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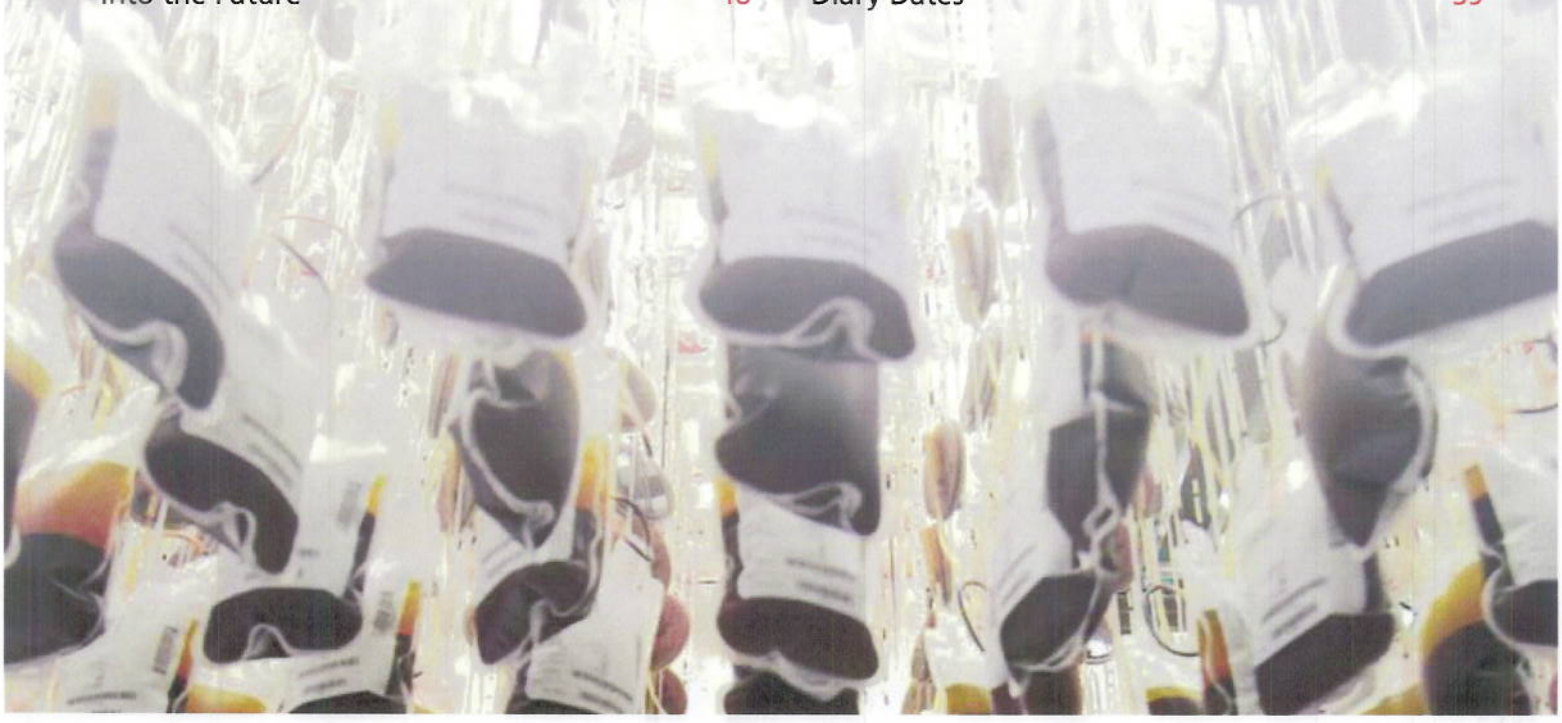

The Transfusion Safety Team of the Biomedical Excellence for Safer Transfusion (BEST) Collaborative

BEST is an international research organisation that works collaboratively to explore ways to improve transfusion-related services through standardisation of laboratory methods, the development of new procedures, and clinical trials. BEST was established in 1991 as a collaboration between scientists and manufacturers active in transfusion medicine research. It has recently encompassed blood services as members.

The activities of BEST are co-ordinated through its team structure and twice yearly two-day meetings. Until 2011, there were four Teams, namely Conventional Components, Clinical Studies, Cellular Therapy and Transfusion Safety. A Team for Donor Studies has recently been established to undertake studies in this under-researched field of transfusion medicine.

