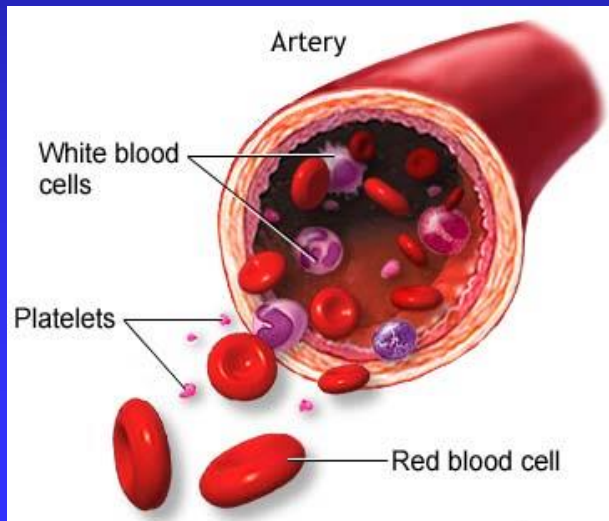


BLOOD TRANSFUSION

By

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Blood Transfusion



Blood transfusion

Definition

Blood transfusion is the transfusion of the whole blood or its component such as blood cells or plasma from one person to another person.

Blood transfusion involves two procedure that is –

- ▣ *Collection of blood from donor*

And

- ▣ *Administration of blood to the recipient.*

➤ Indications

- (1) Decrease blood volume as in hemorrhage & blood loss more than **30%**
- (2) In severe anemia (**Hb** is less than 7gm/dl)

(3) Restore blood contents as **platelets**, **packed RBCs** or **clotting factor**
 as in **purpura** and **hemophilia**

Handwritten notes:
 - قوريض (purpish) next to purpura
 - عوامل التجلط (clotting factors) next to clotting factor
 - ما (Ma) next to clotting factor
 - الصانع الدموي (hemopoietic) next to platelets
 - 8, 9 (referring to clotting factors VIII and IX) next to clotting factor
 - المرض قاتل (fatal disease) next to hemophilia
 - hemophilia factor (next to clotting factor)

(4) **Erythroblastosis fetalis** by **exchange transfusion**.
 in blood as compensatory mechanism to anemia

Handwritten notes:
 - thrombocytopenic (next to Erythroblastosis fetalis)
 - thrombocytopenic (next to Erythroblastosis fetalis)
 - Clotting Factors (Liver) (next to exchange transfusion)
 - انسب بمرضى الكبد (suitable for liver patients) (next to exchange transfusion)

- (5) Restore plasma proteins
- (6) Provide antibodies to persons with lowered immunity **AIDS**
- (7) To improve leucocytes count
- (8) To control infection in case of leucopenia, **chemotherapy**

Handwritten notes in a box:
 Female: Rh-
 pregnancy test
 48 ساعة (48 hours)
 2 أسابيع (2 weeks)
 بعد الولادة (after birth)
 Anti D

Common Blood Component Transfusions

• Packed Red Blood Cells (PRBCs)

- The most common transfusion, given **to raise hemoglobin** levels in patients with severe anemia, trauma, or blood loss during surgery.

• Platelet Transfusion

- Replaces platelets **to stop active bleeding** or prevent bleeding in patients with low platelet counts; often due to chemotherapy.

• Fresh Frozen Plasma (FFP)

- The liquid part of blood containing clotting factors and proteins. It is used for **severe infections, liver failure, or after massive blood loss**.

• Whole Blood

- Contains all blood components. While rare today due to component separation, it is sometimes used **in massive trauma**.

Types of Transfusion Sources

• Allogeneic Transfusion

- Blood donated by someone else (volunteer donor).

• Autologous Transfusion

- The patient receives their own blood, which was donated and stored in advance of a planned surgery.

