

Homeopathy: Pure Water or Pure Nonsense?

Most homeopathy users believe that it's some kind of herbal remedy. Is it?

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Today we're going to take a tiny sugar pill, infused with specially charged water, and cure our ills in a novel way. For today's topic is homeopathy, one of my favorite of the many popular alternative medicine systems. Homeopathy has a large following, but I suspect that a large number of its customers don't really understand what it is. For example, I asked two friends who are homeopathy users, on separate occasions, to tell me about it. By coincidence both were attempting to treat headaches. Both friends had the same general understanding of what homeopathy is: They said it was essentially an herbal remedy, and that the small pills they were taking contained some sort of herbal extract. They could not have been more wrong. I wonder if they would continue taking it if they knew what homeopathy really is.

Samuel Hahnemann was a German physician. In the late 1700's, all medical conditions were believed to be caused by an imbalance in the four basic bodily humors: blood, phlegm, black bile, and yellow bile. Conventional medical practice was to attempt to equalize these humors by such practices as bloodletting, purging, or leeching. Hahnemann observed that these practices often caused more problems than they solved, and so he set about developing a better, safer way to balance the four humors. He reasoned that the body may be able to balance its own humors, if given a sort of "kick start" by administering a small dose of whatever poison or toxin was thought to cause the imbalance. He called this the Law of Similars. The obvious problem was that administering poisons and toxins would kill the patient, so he devised a system of massively diluting the ingredients with water. Hahnemann claimed that greater dilutions had greater effect in balancing bodily humors, and he called this the Law of Infinitesimals. His dilutions were as high as 1 part in 10^{30} . This proportion is vastly larger than one grain of sand in all the deserts and all the beaches and oceans on the Earth. He published his theory in 1807, and homeopathy was born.

And then Hahnemann did a very subtle, a very clever, little thing. He made up a word. The word he invented is *allopathy*. Allopathy is Hahnemann's name for all evidence-based medical sciences. That's right: every medical discipline you've ever heard of — including internal medicine, oncology, neurology, cardiology, psychiatry, pathology, surgery, infectious disease, hematology, geriatrics, gastroenterology, ophthalmology, radiology, orthopedics, nephrology, urology, pharmacology, emergency medicine and critical care — they're all simply allopathy. Allopathy is only one word, so it's no better than homeopathy. They're equals. You have the musings of one guy 200 years ago on one hand, and on the other you have everything medical science has taught hundreds of thousands of researchers since then. Homeopathy vs. allopathy. It's nice to be able to conveniently dismiss so much with just one word. This makes it possible to offer the innocent patient Door A or Door B. Knowing nothing further about either choice beyond its one-word name, the innocent victim will probably take whichever the practitioner advises.

Homeopathy shares one very important component with most other alternative medicine systems. It was developed a long time ago, by one man, during a time when almost nothing useful or true was known about medicine, and it is rigidly required to stay frozen in time with the same original ancient worldview. Homeopathy, like other alternative medicine systems, does not, cannot, must not grow, evolve, or improve as we learn more about the human body. If it did adapt to new knowledge, it would cease to be homeopathy and would be something different.

This ability to include and adapt to new knowledge is the central strength of modern medicine. When we learn new things about the body, when we find a better way to treat a condition, we adapt. We publish the results and we train doctors on the new techniques. Every day, the knowledge base that modern medicine is built upon grows. The collective experience of researchers and doctors grows. But for homeopathy, and other alternative medicine systems, the knowledge base stays frozen in 1807. AIDS drugs, for example, are so much better now than they were just ten years ago, and ten years from now, they'll be even better (there may even be a cure). But with homeopathy, AIDS is treated the same way that any unknown illness was treated in 1807: with a vial of water, possibly containing a few molecules of some compound that are hoped might stimulate a balance of bodily humors.

