



Clinical Transfusion Needs & Systems to Improve Hospitals Transfusion Practice

DR. HIND AL-HUMAIDAN, MD, FRCPA

CONSULTANT & DIRECTOR, BLOOD BANK (DS & TS), THERAPEUTIC APHERESIS & STEM CELL CORD BLOOD BANK

ASSOCIATE PROFESSOR, COLLEGE OF MEDICINE, ALFAISAL UNIVERSITY

VICE PRESIDENT & CHAIRPERSON (KSA) OF AATM & CO-CHAIR OF AATM CELLULAR THERAPY WORKING GROUP

Introduction

- ▶ Blood transfusion essential part modern health care
- ▶ Associated significant clinical risk.
- ▶ Minimizing risk & optimizing benefits depend on close collaboration throughout transfusion chain.

Main elements for safe & effective transfusions

- ▶ Sufficient supply of safe blood
- ▶ Good clinical practice

Good clinical practice

- ▶ Safe & effective transfusion through error avoidance
- ▶ Avoidance errors leading “WRONG BLOOD TRANSFUSION “
- ▶ Appropriate decision making about appropriate use blood-based assessment clinical findings & laboratory parameters.
- ▶ Monitoring patients for adverse effects transfusion & their management.

Cont...

- ▶ Blood transfusion center should proactive role in promoting "Good Clinical Practice"
- ▶ Provide education & training for hospitals
- ▶ Developing guidelines
- ▶ Auditing practice sharing experience

Safe Transfusion Practice

- ▶ Adverse clinical events continue to be under-recognized & under-reported
- ▶ Potential solution under-researched & under-resourced
- ▶ Need to focus on why errors occur & potential solutions

Cont..

- ▶ Accurate patient identification
- ▶ Transfusion blood wrong patient
- ▶ Errors made anywhere in transfusion process
- ▶ Blood sample collection ,laboratory testing ,handling samples ,retrieval blood from refrigerators & during bedside check prior to transfusion

Cont...

- ▶ Risk of wrong transfusion many times greater than risk HIV or HCV
- ▶ Wrong transfusion one of two leading causes of death from transfusion reported to " FDA "

Sazama K: Reports of 355 transfusion associated deaths: 1976 through 1985. *Transfusion* 1990; 30:583–590.

US FDA : Fatalities reported to FDA following blood collection and transfusion. Annual summary year 2008.

Cont...

- ▶ Data from national haemovigilance indicate incorrect blood component transfused “IBCT” account for largest proportion all adverse events.
- ▶ Second most frequent cause mortality & morbidity associated with transfusion .
- ▶ Risk of ABO mis-transfusion 1 in 12000 units

Con...

- ▶ Hemovigilance program in Quebec & France identified wrong transfusion as most common major adverse event.
- ▶ True incidence is higher because failure to recognize many errors.

Baele P, De Bruyere M, Deneys V, et al.: Bedside transfusion errors. A prospective survey by the Belgium SANGUIS group. Vox Sang 1994; 66:117–121

- ▶ True frequency some errors in bedside blood administration 30-fold higher than reported.

Errors in Patient identification

Examples of errors in patient identification

- ▶ The (conscious) patient is not asked to state their name (and date of birth), and these are not checked against the same details on the wristband and other written documentation, such as the request form and the medical notes
- ▶ The patient is not wearing an identification wristband
- ▶ The patient details on the wristband are illegible
- ▶ Staff do not check the details on the wristband
- ▶ Staff rely on self-identification of the patient
- ▶ A surrogate identifier such as bed number is used to identify the patient

Hospital blood transfusion laboratory errors.

- ▶ 29% IBCT laboratory errors
- ▶ Using wrong pts. Sample for testing
- ▶ Technical error in blood grouping
- ▶ Failure to meet pt. special requirements
 - Gamma -irradiation
 - Antigen-negative blood
 - CMV negative blood
- ▶ Reason inadequate communication between clinical team & laboratory.

Examples of laboratory errors

- ▶ Transposition of samples
- ▶ Previous transfusion history not available.
- ▶ Error in blood retrieval

Potential solutions to improve the safety of transfusion practice

- ▶ Staff training:
 - “Transfusion Nurses “ & ”Specialist Practitioners of transfusion“
- ▶ Provide training & promote safe & effective transfusion practice in clinical areas.

Cont...

- ▶ Transfusion process in hospital involves :

Doctors ,nurses ,scientists ,phlebotomist & porters

“All Need Training”

- ▶ New approaches training use e-learning
- ▶ Competency testing for relevant procedures on regular basis.

