

The NAS Risk Assessment Model for Establishing Upper Intake Levels for Nutrients: A Critical Review From a Psycho-physiological Perspective

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The article being reviewed here, “A Risk Assessment Model for Establishing Upper Intake Levels for Nutrients,”¹ has an unusual title and theme. “Risk” assessment implies that there is serious danger, hazard, or peril. When I think of risk in association with ingested substances, I usually think of polluted, chlorinated or fluoridated water,²⁻⁵ fish contaminated with mercury as well as mercury in dental amalgams, toxic drugs,^{4,6} medications, synthetic hormones^{5,7,8} or aspartame.^{6,9,10} Therefore, when I first heard about the National Academy of Sciences paper, “A Risk Assessment Model for Establishing Upper Intake Levels for Nutrients” and downloaded it from the internet, it struck me as quite an odd title. The concept of “Super nutrition”^{7,11,12} makes a lot more sense to me; it suggests that we should be doing a better job of educating people about the critical role that optimal nutrition plays in health maintenance rather than seeking ways to limit their choice of nutrients. It is ironic that twenty years ago (1977), the National Academy of Sciences recognized the critical importance of calcium and magnesium in cardiovascular health. At that time the NAS recommended that the addition of calcium and magnesium to soft water might reduce the annual cardiovascular death rate in the U.S. by 150,000!^{8,13} Therefore, I expected that the Introduction to the present NAS risk assessment paper would provide some urgent or compelling health concern as a rationale for the extensive project described in the paper. However, there was only some vague reference to the “...growing concern that one set of quantitative estimates of

recommended intakes, the RDAs, was scientifically inappropriate...The lack of specific determinations of maximum or *tolerable* upper levels of intake was noted” (italics added).

Pauling^{9,14} in his testimony before a Congressional committee explained that the RDA is:

“... only the estimated amount that for most people would prevent death or serious illness from overt vitamin deficiency. Values of the daily intake of the various vitamins that lead to the best of health for most people may well be *several times as great*, for the various vitamins, as the values of the RDA. The proposed regulation restricting the sale of vitamins, through classifying them as drugs, could lead to great damage to the health of the American people, by interfering with their obtaining vitamins in the optimum amounts, such as to lead to the best of health.” (italics added)

Unfortunately, the same political, economic, and legislative issues are still at work today as they were nearly 25 years ago when Dr. Pauling gave his Congressional testimony. Healthy people who use vitamin and mineral supplements don’t use the medical system as much as do people not using nutritional supplements, nor are healthy people as likely to be taking as many toxic prescription drugs as others. In this context, perhaps the true intent of the NAS paper is reflected in a statement under the topic, Terminology: “Many individuals are *self-medicating* with nutrients for curative or treatment purposes” (italics added). The authors of the NAS paper appear to be using the term “self-medicating” with nutrients in a disparaging sense, im-

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plying that these people don't know what they are doing with nutrients and that they may "harm" themselves with supplements. On the other hand, most people who take supplements believe that nutrients are much safer for their health and wellbeing than toxic prescription drugs. My family members and I often do this because it is far cheaper and safer than going to a medical doctor and getting a prescription for a toxic medication that has questionable effectiveness.

Usually when scientists or clinicians make reference to the need for a risk assessment or investigation or call to action, there is an identifiable health problem or danger.^{5,6,8,9,10} After almost 10 years of investigation, review of the literature, and discussion, the statements in the Introduction to the NAS paper seem quite feeble indeed in providing a rationale for a "risk assessment for nutrients." This is especially so in the current broader context of (1) the proliferation of toxic prescription drug use on such a massive scale,^{6,11} (2) toxic chemicals in the environment and in our mouths (mercury amalgams), (3) a nutritionally depleted food supply, and (4) nutritionally poor food and beverage choices.

