What's new in the blood crisis?

The news is filled with ways to economize on petrol, spending and by use of alternative energy sources. So how are we doing for the blood transfusion economy in provision of alternatives to conserve blood supplies? The answer is described in the four reviews in the symposium in this issue of *BJHM*. Less transfusion means reduced allogeneic blood exposure, fewer risks of adverse transfusion events and better outcomes. Conservation of the patient's own blood is a cheaper and less hazardous means of sustaining haemoglobin than treating anaemia with blood transfusion.

Looking at the long term

Stopping blood loss by preserving nature's coagulation system may be an up-front cost in terms of blood component therapy, but a life- and blood-saver in the long run. Haemoglobin-based oxygen carrying (HBOC) drugs appear to be safe and effective alternatives to the 2–3-unit packed red blood cell transfusion or as an immediately available replacement for uncross-matched blood used in emergency circumstances.

Blood has not undergone scrutiny with prospective randomized clinical trials. As discussed in the article by Marik (p. 12) there is mounting evidence that packed red blood cells are dangerous and should be avoided whenever possible. It is clear that all clinicians need to plan ahead more effectively to prepare patients for surgical blood loss before it happens and to use the techniques described by Shander et al (p. 16) to minimize bleeding.

In emergency circumstances massive transfusion can be predicted (McLaughlin et al, 2008). Early administration of plasma is essential and whole fresh blood (not packed red blood cells) may be a vital part of stopping the bleeding, as outlined by Duchesne and Holcomb (p. 22). Mackenzie (p. 26) emphasizes that HBOC drugs have advantages over blood in treatment of acute anaemia as they require no cross match, have up to a 3-year shelf-life (some without refrigeration), improve rheology and eliminate transfusion errors.

Why is this all so very important?

There is a worldwide crisis where demand for blood exceeds available supplies. In some parts of the world post-partum haemorrhage is still fatal because there are inadequate blood supplies in rural areas. The shrinking donor pools have many causes including the more stringent testing that excludes almost two-thirds of those willing to donate, and the fact that the social obligations felt by the likes of World War II veterans to donate blood are no longer felt by many of the younger generations.

With an ageing population more surgeries are now being performed in both elective and emergency circumstances on the elderly who are recognized to be more anaemic (Kulier and Gombotz, 2001). So clinicians must take on board the lessons demonstrated in these articles and translate them wherever possible into clinical practice.

If we avoid blood transfusion we avoid the 1:14 000–28 000 packed red blood cell and component transfusion errors (Sazama, 1990; Williamson et al, 1999) whose fatality rate far exceeds that resulting from blood transmission of HIV (human immunodeficiency virus). If we maintain coagulation factors in patients needing massive transfusion, use blood conservation techniques for elective surgery and replace 2–3-unit packed red blood cell transfusions in urgent and known high blood loss surgeries with HBOC drugs we would not have a blood supply crisis, that in the US alone is predicted to result in a 4 million unit shortfall by 2030 (Vamvakas, 1990), and lastly we would not have newborn infants surviving while their mothers exsanguinated because of the lack of urgently available blood supplies. BJHM

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KEY POINTS

- Packed red blood cells increase the risk of sepsis, respiratory, renal failure and death.
- Blood conservation techniques and anticipatory preoperative management can minimize the likelihood of transfusion for surgeries that currently use blood.
- Most blood is used in the few trauma patients who require massive (>10 units) transfusion. Much of this blood could be saved by early use of plasma, platelets and fibrinogen, all of which are found in fresh whole blood.
- Haemoglobin-based oxygen carriers are immediately usable to sustain oxygen carriage in emergencies until blood becomes available.