

## Relax with Potassium and Magnesium

Potassium and magnesium are the two most common minerals found within the cells of your body. They each have specific individual functions within your body, and together help to maintain the correct balance of electrolytes and the proper functioning of smooth and striated muscles. That includes allowing muscles to relax properly rather than to cramp.

Before discussing this, let's have a look at the major individual properties of these two metallic minerals with respect to the body's biochemistry.

Magnesium is needed to ensure the proper functioning of the sodium/potassium pump. This is a complex topic, and we shan't dwell on it at length here, although the basics are that it is responsible for the movement of ions into and out of cells. Sodium and potassium ions are moved in opposite directions across the cell plasma membrane, three sodium ions being pumped out for every two potassium ions pumped into the cell.

This is of particular importance to nervous cells responsible for transmitting impulses in response to specific stimuli. In the event of a magnesium deficiency, this pumping action is impaired and the sodium/potassium balance within and without the body cells are imbalanced. This in turn impairs the response of nerve cells to stimuli. Both magnesium and potassium can be depleted through the use of diuretics, in which case a magnesium supplement can redress the imbalance.

There are several consequences of such an electrolytic imbalance, some having potentially serious consequences. Many can cause death if left untreated, although the symptoms usually allow appropriate medical treatment prior to the condition becoming fatal, such treatment frequently involving administration of magnesium and potassium. Among these are:

Calcium overload in certain heart cells that reduces the effective use of oxygen and ATP and causes overactive contraction of the heart muscle.

Spasms in coronary blood vessels

Over-activity of the striated muscle fibers, leading to cramps in the calf and thigh muscles, for example.

Cramp and pain in the smooth muscles of hollow organs such as the bladder or uterus that can also cause premature labor.

Several heart problems caused by an increase in energy consumption and a calcium overload and potassium deficiency that leads to cardiac ischemia and arrhythmia that continue to create a serious medical condition and hazard to life. Potassium, that can stop the heart if given in excess, can be just as harmful if present in too small a concentration.

The whole situation creates a self-perpetuating cycle that can be broken by a magnesium and potassium supplement that restores the correct gradient of potassium and magnesium across the cell membrane, improves the function of the sodium/potassium pump and reduces the excess cellular calcium by replacing it with magnesium.

This only works if both potassium and magnesium are taken together: just either alone is no good. It also takes time for the effect to occur, so the supplement is not suitable for emergency use. A regular supply can prevent the condition occurring.

There are many other properties that magnesium and potassium possess with regard to the body's biochemistry such as the effect of magnesium in activating certain enzymes. However, in discussing relaxation, both of these essential minerals have a significant part to play.

It has been mentioned that a magnesium and calcium deficiency causes spasms and cramps in the smooth and striated muscles, and the corollary is also true. Magnesium and potassium can be used to relieve such cramps, and relax muscle tissue. Hence, because it can relax excited smooth bronchial muscle tissue, magnesium can be used to relieve asthma attacks. The intravenous administration of magnesium is, in fact, an accepted and proven clinical treatment for acute asthma attacks.

In the same way, magnesium has been used to treat muscle spasms and cramps. Again, it is not an immediate treatment for emergency use, but can be used over a period of days to treat athletes with a history of muscle spasms. Such spasm frequently occur after prolonged periods of exercise, when magnesium and potassium, among other electrolytes, can be lost through a combination of sweating and urination.

However, this is not the only means by which magnesium is lost from your body cells, and probably not even the main one. Less obvious, but likely of more importance, is the transfer of magnesium from the plasma into the red blood cells (erythrocytes). The amount by which this occurs is directly

proportional to the more anaerobic the exercise, hence the need by athletes and weightlifters for more magnesium. It can be rapidly lost through exercise with insufficient oxygen, and cause their muscles to cramp up.

Magnesium deficiency is common in Americans, although factors such as high calcium intake, alcohol intake, diuretics, and kidney and liver disease are more responsible for this than a dietary deficiency. Potassium is readily available in bananas, brown rice, potatoes, tomatoes and oranges and dietary deficiencies are not common although supplements are readily available.

Magnesium is also known to play an important part in the secretion and use of insulin by the body. Supplementation with magnesium can help diabetics to make best use of insulin, become more tolerant to glucose and improve the fluidity of the membrane of red blood cells. The mineral; also has a small but definite effect in lowering blood pressure. Other uses for magnesium supplements include congenital heart failure, where higher magnesium contents lead to greater life expectancy and chronic fatigue syndrome (CFS) where magnesium supplements can significantly increase energy levels.

Other uses to which your body puts potassium other than to allow proper muscle contraction and relaxation and to maintain the balance of electrolytes in the body, includes the function of brain and nerve neurons. This, however, is academic since should your potassium levels drop by 50%, death would result.

Potassium, Magnesium and Calcium are essential in maintaining the proper workings of your body cells, although the most visible effect of magnesium and potassium is their relaxation properties on the body, put to specific use by sportsmen and women, particularly those involved in the more anaerobic sports.

#### About the Author

More information on [magnesium and potassium](#) is available at VitaNet &reg;, LLC Health Food Store. <http://vitanetonline.com/>

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