

2021

## Evaluation of Blood Transfusion Practice at University Of Science & Technology Hospital, Yemen

Noor Abdull-aziz Bin kroom

*College of Medicine and Health Sciences, Hadhramout University*

Follow this and additional works at: [https://digitalcommons.aaru.edu.jo/huj\\_nas](https://digitalcommons.aaru.edu.jo/huj_nas)



Part of the [Medicine and Health Sciences Commons](#)

---

### Recommended Citation

Bin kroom, Noor Abdull-aziz (2021) "Evaluation of Blood Transfusion Practice at University Of Science & Technology Hospital, Yemen," *Hadhramout University Journal of Natural & Applied Sciences*: Vol. 14 : Iss. 2 , Article 3.

Available at: [https://digitalcommons.aaru.edu.jo/huj\\_nas/vol14/iss2/3](https://digitalcommons.aaru.edu.jo/huj_nas/vol14/iss2/3)

This Article is brought to you for free and open access by Arab Journals Platform. It has been accepted for inclusion in Hadhramout University Journal of Natural & Applied Sciences by an authorized editor. The journal is hosted on [Digital Commons](#), an Elsevier platform. For more information, please contact [rakan@aar.edu.jo](mailto:rakan@aar.edu.jo), [marah@aar.edu.jo](mailto:marah@aar.edu.jo), [u.murad@aar.edu.jo](mailto:u.murad@aar.edu.jo).

## Evaluation of Blood Transfusion Practice at University Of Science & Technology Hospital, Yemen

Noor Abdull-aziz Bin kroom\*

### Abstract

Blood transfusion is a vital part of the health care system. The accrediting and regulatory agencies make essential policies and guidelines for its transfusion process. The study aimed to evaluate blood transfusion practice specifically its indications at the University of Science and Technology (UST) Hospital in Sana'a, Yemen to improve this service. This was a retrospective descriptive study. A total of 200 files (100 donors, 100 recipients) were reviewed during the study period from January to December 2013. The sample was selected using simple random technique and the size was determined as a rule of thumb. Data was collected in a special form developed from national/international standards. SPSS 20 was used for analysis. The study showed that among 100 donors, 99% were males and 1% were females. There was inadequate pre-transfusion screening tests and recording of the vital signs. Whole blood transfusion is still a common practice and is about 34% of the all transfusions. Most prescribed blood in the medical department (47%), followed by surgery (34%). The main indication was anemia (29%), followed by road traffic accident (17%). Proper documentation and adherence to national and international policies/guidelines for blood transfusion process would prevent its catastrophic consequences and minimize the financial burden and medical legal issue.

**Key words:** blood transfusion, practice, guidelines, donors and recipients, Yemen.

### Introduction:

Blood transfusion is an essential and integral part of patient care in the health system. It saves lives and improves health when used correctly. However, transfusion carries a potential risk of acute or delayed transfusion reactions and transmission of infectious diseases. So, a monitoring and improving program must address the use of blood and blood components through accrediting and regulatory agencies, and quality system should be in place to cover all stages of the transfusion process [3, 8, 18]. Despite of these measures, inappropriate blood transfusion continues [10]. Many transfusions are given unnecessarily when the availability and use of simpler less expensive treatments would provide an equal or greater benefit [16]. Not only does this expose patients needlessly to the risk of transfusion reactions, it also widens the gap between supply and demand and contributes to shortages of blood and blood products for patients who really need them.

The World Health Organization (WHO) recommends that national health programs should develop policies and strategies to reduce the need for blood transfusion and ensure the safe and appropriate use of blood and blood components [17]. The monitoring and evaluation process should help the organization to minimize un-necessary transfusion and recognize those

situations on which its attention could be focused [11]. The transfusion process includes a series of events comprising, ordering of blood or its products for transfusion, taking pre-transfusion blood samples, laboratory practices, collection and administration of blood and/or components, monitoring of the transfused patient, managing adverse events and documenting the transfusion events and outcomes [3]. It is recommended that all clinicians, nurses and laboratory managers in the hospital to be kept informed of all these matters pertaining to transfusion practices in the hospital [5]. Furthermore, medical staff should identify the predictors that define the need for blood transfusion and monitor and evaluate the process and take the leadership role in improving transfusion practices when indicated. The current literature does provide guidelines for some of the more commonly encountered clinical situations. However, variability in transfusion practice often reflects expert opinion, tradition, community practice, or personal experience [19]. Specific written guidelines on the appropriate use of blood in the hospital are available in 13% of low-income countries in comparison to 30% of middle-income countries and 78% of high-income countries [19]. Thus safe transfusion depends on a complex process that requires integration and coordination among multiple hospital disciplines, including clinical departments, laboratory medicine, nursing, clerical support and transportation [5]. The donated blood requires extensive processing and testing before being transfused, hence a unit of

