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Integrative medicine and the nutrition transition: What we learn from history and how it can be applied?

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ABSTRACT

History demonstrates how disease drives society to seek a remedy and industry refines this complementary medicine into a product. Researchers evaluate and modify the medicine before its acceptance by conventional medicine, often as a pharmaceutical.

Whilst the accepted theory is that progress in conventional medicine is driven by medical research. Innovation in medicine is often driven by consumers and industry and acceptance by conventional medicine may incur substantial delays. This raises the question of whether a different construct is required recognising the value of integrating conventional medicines with traditional knowledge, and greater collaboration between the research, consumer, industry, and policy sectors.

This paper describes new approaches to address the current health crisis of increasing rates of obesity and associated chronic disease, and explores the potential for health improvement through integration in medicine with collaborative partnerships between industry and research, acknowledging the pivotal position of consumers in setting the agenda for future research and the potential for policy makers to take action.

Conventional medicine[1] relies on biomedical research to drive progress in medicine. By exploring history, we can compare this approach with the effect of community and industry drivers for delivering progress in health. This critique examines the management of diseases of the past and what their history can teach us about managing the current epidemic of obesity and related chronic diseases.

Recent commentary outlines a model of disease inclusive of conventional, traditional, and holistic medicine, including complementary and environmental medicine. Genuis proposes five pillars of disease causation; genetic, psychological, infectious, nutritional, and environmental [1]. However nutritional and environmental causes, and the corresponding lifestyle and complementary therapies, have been largely overlooked in clinical practice based on the biomedical model [1]. Genetics, infections, and psychology are the focus of conventional medical thinking.

The biomedical model is reflected in the style of health care practice, the patterns of expenditure and ability to translate research into practice (TRIP).

1. Conventional medical practice focuses on the individual patient whereas nutritional or environmental disorders require a focus on society as a whole. Medical practice is designed to manage acute illness with a short latency, an immediately apparent cause, occurring in a single individual and causally related to that person's behaviour or circumstances, whilst nutritional, lifestyle and environmental disorders usually have a long latency and the cause is found in both society and the individual. A comparison of the features for different disorders is provided in Table 1.
2. Health expenditure reflects the focus on individual care as exemplified by the United States of America (USA). According to the OECD, the USA has the highest health costs across the world yet ranks 21st in terms of life expectancy, similar to Chile, and 29th for doctors per head of population, the same as Slovenia.

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[1] In this article the term *Conventional Medicine*, also called orthodox, scientific, or mainstream medicine is used as dictionary defined; the field of applied science related to the art of healing by diagnosis, treatment, and prevention of disease, which applies biomedical sciences, biomedical research, genetics and medical technology to diagnose, treat, and prevent injury and disease, typically through medication or surgery.

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Table 1
Comparison of features and management of disorders with different causes.

	Disorders due to lifestyle and nutritional deficiencies	Disorders due to infection, toxins, genetics, psychology
Cause of disease	Society and culture are highly influential	Individual behaviour and constitution are highly influential
Pattern of disease	Many individuals in one community and other communities with similar social structures	Many individuals in one community but not necessarily in a separate but similar communities
Latency period	Long latency period	Short latency period
Transparency of cause	Usually hidden	Usually obvious
Therapeutic response of health professionals	'Non-medical problem' viewed as the responsibility of the patient not the health professional	A recognized medical disorder with established management guidelines to be followed and explained to the patient using a medical model
Health care provider	Managed by the consumer with industry and pharmacy involvement	Hospital/GP based, with medical treatment provided to the individual.
Medicare and other health benefits	Not supported, but limited finding may be available	Fully supported, but may not be fully funded
Patent Medicine	Complementary medicines are promoted to consumers and pharmacists	Pharmaceuticals are promoted to doctors but not directly to the general public
Instigator of interventions	Individual and industry	Medical or health researchers

Australia spends over 90% of the health budget on individual health care, including up to 33% on hospital care in the last year of life, with less that 10% spent on public health [2].

