ORIGINAL ARTICLE

REVIEW OF THE AUSTRALIAN INCIDENT MONITORING SYSTEM

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Background: A survey was conducted to assess the benefits and limitations of the Australian Incident Monitoring System (AIMS) as a programme to improve patient safety.

Methods: A 12-point questionnaire was sent to 12 current users of AIMS in November 2002.

Results: The AIMS provides a consistent system of coding, trending and monitoring of incident data. It promotes a patient safety culture and an awareness of system error. Other benefits include the building of teamwork and the implementation of strategies to reduce the prevalence and severity of incidents. The majority of respondents (83%) reported that AIMS investigations resulted in significant changes to equipment usage, medication prescribing or administration, clinical protocols, training programmes and falls risk assessment tools. Although 75% of users reported improvements in patient outcomes, these were difficult to measure. A major limitation of AIMS was the low rate of incident reporting by medical staff. Voluntary reporting systems did not capture all incident data and the information was often too generic for root cause analysis. There were difficulties benchmarking data and concerns were raised regarding the ownership of information. The programme requires ongoing resources to implement change strategies and to maintain incident reporting levels. On a scale of 1 (poor rating) to 10 (excellent rating) the mean benefit rating was 7.6.

Conclusion: The Australian Incident Monitoring System is beneficial as a component of a clinical risk management strategy. Usefulness could be improved by increased participation by medical staff. The level of resources required should not be underestimated if the programme is to demonstrate improvements to patient outcomes. More recent versions of AIMS promise improved capabilities and will require similar evaluation.

Key words: adverse event, clinical audit, clinical incidents, clinical risk management, peer review.

Abbreviations: AIMS, Australian Incident Monitoring System; APSF, Australian Patient Safety Foundation; PSI, Patient Safety International.

INTRODUCTION

The Australian Incident Monitoring System (AIMS) is a methodology for the reporting, analysis and monitoring of incidents in health care so that corrective strategies can be implemented. It is being progressively adopted across Australia and an updated version is being rolled out across all NSW health facilities in 2004–2005. Surgeons will therefore increasingly encounter this system.

The purpose of AIMS is to improve patient safety. The AIMS programme was developed by the Australian Patient Safety Foundation (APSF), a not-for-profit organization formed in 1989 and based in Adelaide, South Australia. AIMS is now marketed by Patient Safety International (PSI – http://www.patientsafetyint.com). The APSF is the research basis for and parent organization to PSI.

Generic AIMS, intended for use across health facilities, was implemented in the public health system in South Australia in 1996 and is now extensively used across Australia. Specialty AIMS, intended for use by defined specialist groups, have been implemented in anaesthesia, hyperbaric medicine, intensive care emergency medicine and medical retrieval. Specialty AIMS programmes are directed and coordinated by medical specialists and data are sent to the central site by the participating units.

On behalf of the UK National Patient Safety Agency, and with the co-operation of the APSF, the Clinical Governance Unit of the Hunter Area Health Service, New South Wales, Australia, conducted an evaluation of the AIMS.

METHODS

A questionnaire was developed (Appendix 1). Twelve users of AIMS were surveyed over 11 days in November 2002. Seven were users of Generic AIMS and five were users of Specialty AIMS. Although there were 200 users of Generic AIMS in Australia at the time of the survey, 132 of these had only recently adopted the system. Thus the sample size for this evaluation for users of Generic AIMS was 10%. All (100% sample size) of the Specialty AIMS users were surveyed. The Specialty AIMS users were anaesthesia, emergency medicine, hyperbaric medicine, intensive care and medical retrieval. All Specialty AIMS users involved multiple hospitals.

Questions included the length of time the programme has been operating, the number of incidents recorded and a request to outline the major benefits of implementing the AIMS programme.
Information was requested on significant changes resulting from the investigation of incidents reported via AIMS and whether improvements in outcomes had been measured. Respondents were also asked whether AIMS data provided useful information on important patient safety/quality of care issues and the extent of benchmarking activities. The questionnaire included a scale to rate the overall benefit of AIMS, where 1 was a poor rating and 10 was an excellent rating.

RESULTS
All of the questionnaires were returned (100% response rate).

Programme implementation
Table 1 shows the mean length of time the programme has been operating, the mean number the incidents and the overall benefit rating reported across the organizations. Although Specialty AIMS had a lower average number of incidents recorded, it had been in use for a longer period and the benefits were rated higher than for Generic AIMS. The paradox between the observed lower rate of reporting in Specialty AIMS than that found in Generic AIMS, despite the earlier introduction of Specialty AIMS, reflects the greater reliance of reporting by medical staff in Specialty AIMS compared with Generic AIMS.

