6 Human Factors in SHOT Error Incidents n=2677

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Over the last few years SHOT has highlighted the importance of considering human factors when investigating transfusion incidents. As noted in every Annual SHOT Report over the past two decades, most incidents are caused by errors in the transfusion process. Therefore a recommendation was made in the 2013 Annual SHOT Report (Bolton-Maggs et al. 2014) that in line with human factors research it may be better to review the transfusion process to design out the errors.

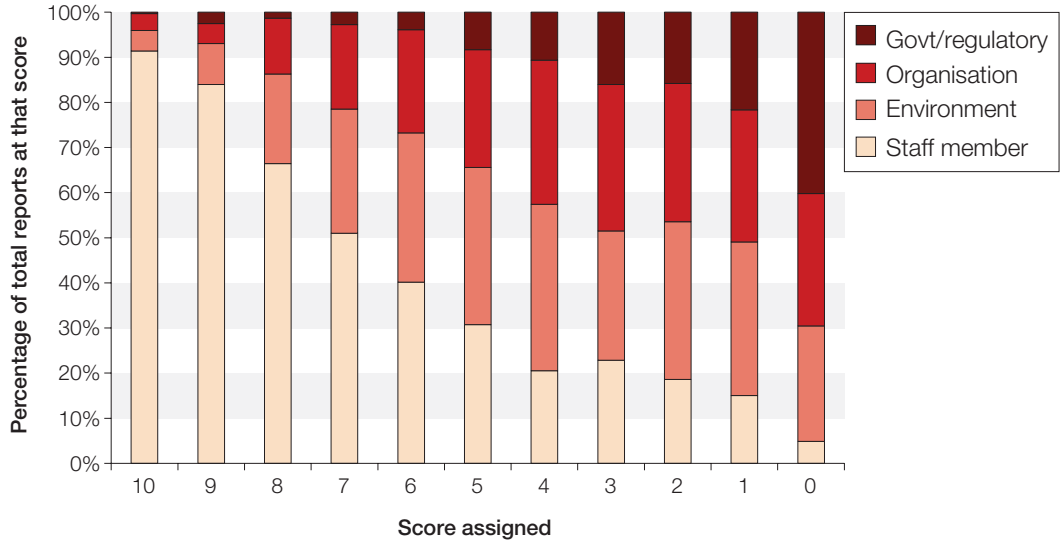
In January 2016 a human factors investigation tool (HFIT) was added to the SHOT database (Dendrite). Human factors questions were added in all error categories to examine which of four human factors was estimated to be implicated in each incident:

To what extent is the cause of this incident attributable to:

- Unsafe practice by individual staff member(s)
- Unsafe conditions associated with the local environment or workspace
- Unsafe conditions associated with organisational or management issues in your Trust/Health Board (e.g. staffing levels)
- Conditions associated with the government, Department of Health or high level regulatory issues (i.e. the error was caused by regulatory issues, not reportable as a regulatory failure)

Reporters were asked to score each question from 0, no contribution, to 10, fully responsible. Data have been analysed from all error reports completed in the SHOT database in 2016 (n=2677) where the HFIT questions were available (in 11 instances not available where cases were transferred from reaction categories or where incidents involving several patients were duplicated by SHOT staff). The error categories included incorrect blood component transfused (IBCT), avoidable, delayed or undertransfusion (ADU), handling and storage errors (HSE), right blood right patient (RBRP) and errors with anti-D immunoglobulin (Ig) administration. There was considerable variability in the scores allocated and the percentages of each score attributed to each of the four human factors is shown in Figure 6.1.

Figure 6.1: Estimation of different human factors contribution to errors, score out of 10



Incident reporters seem to consider the cause of errors to be predominantly attributable to unsafe practice by individual staff member(s). At the simplest level, a total of the scores attributed to each of the human factors (Table 6.1) shows 62.6% of the cause was attributed to staff members, with the percentages diminishing as the human factors get farther removed from the individual.

