British Society for Haematology (BSH)

Guideline on the Investigation and Management of Acute Transfusion Reactions (2023)

Summary of key recommendations:

- Blue shows text which has been included or amended in the recommendations from the previous set (2012)
- Resources and additional comments to support the recommendations are given in green [🔗 = weblinked item]

Recognition of Acute Transfusion Reaction (ATR)

- Initial treatment of ATR should be directed by symptoms and signs. Treatment of severe reactions should not be delayed while waiting for the results of investigations.

Flow diagram on page 4🔗

- All patients should be transfused in clinical areas where they can be directly observed and where staff are trained in the administration of blood components and the management of transfused patients, including the emergency treatment of anaphylaxis.
  In the body of the text: If transfusions are administered at a patient's home, these should only be conducted in accordance with well-developed policies in patients deemed to be at low risk of ATR while otherwise abiding by these recommendations.

All Wales Policy – Transfusion of Blood Components Outside the Acute Hospital Setting🔗

- The recognition and immediate management of ATR should be incorporated into local transfusion policies and there should be mandatory transfusion training requirements for all clinical and laboratory staff involved in the transfusion process.

'Essential Transfusion Practice' e-learning module accessible on ESR and Learning@Wales.

- Patients should be asked to report symptoms which develop following completion of the transfusion.

Immediate Management of ATR

- If a patient develops new symptoms or signs during a transfusion, this should be stopped temporarily but venous access should be maintained. Identification details should be checked between the patient, their identity band and the compatibility label of the blood component. The component should be inspected visually and the patient should be assessed with standard observations.

- For patients with mild reactions, such as a temperature rise of 1–2°C leading to pyrexia ≥38°C but <39°C, **and/or** pruritus or rash but **without** other features, the transfusion may be continued with appropriate treatment and direct observation.

All Wales Transfusion Record🔗 has space to document the minimum transfusion observations required; any additional observations should be documented on a NEWS chart.

- Patients with mild isolated febrile reactions may be treated with oral paracetamol (500–1000mg in adults). Patients with mild allergic reactions may be managed by slowing the transfusion and treatment with an antihistamine. Corticosteroids should not be used routinely.

- Anaphylaxis should be treated with intramuscular adrenaline (epinephrine). Patients who are thrombocytopenic or who have deranged coagulation should also receive intramuscular adrenaline if they have an anaphylactic reaction.

- If a patient being transfused for haemorrhage develops hypotension, careful clinical risk assessment is required. If the hypotension is caused by haemorrhage, continuation of the transfusion may be life-saving. In contrast, if the blood component is considered the most likely cause of hypotension, the transfusion must be stopped or switched to an alternative component and appropriate management and investigation commenced.

- If a patient develops sustained febrile symptoms or signs of moderate severity (temperature ≥39°C **or** a rise of ≥2°C **and/or** systemic symptoms such as chills, rigors, myalgia, nausea or vomiting), bacterial contamination or a haemolytic reaction should be considered.

WBS CQC-233 'Request Form for Investigation of Suspected Contamination of Blood Components'🔗

Diagnostic investigations

- In all moderate and severe transfusion reactions, standard investigations including full blood count, renal and liver enzymes should be performed. Patients with respiratory symptoms not due to allergy should also have a chest X-ray.
- If febrile symptoms of moderate severity are sustained, implicated units should be returned to the laboratory for further investigation and the blood service contacted immediately so that associated components from the implicated donation can be withdrawn if appropriate. Samples should be taken for repeat compatibility testing and culture and urine assessed for haemoglobin.
  WBS CQC-233 'Request Form for Investigation of Suspected Contamination of Blood Components'
- Patients who have experienced anaphylactic reactions or recurrent severe febrile/inflammatory reactions within the first 15 min should have IgA levels measured. Patients with IgA deficiency diagnosed after an ATR should be discussed with an expert in transfusion medicine re: future management.
  WBS Clinical Guideline MOI-168 'Investigation and Clinical Management of Suspected Reactions to IgA'
- In an ATR with only allergic features, repeat compatibility testing is not required.
- In the absence of platelet transfusion refractoriness or acute post-transfusion thrombocytopenia or leucopenia, investigation of the patient with ATR for leucocyte, platelet or neutrophil-specific antibodies is not indicated.
- Patients with respiratory symptoms not caused by anaphylaxis or allergy should have investigations for left atrial hypertension (e.g. echocardiography and pre-and post-transfusion NT-Pro BNP) to help distinguish the type of pulmonary complication to assist diagnosis and haemovigilance reporting.