The BEST Transfusion Safety Team conducts collaborative international studies that address questions regarding the safe transfusion of blood and components. Its projects are based principally in hospitals related to BEST members, and include pilot exploratory studies, definitive large-scale studies, randomised trials, surveys, laboratory-based investigation and qualitative research. While principally focused on countries with advanced healthcare, projects suited to countries with emerging economies are also conducted. The founding team leaders of the Transfusion Safety Team were Sunny Dzik (Boston) and Cees Smit Sibinga (Groningen). The current team leaders are Mark Fung (Vermont) and Mike Murphy (Oxford).

Recent Completed Projects of the Transfusion Safety Team include:

A study of the frequency of mis-labelled and mis-collected blood samples used for pre-transfusion testing. This study assessed the frequency of mis-labelled and mis-collected samples taken for blood grouping and antibody screening. Mis-labelled samples were defined as those not meeting local criteria for acceptance by the laboratory. Mis-collected samples (Wrong-Blood-in-Tube or WBIT) were defined as samples whose blood group result differed from the result on file from prior testing. WBIT rates were corrected for the proportion of repeat samples and for undetectable errors due to chance collection of blood from the wrong patient with the same ABO group. 62 hospitals in ten countries provided data on the frequency of mis-labelled and mis-collected samples during a period of at least three months. Based on the results from over 690,000 samples, the median rate for mis-labeling was one in every 165 samples (6.1 per 1,000). Mis-collected samples demonstrating WBIT occurred at a median rate of one in every 1,986 samples (0.5 per 1,000). There was great variation worldwide in the reported frequency of mis-labelled samples probably resulting from variation in policies for sample acceptance. Mis-collected samples occurred at a more constant rate. It was recommended that rates of mis-labelled samples and WBIT could be tracked as key indicators of performance of an important step in the clinical transfusion process.

A randomised cluster-design study on the utility of a low-cost method to reduce the risk of mis-transfusion clerical errors at the bedside. A trial was conducted to assess the effectiveness of a simple intervention designed to improve performance of the bedside check and the durability of any effect. The intervention was a tag on blood bags reminding staff to check the patient's wristband. The tag was positioned in such a way that the transfusionist was required to remove the tag in order to spike the unit. The intervention was tested in a multicentre cluster-randomised controlled trial at 12 participating hospitals in six countries. The primary endpoint was the proportion of patients transfused with red cell units for whom the key elements of the bedside check were all correctly completed. Combining data from all participating hospitals, the bedside check was correctly performed in only 37% of transfusions during the baseline audit period. There was no evidence of a favourable effect of the intervention immediately after its introduction. The robust study design developed for this study could be applied to investigate other interventions to improve the safety of bedside transfusion practice.

A practical tool for the use of statistical process control to monitor transfusion process. Statistical Process Control (SPC) is a recognised methodology to monitor the performance of a critical process. An easy-to-use SPC method was developed and applied for monitoring the process of sample labelling and collection in ten hospitals in five countries. The method proved suitable for monitoring sample collection. Based on the experience of the hospitals in this study, recommendations were provided about how best to use the tool. SPC could be applied to other critical steps in the transfusion processes as a tool for biovigilance, and to develop regional or national performance standards for pre-transfusion sample collection. The software tool is freely available to all from the BEST website: http://www.bestcollaborative.org/.

A qualitative study using focus group feedback to explore weaknesses in the bedside clerical check prior to transfusion. Focus group discussions and interviews were conducted at six hospitals in five countries. The

findings included that staff were aware of the seriousness of errors and were receptive to continuous monitoring; the focus was on checking the bag label with the paperwork rather than the bag label with the patient at the bedside; training methods varied with most perceived to have minimal effectiveness; access to policies was challenging and keeping up-to-date was difficult. Other factors contributing to errors included workload distractions and interruptions, and familiarity or lack of familiarity with patients. It was concluded that multiple factors contribute to errors during the pre-transfusion checking limiting the effectiveness of any individual intervention designed to improve safety. Areas of further research to improve safety of blood administration were identified.

Current Projects Include:

- A study to model the effect of changes in red cell storage on the inventory of blood available for patient use in hospitals.
- Development of a tool to assess the knowledge of transfusion medicine in junior doctors.
- A trial to investigate the role of patient involvement to improve patient safety.
- A trial to evaluate whether feedback of current utilisation to individual physicians will lead to improved blood product utilisation.

Further information about the BEST Collaborative is available on its website: http://www.bestcollaborative.org.

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