



The discovery of Vitamin C for scurvy, Vitamin D for rickets, and Folate for pregnancy are examples of how nutritional science has simply and dramatically improved public health. Based upon this experience the federal government has set Recommended Daily Intakes, (“RDI’s”) for several decades.

Determining how much of each nutrient we need as a species, and as an individual is an area of science that is insufficiently promoted. In addition, the RDI’s have not been kept up to date and fail to recognize the issues discussed below.

Measurement of Nutrients

The measurement of a compound in a test tube vs. a living being is like apples and oranges. In nature, most nutrients have complex forms and relationships. For example, the zinc in grains is often bound to phytates, which block absorption. While in the test tube there might be high levels, this will have limited value for the body.

The concept of compartments is even more significant. For example, to understand a person’s wealth, you cannot look in their wallet. While the wallet is full of cash, the person can be in huge credit card debt. Conversely, their wallet might be empty despite millions in savings, or an inheritance they don’t even know about. Measuring nutrients like magnesium and B12 is like this—the amount in the blood often does not correlate with what has made it into the cells, where they have their action. A “normal” blood value can fail to show a serious, even potentially fatal deficiency (magnesium deficiency contributes to fatal heart attacks in men and women!) The converse is also true—blood levels can be low or normal when a toxic amount exists in other compartments. For example, toxic lead accumulates in bone—a “normal” blood level does not rule out a potentially toxic situation.

Some compartments are created by specific binding, transport and storage molecules (ferritin for iron, RBG for vitamin A) which can dramatically affect their measurement and function.

Many nutrients exist in a spectrum of forms which are necessary for health, such as Vitamin A, E, and Folate. When added to foods or measured in a lab, one form is usually utilized. Since the discovery of Folate’s importance for pregnancy, a huge amount of synthetic Folate has been added to our foods; so much that the blood test for most people comes back high. However, this causes deficiencies of other forms of Folate that are necessary for processes to

prevent cancer and other diseases.

Like measuring blood pressure or blood sugar in diabetes, sometimes a single measurement can provide misinformation. The proper timing and sampling is critical. Levels can change rapidly in different compartments; or can take months or years.

What is “Normal”

Testing is based on the “bell shaped curve”. The “normal” range is based on 95% of the “normal” population. However, for an individual, getting a 66 on an exam might be passing, but they may need an A or B to achieve optimal health. In addition, since there are global deficiencies of nutrients such as iron and Vitamin D, the “normal” range is clearly incorrect and causes false security when a “normal” value is found in an individual.

Known Deficiencies
Iron
Zinc
Vitamin D
Vitamin B12
Omega-3 Oils
Some Lesser Known Deficiencies
Magnesium
Selenium
Chromium
Folate (see article)
Iodine

Deficiency vs. Insufficiency vs. Toxicity

Due to the magnificent and efficient design of humans, most nutrients in the body have multiple roles. The amount needed for one role is often different than for another role. For example, while Vitamin D was originally thought to only be important for bone, it is now recognized as a hormone that affects the immune system (helping prevent cancer and infections), as well as brain and sex hormone function. While the RDI is sufficient to prevent rickets, it is not for the other roles or optimal health, known as insufficiency. It’s like giving a child or plant the minimum amount of water, food, love and education—the creature will survive, but not thrive. The optimal intake of each nutrient for an individual can vary significantly, and change over time as other factors change. For example, while the RDI for Vitamin D remains at 400 IU, some individuals need 16,000 IU, or 40x the RDI on a short-term or long-term basis, to achieve and maintain adequate levels on repeat testing. Other nutrients, such as iron, selenium, zinc and iodine have narrower or wider windows of low and high levels. One person’s toxicity is another’s insufficiency. This also can change for an individual based on the other factors discussed above and below. Interpretation of levels is as much art as science.

Malnutrition vs. Malabsorption

Even if we knew the optimal amount and form of a nutrient for an individual, and solved the malnutrition problem, many of us have malabsorption—the mechanism of getting a nutrient from the mouth all the way into each cell is impaired. Each nutrient is absorbed by a different

process, and that process is individually affected by genes, life history, and many other factors. Identical twins can have opposite patterns and levels.

Interaction of Nutrients

Certain nutrients, such as the omega-3 and omega-6 oils, or Zinc and Copper compete for the same enzymes and/or transport mechanisms. Therefore, the optimal intake, absorption, and utilization of nutrients is dependent on others. A symphony orchestra needs all of the instruments, in the right balance, playing at the same time to make music. True health is music.

Negative Reactions

A negative reaction is not necessarily bad, just as a positive reaction is not necessarily good. Most people will feel good with a dose of heroin, but we recognize that this goodness is followed by even worse badness. Likewise a negative reaction may represent a necessary detoxification or reset of metabolism. Distinguishing toxicity from detoxification, allergy or other reactions such as die-off or leaky gut requires specific strategies and usually the collaboration with an experienced practitioner.

How to Proceed

Just like the mystery of a beautiful Beethoven symphony, the complex interactions between our past and present, our genetics, our epigenetics⁴, what we ingest, expel and what happens in between defy human cognition and science. We are not just chemical vats that can be manipulated.

Unfortunately, there are imbalanced incentives for the medical, pharmaceutical, insurance, food and advertising industries to research and improve health through natural means. As we become educated about the importance of lifestyle and the use of organic, minimally processed, non-genetically modified foods, consumerism, promoted by the internet, will continue to place demand on these industries and government to address these issues.

Continued sharing of information and commitments among individuals, families and communities, as well as proper and repeat testing can move us forward. Modeling our lives after what nature teaches and provides is probably the most "scientific" way to go. If nutrients are those things that promote growth and healing, then knowledge, lifestyle, the wallet and successful healing are four of the most important nutrients!

IMPORTANT NOTE: This general information should not be used to make decisions about medical care without the involvement of a knowledgeable practitioner. The contents of this article are copyright 2012-13 by Michael Cheikin MD and may not be reproduced without express written permission.

Footnotes and Reading Materials (Books followed by ISBN number)

1. See Dr. Cheikin's website, www.cheikin.com, for related articles and expanded bibliographies and tables
2. Ballentine, Rudolph: Radical Healing: Integrating the World's Greatest Therapeutic Traditions... 2000. 0609-804-847
3. Pitchford, Paul: Healing with Whole Food: Asian Traditions and Modern Nutrition, 3rd Edition. North Atlantic Books, 2002. 1556-434-308.
4. Epigenes are molecules that modulate gene expression and are passed from generation to generation. The health and stressors of a parent affects their child, grandchild and later generations apart from the genes.

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