20 Handling and Storage Errors (HSE) n=254

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Definition:

All reported episodes in which a patient was transfused with a blood component or plasma product intended for the patient, but in which, during the transfusion process, the handling and storage may have rendered the component less safe for transfusion.

Key SHOT message

- Clinical staff are reminded to be vigilant and to adhere to the recommended transfusion times for blood components, available in current British Committee for Standards in Haematology (BCSH) guidelines (BCSH Harris et al. 2009)

Clinical errors accounted for 132 (52.0%) with laboratory errors accounting for 122 (48.0%) of overall HSE errors.

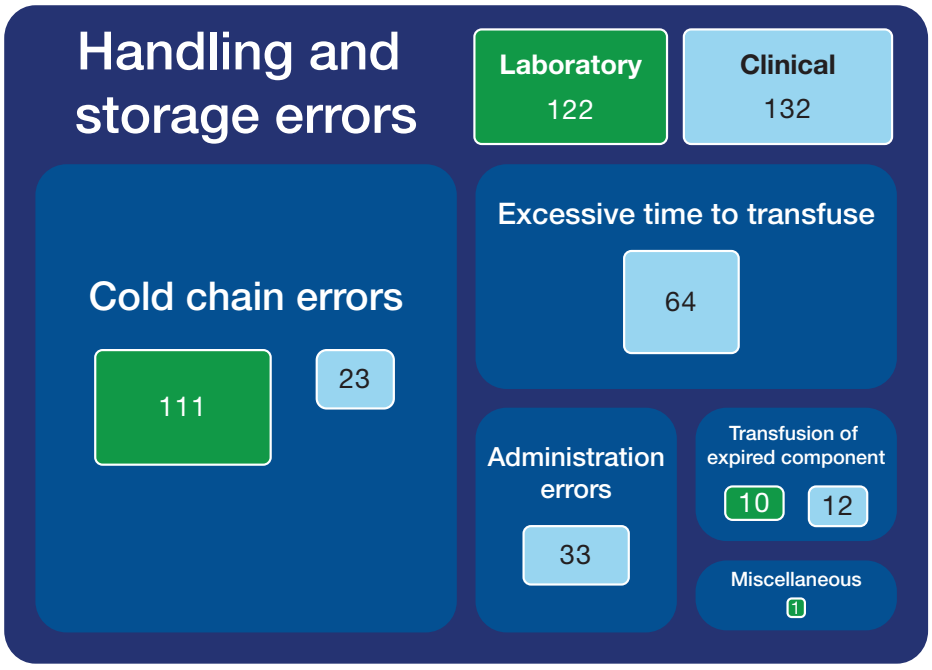

Figure 20.1: HSE type and origin n=254

HSE trends 2015

The most notable trend for 2015 is the overall increase in reports submitted compared to 2014 (254 compared to 188). This could be due to diligence by reporters rather than an actual increase in the overall incident rate. The main areas are in excessive times to transfuse with an increase from 37 to 64, and cold chain errors with an increase from 79 to 134. This included equipment failures where there was a striking increase (6 to 85) of reports compared to 2014 as a result of 11 cases of refrigerator failure which affected multiple patients. In the technical administration errors category 23 cases were due to the wrong giving sets being used.

Table 20.1: Categories of error

Type of error	2013	2014	2015
Technical administration errors	**20**	**42**	**33**
Transfusion of expired blood components	**23**	**30**	**22**
Excessive time to transfuse	**83**	**37**	**64**
Cold chain errors	**67**	**79**	**134**
Equipment failure (number of patients transfused with red cell units that had been out of temperature control)	*11*	*6*	*85*
Alarm-related (staff failed to carry out correct procedure following alarm being triggered on a refrigerator)	*3*	*6*	*3*
Inappropriate storage			
Laboratory error	*24*	*37*	*20*
Clinical error	*22*	*27*	*22*
Transport/delivery	*7*	*3*	*2*
Transfused beyond sample validity			*2*
Miscellaneous			**1**
Total	**193**	**188**	**254**

Case 20.1: Units available beyond expiry and excessive time to transfuse

A 69 year old male patient received solvent-detergent fresh frozen plasma beyond its expiry once thawed. Four units were thawed and were to be used by 02:18. The first two were transfused, however the second two were available for collection at 03:30 and 03:45 respectively. They were taken to the ward but not started until 07:00, and transfusion was completed at 10:40. This was 7 hours after removal from cold storage.

Case 20.2: Cold chain error

A unit of blood was released by remote issue for a patient and returned to the refrigerator after 46 minutes. This unit was quarantined by the refrigerator as it was outside the 30 minute rule and should have been wasted. However, when the unit was returned to the laboratory it was returned into general stock. The biomedical scientist (BMS) made an error and returned the unit by overriding a computer rule. It was later issued and transfused to another patient the next day.

Case 20.3: Administration error

While attaching a blood administration set to a bag of platelets, the bag was pierced. The doctor then drew up the platelets into 4x50ml syringes and injected the contents into a bag of saline before infusing into the patient using a blood administration set.

There were no reports of any adverse effects for the transfused patients in the case studies. This is consistent with previous years and the data for extended transfusion times is summarised in a recent publication (Foley et al. 2016).

Near Miss HSE cases n=97

Table 20.2: Near misses that could have led to HSE n=97

Point in the process	Type of error made	Number of cases	Percentage of cases
Component selection	Expired unit	15	15.5%
Collection	Time-expired component available	12	12.4%
Administration	Incorrect transport/packing of units	6	51.5%
	Inappropriate storage in clinical area	26	
	>30 mins out of temperature control in clinical area	11	
	Unit expired on ward	7	
Other	Outside sample suitability	6	20.6%
	Incorrect storage in the laboratory	12	
	Part used unit returned to refrigerator	1	
	Thawing temperature led to deposits in SD-FFP	1	
Total		**97**	**100%**

**SD-FFP=solvent-detergent fresh frozen plasma*

COMMENTARY

Both laboratory and clinical staff have opportunities to ensure that best use is made of blood components by making sure that blood components are stored correctly and distributed appropriately. It is fortunate that no harm came to any of the patients who received a transfusion which had either expired or run over the recommended time limit. Vigilance is also needed when removing or returning stock to the refrigerator and to ensure that the correct giving set is used.

References

Bolton-Maggs PHB, Poles D et al. (2015) **The 2014 Annual SHOT Report**. www.shotuk.org [accessed 20 January 2016]

Foley K, Poles D et al. (2016) **Are the 'rules' for times in set up and duration of red cell transfusion too strict?** Transfus Med published online: 25 April 2016; DOI: 10.1111/tme.12308 [accessed 15 May 2016]