SHOT Cautionary Tales

No 2. Optimising Blood Administration Set Safety (April 2026)

Sharing learning from events reported to SHOT across the transfusion pathway

Background

Blood transfusions should be given through CE/UKCA marked infusion equipment that is in date and use a specific blood transfusion administration set with integral 170-200µm mesh filter.

Drugs or intravenous (IV) fluids should not be added to blood bags or lines, and administration of them should be avoided while transfusing a blood component.

Using administration sets without any filter increases risk of particulate matter entering the recipients blood stream.

Using standard IV fluid administration sets with a 15µm filter may stop or slow the flow of blood or damage the blood cells, causing avoidable harm.

This cautionary tale describes one specific case with many complex factors. Please refer to local policy for guidance

Case Description

A neonate underwent exchange transfusion for haemolytic disease of the fetus and newborn but was significantly under transfused. The transfusion was set up using an automated blood administration pump; however the wrong administration set was used, which impeded the flow of red cells. This resulted in a transfusion volume that was significantly lower than the amount of blood taken from the baby. The hospital's supplier produced two paediatric administration sets that looked very alike, one for transfusion and one for fluids. An infusion pump was used, which alarmed but staff believed this to be related to a different issue. Exchange transfusion was very infrequently performed in this hospital. The unequal blood replacement was not noticed by the clinical team until the infant became symptomatic, developed hypovolaemic shock with cardiac arrest and required ventilation. The child recovered when appropriately transfused but suffered serious long-term complications.

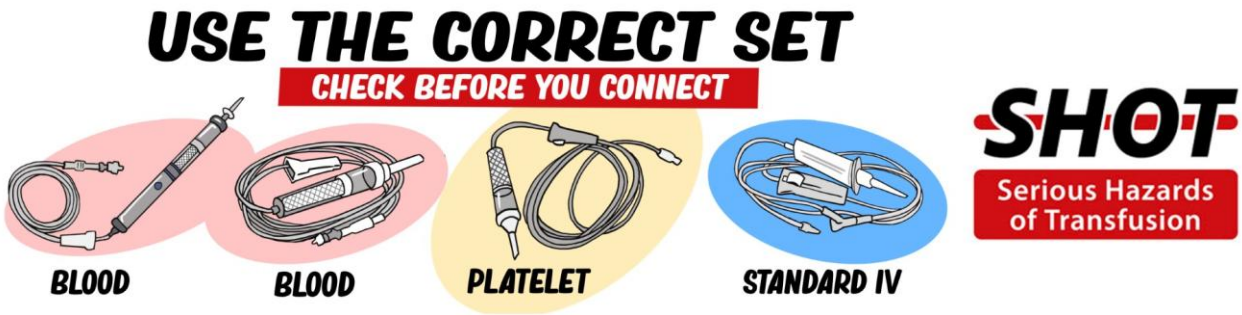
Note: Appropriate escalation, investigation and corrective actions have been taken locally.

Contributory Factors from Case Descriptions

Suboptimal equipment packaging design → Possible alert fatigue → Knowledge gaps

Key Learning Points

- Alarms should be investigated, actioned and if repeated, alternative solutions sought
- During exchange transfusions it is essential to track volume removed and administered to ensure appropriate volume replacement
- Equipment provided in pre-made packs should be checked before use
- There should be clear labelling and storage separation
- Staff should be educated on the risks of incorrect administration set use (Table 1)
- The use of a correct blood administration set should be included in pre-administration checks – both paper and electronic

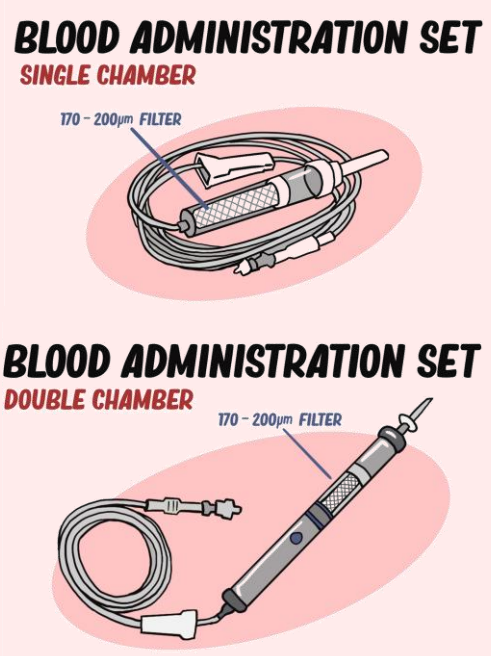
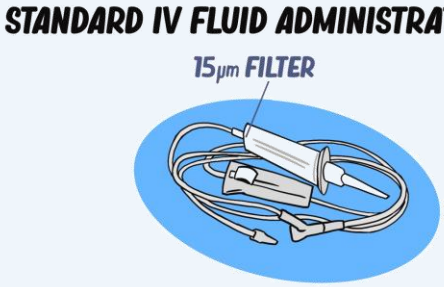


Suggested Actions

Review local documentation to ensure there are clear procedures for the following available to all staff groups:

- The use of correct administration sets for appropriate procedures
- The use of a correct blood administration set within pre-administration checks
- Completing a transfusion pre-administration checklist prior to transfusion

Table 1: Guidance on administration set use for blood components in adults

Administration Set Type	Standard blood administration : 170–200µm filter	Standard intravenous fluid administration :15µm filter vented
Blood component or product	• Red cells • Platelets • Fresh frozen plasma (FFP) • Granulocytes • Cryoprecipitate	• Human albumin solution (HAS) • I/V Immunoglobulin
Special note	Platelet administration sets have a 170-200µm filter but have a smaller priming volume and narrower bore. Platelet administration sets can be used in line with your organisation policy.	Most standard administration sets have a 15µm filter. Please check local standard administration sets and filter presence.
Appearance	**Blood component administration set**	**IV fluid administration set**
		 Scan or click here to view larger illustrations including platelet administration set

Further Resources

- https://www.shotuk.org/resources/pre-administration-blood-component-checking-process/
- https://www.shotuk.org/resources/safe-transfusion-practice-transfusion-checklist/
- https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/36614/blood-essentials-v20-june-2025.pdf
- https://www.mnsi.org.uk/publications/safety-spotlight-exchange-blood-transfusion/
- https://www.bapm.org/articles/safety-alert-lookalike-iv-administration-giving-sets#:~:text=BAPM%20recommendations%20for%20safe%20practice%20include%3A%20Neonatal%20units,technique%2C%20monitoring%20during%20procedure%20and%20post%20procedure%20care

We would like to acknowledge valuable input from the NHS Blood and Transplant Patient Blood Management team and the MHRA Medical devices team

3