



CLINICAL  
EXCELLENCE  
COMMISSION

# CLINICAL FOCUS REPORT

FROM REVIEW OF RCAS AND/OR IIMS DATA



## Diagnostic tests

How access and follow-up affect patient outcomes

September 2011

**Patient**  
*safety*   
looking ■ learning ■ acting

This report was prepared by the Clinical Excellence Commission (CEC) Patient Safety Team.

The information contained has been de-identified and analysed in accordance with the Incident Information Management System (IIMS) datasets and where relevant, the agreed root cause analysis (RCA) report classification sets used by the RCA Review Committees which it supports.

It should be noted that all reviews of incident data, including root cause analysis, are retrospective and can reflect both hindsight and outcome bias. Such reviews are conducted to better understand the impact which patient, system and human factors may have on the provision of clinical care and to facilitate ongoing improvement across the health system.

This report is intended to provide a snapshot of issues to be further explored. It has been prepared by the Patient Safety Team, including Margaret Scrimgeour, Dr John Sammut, Dr Tony Burrell and Bronwyn Shumack, in consultation with local health district, Agency for Clinical Innovation and Health Support Services staff.

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## Foreword

The role of the Clinical Excellence Commission (CEC) is to assist NSW Health staff to provide patients with the best possible care for their conditions.

Analysis of aggregated information from the NSW Incident Information Management System (IIMS) is one of our best tools to identify potential gaps in quality care. We also evaluate root cause analyses conducted after serious clinical incidents. Possible solutions for the issues identified are developed and validated by clinical staff and managers. This is coordinated by the CEC and the Clinical Risk Review Committee.

This report is one of a series developed from this analysis process. Previous analyses and reports have triggered system-wide improvements, such as the Sepsis Kills Project, as well as raising awareness at the clinical level. This report, on access and use of diagnostic test results, also contains recommendations for system-wide improvements.

We greatly appreciate your interest in this report and look forward to your feedback.

A handwritten signature in black ink, which appears to read "Clifford Hughes". The signature is written in a cursive, flowing style.

**Prof Clifford Hughes AO**  
**Chief Executive Officer**

September 2011



## Background

Diagnostic tests are an integral part of clinical diagnosis and subsequent care planning. Failure to review or respond to these test results means that decisions may be made on incomplete information. This poses a significant risk to patient safety, informed decision making and quality of care.

The CEC root cause analysis (RCA) review process identified a number of reports which strongly suggested that the failure to review and/or follow-up test results was a contributing factor to serious incidents. Communication issues are often cited in incident reviews, however, the patient safety team suspected the causes were much more complex and related to the work environment as a whole. This review sought to understand the complexities of the failure to review and/or follow-up test results, with a view to identifying the key contributing factors and possible solutions.

## Method

The CEC root cause analysis (RCA) database was searched on 4 August 2010, to identify all SAC1<sup>1</sup> clinical incident reports where issues associated with diagnostic testing results had been noted during routine review processes. The classifications attributed to these reports by the RCA Review Committee were aggregated.

The Incident Information Management System (IIMS) was also searched on the same date to identify SAC2 incidents where diagnostic tests (investigations) were flagged by the notifier as an issue. Incident reports which contained insufficient information for reviewers to understand what happened were excluded from the final analysis.

All reports underwent content analysis and classification to identify common factors and themes related to the review and/or follow-up of diagnostic test results.

Classification sets included those used by the RCA Review Committees, namely:

- IIMS clinical management principal incident type (PIT) sub-classification
- system factors
- human factors.

Further sub-classification applied to the reports included:

- **Investigation results delayed**

Formal results of investigations performed were not available to clinicians when making management decisions, e.g., CT scan results.

- **Investigations delayed**

Tests were ordered but there was a delay in completing these tests.

- **Abnormal results not notified**

Clinicians were not notified when tests results were significantly abnormal, required immediate action or there was an unexpected finding.

- **Review of results delayed/did not occur**

Formal investigation results were either not reviewed or the review was significantly delayed and impacted on the clinical outcome.

- **Inappropriate or no action taken in response to results**

Abnormal results were misinterpreted resulting in inappropriate or no action.

*Note: RCAs may have more than one classification assigned. For example, an abnormal result may not have been notified AND the result may not have been reviewed.*

Discussion about the identified themes occurs throughout the document. This is supported by case studies based on real incidents. Comments received from clinicians and others have also been included in the discussion points as relevant to the themes/findings. They have not been attributed to individuals, because many were collated by health services or organisations before submission.

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<sup>1</sup> The Severity Assessment Code (SAC) is used to rank the outcome for the patient when an incident occurs. SAC1 indicates a serious outcome, such as a procedure involving the wrong patient or an unexpected death. SAC4 indicates there was minimal or no harm and includes near-miss incidents.

