Expert Guide

Step by step guide to blood unit separation

pet blood bank uk

As the UK's trusted pet blood banking charity, we provide quick access to high quality products as well as expert advice and guidance when you need it most.

We hope this guide is useful.
If you have any further queries, please contact our team.

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Unit separation rationale

Once a blood product has been breached, it must be discarded after four hours. Where the infusion rate, or volume being given would not result in transfusion of the desired volume in four hours, the product can be separated to administer later. Each individually separated element will then have up to four hours to be infused, thus extending the duration over which the product can be transfused.

The product can be withdrawn into one or more individual syringes or where a larger volume of product is to be separated, or if there is no access to a syringe driver to deliver the product, the withdrawn blood can be deposited into a dry blood collection bag.

Unit separation into a syringe

Equipment and attire

Equipment required

- Defrosted unit of plasma or unit of PRBC
- Alcohol wipe
- Drip stand
- Needle free injection spike
- Appropriately sized syringe
- Needle (minimum of 21 gauge) or sterile syringe cap
- Label and pen
- A clean work station

Attire

- Clean scrub top or laboratory coat
- Pair of examination gloves

Preparation of the unit

- Wash hands and don examination gloves.
- Gently, but fully, mix the blood product to ensure even distribution of components.
  (NB plasma units will need to have been defrosted prior to separation. Red cell warming should not have taken place.)
- Hang the unit from the drip stand (Fig. 1).

Fig. 1

Prepare the unit port and needle free valve

Prepare the unit port

- Remove the tab from one of the ports on the blood component unit with a twisting motion, taking care not to touch the revealed port (Fig.2).

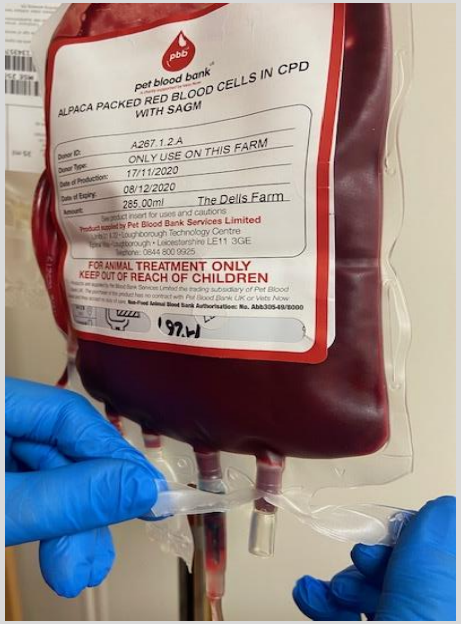

Fig. 2

Prepare the needle free valve

- Take the needle free injection spike out of the packet (but retain packet for use in later steps) and remove the spike cover, taking care not to touch the uncovered spike. The vent cap (1) should be closed (Fig. 3).

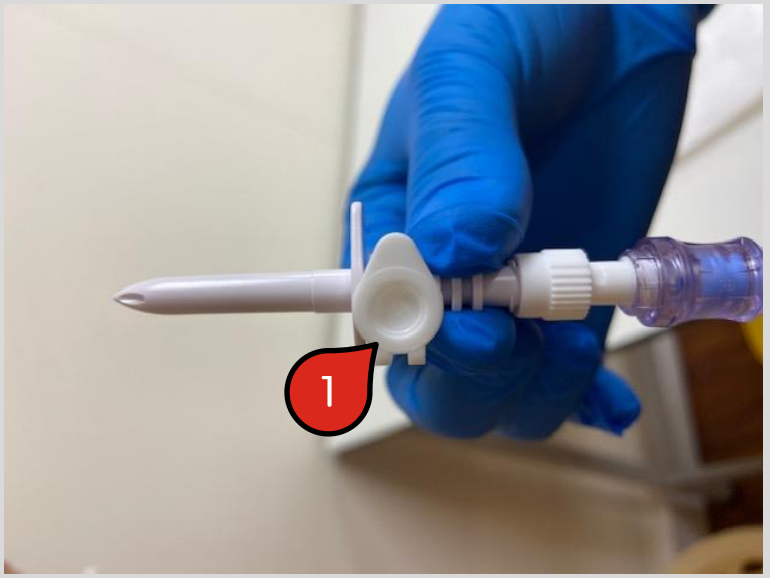

Fig. 3

Prepare the unit port and needle free valve

Fully insert the needle free valve

- Insert the spike into the blood component port with a firm twisting motion. Do not stop until the needle free valve is inserted to the hilt (Fig.4).

