

# Blood Transfusion

**B**lood transfusion can be life-saving. Blood products include **whole blood** (blood with all of its components, rarely used now), **packed red blood cells** (blood cells that carry oxygen), **platelets** (cells in the blood that allow blood clots to form), **plasma** (the liquid portion of blood without cells), and concentrated clotting factors.

When packed red blood cells are transfused, an individual's blood count increases. This blood count is usually measured as the **hemoglobin** level. Hemoglobin is a protein that carries oxygen to the tissues and cells of the body. Normal hemoglobin levels are about 12 to 15 grams per 100 milliliters of blood for women and about 14 to 17 for men. Although individual circumstances can be different, **anemia** (low red blood cell count) requiring transfusion usually occurs when the hemoglobin is about 7. Medical research has shown that significant decreases in tissue oxygen delivery occur when the hemoglobin drops to that level. The October 6, 2004, issue of *JAMA* includes an article about blood transfusion in the setting of **acute coronary syndrome** (heart attack).



## REASONS FOR BLOOD TRANSFUSION

- Blood loss from injuries or internal bleeding
- Blood loss during and after surgery, including organ transplantation
- Treatment for leukemia and other types of cancers
- Anemia caused by illnesses
- Bleeding disorders

## MAIN RISKS OF TRANSFUSION

- **Transfusion reactions from incompatible blood**  
Each person has a specific blood type, characterized by the ABO blood groups and the presence or absence of the Rh factor (Rh positive or Rh negative). Because reactions can occur if a person receives a transfusion of improper blood type, a system of checks and balances (known as **typing and crossmatching**) and other safety procedures have been developed to prevent transfusion reactions. Such reactions vary from mild (fever or chills) to severe, such as ABO blood type incompatibility, which can be fatal.
- **Transmission of an infectious disease**  
Because of the risk of infections from blood or blood products, each unit of donated blood is carefully tested for the presence of viruses (including hepatitis viruses, the human immunodeficiency virus [HIV], cytomegalovirus, and West Nile virus) and the organism that causes syphilis. With this extensive testing, the chance of receiving a unit of blood containing the human immunodeficiency virus is now less than 1 in 1.9 million, and the risk of exposure to the hepatitis C virus is less than 1 in 1 million. Health history questions of the prospective blood donor may exclude that person from donating blood, thereby increasing the safety of donated blood.

Sources: National Heart, Lung, and Blood Institute; American Association of Blood Banks; American Red Cross

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## FOR MORE INFORMATION

- National Heart, Lung, and Blood Institute  
[www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)
- American Association of Blood Banks  
[www.aabb.org](http://www.aabb.org)
- American Red Cross  
202/303-4498  
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## INFORM YOURSELF

To find this and previous JAMA Patient Pages, go to the Patient Page link on *JAMA*'s Web site at [www.jama.com](http://www.jama.com). Many are available in English and Spanish. A Patient Page on blood donation was published in the April 17, 2002, issue.

