

Review

Prevent the cause, not just the symptoms

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ABSTRACT

If people stay healthy, less health care treatments need to be paid. Alternatively, health care treatments are uneconomical and unethical when they only remove signs and symptoms and leave the primary cause neglected and unchanged to cause future harm. Neglected preventable causes continue to cause massive health-related financial loss in the US. Monitoring imbalances of omega-3 and omega-6 hormone precursors in individuals can increase awareness and motivation for making efforts to prevent this pervasive diet-related cause of dysfunction, disease and financial loss. We now have low-cost tools for individuals to monitor their balance of omega-3 and omega-6 hormone precursors and to identify and choose foods that will maintain a desired balance and a desired quality of life.

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1. Introduction

Too few people recognize that nearly every cell and tissue in our body has hormone receptors that respond in different ways to omega-3 and omega-6 hormones [1–3]. As a result, too many people fail to realize how many different disorders reflect an imbalance of these two types of hormone. Deeper insight comes from recognizing that each person's balance of omega-6 and omega-3 hormone precursors depends predictably on the balance of vitamin-like omega-6 and omega-3 nutrients in foods that are eaten [3]. Common health problems made worse by excessive omega-6 actions (see Fig. 1) include cardiovascular and diverse immune-inflammatory and psychiatric disorders such as atherosclerosis, arthritis, asthma, bone loss, cancer growth, heart attacks, length of hospital stays, depression, suicide, classroom disruptions, oppositional behavior and unproductive workplace behaviors [3,4].

Many business plans based on treating signs and symptoms of disease focus on patented pharmaceutical agents that diminish diverse actions of omega-6 components of the “arachidonic acid cascade”. Beneficiaries of this approach include pharmaceutical companies, doctors, nurses, hospitals, insurers, researchers and other health care professionals. However, treatment costs are not needed for healthy people. Health allows people to move their financial resources to other, more desired, activities. It is the employees and employers sharing health care claim costs who have motivation to remove the primary causes of those costs. Employees and employers benefit when a preventable cause is identified and effective actions remove it. Until now, their interests in prevention have not been well represented during state-of-the-art scientific meetings devoted to research and evaluation of profitable treatments advocated by health care professionals.

The easily assayed biomarker of the % omega-6 in highly unsaturated fatty acid (HUFA) hormone precursors [5] is a causal intermediate between diet, disease and death (see Fig. 1). It is a valid indicator of nutrient intakes and a valid surrogate for predicting diverse health problems caused by preventable omega-3

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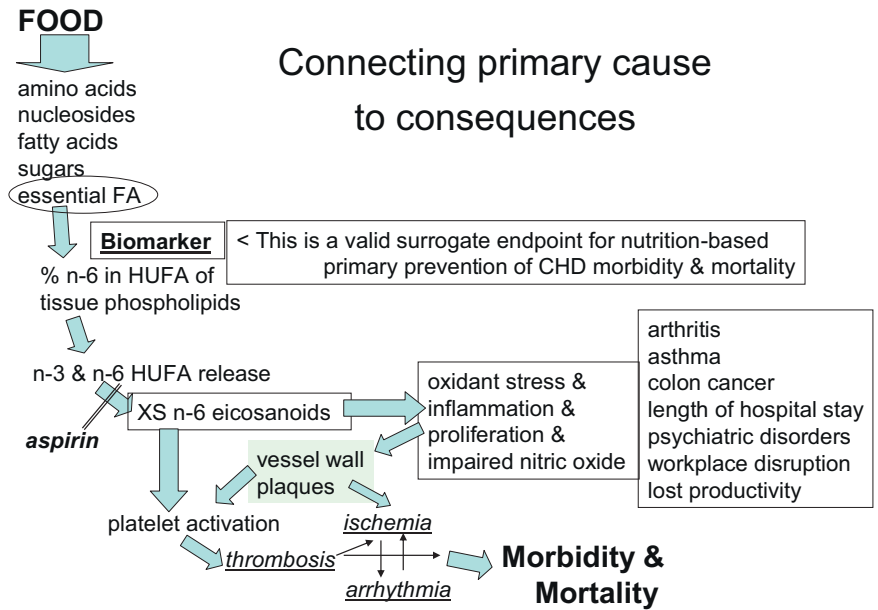


Fig. 1. Connecting cause to consequence.

