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Acute Transfusion Reactions

Working together To drive excellence in care for our patients and communities

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Portsmouth Hospitals University NHS Trust

Guideline

GUIDELINE | Free Access

Guideline on the investigation and management of acute transfusion reactions

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[Corrections made on 5 October 2023, after first online publication: The Supporting Information was corrected in this version.]

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What?

Acute Transfusion Reactions (ATRs) occur <24 hours post transfusion.

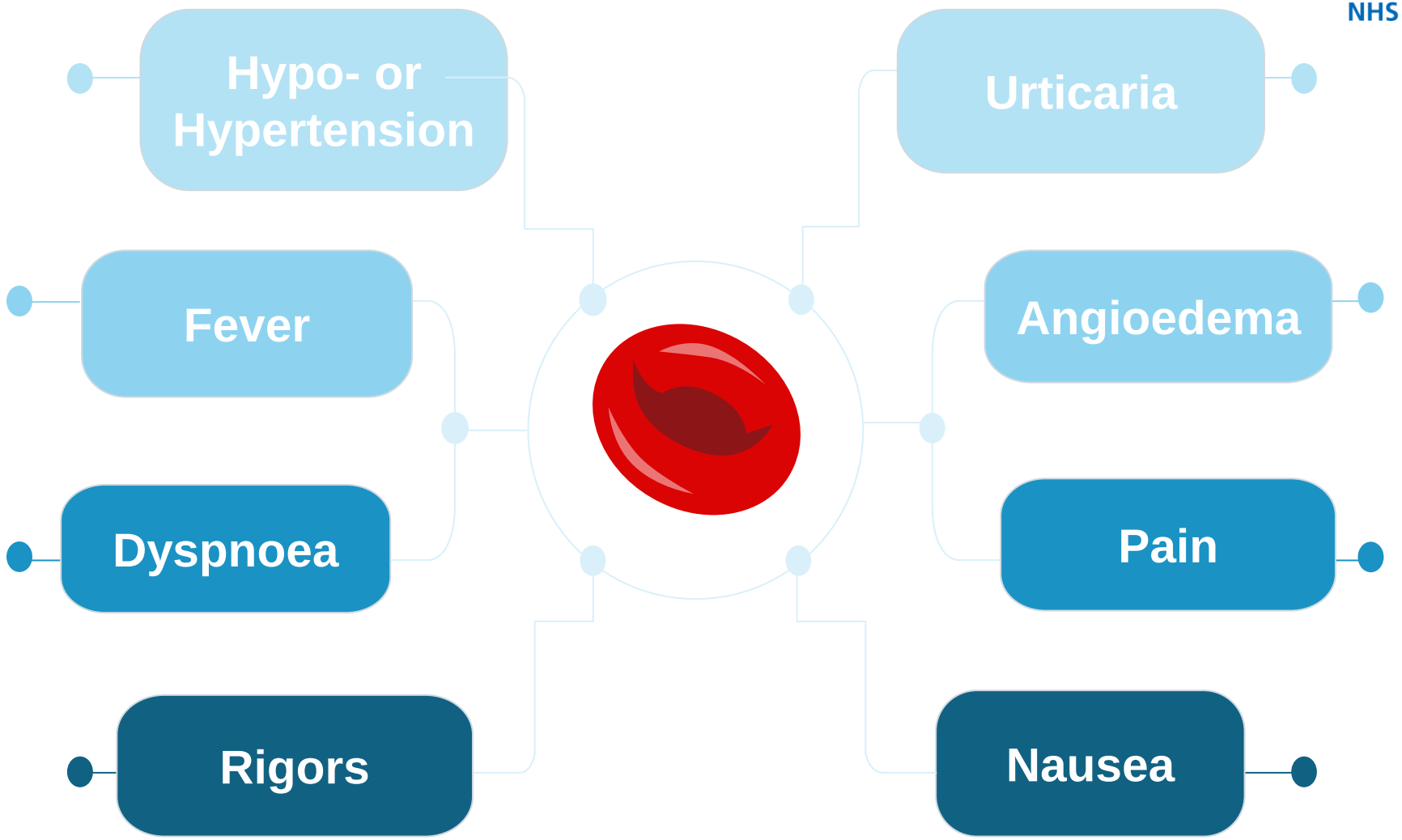
ATRs can present after only a small volume of blood is transfused.