## Findings

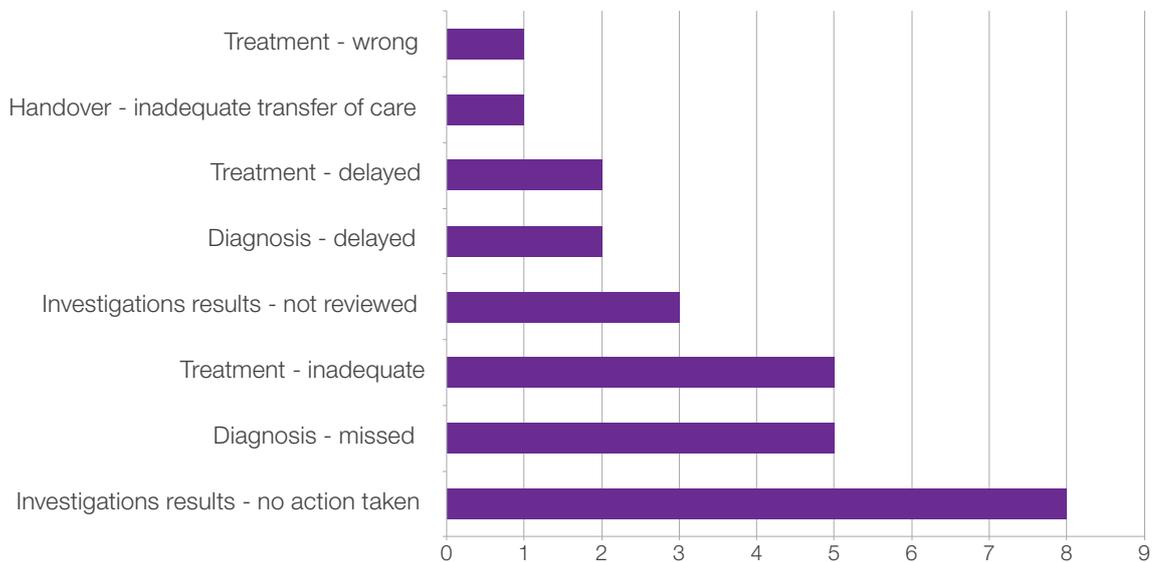
Twenty-seven SAC1 clinical RCAs met the criteria for further review. One hundred and ninety-eight SAC2 incidents were identified in IIMS, however, only 103 provided sufficient information for further analysis. The findings have been presented under sub-headings to assist the reader.

### Clinical Management Sub-classifications

The clinical management sub-classifications applied by the RCA Review Committee are shown below. Classifications are determined by group consensus before being recorded in a CEC database to facilitate future reviews. Only one clinical management sub-classification is applied to each RCA report.

Figure 1 shows the sub-classification applied to each of the 27 RCA reports reviewed.

**Figure 1: Clinical management sub-classifications assigned by the RCA Review Committee**



The following examples from RCA reports demonstrate what can happen when results are not reviewed.

## CASE 1: RESULTS NOT REVIEWED

An elderly patient was admitted through the emergency department with persistent hematuria. He was admitted under an urologist, who planned a cystoscopy the next day. Pre-operative work-up included a chest x-ray which was not reviewed during the admission. The patient had an uneventful recovery from the procedure and was discharged. His discharge summary made no reference to the chest x-ray. He presented to another facility 18 months later for a lung biopsy and required a right upper lobectomy. Review of the x-ray from his previous admission revealed a lung lesion. There was no record that the x-ray report, which identified the lesion, had been reviewed by his clinical team. He experienced complications following the chest surgery, requiring ICU care. He never recovered.

This case raises issues around who is responsible for reviewing results of routine tests ordered during pre-operative assessments. Should it be the pre-operative clinic, or the team providing the surgical care? It also raises issues around notification of unexpected findings and the completeness of discharge summaries. In this case, the RCA team's recommendations focused on:

- processes for review of investigation results
- education about discharge summary completion
- communication strategies related to significant and unexpected findings, including flagging an abnormal result in Powerchart
- communication processes where follow-up by a general practitioner is required.

There are varying views about who is responsible for checking and communicating test results. These include responsibility being assigned to:

- the anaesthetist reviewing the patient in the pre-admission clinic
- the emergency department clinicians who facilitate the tests prior to admission
- the admitting team
- the clinician ordering the test.

Casalino et al (2009) suggest that failure to inform patients of abnormal results and failure to document that the patient has been informed are common (one in every 14 tests) and are legally indefensible factors in malpractice claims.

Fitzgerald (2010) cited a recent case in the Medical Insurance Group (MIG) Bulletin which clearly demonstrates this. "On the 23 December, Susan was referred by her GP for a 19-week morphology scan. She attended for the scan on 28 December. The radiologist prepared the report the following day, noting a number of foetal abnormalities. The radiologist recommended a follow-up foetal MRI. The report was faxed and mailed on 29 December to the GP. That same day, Susan collected the scans from the radiology centre, but noted that the report was not included. She presumed that the GP would contact her if anything was wrong. In early February she consulted a different GP in the same practice and was advised of the results of the scan. A MRI was done urgently and confirmed severe abnormalities.

