



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

Coimbatore – 35

DEPARTMENT OF BIOMEDICAL ENGINEERING



The preservation of blood is a crucial aspect of modern healthcare, as it allows for the storage and transportation of blood and blood products for various medical purposes, such as transfusions, surgeries, and laboratory testing. Several factors must be considered to ensure the effective preservation of blood, and these factors involve biochemistry, as well as aspects of cell biology and hematology.

1. Anticoagulants:

- Blood tends to clot when it is outside the body. To prevent clotting during storage, anticoagulants are added to blood collection tubes or bags.
- Common anticoagulants used in blood preservation include ethylenediaminetetraacetic acid (EDTA), citrate, and heparin. These substances chelate calcium ions, which are necessary for the coagulation cascade.

2. Cold Storage:

- Refrigeration is a common method for preserving blood. Lowering the temperature slows down metabolic and enzymatic processes, reducing the degradation of blood components.
- Red blood cells (RBCs) can be stored at 1-6 degrees Celsius for an extended period.

3. Freezing:

- Some blood components, such as plasma and certain blood products, can be preserved by freezing. Cryoprotectants are often added to prevent the formation of ice crystals, which can damage cells.
- Cryopreservation is commonly used for long-term storage of certain blood components.



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4. Irradiation:

- Blood products, especially those intended for immunocompromised individuals, may be irradiated to prevent graft-versus-host disease. Irradiation damages the DNA of white blood cells, preventing their replication.

5. Cell Separation:

- Blood can be separated into its individual components, such as red blood cells, plasma, and platelets. Each component can then be preserved using specific methods tailored to its characteristics.

6. Leukoreduction:

- Leukocytes (white blood cells) can contribute to various complications, so blood products are often leukoreduced to minimize these risks. Leukoreduction can be achieved through filtration.

7. Quality Control:

- Regular testing and monitoring are conducted to ensure the quality of preserved blood. This includes assessing the viability of red blood cells, checking for bacterial contamination, and monitoring the levels of various blood components.



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8. Transportation:

- During transportation, blood is typically stored in temperature-controlled containers to maintain the desired conditions.