HOWEVER, they can present up to several hours post transfusion.

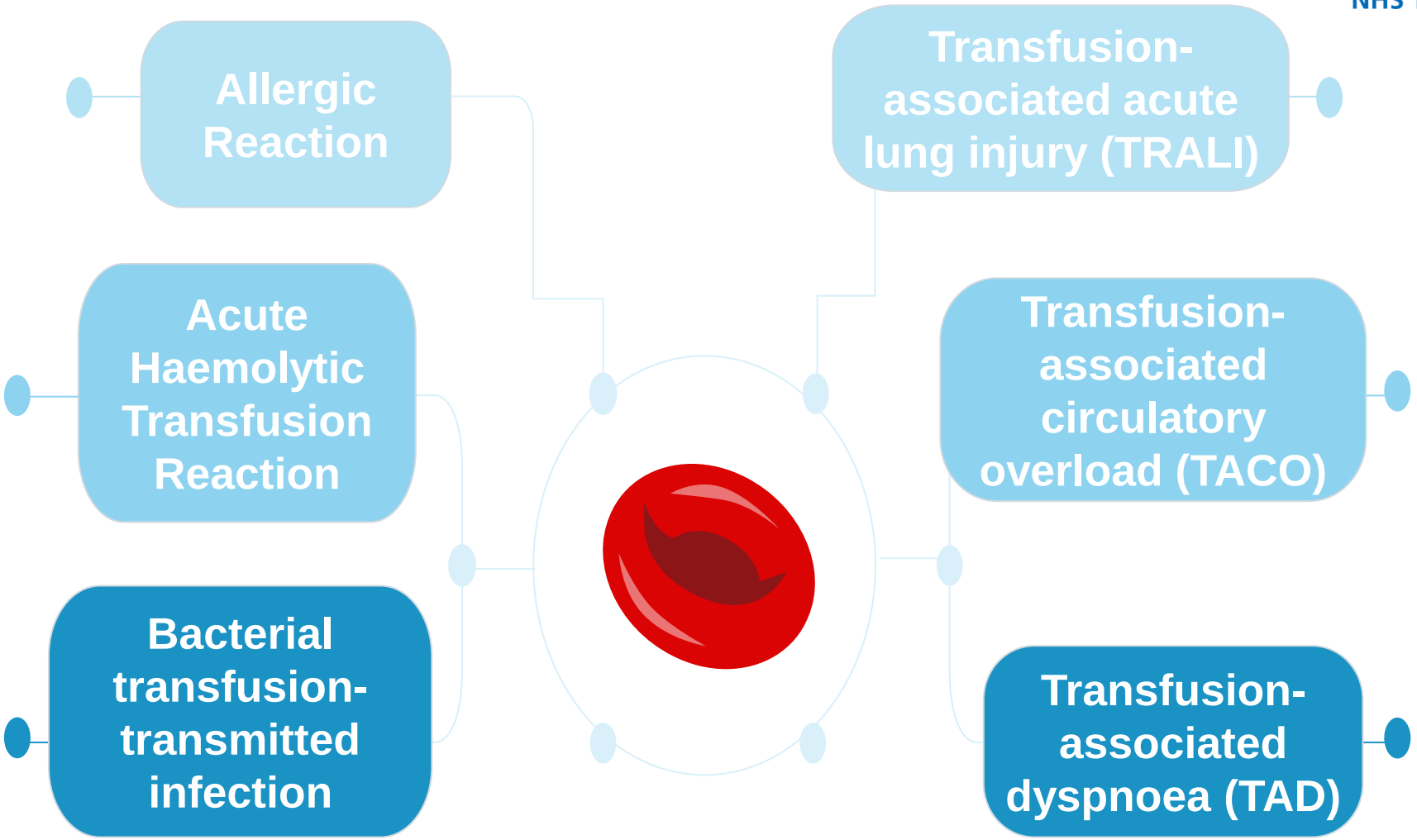
What?

