

Homeopathy: the Scientific Evidence

Homeopathy is more than 200 years old and is used by tens of thousands of physicians and over 500 million people worldwide, making it one of the most popular forms of integrated medicine.¹ It is based on the concept of ‘treating like with like’ (*similia similibus curentur*). Homeopathic treatment aims to stimulate and direct the body’s self-healing capacity.

Scientific scepticism about homeopathy arises from its use of highly dilute medicines. But there is a substantial body of research in this area, a recent review found **98 replicated experiments, over 70% of them positive.**²

Homeopathy is often used ‘to treat the patient, not the disease’ strengthening host defenses and resilience rather than killing microbes or blocking pathophysiological processes. This overlaps with other scientific areas such as hormesis (the paradoxical, stimulatory or beneficial effects of low doses of toxins).³ A hormetic dose response curve is non-linear: J-shaped with a linear dose response relationship at high doses (the shaft) but a reversed dose response, beneficial (the hook) at low dose. Over 10,000 experiments demonstrating hormesis and important therapeutic implications have been identified.⁴

Who Uses Homeopathy?

High quality surveys of use of homeopathy have been conducted in 11 countries. Two surveys in the UK estimated annual use at 3.1% and 9.8%.⁵ **Data from the Federal National Health Interview Survey analyzed by the Harvard Division of General Medicine and Primary Care, show that around 7 million Americans use homeopathy annually, with steady growth. Users consider it more effective than nutritional supplements.**⁶ Users tend to be female, well-educated with healthy lifestyles.⁷ In France 10.2% of the general population and 18% of children aged 0–4 years use homeopathy annually. 43.5% of French health professionals prescribe homeopathy, often alongside conventional medication.

Clinical Trials of Homeopathy

In December 2017 1,176 clinical trials of homeopathy had been published. Details can be found on the CORE-HOM database: <http://archiv.carstens-stiftung.de/core-hom> .

Four systematic review/meta-analyses of homeopathy for all conditions have been published^{8,9,10}. Of these three were positive. The exception was the meta-analysis by Shang *et al.*⁴⁶ This was highly controversial since its conclusions were based on only eight clinical trials whose identity was deliberately concealed. The only undisputed conclusion is that ***clinical trials of homeopathy are of higher quality than matched trials of conventional medicine***: of 110 clinical trials each of homeopathy and conventional medicine, 21 trials of homeopathy but 9 of conventional medicine were of ‘higher quality’.^{11,12} Higher quality equates to less risk of bias, the highest quality trials of homeopathy yield positive results.¹³ Clinical trials of non-individualised homeopathy tend to be larger but less likely to yield positive results, although the evidence remains positive.¹⁴ An independent commentator remarked: ***“To conclude that homeopathy lacks clinical effect, more than 90% of the available clinical trials had to be disregarded. Alternatively, flawed statistical methods had to be applied.”***¹⁵

In total 43 systematic reviews of homeopathy have been published. 21 were clearly or tentatively positive, 9 inconclusive.¹⁶ These proportions are similar to those for conventional treatments. **Conditions with positive results include: allergies and upper respiratory tract infections,^{17,18} Childhood diarrhea,¹⁹ Post-operative ileus,²⁰ Rheumatic diseases,²¹ (2 reviews),^{22,23} Arnica,²⁴ hay fever,^{25,26} and vertigo.²⁷**

Public Health Implications of Homeopathy

Comparative effectiveness research examines the effectiveness of treatments in real-world situations. The largest such study of homeopathy to date is the EPI3 study, a nationwide study in France coordinated by the University of Bordeaux. It included 6,379 patients treated by conventional, homeopathic, and mixed practice family physicians. **Patients treated with homeopathy for musculoskeletal complaints had similar clinical progression but took about half the amount of hazardous non-steroidal anti-inflammatory drugs (NSAIDs) compared to conventionally-treated patients, with fewer adverse events.²⁸ Patients treated with homeopathy for upper respiratory tract infections used less than half the antibiotics compared to those treated with conventional medications, with similar outcomes.²⁹ Similar results were found for anxiety, depression and sleep disorders: patients treated with homeopathy took less than half the number of sleeping tablets, tranquillizers and antidepressants with slightly better results.³⁰**

A multinational comparative effectiveness study led by the American physician Dr David Riley studied 30 doctors, at six clinical sites in four countries, treating patients with acute respiratory problems. **Response at 14 days was 82.6% for homeopathy compared to 68% for conventional treatment. The rate of adverse events for conventional treatment was 22.3%, versus 7.8% for homeopathy.** A replication of this study included 1,577 patients, improvement was significantly faster with homeopathy.^{31,32}

