

Most influencers in the ancestral health community use a self-experimentation (n=1) approach as a core element of their own practice and recommend self-experimentation to others. However, until now no one has mapped out the n=1 process for laypeople or provided simple tools to help individuals navigate the self-experimentation process safely and effectively.

New science: new methods

We each have one-of-a-kind status related to our genetic expression as well as other features of our biology, including our microbiome. We all have distinct histories, health goals and environments.

Using this knowledge, I have spent the past ten years co-developing a method of self-experimentation with my husband Matthew, after he became almost completely disabled by psoriatic arthritis and the side-effects of pharmaceutical treatment. We combined my background in action research and evaluation from the non-profit sector with his knowledge of continuous quality improvement from the aerospace industry, and gradually developed a comprehensive and accessible system for self-healing through n=1 experimentation.

Through trial and error, we also found a pattern of living that enabled him to recover. That pattern aligns with ancestral health practices.

Simultaneously, Dr. Terry Wahls, Dr. Sarah Ballantyne and many other individuals were also using self-experimentation methods to heal from their own debilitating chronic health issues. Dr. Wahls reversed Secondary Progressive Multiple Sclerosis, and in the process, developed the Wahls Protocols [1]. Dr. Ballantyne found a way to manage over a dozen of her own immune- and autoimmune-related diseases, as well as obesity, through ancestral principles. Through the research she undertook for her own self-experiments, she constructed the scientific evidence base for the Paleo Autoimmune Protocol [2].

Anecdotal Evidence

In the past five years, increasing numbers of individuals around the world have used the Paleo Autoimmune Protocol, the Wahls Protocols and other ancestral healing protocols to address myriad health issues including diverse autoimmune conditions, with impressive results. Many of these people have shared their experiences via blogs and social media, creating online communities of individuals committed to self-experimentation and healing.

Scientific Evidence

During this time, scientific evidence about the health benefits of ancestral diets has also been accumulating. Benefits for treatment of type-2 diabetes [3], [4], [5], [6], [7], [8], cardiovascular disease [4], [9], [10], [11], multiple sclerosis [12], [13], inflammatory bowel disease [14], obesity [15], and all-cause mortality [16] have been documented through human trials.

Individualized Health Care

New evidence in the area of genomics, microbiology and neurology all point to an individualized approach to health care in the 21st century. The sequencing of the human genome launched a new conception of medicine, and a new rationale for individualized health care, based on each person's unique genetic signature. In the past decade, the specific composition of each

person's gut microbiome has also been newly recognized as one of the key drivers in both health and disease.

Simultaneously, there is increasing interest among medical researchers in single case/'n-of-1' research as part of the trend toward individualized or precision medicine, because of its effectiveness and the accumulating evidence about human bioindividuality [17].

Richard Smith, editor of the *British Medical Journal* has projected that in the year 2070, "health will be the business primarily of patients, with doctors as advisers, guides and facilitators" [18]. The current interest in self-experimentation among individuals and practitioners is the result of the convergence of a number of factors, including:

1. The increasing incidence of chronic disease worldwide;
2. Technological innovations that are changing health-management attitudes and behaviour; and
3. New scientific discoveries that point to highly individualized treatment as the future of health care.

The trend toward individuals taking personal responsibility for their health is also being driven by people who are dissatisfied with the results of allopathic treatment models. This trend is also being supported by many health practitioners inside and outside the mainstream medical system as a result of evidence that increased patient activation and engagement results in better health outcomes and lower costs [19].

The use of technology is now commonplace for people who are seeking to improve their health. This is evident in the increasing use of wearable sensors; health apps; and formal and informal online communities where individuals are sharing treatment information with each other.

The Method

The self-experimentation method we have developed follows the basic structure of scientific method. It is quantitatively oriented, for ease of analysis. As it is intended for use by laypeople with chronic health issues and no prior research experience, the framework is designed to be effective at the simplest level, with the option to layer in more robust methodologies at any stage of the process.

The basic method includes six steps, with a seventh step to allow for adaptations during an experiment. In layperson's terms, these steps are as follows:

1. Challenge: What do I want to change?
2. Inquire: What has worked (and hasn't worked) for other people? For me?
3. Idea: By doing [x] I hope to get [y].
4. Investigate: Here's where I test my idea in real life.
5. Consider: Did that work out the way I expected it to? What did I learn?
6. Communicate: I can share my results. Or not. It's up to me.
7. Change: I adapt based on new information.

The method walks people through all stages of the experiment design and data interpretation process, and is designed to be cyclical and iterative: data from one n=1 experiment is meant to inform the next.

This approach takes a constructivist perspective and assumes that self-researchers are working with complex adaptive systems, and that these are both interpreted and influenced by human factors throughout the self-experiment process.

Managing Risk

This approach is not pro-alternative medicine or anti-conventional medicine (or vice versa). It emphasizes risk assessment and risk management, and guides participants through the process of identifying and mitigating the risks of any treatment option.

Non-prescriptive self-experimentation provides a natural pathway to ancestral health practices because they are inherently low-risk.

Validity

To track activities and outcomes, individuals can use any measurement tools they wish, including apps; previously validated instruments that are freely available online; and/or custom tools (digital or paper-based) that they create themselves. Users are encouraged to employ ‘face validity’ (i.e. common sense) when assessing measurement tools for their personal use.

Some threats to validity in n=1 research include:

- History: Factors may be influencing results that haven’t been considered and/or aren’t being measured by the self-researcher.
- Maturation: Some things happen because time has passed, not because of a particular experiment.
- Instrumentation: If a measurement tool is changed during an experiment, results lose validity.

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