To address such a critical issue as "risk assessment for nutrients" without putting it into this broader context of other toxic chemicals (including prescription drugs and their deadly interactions) to which people are exposed seems to be much less than scientific. A simple, but common example involves the use of diuretics for treating hypertension that not only reduce the sodium level, but also reduce either magnesium and/or potassium reserves. The drug effect on these essential nutrients can trigger a serious health crisis involving cardiac function in some susceptible individuals who may already be critically deficient in magnesium and/or potassium.^{12,15} In such cases, the patient's need for magnesium and/or potassium supplementation will usually far exceed the "normal" daily

requirements. These types of drug effects on nutrients may be one of the major underlying causes of such high death rates (100,000 per annum) associated with "properly" prescribed medications in hospitals (JAMA, 1998).

At a time when there is a real growing concern about the nutritional status of the American people, especially with the diets and health of children and adolescents, this NAS paper doesn't make a lot of sense. Increasing rates of learning disabilities, ADHD, childhood obesity and diabetes are just some of the health problems with which we are now faced.^{13,16,17} The authors of the NAS paper refer to biologically "tolerable" levels of nutrients. As a practicing psychologist for over 30 years, I have not come across any cases of depressed children or adolescents overdosing on vitamin or mineral supplements. If they do try to overdose, the means chosen are usually over-the-counter drugs or prescription medications, not food supplements. These young people instinctively know that food supplements are not likely to make a good suicide attempt.

The Risk Assessment Model was originally developed to assess the health hazards of toxic chemicals in the environment. These are chemical substances in the environment that are likely to have a significant negative effect on biological organisms with a special focus on their toxic effects on humans. Is this an appropriate model to apply to evaluating nutrients that are necessary for life and for the optimal psycho-physiological functioning of people?^{14,18} Apparently, the authors of the NAS paper recognized this obvious conceptual problem when they wrote:

"Although the risk assessment model...can be applied to nutrients to derive Upper Limits, it must be recognized that nutrients possess some properties that distinguish them from the types of agents for which the risk assessment model was originally developed...a fundamental differ-

ence between the two categories must be recognized: ...many nutrients are essential for human well-being and *usually for life itself* (italics added)."

With this simple acknowledgment, the authors quickly dispose of this fundamental conceptual problem and proceed with their *a priori* agenda of applying a very dubious model to assessing the "risks" of nutrients. The nature of nutrients and how they function synergistically and antagonistically in the human mind/body system^{15,19,20,21} distinguishes them from the nature of the toxic chemicals for which the risk assessment model was originally developed and applied. In particular, nutrient minerals have been referred to as the "spark-plugs" of life^{16,18}. Clinical experience has shown that nutrient minerals need to be in good balance in order to support optimal health and psycho-physiological functioning.^{17,19,20} These nutrients operate in a complex dynamic metabolic system that has unique variations for different individuals.^{18,22,18} Since nutrient minerals play such a critical role in the functioning of the stress response,¹⁹ the effect of psychological factors on nutrient mineral patterns allows us to see more clearly how stress contributes to disease trends.²⁰⁻²²

For the "scientific" assessment of "risk" associated with nutrients, why did the authors of the NAS paper use such a simplistic risk assessment model? Why did they use a hypothetical toxic upper limit (UL) medical model that involves such a small incidence rate of health problems as to be virtually negligible from the perspective of public health issues? Why did they attempt to "medicalize" food and nutrient supplements? Such an approach could be taken *reductio ad absurdum* to the point of claiming that anything at all that a person ingests or breathes in could conceivably affect the mind/body metabolic system and, therefore, a person's health status. Taking in a deep breath, drinking a cup of coffee, or eating a piece of fruit affects our body

chemistry and our metabolism. These factors could possibly contribute to "oxidative stress." Would we need FDA regulation of such personal actions in order to "protect" us from ourselves? Would we also need a medical prescription or medical approval to take such actions of our own choice?

It is instructive to note the following statement from the NAS paper: "Like all chemical agents, nutrients can produce adverse health effects if intakes from any combination of food, water, nutrient supplements, and pharmacologic agents is excessive." (italics added) It is interesting to note that the authors assert that nutrients "can produce adverse health effects" in *combination* with *pharmacologic agents*. Given the extremely high death rates (estimates of 100,000 or more per year) from prescription drugs and health hazards from drug interactions, a risk assessment is far more urgently needed with those toxic substances than with life supporting nutrients and vitamin/mineral supplements. Lumping the effects of nutrients together with pharmacologic agents is grossly misleading. This is analogous to taking a glass of pure water and mixing it with very polluted water. Then the assertion can be made that we need to do a "risk" assessment of the pure water because, in combination with the polluted water, there is a risk to people's health.