- ATRs include the following:
  - Febrile Non-Haemolytic Transfusion Reactions.
  - Haemolytic Transfusion Reactions
- ATR rates of 0.5–3% of transfusions are commonly quoted.
  - The risk of a febrile, allergic or hypotensive reaction is 1:7704.
  - The risk of a haemolytic reaction is 1:57,425.
- Platelets are the components with the highest number of reported reactions per 10 000 transfusions

Symptoms

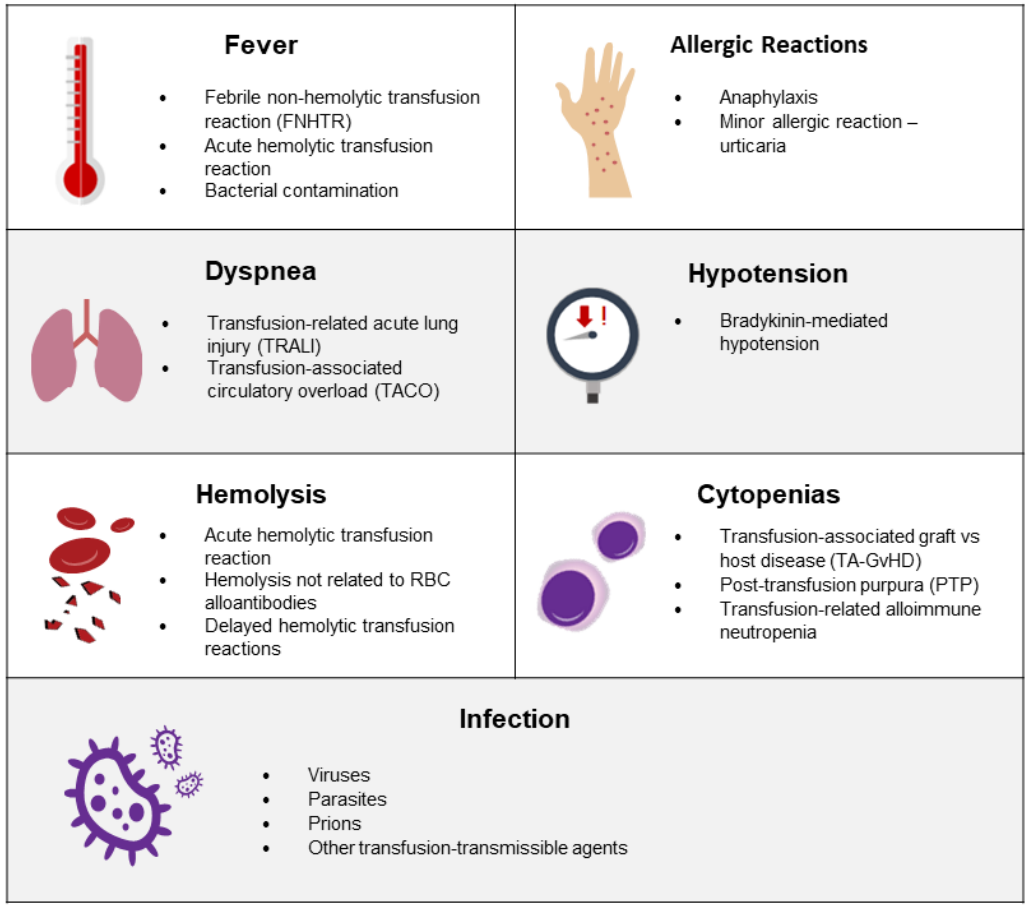

Hypo- or Hypertension
Urticaria
Fever
Angioedema
Dyspnoea
Pain
Rigors
Nausea

Differential Diagnosis



Recognising Reactions

- Patients with ATR can have complex symptoms and signs.
  - Many features have multiple differential diagnoses.
- Studies show that in cases of patient deterioration the link to the transfusion is not always recognised.
  - Pulmonary complications are often missed.