Precautions

➤ (1) Blood is obtained from healthy donors

* Age = 18-60 years old with good general condition

* Weight: more than 55 kg

الاطفال لا عتاشان
safety of the donor is our primary concern

- Blood pressure & all vital signs ^{BP} should be within normal range

- Donor has not donate blood in the previous 90 days

مضان مياذيسر فسنه

~~* Must not have been pregnant within the last 6 months~~

مضان ممكن يكون لها رجا
فكر heavy menstrual bleeding

- Hb% is not less than 90% (13gm/dl)

Hb% $\geq 90\%$

gender → ♂ x
→ ♀
age

- Hematocrit value at least 40%.

percent picked cells RBCs $\geq 40\%$
total volume of blood

- Free from infectious diseases as AIDS, viral hepatitis B, C, ^{كلامهم تتحلل كامل}

* Complete virology tests



بعضهم يتبرعوا بالدم عشان يتحول ببلاش

Precautions

شكلة بالانجليزية

صا بئجدر!

(2) Blood used is stored at 4°C not more than 21 days

(3) Blood bag must contain sodium citrate (anti-coagulant), citric acid (reduce pH) and dextrose (nutrient of RBCs) (all = 120 ml)

anti-coagulate effect
store/lyse effect

(4) Blood groups are compatible by (Cross matching test or slide technique).

حصه على الكيس

بافه صفة وكه كورج بضعفان

2 relatives

المريض المستيري

(5) The blood is warmed before transfusion to restore the Na⁺ / K⁺ pump

كمد طابوئل درون جوفه السهم
حالت منبته

دقي كسي الدم

لو ما صفة ربح نقل ال
Hype Kalamela



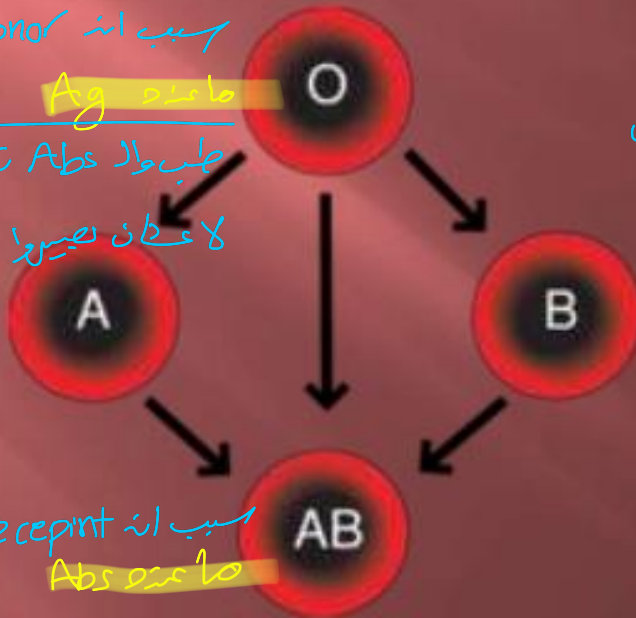
Blood transfusion

Blood grouping and cross matching

سبب انه Universal donor

Ag لا يوجد

طلبه وال Abs تتجوزة مارح تتشوى
لا يمكن يصيروا deleted Abs



ترتيب النسبة بين السكان
الاكثر

O
A
B
AB لاكثر

سبب انه Universal recipient

Abs لا يوجد

او اكثر ذرعا

Blood transfusion

Blood grouping and cross matching

- Each person has one of the following blood types:
A, B, AB, or O.
- O can be given to anyone but can only receive O.
- AB can receive any type but can only be given to AB.
 - Also, every person's blood is either
 - ▣ Rh-positive or Rh-negative.

'take care of Rh⁻ female !!!

Blood transfusion

Blood grouping and cross matching

- ▣ The blood used in a transfusion must be compatible with the patient's blood type.
 - ▣ Type O blood is called the universal donor
 - ▣ People with type AB blood are called universal recipients
- ▣ People with Rh-positive blood can get Rh-positive or Rh-negative blood. But people with Rh-negative blood should get only Rh-negative blood.

- The Main Role In Blood Transfusion

- The recipient's plasma should not contain agglutinins(antibodies) against the donor's red cells agglutinogens (antigens).

