Chloride

Facts:

- One of three powerful electrolytes required by the body (the other two being sodium and potassium), chloride performs a number of important functions within the body. It makes up about 0.15 percent of our body weight. Chloride is a major component of stomach acid (hydrochloric acid), and it stimulates the production of hydrochloric acid.[1] As individuals age, they secrete less hydrochloric acid, which diminishes one's ability to properly digest goods and assimilate important nutrients.[1,2]
- Chloride is an anion that is usually consumed as sodium chloride (NaCl) or as common table salt.[2]
- The highest concentrations of chloride can be found in cerebrospinal fluid and gastric and pancreatic juices.
- Chloride is readily absorbed through the intestinal tract and excesses are excreted in the urine, feces and perspiration.[2]

Functions:

- Chloride is an enzyme activator and is also involved in maintaining acid-base and water balance. It allows fluids to pass in and out of cell membranes until the concentration of dissolved particles is equal on both sides.[2]
- Chloride adjusts metabolic alkalosis resulting from disease or chronic use of diuretic agents.
- It stimulates the liver to act as a filter to separate waste and then eliminate it from the body.[2]
- Chloride and the other electrolytes work with calcium and magnesium in maintaining nerve transmission and normal muscle contraction and relaxation.
- Chloride, as a member in the chloride-bicarbonate shift, moves in and out of red blood cells and blood plasma. This allows the plasma transport of tissue carbon dioxide as bicarbonate to the lungs for excretion.[2]

Requirements:

No Recommended Dietary Allowance (RDA) has been established for chloride. The Food and Nutrition Board of the National Academies of Science has estimated daily minimum chloride requirements as follows[3]:

Category and Age:	RDA (milligrams):
Infants 0-5 months	180 mg
6-11 months	300 mg
Children 1 year	350 mg
2-5 years	500 mg
6 -9 years	600 mg
Children 10+ years and Adults	750 mg

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Signs of Deficiency:

- Because chloride is an electrolyte, a deficiency would result in an imbalance in the normal acid-base balance, which in extreme cases could be characterized by nausea, vomiting, diarrhea, and perspiration. It is important to note that deficiencies of chloride are very rare except in certain instances where an individual is experiencing chronic vomiting, diarrhea, or excessive perspiration. Other symptoms include hair and tooth loss and impaired digestion.[2]

- Infants deficient in chloride can develop loss of appetite, lethargy, failure to thrive, muscle weakness.[3]

Signs of Toxicity:

- Only known cause of chloride toxicity is water-deficiency dehydration. Excessive intake, however, of sodium chloride (processed salt) can elevate blood pressure in individuals sensitive to salt.[2,3] Increased blood levels of chloride can occur when there is improper waste elimination, which is common in kidney diseases. People who suffer from kidney diseases should avoid chloride.

Research Findings:

Hypertension: Researchers at Washington State University at Spokane found evidence linking salt with hypertension and concluded a high intake of sodium chloride (common table salt) increases urinary loss of magnesium, thereby creating a negative calcium balance and a possible increased risk for developing hypertension.[4]

References:

1.Schauss, AG (1995). Chloride. In: *Minerals and human health: the rationale for optimal and balanced trace element levels* (pp. 9). Tacoma, WA: Life Sciences Press.

2. Dunne, L.J (1990). In: *Nutrition Almanac* (3rd ed., pp.69-70) New York, NY: McGraw-Hill Publishing Company.

3. Neumann, C (2006). Chloride. American Society for Nutritional Sciences. Retrieved from: http://www.jn.nutrition.org/nutinfo.

4. Massey L, Whiting S. Dietary salt, urinary calcium, and bone loss. *J Bone Min* 1996; 11:731-736.