

# How the Sick Get Sicker by Following Current Medical Protocol: The Example of Undiagnosed Magnesium Deficiency

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Medicine is a strange field. Even though one of the roles of research biochemists is to make important discoveries about human health, doctors in general do not read the biochemistry research journals. Instead, they read medical journals which are often 10 to 45 years behind the actual scientific discoveries. And should anyone take a preview peek into the literature and report it before some mysterious self-appointed authority in medicine does, the information has been down through history (and even into this very moment in history) proclaimed as unsubstantiated.

Oddly enough, however, this mysterious self-appointed keeper of the facts can rely on being believed, even if its conclusions are erroneous, for rarely does any physician return to the biochemistry literature to see if indeed what was said is true. This innominate group actually decides what shall and shall not be publicized, despite obvious benefits to mankind. It is almost as though there is an unwritten rule, "It shall not be discovered and announced and taken for common knowledge until we are ready."

For example, most grocery store cooking oils and margarines are purified and hydrogenated. This means the oils and margarines have been processed with strong chemicals that remove most of the vitamins and minerals. This enables the product to last for months on a shelf and not spoil. Unfortunately, these nutrients, such as vitamins E and B<sub>6</sub>, and minerals such as magnesium, chromium, and copper are pivotal in the prevention of arteriosclerosis (early heart attacks, high blood pressure, impotence, Alzheimer's disease, presenile dementia, strokes

and premature aging), the number one health problem in the United States.

But more importantly, hydrogenation means that the product has been exposed to a temperature often in excess of 500 degrees Fahrenheit. This causes a twisting of the molecule. In chemistry terms, this changes the configuration or shape of the molecule from a cis-form to a trans-form. Normally, lipid (fat or oil) molecules fit into the membranes of cells as part of the structure, upon which all function depends.

When these heat twisted molecules (trans-fatty acids) are ingested, they fit into the membranes like a broken key. They get locked into the structure, but they stop it from functioning properly, and they compete with natural cis form fatty acids that are necessary for membrane function.

Meanwhile, the trans-form fatty acids are capable of doing the very same damage that saturated fats (bacon, cheese, steaks) do. After decades of scientific journal articles warning of this, it was reported in the medical literature in the *New England Journal of Medicine* in 1990, but never made the lay news. Margarines, recommended by cardiologists to prevent cardiovascular disease, are as much as 35% trans (the bad twisted molecules) fatty acids. Corn oil, artificial ("plastic") egg substitutes and most "natural whole grain health breads" contain significant amounts as well. So the cardiologists of the U.S.A. have been actually accelerating disease by recommending corn oil margarines, egg substitutes, corn and safflower oils all of these years.

I designate "U.S.A." cardiologists, because medicine in Europe is neither so ignorant of biochemistry, nor so egocentric that they cannot listen to physicians who do read the latest research, or perhaps they are not as

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controlled financially by other interests, such as food and chemical manufacturers. I suggest this because Europe won't even allow the sale of our margarines there because they are so high in trans-fatty acids, and notoriously bad for health.

Now that this has been known for over 20 years, the *New England Journal of Medicine* finally published it in 1990. They showed physicians across the world that margarines and grocery store polyunsaturated oils are at least as harmful to the body as saturated oils. That was six years ago. But I do not yet know of one cardiologist or hospital dietician who has caught on and stopped recommending margarines, plastic eggs, processed foods and corn oil.

What did make national news from that issue, however, was a study designed to refute a technique to test for food and chemical sensitivities. In spite of this technique having been published in over half a dozen reputable journals, including the United States government's National Institutes of Health medical journal, *Environmental Health Perspectives*, no one actually studied the article to find its 13 flaws. An overwhelming publicity was manufactured for this study (over two dozen major newspapers across the U.S. were alerted by the journal two days before doctors received their copies in the mail. (I know because I was personally telephoned by these two dozen papers for a comment). Interestingly, the publicity that this article received was out of proportion to its importance, even if the conclusions had been correct. But in the very same August 1990 issue was the article showing the dangers of trans-fatty acids, having an impact on a far greater number of Americans, but not a peep was heard about this. The most outrageous flaw of all was the fact that because the researchers were so ignorant about the technique that they had set out to disprove, they had the technique backwards! They actually used the dose that is supposed to cause symptoms or provoke them in place of the dose that is sup-

posed to turn off the symptoms. Its no wonder they were successful in showing the technique does not work. If you have it absolutely backwards, it is not the technique! There is a power in medicine which is very influential, and at the same time dangerously unfamiliar with the scientific literature. It appears to be under the influence of its own agenda, irrespective of what is best for the American people.

Let's get back to the cardiologist (since he specializes in the treatment of the leading cause of death and illness in the U.S.A.) and see another example of how he has been hood-winked by this mysterious governing body.

