

### **Orthomolecular Medicine: The Best Cost Effective, Rational and Scientific Choice for Disease Treatment**

The current healthcare system doesn't work. For the past several decades medical practice in the USA has become excessively dependent on drugs and technology. Medical science and healthcare policy are influenced by a myriad of powerful private interest groups. This is the main reason why medical care in the USA is by far the most expensive in the world but, sadly, by no means the best. Many countries have higher longevity and lower mortality rates in many diseases. The "USA way" of practicing medicine is just profit-oriented and not consistent with public health priorities.

In 2009, the National Health Expenditure Accounts estimated that the US expenditure in healthcare was \$2.5 trillion, although an independent study claimed that the amount reached was \$2.8 trillion.<sup>1</sup> This represents 17.3% of our gross national product, more than double the percentage of the gross national product spent by any other nation on healthcare.<sup>2</sup> Seventy-eight percent of our healthcare costs are aimed at treating the 133 million Americans who have chronic diseases. Despite this, we rank 12th out of 13 industrialized nations in 16 major indicators of the health status of a population, such as life expectancy for different groups, neonatal and age adjusted mortality.<sup>3</sup> We wait for illness to develop and then we spend huge sums on heroic measures. We practice "Rescue Medicine." We have a large population of vertically ill people: they are not sick enough to lie down (horizontally ill) but are sufficiently unhealthy to pose a substantial risk of needing major therapeutic investments. When we talk about health insurance what we really mean is disease-care reimbursement. We spend more but feel worse. This is a very expensive and ineffective system of healthcare (or rather disease-care).

Moreover, we should have in mind that acute and emergency care cannot effectively treat chronic disease. This kind of medicine

focuses only on getting rid of the immediate symptoms, not the disease. Not only does our current approach fail to effectively diagnose and treat the underlying causes of chronic disease, it does great harm at a high economic cost. Since the Renaissance, science, especially medicine, has taken a particular path in its analytical evaluation of the world. It is rooted in the assumption that complex problems are solvable by dividing them into smaller, simpler units. By reducing it into smaller units, this approach has been termed "reductionist" and has been the predominant paradigm of science over the past four centuries. Reductionism pervades the medical sciences and affects the way we diagnose, treat, and prevent disease. Is reductionist medicine part of our overall healthcare problem? Probably!

Reductionist medicine is a direct product of Cartesian ideas about the body, specifically, the long-held view that the mind is separate from the body. The philosopher René Descartes (1596–1650) argued that the mind and body are made of totally different substances: mind is spiritual matter and body is material matter. Within conventional scientific thinking, there was no way to link the activities of the mind with the functions of the body. In general, Reductionism is the process of learning more and more about less and less until eventually one knows everything about nothing. Such symptom-driven treatment lacks a curative effect since it fails to identify and eradicate underlying causes of disease. At some point the late Dr. Emanuel Cherskin stated: "Health in America is the fastest growing failing business in the western civilization." Is our healthcare status a product of capitalism? Should we add to our constitution the right to be healthy? That would be the right thing to do but unfortunately this ideal is not part of our current healthcare system.

### **Orthomolecular Medicine to the Rescue**

A better approach that leads to health and wellness is to focus on optimizing the biological functioning in our bodies' core biochemical/physiological systems. This approach is called Orthomolecular Medicine (OM). OM

utilizes nutrition and supplementation as important corrective metabolic tools, tools that are effective and inexpensive. Nutritional science has always been neglected in medicine. It is seen as a secondary, less relevant factor in health. Physicians have abdicated the science and practice of nutrition. This is why we do not have concise nutritional guidelines or consensus related to nutrition and disease, despite abundant evidence. It is also why there is so much professional and public confusion around nutrition and supplementation in general.

The Standard American Diet is lacking in necessary nutrients. This state of nutritional insufficiency is a possible reason why millions are walking around with headaches, body aches, digestive upset, skin problems, sinus problems, frequent colds, and many other diseases that may quickly disappear when you start taking the necessary vitamins and minerals. Nutrition is enhanced through supplementation.

The current dietary reference intakes (DRI) recommends only a minimum amount of nutrients enough to prevent deficiency diseases, not the varying amounts needed by a polymorphic population for optimal health that may be hundreds of times the DRIs. Most physicians and consumers do not realize that DRIs are the minimum necessary to prevent index deficiency diseases. Medicine has failed to recognize that nutrients are multifunctional metabolic substances with multiple biochemical/physiological roles. For example, vitamin D not only prevents rickets, but may have a role in treating or preventing heart disease, multiple sclerosis, polycystic ovarian syndrome, depression, epilepsy, type 1 diabetes and cancer.<sup>4-6</sup> Folate not only prevents megaloblastic anemia, but also prevents neural tube defects, cardiovascular disease, dementia, depression, and colon and breast cancer.<sup>7,8</sup>

Conventional medical thinking has been biased against the therapeutic use of vitamins/minerals in disease and has largely ignored the fact that vitamins/minerals have a role in optimizing health. Here are just a few of the diseases common in our population,

along with the nutritional deficiencies or insufficiencies associated to them:

\* Cardiovascular disease: Significant deficiencies in vitamin D have been linked to peripheral artery disease,<sup>9,10</sup> which usually precedes cardiovascular disease. Also, vitamins C, D, E, folate, pyridoxine, and cobalamin promote healthy endothelial function,<sup>11-13</sup> which reduces the risk of heart disease. Coenzyme Q<sub>10</sub> deficiencies also cause cardiac problems.<sup>14-15</sup>

\* Osteoporosis: Long-term calcium deficiencies usually bring about problems in bone structure and strength.<sup>16</sup> Vitamin D and magnesium are necessary for calcium absorption.