A group at the Charité University Medical Centre in Berlin (the largest academic medical center in Germany) compared outcomes between homeopathic and conventional family physicians in 493 patients followed up for a year. **The conclusion was that patients who sought homeopathic treatment had better outcomes at similar cost.**^{33,34}

Cost-effectiveness

Economic analysis of the French EPI3 data showed that **overall health expenditure was 20% less for patients consulting homeopathic, compared to conventional family physicians.** The lower cost of prescriptions for homeopathic family physicians was partially offset by higher consultation costs. Homeopathic physicians prescribed far fewer potentially hazardous drugs including psychotropics, antibiotics and non-steroidal anti-inflammatory drugs.³⁵

In all comparative effectiveness studies of homeopathy, its integration into health care resulted in better outcomes for patients with improved safety. Those that included cost-effectiveness analysis showed no additional cost or reduced costs.

Safety of Homeopathy

Physician and consumer confidence in the safety of homeopathy is justified. **There is no evidence that homeopathic medicines cause serious or long-lasting harm.** A systematic review which included a comprehensive search of the English-language literature and enquiries with regulatory authorities,

including FDA, concluded: “Homeopathic medicines may provoke adverse effects, but these are generally mild and transient.”³⁶

Basic Research: Biological Models

There is a substantial body of research in homeopathy using animal models, human cells, plants, and other organisms. **The HomBRex database** <https://www.carstens-stiftung.de/databases> **contained details of 2,361 basic research experiments in December 2017.** Of these experiments 89% reported at least one positive result. **A review of biochemical, immunological, botanical, cell biological and zoological experiments on homeopathic dilutions found 98 replicated experiments with over 70% of replications positive.**²

Arnica montana is one of the most used homeopathic medicines, for injuries and trauma. **A review of the clinical evidence, suggests it is effective post-surgery³⁷ while its mechanism of action has recently been demonstrated by advanced genomic methods.**³⁸

Basic Research: Physical and Chemical Methods

Homeopathic medicines are made from substances serially diluted and vigorously agitated. The details of the substances and production methods are specified in the FDA-recognized US Homeopathic Pharmacopoeia. **Twelve independent research labs have reported that homeopathic medicines contain nanostructures, including source material, silica nanoparticles and gas.**^{39,40,41,42} This suggests that homeopathic medicines act by modulating the allostatic stress response network (allostasis is the process of restoring a stable internal environment).^{43,44} **Several physical and physico-chemical methods demonstrate that homeopathic dilutions have specific structural properties in dilutions beyond the Avogadro limit.** These include low temperature thermoluminescence^{45,46} T1/T2 Nuclear Magnetic Resonance Relaxation time⁴⁷, conductivity⁴⁸, the electrical properties of polymer films⁴⁹. This work has recently been systematically reviewed.⁵⁰

Conclusion

Sceptics claim that there is no scientific evidence for homeopathy. This is untrue. Although, according to current scientific understanding, it is implausible that the very high dilutions used in homeopathy have effects which are not placebo, there is abundant evidence that they do. Several physical and physico-chemical methods demonstrate that homeopathic dilutions have specific structural properties. Homeopathy is geographically widespread and increasing in popularity. Research shows it to be safe and effective for a range of conditions. Integrating homeopathy is associated with benefits including improved outcomes, less use of drugs including antibiotics, and economic benefits.