#### **Magnesium Leads the Way as an Example**

With the processing of foods such as whole wheat or brown rice to bleached white flour or rice, over 75% of the magnesium is lost.<sup>1</sup> U.S.A. government surveys confirm that the average American diet provides only 40% of the recommended daily amount of magnesium.<sup>2</sup> In another study 39% of the populus had less than 70% of the RDA for magnesium.<sup>3</sup> Add to this the fact that sugar, phosphates (high in processed foods, soft drinks), alcohol, stress, and a high fat diet further potentiate magnesium deficiency.<sup>4</sup> There is no blood test to adequately confirm magnesium repletteness. The serum level is the most commonly performed, but is too insensitive to be of any value except in cases of severe deficiency, since only 1% of body magnesium is extracellular.<sup>5</sup> Unfortunately, the serum magnesium has become a standard, allowing the doctor who does not know how insensitive the test is to assume magnesium repletteness when he sees it reported as normal.

This is a dangerous assumption, especially in light of the *JAMA* study<sup>6</sup> showing 90% of physicians caring for 1033 hospitalized patients never even thought of assessing magnesium status in any form. And many of these patients died as a consequence of a magnesium deficiency not being diagnosed and corrected. The in-

tracellular erythrocyte level is the best currently available blood test<sup>7</sup>, but that also is too insensitive to be of reliable value, one of the reasons being the actual active transport mechanism for proper magnesium distribution throughout its pools has been damaged.<sup>8</sup>

The best test is a loading test.<sup>8-13</sup> Magnesium causes muscle relaxation, while calcium causes muscle contraction or spasm, which is especially pronounced if unbalanced by an undiagnosed magnesium deficiency. If the spasm is in the smooth muscle of the vascular tree, it can lead to hypertension,<sup>10,14</sup> peripheral vascular disease,<sup>15</sup> angina, arrhythmia, and sudden death.<sup>16,17</sup> Magnesium deficiency also damages the sodium pump,<sup>18</sup> providing a dual mechanism for hypertension.

If a magnesium deficiency is causing hypertension and the cause is not sought, or equally deleterious, a mere serum magnesium is done and found to be normal, the first drug to be prescribed is often a diuretic. In addition to hypokalemia, this also causes magnesium deficiency, thereby exacerbating the underlying cause of the symptom for which the drug was prescribed. Hence hypertension can worsen, requiring other drugs, or go on to cause other symptoms such as refractory hypokalemia<sup>19</sup> or recalcitrant cardiac arrhythmia.<sup>20,21</sup> The latter spurs the use of calcium channel blockers but magnesium is nature's calcium channel blocker<sup>22</sup> and controls the calcium pump, as well.<sup>23</sup> The undiagnosed magnesium deficiency continues, plus the calcium channel blocker can itself cause further magnesium deficiency.<sup>24</sup> We get into the familiar downward spiral of disease where the sick get sicker. And this is only the beginning.

For not only do diuretics accentuate hypomagnesemia but they cause the loss of other nutrients when the body detoxifies the drug. If that were not enough, diuretics raise lipids;<sup>25</sup> but magnesium deficiency itself also disturbs proper lipid metabolism.<sup>26</sup> So now disordered lipid metabolism is added to the initial problem of hypertension. Therefore, by using drugs to mask one symptom, not only can the

illness be exacerbated, but new symptoms emerge as well, as the sick get sicker.

With the exercise craze, our unsuspecting patient may decide to jog, but sweating accelerates the loss of magnesium through the skin.<sup>27</sup> Sudden death from magnesium deficiency-induced cardiac arrhythmia may result.<sup>28</sup>

There are examples in the literature that demonstrate medicine's neglect of the facts regarding nutrient biochemistry. For example, in one study of 22 cardiac arrest victims, 13 had abnormal serum magnesium levels, all of whom died. In the "normomagnesemic" group (many were not actually magnesium replete because the least sensitive indicator of magnesium status, a serum level, was used), six died.<sup>29</sup>

So magnesium status (determined by the inadequate serum value) still made a significant difference of 0% versus 34% survival. In another study of 103 patients with documented acute myocardial infarction, patients were randomized into two groups: one received intravenous magnesium, the other group received placebo. The in-hospital mortality of the placebo group was 17% compared to 2% for the magnesium group, leaving the magnesium-treated group with a reduction in mortality of 88.2%.<sup>30</sup> Yet with all this data, magnesium status is not routinely evaluated to this date.

Nor is magnesium status routinely assessed for chronic electrolyte abnormalities, despite reports where hypokalemia, hypocalcemia, and/or hypophosphatemia could not be corrected until the hypomagnesemia was diagnosed and corrected.<sup>19,31</sup> And, of course magnesium deficiency has a major bearing on the development of arteriosclerosis, the number-one cause of morbidity and mortality.<sup>32</sup>

Despite over 30 million hypertensive Americans,<sup>33</sup> and the fact that magnesium deficiency is a part of the cause for many,<sup>14,34,35</sup> 90% of physicians in the United States do not check for a magnesium deficiency in patients sick enough to be hospitalized.<sup>6</sup> And in an era where such

insurance phrases as "reasonable and customary" dictate what is reimbursed, it becomes clear that the standard is not in the best medical interest of the patient or society that often picks up the medical tab.