---

\* Assistant Professor of pediatrics, pediatrics department, College of Medicine & Health sciences; Hadhramout University. Received on 20/11/2017 and Accepted for Publication on 8/1/2018

blood is therefore an expensive matter [19]. Yemen is a developing country with limited resources where blood supply, distribution and delivery add a further burden to its economy [7]. The blood transfusion service (BTS) basically is a hospital-based blood banking system where blood banks are responsible for the blood transfusion services, including the recruitment of donors, testing for infective agents, preparation, storage and issue. Blood is usually collected in the hospital from a voluntary friend, relative or co-workers, and on occasion by donors who are paid by the family. It is routinely screened for immunodeficiency Virus (HIV), Syphilis, Hepatitis B and C and in some hospitals for malaria [7].

The aim of our study was to assess the clinical transfusion practice and identify the main indications at University Sciences & Technology (UST) hospital. To our knowledge this is the first study dealing with evaluation of blood transfusion process in Yemen.

#### Material and Methods:

This is a retrospective study which was conducted at University of Sciences & Technology (UST) hospital. UST hospital is a private teaching hospital for the medical school of UST. It has a capacity of nearly 200 beds and considered to be a tertiary hospital in which advanced medical and surgical interventions are conducted including cardiac surgery.

We got the approval of college of medicine at UST and the hospital director of UST- Hospital. We approached the blood bank for their records of the year 2013 (from 1/1/2013 - 1/11/2013) to get the blood/products' recipient and donor patients files' number. Two hundred medical

records (100 donors and 100 recipients) were selected by simple random sampling.

Clinical transfusion practice is variable and often reflects expert opinion, tradition, community practice and personal experience [19]. For this reason, we developed special collecting formats (one for donor and the other for recipient, see appendix 1& 2) taking into consideration these aspects by reviewing some of the international blood transfusion guidelines and practices such as those of the World Health Organization [9], American National Red Cross [5], and Malaysia hospital practice [3].

The medical and transfusion histories were studied and collected in the special format. We reviewed the donor sheet for personal data, and the pre-transfusion screening. The recipient file was examined for personal data, pre/post transfusion testing, type of blood products, indications, the transfusion process particularly vital signs before, at the beginning and after completion of transfusion, transfusion reaction, and patient outcome. We used SPSS 20 for analysis.

#### Results:

A total of 200 files (100 donors and 100 recipients) were reviewed. Of the 100 donor s there were 99% males and 1% female. All donors were consented. Of these, only 1% had their socioeconomic status, donor addresses and phone numbers recorded, the place of donation was not recorded in either of the 100 donors' sheets. Screening for Human Immune deficiency virus (HIV), Hepatitis B surface antigen (HBsAg), Hepatitis C Virus (HCV) and Malaria was documented in 71% files, vital signs were not recorded in any of the donor files (Table 1).

**Table 1: Frequency (%) of available personal data and pre-transfusion screening of the donors (no. 100)**

Variable	Available	Not-Available
	Frq (%)	Frq (%)
Sex	99 (99% male)	1 (1%female)
Residency	1 (1%)	99 (99%)
Family socioeconomic status	1 (1%)	99 (99%)
Consent	100 (100%)	0 (0%)
Vital sign	0 (0%)	100 (100%)
HIV	71 (71%)	29 (29%)
HBsAg	71 (71%)	29 (29%)
HCV	71 (71%)	29 (29%)

