

Category:

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Advancing the Use of the ISBT-128 Coding System in Electronic Health Records to Monitor Blood Transfusion Prevalence in the United States

Background: The most detailed information about transfusion of whole blood and blood components in electronic health records (EHR) is recorded with the Information Standard for Blood and Transplant (ISBT)-128 coding system in the United States (U.S.). The ISBT-128 coding system adds sensitivity and granularity to blood surveillance which other coding systems, such as billing and reimbursement codes, may lack. The U.S. Food and Drug Administration (FDA) Center for Biologics Effectiveness and Research (CBER) recently established the Biologics Effectiveness and Safety (BEST) Initiative, a part of the CBERSentinel Program. The aim of this study is to characterize the prevalence of whole blood and blood components transfusion from 2012 to 2017 using ISBT-128 codes from participating data partners in the BEST Initiative.

Methods: We explored approximately 24 million patient records from three EHR databases (Columbia University, Stanford University, and Regenstrief Institute) along with a library of 14,543 ISBT-128 codes. We assessed transfusion of whole blood or a blood component (red blood cells, plasma, cryoprecipitate and platelets).

Results:

Table 1. Transfusion trends in three EHR databases in the BEST Initiative, 2012-2017

Year	2012	2013	2014	2015	2016	2017	Total
Whole Blood	34	16	6	8	8	-	72
Red Blood Cells	56,519	57,397	62,236	66,715	69,416	63,195	375,478
Platelets	32,713	22,534	25,919	27,081	26,824	24,911	159,982
Plasma	11,607	11,881	12,385	11,878	11,501	9,845	69,097
Cryoprecipitate	2,947	2,936	3,410	3,539	3,627	3,431	19,890
All Transfusions	103,820	94,764	103,956	109,221	111,376	101,382	624,519

Transfusion trends of blood components varied between 2012 and 2017. Of the 624,519 total transfusion events, red blood cells (RBCs) accounted for more than half (51.1%) of events, with platelets (21.8%), plasma (9.4%), cryoprecipitate (2.7%), and whole blood (0.01%) comprising the remaining events. We observed increasing RBC transfusion events up through 2016, a suggestion of increasing administration of cryoprecipitate, and relatively consistent use of plasma. There is overall downward trend in administration of platelets. Whole blood usage was minimal and became obsolete over the study period.

Summary/Conclusions: We have demonstrated that using the ISBT-128 coding system is feasible and well-captured within the BEST EHR databases. Incorporation of ISBT-128 codes into the CBERSentinel blood

surveillance system can enhance hemovigilance activities and will afford FDA the ability to actively monitor blood component utilization and transfusion-related adverse events.

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