specifically stated in this report. The report has been prepared subject to the provisions and qualifications stated herein, for the sole use of the ACT Health Directorate. PwC, its partners, its agents and servants specifically deny any liability whatsoever to any other party who may use or rely on the whole, or any part, of this report or to the parties to whom it addressed for the use, whether in whole or in part, for any other purpose than that herein set out. This report should not be used for any other purpose without PwC's prior written consent.

This report is prepared based on information made available to us up to the date of this report and we reserve the right to amend our opinions, if necessary, based on factual information that comes to our attention after that date.

Investigative Report

1. Executive Summary

We identified that an executive of The Canberra Hospital was responsible for a number of changes to Emergency Department (ED) data relating to wait times across triage categories 2, 3, 4 and 5.

These changes have primarily occurred since January 2011. There were 7,506 changes in 2011 equating to 11.9% of all presentations and 2,733 changes to April 2012 equating to 11.4% of all presentations. An executive of the ED has admitted to making changes to the data.

We note that there is a possible risk of other unidentified persons making changes to data some of which may date back to 2009.

2. Background

We were engaged on 1 May 2012 to provide forensic services to determine the integrity of ED records and processes, and other information assets with the ACT Health Directorate. The Directorate was advised by the Australian Institute of Health and Welfare (AIHW) on 5 April 2012 that there were some anomalies in the ED data submitted by the Directorate. The Directorate conducted preliminary investigations into the anomalies and determined that there were changes made to recorded wait times in the ED that were not in accordance with established processes and procedures. We were engaged to provide the services described in the terms of reference at Appendix C and outlined in the scope below.

We would like to acknowledge the assistance of the Steering Committee appointed to the project to provide external review and feedback on our investigative process and results analysis. Members of the steering group are listed in Appendix A

Emergency Department data is maintained within the Emergency Department Information System (EDIS). The anomalies reported by the AIHW and investigated during our review relate to the patient wait and discharge times. There are established benchmarks of performance set, that Emergency Departments are measured by and aim to achieve. These benchmark measures for KPI reporting are:

- Triage category 1 – immediately seen by a Doctor
- Triage category 2 – 10 minutes to be seen by a Doctor
- Triage category 3 – 30 minutes to be seen by a Doctor
- Triage category 4 – 60 minutes to be seen by a Doctor
- Triage category 5 – 120 minutes to be seen by a Doctor
- Discharge time – 240 minutes target benchmark to be admitted or discharged.

3. Approach

During our investigation of ED data we undertook the following steps for each scope item:

Data changes

We obtained a copy of the EDIS database from Shared Services ICT. Our computer forensics team analysed the data and focussed on changes made to data that were outside of established policy. We analysed the number of changes made outside of established policies to determine the extent of the invalid changes.

Data control processes

We interviewed key team members in the EDIS validation process and performed walk throughs of the validation process, noting areas for improvement to the control environment, including IT security controls.

Investigative response

We conducted interviews with Health Directorate staff that were involved in the investigative responses to concerns raised about EDIS data. We compared the processes undertaken by the Directorate to the ACT Government's Integrity Policy and the Directorate's fraud control policy and framework.

To corroborate the above information we also:

- Completed a physical search of the office of the individual of the Executive involved
- Made a forensic image of the desktop computer of the individual of the Executive involved and forensic images of all USB drives taken from the office were also made
- Completed a key word search of all electronic data - over 150,000 files.

4. Key Findings

4.1 Overall

We analysed the changes made outside of established policies by isolating the following amendments made to EDIS data;

- Changes that were made by generic log-ins such as NURSE, CLERK, DOCTOR or BEDMAN (changes made in accordance with policy at this time should be made by EDIS clerks or administrators using specific log-ins). The vast majority of the generic changes were made under the user name NURSE.
- Changes to a presentation's wait/National Emergency Access Target (NEAT) time in order to bring the minutes down from above the KPI threshold, to or to below the triage time threshold
- Changes made from the next day and up to 3 days following the patient's presentation.

In the table below we set out the number of Wait and NEAT times changed to or below the triage time threshold using the NURSE and BEDMAN -by triage category. The executive admitted to making changes using these log-ins. We have also calculated the average time changed, for example for triage category 3 in 2011 the original average triage time for these records was 89 minutes and averaged 28 minutes after the changes.