Subsequent management of the patient

- Patients who have experienced an anaphylactic reaction should be discussed with an allergist or immunologist if there is uncertainty about the causative agent (e.g. if other drugs were administered at the same time as the transfusion).
- For patients with recurrent febrile reactions, we recommend a trial of premedication with oral paracetamol given 1 h before the reaction is anticipated (or non-steroidal anti-inflammatory drugs in patients with predominant chills or rigors—but an assessment of the risks of medication against the severity of reaction should be made in each case). Patients who continue to have recurrent moderate or severe febrile reactions despite premedication should have a trial of washed blood components (i.e. red cells and platelets). There is no role for prophylactic antihistamine or corticosteroids in the absence of allergic symptoms.
- For recurrent mild allergic reactions, there is no evidence to support routine prophylaxis with antihistamines or corticosteroids. Alternative causes, e.g. allergy to drugs or latex gloves, should be excluded.
- For patients with recurrent moderate or severe allergic reactions, options for further transfusion include:
  - if prior reactions were to apheresis platelets, consider pooled platelets (suspended in platelet additive solution);
  - consider antihistamine prophylaxis (although the evidence for efficacy is low, the risks are also low);
  - routine prophylaxis with corticosteroids is not recommended;
  - transfusion of washed red cells or platelets;
  - the use of pooled solvent–detergent-treated fresh frozen plasma (FFP) when there are recurrent allergic reactions to FFP in patients undergoing plasma exchange;
  - if further transfusion is urgent and withholding blood is a greater risk, transfuse standard components under direct monitoring in a clinical area with resuscitation facilities.
- Patients with confirmed IgA deficiency (IgA <0.07g/L):
  - with a history of reaction to blood components should receive washed components for elective transfusion but life-saving transfusion should not be delayed if these are not immediately available. The patient must be monitored closely for an acute reaction;
  - with no history of blood transfusion reactions should receive standard components with a higher frequency of monitoring. Those with a history of allergy/anaphylaxis in other settings should be discussed with a transfusion medicine or clinical immunology or allergy specialist if time allows.
    WBS Clinical Guideline MOI-168 'Investigation and Clinical Management of Suspected Reactions to IgA'

