

TRANSFUSION MEDICINE PROTOCOLS

Management of Transfusion Reactions and Adverse Events

This document should be read in conjunction with the [Disclaimer](#)

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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 O₂ sats **Base line** before the start of each infusion
- **T,P,R,BP** and O₂ sats **15 minutes after commencing** each blood component
- Then **hourly measurements** of **T,P,R,BP** and O₂ sats
- A final **T,P,R,BP** and O₂ 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	Immediate nursing action: STOP transfusion (leave IV line in place), then	Refer to Transfusion Reaction Flowchart as a guide to who should be contacted in the event of a reaction and for advice of investigations required.
Chills/ rigors	Provide emergency patient care	Complete the Transfusion Reaction Investigation Form
Urticaria (hives), pruritis	Arrange immediate medical review. Medical Emergency Team (MET). Call/Code Blue if necessary	Document all treatment and actions in the medical record.
Hyper/ hypotension	Keep IV line open with normal saline (do not flush existing line – use a new IV line if required)	Refer to Staff Responsibilities Flowchart for reporting and notification responsibilities in the event of a reaction
Tachycardia	Repeat all clerical and identity checks of the patient and blood pack	
Dyspnoea/stridor/wheeze	Vital observations at least every 15 minutes until stable (document in medical record)	
Pain (chest, back, IV site)		
Bleeding, oozing		
Dark urine (haematuria)		
Unexplained bleeding		
Nausea/vomiting		
Tachycardia		
	For a guide to further treatment and management of the patient refer to the Transfusion Reaction Flowchart	



PATIENT EXHIBITING POSSIBLE FEATURES OF AN ACUTE TRANSFUSION REACTION

which may include: fever, chills, rigors, tachycardia, hyper- or hypotension, collapse, flushing, urticaria, 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

No

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, 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

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 Transfusion Medicine Protocols

Inform medical staff

MODERATE

- Temperature $\geq 39^{\circ}\text{C}$ or rise $\geq 2^{\circ}\text{C}$ 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, SpO₂, 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 $\geq 38^{\circ}\text{C}$ and rise of 1-2 $^{\circ}\text{C}$ from baseline and/or
- Pruritus/rash only

