TRANSFUSION MEDICINE PROTOCOLS

Management of Transfusion Reactions and Adverse Events

This document should be read in conjunction with the Disclaimer

Contents

Transfusion Monitoring

Patients receiving transfusions must be monitored for signs and symptoms of potential complications and any deterioration must be investigated urgently. Severe reactions are most likely to occur within the first 15 minutes of the start of each component and patients MUST be closely observed during this period. Unless otherwise indicated by the patient's clinical condition, the rate should be no greater than 5mL/minute for the first 15 minutes. The following observations **MUST be undertaken and recorded in the observations chart in the medical notes:**

- **T,P,R,BP** and O_2 sats **Base line** before the start of each infusion
- **T,P,R,BP** and O_2 sats **15 minutes after commencing** each blood component
- Then **hourly measurements** of **T,P,R,BP** and O_2 sats
- A final **T,P,R,BP** and O_2 sats at the **end of each transfusion** episode

The patient should be located in an area where they can be observed by clinical staff throughout the transfusion. Closer observation should take place for babies and patients who are unable to verbalise symptoms due to mental or physical limitations.

Transfusion Reactions

Each blood product transfused carries a small risk of an acute or delayed adverse reaction. The most common immediate adverse reactions are fever, chills and urticaria. The most potentially significant reactions include acute and delayed haemolytic transfusion reactions, febrile non-haemolytic transfusion reaction, bacterial contamination of blood products, anaphylaxis and Transfusion Related Acute Lung Injury (TRALI).

Transfusion reaction can be fatal, so it is important these incidents are recognised promptly and managed appropriately. Acute transfusion reaction can occur up to 24 hours following administration of the blood product. Delayed transfusion reactions occur days or even weeks following the transfusion. All significant adverse events should be reported **immediately** to the Blood Bank Transfusion Medicine Unit (TMU) and Consultant Haematologist for advice on immediate management and investigation. All cases will also be reviewed by the Hospital Transfusion Committee and reported to the supplier (ARCBS or CSL) when appropriate. **Remember, report any adverse events immediately. If the cause is product related other patients may be at risk from components manufactured from the same blood donation.** For a full explanation and definition of what constitutes an adverse event please click on the link

Haemovigilance - Definition of Transfusion related adverse Events

A completed Transfusion Reaction Investigation Form must be sent to the TMU to ensure the event is recorded and investigated appropriately. (Click link above to download form or you can ring TMU on extension 82748 to obtain a hard copy). Serious non-infectious adverse events will be reported to the Australian Incident Monitoring System (AIMS) as appropriate.

Immediate management of acute transfusion reactions

The following table provides a summary of the main requirements for immediate management of a suspected transfusion reaction.

RECOGNISE	REACT	REPORT
Rise in temperature to > 38°C or >1°C above baseline Chills/ rigors Urticaria (hives), pruritis Hyper/ hypotension Tachycardia Dyspnoea/stridor/wheeze Pain (chest, back, IV site) Bleeding, oozing Dark urine (haematuria) Unexplained bleeding Nausea/vomiting Tachycardia	Immediate nursing action: **STOP transfusion (leave IV line in place), then** Provide emergency patient care Arrange immediate medical review. **Medical Emergency Team (MET). Call/Code Blue if necessary** Keep IV line open with normal saline (do not flush existing line – use a new IV line if required) Repeat all clerical and identity checks of the patient and blood pack Vital observations at least every 15 minutes until stable (document in medical record) **For a guide to further treatment and management of the patient refer to the Transfusion Reaction Flowchart**	Complete the Transfusion Reaction Investigation Form Document all treatment and actions in the medical record. Refer to Staff Responsibilities Flowchart for reporting and notification responsibilities in the event of a reaction and for advice of investigations required.

Government of Western Australia
Department of Health

Transfusion Reaction Flowchart

King Edward Memorial Hospital

PATIENT EXHIBITING POSSIBLE FEATURES OF AN ACUTE TRANSFUSION REACTION

which may include: fever, chills, rigors, tachycardia, hyper- or hypotension, collapse, flushing, utricaria, pain (bone, muscle, chest, abdominal), respiratory distress, nausea, general malaise

STOP THE TRANSFUSION - undertake rapid clinical assessment, check patient ID/blood compatibility label, visually assess unit, maintain IV access with saline

Evidence of:

Life-threatening Airway and/or Breathing and/or Circulatory problems and/or wrong blood given and/or evidence of contaminated unit

Yes

SEVERE/LIFE - THREATENING

- Call MET/CODE BLUE
- Initiate resuscitation - ABC
- Discontinue transfusion (do not discard implicated units)
- In event of ongoing haemorrhage seek urgent haematological advice on suitable blood product support
- Maintain venous access
- Monitor patient e.g. TPR, BP, $SPO2^{2}$, urinary output