Fig. 4

Remove the valve cap

- Remove the needle-free valve cap (Fig. 5). **Put it to one side in its sterile packet.**

Fig. 5

Withdraw the desired volume

Attach the syringe

- Remove the syringe from the packet, taking care not to touch the syringe luer, and push the luer into the needle-free valve with a twist, ensuring it is seated securely (Fig.6).

Fig. 6

Remove the valve cap

- Gently withdraw the desired blood component volume (Fig.7) avoiding excessive aspiration pressure and then place the sterile needle or syringe cap on the syringe to seal. Blood should not be stored in a plastic syringe as no gaseous exchange can occur.

Fig. 7

Secure the unit

Disinfect the valve

- Disinfect the needle-free valve with an alcohol wipe (Fig.8).

Fig. 8

Secure the valve cap

- Take the needle free cap from the sterile packet and carefully replace the needle free valve cap (Fig.9).

Fig. 9

Label and store until ready to transfuse

- Label the blood component syringe with the date, time, product name, your initials, product expiry date and ID number, and DEA status +/- the patient's name.
- Place the blood component in a fridge at 2-6°C.
- To prepare the product syringe for use, a blood filter (Fig. 10) should be attached to the syringe luer and an intravenous extension attached to the opposite side of the filter. The extension set should then be attached to the patient's intravenous catheter.

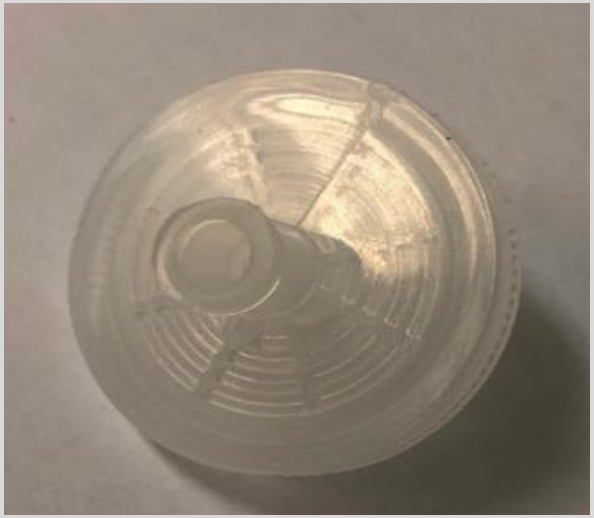

Fig. 10

Unit separation into a collection bag

Equipment and attire

Equipment required

- Defrosted unit of plasma or unit of PRBC
- CPDA-1 collection bag
- A pair of examination gloves
- Alcohol wipe
- Drip stand
- 2 x needle-free injection spike
- 60ml syringe (to remove the blood component)
- Syringe to remove the anticoagulant to create an empty bag for blood component (size will depend on volume of anticoagulant being removed)
- Label and pen
- A clean work station

Attire

- Clean scrub top or laboratory coat
- Pair of examination gloves

Preparation of the unit

- Wash hands and don examination gloves.
- Gently, but fully, mix the blood product to ensure even distribution of components.
  (NB plasma units will need to have been defrosted prior to separation. Red cell warming should not have taken place.)
- Hang the unit from the drip stand.
- Remove the tab from one of the ports on the product unit with a twisting motion, taking care not to touch the revealed port (Fig.11).

Fig. 11

Place the needle free valve

- Take the injection spike out of the packet and remove the spike cover taking care not to touch the spike. The vent cap should be closed.
- Insert the spike into the port with a firm twisting motion (Fig.12), do not stop until the spike is fully inserted to the hilt.

