Other infections:

All blood for transfusion is tested for syphilis, as well as HTLV-I and HTLV-II (viruses linked **to human T-cell leukemia/lymphoma**).
Since **2003,** donated blood has been tested for the West Nile virus.
In **2007**, blood banks also began testing for Chagas disease (common in South and Central America).
Diseases caused by certain bacteria, viruses, and parasites, **such as babesiosis, malaria**, **Lyme disease**, and others can also be **spread** by blood product transfusions. But because donors are screened with **questions** about their **health status** and **travel**, such cases are **very rare**.

Other risks:

Some patients with certain cancers, like colorectal, prostate, lung , and breast cancer, had worse outcomes , **if** transfusions were given **before** or **during surgery** and/or while getting **chemotherapy**, it's possible that transfused blood might **affect the immune system** in ways that may cause problems later.
Also, the transfused patients might have been **treated** in different ways during surgery and afterward.

Tests for detecting unexpected antibodies in serum

Serum or plasma from **donors** should be tested for **unexpected antibodies** with pooled O Rh (D) positive cells or preferably screening cell panel using albumin/enzyme/indirect AHG test which can identify clinically significant antibodies.

- Blood in which such **antibodies** are found, should be used as **packed cells** only.
- Any component with cold antibody should be transfused only with special instructions to warm before transfusion.
- If warm allo antibody is present only packed cells should be used for transfusion under observation.
- In case when warm auto-antibody is present least incompatible blood should be used, depending on patient's clinical condition**.**

Laboratory tests for infectious disease

All mandatory tests should be carried out on blood samples in pilot tubes taken at the time of collection. The whole blood or components from **any unit that tests positive** should be **discarded**.

- Test for **Syphilis** Each donation of whole blood should be subjected to a serological test for syphilis **by VDRL / RPR Method / TPHA.**
- Test for **Viral Hepatitis A** test for **hepatitis B (HBsAg) and hepatitis C (anti-HCV) by ELISA/Rapid test** .
- Screening for **HIV Antibodies** All blood units collected should be tested for HIV 1&2 antibodies using **ELISA/Rapid**.
- Test for **Malaria** All blood units should be tested for malarial parasites using antigen test.

Quarantine storage

The **whole blood** or **components** should not be **issued** for transfusion, till **the mandatory tests** are completed and reported as **non-reactive**. In order to **ensure** this procedure, the **untested** blood should be **kept** in quarantine storage. The units which test reactive in any test should be **segregated** immediately and kept in a separate quarantine area till **sent** for disposal. It is preferable to use **biohazard labels.**

STERILITY

The sterility of the blood should be checked on 1% of the blood units collected . **The blood sample** from the tubing **attached to the container** should be used for sterility testing i.e. **culture** at 4C, 22C & 37C.

- The blood bank should establish a procedure to identify a recipient of a transfusion of blood from a donor who is subsequently found to have been infected with **transfusion transmissible infection**. In case this happens the blood should be **discarded.**

Preparation of Blood Components:

❖ **GENERAL PRINCIPLES**

- **Sterility**

The sterility of all components should be maintained during processing by the use of **aseptic methods and sterile pyrogen free disposable bags and solutions.**

- **Seal**

Blood bags that allow transfer of component **without breakage** of the seal (closed system). If the seal is not broken, the viability and stability of the component is assured.

- If the seal is **broken** during processing, components stored between 40C + 20C **must** be transfused within 24 hours and component stored between 220C + 20C should be transfused **as early** as possible and not beyond 6 hours.
- Once the frozen components are thawed, these should be transfused at the earliest and positively within 6 hours.

❖ RED BLOOD CELLs

Red blood cell concentrate should be prepared from the whole blood collected in plastic bags, preferably in **double or multiple plastic bags system**. **Plasma i**s separated from red blood cells following **either centrifugation** or undisturbed **sedimentation** at any time before the expiry date of blood. If closed system is in use, the expiry date of red cells should be the same as whole blood. The hematocrit of packed cells should be adjusted so that it is not more than 70%.

Washed Red Cells

Red blood cells should be washed with **normal saline** by automatic **cell washer or manually** by **centrifugation**. The cells should be **washed 2-3 times with normal saline** by centrifuging at 4 ºC ±2 ºC.

Leucocyte depleted red blood cells

Leucocyte depleted red blood cells concentrate should be prepared by a method known to **reduce leucocytes** in the final component to less than 5x108 when intended to **prevent febrile reactions** and to less than 5x106 when it is required to **prevent alloimmunisation** or **CMV** infection. For achieving a level <5x106, use of leucocytes filter is necessary.

Frozen and deglycerolised red blood cell concentrate

Red cells should be stored frozen continuously at low temperature of -80 ºC -196 ºC in the presence of **cryoprotective agent**. The red cells should be **washed** to remove the cryoprotective agent prior to transfusion.

- The method of preparation, storage, thawing and washing should ensure a recovery of at least 80% of original red cells.
- Red blood cells should be ordinarily frozen within 6 days of collection of blood and can be kept frozen upto 10 years.
- The cryoprotective agent in most common use is **glycerol**. The concentration of glycerol used should **depend on** the storage temperature.