Year	Triage Category	Username	Wait Time Fixes	Wait Time Fixes (%) of all presentations	Average Wait Change	NEAT Time Fixes	NEAT Time Fixes (%)	Average NEAT Change
2009	2	NURSE	53	0.70%	21			
	3	NURSE	862	4.44%	58	5	0.03%	445
	4	NURSE	19	0.08%	93	12	0.05%	178
	5	NURSE	1	0.02%	30	2	0.04%	148
2010	2	BEDMAN	1	0.01%	17			
		NURSE	100	1.31%	24	2	0.03%	223
	3	BEDMAN	6	0.03%	198			
		NURSE	422	2.23%	67	5	0.03%	167
	4	BEDMAN	2	0.01%	38			
		NURSE	40	0.16%	103	21	0.08%	152
	5	NURSE	1	0.01%	57	4	0.06%	196
	2011	2	BEDMAN	30	0.35%	16		
NURSE			1109	12.79%	22	56	0.65%	50
3		BEDMAN	75	0.39%	50			
		NURSE	3887	20.11%	61	204	1.06%	54
4		BEDMAN	38	0.15%	47			
		NURSE	2080	8.02%	48	263	1.01%	56
5		BEDMAN	2	0.03%	48			
		NURSE	285	3.83%	37	52	0.70%	51
April 2012	2	BEDMAN	4	0.12%	19			
		NURSE	308	9.22%	16	11	0.33%	17
	3	BEDMAN	4	0.05%	46			
		NURSE	1288	16.78%	51	52	0.68%	35
	4	NURSE	1017	9.89%	47	81	0.79%	37
5	NURSE	112	4.68%	38	11	0.46%	60	
Total			11,746			781		

Table 1- Summary Report of Changes Made to Emergency Department Data

From 2009 up to and including April 2012, under the username NURSE and BEDMAN, we have calculated that there were approximately 11,700 records or 6% of total records that were changed to or below the KPI threshold limit. From January 2011 to April 2012 approximately 10,200 Wait time records were changed, 7,506 or 11.9% in 2011 and 2,733 or 11.4% in 2012. The majority of the changes were made to Triage Category 3. There were 781 NEAT time records changed, just less than 1%. From January 2011 these changes were made between 6-7 days per week, often out of office hours.

We note that the average wait time for the records changed was significantly lowered, where for example for Triage category 3 the time was reduced by 61 minutes in 2011 and 51 minutes in 2012. Although we note that there were some large outliers where the original maximum hour range was up to 9.6 hours

The executive has admitted to making changes to ED data using the NURSE and BEDMAN log-ins. She stated that she undertook the changes on her own initiative, no one had

suggested or applied pressure for the records to be changed and she does not believe that anyone else was aware of the changes. The individual stated that the reason for making the changes was to improve the wait time performance and discharge times of the ED at The Canberra Hospital. It was stated by them that; "the only that thing that worked to achieve benchmark targets was to alter the data".

Through our review of computer files, emails, correspondence and interviews there was no indication that the changes were being made under the direction of senior management.

Based on our data analysis it is possible that other people may have been making improper changes to the data due to the following:

- During January 2009 and April 2012 between the hours 9am to 5 pm there were 2,578 changes to data to bring figures to at or below the KPI criteria using the NURSE log-in. The individual stated that these hours were not the usual hours she was able to make changes to data
- There were a series of minor unusual record changes in 2009 which the individual denies making
- The individual claims to have only made on average 20 changes per day. Data evidence indicates changes- using NURSE username- of up to 120 for a given day, therefore it is possible that others may have been making changes
- Since 2009 there were a number of changes using the DOCTOR log-in and in particular on 17 and 18 September 2011 there were approximately 40 changes to using the DOCTOR log-in. The executive denies using the DOCTOR log-in
- The executive stated during her interview that she had noticed some records that she had planned to change had already been changed, but she did not know who had made the changes and could not provide details of specific cases.

4.2 Data control processes

The policy documentation relating to EDIS is limited and the most recent official release was in May 2009. There is no official documentation of procedures in relation to EDIS administration, including user access management, validation procedures or reporting. Our walkthrough of data control processes identified the following issues:

- **No access controls:** Access to the EDIS system is provided by having the EDIS application installed on a terminal and user names and passwords being provided by the EDIS administrator. There are over 240 user ID's as well as four generic user ID's (NURSE, DOCTOR, CLERK and BEDMAN) that the majority of user access is provided through. In addition, the EDIS system records every terminal that accesses the EDIS database as 'workstation 14', making it impossible to detect the terminal from which particular changes are made.
- **Monitoring user access:** Responsibility for administration of the EDIS system is not clear between shared services ICT and the ED. This results in a lack of clarity for the responsibility of managing and monitoring user access. There are over 200 known instances of the EDIS application being installed on desktop computers within the Health Directorate and management of user access requests is not documented with the majority of users granted access via generic log-ins.
- **Lack of validation of final data:** The EDIS validation process conducted by the EDIS administrators is limited to validating breach reports. Breach reports identify where the time a patient has been seen by a Doctor has not met the established benchmarks. EDIS administrators then validate whether there is a legitimate reason why the time seen by Doctor may be changed. This process does not validate other

times seen by Doctor that are within the established benchmarks.

