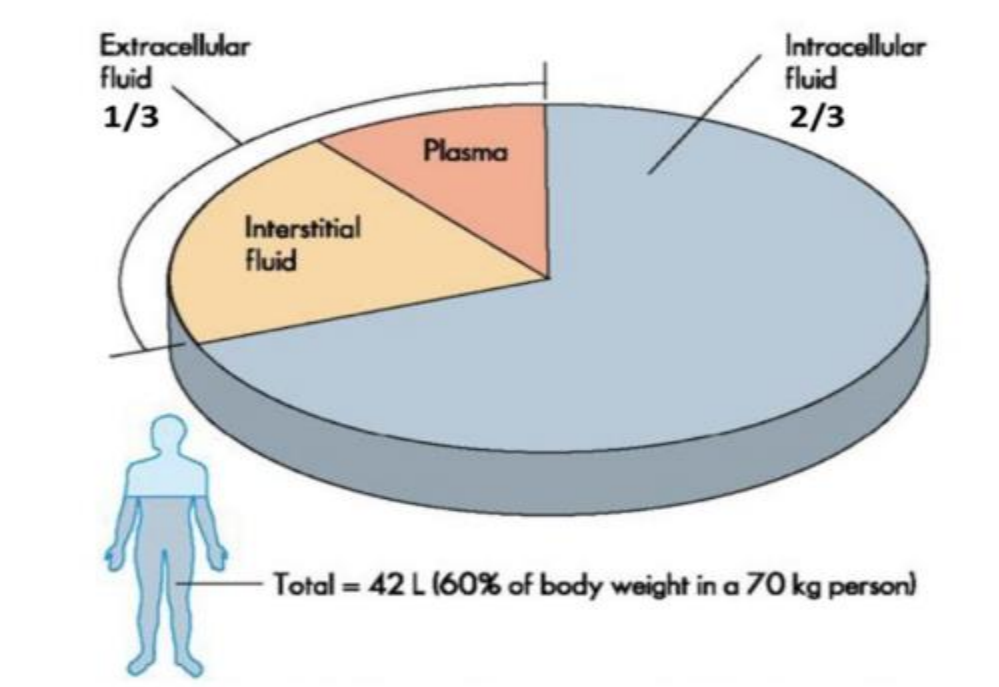
Body Fluids and Fluid Compartments

5th Lecture



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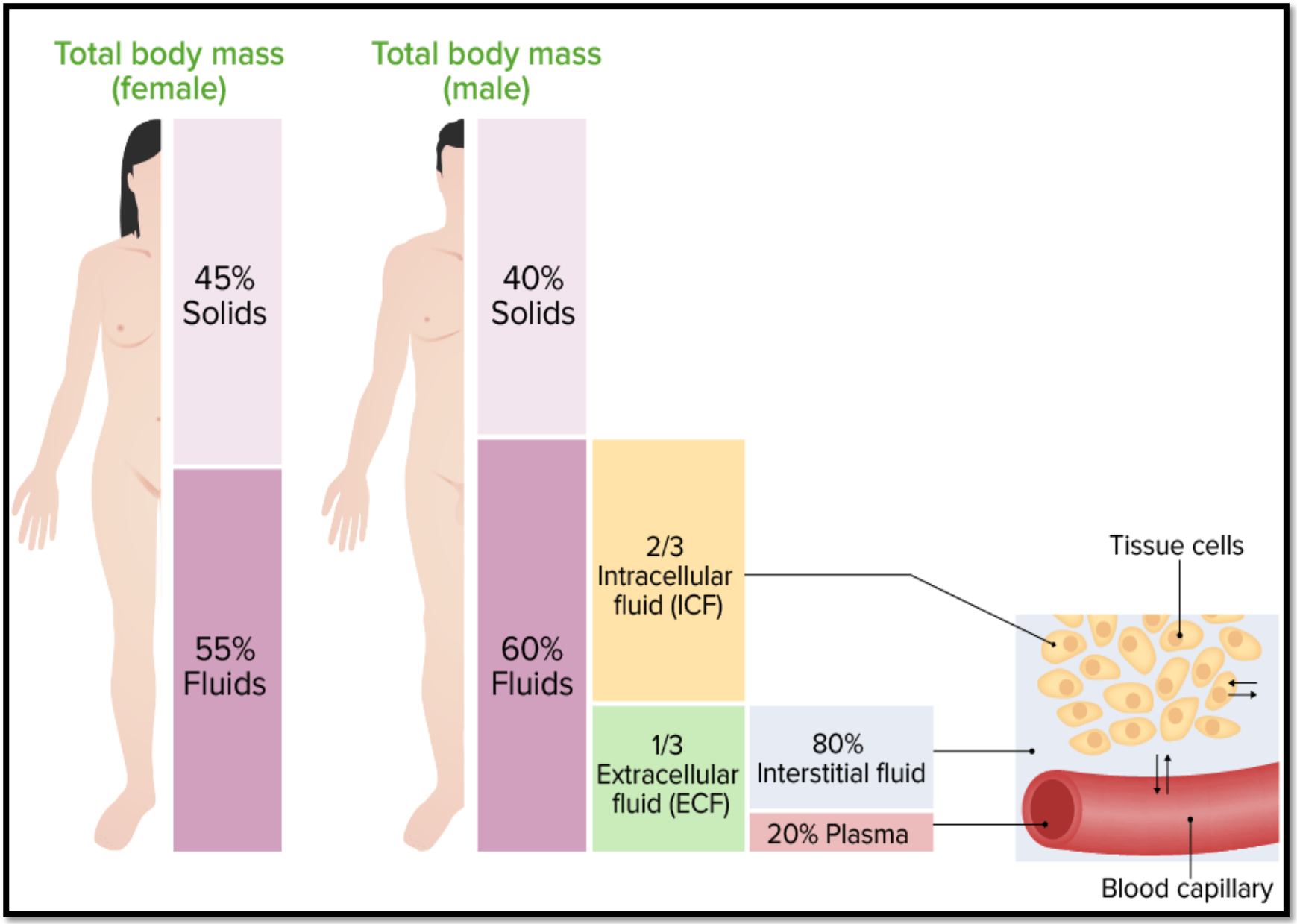
Body fluids are liquids originating from inside the bodies of living humans. They include fluids that are excreted or secreted from the body. Human blood, body fluids.