*Proceedings were issued against the GP, the general practice entity, the radiologist and the radiology practice. The claim for damages was based on the delay in the communication of the abnormal morphology scan and the failure of the GP to follow-up the results. MIG obtained a legal opinion that concluded, in particular, that there was significant risk that the court would regard the radiologist's failure to attempt to verbally contact or alert the GP to the urgency of the report was a breach of his duty of care. MIGA noted that: the Royal Australian and New Zealand College of Radiologists and the Royal College of Pathologists have similar expectations: that those preparing the report have obligations to report unusual, urgent or significant unexpected findings to the referrer in a timely manner."*

While this case relates to general practice, it has relevance to the health care system.

## CASE 2: RESULTS NOT REVIEWED.

A patient with severe respiratory failure and complications from abdominal surgery underwent a surgical tracheostomy. Twelve hours after the procedure, the tracheostomy tube dislodged. The patient had a total down-time of 25 minutes before an adequate airway was established. He suffered irreversible hypoxic brain damage.

The RCA team found that the patient had undergone an uncomplicated insertion of the tracheostomy tube and a routine x-ray to confirm placement. The x-ray, which showed the tracheostomy tube was only just in the trachea, was not reviewed. If it had been, action could have been taken to correct the tube placement and prevent dislodgement.

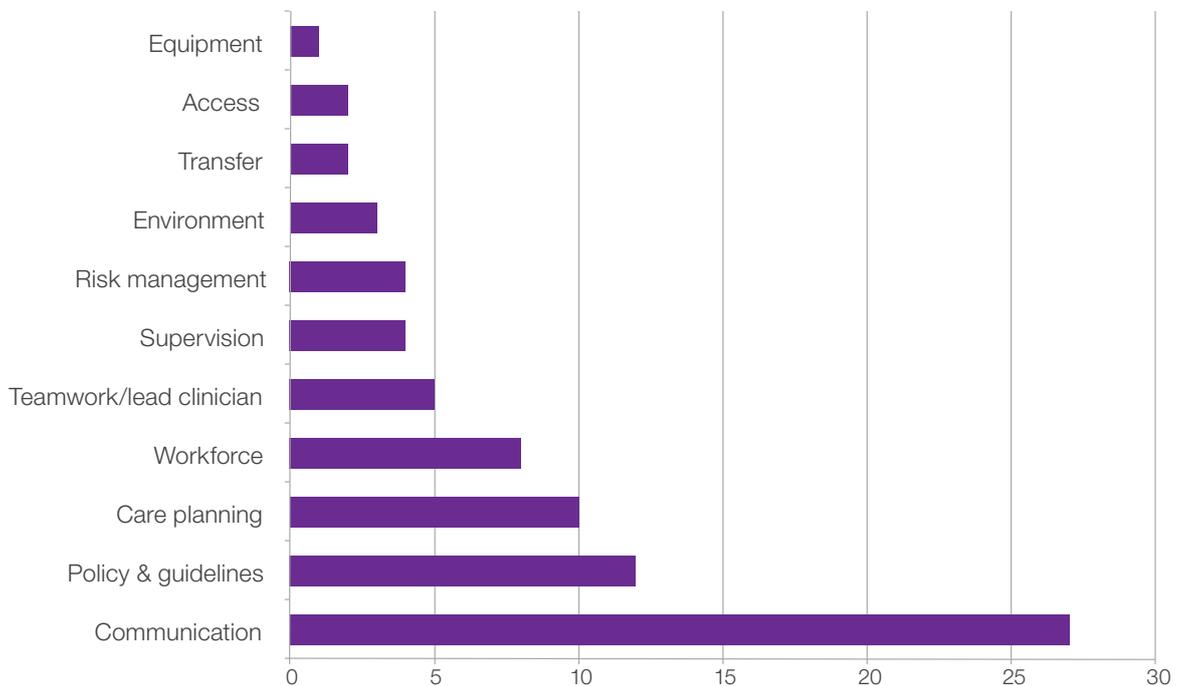
While this case raises issues around airway management following tracheostomy tube dislodgement, it again highlights the fundamental problem of not reviewing routine tests, which are prescribed to confirm safe and effective treatments.

The RCA team made a recommendation focused on the timely review of post-procedure x-rays and the communicating and documentation of results.

### System Factors

Each RCA report is reviewed to identify system factors which may have contributed to the incidents. These are classified by broad category, as shown in Figure 2.

**Figure 2: System factors assigned by the RCA Review Committee**



As shown above, communication and knowledge of, and compliance with, policy and guidelines were the most common system factors identified.

## Human Factors

This category reflects the behaviour lapses and other human characteristics, where they can be identified from RCA reports. Few reports contain evidence of investigation continuing down to the level of the human factors, which underlie the actions and decisions of those involved in incidents.

The following human factors were identified in the 27 RCAs reviewed:

- Cognitive error . . . . . 11
- Skill-based error . . . . . 1
- Violation . . . . . 2

## Clinical Investigation Sub-classification

Issues about reviewing and/or interpreting investigation results were identified as either primary or secondary contributing factors in the RCA reports reviewed, as shown in Figure 3.