اسم التفاعل
(Agglutination)

- **N.B the donor's serum is diluted in recipient blood.**

Complications of blood transfusion

➤ (A) Incompatibility

leads to:

1. RBCs are agglutinated in clumps

يتجمعوا بشكل (يتكثروا)

fibrinolysis system
Oxygenation

منع
←

عثر الكلية
↓
(المرنة)
بتصفى بالاعتر

Block small blood vessels → ischemic pain in chest

If the amount of the blood is less than 350 ml, death not occur.

يعني اخر اذا قلت دم ≤ 350 وهو غير متوافقة مع المستعمل راجع عورت
! 🤯

هذول اد RBCs الى سكتوا راعين يكحلوا وال طاله ينزل بال plasma

2. Agglutinated RBCs hemolyse and hemoglobin is liberated in plasma

• **Converted to bilirubin** → **post-transfusion jaundice**  
Yellowish discoloration of skin + mucous membrane

• **Precipitate as acid hematin** in the renal tubules blocking it → **acute renal failure** and **anuria** this may cause death from **uremia**

Urine ما في

Nephrons Kidney الوفا الوظيفية ال

ARFI

• **↑ Viscosity of blood** → **heart work** and may cause **heart failure**

HFI

3. **Hemolysed RBCs may produce toxic substances** → **V.C** of renal vessels → **renal failure** Or may release histamine with severe **vasodilatation** and drop in blood pressure **Shock** عقل

↓ BP

(B) Other complications

1. Transmission of diseases as AIDS & hepatitis B,C.
2. Bacterial contamination and increase body temperature.
Bacteremia even febrile convulsion
3. Over loading by excessive transfusion → heart failure. *مش عتاد قریب*
زیادہ/ازراط *مگر ہون اجب غمگنہ نکل اسے بس* overload
4. Hyperkalemia → arrhythmia
AK+ *pump* *مع تختہ الٹی* *incompatibility ... Renal*
5. Hypocalcemia → tetany, this occurs if large volume of citrated blood is transfused (citrate toxicity as it binds with the ionized Ca^{++})
intermittent muscular spasms *ionized calcium* *سڈیم سائٹریٹ* *سڈیم سائٹریٹ*
6. Allergic reactions → occurring when the immune system reacts to donor plasma proteins (*very rare but recorded*)

➤ Changes occur in stored blood

1- Increase K^+ ions in plasma (Na^+/K^+ pump inhibited by cold)

2- Decrease dextrose and changed to lactic acid. *بیس منشی ہالاجری اکثر*
Cost v.s benefit

3- Decrease Platelets number (short life span) *within days*

4- **RBCs** swell and become spherical and more hemolysed.
التي جعلت تسمى بالكرة *NaCl*
osmotically active *Loose to capture*

5- Decrease the plasma concentration of factors **VII, VIII & IX**
7 8 9

6- Decrease **2,3 DPG** → more **Hb** affinity to **O₂**
→ less O₂ supply to the patient → hypoxia.

Shift to Left

left *decreases*
right *increases*

↑ 2,3 DPG

shift to rt
↓ affinity

vs

↓ 2,3 DPG

shift to Lt
↑ affinity

DID YOU KNOW?



- When someone donates blood, that blood is separated into red cells, plasma and platelets.
- Each one of these can be given to a different patient who needs only that part of the blood.↓

﴿فما تتجدد خالتي﴾ - إذا كانت عندك القدر -
وتذكر:

- مَنْ سَتَرَ أَخَاهُ الْمُسْلِمَ سَتَرَهُ اللَّهُ فِي الدُّنْيَا وَالْآخِرَةِ وَمَنْ فَرَّجَ عَن مَّسْلَمٍ كُرْبَةً فَرَّجَ اللَّهُ عَنْهُ كُرْبَةً مِنْ كُرْبٍ يَوْمَ الْقِيَامَةِ وَاللَّهُ فِي عَوْنِ الْعَبْدِ مَا كَانَ الْعَبْدُ فِي عَوْنِ أَخِيهِ

A vibrant sunset scene with a sky transitioning from deep purple at the top to bright orange and red near the horizon. The sun is partially obscured by dark, silhouetted mountains or hills. The water in the foreground reflects the intense colors of the sky. The text 'THank you' is written in a large, bold, blue font with a white outline, centered horizontally across the middle of the image.

THank you