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Indications of Red Blood Cell Transfusion

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Safety

The safety and effectiveness of transfusion depend on two key factors:

• A supply of blood and blood products that are safe, accessible and adequate to meet national needs.

• The appropriate clinical use of blood and blood products.
Important

• The only indication of RBC transfusion: increase the oxygen-carrying capacity of the blood and, in turn, to maintain satisfactory tissue oxygenation.

• The appropriate use of blood and blood products means the transfusion only to treat a condition that:
  1- Leading to significant morbidity or mortality &
  2 – Cannot be prevented or managed effectively by other means.
PRINCIPLES OF CLINICAL TRANSFUSION PRACTICE

• The patient’s hemoglobin value, although important, should not be the sole deciding factor in starting transfusion.

• Transfusion should be prescribed only when the benefits to the patient are likely to outweigh the risks.

• The clinician should record the reason for transfusion clearly.
اندیکاسیون های مهم تزریق گویچه های قرمز

• در آنمی حاد Hb<7
• بین 7 تا 9 در صورت تداوم همولیز یا خونریزی کنترل نشده.
• مشکل جدی قلبی یا ریوی (بیماری سیانوتیک قلبی، هیپوکسی)
• آنمی دارای علامت در یک بیمار با آنمی مزمن
• ازدست دادن حاد خون بیشتر از حدود 25% حجم خون (20 سی سی به ازای هر کیلو وزن)
• بیمار بدحال و بحرانی (شرايط ناپایدار همودینامیک)
CHILDREN AND ADOLESCENTS

• Acute loss of > 25% of circulating blood volume

• Hemoglobin < 7.0 g/dL in the perioperative period

• Hemoglobin < 12.0 g/dL and severe cardiopulmonary disease & ECMO

• Hemoglobin < 7.0 g/dL and *symptomatic* chronic anemia

• Hemoglobin < 7.0 g/dL and *marrow failure*
INFANTS ≤ 4 Month Old

• Hemoglobin < 12.0 g/dL and severe pulmonary or cardiac disease & ECMO

• Hemoglobin < 10.0 g/dL and moderate pulmonary disease

• Hemoglobin < 10.0 g/dL preoperatively and during major surgery

• Hemoglobin < 7.0 g/dL and postoperatively

• Hemoglobin < 7.0 g/dL and symptomatic anemia
Factors other than hemoglobin concentration considered in the decision to transfuse RBCs

- Patient's symptoms, signs, and compensatory capacities
- Presence of cardiorespiratory, vascular, and central nervous system disease
- Cause and anticipated course of the anemia
- Alternative therapies, such as recombinant human erythropoietin (EPO) therapy.
Sickle Cell Anemia

• sequestration crisis
• aplastic crisis
• severe acute anaemia (haemoglobin concentration of <5 g/dl or >2 g/dl below the patient’s normal baseline). (Aim for a haemoglobin level of 7–8 g/dl only.)
• Acute chest syn. (Hb up to 10 & HbS <30%)
• Stroke (HbS <30%)
• General anesthesia (Hb up to 10 & HbS <60%)
• General anesthesia in pregnancy (Hb up to 10 & HbS <30%)
Other Red Cells Products

• Whole blood
• Leuko-reduced red cells
• Irradiated red cells
• Washed packed cells
• Frozen packed cells
WHOLE BLOOD

Indications

• Red cell replacement in acute blood loss with hypovolemia
• Exchange transfusion
• Patients needing red cell transfusions where red cell concentrates or suspensions are not available

Contraindications

• Risk of volume overload in patients with: Chronic anemia or Incipient cardiac failure
Leuko-reduced red cells

• **Indications:**
  - Minimizes white cell immunization in patients receiving repeated transfusions.
  - Reduces risk of CMV transmission in special situations.
  - Patients who have experienced two or more previous febrile reactions to red cell transfusion.

• **Contraindications:**
  - Will not prevent graft-vs-host disease: for this purpose, blood components should be irradiated where facilities are available.
Irradiated red cells

**Definite Indications:**

- Immuno-compromised patients:
  Severe Combined Immune Deficiency Syndrome (SCIDS),
  Common Variable Immune Deficiency (CVID)
  Hodgkin Lymphoma
- Transplant recipients (bone marrow and solid organ)
  Intrauterine and exchange transfusions
- Directed donations

**Possible Indications:**

- Infants under 3 months of age
- Aplastic anemia receiving immunosuppressive therapy
- ALL
Washed Packed Cell

- Recurrent severe allergic transfusion reactions such as anaphylaxis or severe urticarial reactions not prevented by pre-transfusion antihistamine and corticosteroid administration
- Depletion of potassium and anticoagulants prior to transfusion to a fetus or to a neonate with renal failure or when large amount of RBC component needed for neonate (i.e., RBC exchange, dialysis, ECMO, etc.) when fresh RBCs are not available.
- IgA deficiency with documented anti-IgA antibodies when IgA deficient donors are not available to prevent anaphylactic transfusion reactions
PRINCIPLES OF CLINICAL TRANSFUSION PRACTICE

• Must be ABO and RhD compatible with the recipient.

• Never add medication to a unit of blood.

• Transfusion should be started within 30 minutes of removal from refrigerator.

• Complete transfusion within 4 hours of commencement.
The need for transfusion can often be avoided by:

- Prevention or early diagnosis and treatment of anemia and conditions that cause anemia.
- Correction of anemia and the replacement of depleted iron stores before planned surgery.
- Use of simple alternatives to transfusion, such as intravenous replacement fluids.
- Good anesthetic and surgical management.
Good anesthetic and surgical management

- Using the best anesthetic and surgical techniques to minimize blood loss during surgery.
- Stopping anticoagulants and anti-platelet drugs before planned surgery, where it is safe to do so.
- Minimizing the blood taken for laboratory use, particularly in children.
- Salvaging and re-infusing surgical blood losses.