**Figure 3: Issues related to clinical investigations from RCA reports**



The failure to review results, including prior to discharge, was seen in four RCAs. The following case shows the risks associated with discharging a patient before tests results are reviewed.

### CASE 3: RESULTS NOT REVIEWED PRIOR TO DISCHARGE

A middle-aged man presented with central chest pain. While he had no cardiac history, he did have risk factors and a family history of myocardial infarction. He was triaged as category 3. Observations were pulse 130, B/P 125/75 respiratory rate 18 and oxygen saturations 99 per cent in room air. The patient described feeling light-headed and nauseous. He was placed on a monitor, had diagnostic investigations, including Troponin levels, an ECG and chest x-ray completed. All tests were documented as normal and the patient was discharged five hours later. He was advised to have a stress test.

He re-presented 36 hours later, this time by ambulance. Again, he gave a history of central chest pain, diaphoresis and dizziness with mild disorientation, when lying flat.

Ambulance officers had administered aspirin, inserted an IV cannula and provided oxygen therapy. On arrival he was again triaged as category 3. Observations were similar to his first presentation. Prior to being seen by the treating clinician, baseline investigations, including Troponin levels and an ECG were undertaken.

The patient was seen by the treating clinician about two hours later. He was discharged. The treating clinician was unaware that further blood tests, including Troponin levels had been done. As a result, the results were not reviewed.

The next morning the patient was found unresponsive and could not be resuscitated.

During investigation, it was found that he had a positive Troponin on the second presentation. This result was not seen before he arrived in an asystolic cardiac arrest.

This case raises a number of issues, including management of acute coronary syndrome, clinical supervision, communication and workforce issues. It also highlights a situation where the treating clinician was unaware of tests being ordered by other members of the team. This ultimately resulted in the patient being discharged with a positive Troponin.

In a study examining the prevalence, characteristics and physician awareness of potentially actionable test results returning after hospital discharge, Roy et al (2005) found that physicians were often unaware that tests were done and that potentially actionable results were pending.

### CASE 4: ABNORMAL RESULTS NOT NOTIFIED

An elderly patient was admitted with a two-week history of diarrhoea. She had blood taken for testing by a private pathology service. Several of the results were abnormal. They were phoned and faxed to the hospital and communicated to the treating medical officer. Treatment was ordered, based on these abnormal results (only low potassium was noted in the RCA report). Further tests two days later revealed critically abnormal results, requiring urgent action. (They were not specified in the report). Neither the treating medical officer, nor the hospital staff were notified of these results and therefore no action was taken. The patient was found dead the next day.

While this case raises other issues of care, it also highlights the need for robust processes to ensure that all critical results are notified and acted on appropriately.

The RCA team's recommendations focused on:

- the need for direct communication with clinicians
- identification of what results must be notified
- policies and procedures for all staff to manage critical results.

## CASE 5: INVESTIGATIONS DELAYED

A 45 year-old female patient was admitted following a motor vehicle accident. She underwent both primary and secondary surveys in a standard trauma response. X-rays showed leg fractures, which were surgically managed. The cervical spine was cleared in the emergency department. The following day a registrar conducted a tertiary survey which included a full physical assessment and review of x-rays and other tests. The cervical spine x-rays were not reviewed.

The patient complained of back pain and subsequently underwent further thoracic and lumbar x-rays. These were reviewed the following day when the case was discussed. The cervical x-rays were again not reviewed. The team was unaware that they had not been reviewed during the tertiary survey. During the next few days, the patient's post-operative recovery was uneventful, except for back pain which was not localised. When her hand became numb, staff did not consider the possibility of a cervical spine injury, because this had previously been cleared. (The cervical spine x-rays were later found to be inadequate, because C7 level was not well defined and the pre-vertebral tissue was also unclear). A CT scan was ordered during the weekend, but not marked urgent.

A full neurological examination on the Monday identified numbness of the hand. Communication with the radiology department ascertained that the CT scan was booked for the following day. This was considered acceptable. The treating consultant was not notified of the neurological symptoms. In the early hours of Tuesday morning, the patient complained of increasing numbness and pain when being moved. A MET call was made and she was found to have a paralysing injury. Despite this and the team's sense of urgency, she was unable to access an MRI or CT scan for a further six hours.

The patient had acute tetraplegia at C6 and required surgical reduction and fixation of spinal injury at 6<sup>th</sup> and 7<sup>th</sup> cervical vertebra level.

This case reflects issues around trauma management processes, the adequacy of radiological tests in potential spinal injuries, communication, senior clinician input, access to, and prioritisation processes of, diagnostic tests. The RCA team found no root cause and therefore made no recommendations. Opportunities for improvement, however, did focus on:

- ordering and processing of radiology tests, including prioritisation processes
- standards for radiological tests in suspected spinal trauma
- protocols for cervical spine clearance.