- If likely anaphylaxis/severe allergy treat for anaphylaxis
- If bacterial contamination likely start antibiotic treatment
- Use BP, pulse, urine output (catheterise if necessary) to guide intravenous physiological saline administration
- Perform appropriate investigations (Consultant Haematologist will advise which samples to collect, see Table 1)

- Contact Consultant Haematologist via switch for advice
- Inform Transfusion Medicine Unit TMU Ext 2748 or pager 3254
- Complete Transfusion Reaction Investigation Form
- Document reaction in medical record
- Review at Hosital Transfusion Committee

No

Inform medical staff

MODERATE

- Temperature ≥ 39ºC or rise ≥ 2ºC from baseline and/or
- Other symptoms/signs apart from pruritus/rash only

- Consider bacterial contamination if the temperature rises as above and review patient's underlying condition and transfusion history
- Monitor patient at least 15 minutely until stable e.g. TPR, BP, SpO_2, urinary output

- Not consistent with condition or history
- Discontinue (do not discard implicated units)
- Perform appropriate investigations (Consultant Haematologist will advise which samples to collect, see Table 1)

If consistent with underlying condition or transfusion history consider continuation of transfusion at slower rate and appropriate symptomatic treatment

MILD

- Isolated temperature ≥ 38ºC and rise of 1-2ºC from baseline and/or
- Pruritus/rash only

- Consider symptomatic treatment (Paracetamol +/- antihistamine)
- Continue transfusion
- Monitor patient at least 15 minutely until stable e.g. TPR, BP, SpO_2, urinary output
- If symptoms/signs worsen, manage as moderate/severe reaction (see left)

Continue transfusion

- Contact TMU Scientist on Ext 2748 or pager 3254 with patient's name, UMRN, date, time and symptoms of reaction.
- Document in patient's medical record

Table 1. TRANSFUSION MEDICINE INVESTIGATIONS

Platelet reactions:Consultant Haematologist will advise which samples to collect.
All other moderate/severe reactions:
- Consultant Haematologist will advise which blood samples to collect
- Post reaction urine sample
- Return unit (with giving set) to TMU

For more information see "The Management and Reporting of Adverse events Section 10 of the Transufusion Medicine Protocols

More information available in KEMH Transfusion Medicine Protocols on WNHS intranet.

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WOMEN AND NEWBORN HEALTH SERVICE
King Edward Memorial Hospital

NSQHS Standard 7
Applicable Document

REPORTING A TRANSFUSION REACTION/ ADVERSE INCIDENT
STAFF RESPONSIBILITIES FLOWCHART

MODERATE AND SEVERE TRANSFUSION REACTION OR ADVERSE INCIDENT

DOCTOR
- Refer to Consultant Haematologist
- Liaise with Transfusion Medicine Unit Extension 2748 or Out of Hours Shift Scientist pager 3254
- Document clinical assessment of patient and adverse incident in patient medical notes
- Refer to Transfusion reaction Flow Chart for patient management

NURSE
- Notify Doctor
- Notify Transfusion Medicine Unit Extension 2748 or Out of Hours Shift Scientist pager 3254
- Complete Transfusion Reaction Investigation Form in liaison with attending Doctor
- Document adverse incident in patient medical notes
- Refer to Transfusion reaction Flow Chart for patient management
- Return blood bags and giving sets with Transfusion Reaction Investigation Form to TMU

TRANSFUSION MEDICINE UNIT (TMU) SCIENTIST
- Collate details of event as notified by Clinical Staff. Retain details for TMU Scientist in Charge.
- Advise Medical and Nursing staff to discuss with Consultant Haematologist
- Discuss process for investigation with Consultant Haematologist and proceed as instructed regarding obtaining samples and initiating testing.

CONSULTANT HAEMATOLOGIST
- Expert Clinical Advice on investigation and management of reaction or adverse events
- Can be contacted through switchboard

SCIENTIST IN CHARGE TMU
- Document investigations
- Provide Transfusion Coordinator with event details/ TC will discuss with Haematologist/ TMU team and collate further clinical evidence as warranted
- TC will collate data for KEMH Hospital Transfusion Committee and discuss with TMU team to Classify Reaction for TM report.

Investigation Requirements

For moderate and severe reactions the Consultant Haematologist will advise medical staff which blood samples to collect. Send blood samples, 1st urine sample post reaction and blood component unit with giving set **still attached** to TMU, accompanied by completed Pathology request forms and a Transfusion Reaction Investigation Form.