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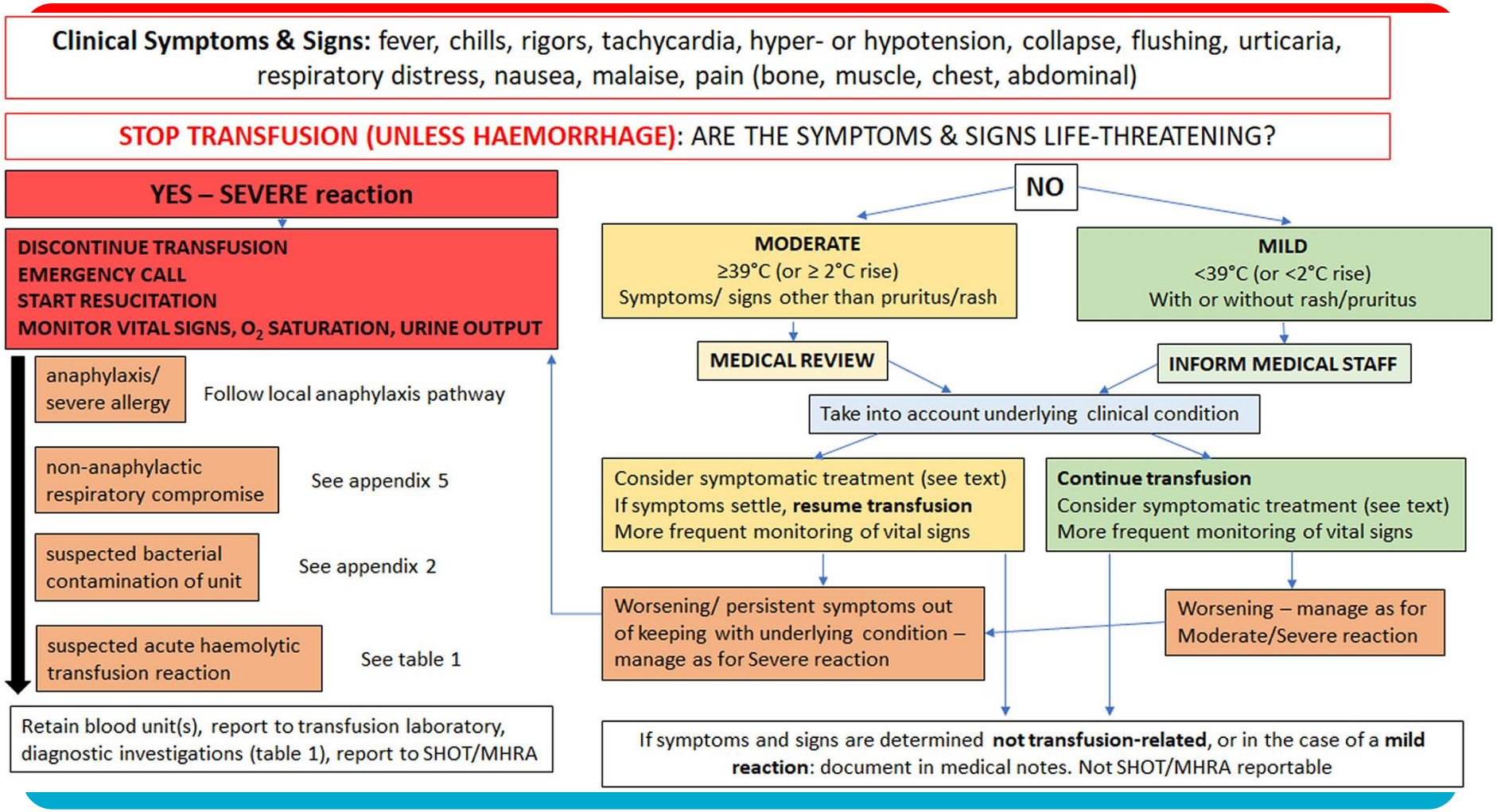
Recognising Reactions