## SAC2 INCIDENTS

SAC2 incidents were also reviewed. They were considered in terms of:

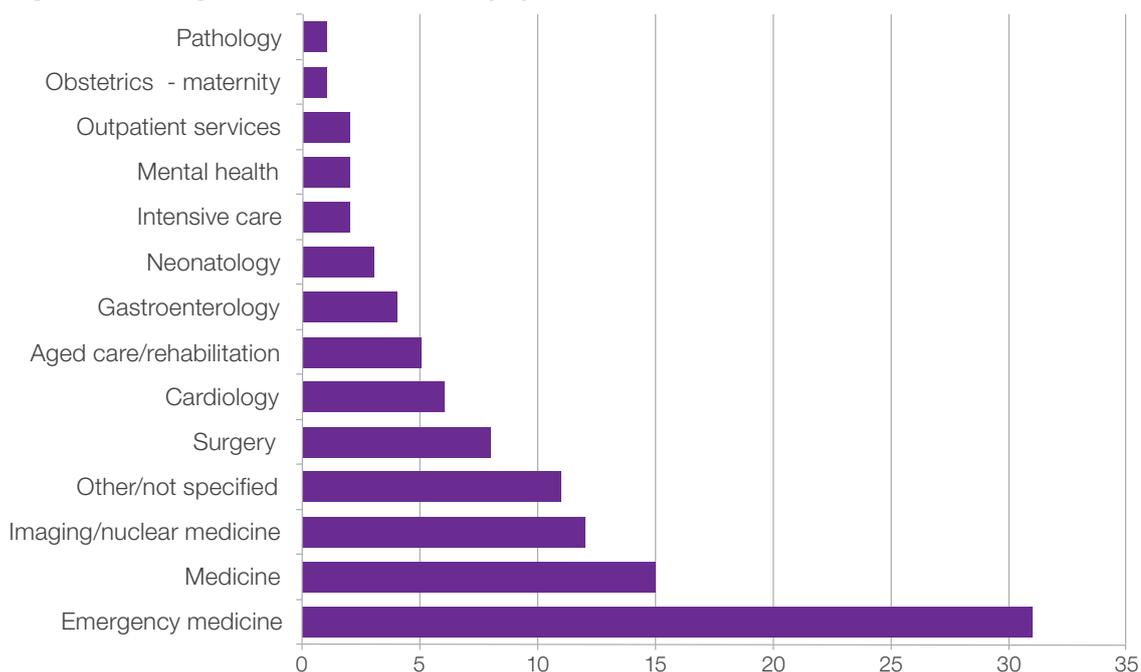
- which service was involved
- what the notifier considers to be the problem
- which investigation classification could be assigned.

This process was somewhat limited by the information contained within the notification. There was wide variation in how incidents were notified and documented in IIMS. There also appeared to be inconsistency in how SAC2 incidents were reviewed. Information in the IIMS notifications, including manager's reviews, often reflected the immediate clinical management at the time of the incident, rather than analysis of contributing factors. A number of incidents had no details of related to review of the incident. Some, however, did reflect a thoughtful investigation, with clear identification of the system failures and most importantly, possible solutions.

### Specific Service

More than one specific service can be selected in IIMS. For the purpose of this review, only the primary service by broad category is identified.

**Figure 4: Investigation-related incidents by specific service**

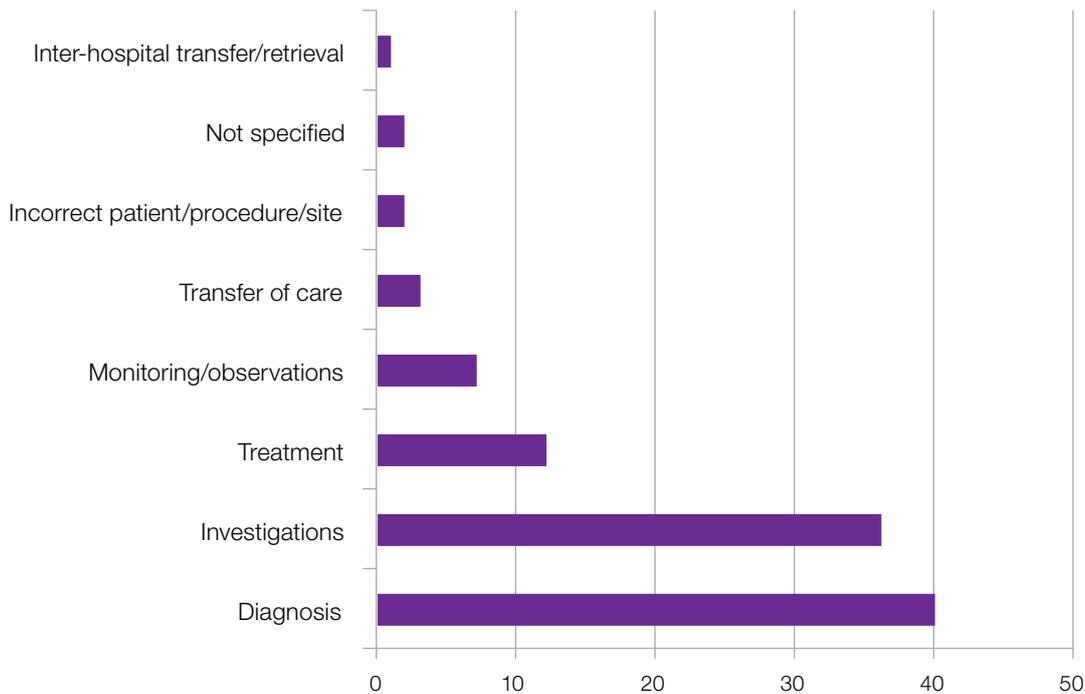


As noted above, the emergency department is cited most frequently. This must be viewed with consideration given to the numbers of patients seen, the number of tests performed and results requiring review, prior to the patients being discharged.