The authors of the NAS paper simply do not present any urgent health issues to justify their tedious and intellectually contorted efforts to set ULs for nutrients. Today's more urgent biochemically related health issues have to do with the real dangers of our adulterated food supply, environmental toxins and toxic medications and drugs. All of these factors have a serious impact on the absorption, utilization, retention, and elimination of nutrient minerals and vitamins. Addressing issues of limits and dosages for food supplements needs to be viewed in the broader context of the health impact of our adulterated food

supply, environmental toxins and toxic medications and drugs. A recent Dateline TV news program (NBC) reported on the devastating effects of the new diabetes drug Rezulin. According to the Dateline report, there were at least 28 drug-related deaths reported by the drug manufacturer and close to 60 deaths reported by the FDA. In the context of the NAS paper, why would medical doctors put their diabetic patients at risk with a new drug before putting them on magnesium and chromium? It has been known for decades that these nutrients are related to insulin and blood sugar regulation. These are among the supplements that restored my glucose levels to normal during the past 20 years with no adverse effects or "risks" to my health. (see page 77)

These toxic chemical substances have had a very serious adverse impact on the health of large segments of our population. A strong argument could be made that, rather than arbitrarily setting artificial ULs for nutrients, every opportunity should be provided to people to maximize their nutrient intake in order to optimally support their immune system and their health—both mental and physical. This is what is called "supernutrition."^{11,12,21}

Over the past 50 years, there have been so many fundamental changes in the chemistry of the environment that have altered the body chemistry of large segments of our population that old paradigms and simplistic models are hopelessly inadequate to the task of understanding the present nutrient needs of our population.²²⁻²⁴ Twenty-five years ago, Carl Pfeiffer, M.D., Ph.D., pointed out the serious health problems associated with excess copper buildup in the liver and the brain.^{23,25} The combination of several factors including the increased estrogen intake with the birth control pill, copper IUDs and copper water pipes lead to a significant increase in the accumulation of excess copper in countless numbers of teens and young women. The proliferation of hormone replacement has only added to the

problem of copper excess.^{7,24}

Ironically, in the context of this NAS risk assessment article, even though copper is an essential nutrient mineral,^{25,26} its buildup to toxic levels has very little to do with its ingestion as a nutrient. Rather, its buildup to toxic levels^{26,27} is primarily associated with medical actions (insertion of copper IUDs or the prescription of the birth control pill). Estrogen tends to raise copper levels in cells and tissues, especially in liver and brain tissue.^{7,27} A very strong case can be made that the buildup of excess copper levels in vast numbers of teens and women during the past 50 years constitutes a major health problem both physically and mentally. This toxic buildup of copper has been primarily iatrogenic in origin and not from ingestion of copper in the diet and in supplements.

The NAS authors define risk assessment as a "systematic means of evaluating the probability of occurrence of adverse health effects in humans from excess exposure to an environmental agent." The risk assessment model is far better suited to environmental toxic substances. Yet, throughout the NAS paper, the authors insist on forcing nutrients and food supplements into a "risk assessment model" that is totally inappropriate for nutrients and the manner in which they function in a complex bio-psychological system.

Nutrients and food supplements support the life processes and mechanisms of the human bio-psychological system. This extraordinary human system has the characteristics of all biological systems that are inherently complex, dynamic and have positive feedback mechanisms. Such systems are subject to chaos in their processes.²⁸ Chaos theory is based on non-linear mathematical models that are better suited to pattern analysis of complex dynamic natural systems operating over time.²⁹ Chaotic dynamic systems are subject to feedback. "Systems that change radically through their feedback are called

'non-linear.' In non-linear systems, the folding and refolding of feedback quickly magnifies small changes so that the effect... seems all out of proportion to the cause. Non-linear systems behave non-linearly because they are so webbed with positive feedback that the slightest twitch anywhere may become amplified into an unexpected convulsion or transformation."^{29,30} As Peter Oppenheimer notes, "one of the messages of chaos theory is that no matter how good a scientific model or formula, there is always a fundamental unpredictability and uncertainty driving dynamic systems."^{29,31}