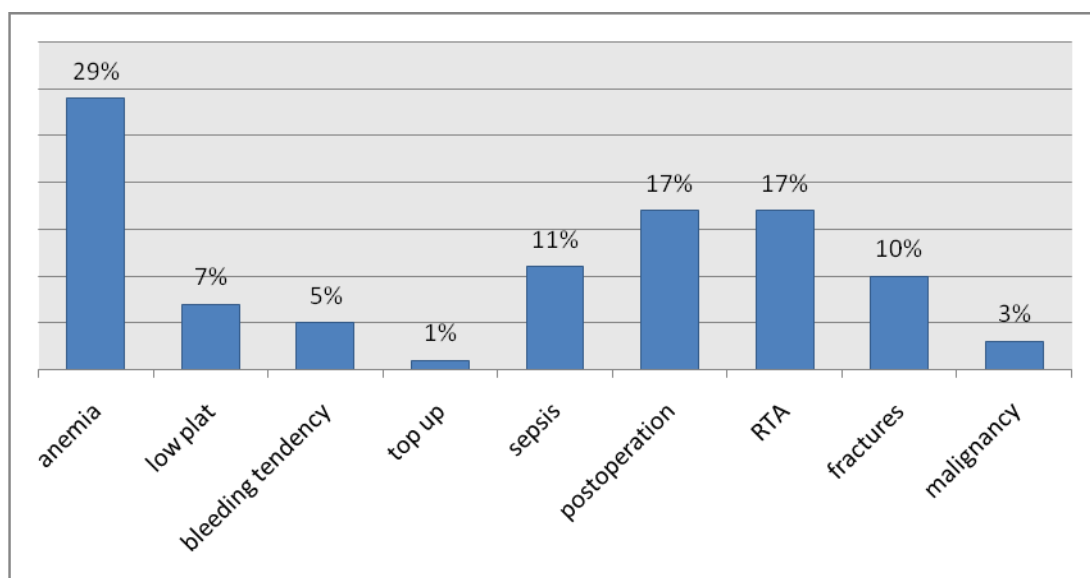
Of the 100 recipients (Table 2) 48% were males and 52% were females, there were no blood transfusion consent forms in any of the files.

**Table 2: Frequency (%) of available personal data and pre-transfusion screening of the recipients (no. 100)**

Variable	Available Frq (%)	Not-Available Frq (%)
Sex	48 (48% male)	52(52% female)
Residency	0 (0%)	100 (100%)
Family socioeconomic status	2 (2%)	98 (98%)
Consent	0 (0%)	100 (100%)
Vital sign	96 (96%)	4 (4%)
HBsAg	0 (0%)	100 (100%)
HCV	0 (0%)	100 (100%)
HIV	1 (1%)	99 (99%)

HIV test results were found in 1 file, and HBsAg and HCV were not found in any of the files. Pre-transfusion vital signs were recorded in 96% of the files. Of the recipients, no post transfusion complete blood count (CBC) or clotting tests (for patient with bleeding tendency) were found in the files and the patient outcome after transfusion was not recorded for any of the recipients. There were no adverse

reactions recorded. The most prevalent specialty prescribing blood was medical department (including pediatrics) 47%, followed by surgery 36%, obstetrics 14.5% , Intensive Care Unit (ICU) 2%, and emergency 1%.Over all, there was 56% packed Red Blood Cells (RBC), 34% whole blood, 6% plasma, and 4% platelet transfused.



**Figure 1: Indications for blood transfusion of the recipients**

Figure 1 shows that the most common indication for blood transfusion at UST hospital was anemia (29%), followed by post-operation and Road Traffic (RTA) accident each 17%. The main primary diseases of the recipients were as following: hemorrhage 26%, accidents 20%, sepsis 11%, immune thrombocytopenic purpura (ITP) 7%, hemolytic anemia 10%, and iron deficiency anemia (IDA) 7%.

#### **Discussion:**

Data about the gender profile of blood donors show that globally 30% of blood donations are given by women, although this differs widely, where in 20 of the 111 reporting countries, less than 10% donations are given by female donors [12]. In our study nearly all of the donors are males (99%). In comparison to the nearby countries such as Oman, in 2008 female donors constituted about 6.43% (12), whereas in Saudi Arabia, it was about 2% (1). In India a study reported 3% female donors [15], while in Brazil 20% to 40.3% female donors [6] in contrast to Europe where the distribution of men and women donors is similar with Italy being an exception in that women account for only 30% of the donors [4]. In general, in western countries, female donors represented a high percentage compared to ours and the nearby countries [4]. There are many reasons for such big gender difference in our female donors of which socio-economic status and cultural reasons play a crucial role. "For examples many women as well as men prefer "wet cupping therapy" (Hijama) rather than donation. Though cupping therapy is used mainly for therapy of some diseases, but some of people use it to get rid of excess blood [13]. Generally speaking, there is scarce information on gender attitude towards blood donation in Yemen which has to be explored so as to increase donor recruitment.