- Recognition is ESSENTIAL for patient safety.
  - Transfusion reaction guidance is included in all local transfusion policies.
  - Mandatory training for clinical and lab staff is recommended.
- All patients should be transfused in clinical areas where they can be directly observed.
  - Staff present should be trained in administration and management of transfusions.

Recognising A Reaction: Next Steps.



Managing a Reaction

- Core identifiers (name, NHS number etc.) **MUST** be checked immediately.
  - Do they correspond with those on the blood component compatibility label?
  - **Has the right blood gone into the right patient?**
- The component must be examined.
  - Unusual clumps, particulate matter, or discolouration.
    - Suggestive of bacterial contamination.

Treating a Reaction: Mild to Moderate

Moderate Symptoms

- Temperature >39ºC or >2ºC.
- Angioedema and bleeding.
- Severe anxiety and pain.

Management

- Consider causative comorbidities.
- Switch to a new unit.
- Patients may require drug management depending on severity and symptomology.

Mild Symptoms

- Temperature rise of 1-2ºC >38ºC but <39ºC.
- Pruritus/Rash only.

Management.

- Transfusion can continue under direct supervision. Febrile cases can receive paracetamol, and allergic reactions may benefit from antihistamines.

Treating a Reaction: Severe

Severe Symptoms

- Hypotension and shock.
- Anaphylaxis
- Severe dyspnoea.