In this context, it is interesting to note that the NAS authors laboriously try to reduce ULs of nutrients to a mathematical model that includes hypothetical values for the unknown factor (UF) related to each nutrient. Finally, they give up on finding such a mathematical model because their data don't fit very well. This is precisely what Tarnas noted about the "practice" of science: "Far from subjecting the (conventional) paradigm itself to constant testing, normal science avoided contradicting it by routinely reinterpreting conflicting data in ways that would support the paradigm, or by neglecting such awkward data altogether."^{30,32}

Since the authors chose a highly inappropriate model for their "risk" assessment of nutrients, then the "science" they present is built on a very shaky foundation. One wonders, if they are so concerned about finding a mathematical model related to the complex dynamic functioning of nutrients, then why not adapt the mathematics and related concepts of chaos theory? This is cutting edge mathematics and an excellent foundation for biological sciences in general and the dynamics of nutrients in particular.^{28,33} Chaos theory naturally incorporates ways to better account for unknown factors than the highly speculative ULs and UFs of the NAS paper.

When addressing the complex nutrient needs of people, it makes more sense

to use a psycho-physiological dynamic systems model that is regulated by minerals than a hypothetical toxic upper limit medical model. The latter involves such a small incidence rate of health problems related to nutrients as to be virtually negligible from the perspective of public health issues. The introduction of UFs by the authors of the NAS paper seems to be quite arbitrary from both a clinical and a scientific viewpoint. This is a poor way of addressing the types of problems created for scientists by Heisenberg's uncertainty principle^{31,32,34} that "radically undermined and replaced strict Newtonian determinism."^{30,35}

The NAS authors do refer to commonly recognized scientific phenomena in nutritional biochemistry, i.e. the possibility of nutrient interactions and bio-availability of nutrients. But these references tend to be misleading because they have very little to do with the thesis of the NAS paper, namely setting upper limits on nutrient intake. Nor do these references add any support for the selection of a highly inappropriate "risk" model for assessing the impact of nutrients on human health. The NAS references to these commonly recognized scientific phenomena may lead some readers of the NAS paper to conclude that the rest of the paper also has a solid scientific foundation. In the view of this writer, the NAS authors do not present a very convincing case that the "risk" assessment model they have chosen to apply to nutrients has any scientific foundation or validity.

As we have learned more about the role of nutrients in psychological functioning and the mind/body system,^{25,33,34,36} it is noteworthy that the authors of the NAS paper don't discuss such nutrient interactions in terms of a psycho-physiological dynamic systems model to support and make sense of such interactions. Also, by not referring to such a psycho-physiological dynamic systems model, they omit reference to psychological and stress factors that often have a profound impact on nutrient status and

nutrient needs. These factors also add to the complexity and uncertainties of dealing with nutrients. These uncontrollable factors lead to formidable problems with experimental and clinical control.^{30,37} Psychological and stress factors need to be considered in any discussion of nutrient need because these factors clearly impact a person's nutritional status.^{20,21,38}

One of the most critical issues that is not addressed in the NAS risk assessment paper has to do with detoxification processes when toxic metals and other toxic substances are being eliminated from cell and tissue storage. These detoxification processes are often triggered by certain nutrients, i.e. zinc and vitamin C triggering an elimination of excess copper from cell and tissue storage that is accompanied by a flare-up of various reactions and symptoms. Headaches, muscle aches, anxiety, depression, and mood swings may be just a few of the different temporary reactions experienced by a person.

How would the authors of the NAS paper deal with reports of such detoxification reactions? Would they consider such reactions to zinc and/or vitamin C as evidence of a "toxic" effect at a certain dose? How would they distinguish between a chemical being eliminated from cell and tissue storage and a toxic chemical being added to the mind/body system producing a significant adverse health reaction? Would they set a very low UL for zinc and vitamin C simply because of their natural antagonistic relationship to copper? Also, do uncomfortable detoxification reactions constitute health safety issues? Or, are they simply part of living in our contemporary world with constant exposure to so many toxic environmental chemicals?