Another example of how we tend to undervalue nutrient biochemistry in medicine, is in an issue of the *Archives of Internal Medicine*.<sup>36</sup> There was one article on muscle cramps, one on Raynaud's phenomenon, and one on the correction of hypokalemia. All three problems can be classic symptoms of magnesium deficiency, yet magnesium deficiency was not mentioned in the entire issue.

Since diseases of the cardiovascular system are the number one cause of death and dying in the United States, and consequently a major part of the 12% of GNP medical expenditures, this is no small matter. And bear in mind that magnesium is merely an example of but one of over 40 essential nutrients.

In a study with 59 hip fracture patients with a mean age of 82, one half of the group received limited nutrient tests and supplements, while the other half of the group did not. The rate of medical complications for the nutrient group was 44% compared with 87% for the other, nearly double. Likewise the mean duration of hospital stay for the nutrient group was 24 days versus 40, nearly half, while the death rate in this highly fragile, aged and injured group was 24% versus 37%.<sup>37</sup>

Yet in spite of the enormous health and financial benefits this is not standard care. In fact we are entering an era where patients and their physicians are penalized for deviating from the "standard" of care.

Chronic magnesium deficiency has been implicated in some cases of TIA or mini-strokes;<sup>38</sup> organic brain syndrome;<sup>39</sup> contributes to the pathology of Alzheimer's disease; intestinal spasms mimicking colitis;<sup>40</sup> cerebral vascular spasms called migraine; bronchial spasms of asthma;<sup>41</sup> chronic fatigue;<sup>42</sup> unwarranted depression; fallopian spasms of infertility, and chemical sensitivity.<sup>13</sup> It is interesting that emergency injections of magnesium have been

the time-honored treatment for often tragically fatal toxemia of pregnancy for over 60 years,<sup>43</sup> for example, but the correct prophylactic determination of magnesium status, so easy to do with a urine loading test,<sup>13</sup> is not routine.

When magnesium deficiency symptoms include psychiatric symptoms like irritability, anxiety, agitation, and panic attacks,<sup>39</sup> you can appreciate how one almost feels clairvoyant reading an article on panic disorder in cardiology patients.<sup>44</sup> And still no mention of the potential common deficiency that could trigger both target organs. And the recent National Institutes of Health Consensus Statement on panic disorder fails to mention nutrient deficiencies in the differential diagnosis.<sup>45</sup> Nor do they mention that stress and magnesium deficiency are mutually enhancing,<sup>46,47</sup> in that stress through catecholamine induction enhances magnesium deficiency, while magnesium deficiency causes irritability, agitation, and panic, which in turn push more on the catecholamines: another spiral mechanism of how the sick get sicker.

### **"If You Eat a Balanced Diet, You Can't Be Deficient"**

This commonly offered medical advice overlooks the fact that the majority of the SAD (standard American diet) is processed, leaving 25-75% of the original nutrients in food. In a Food and Drug Administration study to analyze 234 foods over two years, they found the average American diet to have less than 80% of the RDA of one or more of calcium, magnesium iron, zinc, copper, and manganese.<sup>48</sup>

In another study of patients admitted to an acute medical service, 23-50% had undiscovered deficiencies, and this was not a sophisticated analysis.<sup>49</sup> When other studies have demonstrated magnesium deficiency in well over 50% of the population,<sup>6,13</sup> and U.S.A. government studies show the standard American diet provides less than 40% of the daily magnesium, it behooves the physician to condemn any symptom to a lifetime

of medications without ruling out deficiencies. For as shown, even the more seemingly minor symptoms, like anxiety or insomnia, can herald a magnesium or other nutrient deficit that can begin to insidiously disrupt arterial and cardiac integrity and consequently increase the vulnerability to life-threatening events.<sup>10</sup> If these symptoms are unknowingly masked with a tranquilizer or hypnotic, the opportunity to prevent more serious sequelae is lost. You can begin to appreciate how clairvoyant you become as you read such article titles as “Excess mortality associated with diuretic therapy in diabetes mellitus.”<sup>50</sup> There was no mention of magnesium in this article either. But yes, diabetes does foster the loss of magnesium<sup>51,52</sup> and vice versa, magnesium deficiency potentiates diabetes;<sup>53</sup> and you know diuretics cause magnesium loss, and so it comes as no surprise, in fact it is inevitable, that a person with not one but two mechanisms to potentiate magnesium loss would succumb faster, probably to sudden death. Now you are beginning to think like a specialist in environmental medicine when you see the connectedness. For environmental medicine forces the practitioner to relate all events in the body to the total load, or he or she simply cannot help people heal, and the sick get sicker.

In summary, we see (1) that by not reading the current biochemical and environmental literature, the sick get sicker more quickly, and one nutrient has served as an example of how (2) when drugs are used in the current medical system to mask symptoms, that by ignoring the underlying cause, the condition is left to worsen and inevitably leave new symptoms in its wake, and (3) that medications also have effects of their own that induce further nutrient deficiencies, thus potentiating the decline in health of the patient.

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