Table 1. Time in use, number of incidents and rating of benefit by the Australian Incident Monitoring System (AIMS) users

<table>
<thead>
<tr>
<th>Category of comment</th>
<th>Generic AIMS</th>
<th>Specialty AIMS</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time in use (years)</td>
<td>Mean 3.5</td>
<td>Mean 7.2</td>
<td>Overall 5</td>
</tr>
<tr>
<td>No. incidents</td>
<td>Range 0.75–6</td>
<td>Range 1–15</td>
<td>Range 0.75–15 years</td>
</tr>
<tr>
<td>Benefit rating of AIMS on a scale of 1–10 (where 1 = poor and 10 = excellent)</td>
<td>7.1</td>
<td>8.4</td>
<td>7.6</td>
</tr>
</tbody>
</table>

Table 2. Summary of the major benefits of the Australian Incident Monitoring System (AIMS)

<table>
<thead>
<tr>
<th>Category of comment</th>
<th>No. users who listed the comment as a benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing an awareness of error and a safety culture with less emphasis on the ‘blame’ approach</td>
<td>Total 8</td>
</tr>
<tr>
<td>Monitor, trend and review incident data including investigations and actions</td>
<td>8</td>
</tr>
<tr>
<td>Increased consistency and identification of incident reporting and investigation, including prioritization and prevention of adverse events and near misses</td>
<td>8</td>
</tr>
<tr>
<td>Analysis of incidents using a system approach</td>
<td>4</td>
</tr>
<tr>
<td>Builds team work and goodwill</td>
<td>2</td>
</tr>
<tr>
<td>Strategies to reduce prevalence and severity of incidents are developed</td>
<td>2</td>
</tr>
<tr>
<td>The capacity to benchmark across units due to the common system for coding and classifying incidents</td>
<td>1</td>
</tr>
<tr>
<td>Involvement and interest by clinicians</td>
<td>1</td>
</tr>
<tr>
<td>Evidence to administrators/educators and others that there are problem areas that need to be addressed</td>
<td>1</td>
</tr>
<tr>
<td>Reinforce the value/purpose of existing protocols and policies</td>
<td>1</td>
</tr>
<tr>
<td>Education/orientation in terms of highlighting types of incidents and their antecedents, impact and prevention</td>
<td>1</td>
</tr>
<tr>
<td>Anonymous reporting adds great information not gathered in any other monitoring programme</td>
<td>1</td>
</tr>
<tr>
<td>National data allows for the identification and analysis of broader problem areas and strategic interventions</td>
<td>1</td>
</tr>
</tbody>
</table>

Major benefits of implementing the Australian Incident Monitoring System

The major reported benefits of implementing AIMS are summarized in Table 2. Three of the Specialty AIMS users referred to publications and seminar presentations of AIMS data as evidence for the utility of the system in identifying problems that require action. Significant changes had been introduced in 71% of facilities using Generic AIMS and in 100% of Specialty AIMS users. The most frequent changes were related to equipment standardization or modification, medication prescribing or administration standards, new policies or protocols for clinical care, training programmes, falls and pressure ulcer risk assessment tools. Other significant changes related to improved safety for patients (secure areas, labelling pathology tubes, improved staffing) and a better understanding of factors relating to human error as distinct from violations.

It was more difficult to measure improvements in outcomes as a result of changes implemented, with four of the seven (57%) Generic users and three of the five Specialty users (60%) being able to measure improvements. Difficulties in measuring outcomes was attributed to the multidimensional nature of incidents, limited resources to undertake analysis and the anonymous nature of reporting, which made tracking, follow-up and detailed analysis difficult.
The measured outcomes reported were:

(1) Generic AIMS users
- Reporting rates for some types of incidents reduced
- A measurable change in patient safety awareness
- Reductions in the number and severity of falls

(2) Specialty AIMS
- Brain damage in anaesthesia resulting from accidental circuit disconnection has virtually disappeared
- Endobronchial intubation is now quickly recognized
- Inhalation agent routine monitoring has greatly reduced the incidence of both overdose and awareness
- One European unit contributing to the hyperbaric AIMS study reported change in ear barotrauma incidence

Use of Australian Incident Monitoring System data

All of the Specialty users and four of the seven (57%) of the users of Generic AIMS responded that they found AIMS data useful (responses to Question 3.1 (Appendix 1)) for providing information on important patient safety/quality of care issues.

Two users highlighted that the usefulness for patient safety is limited as data only reflects patient safety issues that are voluntarily reported and that it better informs about trends than individual incidents. Other users commented that serious incidents tended to not always be reported through AIMS and that there were poor levels of reporting by medical staff.

Benchmarking Australian Incident Monitoring System data

Seven of the 11 (58%) users benchmarked their data, mostly against local trends and the published literature. Reasons given for not benchmarking were that opportunities were limited given a small number of cases, the selective bias inherent in voluntary reporting systems and the perception that benchmarking would be seen as a performance measure. It was also reported that centrally stored data were not easily available for local benchmarking activities.

Medical staff reporting

Poor levels of reporting by medical staff was reported as a limiting factor by most respondents. At one facility, medical staff reported only 5% of all incidents in the AIMS database. Analysis of AIMS data at another facility showed that when medical staff reported incidents, the incidents were generally associated with a more serious patient outcome.