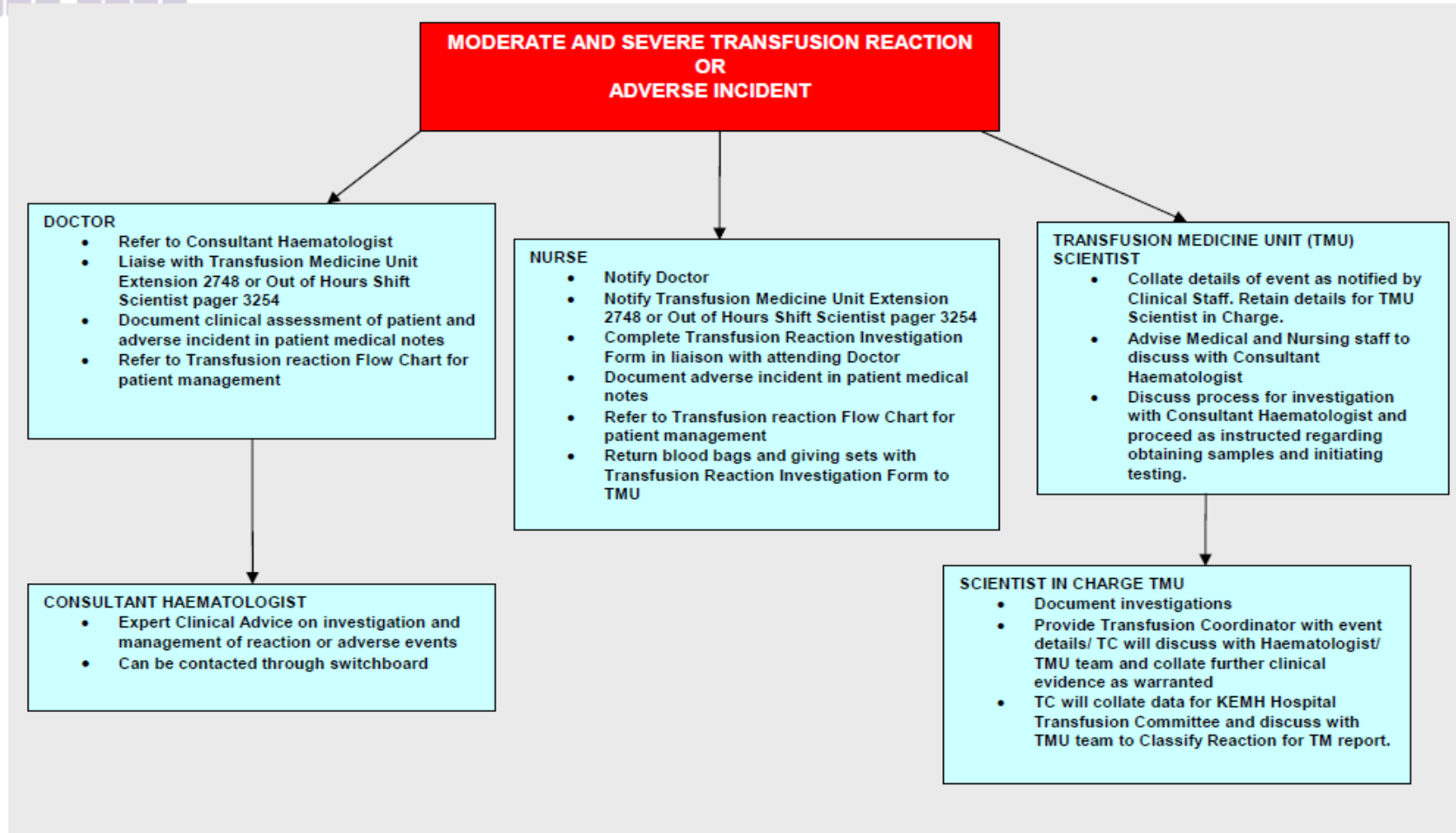
- Consider symptomatic treatment (Paracetamol +/- antihistamine)
- Continue transfusion
- Monitor patient at least 15 minutely until stable e.g. TPR, BP, SpO₂, urinary output
- If symptoms/signs worsen, manage as moderate/severe reaction (see left)

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



**REPORTING A TRANSFUSION REACTION/ ADVERSE INCIDENT
STAFF RESPONSIBILITIES FLOWCHART**





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)

Delayed Transfusion Reactions

Delayed haemolytic Transfusion Reactions may occur 2-14 days after transfusion. Most are unrecognised or clinically benign. **If a delayed haemolytic transfusion reaction is suspected the Consultant Haematologist must be consulted for further advice regarding patient management.**

A Group and Antibody Screen request must be sent to TMU together with a completed [Transfusion Reaction Investigation Form](#) (click link to download form or phone TMU for a hard copy).

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
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 $>38^{\circ}\text{C}$ or $1-2^{\circ}\text{C}$ rise from baseline All other observations stable and patient otherwise well	STOP or slow 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 $>39^{\circ}\text{C}$ or rise $> 2^{\circ}\text{C}$	STOP transfusion	Consultant Haematologist, TMU and Treating Consultant Complete Transfusion Reaction Investigation Form and send to TMU