- **Long period for changes to be made:** The EDIS system remains open for changes to be made up to 3 days after a patient presents to the ED. This results in a window of opportunity to make changes after the EDIS administrators have performed the validation of breach reports.
- **No data analysis of record changes:** At the time of the invalid data changes there were no reports being generated within the Directorate to analyse high level patterns of wait times.

4.3 Investigative response

February 2012

Concerns were raised by administrators that they had identified changes to the ED data. This was reported to a member of the executive, the person who was later identified as being responsible for the changes. That person at the time claimed to have investigated the matter and stated that the changes were due to a system error and that no further investigation was warranted. Based on interview evidence, other senior executives do not appear to have been made aware of the issue.

According to the Health Directorate's Fraud Control Policy the matter could have been reported to the Senior Executive Responsible for Business Integrity Risk (SERBIR), however, at this stage there was no evidence that a manager or director was involved and therefore there are no specific requirements to do so. In accordance with the Fraud Control Policy the matter should have been documented, if it had been identified as a breach in data integrity. According to the information we have received it was not treated as a breach and was therefore there was no specific documentation requirement.

April 2012

The investigative response to concerns raised by the AIHW in April 2012 was appropriate and in accordance with the fraud control policy.

4.4 Interview findings

We conducted a number of interviews of Emergency Department executives and administrative staff. Overall interviewees stated that they were not aware of the data changes and were not aware of any directive or pressure to change ED records.

5. Recommendations

We contacted a number of Emergency Departments in other States (NSW x 3, QLD x 2, WA x 2) and understand that data integrity, reliability and accountability are of major concerns to a number of these Emergency Departments. The common issue faced is determining that the information entered under a particular user name is actually entered by that individual user. The practice of requiring individual log-ins has proven problematic in other Emergency Departments as common practice then evolves to not log-out of the system so that the one user ID is accountable for all changes made in a shift or day.

This issue also appears to compromise hospitals meeting the documentation and accountability standards required to successfully achieve accreditation.

Our recommendations are for consideration by ACT Health and are designed to address the immediate risk of systemic changes being made to ED data. The recommendations need to be assessed in terms of priority, expense and should not be implemented in any way that compromises the delivery of care to Emergency Department patients.

1.1 Recommendations

We contacted a number of Emergency Departments in other States (NSW x 3, QLD x 2, WA x 2) and understand that data integrity, reliability and accountability are of major concerns to a number of these Emergency Departments. The common issue faced is determining that the information entered under a particular user name is actually entered by that individual user. The practice of requiring individual log-ins has proven problematic in other Emergency Department's as common practice then evolves to not log-out of the system so that the one user ID is accountable for all changes made in a shift or day.

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Recommendation 1 – data changes require explanatory note

Changes to the time/date fields should require an explanatory note to be entered that is viewable. This will allow clarity in who made the change and the reason for any alteration to data that affects KPI outputs.

Management Response: Agreed.

The Health Directorate will seek both technical advice on how explanatory notes can be entered and clinical advice on any potential impacts on ED work flow.

Recommendation 2 – data analysis to be conducted of data changes

The EDIS administrators' validation checks should include running a check (on a sample basis) for time adjustments to triage times, seen by doctor times and discharge times that occur after the initial time entry occurs. This will allow visibility of the number of data fixes occurring at any given time.

Management Response: Agreed.

The Health Directorate will seek technical advice in developing a protocol on validation checks within EDIS.

Recommendation 3 – data analysis of time distribution patterns

As part of the validation process performed each month a time distribution for each of the KPI time categories should be run, this additional data analysis performed by a team independent of the ED should allow early detection of unusual time patterns in the data.

Management Response: Agreed.

A protocol will be developed that sets out all additional processes to maximise data integrity, including validation processes that are to be performed independently of the ED.

Recommendation 4 – system to logout after period of inactivity

The computers used to enter EDIS data should log-out after a short period of time if no activity has occurred eg; 60 seconds. This should help prevent staff being 'locked –out' of the system and unable to log-in using their own unique identifier.

