

INFUSION OF BLOOD PRODUCTS

1. Levels: Paramedic, RN

2. Procedure

- 2.1. All blood products to be infused must be initiated by the transferring facility. This protocol does not authorize the paramedic to start, hang or otherwise initiate the infusion of blood products.
- 2.2. Before accepting responsibility for the patient, confirm together with a nurse or physician from the transferring facility that the name on the patient's armband is the same as the name on the unit(s) of blood which is (are) infusing. The patient must have an arm band -no exceptions.
- 2.3. Obtain a written order from the transferring nurse or physician as to the rate of infusion, the total amount to be infused during transport of the patient.
- 2.4. Vital signs must be recorded prior to the transport and every ten minutes during transport until arrival at the receiving facility.
- 2.5. If the patient develops any sign of allergy/sensitivity reaction, the infusion of blood products should be immediately stopped and a crystalloid (saline) infusion continued. Attempts should be made to contact medical control hospital for medical direction. True anaphylactic reactions are treated per our **ALLERGIC REACTION Protocol**. Hemolytic reactions may require a diuretic in addition to large amounts of fluid to maintain intravascular volume.

COMPLICATIONS OF TRANSFUSIONS

Hemolytic Reactions:

The most serious immediate transfusion reaction, the hemolytic transfusion reaction, is any antigen or antibody-induced reaction that results in the destruction of transfused cells. Intravascular destruction may be rapid, with lysis of all the transfused red cells occurring within minutes. As a result, hemoglobin is released, producing hemoglobinemia and hemoglobinuria.

Clinically, the immediate transfusion reaction includes fever, chills, and a burning sensation at the site of the infusion. Other common symptoms include a sensation of chest restriction, shock, and joint or low back pain. The onset of such a reaction may occur after the transfusion of a relatively small amount of blood and most commonly appears before the whole unit of blood is transfused. This rapid destruction of red cells may also trigger disseminated intravascular coagulation (DIC) as a result of damaged red cell debris activating the coagulation system. The diagnosis of an intravascular transfusion reaction is most difficult in pediatric, unconscious, or anesthetized patients in whom the only clues may be hypotension, oozing from the needle puncture sites, and hemoglobinuria.

The treatment of patients with an acute intravascular transfusion reaction must be directed toward the prevention of shock and renal cortical hypoperfusion. If an intravascular transfusion reaction is suspected, the transfusion should be terminated immediately. Vigorous intravenous fluid therapy should be initiated and medical control contacted.

INFUSION OF BLOOD PRODUCTS

Febrile Reactions:

The most common and least serious transfusion reaction is the simple febrile transfusion reaction characterized by fever, chills, and malaise. These reactions are usually secondary to anti leukocyte and anti platelet antibodies. Febrile transfusion reactions rarely progress to include hypotension and respiratory distress.

Once a febrile transfusion reaction is recognized, the current transfusion should be terminated immediately, because there is usually insufficient clinical evidence to differentiate the simple febrile reaction from the more serious immediate hemolytic reaction. Like the hemolytic transfusion reaction, the simple febrile transfusion reaction may be difficult to detect in infants incapable of shivering. The only clue may be a refusal to feed, pallor, and cool skin. Unconscious and anesthetized patients are also incapable of demonstrating or reporting the clinical symptoms of a febrile transfusion reaction.

Allergic Reactions:

Another possible immediate transfusion reaction is the allergic reaction. Immediate anaphylactic reactions are characterized by skin flushing, laryngeal edema, chills, and hypotension. Such a reaction occurs once in about 20,000 transfusions. In the majority of reported cases the reaction occurs before 10 ml. of blood has been infused.

When an immediate hypersensitivity reaction occurs in an adult, the transfusion should be immediately terminated and the standard treatment for anaphylaxis as per ALLERGIC REACTION Protocol should be instituted. Patients with a history of allergies should be watched closely during transfusions. A patient with a known history of allergic transfusion reactions should be given antihistamines before the transfusion. Drugs should not be added to the blood.

Hypocalcemia (citrate toxicity)

Other acute complications of blood transfusion are most commonly associated with multiple unit transfusions. All commonly used preservative-anticoagulants for stored blood contain an excess of citrate. One advantage in the use of citrate as a preservative-anticoagulant is that it is not metabolized or otherwise changed during storage. When transfused the citrate is neutralized because it is a normal intermediary metabolite. When multiple units are transfused, however, citrate can bind enough of the recipient's ionized calcium to impair cardiac function.

The clinical signs of citrate toxicity include skeletal muscle tremors and a prolongation of the QT segment of the electrocardiogram. Higher citrate concentrations may cause cardiac arrest. The treatment of citrate toxicity is intravenous administration of 1 to 10 g. of a 10% solution of calcium chloride. The prophylactic administration of intravenous calcium chloride is not recommended, because of the possible toxic effects of calcium administration and the rapid metabolism of citrate.

INFUSION OF BLOOD PRODUCTS

Delayed Reactions:

The major delayed transfusion reactions may be classified into hemolytic and allergic reactions.

Extravascular hemolytic reactions:

The delayed hemolytic transfusion reaction results in the extravascular destruction of red cells most often caused by nonagglutinating antibodies. Fever and chills commonly occur but may not develop until hours after the transfusion is completed. The diagnosis may be even more difficult because an occasional hemolytic transfusion reaction may be a combination of both intravascular and extravascular cell destruction.

When either an intravascular or extravascular hemolytic transfusion reaction is suspected clinically, the transfusion should be immediately terminated, and intravenous fluids should be instituted.

Allergic Reactions:

The last major category of delayed transfusion reactions is the delayed allergic reaction. Unlike the immediate type of hypersensitivity reaction, a milder reaction commonly characterized by urticaria may occur. These reactions are referred to as anaphylactoid reactions. If an anaphylactoid reaction occurs, the transfusion should be immediately terminated and intravenous fluids should be implemented and 50 mg. of Benadryl should be administered intravenously.

Source: *Peter Rosen, Emergency Medicine Concepts and Clinical Practice*