\* Prostate disease: Zinc is essential for a healthy prostate and for male reproductive and urinary health in general.<sup>17</sup> Zinc supplementation in some cases helps overcome erectile dysfunction.

\* Hypothyroidism: We need at least 200 micrograms daily of iodine for general health. That dose is the bare minimum. Lack of iodine translates to millions of people feeling tired or cold, and has also been linked to breast cancer.<sup>18</sup> Long-term iodine deficiencies often turn into hypothyroidism.

These common deficiencies/insufficiencies are just the tip of the disease iceberg. Every chronic disease or illness can be traced to a nutritional deficiency or insufficiency. We are actually treating nutritional deficiencies/insufficiencies with drugs.

### The Hidden Hunger Concept

Since we are not eating enough of the proper nutrient-dense foods, what we end up eating is lacking in vital nutrients and too high in calories. Hidden Hunger or the "Occult Hunger Concept" refers to subclinical deficiencies or nutrient insufficiencies that our population suffers due to excessive consumption of calorie-rich, nutrient-poor, refined food. This is likely the basis of metabolic disruptions that underlies many pathological/disease states.

Nutrients restore normal function, and they do so by optimizing normal biological functions, mostly by their action as coen-

zymes/cofactors in thousands of biochemical reactions. They function within the genetic and cellular environment of the cell to enhance and facilitate the optimal functioning of our physiology. Failure to utilize nutritional interventions when such interventions are clinically indicated is inconsistent with the delivery of quality healthcare and should be considered malpractice.<sup>19</sup> To get the most benefit from supplements, they should be taken every day, long-term, and not as drugs that are only taken when sick or diseased. The goal of nutritional supplementation is to create optimal physiologic nutrient levels capable of producing what is known as “Metabolic Correction.”<sup>20</sup>

### Are Supplements Toxic?

Over the years, there have only been two or three times when a dietary supplement was deemed unsafe and pulled off the market. One of the banned supplements was ephedra, which was used to help with weight loss/energy. Ephedra is a stimulant and, if abused, it can cause problems. The other case was tryptophan, an amino acid substance present in turkey, milk and many other foods. One manufacturer (from Japan) shipped contaminated tryptophan, so the FDA banned the supplement completely for many years. Tryptophan itself is completely safe; the problem was the contaminant.

On the other hand, there is a long list of disasters with prescription drugs causing deaths and severe, permanent adverse effects. Hundreds of thousands of people are rushed to an emergency room every year with an adverse reaction to a prescription drug. Moreover, the incidence of serious and fatal ADRs from prescription medication in US hospitals has been reported to be extremely high, reaching 2,216,000 serious adverse reactions and 106,000 deaths.<sup>21</sup> ADRs also significantly increase length of hospital stay and total hospitalization costs.<sup>22</sup> Overall, the cost of drug-related morbidity and mortality exceeded \$177.4 billion in 2000. Given the economic and medical burdens associated with medication-related morbidity and mortality, new models and strategies for preventing this problem are urgently needed.<sup>23</sup>

### Orthomolecular Medicine is a Viable Scientific Strategy to Prevent and Treat Disease

An essential aspect of OM is that it seeks to provide a molecular understanding for how our nutrient intake affects health by altering the expression and/or structure of the genes. The progression from a healthy phenotype to a chronic disease phenotype must occur by changes in gene expression or by differences in activities of proteins and enzymes and those dietary components that directly or indirectly regulate the expression of genomic information. In this sense, dietary intervention and nutritional supplementation based on knowledge of nutritional requirements, nutritional status, and particular genotype (i.e., individualized OM) can be used to prevent, mitigate, or cure chronic disease. Genes are selectively activated or suppressed when molecules such as neurotransmitters, hormones, growth factors or other signal molecules bind to and activate cell surface receptors initiating a cascade of biochemical reactions in which enzymes play a central role. These enzymes require cofactors to enable its catalytic activity. These cofactors are vitamins and minerals.

OM can also compensate for short-term nutrient deficiencies or insufficiencies that, if uncorrected, lead to infirmity and chronic diseases. Dr. Bruce N. Ames’ “Triage Theory” of optimal nutrition describes how the human body prioritizes the use of vitamins and minerals when receiving an insufficient amount of them in order to sustain functionality.<sup>24</sup> Under such a limited nutritional environment, the body will always direct nutrients toward short-term health and survival and away from the regulation and repair of cellular DNA and proteins that optimize health and increase longevity. OM affords all individuals the opportunity for robust health, so that short-term nutrient deficiencies or insufficiencies are adequately dealt with, and thus do not result in increased morbidity and early mortality.

The term Metabolic Correction, introduced by Drs. Michael J. Gonzalez and Jorge R. Miranda-Massari in 2011, is a functional term that explains how nutrients are capable of correcting biochemical disruptions that

promote disease and infirmity.<sup>25</sup> Thus, another scientific rationale for OM is derived in part from the recognition that altered enzymatic function due to distorted enzyme structures can be metabolically corrected by the administration of supraphysiologic doses of nutrients.

## Conclusion

The focus of medicine should be on repairing and correcting the imbalances which allow illness to develop in the first place. It requires a change in thinking, which is thinking “outside the box.” OM is preventive, protective and corrective. The principles and practices of OM are now sufficiently established to change medicine forever, from a pathology-based system to a health-based practice.

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