Management

Medics should be contacted, and the patient treated as **critically ill.**

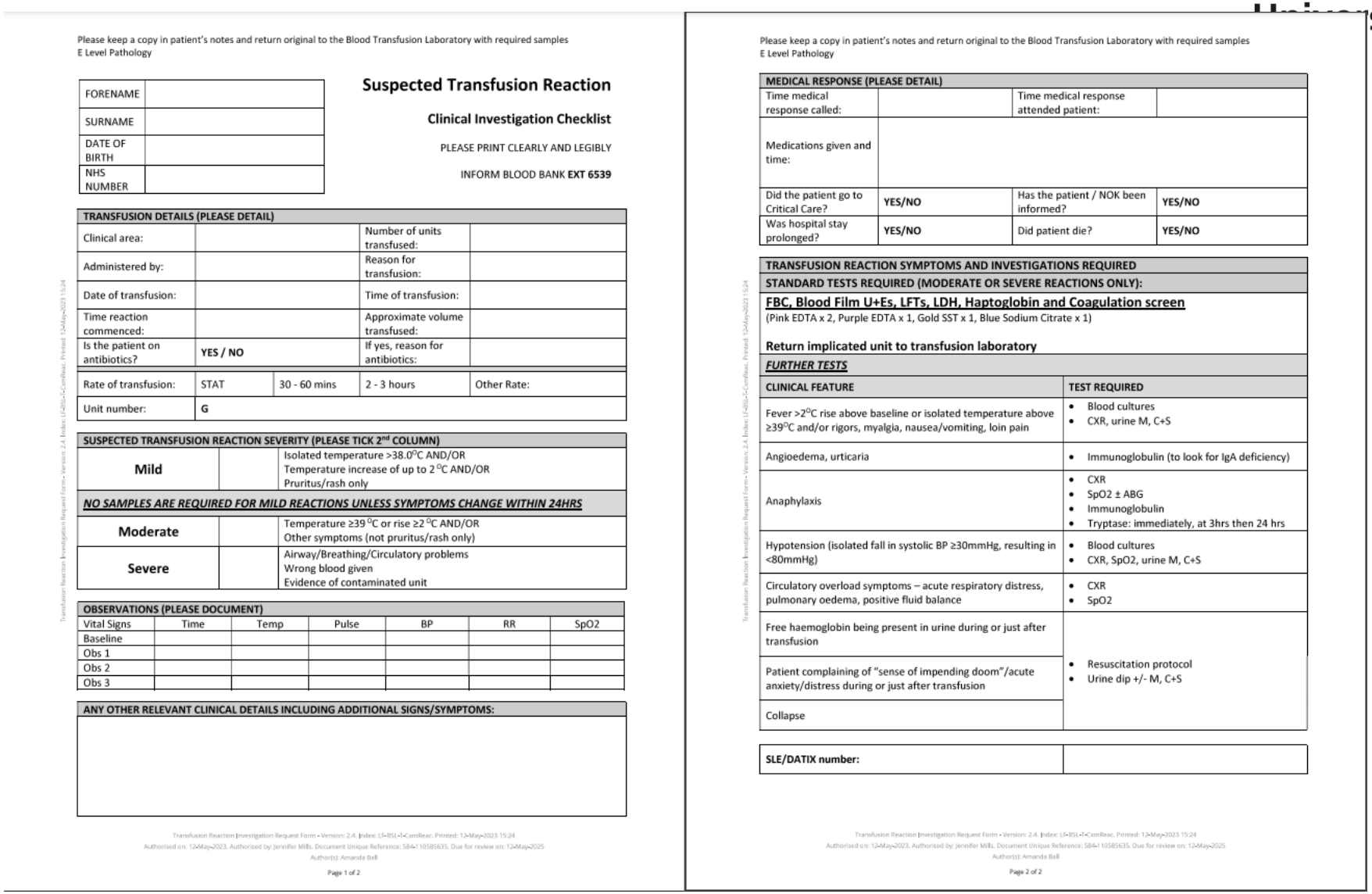
- Venous access should be maintained with intravenous physiological saline.
- High-flow oxygen should be given for severe dyspnoea.
- Salbutamol can be given for wheeze without upper airways obstruction.
- Intramuscular Adrenaline is given to patients in anaphylaxis.

Investigations

- Units should **ALWAYS** be returned to the laboratory.
  - This ensures teams can complete investigations.
- Testing is only **REQUIRED** for Moderate and Severe Reactions.
- **Testing takes time**; patients should be managed empirically at the time of the reaction.
  - The result of testing MAY help guide future transfusions and management.

Moderate and Severe Reactions MUST be reported to MHRA.
The first step of this is to complete a DATIX/Safety Learning Event.

Paperwork!



Please keep a copy in patient's notes and return original to the Blood Transfusion Laboratory with required samples
E Level Pathology

FORENAME	
SURNAME	
DATE OF BIRTH	
NHS NUMBER	

Suspected Transfusion Reaction

Clinical Investigation Checklist

PLEASE PRINT CLEARLY AND LEGIBLY

INFORM BLOOD BANK **EXT 6539**

TRANSFUSION DETAILS (PLEASE DETAIL)				
Clinical area:			Number of units transfused:	
Administered by:			Reason for transfusion:	
Date of transfusion:			Time of transfusion:	
Time reaction commenced:			Approximate volume transfused:	
Is the patient on antibiotics?	YES / NO		If yes, reason for antibiotics:	
Rate of transfusion:	STAT	30 - 60 mins	2 - 3 hours	Other Rate:
Unit number:	G			

