

**TITLE 1:** “Ask the Doctors”

**TITLE 2:**

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- Pharmaceutical treatment
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**ABSTRACT OVERVIEW:** One reader asks about whether or not the drug famotidine (Pepcid), used to reduce stomach acid, could actually be helping her RLS symptoms. Dr. Ehrenberg provides a lengthy and detailed response explaining how this drug could be helping her and explains the science involved.

**COPY OF ARTICLE:**

**Q.** *I am 66 years old and ever since I began taking famotidine (Pepcid) to reduce stomach acid, my RLS symptoms have subsided. I usually take the famotidine well before bedtime, such as an hour and a half before bedtime. What could explain this therapeutic benefit of the stomach medication? Could this medication be studied for its effect on RLS?*



**A.** Famotidine (Pepcid) is an antihistamine that selectively blocks H1 receptors. It is designed to be too large a molecule to cross the blood-brain barrier, and thus it cannot get to the brain’s receptors and cause side effects such as drowsiness. The standard antihistamines are all known to cause drowsiness and indeed are often used as over-the-counter sleep aids (for example, diphenhydramine, the active ingredient in Somnex). These sedating antihistamines are not known to be of benefit for the symptoms of RLS, but in a rare individual, it is possible that the sleep-inducing effect could be

helpful in overcoming the insomnia caused by leg irritability. What is surprising to me is that a drug such as famotidine would produce such an effect on its own.

Perhaps along with the famotidine, you are also taking some over-the-counter antacids for the stomach problems. It turns out that most antacids available without prescription contain magnesium. This “mineral” is a vital and underemphasized ion in our bodies. The other vital ions include sodium, potassium, calcium and iron, the last one being very important as a first-line RLS remedy. However, it has recently been noted that magnesium may also be an important remedy for RLS! I have been recommending it to my patients for the past year, ever since hearing an RLS Board member discuss how much it has helped her. In fact, another patient said she discovered on her own that taking a nightly dose of Maalox (a standard antacid) was sufficient to relieve her RLS symptoms for many years!

What is interesting about magnesium is that, in addition to being a laxative (it is the main ingredient in milk of magnesia), it has been found to be helpful in treating migraine headache and can even be used to limit damage during heart attacks! Of course, its most common use is in antacids such as Roloids, Mylanta and Maalox (ironically, these are used for “heart”burn caused by acid indigestion). Magnesium is also given intravenously for eclamptic seizures and toxemia of pregnancy, but in pregnancy, it is given in much higher doses than can be consumed by mouth. Magnesium does not cause diarrhea when given intravenously, which means that the diarrhea effect is not due to systemic effects but only due to local “irritation” in the intestines (this is probably not a true inflammatory irritation but rather an increase in the neuronal activity

controlling intestinal motility). Therefore, I suspect that mixing in some constipating ingredients such as iron, calcium (as in Roloids) or aluminum (as in Maalox) should balance the intestinal motility without having to give up the beneficial effect of the magnesium itself. This kind of “balancing act” may need to be worked out on an individual basis over time by the trial-and-error method, but many of my patients have found it helpful.

Magnesium tablets are available over the counter in various preparations, and I usually recommend taking twice the recommended daily allowance. The most intriguing question is what the mechanism of action of magnesium might be. It is one of our most basic necessities and is usually underrepresented in our diet (it is the main metallic ion in chlorophyll and therefore is present in all green leafy vegetables). These ions are more basic to life than chemicals such as L dopa (which is a normal constituent of the neurochemistry of dopamine-producing nerve cells and currently a site where some scientists think RLS originates). Thus it is entirely possible that magnesium does indeed tell us something about the cause of RLS. Perhaps the ion is involved in the dopamine-firing mechanism in some way or, more likely, it is involved in slowing down cells that excite the actions that dopamine is supposed to be inhibiting (we do know that NMDAglutamate neurons are partially blocked by magnesium, thus making it an “antioxidant”). Indeed, we know that stress causes the body to lose magnesium, and ironically (no pun intended) it has also been pointed out that stress usually worsens RLS symptoms. The fact that only certain RLS patients are finding magnesium helpful may indicate that this mechanism is not universal among all RLS patients, or perhaps that there are only certain individuals who absorb and use the magnesium efficiently enough to obtain benefit.

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