In our study in Sana'a as well as the rest of Yemen the use of whole blood transfusion particularly for anemia is still a common practice [7]. Similar findings of the use of whole blood transfusion practice were reported in other developing countries such as Uganda (58.4%) in which malaria is most prevalent [14]. Whole blood should be used only for exchange transfusion and acute massive blood loss with hypovolemic shock as recommend by WHO [16]. Whole blood should be replaced by Packed Red Blood Cells to save the rest of the blood by fractionation for other indications.

Departmental utilization and indications of blood

is greatly variable among countries and within the country of the current study [9]. Our study showed that the most prevalent department prescribing blood is medical department in contrast to other countries such as Uganda [14], Nigeria [2], and Europe [9] where surgical department is the most prevalent one. Our finding might be different due to the UST-hospital is a private facility, and majority of people use the government hospital. However, this could still be minimized by refining the indications, following guidelines, and using alternatives to blood when possible and incase of surgery, encouraging the use of autologous blood transfusion. Further study is needed to compare transfusion practices between the private and government sectors.

Our findings showed that, the most common indication for blood transfusion at UST hospital was anemia (29%) and that of iron deficiency anemia (IDA) constituting about 7%. Obviously this is a common practice our hospitals to treat moderate to severe IDA with blood transfusion rather than iron therapy which would save time and money, and avoid the risks of transfusion. This practice can be changed through auditing, training and increased awareness of medical staff. Although there was no evidence of adverse reactions and wastage during this period, we think it is more of inadequate documentation of the transfusion process rather than their absence.

#### **Limitations of the Study:**

Our study showed poor blood transfusion documentation in the patient files, and absent specific written transfusion guidelines in the files.

There is inadequate recording of donor address which makes it difficult to follow them up for further donation. On the other hand inadequacy in pre-transfusion screening jeopardizes patient safety. Blood donation and voluntary donor recruitment is an essential step of blood transfusion services.

#### **Conclusion & Recommendations:**

There is a real concern regarding the safety of clinical blood transfusion practice from the inadequacies of documentation. There were no consensus guidelines for identifying the predictors that define the need for blood transfusion so as to reduce inappropriate transfusions and improve patient care as well as being a cost effective procedure. There were also no records of adverse reaction, deferral and wastage. The current practice which has cost

implications could be improved through encouraging and retaining voluntary donors through blood donation campaigns which is in keeping with the WHO drive. (Towards 100% voluntary blood donation: a global framework for action) [8].

We recommend the following:

- Establishment of a hospital transfusion committee and development of blood transfusion guidelines at UST hospital.
- Adoption of a quality management system so as to maintain satisfactory standards of transfusion records.

- Maximizing the use of donated blood by development of blood fractionation system and proper storage facilities.
- Designing 'blood transfusion forms' for easy monitoring and evaluation.

**Acknowledgement:**

We would like to thank the sixth year medical students (Adnan Bayhia, Ammar Banakher, Abdulkarim Altarazi, Abdulrahman Moalim and Abdulaziz Badabi) of UST-College of Medicine for their assistance in data collection, the director and staff of UST Hospital in Sana'a for their cooperation and doctors Mahdi Alqayrwni and Farook Alqadasi for their help in finalizing the proposal for the study.

