Donor Weight and Donation Volumes

The current entry in the Donor Selection Guidance for Donor weight is:

Weight Problems

Obligatory

1. Must not donate if:
a) The donor weight means that they have difficulty in getting onto or off the donation couch.

b) Venous access is very difficult.

c) The safe weight limit of the bleeding couch/chair is exceeded.

2. Component donor:
If a donor is under 70 kg (11 stone) see:
Chapter 6, Volume collected, 'Guidelines for the Blood Transfusion Services in the United Kingdom'.

3. Double red cell donor:
Must not donate if:
Under 70 kg (11 stone).

4. Whole blood donor:
Must not donate if:
Under 50 kg (7 stone 12 pounds).

Discretionary

Treatment with anti-obesity drugs, accept.

See if Relevant

Sleep Apnoea

Additional Information

Blood service staff should not put their own health at risk by helping donors on and off the donation couch, except in an emergency.

It is recommended that no donor should lose more than 13% of their blood volume during any donation procedure. This is to protect them from adverse effects such as fainting and becoming anaemic. There is a minimum donor weight at which a donation can be accepted. This is not always appropriate, particularly for double red cell donations, but also because of the increasing volume that is being taken at a routine blood donation. Obesity also makes it desirable to use more than a donor's weight to estimate their blood volume. Fat contains far less blood as a proportion of its weight than muscle. In obese individuals the blood volume can be seriously overestimated from weight alone. Overestimating a donor's blood volume makes it more likely that they will have an adverse incident.

With the replacement of Chapters 3 (Care and Selection of blood donors), 4 (Premises and quality assurance at blood donor sessions), 5 (Collection of a blood donation) and 6 (Component donation: apheresis) of the 7th edition of the Red Book with the new Chapters 3 (Care and Selection of whole blood and component donors), 4 (Premises and quality assurance at blood donor sessions), and 5 (Collection of a blood or component donation this entry which refers to a Chapter 6 is incorrect. The reference to a component donor is outdated and actually incorrect as all donors are in a real sense component donors (including double red cell donors). Therefore this entry needs updating.

The BSQR 2005 specifies a minimum donor weight for whole blood and component donors of 50kg. This is based on an outdated assumption that Estimated Blood Volume EBV is 70ml per kg and that therefore a donor of 50kg and above will have an EBV of 3500ml at least.

The current Council of Europe guidance recommends that no more than 13% of estimated blood volume (EBV) be taken at any one donation, this recommendation is set to change in the next (16th) Edition to 15% of EBV. This is in line with standard medical practice that says that Grade 1 shock is loss of up to 15% EBV and leads to a mild resting tachycardia which can be well tolerated in otherwise healthy individuals ([1,2]) and that it is reversed by normal compensatory mechanisms within 24 hours. Grade 2 shock 15-30% loss of EBV is clinically significant with tachycardia, narrow pulse pressure and significantly delayed capillary filling, with the sufferer looking and feeling unwell, anxious, thirsty etc. This usually requires fluid replacement to correct.

Currently in the UK a whole blood donation is 450ml ±10% (405-495ml) plus 30-45ml in the diversion pouch. This means the total donation is often 525-535ml, which is 15% of a blood volume of 3500ml. For this total donation volume to constitute 13% of the EBV, the EBV would need to be over 4000ml. The revised Council of Europe guidance is changing to bring it in line with common practice - current UK practice is not covered by the entry in the DSG as it stands.

Chapter 6 of the 7th Edition of the Red Book 'Component donation: apheresis' states in section 6.4 Volume collected:

> For any single apheresis procedure, the final collection volume should not exceed 15% of the total blood volume (TBV) excluding anticoagulant.
>
> During apheresis procedures the ECV should not exceed 20% TBV (excluding anticoagulant). Some procedures may result in a total ECV of as much as 1 litre. In donors under 70 kg in weight this may represent more than 20% of their total blood volume and procedure may need to be adjusted to suit each individual donor's safety tolerance limits.

The new Chapter 3 of the Red Book states in Section 3.7 Volume of Donation:

> Whole Blood: A donation of 450 mL±10% is required to ensure the final red cell component meets specification. No more than 15% of the estimated blood volume should be taken during any one donation. In general 470–475 mL of blood, excluding samples, is collected into the main pack.

Attention must be paid during apheresis to the extra-corporeal volume (ECV) in order to avoid rendering the donor significantly hypovolaemic. Consideration must be given to the following factors:

donor weight and estimated blood volume

type of apheresis procedure: intermittent flow or continuous flow

donor's haematocrit: this influences volume of plasma collected during any one cycle of an intermittent flow procedure (see Appendix III).

For any single apheresis procedure, the final collection volume should not exceed 15% of the total blood volume (TBV) excluding anticoagulant (see Appendix I).

During apheresis procedures the ECV should not exceed 15 % TBV (excluding anticoagulant). Some procedures may result in a total ECV of as much as 1 litre. The procedure may need to be adjusted to suit each individual donor's safety tolerance limits. Special considerations should be given during intermittent flow apheresis procedures (see Appendices I, II and III). TBV can be estimated using the Nadler formula (see Appendix I) [(4).]

ECV is the total volume of blood and plasma removed from the donor at any time. It includes all blood and plasma in collection packs and contained within the machine harness (volumes contained within collection harness can be obtained by reference to manufacturers' manuals).

Therefore it is suggested that the current DSG entry above is replaced with the following entry for the safety of donors:

Donor Weight

Obligatory
Must not donate if:

a) Under 50 kg (7 stone 12 pounds)

b) The donor weight means that they have difficulty in getting onto or off the donation couch.

c) Venous access is very difficult.

d) The safe weight limit of the bleeding couch/chair is exceeded.

e) They are a double red cell donor and weigh under 70 kg (11 stone).

Discretionary

Treatment with anti-obesity drugs, accept.

See if Relevant

Sleep Apnoea

Additional Information

No donor should lose more than 15% of their estimated blood volume (EBV) during any donation procedure. During apheresis procedures the extra corporal volume should not exceed 15 % EBV (excluding anticoagulant). ECV is the total volume of blood and plasma removed from the donor at any time. It includes all blood and plasma in collection packs and contained within the machine harness.

This is to protect the donor from adverse effects such as fainting and becoming anaemic. There is a minimum legal donor weight of 50kg at which a donation can be accepted. This is not appropriate for double red cell donations because of the increased volume, and iron that is being taken from the donor.

Obesity also makes it desirable to use more than a donor's weight to estimate their blood volume. Fat contains far less blood as a proportion of its weight than muscle. In obese individuals the blood volume can be seriously overestimated from weight alone. Overestimating a donor's blood volume(particularly in very short obese donors) makes it more likely that they will have an adverse incident.

Blood service staff should not put their own health at risk by helping donors on and off the donation couch, except in an emergency.

References

1. Nelson; & Mitchell, Richard N. (2007). Robbins Basic Pathology (8th ed.). Saunders Elsevier. pp. 102-103 ISBN 978-1-4160-2973-1

2. American College of Surgeons (2008). ATLS, Advanced Trauma Life Support Program for Doctors. Amer College of Surgeons. pp. 58. ISBN 1-880696-31-6.

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