What should be the immediate approach to the patient?

Respiratory symptoms during or after transfusion could be caused by the blood components transfused or have an alternative cause, and it is often not immediately clear. It could be due to the patient's underlying condition (not related to transfusion), an allergic/anaphylactic reaction, or one of the recognised pulmonary complications of transfusion: Transfusion associated circulatory overload (TACO)/Transfusion related acute lung injury (TRALI)/Transfusion associated dyspnoea (TAD). See the BSH guideline for the management of Acute Transfusion Reactions (ATR) https://b-s-h.org.uk/guidelines/guidelines/investigation-and-management-of-acute-transfusion-reactions/ . Initial treatment of ATR is not dependent on classification but should be directed by symptoms and signs. Treatment of severe reactions should not be delayed until the results of investigations are available.

How do I know if it is an allergic/anaphylactic reaction?

Many of the acute immunologic reactions post transfusion can present with fever and/or respiratory symptoms, making it challenging to distinguish them from each other in the initial stages. Associated clinical signs and symptoms may provide a clue for example: angioedema and wheeze in cases of allergy/anaphylaxis and/or there may be supporting tests such as a raised mast cell tryptase. Allergic reactions should be reported to SHOT/SABRE in the FAHR category.

What if it's not thought to be an allergic reaction, but the blood seems the likely cause?

In this case consider whether this could be one of the pulmonary complications of transfusion: TACO/TRALI/TAD. Timing is the first consideration. TRALI occurs within 6 hours, and TACO/TAD within 12 hours (though SHOT accept cases up to 24 hours). You will need access to the patient's records including medical history, transfusion history, vital sign observations, chest examination and imaging (before and after transfusion), details of non-blood fluids given, fluid balance chart, details of medications given (including diuretics) and the response to them, blood tests etc. It is essential that as much information as possible is provided. Lack of data is a significant problem in differentiating between pulmonary complications categories.

How do I differentiate TRALI and TACO?

This can be very difficult, and it is recognised that they may co-exist. The algorithm below provides some guidance and suggestions for further testing that may help. These will be in addition to your standard laboratory testing panel for transfusion reactions. A useful approach is to establish whether there are signs of pulmonary oedema, more specifically left atrial hypertension (LAH). Echocardiogram and/or NT-proBNP levels should be reported if available. Fever can occur in both TACO and TRALI.

What should I report to SHOT/SABRE?

If you suspect TRALI you must report it to the Blood Service as a product recall of components from the same donor may be required. The Blood Service consultant will co-ordinate investigation. Any patient who develops respiratory distress during or up to 24 hours after transfusion, where transfusion is the suspected cause must be reported to SHOT/SABRE. SHOT experts can transfer cases between categories following assessment if required.

The algorithm below helps in differentiating among the different categories of pulmonary complications post transfusion but please note that this does not substitute for clinical judgment in the patient evaluation.

SHOT Bite No 11: Respiratory symptoms during transfusion

Respiratory compromise thought to be transfusion-related (allergy/anaphylaxis excluded)

Does the patient have pulmonary oedema (image or examination)?

YES

(or no data available)

NO

Review again for possible non-transfusion cause, anaphylaxis (otherwise consider TAD)

Unexpected changes in cardiovascular status

- Hypertension (hypotension can occur in TRALI)
- Tachycardia
- Raised Jugular Venous Pressure (JVP)/Mean Arterial Pressure (MAP)
- Enlarged cardiac silhouette on chest x-ray
- Peripheral oedema

Objective signs of Left Atrial Hypertension (LAH)

- New/worsening cardiac failure on echocardiogram
- NT-proBNP (Brain Natriuretic Peptide) on the pre- and post-transfusion sample (1.5x rise is suggestive of TACO, normal NT-proBNP excludes TACO)

Fluids

- Was there an improvement in respiratory status after diuretic treatment?
- Was the fluid balance significantly positive?

PRESENT

CONSIDER TACO

ABSENT

CONSIDER TRALI or TAD

TRALI: within 6 hours of transfusion and the respiratory symptoms are not likely due to deterioration of the patient's underlying condition. Suspicion of TRALI must be reported to NHSBT as a product recall may be required