

## Implementation of an event reporting system in a transfusion medicine unit: a local experience

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### Abstract

Event reporting can provide data to study the failure points of an organization's work process. As part of the ongoing efforts to improve transfusion safety, a Medical Event Reporting System – Transfusion Medicine, (MERS – TM) as designed by Kaplan *et al* was implemented in the Transfusion Medicine Unit of the University Malaya Medical Centre to provide a standardized means of organized data collection and analysis of transfusion errors, adverse events and near misses. An event reporting form was designed to detect, identify, classify and study the frequency and pattern of events occurring in the unit. Events detected were classified according to Eihdhoven Classification model (ECM) adopted for MERS – TM. Since our system reported all events, we called it Event Reporting System – Transfusion Medicine (ERS-TM). Data was collected and analyzed from the reporting forms for a period of five months from January 15<sup>th</sup> to June 15<sup>th</sup> 2002. The initial half of the period was a process of evaluation during which 118 events were reported, coded, analyzed and corrective measures adopted to prevent the recurrence of the same event. The latter half saw the reporting of 122 events following the adoption of corrective measures. There was a reduction in the occurrence of some events and an increase in others, which were mainly beyond the organization's control. A longer period of evaluation is necessary to identify the underlying contributory causes that can be useful to develop plans for corrective and preventive action and thereby reduce the rate of recurrence of errors through proper training and adoption of just culture.

**Key words:** Transfusion errors, Event Reporting System, Medical Event reporting System- Transfusion Medicine.

### INTRODUCTION

Event reporting systems in many industries have provided a valuable resource for study on preventing and managing errors. Reporting of errors, incidents, deviations, variances, discoveries, occurrences or adverse events show that good safety culture exists in the work place. An Event Reporting System – Transfusion Medicine (ERS – TM) was implemented at our centre in an effort to quantify and study both errors and near miss events. In the past, events were unreported because of the fear that reporting them would affect staff performance assessment whether or not the events reflected their personal errors or errors committed by others. Following implementation of this system it was made clear to all staff that it was not a fault finding system but rather meant to provide new insights into conditions producing undesired events and to adopt corrective measures for this purpose and thereby enhance the quality of patient care.

### MATERIALS AND METHODS

A Medical Event Reporting System – Transfusion Medicine (MERS – TM) as designed by Kaplan *et al*<sup>1</sup> was implemented in January 2002 in Transfusion Medicine Unit of the University Malaya Medical Center. An event reporting form was designed which contained four components (Figure 1). Part A contained information of discovery and occurrence, discoverer's name and designation, area of discovery and occurrence. Part B contained the description of event, of what happened, how it was discovered, how the event occurred and who was involved. Part C contained the action and decision taken and part D contained follow up and evaluation of action taken. Events detected are classified according to the Eihdhoven Classification Model (ECM) adopted for MERS-TM. Descriptive codes are assigned to each of the categories. Some modifications were made to suit our organization needs (Table1). Events are made up of

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**TABLE 1: Descriptive code categories of the ERS-TM**

Code	Category	Definition
A) LATENT ERRORS		Latent Failures occurs when individuals such as managers or administrators take actions and/or make decisions that affect technical or organizational policy and procedures or the allocation of resources. Their actions and decisions may have unintended consequences in the future that negatively impact patient care.
<b>1) Technical</b>		
TEX	External	Technical failures beyond the control and responsibility of the investigating organization.
TD	Design	Inadequate of design of equipment, software or materials.
TC	Construction	Correct designs that were not constructed properly. Examples include incorrect set-up of blood drives and installation of equipment in an inaccessible area.
TM	Materials	Material defects found. Examples could be the weld seams on blood bags, defects in label adhesive, or ink smears on previously printed labels.
TE	Equipment	Unable to run procedures because of equipment breakdown.
TCS	Computer software	Computer software problems.
TCH	Computer hardware	Computer hardware problems.
<b>2) Organizational</b>		
OEX	External	Organizational failures beyond the control and responsibility of the investigating organization.
OP	Protocols/Procedures	The quality and availability of the protocols are too complicated, inaccurate, or poorly presented.
OK	Knowledge transfers	Failures resulting from inadequate measures taken to ensure that information is transferred to all new staff.
OM	Management priorities	Wrong management priority.
OC	Culture	Collective misunderstanding of how work should be done.
B) ACTIVE ERRORS		Errors or failures occur when individuals are in direct contact with the work process. Their actions and decisions may result in failures that can immediately impact patient safety.
Human		
<b>1.1) General</b>		
HEX	External	Human failures originating from another department or centre.
HOM	Internal	Omission of certain task. An example would be failing to take action on atypical results.