Reporting of ATR

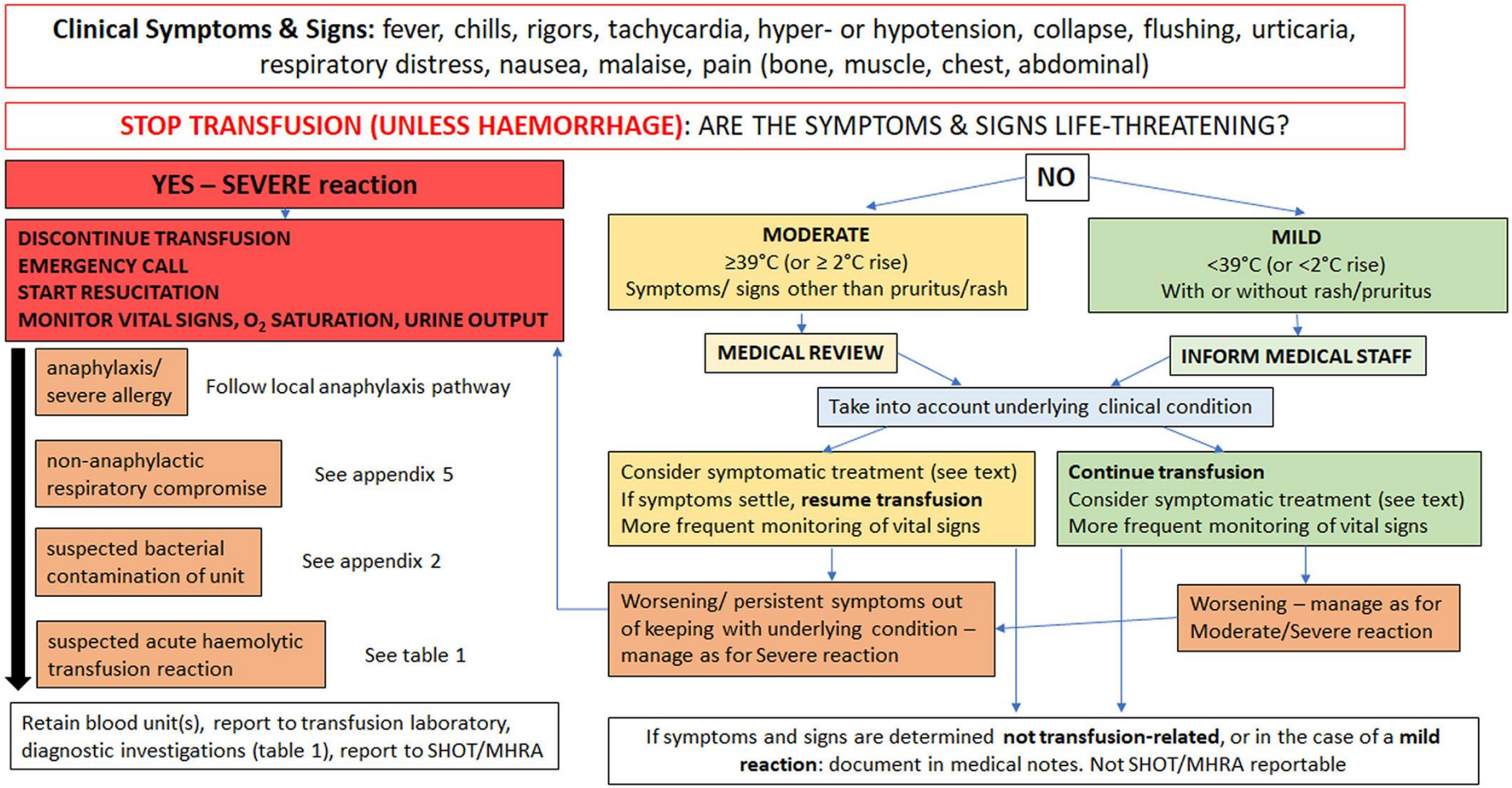
- All transfusion reactions except mild febrile and/or allergic reactions must be reported to appropriate regulatory and haemovigilance organisations and should also be reviewed within the hospital.

This document has been produced by the Welsh Blood Service Blood Health Team on behalf of the Blood Health National Oversight Group (BHNOG) as a reference resource only.

It is advised that persons involved in the drafting of local policy read the full BSH guideline, which can be accessed here:
https://b-s-h.org.uk/guidelines/guidelines/guideline-on-the-investigation-and-management-of-acute-transfusion-reactions

The BSH audit template for this guideline can also be accessed from this webpage.

Flow diagram for recognition, initial management and subsequent management and investigations



Reproduced from the *BSH Guideline on the investigation and management of acute transfusion reactions (2023)*

TABLE 1 Investigation of Moderate or Severe Acute Transfusion Reactions (for detailed guidance and references, see Appendix S2).

Symptoms	Investigations
Fever (≥2°C rise or ≥39°C), and/or chills, rigors, myalgia, nausea or vomiting and/or loin pain	Standard investigations[a] If febrile reaction sustained: Return unit to laboratory Take samples for repeat compatibility testing and DAT on both the pre- and post-transfusion samples. If the DAT is positive or stronger on the post-transfusion sample, elution studies should be performed[b] Haptoglobin, LDH[b] Coagulation screen Assessment of urine for haemoglobin[b] Blood cultures from patient
Dyspnoea, wheeze, or features of anaphylaxis	Standard investigations[a] Check oxygen saturation or blood gases. Chest X-ray (mandatory if symptoms are severe) If severe allergy/anaphylaxis suspected, consider measurement of serial mast cell tryptase (plain tube) (immediate, 1–2 h and 24 h) Patients with respiratory symptoms not caused by anaphylaxis or allergy should have investigations for left atrial hypertension (e.g. echocardiography and pre- and post-transfusion NT-Pro BNP) to help distinguish the type of pulmonary complication to assist diagnosis and haemovigilance reporting
Hypotension (isolated fall systolic of ≥30 mm Hg resulting in level ≤80 mm Hg)	Investigate as for fever If severe allergy/anaphylaxis, consider measurement of serial mast cell tryptase, as above

Abbreviations: DAT, direct antiglobulin test; LDH, lactate dehydrogenase; NT-Pro BNP, N-terminal-pro hormone B-type natriuretic peptide.

