

Inspecting the Practice of Blood Transfusion through the Approach of Human Factors and Risk Management

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Introduction

Mistransfusion of blood remains a serious hazard of transfusion. In this study, human factors and risks analysis were integrated into the procedure of blood transfusion and all findings were announced to clinical settings in order to promote valuable practices and to enhance the safety of blood transfusion.

Results

Examining the observation of blood transfusion process, the results show that the risks are concentrated in the “working procedures and methods of factors”. For example, staff can't find order sheets, miscollection or mislabeling of blood, double check errors, and wrong handwriting on the transcript resulting errors. Therefore, during the procedure of blood transfusion, several appropriate practices were to meet human factors.

1. While a physician places this order, the message will also be reminded through the functional mobile e-nursing cart such as sound appearing or monitor displaying.
2. Also, in the stage of blood collection for testing, the “visual image” of correct tubing color or sufficient volume of blood drawing can be shown on the medical system and a clear labeling with “wording reminder” on a tube which help avoid mistakes.
3. During the stage of blood collection or transfusion, wireless barcode scanners to identify correct patients can be adopted effectively for the first-line staff.
4. The information system is open to the medical professionals for tracking the progress of blood products which is reducing verbal communication or phone call notification in clinical settings.

Overall, the common risk of blood transfusion is due to excessive double-checking mechanisms, environmental or personal interferences which causes more interruption or distraction.

Methods

Oncology wards or units with high frequency of blood transfusion from 5 organizations were chosen to visit. Five experts in the background of patient safety or human factor engineering professionals were invited to each organization going through on-site observation of transfusion procedures and conducting interviews with the operating personnel. In addition, the expert group conducted qualitative records according to the assessment form of the five major factors (individuals, working procedures and methods, external environment, equipment, organizational culture and society). Reviewing hospitals, some of them tends to follow “traditional” way to perform the procedure of blood transfusion. This relies on "people-to people" for double checking, paper documents or phone calls communication to send messages, confirmation of manual cross-matching procedure, etc. On the other hand, others are “semi-information-based or full information-based ” in the blood transfusion procedure. This involves the use of information systems to conduct double-check of “people to machine” (e.g. barcode, RFID), information system communication, and the second cross-matching blood test by instrument confirmation, etc.

Graphs



Conclusion

Taiwan Patient Safety Reporting system data show that the results of reporting blood transfusion events are “near-misses”. Correct patient identification and applying “double check” mechanisms play an essential role in the process of blood transfusion. On the other hand, over developed mechanisms of double-checking may result in “double check fatigue” or “Bystander effect”. Furthermore, let's rethink from quality improvement in healthcare, whether it improves the safety through many designed protective barriers in organizations and how to minimize operation interference in medical environment.

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Tables

Expert background	
1	Physician (eg: specialty of Emergency Medicine, surgical background etc.)
2	Human Factors Engineering and Ergonomics
3	Human Factors Engineering and Ergonomics
4	Registered Nurse
5	Medical Laboratory