Management Response: Not agreed.

Health Directorate consider that implementation of this recommendation will have an adverse impact on clinical workflow and timeliness within the ED. The Health Directorate is currently progressing the development of an Identity Access Management and Rapid Sign-On system that when implemented, will deliver a timely log-on and unique identifier for all users. At that time, it may be that a log-out after a short time period such as 60 seconds may be able to be implemented without adverse effect on the workflow.

Recommendation 5 –system lock after data validation

The Directorate should investigate implementing functionality that locks EDIS for editing after the EDIS administrators have run their validation checks and error correction. This will have the effect that any changes required after this time will require an EDIS administrator to be involved.

Management Response: Noted.

Technical advice will be sought in relation to the availability of the functionality suggested in this recommendation and if it is available, any associated cost implications. However the Health Directorate believes that this recommendation will become redundant when the other agreed recommendations are implemented.

Recommendation 6 - review extent of staff access rights

There needs to be review conducted of the current access to EDIS within the Canberra Hospital. User ID's that are no longer required should be deleted and computers that do not require access to EDIS should have the access removed.

Management Response: Agreed. Access will be reviewed to delete redundant user ID's and restrict EDIS access to the minimum number of computers required whilst ensuring that delivery of care within the ED is not compromised.

Recommendation 7 –review of need for generic logins

A review of the use of generic log-ins should occur to identify where there may be suspicious activity, parameters for the review could include post 24 hrs after the patient has presented and the last change being made by a generic log-in. Further consideration could be made to removing all generic user profiles.

Management Response: Agreed

A protocol will be developed that sets out all additional processes to maximise data integrity, including checks for suspicious activity. Any change to generic log-ons will need to be ensure that the clinical workflow within the ED is not compromised; however it is unlikely that all generic user profiles could be removed in the short term. Consideration will be given to the option of removing all generic user profiles once the Identity Access and Management system and the Rapid Sign on system are fully implemented

Recommendation 8 – establish unique staff logins

The Directorate should continue to investigate the introduction of a system to rapidly log-in to EDIS using a unique staff identifier. This would facilitate rapid individual log-ins for data entry and data changes and allow better tracking in audit logs of any data changes.

Management Response: Agreed.

The Health Directorate is currently progressing the development of an Identity Access Management and Rapid Sign-On system that when implemented, will deliver a timely log-in and unique identifier for all users.

Recommendation 9 – system to capture unique computer identifiers

Individual computers should have unique identifiers so that the actual computer and its location is registered in the system for each occurrence of data entry or modification. This will allow the tracking of the location of computers that are used to enter or make any changes to data in EDIS.

Management Response: Agreed in principle.

Individual computers within Health Directorate do have individual asset numbers but this is not currently reflected within the EDIS configuration. Technical advice will be sought on the requirements for configuring the system to recognise individual computers and any associated cost implication.

Recommendation 10 – update any policy documentation for above changes

The policy documentation in relation to EDIS validation should be updated to incorporate the procedures to be followed by EDIS clerks and administrators, noting the above recommendations to EDIS procedures.

Management Response: Agreed.

Implementation of this recommendation will be undertaken as part of a broader review of the EDIS governance system.

Recommendation 11 – consider need to amend public reports

The Directorate should – where appropriate -amend publicly reported data by adjusting the achievement of targets by removing the invalid changes identified in this report.

Management Response: Agreed.

The Health Directorate will seek advice from PricewaterhouseCoopers on the most appropriate methodology to adopt to adjust the published data on the achievement of ED timeliness and wait time targets from 2009 – 2012.

Recommendation 12 – training of staff

There should be further training for hospital staff at all levels on their responsibilities regarding the importance of all policies, procedures and controls and also their obligations and mechanisms to report suspicions of fraud.

Management Response: Agreed.

Health Directorate will undertake a broader strategy to educate staff on integrity and values based behaviour in line with the Code of Conduct. Responsibilities in relation to fraud reporting and controls will comprise one element of that broader agenda.

Appendix A

Steering Committee Membership

- 1) Darlene Cox
Executive Director
HCCA
- 2) Diane Merryfull
Senior Assistant Ombudsman
ACT Ombudsman
- 3) Prue Power
Chief Executive Officer
Australian Healthcare and Hospitals Association
- 4) Christine Brill
Chief Executive Officer
Australian Medical Association (ACT) Limited
- 5) Geoff Knuckey
Independent Chair
Health Directorate Audit and Risk Management Committee
- 6) Doctor Paul Lamberth
Calvary Health Care ACT