[a]Standard investigations: full blood count, renal and liver enzymes.

[b]Note that in adults, platelets and plasma components are unlikely to cause significant haemolysis and so haemolysis screen is of limited value.

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Appendix 2:
Laboratory investigation of ATR

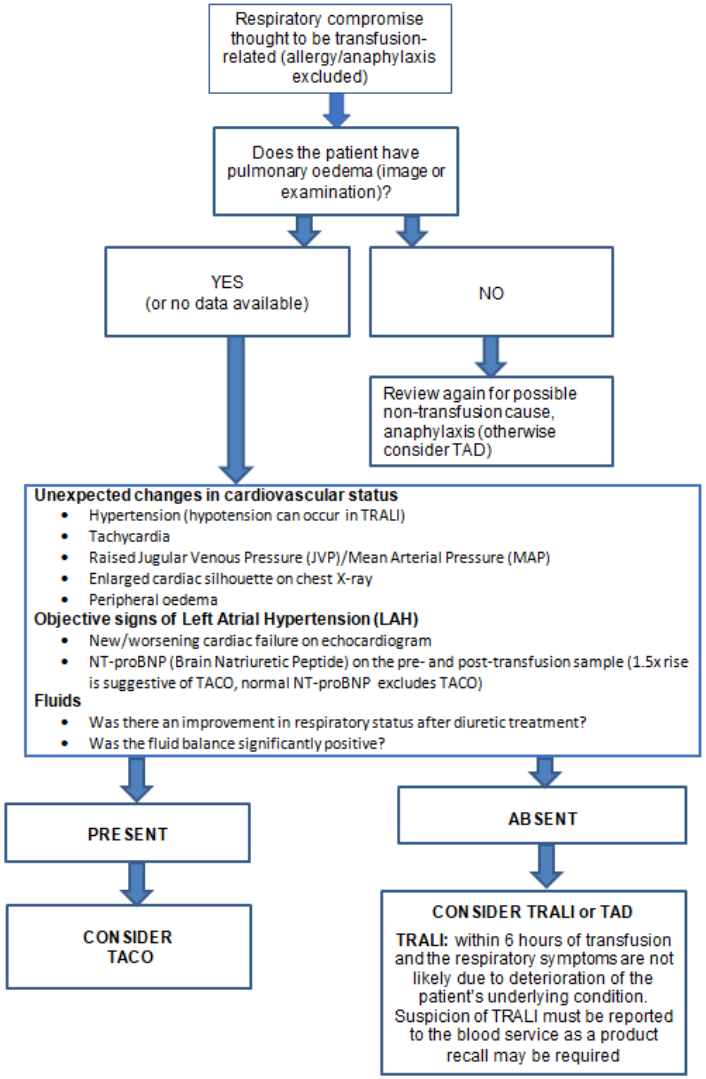
Microbiological investigations

Blood cultures from a peripheral vein and any central lines should be performed. The component should be sealed and transported to the transfusion laboratory as soon as possible. The transfusion laboratory should have an agreed policy for culture of the component in the hospital microbiology laboratory or referral to a blood transfusion service laboratory. The microbiology laboratory should have standard operating procedures for sampling the pack with minimal risk of contamination.

Where the hospital site does not have suitable local facilities for microbiological sampling the implicated blood component, appropriately secured, should be sent to the relevant transfusion service bacteriology laboratory. Clinically significant local culture results should be confirmed by the blood service reference laboratory, where molecular typing of the organism to assist investigation of the donor can be performed.

Whenever culture of an implicated unit is performed for a severe or sustained moderate febrile transfusion reaction, the local haematologist must be informed and the blood service contacted immediately so that any associated components from the implicated donation can be withdrawn and other patients protected from harm. All UK blood services provide access 24/7 to specialist transfusion medicine advice.

Appendix 5: Algorithm for investigation and categorising pulmonary complications of transfusion without allergic cause



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