In clinical practice, people are quite able to tolerate temporary discomfort with detoxification reactions as long as they have been given an adequate explanation of what to expect and what occurs. These are not health safety issues that warrant

"protection" by medical organizations or the government. There are many other health safety issues that more urgently warrant risk assessment study and regulation than nutrient vitamins and minerals.

In the NAS paper dealing with "risks" involved with essential nutrients, it is noteworthy that fluoride is addressed in the manner that the authors chose. In the NAS paper, fluoride is mentioned in the same sentence as magnesium assigning the same to each. This raises the question of why the authors chose to link fluoride, with its known toxic effects,^{2,3,5,39} with magnesium, a vital nutrient that performs so many essential functions in the mind/body system.^{15,18,40} Since the authors assigned the same UF (1.0) to both fluoride and magnesium, it implies that the extremely mild reversible adverse effect of too much magnesium also applies to fluoride, i.e. that the adverse effects of too much fluoride are also "mild" and "reversible." This is grossly misleading. That the authors consider fluoride to be an essential nutrient is rather surprising given the concern expressed about this chemical being such a highly toxic industrial waste product^{3,4,5,41} and how it came to be added to the water supply and its use in dentistry. This makes no scientific nor clinical sense. Among all of the "nutrients" listed in the NAS paper, fluoride certainly warrants the application of the risk assessment model selected for this project. Why were no studies cited relating to the toxic effects of fluoride?

"Existing data indicate that subsets of the population may be unusually susceptible to the *toxic* effects of fluoride and its compounds. These populations include the elderly, people with *magnesium deficiency*, and people with cardiovascular and kidney problems (U.S. Dept. of Health, 1991)." (italics added) In view of the fact that, during the past quarter century, the NAS itself has reported on the problem of magnesium deficiency related to cardiac health and the prevalence of magnesium defi-

ciency (nearly 80% of Americans), it is difficult to comprehend the linking of fluoride and magnesium in the present NAS paper. Given the extent of magnesium deficiency in the American population, the health risk of fluorides to the American public are enormous. "The symptoms of magnesium deficiency are similar to those produced by fluoride toxicity."^{38,42} For the authors of the present NAS risk assessment paper to propose setting an "upper limit" for magnesium using such a highly questionable risk assessment model is the height of absurdity by arbitrarily restricting the recommended daily amount of magnesium. From a health risk perspective, it makes much more sense to reduce fluoride exposure for all people when magnesium deficiency is so prevalent.

Also, in the chart on page 24 of the NAS paper listing different nutrients and suggested daily intake, again why was fluoride listed with essential nutrients? What is conspicuous by their absence from this chart are zinc and copper.^{7,26,43} Again, why do the NAS authors omit such critical nutrient minerals from their chart? Since it is a well established fact that intense stress depletes nutrients, especially magnesium and zinc, why set an arbitrary UL for such essential nutrients when the need for them varies so much from person to person and from situation to situation?^{39,44} Psychological stress conditions require much higher intake levels of nutrients, not lower levels.^{20-22,45}

The NAS paper carefully distinguishes between "risk assessment" and "risk management." The latter involves policy issues and decisions that go beyond the scientific data, analysis, and conclusions of the risk assessment. However, the authors of the NAS paper sometimes cross this fine line when they talk about "protection" of different "vulnerable" groups within the population. Not only does the issue of protection involve political, social and economic factors, but it also involves psychological and trust issues. As the authors clearly

noted "there is no single, scientifically definable distinction between "safe" and "unsafe" exposures" (to a nutrient). Therefore, risk assessment incorporates scientific judgement (opinion) and risk management incorporates "components of sound, practical decision making." Thus, there is a very important human element in both risk assessment and risk management. This human element can be scientific, clinical, political, social, and economic. It is also inherently psychological, especially when "protection" of public health or public safety is invoked as a rationale for the activity.

In certain situations, when scientists, health care providers or government officials invoke "protection" of public health or public safety, a psychological phenomenon associated with what I refer to as the "Judge" may be operating. The "Judge" is that part of our personality that judges and criticizes whatever we do.^{40-42,46} One of the main functions of the "Judge" is to block us in growth and development towards realizing our true potential. When the "Judge" is operating psychologically in an individual or in a relationship, words and concepts are manipulated in an effort to gain power and control.