CAUSE	SYMPTOMS	ACTION & SUGGESTED TREATMENT	REPORT TO
ACUTE HAEMOLYTIC TRANSFUSION REACTION			
<p>ABO incompatible transfusion or haemolytic antibody. Usually result of clerical error when samples drawn or blood is administered. Rare event. 1 in 12,000-77,000</p> <p>May occur during first few mLs of transfusion.</p> <p>10% mortality rate. Consider possibility of renal failure and DIC</p> <p>Maintain blood pressure and renal perfusion</p>	<p>Anxiety, chest and or back pain, dyspnoea, chills, fever, shock</p> <p>Unexplained bleeding, Haemoglobinaemia, Haemoglobinurea, Cardiac arrest</p>	<p>STOP transfusion Call Code Blue if necessary</p> <p>Seek URGENT critical care and haematology advice</p> <p>Return transfused unit and giving set to TMU</p>	<p>Consultant Haematologist, TMU and Treating Consultant.</p> <p>Complete Transfusion Reaction Investigation Form and send to TMU</p> <p>Complete Clinical Incident Form (AIMS).</p>
ANAPHYLACTIC/ANAPHYLACTOID/SEVERE ALLERGIC REACTIONS			
<p>Patient antibodies to donor IgA</p> <p>Very rare but may be fatal. 1 in 20,000-170,000.</p> <p>Rapid and often during first few mLs of infusion</p>	<p>Coughing, bronchospasm, laryngospasm, respiratory distress, vascular instability</p> <p>Nausea, abdominal cramps, vomiting, diarrhoea, shock and loss of consciousness</p>	<p>STOP TRANSFUSION Call Code Blue if necessary</p> <p>Administer adrenalin and corticosteroids. Treat hypotension</p> <p>Seek URGENT critical care and haematology advice</p> <p>Return transfused unit and giving set to TMU</p>	<p>Consultant Haematologist, TMU. Treating Consultant.</p> <p>Complete Transfusion Reaction Investigation Form and send to TMU</p>
INFECTIVE SHOCK			
<p>Bacterial contamination of blood component</p> <p>Rare but very severe with high mortality rate. Usually during first 100mL.</p>	<p>Onset of high fever, Severe chills, hypotension or circulatory collapse during or soon after transfusion</p>	<p>STOP TRANSFUSION</p> <p>Management of septicaemia. Fluids and intravenous antibiotics. Seek URGENT critical care and haematology advice</p> <p>Return transfused unit and giving set to TMU</p>	<p>Consultant Haematologist, TMU. Treating Consultant.</p> <p>Complete Transfusion Reaction Investigation Form and send to TMU</p>

CAUSE	SYMPTOMS	ACTION & SUGGESTED TREATMENT	REPORT TO
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	Consultant Haematologist. TMU urgently: (There may be other associated products from the same donation. Australian Red Cross Blood Service ARCBS may then be notified by TMU.) Treating Consultant Complete Transfusion Reaction Investigation Form and send to TMU
OTHER DELAYED COMPLICATIONS OF TRANSFUSION			
DELAYED HAEMOLYTIC TRANSFUSION REACTION			
Patient produces allo-antibodies to recently transfused red cells	Unexplained fever, jaundice, unexplained drop in haemoglobin	Contact laboratory Haematology for advice	Consultant Haematologist, TMU.
POST TRANSFUSION PURPURA			
Patient has high titre platelet specific antibody	Profound unexplained thrombocytopenia 7-10 days post transfusion	Seek urgent haematology advice from Consultant Haematologist	Consultant Haematologist, TMU. Treating team Consultant.
TRANSFUSION –ASSOCIATED GRAFT VS HOST DISEASE			
Immune reaction of donor T cells against the recipient who is often immune-deficient.	Symptoms develop 4-30 days after transfusion and 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 and Microbiologist advice, inform TMU			

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

File path:	WNHS.HAEM.ManagementOfTransfusionReactionsAndAdverseEvents.pdf		
Keywords:	Blood, Prescription, risk of transfusion, transfusion reaction, refusal of blood products, patient blood management guidelines, indication for blood products, special requirements for blood products, irradiated blood products, CMV Negative blood products, washed red cells, IgA deficient components, Delayed transfusion reaction, allergic transfusion reaction, TRALI, Transfusion Reaction classification, Transfusion observations, management of transfusion reaction and adverse events, post transfusion purpura, transfusion infective shock, Transfusion Reaction Flowchart, reporting a transfusion reaction, transfusion reaction investigation form		
Document owner:	Chair of KEMH Hospital Transfusion Committee		
Author / Reviewer:	Consultant Haematologist, Scientist in Charge Transfusion Medicine, KEMH Transfusion Coordinator		
Date first issued:	01 01 2005		
Last reviewed:	01 06 2015	Next review date:	01 03 2019
Endorsed by:	KEMH Hospital Transfusion Committee	Date:	01 03 2017
Standards Applicable:	NSQHS Standards: 1  Governance, 2  Consumers, 5  Patient ID/Procedure Matching, 7  Blood Products		
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