## Problems identified by the notifier

Within IIMS, the notifier has the opportunity to identify the primary problem. This is not a mandatory field, but when completed, provides further insight into the circumstances surrounding the incident. Figure 5 shows how incidents were classified by the notifier.

**Figure 5: SAC2 incidents - problem identified by the notifier**



Issues related to diagnosis and investigations were most commonly identified.

## Investigation Classification

The SAC2 incidents were classified using the same investigations subset as the RCAs, as shown in Figure 6.

**Figure 6: SAC2 Incident investigation subset classification**



## CASE 6: DELAYED INVESTIGATION

A 37 year-old patient had a PACE (pre-arrest criteria for escalation) call at 2100 due to a drop in Glasgow Coma Scale (GCS) score, left facial droop, right hand tremor and sudden severe headache.

The neurology registrar requested an urgent CT scan. The radiology registrar refused to perform the scan, stating that there were not enough indications of urgency. He advised continued monitoring and said he would undertake the scan if there was further deterioration, otherwise it could wait until the morning. There is no evidence that the admitting medical officer or radiologist on call was contacted to discuss urgency.

The PACE was escalated to an Advanced Life Support call. No information was provided about why this occurred. The outcome was not documented.

While the outcome for the patient is not known, one could speculate that there was further deterioration. The incident raises issues about who determines whether/when an investigation is required and how competing priorities are balanced against the duty of care.

## CASE 7: DELAYED ACCESS TO FORMAL RESULTS

An elderly patient presented following a fall. A head CT scan was performed. Documentation by the ED clinician reflects that the radiology registrar reported no acute haemorrhage. The patient was subsequently discharged. A formal report dated 23 days after the presentation was reviewed by the emergency department director. It indicated that the patient had a haemorrhage in the left frontal and posterior left temporal lobes of "likely traumatic origin". When recalled by the emergency department, the patient reported two weeks of headaches, but fortunately had no obvious neurological deficits. The patient had a repeat non-contrast CT scan and was referred to a neurosurgeon. The outcome is not documented.

The factors documented by the notifier were:

- a relatively junior registrar reviewed the CT scan and may not have had the experience to identify subtle abnormalities
- There are inherent risks associated with delayed reporting of diagnostic tests.

## CASE 8: RESULTS NOT REVIEWED/ACTED ON

A patient presented in 2005 with loss of vision in his left eye. Blood tests taken at the time were abnormal and indicative of sarcoidosis. Serum angiotensin converting enzyme was markedly elevated at 79 (normal < 40). For no apparent reason, these results were not acted upon. One could speculate that they were not seen, or were seen but misinterpreted.

The patient re-presented in 2009, this time with reduced vision in the right eye. Sarcoidosis was identified as the cause. The missed diagnosis of sarcoidosis was considered to be the cause of loss of vision in his left eye. A CT scan of his lungs was also highly consistent with sarcoidosis.

This incident again raises questions about who is responsible for reviewing and acting on diagnostic tests.

Another issue identified in discussion with medical staff, which may or may not apply to the above case, is that attempts to contact discharged patients or their GP about abnormal results can be unsuccessful, because contact details in hospital records are incorrect or out of date.

## CASE 9 NOTIFICATION OF ABNORMAL RESULTS

A patient underwent a CT pulmonary angiogram. This was reported as negative for pulmonary emboli. The report was amended the following day (by the same radiologist) to indicate that a non-occlusive pulmonary embolism had been identified.