Poor reporting and classification results in AIMS data being under utilized in comparison to case audits, which are favoured by the majority of medical staff. However, AIMS data could better inform staff and should be part of a comprehensive clinical risk management strategy, which includes audit, peer review and root cause analysis of adverse events. It was also suggested that the AIMS programme could be a valuable educational tool when incorporated into junior medical staff teaching and orientation.

In general, it was reported that AIMS information could be used more widely if better feedback mechanisms were in place. Further work was needed to simplify the reporting process within organizations (for example, modification of the forms, use of telephone and/or email notification systems) and amalgamation with parallel databases (for example with a separate pharmacy reporting adverse events database).

DISCUSSION

There was support for AIMS across both the Specialty and Generic users of AIMS. All of the respondents rated the benefit of AIMS to their organization highly. The users of Specialty AIMS rated the benefit higher than the users of Generic AIMS. Many specialist staff contributed hours of unpaid work to maintain the systems.

The benefits of AIMS for the majority of users were that the programme provided a consistent system of coding, trending and monitoring of incident data. It also promoted a patient safety culture and an awareness of error. Other benefits included use of a systems approach to investigations, the building of teamwork and the implementation of strategies to reduce the prevalence and severity of incidents.

The AIMS programme had resulted in the implementation of significant changes. There were some differences between Specialty AIMS and Generic AIMS regarding the type of changes implemented. Measuring outcomes as a result of the changes was more problematic with only 58% of respondents stating that they have been able to measure improvements in outcomes.

Sustainability of the AIMS required ongoing resources (for example funding for staff, system upgrades, computer hardware and to correct identified system deficiencies) to ‘push’ the programme within an organization. It was suggested that AIMS should be implemented as part of a broader clinical risk management strategy to effectively manage patient safety change processes. This is now occurring in NSW. AIMS data should not be used to monitor effective patient safety and clinical quality strategies for the foreseeable future, as this would create an incentive for under-reporting. Rather they should be used for identifying and correcting deficiencies in the patient care system.

There appeared to be little use of benchmarking except for local efforts to benchmark against published data. Although the APSF provide national data reports to users on request, it was felt that comparison data should be more readily available and accessible. The majority of users felt that AIMS was a useful indicator of important patient safety/quality of care issues. The usefulness in patient safety was thought by some to be limited as it only reflects patient safety issues that are voluntarily reported. There was comment that the data better informed about trends, as serious/sentinel events were not always reported through AIMS. There was poor reporting by medical staff in terms of the number of incidents reported, but those incidents tended to have resulted in more serious outcomes for patients. It is therefore important to encourage greater involvement of medical staff in order to facilitate the identification and management of patient safety issues.

The major limitations of AIMS were frustrations around the limited reporting capabilities and the lack of control over the database to modify reports for individual user needs.

Resource constraints have contributed to the faltering of some of the Specialty AIMS studies, such as intensive care. These studies are led by senior medical staff who report significant benefit from AIMS but are constrained by resources. The level of resources required should not be underestimated if the programme is to demonstrate outcomes in terms of improvements to patient safety.

Most of the technical limitations reported in our survey have been addressed with the latest version of AIMS, now renamed the Advanced Incident Monitoring System. As AIMS becomes the predominant national incident monitoring system, it is timely to report the prior experience with it so that the early learnings are heeded. Advanced AIMS will require similar scrutiny in future.
REFERENCES


APPENDIX 1

Questionnaire

1. Programme Implementation

1.1 Have you implemented:

- Generic AIMS? Yes No
- Specialty AIMS? Yes No

If yes, which Specialty?

1.2 How long has the program been operating in your facility? years

1.3 What is the number of incidents recorded in your database?

1.4 What would you describe as the major benefits of implementing the AIMS program into your Service?

2. Outcomes

2.1 Have you received any assistance with resources e.g., financial, human, to analyse your information and implement corrective strategies?

Yes No

If so, to what extent?

2.2 Have significant changes been introduced from the investigation of incidents reported via AIMS?

Yes No

- 2.2.1 If ‘yes’, please list the 5 most important changes, if ‘no’, please comment on why this has not occurred.

2.3 Have you been able to measure improvements in outcomes as a result of these changes?

Yes No

- 2.3.1 If ‘yes’, could you provide any examples, if ‘no’ what are the main difficulties in measuring outcome improvements?

2.4 Are learnings from AIMS investigations disseminated across the organization or Specialty where applicable?

Yes No
3. Use of AIMS data
3.1 Do you find AIMS data useful for informing you of important patient safety/quality of care issues?
   - YES □  NO □

3.1.1 If ‘yes’, how is it most useful, if ‘no’ why not?

3.2 Do you benchmark AIMS data?
   - YES □  NO □

3.2.1 If ‘no’, why not?
3.2.2 If ‘yes’, could you provide any examples of how the benchmarking process has been useful for indicating areas in need of quality improvement initiatives?

3.3 Overall, on a scale of 1–10, how would you rate the benefit of the AIMS program to your facility?
   (please circle) (1 = poor 5 = average 10 = excellent)
   1 2 3 4 5 6 7 8 9 10

4. Any Other Comments