- Total amount of fluids in the human body is approximately 70% of body weight.
- Body fluid has been divided into two compartments.
- Intracellular fluid (ICF)

  Inside the cells, 55% of total body water
- Extracellular fluid

  Outside the cells, 45% of total body water


Total body mass (female)
45% Solids
55% Fluids
Total body mass (male)
40% Solids
60% Fluids
2/3 Intracellular fluid (ICF)
1/3 Extracellular fluid (ECF)
80% Interstitial fluid
20% Plasma
Tissue cells
Blood capillary

Composition of body fluids

- Organic substances
Glucose, Amino acids, Fatty acids, Hormones, Enzymes.

- Inorganic substances
Iron, calcium, sodium, potassium and magnesium.

1- Extracellular fluid

- **Interstitial fluid**

Present between the cells, Approximately 80% of ECF.

- **Plasma**

Present in blood, Approximately 20% of ECF

- **Also includes**

Lymph
synovial fluid
cerebrospinal fluid
pleural, pericardial and peritoneal fluids.

Interstitial Fluid:

Also known as intercellular fluid and tissue fluid is fluid between the cells of multi-cellular organisms which delivers materials to the cells, intercellular communication, and removal of metabolic waste.

- It represents the largest portion of the ECF compartment.
- Interstitial fluid consists of a water solvent containing amino acids, sugars, fatty acids, coenzymes, hormones, neurotransmitters, salts, as well as waste products from the cells.
- This fluid presents as gel-like extracellular matrix.

Barriers separate ICF, interstitial fluid and plasma.

- **Plasma membrane**
  Separates ICF from surrounding interstitial fluid.

- **Blood vessel wall**
  Separate interstitial fluid from plasma.

Blood plasma:

Plasma, also known as blood plasma, appears light-yellowish. It serves as the liquid base for whole blood.

Lymph

- Clear and colorless fluid, 96% water and 4% solids, Solids.

Functions of Lymph:

- Return protein from tissue spaces into blood.
- Removal of bacteria, toxins and other foreign bodies from tissues.
- Maintain structural and functional integrity of tissue.
- Route for intestinal fat absorption.
- Transport lymphocytes.

