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**COURSENAME**/**CODE**: **MEDICAL BIOCHEMISTRY III/ BCH 204**

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**DEPARTMENT**: **PHYSIOLOGY**

ASSIGNMENT TITLE: MINERAL METABOLISM

1. OUTLINE THE TOXICITY VALUES AND DEFICIENCY MANIFESTATIONS OF THE FOLLOWING MINERALS

A. POTASSIUM

B. CALCIUM

C. MAGNESIUM

D. CHLORIDE

E. IRON

1. POTASSIUM:

TOXICITY VALUE AND DEFICIENCY MANIFESTAION: The normal level of potassium in the bloodstream is in the range of 3.5–5.0 mM, while levels of 6.3–8.0 mM (severe hyperkalemia) result in cardiac arrhythmias or even death due to cardiac arrest.

Potassium is potentially quite toxic; however, potassium poisoning is usually prevented because of the vomiting reflex.

1. CALCIUM

TOXICITY VALUE AND DEFICIENCY MANIFESTAION:

Hypercalcemia occurs when serum calcium levels are 10.5 mg/dL (also expressed as 2.63 mmol/L) or greater depending on normative laboratory values.

Hypocalcemia, commonly known as iron deficiency disease, this occurs when calcium levels in the blood are low. A long-term deficiency can lead to dental changes, cataracts, alterations in the brain, and osteoporosis, which causes the bones to become brittle.

1. MAGNESIUM:

TOXICITY VALUE AND DEFICIENCY MANIFESTAION:

Symptoms of magnesium toxicity, which usually develop after serum concentrations exceed 1.74–2.61 mmol/L.

 Mg deficiency is usually due to losses from the gastrointestinal tract or from the kidney.  Acute clinical manifestations of Mg deficiency include neuromuscular hyperexcitability, cardiac arrhythmias, and biochemical abnormalities of hypokalemia and hypocalcemia. Chronic Mg depletion may contribute to hypertension, atherosclerotic vascular disease, altered glucose homeostasis, and metabolic bone disease.

1. CHLORIDE:

TOXICITY VALUE AND DEFICIENCY MANIFESTAION:

The normal range for blood chloride is between 96 and 106 milliequivalents of chloride per liter of blood (mEq/L).

A chloride level that's above normal means there's too much chloride in your blood, which is called hyperchloremia. Many people do not notice any symptoms, unless they are experiencing very high or very low levels of chloride in their blood. Dehydration, fluid loss, or high levels of blood sodium may be noted. You may be experiencing other forms of fluid loss, such as diarrhea, or vomiting.

1. IRON

TOXICITY VALUE AND DEFICIENCY MANIFESTAION:

Toxic effects begin to occur at doses above 10–20 mg/kg of elemental iron. Ingestions of more than 50 mg/kg of elemental iron are associated with severe toxicity. In terms of blood values, iron levels above 350–500 μg/dL are considered toxic, and levels over 1000 μg/dL indicate severe iron poisoning.

Iron deficiency occurs when the body doesn't have enough of the mineral iron. This leads to abnormally low levels of red blood cells. If your body doesn't have enough hemoglobin, your tissues and muscles won't get enough oxygen and be able to work effectively. This leads to a condition called anemia.