



AL-Mustaqbal University College



Medical laboratory Techniques Department

Clinical Biochemistry
(Magnesium Test)



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Magnesium

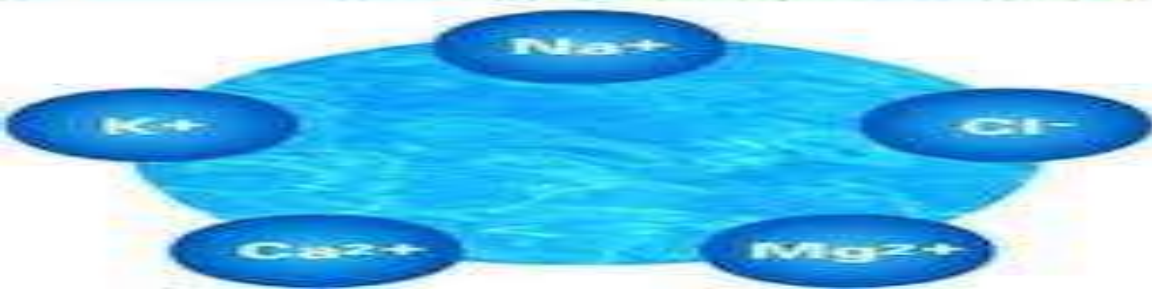


- ❑ Magnesium is a mineral that is essential for controlling intracellular activity, for the formation of bones and teeth, for the transmission of nerve signals, and for muscle contraction. It also activates many enzymes and is important for transporting calcium and potassium across the cell membrane.
- ❑ The majority of magnesium is found in the bones and teeth. Magnesium is absorbed in the intestine from green vegetables, nuts and grains and is excreted from the body through urine and feces.

Maintain magnesium naturally

A constant level of magnesium in the blood is usually maintained and monitored by vitamin D and the kidneys. Because the body loses magnesium every day, it is recommended to eat approximately 300-500 mg of magnesium per day.

The main electrolytes in Body Fluid.



Na ⁺	Sodium Ion
Cl ⁻	Chloride Ion
Mg ²⁺	Magnesium Ion
Ca ²⁺	Calcium Ion
K ⁺	Potassium Ion

Each ion has its own rules, and body movement is a result of the function of these ions.

The main objective of the analysis

The main objective of this examination: assessing the level of magnesium in the blood, contributing to the diagnosis of disorders in the nervous system, muscles and kidney activity.



When is the examination performed?

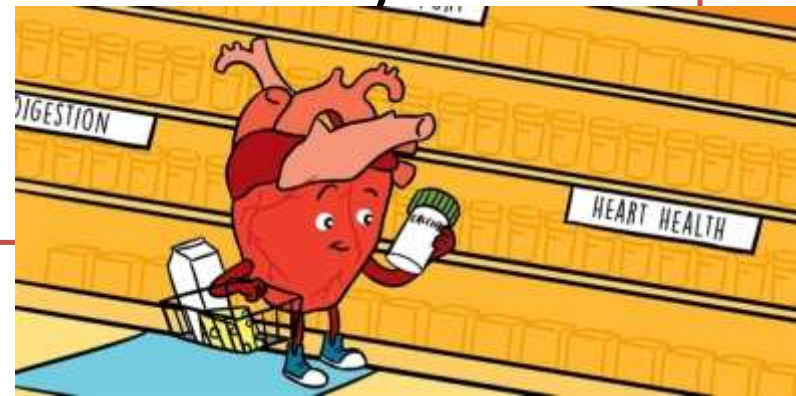
- A magnesium blood test may be ordered if there are symptoms of low magnesium levels or high magnesium levels.

Symptoms of magnesium deficiency include:

- Weakness
- Muscle cramps and/or twitching
- Confusion
- Arrhythmia
- Seizures (in severe cases)

Symptoms of high magnesium include:

- muscle weakness
- Fatigue
- Vomiting and nausea
- breathing difficulties
- Cardiac arrest,
- sudden cardiac arrest (in severe cases)



Hypermagnesemia

- A. The level of magnesium is usually high in patients with impaired kidney function,
- B. In patients with adrenal insufficiency.
- C. Blood pressure.
- D. cardiac arrest.
- E. Certain factors such as hypocalcemia, high potassium in the blood.

Hypomagnesemia

- A. Malabsorption.
- B. Hyperaldosteronism.
- C. Hypercalcemia.
- D. Disturbance in the balance of potassium and calcium in the blood (Hypokalemia, Hypocalcemia)

Laboratory devices and tools

1- *Spectrophotometer*

2- *Centrifuges*

3- *Water bath*

4- *Micropipettes*

5- *Tubes, cups, cuvettes, tourniquet, syringes, cotton, plain tubes, yellow and blue tip s*

6- *kit **Mg++***



Spectrophotometer

Principle, Instrumentation, Applications



R1

MAGNESIUM

liquicolor
1001 0078

100 ml

2020/08

1.2 2010

100 ml

R2(STD)

liquicolor

REF 10010

LOT 18005

Human

References

1. Many G.K., Year 111 -

Procedure:-

- 1- Take the blood from the person.
- 2- Centrifuge the blood to gets the serum.
- 3-The additions as in the shown Table:

	Blank	Standard	Test
Reagent (R1)	1000 μL	1000μL	1000μL
Standard (R2)	-----	10μL	-----
Serum	-----	-----	10 μL
Distill water	10 μL	-----	-----

Procedure:-

4-Mix well and let for 10 minutes at room temperature.

5- Read the absorbance for standard and test against the blank at wave length 520 nm.



Calculations:-

- $\text{Con. of test} = \frac{\text{(A) of test}}{\text{(A) of standard}} * \text{Con. Of Stad. (2.5 mg per 100 ml)}$



Normal value:-

☐ Normal levels for men: 1.5-2.5
mg/dLin

☐ Normal levels for women: 1.5-2.5
mg/dLin

☐ Normal levels in children: 2.9-1.4
mEq/L.

**Thanks for your
attention**