<b>1.2) Knowledge-based behaviours</b>		
HKK	Knowledge-based errors	The inability of an individual to apply what they should know to a routine situation. An example is a trained technologist unable to decide what blood type to be given in an exchange transfusion.
<b>1.3) Rule-based behaviours</b>		
HRP	Protocols	Not following set rules, protocols or procedures.
HRQ	Qualification	The incorrect fit between an individual's qualification, training or education, and a particular task. An example would be expecting a nurse to solve a technical problem.
HRC	Coordination	A lack of task coordination within a team in an organization. An example would be an essential task not being performed because everyone thought that someone else had completed the task.
HRM	Monitoring	Monitoring of process or patient status. An example would be a trained technologist operating an automated instrument without realizing the pipette that dispenses the reagent is clogged.
HRV	Verification	The correct and complete assessment of a situation, including related conditions of the patient/donor and materials to be used before beginning the task.
HRI	Intervention	Failures that result from faulty task planning and execution. An example would be selecting the wrong rule or protocol (planning) or executing the protocol incorrectly. An example would be washing red cells by the same protocol as platelets.
<b>1.4) Skill-based behaviours</b>		
HSS	Slip	Failures in the performance of skills. An example could be a technologist adding a drop of reagent to a row of test tubes and then missing the tube, or computer entry error.
HST	Tripping	Failures in whole body movement. These errors are often referred to as 'slipping, tripping, or falling. Example would be a blood bag/reagent bottle slipping out of one's hands and breaking or tripping over a loose tile on the floor.
<b>1.5) Communicative behaviours</b>		
HCR	Attitude	Misunderstanding or being rude to the donor.
HCP	Poor Communication	Lack of interpersonal communication skills.
X	Unclassified	Failures that cannot be classified in any of the current categories.

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**EVENT REPORTING FORM**

			Report No:
Date of Report	Date of Discovery	Date of Occurrence	Event Code
Time of Discovery / Occurrence <input type="checkbox"/> AM <input type="checkbox"/> PM	Discovery's Designation <input type="checkbox"/> Administrator <input type="checkbox"/> Consultant <input type="checkbox"/> M.O. <input type="checkbox"/> MLT. <input type="checkbox"/> Nurse <input type="checkbox"/> Clerk <input type="checkbox"/> Attendant <input type="checkbox"/> Others (specify)		
	Discoverer's Name	Area of Discovery <input type="checkbox"/> Donor Section <input type="checkbox"/> Lab <input type="checkbox"/> Mobile <input type="checkbox"/> Other (specify) <input type="checkbox"/> Ward <input type="checkbox"/> Clinic	
Area of Occurrence <input type="checkbox"/> Donor Section <input type="checkbox"/> Lab <input type="checkbox"/> Mobile <input type="checkbox"/> Other (specify) <input type="checkbox"/> Ward <input type="checkbox"/> Clinic			
DESCRIPTION OF EVENT			
What happened:			
How it was discovered:			
Who was involved:			
ACTION / DECISION			
FOLLOW UP AND EVALUATION OF ACTION TAKEN			

Figure 1: Event reporting form.

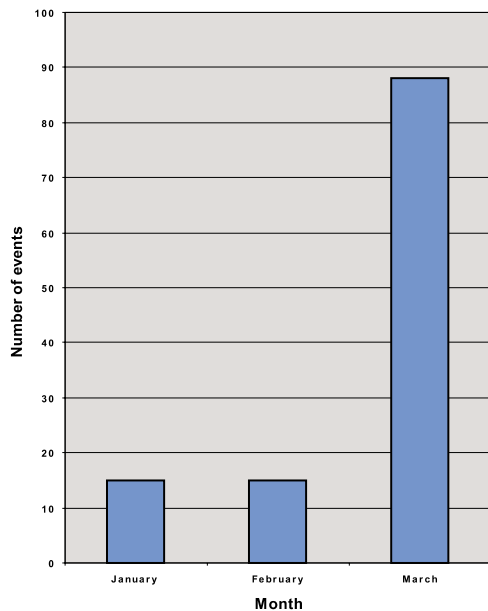


Figure 2: Number of events reported from 15<sup>th</sup> January to March 2002.