Dilutions of homeopathic products that are sold today usually range from 6X to 30X. This is homeopathy's system for measuring the dilution, and it doesn't mean 1 part in 6 or 1 part in 30. X represents the roman numeral 10. A 6X dilution means one part in 10^6 , or one in one million. A 30X dilution means one part in 10^{30} , or one followed by 30 zeros. A few products are even marketed using the C scale, roman numeral 100. 30C is 100^{30} . That's a staggering number; it's 1 followed by 60 zeros, about the number of atoms in our galaxy. In 1807, they knew more about mathematics and chemistry than they did about medicine, and it was known that there is a maximum dilution possible in chemistry. Some decades later it was learned that this proportion is related to Avogadro's constant, about 6×10^{23} . Beyond this limit, where many of Hahnemann's dilutions lay, they are in fact no longer dilutions but are chemically considered to be pure water. So Hahnemann designed a workaround. Hahnemann thought that if a solution was agitated enough, the water would retain a spiritual imprint of the original substance, and could then be diluted without limit. The water is often added to sugar pills for remedies designed to be taken in a pill form. So when you buy homeopathic pills sold today, you're actually buying sugar, water, or alcohol that's "channeling" (for lack of a better term) some described substance. The substance itself no longer remains, except for a few millionth-part molecules in the lowest dilutions.

Let's look again at Avogadro's number. 6×10^{23} atoms is called a mole, a term any chemistry student is familiar with. How big is that number? Well, if you had 500 sheets of paper, you'd have a stack about two and a half inches high, like a ream that you'd buy at the stationery store. If you had 6×10^{23} sheets of paper, your stack would reach all the way from the Earth to the Sun. And not only that: it would reach that distance four hundred *million* times. Think about that for a moment. One sheet of paper, in a stack that's 400,000,000 times the distance from the Earth to the Sun. That's a typical homeopathic dilution. Sounds pretty potent, doesn't it?

One explanation made by some homeopaths is that it works the same way as a vaccine: putting a tiny amount of a disease-causing agent into the body — not enough to cause the disease, but enough to stimulate the body's natural defenses into fighting off that disease. Well, this is indeed the way a vaccine works, but it's got nothing to do with the way Hahnemann defined homeopathy. Vaccines are used to prevent an illness which does not yet exist in the body by triggering the production of preventive antibodies; and homeopathy is used to fight a disease already in the body, in which case any antibodies would already be in production. The number of the antibodies triggered by a vaccine can be measured in the bloodstream, whereas homeopathy is not intended to, and does not, produce any measurable reaction. Vaccines insert inert versions of the disease-causing agents into the body, where homeopathic substances are the same as that which causes the disease. Finally and most obviously, vaccines contain a large and fully measurable

amount of active ingredient, whereas homeopathic remedies contain no measurable active ingredient. So homeopathy can indeed be said to work just like a vaccine; well, at least, it works just like a spiritual imprint of a vaccine.

So why do so many people claim that it works, and swear by it? Homeopathy has been tested over and over again, and though most studies show its effects to be consistent with the placebo effect, a surprisingly large number of studies do show that homeopathy produces results superior to a placebo. But in every one of these cases, doubts have been raised about the quality of evidence in the studies. According to the National Institutes of Health, "Problems include weaknesses in design and/or reporting, choice of measuring techniques, small numbers of participants, and difficulties in replicating results." A favorite study of homeopaths is that of the British Medical Journal in 1991, a meta-analysis of 107 controlled trials over a 25 year period. The majority of the studies did show some positive results, and homeopaths stop there. They stop short of the Journal's final conclusion, which was "At the moment the evidence of clinical trials is positive but not sufficient to draw definitive conclusions because most of the trials are of low methodological quality and because of the unknown role of publication bias." If you need the term "publication bias" translated, it means that the studies showing positive results were conducted and/or published by the homeopathy industry. The British Medical Journal went on to say "This indicates that there is a legitimate case for further evaluation of homeopathy, but only by means of well performed trials."

Well, good luck to you, gentlemen. The UK Society of Homeopaths has stated "It has been established beyond doubt that the randomized controlled trial is not a fitting research tool with which to test homeopathy." In other words, homeopathy has given itself a *Get Out of Jail Free* card. Tests are not adequate to test them. If you perform a clinical trial, and find that homeopathy is no more effective than a placebo, the reason for the failure is that homeopathy should not be tested. Claimed immunity from scientific scrutiny should stand out as a huge red flag. When you hear anyone defend their claim by stating that its effect cannot be detected through testing, be skeptical.

The upside of homeopathy is that it's not going to hurt anyone, since it lacks any measurable active ingredients. And when treating conditions that are not life threatening, like headaches or fatigue, there's no harm done. There is massive harm done when practitioners or store owners recommend homeopathy as a replacement for real medical treatment when a serious illness exists. Be vigilant, and protect the health of your family, your friends, and yourself.



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