	Staff member	Environment	Organisation	Government/ regulatory
Total sum of scores assigned to each	16,891	5,087	3,862	1,141
Percentage assigned to each	62.6%	18.9%	14.3%	4.2%

Table 6.1: Total scores (0-10) for each of the human factors

Studies using James Reason's decision tree for determining the culpability of unsafe acts (Reason 1997) have shown that 90% of quality lapses are defined as blameless (Karl 2012). If culpability by the individual is about 10%, then there may have been an overestimation of the liability of individuals (62.6%) in the answers to the SHOT HFIT questions, and an underestimate of the impact of environmental, organisational or high level government or regulatory factors.

Discussion of results

These data show that the HFIT added to the SHOT database is a reasonable method of elucidating at a high level which human factors are considered most likely to be the cause of blood transfusion errors. However, the scores given may not always reflect the reality if there is too much focus on individual error. We reviewed these data by taking a selection of cases to assess whether the details of the incident as reported matched the scores allocated. As an example, Case 6.1 was scored as 10 for unsafe practice by the individual, with no scores for any of the other human factors.

Case 6.1: Total cause of incident attributed to individual

Patient 1 had a pre-transfusion sample taken by a nurse in a side room of the ward. The nurse was also coordinating the ward beds and labelled the sample away from the bedside, while dealing with a query from another member of staff about Patient 2. The nurse labelled the sample and request form with Patient 2's details instead of Patient 1. Patient 2 had a historical blood group result, so the ABO mismatch was detected by laboratory testing. The nurse then realised her error and repeated the sampling of Patient 1. There was a slight delay in ordering blood for Patient 1, but no major harm was caused.

The following observations can be made from the information provided in this case:

- The local environment or workspace was not ideal, because the nurse was working in a side room, while also being responsible for coordination of all ward beds. This observation suggests that a score should have been given for local environment or workspace
- The member of staff involved in the critical task of taking pre-transfusion samples should not be disturbed by another staff member
- A patient's request form should be written in advance of taking a sample, so the details can be cross-checked during the sampling process, but on this occasion that was not done, because 'the nurse labelled the sample and request form with Patient 2's details instead of Patient 1'

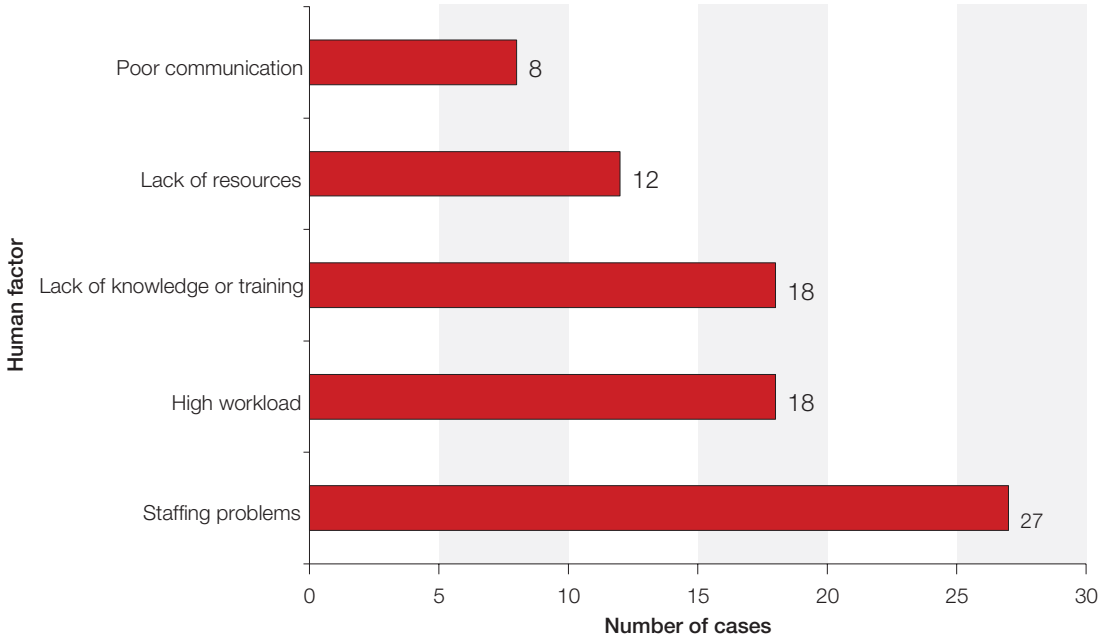
These latter factors could have been caused by a lack of appropriate policies, which is an organisational factor. Alternatively, staff may have failed to comply with policies, because of an excessive workload, also an organisational factor. If the excessive workload was caused by poor staffing levels, that could be as a result of government-level factors affecting the health service. The recent Care Quality Commission (CQC) report (CQC 2017) states 'The scale of the challenge that hospitals are now facing is unprecedented'. Therefore, in this case it might be more accurate to have an even spread of scores across all four of the human factors identified for this study.