2- Intracellular Fluid:

- **The cytosol or intracellular fluid is the liquid found inside the cells .**
- **Physiological Function :**
- **The cytosol has no single function and instead it is the site of multiple cell processes including metabolic processes (such as glycolysis, gluconeogenesis, PPP).**

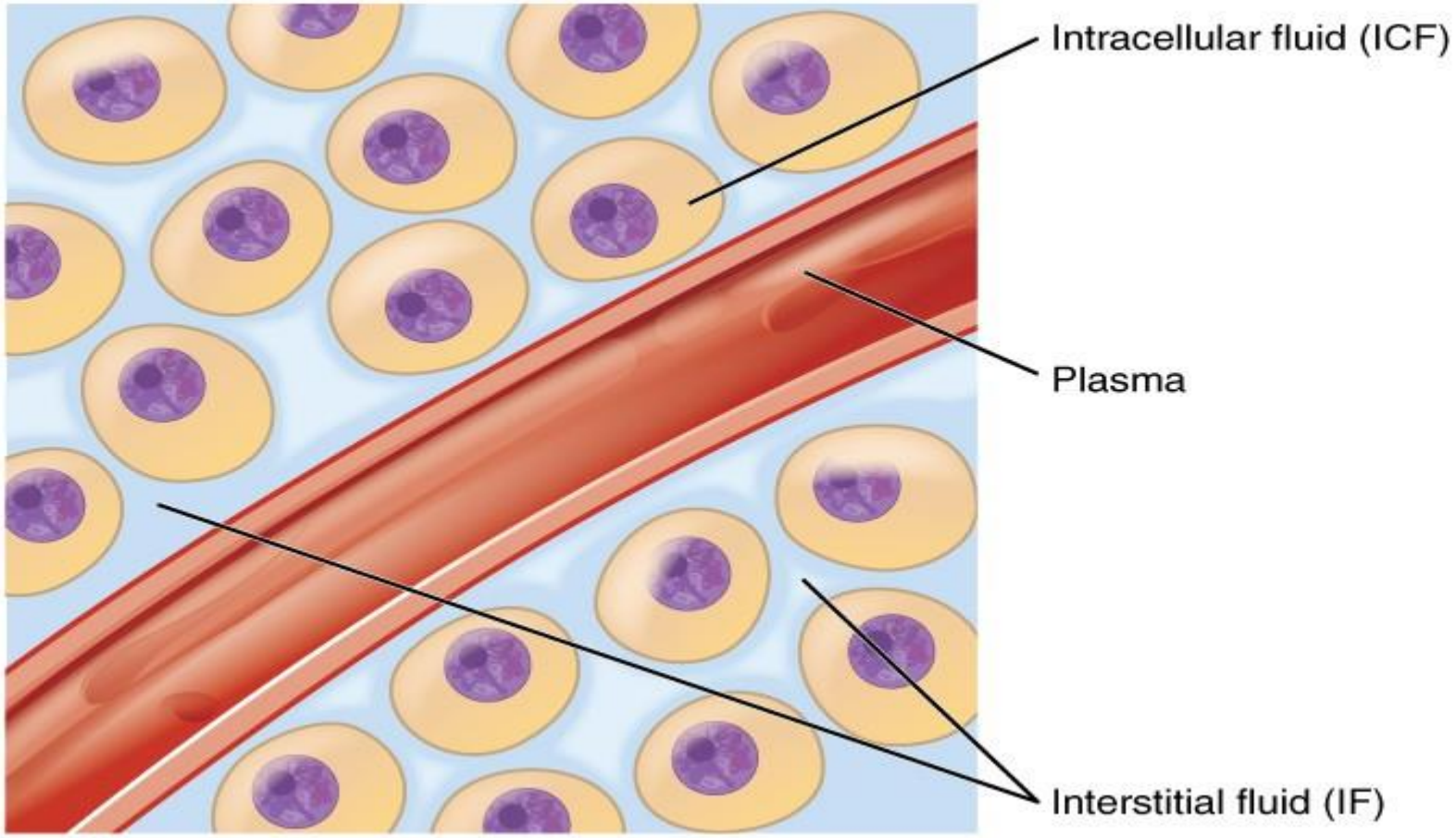
It is also involved in signal transduction from the cell membrane to sites within the cell .

The body fluid composition of tissue varies by

- **Tissue type: lean tissues have higher fluid content than fat tissues.**

- **Gender: males have more lean tissue and therefore more body fluid.**

- **Age: lean tissue is lost with age and body fluid is lost with it.**


Intracellular fluid (ICF)
Plasma
Interstitial fluid (IF)