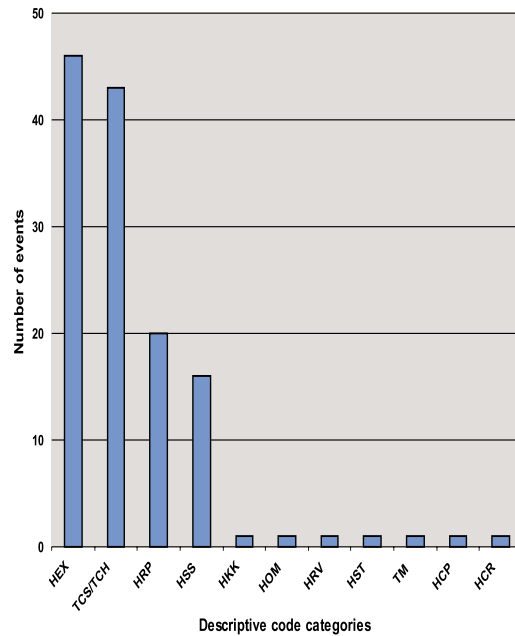


Figure 3: The distribution of events according to descriptive code categories from 15<sup>th</sup> January to March 2002.



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**TABLE 2: Selected events illustrating action/decision, follow up and evaluation of action taken**

Event code	Event Description	Action /Decision	Follow Up and Evaluation of Action Taken mid June.
HSS/HRP	<p>a) 4 cases - No barcode label on the blood pack.</p> <p>b) 1 case – MLT did not correctly identify the serum sample.</p>	<p>a) Action-Investigation revealed that the mistake was made during the collection process. The first nurse had made the slip (HSS). The second nurse who collected the sample also did not recheck the labeling (HRP)- written down in their work instruction.</p> <p>Decision – The nurses were educated on the importance of labeling and adherence to protocols.</p> <p>b) Action – Investigation revealed that the serum used to crossmatch belonged to another patient.</p> <p>Decision – Counseled the MLT to correctly identify the sample before proceeding to do any test (HSS/HRP).</p>	<p>a) No recurrence of the same error.</p> <p>b) Recurred again once.</p>
HKK	Blood requested for exchange transfusion was not crossmatched with the mother’s sample.	<p>Action – Investigation revealed the MLT had no knowledge/forgotten of the procedure.</p> <p>Decision – Retraining was provided to the MLT concerned.</p>	No recurrence of the same error.
HRP TM	14 packs of blood packs burst during spinning. (for a period of 3 months)	<p>Action – Investigation revealed that in 11 packs the tubings were detached from the primary pack and in 2 of the packs the seal gave way (HRP). In 1 of the packs the seams gave way (TM).</p> <p>Decision – Instruction on proper techniques of spinning was put up in the component bench and the supplier for the blood packs was called up to look into the matter.</p>	Reduction in the number of packs burst. (only 3 cases reported).