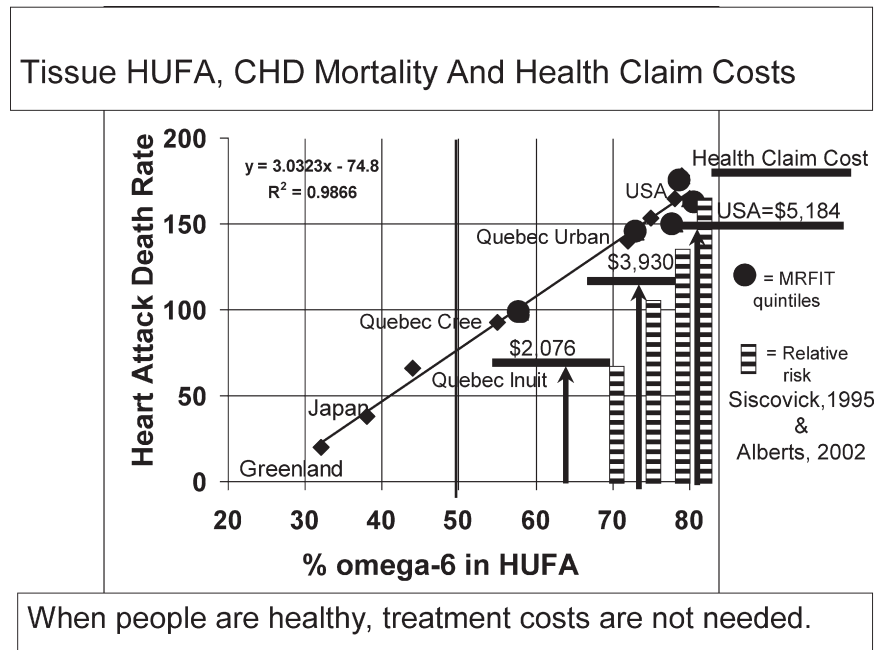


Fig. 2. Tissue HUFA, CHD mortality and health claim costs.

deficits [3,6]. Eating less omega-6 and more omega-3 can decrease those health disorders and their associated financial losses.

2. Financial losses linked to uninformed food choices

With so many disorders caused by foods that create an omega-3 deficit among tissue hormone precursors [4,6], we should consider the proportions of HUFA that are associated with the average 2010 American employee's health claim cost of \$5184. People with more than half of their hormone precursors as omega-6 have more CHD deaths than those with less than half (Fig. 2). Americans typically eat foods that give an average near 80% omega-6 in HUFA. Less than one-fifth of Americans in the large MRFIT study had healthy average biomarker values below 65%. Fig. 2 combines different values of the % omega-6 in HUFA for the five quintiles in the MRFIT study

(black circles) with results from the Quebec Heart Study and other studies. They all fit a simple relationship of fewer heart attacks with lower proportions of omega-6 in tissue HUFA [1]. More evidence of a lower relative risk with lower %n-6 in HUFA comes from clinical reports by Siscovick et al. [7] and Albert et al. [8].

The information in Figs. 1 and 2 indicates that overall health claim costs are likely lower with lower proportions of omega-6 in tissue HUFA and higher proportions of omega-3 HUFA. Preliminary results from a self-insured corporation that made omega-3 supplements freely available to 800 employees showed average employee health claim costs last year of \$3929 rather than the \$5184 USA average. That means overall an annual \$1 million difference. The 51-employee subset that volunteered for blood tests averaged 64% n-6 in HUFA with an average annual \$2076 health claim cost – making more future saving likely.

When disease is prevented, treatment costs are not needed

Every year excess actions of omega-6 at tissue receptors cause financial loss for people & corporations & the nation

	employee	100 thousand employees	150 million employees
Medical costs & Pharmacy costs	\$5,184	\$518,400,000	\$777,000,000,000
Absenteeism loss & Presenteeism loss	\$10,000	\$1,520,000,000	\$2,250,000,000,000
Overall loss =	\$15,200	> billion	> trillions

Fig. 3. Health-related financial losses.

The US Centers for Disease Control and Prevention (CDC) describes losses due to heart disease and stroke as “among the most preventable” [9]. It also notes that the cost of cardiovascular diseases (CVD) in the United States, including health care expenditures and lost productivity from deaths and disability, is estimated to be more than \$503 billion in 2010. Approximately half of the overall annual \$503 billion CVD cost is for combined acute clinical CVD events, heart attacks and stroke. More than 1 in 3 (81 million) US adults currently live with one or more types of this “most preventable” disease.

Further preventable corporate financial loss occurs when health-related absenteeism and presenteeism cause lost workplace productivity. Presenteeism is a fertile area for primary prevention when omega-3 deficits cause employee conduct disorders [10,11] that disrupt workplace productivity with inattentive and oppositional behaviors plus high perceived stress and anxiety with more accident frequency and severity. Loeppke et al. [12] estimated that workplace losses due to health related absenteeism and presenteeism are likely more than twice the medical and pharmacy claims (Fig. 3). If correct, maintaining a 20% lower average biomarker value among employees may lead to hundreds of millions of dollars less overall financial loss every year for a self-insured corporation with 100,000 employees.