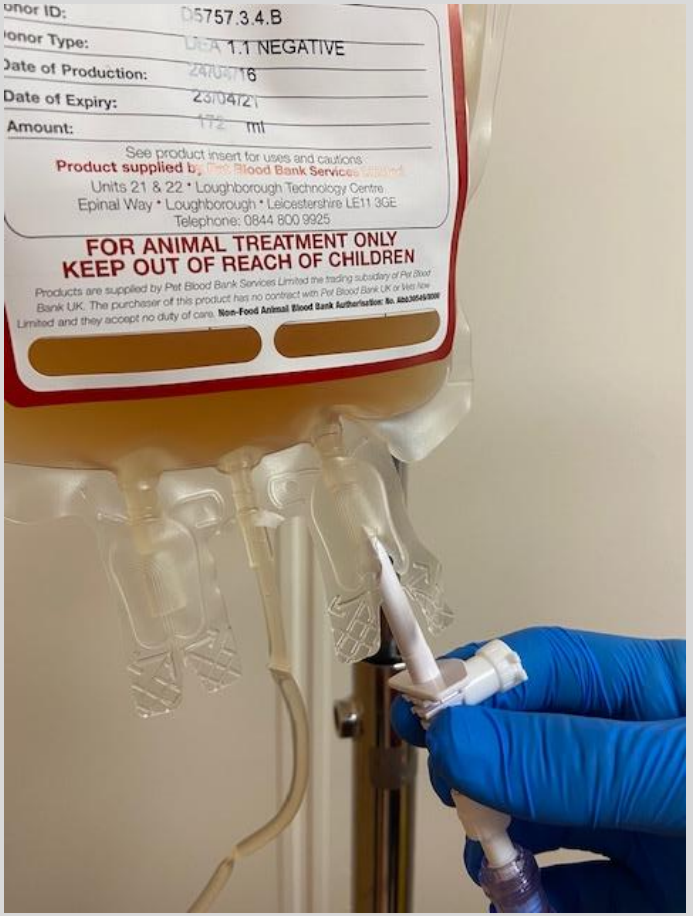

Fig. 12

Prepare the CPDA-1 collection bag

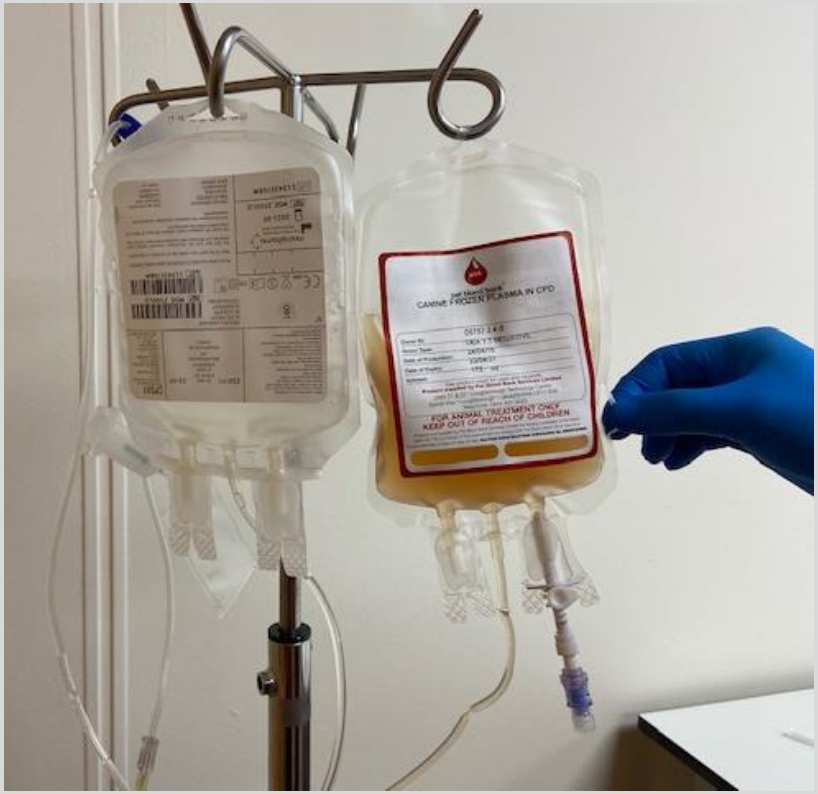

Fig. 13

Attach the syringe

- Aseptically remove the syringe from its packet and remove the needle-free valve cap (put it to one side in its sterile packet).
- Push the syringe luer into the needle-free valve attached to the collection bag with a twist and ensure it is seated securely (Fig.14).

Fig. 14

Withdraw the CPDA-1 anticoagulant

Withdraw the CPDA-1

- Withdraw all the CPDA-1 anticoagulant from the collection bag (Fig.15). Remove the syringe and discard as pharmaceutical waste – multiple aspirations may be required depending on the volume of anticoagulant held within the collection bag.

Fig. 15

Remove the unit needle free valve cap

- Remove a new 60ml syringe from the packet taking care not to touch the luer and remove the cap from the needle free valve attached to the blood component unit (Fig.16) and carefully place the cap in the sterile packing.

Fig. 16

Transfer the blood product

Withdraw blood product

- Push the syringe luer into the needle-free valve attached to the blood component and withdraw the desired blood component volume avoiding excessive aspiration pressure (Fig.17).

Fig. 17

Instill the blood into the collection bag

- Attach the blood component filled syringe to the needle-free valve on the empty collection bag and gently instil the blood component (Fig.18). Repeat using a clean sterile syringe each time until the desired volume has been transferred. Ensure the port and valve are never touched with anything non-sterile.