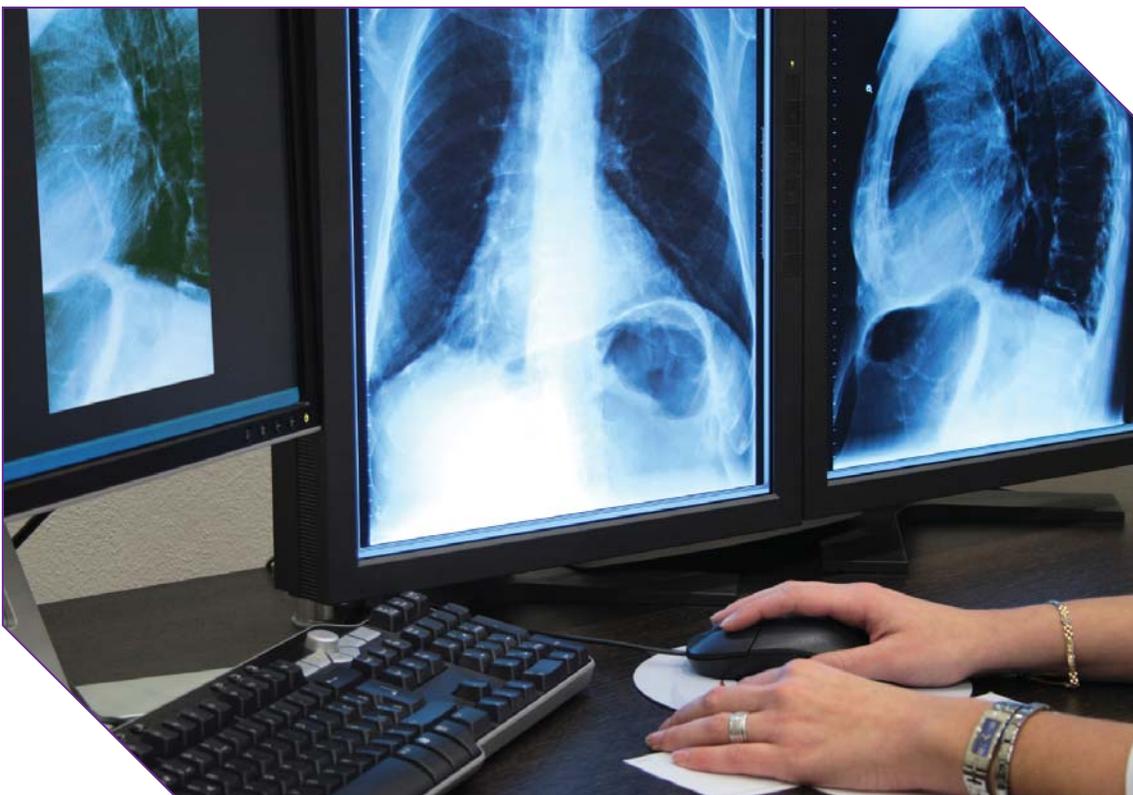
This revision, which significantly altered the patient's clinical management, was not communicated to the clinical team.

This case raises issues around responsibility for communication of amendments directly to clinicians, particularly when they impact on care and treatment.

## Summary

The findings of this review indicate that failures in processes associated with obtaining and using the results of diagnostic testing have the potential to compromise patient safety. This is supported by Singh et al (2009) who suggest that, even with the best information systems (including those which contain advanced notification features), patients with abnormal imaging and other diagnostic tests are vulnerable to "falling through the cracks".

The reasons why this may occur are as complex as is the health care system as a whole. Often it is a simple matter of communication. In a chaotic environment, the responsibility for reviewing results is often delegated to the most junior personnel, who may not have the experience or knowledge to interpret the results, or fully appreciate the need for more senior level input.



## ISSUES IDENTIFIED

### Issues associated with requesting and reporting on diagnostic tests

- 1 The lack of a consistent, formal process for clinical teams, and/or imaging services, to triage the clinical urgency of imaging requests leads to variable approaches regarding prioritisation. This may result in delays in completing and reporting clinically urgent imaging procedures, which in turn, can compromise patient outcomes.
- 2 Timeframes for formal reporting of specific tests appear to be poorly defined and unrelated to clinical urgency/relevance.
- 3 The capacity of imaging services to provide “real-time reporting” is limited. This can result in a range of problems, including:
  - variable interpretation of unreported images by clinical staff
  - the risk of inappropriate treatment, because clinical action is required prior to the availability of formal imaging reports
  - inappropriate or delayed discharge
  - access block and/or ED overcrowding, pending availability of results to validate or determine care plans
  - increased risk that potentially critical pending results are never reviewed by the treating team.

### Issues associated with reviewing test results

- 4 There is no consistent mechanism for:
  - alerting clinicians and teams to results (text reports) that are critical and requiring action, which have not been reviewed
  - indicating if and when modifications have been made to provisional imaging reports (i.e., date and time of amendments, so that most recent/final report is easily identified)
  - ensuring that clinicians are made aware of amended results. This may result in inappropriate clinical care based on initial findings, not the final report.
- 5 The processes and responsibility for reviewing test results appear variable within and between health services and facilities. The overall responsibility for reviewing and acting on results is not always clearly defined. This is most evident in the case of:
  - surgical patients, or those where multiple teams are routinely involved, e.g., anaesthetists, surgeons, consulting physicians
  - patients, presenting to the emergency department, who undergo tests and are subsequently admitted. While emergency department staff may expect that the admitting team will review the test results, the admitting team may be unaware that the tests have been done.
- 6 The results flow sheet does not list all the tests ordered for the patient, or indicate where results are pending/not yet available. As indicated in 3 above (real-time reporting), this increases the risk of potentially critical results never being reviewed by the current treating team, particularly if another clinician has ordered diagnostic tests and the user does not review the “orders” section of Powerchart.
- 7 New test results (i.e., those which have not yet been marked as viewed by the staff member logged in to the system) are flagged in Powerchart, provided the reviewer uses the “bookmarking” function in the results. There is variability in the awareness and use of tools such as “bookmarking”. Similarly, clinical staff have no way of knowing whether results have been reviewed or endorsed by other members of the team or who else has reviewed the results or when this was done.

