3.2: Tests on blood donations

3.2.1: Screening for infectious agents

At each donation, the following mandatory tests are performed:

- Hepatitis B – HBsAg
- Human immunodeficiency virus – anti-HIV 1 and 2 and HIV NAT (nucleic acid testing)
- Hepatitis C – anti-HCV and HCV NAT
- Human T-cell lymphotropic virus – anti-HTLV I and II
- Syphilis – syphilis antibodies.

Some donations are tested for cytomegalovirus (CMV) antibodies to provide CMV negative blood for patients with certain types of impaired immunity (see Chapter 5).

Additional tests, performed in special circumstances, include:

- Malarial antibodies
- West Nile Virus antibodies
- Trypanosoma cruzi antibodies.

3.2.2: Precautions to reduce the transfusion transmission of prion-associated diseases

These include variant Creutzfeldt–Jakob disease (vCJD – caused by the same agent as bovine spongiform encephalopathy (BSE) in cattle – ‘mad cow disease’) and sporadic or inherited CJD. The following are permanently deferred from blood donation:

- Persons who have received a blood transfusion or tissue/organ transplant from a donor since 1980
- Anyone who has received human pituitary-derived hormones, grafts of human dura mater or cornea, sclera or other ocular tissue
- Members of a family at risk of inherited prion diseases
- Persons notified that they may be at increased risk of vCJD due to possible exposure to an infected individual by surgical instruments, blood product transfusion or transplant of tissues or organs
- Persons notified that they may be at increased risk because a recipient of their blood or tissues has developed a prion-related disorder.

More information, including the latest data on transfusion-transmitted vCJD, can be obtained from the National CJD Research and Surveillance Unit (http://www.cjd.ed.ac.uk/index.html).

3.2.3: Blood groups and blood group antibodies
Every donation is tested to determine the ABO and RhD group of the red cells and the plasma is screened to detect the most common blood group antibodies that might cause problems in a recipient. Some donations are tested for a wider range of clinically significant blood groups (extended phenotyping) to allow closer matching and reduce the development of alloantibodies in patients who need long-term red cell transfusion support (see Chapter 8). Blood for neonatal or intrauterine use has a more extensive antibody screen (see Chapter 10).

Some group O donations are screened for high levels of anti-A and anti-B antibodies to reduce the risk of haemolytic reactions when group O plasma, platelets or other components containing a large amount of plasma (e.g. red cells for intrauterine or neonatal exchange transfusion) are transfused to group A, B or AB patients, especially neonates and infants.

### 3.2.4: Molecular blood group testing

The genes for most human blood groups have now been identified. Currently only a limited number of patients undergo genotyping. These include recently transfused patients whose blood group is uncertain and fetuses that require typing to define the risk from maternal antibodies. Routine DNA testing/genotyping using rapid automated technology is likely to enter blood service and hospital laboratory practice in the next decade.