SUSPECTED TRANSFUSION REACTION SEVERITY (PLEASE TICK 2nd COLUMN)		
Mild		Isolated temperature >38.0°C AND/OR Temperature increase of up to 2 °C AND/OR Pruritus/rash only
NO SAMPLES ARE REQUIRED FOR MILD REACTIONS UNLESS SYMPTOMS CHANGE WITHIN 24HRS		
Moderate		Temperature ≥39 °C or rise ≥2 °C AND/OR Other symptoms (not pruritus/rash only)
Severe		Airway/Breathing/Circulatory problems Wrong blood given Evidence of contaminated unit

OBSERVATIONS (PLEASE DOCUMENT)						
Vital Signs	Time	Temp	Pulse	BP	RR	SpO2
Baseline						
Obs 1						
Obs 2						
Obs 3						

ANY OTHER RELEVANT CLINICAL DETAILS INCLUDING ADDITIONAL SIGNS/SYMPTOMS:

Transfusion Reaction Investigation Request Form • Version: 2.4. Index: LF-BSL-7-ComReac. Printed: 12-May-2023 15:24
Authorised on: 12-May-2023. Authorised by: Jennifer Mills. Document Unique Reference: 584-110585635. Due for review on: 12-May-2025
Author(s): Amanda Ball

Page 1 of 2

Please keep a copy in patient's notes and return original to the Blood Transfusion Laboratory with required samples
E Level Pathology

MEDICAL RESPONSE (PLEASE DETAIL)			
Time medical response called:		Time medical response attended patient:	
Medications given and time:			
Did the patient go to Critical Care?	YES/NO	Has the patient / NOK been informed?	YES/NO
Was hospital stay prolonged?	YES/NO	Did patient die?	YES/NO

TRANSFUSION REACTION SYMPTOMS AND INVESTIGATIONS REQUIRED

STANDARD TESTS REQUIRED (MODERATE OR SEVERE REACTIONS ONLY):

FBC, Blood Film U+Es, LFTs, LDH, Haptoglobin and Coagulation screen
(Pink EDTA x 2, Purple EDTA x 1, Gold SST x 1, Blue Sodium Citrate x 1)

Return implicated unit to transfusion laboratory

FURTHER TESTS

CLINICAL FEATURE	TEST REQUIRED
Fever >2°C rise above baseline or isolated temperature above ≥39°C and/or rigors, myalgia, nausea/vomiting, loin pain	• Blood cultures • CXR, urine M, C+S
Angioedema, urticaria	• Immunoglobulin (to look for IgA deficiency)
Anaphylaxis	• CXR • SpO2 ± ABG • Immunoglobulin • Tryptase: immediately, at 3hrs then 24 hrs
Hypotension (isolated fall in systolic BP ≥30mmHg, resulting in <80mmHg)	• Blood cultures • CXR, SpO2, urine M, C+S
Circulatory overload symptoms – acute respiratory distress, pulmonary oedema, positive fluid balance	• CXR • SpO2
Free haemoglobin being present in urine during or just after transfusion	• Resuscitation protocol • Urine dip +/- M, C+S
Patient complaining of "sense of impending doom"/acute anxiety/distress during or just after transfusion	
Collapse	

SLE/DATIX number:	

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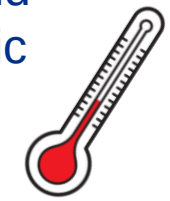
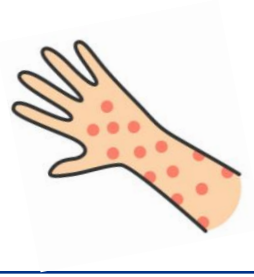
Page 2 of 2

Investigations

Reaction Type	Testing.	Differential.
All	• Full blood count • Renal/Liver function	• Establishing Severity and end organ damage.
Febrile and Haemolytic 	• Compatibility and DAT • LDH and Haptoglobin • Coagulation screen • Unit/Patient cultures.	• Incompatible unit. • Contamination e.g., bacterial.
Anaphylaxis 	• IgA and Anti-IgA levels • Serum Tryptase • X-rays • O2 saturation	• IgA Deficiency • Allergies • TACO • TRALI • TAD

Investigations

INVESTIGATING A SUSPECTED TRANSFUSION REACTION

Surname	
First name	
DOB	
NHS Number/Hospital Number	
Ward	
Clinician	
Name of Haem. Consult. Informed	
Name of TP informed (if routine working hours)	

Implicated unit numbers	**Expiry date of unit**
1.	
2.	
3.	