The "Judge" is a powerful part of everyone's personality. It criticizes, judges, dominates and controls our lives psychologically in very stressful and destructive ways. In the political and economic realms, the "Judge" is also a master of words and concepts, using them in a highly manipulative manner to create illusions of risk and danger. It then argues that there is an urgent need to "protect" the public from these illusionary risks and dangers. Historically, one of the most tragic examples of this process of using words to create the illusion of risks and dangers is Hitler in his rise to power. He was a master at using words and rhetoric to create illusions of risk and danger. He then offered his own plan to "protect" the German people from

these illusionary dangers that he created. With Hitler's rise to power, the "Judge" had achieved mastery and control in Europe for 12 deadly and destructive years.

From a financial and economic perspective, the "Judge" may be the driving psychological force that seeks to establish or to maintain tight monopolistic control of the health care marketplace in which there are such vast sums of money at stake. The layman's term for this "driving psychological force" is greed. Political, economic, social and emotional factors all may be influences on scientific research and the healthcare enterprise. To believe that scientific studies and healthcare practices are endeavors that occur in a vacuum outside of political, economic, and emotional factors is incredibly naïve.^{30,47} In presenting Thomas Kuhn's view of science, Tarnas noted:

"...science typically proceeded by seeking confirmations of the prevailing paradigm — gathering facts in the light of that theory, performing experiments on its basis, extending its range of applicability, further articulating its structure, attempting to clarify residual problems. Far from subjecting the paradigm itself to constant testing, normal science avoided contradicting it by routinely reinterpreting conflicting data in ways that would support the paradigm, or by neglecting such awkward data altogether. To an extent never consciously recognized by scientists, the nature of scientific practice makes its governing paradigm self-validating. The paradigm acts as a lens through which every observation is filtered, and is maintained as an authoritative bulwark by common convention. Through teachers and texts, scientific pedagogy sustains the inherited paradigm and ratifies its credibility, tending to produce a firmness of conviction and theoretical rigidity not unlike an education in systematic theology."

From this perspective, our healthcare system is far more complex than most peo-

ple imagine. These complex factors in healthcare provide many opportunities for the "Judge" in people's personalities (including scientists) to manipulate healthcare research, information, and healthcare practices to the great detriment of many people.^{43,48} When the "Judge" dominates and manipulates people's choices in health care, it limits their options for healthier alternatives and free choices that often are far more beneficial and much less hazardous and costly than are artificial invented drugs and medications.

If we are ever going to be able to extricate ourselves from the healthcare mess in which we find ourselves today, we are going to have to rely more than ever before on sound nutritional science and inexpensive high quality nutritional supplements. These include vitamins, minerals, herbs and other supplements that are needed in order to help more people move towards supernutrition and better health—physically, mentally, and spiritually. These kinds of products are already available to us along with many of the most essential advances in nutritional science. As the NAS paper has already noted, more and more people are using nutritional supplements. And they are using nutritional supplements with far less risk and damage to their health than they would experience with the side effects of prescription and over-the-counter medications. In fact, as many cases can attest, they are experiencing great improvement with nutritional supplements that amaze their medical doctors.

I have found no convincing evidence or arguments in the NAS Risk Assessment Model for Establishing Upper Intake Levels for Nutrients to support its basic thesis, namely that we need to establish such upper intake levels for nutrients in order to "protect" the public's health and wellbeing. From my personal and professional experience, I have a very strong inclination to distrust the purpose and methodology of the authors of the NAS paper. In the

broader context of our people's health status today, it doesn't make any scientific or clinical sense. I believe the authors made their real agenda quite clear in their statement quoted above: "Many individuals are *self-medicating* with nutrients for curative or treatment purposes" (italics added). This is exactly what one of my colleagues and I both did when we took personal responsibility and control of our own health. We found good sensible information and used nutrients to heal ourselves and restore our health. (see Appendix)

I am highly skeptical about the NAS authors' claim that there is a need to "protect" me, my family, and the American people (Canadians as well) from the "risks" of nutrients, especially in the form of vitamins, minerals, herbs, and other supplements. From a psychological perspective, their use of the term "protect" sounds more like the language of the "Judge"^{41,42} than that of concerned scientists. Their intellectually tedious paper has failed to convince me otherwise. Given the financial and political backing for this NAS paper (see the list of supporting government agencies and corporations), it is likely to be presented as the "gold standard" of nutritional "science." In my opinion, it is "fool's gold."