### Issues associated with the response to significantly abnormal results

- 8 The process for communicating significantly abnormal results is variable and appears to depend on knowledge about who/where to call, knowing contact numbers and good interpersonal relationships between diagnostic staff and clinical teams/units. There is considerable variability evident in the incidents reviewed.
- 9 There is inconsistency around actions taken by clinicians in response to abnormal test results. While results need to be considered in context for each patient, there is no “minimum standard” expected of the clinical team when significantly abnormal results are reported. The failure to act on abnormal results may be due to inexperience in recognising the clinical importance and/or urgency. This may be compounded by a lack of point-of-care supervision of more junior staff allocated responsibility for reviewing results. This poses significant risks to patients and corporate risk to organisations.
- 10 While some local health districts provide off-site EMR access to their AMOs (e.g., for specialists & GP VMOs and on-call registrars/fellows), this is not routinely available across the State. This means that AMOs and on-call staff cannot access test results online when in their rooms or at home. While department contact phone numbers are provided as part of the patient’s discharge summary, there are limited resources available to respond to requests for results. Off-site access is often unavailable after-hours.

### Issues associated with communicating results to patients and their post-discharge carers

- 11 Patients are not always informed about clinically relevant test results, or the need for further tests. This poses a risk to the patient, particularly after discharge, while formal results are pending, or more tests need to be arranged. Patients frequently assume that the results have been formally reviewed and are normal, if they don’t hear from the clinician prior to discharge.
- 12 Community-based clinicians (specialists & GPs), who assume ongoing care of the patient, may be unaware of results pending at the time of discharge. While automated discharge summaries may include a statement on results still pending, it is not always easily identifiable within the body of the summary.
- 13 The current eDRS does not automatically pull tests results. It requires the medical officer doing the eDRS to “cut and paste” clinically relevant results into the discharge summary. This increases the risk of results being omitted from the discharge summary.
- 14 There is no standard process to ensure that patient demographic data is updated at each presentation e.g., contact details, address and current GP. This is particularly relevant to high-volume clinical settings. This accurate information is essential for post-discharge notification of unexpected, significant abnormal results.

# RECOMMENDATIONS

## 1 Structures:-electronic systems for requesting and recording patient care processes

- 1.1 NSW Health and local health districts must ensure that electronic systems are of a standard which supports safe patient care by:
  - 1.1.1 Having all diagnostic modalities linked with eMR (including reports from procedural services, e.g., gastroenterology, cardiology etc.)
  - 1.1.2 Providing the option of secure off-site access to the eMR for all treating clinicians, including GP VMOs
  - 1.1.3 Facilitating reporting and audit processes.

## 2 Processes: Core elements to ensure timely and effective use of diagnostic results

- 2.1 NSW Health develop a policy for the management of test results which provides direction on:
  - 2.1.1 Who is ultimately responsible for reviewing and acting on test results
  - 2.1.2 Expected turn-around time for each test or type of test (will need to be negotiated with diagnostic services)
  - 2.1.3 Standards for the management of test results must include criteria for:
    - notifying critical abnormal results to the ordering clinicians by the service provider,
    - reviewing results and documenting in the patient records the actions that resulted from the investigation findings
    - informing patients and/or their general practitioner if further tests are required after discharge.
  - 2.1.4 Actions to be taken when an abnormal result is identified after patient discharge (including how, and by whom, such findings should be communicated and documented).
  - 2.1.5 Actions to be taken when worsening or previously unknown abnormal results are found during pre-admission or an ED attendance and it is determined that follow-up is required.
  - 2.1.6 Actions to be taken when unexpected abnormal results are identified.
- 2.2 All health service contracts, policies and service agreements which apply to diagnostic services should reflect the above standards and delegation of responsibilities.

## 3 Key performance indicators

- 3.1 NSW Health and local health districts should:
  - 3.1.1 Identify a small number of key performance indicators related to diagnostic test results, to monitor timeframes for formal reporting. In particular, the time to report formally on imaging procedures needs to be monitored.
  - 3.1.2 Ensure that processes are in place to identify and manage the resource implications of these benchmarks and any associated risks.

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## Clinical Excellence Commission

Main office location:  
**Level 13**  
**227 Elizabeth Street**  
**Sydney NSW 2000**

Postal:  
**Clinical Excellence Commission**  
**Locked Bag A4062**  
**Sydney South NSW 1235**

Telephone: **02 9269 5500**  
Fax: **02 9269 5599**  
Email: **[patientsafety@cec.health.nsw.gov.au](mailto:patientsafety@cec.health.nsw.gov.au)**  
Web: **[www.cec.health.nsw.gov.au](http://www.cec.health.nsw.gov.au)**