Pre Transfusion Sample		**Post transfusion Sample**	
Sample Number		Sample Number	
Sample labelled correctly?		Sample labelled correctly?	
Original Results			
ABO/Rh D			
Antibody screen			
If antibody screen positive, antibody identified (photocopy & attach panel sheet)			
Repeat Results		**Results**	
ABO/Rh D		ABO/Rh D	
Antibody screen		Antibody screen	
If antibody screen positive, antibody identified (photocopy & attach panel sheet)		If antibody screen positive, antibody identified (photocopy & attach panel sheet)	

DAT result						**DAT result**					
IgG	IgA	IgM	C3c	C3d	Ctl	IgG	IgA	IgM	C3c	C3d	Ctl

Unit DAT Result	IgG	IgA	IgM	C3c	C3d	Ctl	**Perform part DAT card, if IgG and C3d positive perform full DAT card**
1							
2							
3							

Unit Group Confirmation	Anti-A	Anti-B	Anti-D	Ctrl	A cells	B cells	ABO/D Conclusion
1							
2							
3							

Investigating a Suspected Transfusion Reaction - Version: 2.1. Index: LF-BSL-T-CxmReac Lab. Printed: 18-Aug-2023 15:51

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Repeat Crossmatch (Red Cells only)		
Pre Transfusion Sample		**Post transfusion Sample**
IAT	Unit number	IAT
	1.	
	2.	
	3.	
Final Review by Consultant	Sign:	Date:

- € Investigation of a Suspected Transfusion Reaction form returned and attached.
- € All forms photocopied, copy to TP, attach original forms to the post transfusion reaction sample form.
- € Unit fated on LIMS as Transfused
- € Unit sent to NHSBT if applicable. See Investigation of Transfusion Reactions **LPR-BSL-T-CxmReac**, for applicable units.

Record any additional information below.

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Further Management

Febrile Non-Haemolytic Reactions

Mild

- Consider a trial of premedication with oral paracetamol given 1 h before transfusion.
- Consider NSAIDs in patients with predominant chills or rigors
- Risks of medication against the severity of reaction should be assessed.

Moderate/Severe

- Premedication as per Mild symptoms.
- Recurrent febrile reactions despite premedication should be managed with a trial of washed blood components.

There is no role for prophylactic antihistamine or corticosteroids in the absence of allergic symptoms.

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Further Management

Mild

- **There is no evidence to support routine prophylaxis with antihistamines or corticosteroids.**
- Alternative causes such as allergy to drugs or latex gloves should be excluded.

Moderate/Severe

- If prior reactions were to apheresis platelets, pooled platelets should be considered.
- Consider antihistamine prophylaxis.
- Routine prophylaxis with corticosteroids is **not** recommended.
- Transfusion of washed red cells or platelets.
- Use pooled solvent–detergent-treated plasma.
- In emergencies, standard components should be transfused. There should be direct monitoring in a clinical area with resuscitation facilities.

Further Management

Repeated Severe Reactions

- Anaphylactic reactions.
- Recurrent severe febrile reactions within the first 15 mins of transfusion.

IgA Levels should be measured.

IgA Deficiency identified POST ATR

- Patients should be discussed with a specialist in transfusion medicine.
- Patients should receive washed components for elective transfusions.
- Life-saving transfusion should not be delayed if these are not immediately available.
- Patients should be closely monitored.

IgA Deficiency identified WITHOUT ATR

- Patients with known IgA deficiency (IgA <0.07 g/L) should receive standard components with a higher frequency of monitoring.

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