There is a vast amount of health information that is readily available and accessible in the form of health newsletters, pamphlets, books, papers and articles. The internet has added access and availability of health and nutrition information on a scale that we have never seen or experienced before. I believe that the accessibility and availability of good clear information regarding nutrition is the public's best protection of their health and wellbeing. It is also the best guarantee of freedom to choose those nutrients that make the most sense for any particular individual. This is the most sensible way for people to support the "wisdom" of the mind/body system by providing those nutrients that contribute to optimal energy, health and wellbeing. It is also the best way

to maintain healthy competition in the healthcare industry in general and in the nutritional supplement industry in particular to assure that high quality products will be readily available at reasonable and fair prices. In this day and age, in order for people to maintain good health, it is imperative to provide good quality as well as quantity of food supply. It is also essential to make high quality vitamin/mineral (food) supplements easily available in order to provide the opportunity to the American (and Canadian) people to take care of their essential energy and health needs.

Appendix Case Illustrations

I personally have used a variety of vitamin and mineral supplements daily for the past 20 years beginning with a severe health crisis. At that time, I had a fasting blood sugar level of 45! I also had a nasty looking large red growth on my forehead that dermatologists were convinced was a skin cancer. My hair tissue magnesium level was extremely low. My blood pressure was high. Extensive use of high quality vitamin and mineral supplements led to my complete recovery. My most recent fasting glucose in November, 1999 was 85 and was part of my pre-insurance physical lab tests that yielded an A+ rating for me at age 63! Magnesium and chromium supplementation was especially helpful in restoring much more normal glucose levels for me during the past 20 years. At no time during these past 20 years have I felt a need for a "risk" assessment for any of the vitamin and mineral supplements that I have taken. In fact, continuing with a critically low magnesium tissue level that was not detected by many different medical doctors would have left me in an extremely high risk condition for cardiac problems.⁴⁵ I have felt great confidence in the safety and efficacy of the supplements that I personally have taken and in those that I recommend to my clients in my professional nutritional counseling.

In this context, the observations of one of my colleagues, Sam Fitting, are relevant:

"The medical profession is being decimated by managed care as the psychological profession is. The mean salaries of MDs have dropped 20-50% in the last ten years. Many people are not entering that field due to this serious problem. As people are being managed on a deficit model of health (only come in when your condition is in crisis), many people have given up fighting the managed care edicts, and have found ways to heal themselves. These ways are through supplements that the drug companies missed, or could not patent and make a fortune off of. Now that someone else is making all the money and not them, they want to re-assert control over these very successful nutrients so they can get in on the action. I have had some spectacular results in the rehabilitation of a knee injury that the doctor said would result in a knee replacement within 10 years (1993). I have been taking glucosamine chondroitin and supportive herbals and when I went to visit him and had an X-ray (in Spring 1999) because of a slip and fall injury to the other knee, his jaw dropped when he saw that not only had the erosion of the knee cartilage stopped on the left knee, it had grown back. He now says I may not need the replacement surgery, ever! He was so intrigued that he asked if we had to do surgery on the other knee if he could make an incision and take some arthroscopic photographs. His comment to me was, 'Whatever you are doing, keep doing it.' I now do weight lifting and my martial arts practice 5-6 times a week with only minor stiffness. Prior to this time as you know, I was unable to work out even briefly more than once a week."⁴⁴

Or, as Mr. Fitting also notes:

"Since there is this interest in risk assessment, and since it is unlikely they will find toxicity with nutrients, at the least it is a waste of effort and money. Perhaps we could test all foods such as tomatoes, by

feeding large dosages to people. If we happen to have one person who is allergic to tomatoes, well there you go. Then you have evidence of an 'adverse' effect. Set the nutrient UL at the dosage for the most sensitive sub-population level of distress and then make it a prescription item. Now the pharmaceutical industries can grow tomatoes and get in on the food racket."⁴⁴