3. The cause of a disease may also influence the translation of research into practice (TRIP). A leading institution researching 'Translation', with £1,000,000,000 in current grants, describes the process as a long, slow and expensive with a very high rate of failure [3]. This research drives the development of pharmaceuticals for rare diseases, such as amyloidosis, with little relevance to the health of the population, while conventional medicine may resist lifestyle change and complementary medicines for common debilitating nutritional and environmental disorders. This leads to delays in the uptake of potentially innovative treatments and reliance on possibly outdated treatments; for example in conventional medicine in the developed world with supposedly the highest quality health care systems, Grimshaw and Eccles state that "30–40% of patients do not get treatments of proven effectiveness, and 20–25% patients get care that is not needed or potentially harmful" [4]. Similarly, there is "evidence that this process is leading to a progressively widening of the gap between research and improved health" [5]; such that "much of the $100 billion/year worldwide investment in biomedical and health research is wasted because of dissemination and implementation failures" [6].

The slow progress of TRIP is described as a leaky pipe due to poor education and implementation [7]. An alternate explanation by Genuis emphasises the role of intractable stubbornness. "Knowledge translation remains notoriously slow and often occurs only after education and empowerment of subsequent generations. Many researchers, clinicians, and health administrators of each epoch steadfastly refuse to consider iconoclastic evidence, no matter how compelling; some remain immune to the power of facts—no matter how true, no matter how precise." [1] Thus the reliance on research by conventional medicine leads to some discoveries being ignored, such as vitamins, whilst others are over emphasised and researched for limited gains, as for infectious disease. This limits innovation and progress, increases health care costs and ultimately leads to poor health outcomes. History supports this hypothesis for nutritional medicine.

1. History of nutritional disorders

We suggest that the history of nutritional disorders shows a time line starting with the community seeking a remedy for a disease developing in their community. Industry then refines this 'complementary medicine' into a 'product'. After research evaluates and modifies the medicine it is accepted by conventional medicine; typically as a 'pharmaceutical'. The history of scurvy and rickets shows the relationship between disease, remedy, complementary medicine, research, and acceptance by conventional health practitioners.

1.1. Scurvy

Scurvy is a potentially fatal connective tissue disease caused by a deficiency of vitamin C. This is an essential nutrient sourced from fresh foods, especially citrus fruits. Thus scurvy caused the death of sailors on long voyages due to the lack of fresh food. Here the histories diverge.

The official history is that the English Royal Navy made a major breakthrough in medicine by curing scurvy. Specifically a naval surgeon, James Lind, performed the first empirical study of scurvy in 1753, finding that citrus fruits were more helpful than salt water purges or patent medicine [8] which led to the use of citrus fruits in the Royal Navy saving the lives of many sailors.

In reality, 250 years before Lind, scurvy grass and citrus fruits were widely used by merchant sailors and described as the cure for scurvy in 1653 [9]. A hundred years later James Lind published his research challenging both the efficacy of patent medicines and the dominant Galenic theories of the day involving humours and miasmas. The Royal Admiralty physicians did not accept the views of people with a lowly status, such as a ships surgeon and merchant seaman or empirical research or five centuries of traditional knowledge [9]. These physicians were European trained, used purging and bloodletting, lacked experience of scurvy and the high seas, had an antipathy to empirical medicine, a financial interest in patent medicines, and were content to blame dying sailors for their 'laziness'. Four centuries after cures for scurvy were in common use, the Admiralty persisted in reviewing conflicting literature on scurvy for a further half century resulting in the deaths of hundreds of thousands of sailors in the British Navy [9]. Thus the history of vitamin C supports the view of Genuis that progress requires generational change [1] and is resistant to traditional knowledge or evidence-based medicine.

1.2. Rickets

Rickets is a debilitating bone disease in children caused by a deficiency of vitamin D. This is an essential nutrient produced in the skin from sunshine and also available in some fish and fortified foods. People in medieval agrarian societies received enough vitamin D from sunlight, and fish provided vitamin D for people where sunlight was scarce such as northern Europe. However with