Fig. 18

Secure, label and store

Secure both bags

- Once the volume required has been withdrawn, clean both needle-free valves with an alcohol wipe and carefully replace the caps (Fig.19).

Fig. 19

Label the collection bag

- Label the collection bag (Fig.20) with the date, time, product name, your initials, product expiry date and ID number, and DEA status +/- patient's name.
- Place the bag in a temperature monitored fridge at 2-6°C.

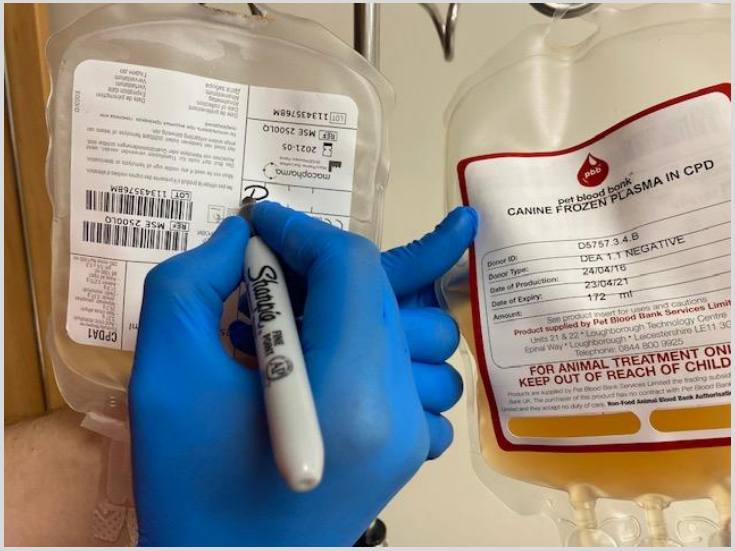

Fig. 20

Storage of Separated Products

- Separated PRBC and defrosted plasma must be stored in a temperature monitored fridge at 2 - 6°C.

- Care must be taken to ensure products are separated using an aseptic technique with the knowledge that contamination is possible when opening a closed system. Products must be monitored for signs of contamination:
  - Dark purple to black discoloration in red cells units
  - Grey discoloration in plasma may be seen
  - Excessive and unusual air bubbles
  - Clots and fibrin strands
- As plastic syringes are impermeable to gases, any product separated in a syringe should be refrigerated immediately at 2 – 6 °C and used within 24 hours.

- With regard to separated red cells, Pet Blood Bank recommends keeping the original unit and the withdrawn volume/s for a maximum of five days following separation, providing they are stored in blood collection bags.

Storage of Thawed FFP for Urgent Cases

According to a study by Chee et al (2020) Thawed Fresh Frozen Plasma kept refrigerated at 4°C retained a minimum coagulation factor activity of 50% and a concentration of fibrinogen of >0.982 g/dl for up to 28 days and was deemed by the authors to be 'suitable for transfusion'. All samples taken from the units during the study were negative for anaerobic and aerobic culture.

The coagulation activity of thawed FFP has also been investigated by Edwards et al (2020) and this study is in agreement regarding the retention of coagulation factor activity during refrigerated storage.

It is vital that the thawing of the units prevents contamination of the ports and that the unit is handled aseptically for any plasma withdrawals.

References

Chee, W., Sharp, C. R., Boyd, C. J., Claus, M. A. and Smart, L. (2020) 'Stability of ex vivo coagulation factor activity in never frozen and thawed refrigerated canine plasma stored for 42 days', *Journal of Veterinary Emergency and Critical Care*, Vol. 32, pp. 189 - 195

Edwards, T.H., Meledeo, M. A., Peltier, G. C., Ruiz, D. D., Henderson, A. F., Travieso, S. and Pusateri, A. E. (2020) 'Effects of refrigerated storage on hemostatic stability of four canine plasma products', *Journal of the American Veterinary Medical Association*, Vol. 81. No. 12, pp.964 - 972

Additional notes

- Pet Blood Bank provides a 24 hour blood service and can dispatch blood (and consumables) within 60-90 minutes to be couriered directly to the practice for urgent cases.

- Alternatively, we facilitate a local Blood Sharing Scheme where practices who store blood make their blood units available to other local practices in an emergency. Collection is arranged between the practices and Pet Blood Bank dispatches replacement product to the loaning practice on notification that sharing has taken place. To find the closest blood sharing practice to you, please visit www.petbloodbankuk.org/sharingscheme

Thank you for using this guide.
We hope you found it useful.

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- Blood deliveries around the clock
- Quality tested products that reduce the risk of complications
- Advice on cross matching and selecting blood products
- Administrative equipment

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