Needless to say, my colleague easily sees through the ploy of the NAS authors and their sponsors to use "science" to create an illusionary "risk" in order to justify tight regulation and control of essential nutrients that support life and good health. He was not thrilled about the prospect of having to undergo knee surgery, but he was very pleasantly surprised to find that when he took his health care into his own hands and that by selecting the right nutrients, he could significantly improve the condition of his damaged knee. He did not need to wait for a "double-blind" "scientific" peer-reviewed published study to prove that what he did for himself really works. What he knows is that he accessed good nutritional information and applied it sensibly for himself, and it worked very well for him. That's all that really matters to him. An interesting aftermath to my colleague's use of nutrients to "self-medicate" was that his orthopedist was amazed at the positive results of nutrients for his patient. My colleague now may be able to avoid the serious risks of surgery and its enormous cost. However, if this NAS document is used to set the UL standards for nutrients at arbitrarily low levels in order to "protect" us from ourselves, it would become nearly impossible to secure a medical doctor's prescription for the nutrients that he easily and inexpensively used to improve and rehabilitate his knee.

My wife, Rosalie, and I recently worked with a 32 year-old woman who had a history of severe post-partum depression with her first two pregnancies. These pregnancies ended with intense stress and severe

post-partum depression. The woman was immediately hospitalized after each of these first two pregnancies and was unable to see her new-born babies each time. She was put on very strong anti-depressant and anti-psychotic medications that left her severely dehydrated. She had other severe side effects to the medications and she was hospitalized until her insurance ran out. The woman was left severely traumatized by the treatment she was given and she was terrified of having another baby. She also was led to believe that she had a serious "mental" problem. When she found that she was pregnant with her third child, she panicked and called me to see if I could help her and her husband get through this third pregnancy without needing to be hospitalized. I strongly suspected that her post-partum depression had a lot to do with a high tissue copper level that became more severe in the third trimester. A hair tissue mineral analysis revealed that she did, indeed, have a high copper level (5.2 mg/%) and a low zinc level (11 mg/%). The resulting zn/cu ratio of 2.12 is very low (ideal ratio = 20/2.5 or 8.0). She also had a high sodium/potassium ratio of 7.0 (ideal ratio = 24/10 or 2.4). A high Na/K ratio kept her in a high stress state and maintained a chronic high anxiety level.^{20,21} Supplementation with magnesium and potassium helped her to cope with the high stress condition and helped to stabilize her glucose levels. Zinc, vitamin C, and potassium supplements helped with the high copper level. Counseling focussed on managing her own "Judge"⁴³ reactions as well as those of her husband and her family members. We also helped her and her husband cope with the dire predictions of her Ob Gyn doctor who told her to go on psychotropic medications immediately following delivery of her new baby. This was a good example of the "Judge" being activated in the personality of a medical doctor and influencing healthcare recommendations. Counseling also focussed on relaxation

techniques in preparation for labor and delivery. With proper nutritional supplementation, defusing the impact of the "Judge," and relaxation preparation, this woman was able to approach the delivery of her new baby with great confidence and support. She had a relatively short labor and delivered a healthy baby girl. Within a few hours, she took her baby home and successfully nursed her, creating a much closer bond than she was able to have with her first two babies. No post-partum problems occurred and she has been a confident, well functioning, nurturing mother. The availability of inexpensive high quality vitamin/mineral supplements helped to prevent a post-partum depression and traumatic hospitalization. The counseling and relaxation training also helped her immensely in overcoming her worst fears of repeating the severe post-partum trauma of her first two pregnancies. In her own words, she and her new baby "... have an incredible bond. The hair tissue mineral analysis and (vitamin/mineral) supplements as well as the counseling sessions made all the difference."

To the scientific and clinical "purists" who only accept "double-blind" studies, this may only be an anecdotal case, but it is as predictable and real as any so-called "double-blind" scientific study.³⁹ I would venture to say that this is the kind of anecdotal case study that Dr. Hoffer had in mind when he said "double-blind studies are often the bane of health advancement."³⁹

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