Performance standards & repeated audit

- ▶ Detailed performance standards defined for safety & content blood components
- ▶ None for transfusion safety in hospitals
 - Sample collection area for compatibility
 - Bedside checking ensure pt. receive right blood
- ▶ Development performance standard strong incentive for hospitals monitor practice & seek resources improve practice

Con...

- ▶ Statistical process control „methodology monitor performance critical process ‘‘SPC’’
- ▶ SPC used develop regional or national performance standard pretransfusion sample collection & applied other critical steps transfusion processes.

‘‘Transfusion 2008,,Dzik 23’’

Cont....

- ▶ Repeated rounds direct observational audit.
- ▶ Model performance improvement initiatives described hospital transfusion committee.
- ▶ Prioritized around problem prone areas
 - High-risk
 - High-volume activities

New Technology

- ▶ Barcode technology in routine use
- ▶ Blood components are barcoded many years
- ▶ Should be used patient identification bedside checking process
- ▶ Barcoding currently most widely used auto identification technology
- ▶ Radiofrequency identification “RFID” tags use small chips with antenna
- ▶ RFID increasingly used.

Con....

- ▶ Computerized transfusion aids cannot eliminate human error.
- ▶ Less complicated
- ▶ More "user – friendly " procedure
- ▶ Less error

The effective use of blood

- ▶ Strategies inform & implement effective use of blood
- ▶ Require sound evidence from appropriately designed clinical studies
- ▶ Many accepted indications not based on high – quality evidence

Cont...

- ▶ Objective of transfusion to prevent or treat clinical problem caused deficiency of blood cells or plasma constituent
- ▶ Alternative ways of treating deficiency without transfusion should be considered ‘reduce complications & cost ‘
- ▶ Combination of alternative to transfusion & transfusion only when alternative use not appropriate or ineffective is

‘BLOOD MANAGEMENT’

Cont....

- ▶ Transfusion therapy should be guided by objective measurements as well as observational clinical effects
- ▶ Laboratory measurements often used
- ▶ Normalization of number of blood cells or coagulation factors not needed to achieve desired clinical effects
- ▶ Know target value for replacement of red cells or coagulation factor
- ▶ Target value vary dependent on clinical factors
- ▶ Need for ongoing replacement dependent on clinical factors, continued bleeding ,BM failure.

Evidence base for the effective use of blood

- ▶ Identify relevant systemic reviews, more explicit & less biased.
- ▶ Systemic reviews in transfusion show available trials inadequate to identify appropriate use blood component.

Variation in the use of blood products

- ▶ Hospital transfusion practice should be effective demonstration through audit or survey evidence-based practice implementation'
- ▶ Variation in transfusion practice widely observed

Cont....

- ▶ There is evidence large differences between hospitals & clinical teams use RBCs transfusions and other blood products for some surgical procedures
- ▶ No clear explanation clinical factors, age, pre-op HB, peri-op blood loss

Cont....

- ▶ Important need ensure practice which is less effective or cost-inefficient discontinued
- ▶ Methods, guidelines adoption & dissemination education materials, teaching sessions, use audits feedback reminders

Cont....

- ▶ Variations use blood indicate potential for reduction in blood usage without affecting patient care
- ▶ Considerable value comparing blood usage & practice between different hospitals, regions, countries, understand practice difference, learning lessons from best practice
- ▶ More resources devoted to field implementation research & towards better understanding promotion clinical effectiveness & uptake clinically effective transfusion practice

“Evidence based implementation “

Organizational initiatives for improving the safe & effective use of blood products

- ▶ Varied emphasis on blood management
- ▶ Clinical teams carry out major procedures without blood transfusion through out peri-op period

Strategies for reducing blood use in surgical patients

Preoperative:

- ▶ Identification and correction of anaemia
- ▶ Avoidance of drugs interfering with haemostasis e.g. anticoagulants
- ▶ drugs with anti-platelet activity

Strategies for reducing blood use in surgical patients

Operative:

- ▶ Good anaesthetic and surgical technique
- ▶ Avoidance of hypothermia
- ▶ Reduction of regional vascular pressure
- ▶ Cell salvage
- ▶ Point-of-care testing (for blood count and haemostasis) to guide the use of blood components
- ▶ Use of drugs such as tranexamic acid

Strategies for reducing blood use in surgical patients

Postoperative:

- ▶ Implementation of local guidelines for the use of blood, based on
- ▶ national guidelines, with education, audit and feedback of data to clinical teams
- ▶ Minimising the volume of blood collected for laboratory samples
- ▶ Washed or unwashed cell salvage