Concern has been expressed about staff shortages, particularly in transfusion laboratories, with dependence on locum and agency staff. The United Kingdom transfusion laboratory collaborative (UKTLC) survey in 2015 (UKTLC 2015; Bark et al. 2016) showed that 90/204 (44.1%) transfusion laboratories

were carrying vacancies and 43 of these laboratories were using agency staff. Reorganisations often lead to staff vacancies and 100/178 (56.2%) laboratories were involved in reorganisation processes.

An analysis was made of the comments given in responses to the HFIT questions in the most serious categories of errors made, such as ADU or cases of IBCT. There were 96 serious incident reports where comments were given. In 83/96 (86.5%) cases the human factors responsible for the incident could be identified and these are summarised in Figure 6.2.

Figure 6.2: Human factors identified from comments in HFIT n=83



These data corroborate concerns that staff shortages in all departments might be contributing to errors. Staffing problems were mentioned in 27/83 (32.5%) cases and a high workload or being busy was mentioned in a further 18/83 (21.7%).

Figure 6.3: Example of a comment about staffing in a transfusion laboratory

The BMS was sick and should not have been at work, but there was no one else available to cover the night shift so he came in. Staffing levels are critically low and there is no give in the system to allow for sickness. All band 6 staff are locums, because the pay is better.

BMS=biomedical scientist

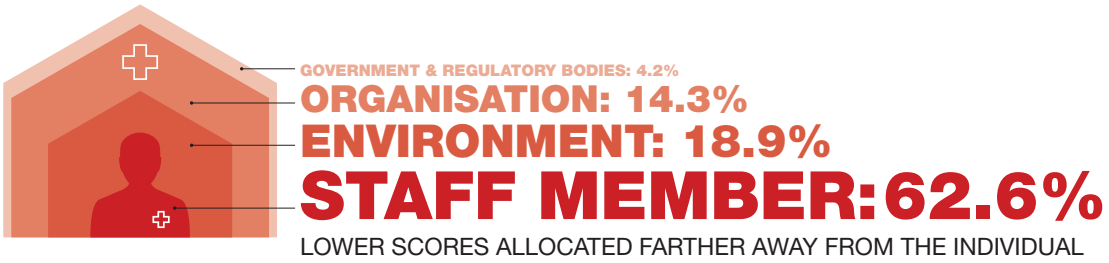


Figure 6.4: Scores for factors other than the staff member decrease the farther away they are from the individual

Commentary

After one year of data collection it is apparent that higher scores have been attributed to staff members as a cause of error than to other potential human factors. From January 2017 a self-learning package has been made available to help reporters consider the human factors aspects of adverse incidents. This package includes real case studies and examines how best to categorise and score the human factors aspects of these cases. The tuition package is published on the SHOT website: http://www.shotuk.org/reporting/human-factors-tuition-package/.

References

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