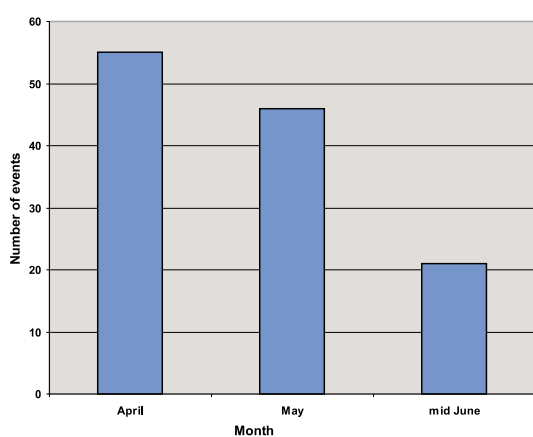


Figure 4: Number of events reported from April to mid June 2002

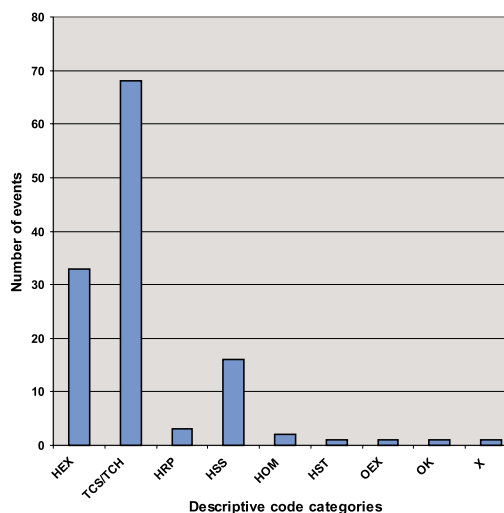


Figure 5: The distribution of events according to descriptive code categories from April to mid June 2002



both latent errors and active or human errors. Latent errors result from actions taken and decision made prior to the event itself and is categorized into technical and organizational. Human errors or active errors were divided into 4 categories i.e. knowledge-based behaviour, rule-based behaviour, skill-based behaviour and communicative behaviour. All categories of staff were informed of the system and were advised to record all events. It was explained to the staff that this was a no-fault event reporting system established to improve staff performance and teamwork thereby enhancing the quality of patient care.

## RESULTS

A total of 118 events were detected and recorded over a period of two and a half months from January 15<sup>th</sup> to 31<sup>st</sup> March. The distribution of the number of events detected is shown in Figure 2. There was a sharp increase in the detection of events, the highest being in March where 88 events were reported. The distribution of events according to descriptive code categories is shown in Figure 3. The highest code category of events reported was HEX (46 cases) followed by TCS/TCH (43 cases).

All the coded events were analyzed and corrective actions were taken to prevent further occurrence of the same event. A single event can be coded into one or more categories. To illustrate how ERS-TM operates we have selected some of the events that were reported using our event reporting forms from 15<sup>th</sup> January to March 31<sup>st</sup> and shown them in Table 2.

After the initial evaluation period from January 15<sup>th</sup> to March 31<sup>st</sup> 2002, a further study of two and a half months from April to mid June 2002 was conducted. A total of 122 events were detected and recorded. The distribution of the number of events from is shown in Figure 4. The distribution of events according to descriptive code categories following evaluation and corrective action is shown in Figure 5. The highest code category of events reported was TCS/TCH (68 cases) followed by HEX (33 cases).

## DISCUSSION

The best way to prevent errors is to understand their real causes and learn from mistakes. The goal of the event reporting system is not to fault-find, but rather to learn from mistakes and take corrective action to prevent errors from recurring.<sup>2</sup> We noticed that from January 15<sup>th</sup> to

March 31<sup>st</sup> there was a sharp increase in error detection and reporting rates. This was because more staff has come forward without fear to report errors or events. Increased detection and reporting is good because more information is available for use in the organization's event management program. Before the implementation of this event reporting system we had an incident reporting book where the events were reported. For the year 2001 only 18 events were reported. Most of these events were reported in the book because of fear that the event would be brought to the attention of the department's head.

All the events reported for a period of two and a half months from January 15<sup>th</sup> to March 31<sup>st</sup> 2002 were analyzed and corrective action taken. In some areas we noticed a drop in the recurrence of the events. One such event was a reduction in the number of blood bags bursting during spinning (85%) following adherence to protocols coded as HRP. Events coded as HEX originating from another department also showed a reduction (21.7 %) following circulars to the department concerned. Events coded as HSS did not show any improvement but the errors were of a different nature except for data entry errors. One particular staff who repeatedly made the errors was sent to a reference training centre to be evaluated by an independent body as it was unsure whether the errors were skill-based or knowledge-based. Errors coded as TCS/TCH usually involving the computer server or network problem has greatly increased (58%); however the problem is beyond the control of the department.

A longer period of time is necessary for further evaluation and investigation to identify the underlying contributory causes that can be useful in developing plans for corrective and preventive action. Data entry errors are expected to reduce after automation is established.

## REFERENCES

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