▶ Algorithms for blood management & restrictive transfusion thresholds
better approach to blood conservation

Slappendel R, Dirksen R, Weber EWG, et al.: An algorithm to reduce allogenic red blood cell transfusions for major orthopaedic surgery. *Acta Orthop Scand* 2003; 74:569–575

Carless P, Moxey A, O'Connell D, et al.: Autologous transfusion techniques: a systematic review of their efficacy. *Transfus Med* 2004; 14:123–144

▶ Countries developed better blood management & safe transfusion
practice through national initiatives

- Creation haemovigilance schemes
- Establishment of national, regional hospital transfusion committees

Cont....

Improve education & training clinical staff prescribing blood

- ▶ develop guidelines on blood usage, provide mechanism
- ▶ reviewing blood use local ,regional ,national audits with feedback on data to clinicians

A Forum

- ▶ Hospital transfusion committee
- ▶ Hospital transfusion team
- ▶ Hospital blood safety officer

National supporting elements of clinical transfusion practice

- ▶ N. Clinical blood policy forum
- ▶ N. Guidelines
- ▶ N. Hemovigilance
- ▶ N. Regulation

Hospital-based support

- ▶ Hospital transfusion laboratory
- ▶ Bedside transfusion
- ▶ Clinical use of blood

What has to be done at the hospital level?

- ▶ Standard operating procedures
- ▶ Requests
- ▶ Collection
- ▶ Administration
- ▶ Documentation
- ▶ Adverse events
- ▶ Identification/selection and training of staff

A bridge across the clinical interface

N . clinical blood
policy forum
N . Guidelines
N. Hemovigilance

Hospital transfusion
committee
Hospital transfusion team
Hospital blood safety officer

Hospital transfusion
laboratory
Bedside transfusion
Clinical use of blood

Functions of Hospital Transfusion committee

1. Promote safe and appropriate blood transfusion practice through local protocols based on national guidelines
2. Audit the practice of blood transfusion against the hospital policy and national guidelines,
3. Lead multi-professional audit of the use of blood within the hospital focusing on stock management, wastage and blood utilization.
4. Provide feedback on audit of transfusion practice

Committee membership

1. Transfusion Laboratory Manager
2. Transfusion Practitioner/ Nurse/ Blood safety officer
3. Haematologist in charge of blood transfusion
4. Senior nursing and midwifery representation
5. Representative from the clinical high users of blood
6. Anaesthetist
7. Member of the hospital risk management unit
8. Representative from finance
9. Representative from local BTS

WHO Recommendation

- ▶ WHO produced recommendations on developing national policy & guidelines on clinical use of blood.

World Health Organisation Blood Safety Unit: Developing a national policy and guidelines on the clinical use of blood. World Health Organisation, Geneva. Available at: http://www.who.int/bloodsafety/clinical_use/en/WHO_BLS_98.2_EN.pdf (accessed 30 May 2010)

Key elements for a national policy on the clinical use of blood (WHO)

- ▶ A commitment by health authorities, health care providers, and clinicians to the prevention, early diagnosis, and effective treatment of conditions that could lead to the need for transfusion by strengthening public health and primary health care programmes.
- ▶ A blood transfusion service that is able to provide adequate and timely supplies of safe blood and blood products.

Key elements for a national policy on the clinical use of blood (WHO)

The promotion and availability of:

- ▶ Intravenous replacement fluids (crystalloids and colloids) for the correction of hypovolemia
- ▶ Pharmaceuticals and devices to minimize the need for transfusion
- ▶ Sterile disposable equipment for blood samples, injection, and infusion

Key elements for a national policy on the clinical use of blood (WHO)

The availability of national guidelines on the clinical use of blood, which include:

- ▶ A standard blood request form
- ▶ A model blood ordering schedule
- ▶ Standard operating procedures for all stages of the clinical transfusion process
- ▶ Information on the specific characteristics of blood products, plasma derivatives, intravenous replacement fluids, and pharmaceuticals
- ▶ Clinical indications for transfusion.

Key elements for a national policy on the clinical use of blood (WHO)

- ▶ The establishment of a National Committee on Clinical Use of Blood and hospital transfusion committees at local level
- ▶ Education & training in effective clinical use of blood & blood products for all clinical & blood bank staff involved in transfusion process
- ▶ Effective clinical transfusion practice in accordance with national guidelines on clinical use of blood
- ▶ Monitoring and evaluation of clinical use of blood

THANK YOU