The Consultant Haematologist **may** require the following tests:

- Blood Samples: Group and antibody screen, crossmatch, IgA Levels, Mast Cell Tryptase, blood cultures, plasma haemoglobin, haptoglobin, coagulation profile & FDPs and bilirubin.
- Subsequent urine samples (free haemoglobin and derivatives)

Transfusion Reaction Table

This chart is summary of the most common symptoms of Transfusion Reactions. It also gives advice on who should be notified of a reaction.

CAUSE	SYMPTOMS	ACTION & SUGGESTED TREATMENT	REPORT TO
ALLERGIC REACTIONS			
Antibodies to plasma proteins or allergens Occurs during 1-3% of transfusions	**Mild:** Pruritus Urticaria	**STOP** or slow transfusion Administer antihistamines Resume transfusion at slower rate and observe more frequently **If symptoms/signs worsen, STOP** transfusion	Record in patient notes. If occurs frequently consider premedication. Contact TMU with patient's name, UMRN, date and time of reaction and symptoms.
	Severe: Wheezing or angioedematous reactions, +/- pruritus and urticaria	**STOP** transfusion Administer antihistamines hydrocortisone, adrenaline	**Consultant Haematologist,** **TMU and Treating Consultant.** **Complete Transfusion Reaction Investigation Form and send to TMU**

CAUSE	SYMPTOMS	ACTION & SUGGESTED TREATMENT	REPORT TO
FEBRILE REACTIONS			
Antibodies to leucocyte antigens. Cytokines in stored platelet units. Occurs towards end of infusion or within hours of completion in 1% of transfusions. The incidence is reduced with leucocyte-depleted blood components.	**Mild:** Temperature rise >38°C or 1-2°C rise from baseline All other observations stable and patient otherwise well	**STOP** transfusion Administer paracetamol or other antipyretic Resume transfusion at slower rate and observe more frequently **If symptoms/signs worsen, STOP** transfusion	Record in patient notes. If occurs frequently consider premedication. Contact TMU with patient's name, UMRN, date and time of reaction and symptoms.
	Moderate: **Temperature increase >39°C or rise > 2 °C**	**STOP transfusion**	**Consultant Haematologist,** **TMU and Treating Consultant** **Complete Transfusion Reaction Investigation Form and send to TMU**
ACUTE HAEMOLYTIC TRANSFUSION REACTION			
ABO incompatible transfusion or haemolytic antibody. Usually result of clerical error when samples drawn or blood is administered. Rare 1 in 12,000 - 77,000 May occur during first few mLs of transfusion. 10% mortality rate. Consider possibility of renal failure and DIC Maintain blood pressure and renal perfusion	Anxiety, chest and or back pain, dyspnoea, chills, fever, shock Unexplained bleeding, Haemoglobinaemia, Haemoglobinurea, Cardiac arrest	**STOP** transfusion **Call Code Blue if necessary** Seek URGENT critical care and haematology advice Return transfused unit and giving set to TMU	**Consultant Haematologist, TMU and Treating Consultant.** **Complete Transfusion Reaction Investigation Form and send to TMU** **Complete Clinical Incident Form (AIMS).**
ANAPHYLCATIC/ANAPHYLACTOID/SEVERE ALLERGIC REACTIONS			
Patient antibodies to donor IgA Very rare but may be fatal. 1 in 20,000-170,000. Rapid and often during first few mLs of infusion	Coughing, bronchospasm, laryngospasm, respiratory distress, Nausea, abdominal cramps, vomiting, diarrhoea, shock, loss of consciousness	**STOP** TRANSFUSION **Call Code Blue** Administer adrenalin/ corticosteroids. Treat hypotension. Seek URGENT critical care and haematology advice. Return transfused unit and giving set to TMU	**Consultant Haematologist, TMU.** **Treating Consultant.** **Complete Transfusion Reaction Investigation Form and send to TMU**