Corporate executives can easily arrange feedback data to examine this loss further. Correlating data on biomarker values with new measures of corporate productivity can provide feedback likely to motivate employers to put more effort on helping employees prevent personal omega-3 deficits [6]. When employees are healthy, treatment costs are not needed.

3. The paradox of caution

Health-related financial losses among USA corporations can be more than \$2 trillion dollars every year (Fig. 3). Managing those losses involves a paradox from two sets of priorities. On one side, the actuaries advising cautious health claim managers are justified in using all known predictive risk factors in their estimates of likely expenditures. The more factors used, the more accurate the statistical predictions have proved to be and the less likely is the risk of bankruptcy in managing the collected funds. Also, the steadily “ballooning” costs of health claim payments reflect an over-cautious approach by physicians wanting to avoid neglect of any possible treatment benefit or any possible risk of lawsuit for negligence.

On the other side are priorities of the employees and employers who share in providing the \$2 trillion in resources needed to cover current health-related losses. They have no incentive to

provide funds for treatments that only remove signs and symptoms and leave the primary cause neglected and unchanged to cause future harm [4]. For them, a high priority is to remove the preventable causes that continue to cause emergencies and massive health-related financial losses. Fig. 1 illustrates the wide range of preventable health-related losses caused by excessive omega-6 hormone actions caused by imbalanced intakes of the vitamin-like omega-6 and omega-3 nutrients. Much more can be done to inform and assist employees and employers in preventing the nutrient imbalance that causes the imbalanced hormone actions.

A key limitation in informing scholars about a neglected causal factor is the paucity of published evidence in the traditional scholarly format. However, this “opinion piece” identifies employees and employers (rather than health care professionals) as the people with the most to gain by gathering the missing evidence to document and confirm the diet-based cause-effect relationship. Many CEOs of large self-insured corporations can profitably arrange to collect feedback data focused on voluntary food interventions that prevent the omega-3 deficits causing health impairments and large annual corporate financial losses. The decision to fund the collection of missing causal evidence will most likely be made by a self-insured CEO who can annually save millions of dollars as a result of the decision. For these reasons, the Special Lecture and this “opinion piece” are not traditional reviews of the scientific literature, but are concisely designed to challenge CEOs to begin gathering the neglected evidence. My experience is that Figs. 2 and 3 convey that challenge.

4. Actions needed

The evidence in Fig. 2 indicates that people eating more omega-3 and less omega-6 will likely have less risk of cardiovascular disease and lower annual health care claim costs. A tool to help individuals make informed decisions about the foods they eat is a searchable list of “Omega-3 Balance Scores” [13] based on the extensive US Department of Agriculture Nutrient Database. Each score compresses data on eleven essential 18-, 20- and 22-carbon n-3 and n-6 fatty acids into a single score for each food item. Foods with more positive scores will increase the proportion of n-3 in HUFA, whereas those with more negative scores will increase the proportion of n-6 in HUFA. Easy access to this information allows individuals to plan their shopping and make informed decisions at the point of purchase. The average Omega-3 Balance Score for the 20–30 foods eaten per day can also provide an estimate of the likely value in a finger-tip blood spot health risk assessment for the %n-6 in HUFA.

Preventing this primary cause of preventable diseases will also generate another valuable benefit in the form of a higher quality of life for employees. Toward this end, the American Heart Association recommends that healthy adults with no history of heart disease eat fish at least two times per week, preferably fatty fish such as anchovies, bluefish, carp, catfish, halibut, herring, mackerel, pompano, salmon, striped sea bass, tuna (albacore). The World Health Organization and governmental health agencies of several countries recommend consuming 0.3–0.5 g daily of n-3HUFA and 0.8–1.1 g of alpha-linolenic acid (ALA). The American Psychiatric Association also recommends that all adults should eat fish two times per week, and patients with mood, impulse-control, or psychotic disorders should consume 1 g/d of n-3HUFA.

5. Conclusion

Hundreds of scientific and clinical papers interpret the multiple health-related consequences of an omega-3 deficit that is easily anticipated from low-cost finger-tip blood spot assay results [5]. A

voluntary choice of foods that lowers by 20% the current average %omega-6 in HUFA may prevent more than \$400 million annual losses for a self-insured corporation with 100,000 employees and a typical health-care plan. This lowering would be equivalent to \$500 billion annually for 150 million US adults nationwide. Many CEOs can profitably arrange for feedback data that focuses attention on encouraging voluntary food intakes that prevent the omega-3 deficits that cause health impairments and large annual corporate financial losses. Thus, one can foresee an alternative set of business plans that shift financial resources away from traditional treatment-oriented health-care purveyors to ensure effective prevention and to stimulate new uses for the financial resources no longer needed for treatments after a primary cause of disease is prevented.

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