**References:**

- 1- Alabdullateef A. 2012. Transfusion in Saudi Arabia. Cited on 17/09/2014: at <http://www.transfusionmedicine.ca/sites/transfusionmedicine/files/events/Saudi%20Arabian%20Blood%20Services.pdf>
- 2- Amucheasi AO, Ajuzeigu VO, Ezike HA, Odiakosa MC, Nwoke OM, Onyia E. (2011). A survey of blood conservation methods in clinical practice in some urban south eastern government hospitals in Nigeria. *Asian Journal of Asian Transfusion Science*; 5:35-38
- 3- Ayob DY., Director National Blood Centre Kuala Lumpur. (2008). *Transfusion Practice Guidelines for Clinical and Laboratory Personnel*. National Blood Center Ministry of Health Malaysia (3rd ed).
- 4- Bani M, Giussani B. (2010). Gender differences in giving blood: a review of the literature. *Blood Transfus*; 8:278-287. DOI 10.2450/2010.0156-09
- 5- Cable R, Carlson B, Chambers L et al. (2002). *Practice Guidelines for Blood Transfusion 2nd edition*. American Red Cross-region or through the AABB (cited at: <http://www.aabb.org>).
- 6- Carneiro-Proiett AB, Sabini SC, Sampaio D et al. (2010). Demographic profile of blood donors in Brazil: Results from the International REDS II Study, 2007–2008. *Transfusion*; 50(4): 918–925.
- 7- Darbandi A, Mashati P, Yami A et al.(2017). Status of blood transfusion in World Health Organization-Eastern Mediterranean Region (WHO-EMR): Successes and challenges. *Transfusion and Apheresis Science*; 56 (3): 448-453
- 8- Dhingra N, Carolan P. Towards 100% Voluntary Blood Donation, A global frame work for action. Cited on 26/10/2017: at <http://www.who.int/bloodsafety/publications/9789241599696/en/>
- 9- Dzik WH, Corwin H, Goodnough LT. (2003). Patient safety and blood transfusion: new solutions. *Transfusion Medicine Reviews*, 17, 169–180.
- 10- Geißle RG, Franz D, Buddendic H, Krakowitzky et al. 2012. Retrospective Analysis of the Blood Component Utilization in a University Hospital of Maximum Medical Care. *Transfus Med Hemother*; 39:129–138. DOI: 10.1159/000337956
- 11- Joshi GP, McCarroll SM, O'Rourke PJ, Coofey F. (1997). Role of quality assessment in improving red blood cell transfusion practice. *Irish Journal of Medical Sciences*; 166: 16-19.
- 12- Joshi GP, Landers DF. (1998). Audit in transfusion practice. *Journal of Evaluation in Clinical Practice*; 4:141-146.
- 13- Joshi SR, Al-Bulushi SNS, Ashraf T. (2010). Development of blood transfusion service in Sultanate of Oman. *Asian Journal of Transfusion Science*; 4: 34-40
- 14- Mehta P, Dhapte V. (2015). Cupping therapy: A prudent remedy for a plethora of medical ailments. *Journal of Traditional and Complementary Medicine* 5 (2015) 127-134
- 15- Natukunda B, Schonewille H, Smit Sibinga C Th. (2010). Assessment of the clinical transfusion practice at a regional referral hospital in Uganda. *Transfusion Medicine*; 20, 134–139
- 16- Shah R, Tulsiani S, Harimoorthy V, Mathur A, Choudhury N. (2013). Analysis of efforts to maintain safe donor in main donor pool after completion of temporary deferral period. *Asian Journal of Transfusion Science*; 7:63-67
- 17- Smit Sibinag C Th. (1995). *Blood Trasfusion and blood components*. WHO Regional Publications, Regional Mediterranean Series, no; 12 chapter 5
- 18- World Health Organization (1992). *Report on the informal consultation on collaboration in training in transfusion medicine*. Geneva, Switzerland.
- 19- World Health Organization (2006). *Blood Transfusion Safety Department of Essential Health Technologies*, Geneva 27, Switzerland. Cited at [www.who.int/bloodsafety](http://www.who.int/bloodsafety).
- 20- World Health Organization (2011), *Summary report. Global Data on Blood Safety*. Cited at: [http://www.who.int/bloodsafety/global\\_database/GDBS\\_Summary\\_Report\\_2011](http://www.who.int/bloodsafety/global_database/GDBS_Summary_Report_2011)

## Appendix 1

**DONOR FORMAT**

<b>Personal data</b>			
Name .....	Age .....	Sex: M / F	Residency .....
Family Socio-economic status .....		consent : Yes/No	
Phone number .....			
<b>Place of Transfusion</b>			

<b>Pre-transfusion screening</b>					
	Yes	No	Hb	YES	No
Blood group			WBC		
Rh			Plat		
HIV			MCV		
HBs Ag			Hct		
HCV					
Malarial parasite (MP)			Vital signs ( temp – PR – RR – BP )		