CAUSE	SYMPTOMS	ACTION & SUGGESTED TREATMENT	REPORT TO
INFECTIVE SHOCK			
Bacterial contamination of blood component Rare but very severe with high mortality rate. Usually during first 100mL.	Onset of high fever, Severe chills, hypotension or circulatory collapse during or soon after transfusion	**STOP** TRANSFUSION Manage septicaemia. Fluids and intravenous antibiotics. Seek URGENT critical care / haematology advice Return transfused unit and giving set to TMU	**Consultant Haematologist, TMU.** **Treating Consultant.** **Complete Transfusion Reaction Investigation Form and send to TMU**
TRANSFUSION RELATION ACUTE LUNG INJURY (TRALI)			
Donor plasma containing antibodies to patient leucocytes Occurs during or within 6 hours in 1 in 5,000-10,000 transfusions May be life threatening	Acute respiratory reaction with fever, tachycardia, hypotension, hypoxia and pulmonary oedema	**STOP** TRANSFUSION **Call Code Blue if necessary** O_2 support Seek URGENT critical care and haematology advice Return transfused unit and giving set to TMU	**Consult Haematologist/ TMU urgently:** (may be other associated products from the same donation. TMU may notify Australian Red Cross Blood Service.) **Complete Transfusion Reaction Investigation Form and send to TMU**
DELAYED HAEMOLYTIC TRANSFUSION REACTION			
Patient produces allo-antibodies to recently transfused red cells Delayed haemolytic Transfusion Reactions may occur 2-14 days after transfusion. Most are unrecognised or clinically benign	Unexplained fever, jaundice, unexplained drop in haemoglobin	**If delayed haemolytic transfusion reaction is suspected consult the Consultant Haematologist/ TMU for further advice regarding patient management**.	**Consultant Haematologist, TMU.** A Group and Antibody Screen request must be sent to TMU together with a completed Transfusion Reaction Investigation Form (print form or call TMU for hard copy).
POST TRANSFUSION PURPURA			
Patient has high titre platelet specific antibody	Profound unexplained thrombocytopenia 7-10 days post transfusion	**Seek urgent advice from Consultant Haematologist**	**Consultant Haematologist, TMU.** **Treating team Consultant.**
TRANSFUSION ASSOCIATED GRAFT VERSUS HOST DISEASE			
Immune reaction of donor T cells against the recipient who is often immune-deficient.	Symptoms 4-30 days post transfusion. Include fever, rash, liver and renal failure and pancytopenia	**Seek urgent haematology advice from Consultant Haematologist**	**Consultant Haematologist, TMU.** **Treating team Consultant.**
Iron Overload			Seek Consultant Haematologist advice
Transfusion Transmitted Infectious Diseases			Seek Consultant Haematologist/ Microbiologist advice. Inform TMU

Transfusion Reaction Investigation Form

PathWest Laboratory Medicine WA

Manual: KEMH Transfusion Medicine Forms
Title: Transfusion Reaction Report Form

TRANSFUSION REACTION INVESTIGATION FORM

UMRN _____

Family Name _____

Given Name _____

Affix addressograph label here

Date of Birth _____ M / F

Consultant _____ Ward _____

Requesting Doctor (print) _____

Signature _____

Request date _____

CLINICAL HISTORY: Previous transfusion(s)? Y / N Previous pregnancy(s)? Y / N

On medication? Y / N Previous transfusion reaction? Y / N Specify _____

REACTION: Date _____ Time _____ Reason for Transfusion _____

Component (Red cell, platelet etc) _____ Volume infused _____

Donation number of offending unit(s) _____ _____ _____

Transfusion ceased? Y / N Used bag(s) returned to Blood Bank? Y / N

SYMPTOMS Please tick boxes that apply.

☐ Pyrexia: ……. °C	☐ Nausea/Vomiting	☐ Haemoglobinuria
☐ Chills/Rigors	☐ Burning around vein	☐ Excessive bleeding
☐ Urticaria	☐ Hypotension	☐ Jaundice
☐ Tachycardia	☐ Dyspnoea	☐ Shock
☐ Chest pain	☐ Lumbar pain	☐ Bronchospasm

Other symptoms:

Treatment given:

Outcome:

BLOOD BANK USE ONLY

Request received: Date _____ Time _____

Clerical labelling error check: Pass / Fail

Post-transfusion urine sample haemoglobinuria? Y / N

Post-transfusion EDTA haemolysed? Y / N

Jaundice (delayed transfn reaction)? Y / N

Patient Sample	Laboratory number	Blood Group	Antibody screen	DAT
Pre-transfusion				
Post-transfusion				

Donation ID	Blood Group	DAT	Compatibility		
			Sample	I/S	IAT
			Pre		
			Post		
			Pre		
			Post		
			Pre		
			Post		

CONCLUSION:

NSQHS Standard 7 Applicable Document

Reported to BTC: Date _____ Minute No: _____ TR Panel resulted? Y / N

Scientist-in-Charge TM Sign _____ Date _____

DOC LOC: 1 copy TM Forms manual

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- Flippin' Blood BloodSafe SA / ARCBS Second Edition June 2012 http://resources.transfusion.com.au/cdm/ref/collection/p16691coll1/id/20

Related policies

- National Safety and Quality Health Service Standards, October 2012. Standard 7: Blood and Blood Products

Related WNHS policies, procedures and guidelines

- KEMH Blood Transfusion Checking Procedure
- WNHS Transfusion Medicine Blood Product Prescription Consent and Refusal
- Women & Newborn Health Service Patient Identification Policy
- WNHS Checking Procedure Pre Administration of Blood Products
- WNHS Blood Transfusion Equipment and Administration
- Neonatology Clinical Care Guidelines
- Obstetrics and Gynaecology Clinical Guidelines

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