**Appendix 2: Recipient format**

<b>Personal data</b>					
Name.....	Age .....	Sex: M / F	Residency .....	Family Socio-economic status .....	File number .....
consent yes/no					
Phone number .....					
Place of Transfusion : SCBU <input type="checkbox"/> Medical ward <input type="checkbox"/> Emergency <input type="checkbox"/> Surgical ward <input type="checkbox"/> Other <input type="checkbox"/>					
<b>Indication of transfusion</b>					
Anemia (type)		Low plat		Bleeding	
Top up		Sepsis		Other (specify)	
Post operation					

<b>Pre-transfusion screening</b>				Yes	No
WBC:	Hb:	Plat:	Others:		
Blood group					
Rh					
HIV					
HBsAg					
HCV					
Coomb test					
Vital signs ( temp – PR – RR – BP)					
<b>Post transfusion test</b>					
Hb		WBC		Plat	
PT		aPTT		Liver enzymes	
<b>Patient outcome</b>					
Improved		Discharged in good condition		Transfer to other Hosp	Died



<b>Blood product type and amount, frequency ,Bag, use of filters</b>			
	<b>Amount</b>	<b>Frequency per admission</b>	<b>Weight (kg)</b>
Packed RBC			
Whole blood			
Plasma			
Plat			
Factor VIII			
Other			
<b>Primary Disease</b>			
Chronic disease (type)	Congenital hemolytic anemia		prematurity
IDA	ITP		Other (specify)
Malignancy	sepsis		
Bleeding disorder	Accident		

## تقويم ممارسة عمليات نقل الدم في مستشفى جامعة العلوم و التكنولوجيا \ صنعاء 2013

نور عبدالعزيز بن كروم

### الملخص

يعد نقل الدم جزءاً حيوياً لا يتجزأ من خدمات الرعاية الصحية و عليه يتحتم توفير جودة عالية لتبرعه، نقله ، حفظه وترشيده استخدامه وذلك عبر الإرشادات والسياسات المتبعة لكل مؤسسة من خلال اللجان المختصة في هذا المجال استهدفت هذه الدراسة تقويم ممارسة نقل الدم في مستشفى جامعة العلوم والتكنولوجيا في صنعاء و خاصة دلالات نقل الدم وذلك لتحسين وتطوير خدمة نقل الدم في المستشفى . هذه دراسة وصفية استرجاعية. تم مراجعة ما مجموعه 200 ملف (100 متبرع، 100 مستقبل) خلال فترة الدراسة من يناير إلى ديسمبر 2013 . تم جمع البيانات من الملفات وتدوينها في استمارات خاصة أخذت بعين الاعتبار الإرشادات التابعة لمنظمة الصحة العالمية و غيرها من الدول المتقدمة . أظهرت الدراسة أن من بين 100 متبرع 99% من الذكور و 1% من الإناث. وهناك قصور في سجل المتبرعين للأمراض المعدية مثل فيروس المناعة المكتسبة و التهاب الكبد الوبائي حيث وجد التدوين في 70%. كما أن نسبة نقل التام الكامل لاتزال من الممارسات الشائعة (34%). كما لم توجد في ملفات المرضى استمارة أو سجلات للمضاعفات الجانبية بنقل الدم وتدوين حالة المريض بعد نقل الدم . وأظهر البحث أن أكثر الأقسام استخداما للدم قسم الباطنة (أطفال و كبار) بنسبة (47%) يليه قسم الجراحة بنسبة (36%). وبالنسبة لدلالات نقل الدم وجدنا أن مرض فقر الدم يشكل النسبة الأعلى (29%) وتأتي الحوادث المرورية في المرتبة الثانية بنسبة (17%). وهناك قصور في سجلات عمليات نقل الدم . كذلك ندرة العنصر النسائي المتبرع. كما أن شيوع استخدام الدم الكامل وخاصة في فقر الدم مما يتقل كاهل القطاع الصحي المادية وعليه نوصي بإيجاد إرشادات و سياسات لعمليات نقل الدم وذلك عبر إيجاد اللجان الخاصة وكذلك التشجيع المستمر للتبرع التطوعي للدم لكلا الجنسين عبر الوسائل المختلفة المرئية والمقروءة.

**الكلمات المفتاحية:** عمليات نقل الدم، الدلالات والإرشادات، متبرعي ومستقبلي الدم ، اليمن