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References

1. Bell IR, Schwartz GE. Adaptive network nanomedicine: an integrated model for homeopathic medicine. *Frontiers in Bioscience (Scholar Ed.)*. 2013;5:685-708
2. Endler PC, Bellavite P, Bonamin L, Jäger T, Mazon S. Replications of fundamental research models in ultra high dilutions 1994 and 2015. *Homeopathy* (2015):104 ;234 - 245
3. Calabrese EJ (2016). Preconditioning is hormesis part I: Documentation, dose-response features and mechanistic foundations. *Pharmacol Res*. 2016 110:242-264.
4. Calabrese V, Giordano J, Signorile A, Laura Ontario M, Castorina S, De Pasquale C, Eckert G, Calabrese EJ (2016). Major pathogenic mechanisms in vascular dementia: Roles of cellular stress response and hormesis in neuroprotection. *J Neurosci Res*. 94(12):1588-1603.
5. Relton, C, Cooper, K, Viksveen, P, Fibert, P, Thomas, K. Prevalence of homeopathy use by the general population worldwide: a systematic review. *Homeopathy*. 2017; 106: 69–78
6. Dossett, M, Davis, R.B, Kaptschuk, T.J, Yeh, G.Y. Homeopathy Use by US Adults: Results of a National Survey. *American J Public Health*. 2016; 106: 743–745
7. Lert F, Grimaldi-Bensouda L, Rouillon F et al. Characteristics of patients consulting their regular primary care physician according to their prescribing preferences for homeopathy and complementary medicine. *Homeopathy* (2014);103: 51-57
8. Kleijnen J, Knipschild P, ter Riet G (1991). Clinical trials of homoeopathy. *British Medical Journal*, **302**:316–323.
9. Linde K, Clausius N, Ramirez G et al. Are the clinical effects of homeopathy placebo effects? A meta-analysis of placebo-controlled trials. *Lancet* 2005; 366:2081–2082.
10. Shang A, Huwiler-Muntener K, Nartey L, et al. (2005). Are the clinical effects of homeopathy placebo effects? Comparative study of placebo-controlled trials of homeopathy and allopathy. *Lancet*, 366:726–732.
11. Fisher P, Berman B, Davidson J, Reilly D, Thompson T et al. Meta-analysis of homeopathy. *Lancet* 2005; 366:2083-4.
12. Lüdtkke R, Rutten AL. The conclusions on the effectiveness of homeopathy highly depend on the set of analyzed trials. *J Clin Epidemiol* 2008; 61:1197–1204.
13. Mathie RT, Lloyd SM, Legg LA, et al. Randomised placebo-controlled trials of individualised homeopathic treatment: systematic review and meta-analysis. *Syst Rev* 2014;3:142.
14. Mathie RT et al. Randomised, double-blind, placebo controlled trials of non-individualised homeopathic treatment: systematic review and meta-analysis *Systematic Reviews* (2017) 6:63
15. Hahn RG. Homeopathy: Meta-Analyses of Pooled Clinical Data. *Forsch Komplementmed* 2013;20:376–381.
16. Mathie RT et al. Controlled clinical studies of homeopathy. *Homeopathy* 2015;104:328-332
17. Bergemann SM, Bornhöft, Bloch D, Vogt-Frank C, Righetti M, Thurneysen A, Clinical Studies on the Effectiveness of Homeopathy for URTI/A (Upper Respiratory Tract Infections and Allergic Reactions). In Bornhöft G, Matthiessen PF (eds), *Homeopathy in Healthcare – Effectiveness, Appropriateness, Safety, Costs*. Springer, Berlin 2011.
18. Bellavite P, Ortolani R, Pontarollo F, et al. Immunology and homeopathy. 4. Clinical studies – Part 1. *Evidence-based Complementary and Alternative Medicine: eCAM*, 2006; 3: 293–301.
19. Jacobs J, Jonas WB, Jimenez-Perez M, Crothers D. Homeopathy for childhood diarrhea: combined results and metaanalysis from three randomized, controlled clinical trials. *Pediatric Infectious Disease Journal*, 2003; 22: 229–234.
20. Barnes J, Resch K-L, Ernst E. Homeopathy for postoperative ileus? A meta-analysis. *Journal of Clinical Gastroenterology*, 1997; 25: 628–633.
21. Jonas WB, Linde K, Ramirez G. Homeopathy and rheumatic disease. *Rheumatic Disease Clinics of North America*, 2000; 26: 117–123.
22. Bergemann SM, Bornhöft, Bloch D, Vogt-Frank C, Righetti M, Thurneysen A, Clinical Studies on the Effectiveness of Homeopathy for URTI/A (Upper Respiratory Tract Infections and Allergic Reactions). In Bornhöft G, Matthiessen PF (eds), *Homeopathy in Healthcare – Effectiveness, Appropriateness, Safety, Costs*. Springer, Berlin 2011.
23. Bellavite P, Ortolani R, Pontarollo F, et al. Immunology and homeopathy. 4. Clinical studies – Part 1. *Evidence-based Complementary and Alternative Medicine: eCAM*, 2006; 3: 293–301.
24. Brinkhaus B, Wilkens JM, Lüdtkke R, et al. Homeopathic arnica therapy in patients receiving knee surgery: Results of three randomized double-blind trials. *Complementary Therapies in Medicine*, 2006; 14: 237–246.
25. Taylor MA, Reilly D, Llewellyn-Jones RH, et al. Randomized controlled trials of homeopathy versus placebo in perennial allergic rhinitis with overview of four trial series. *British Medical Journal*, 2000; 321: 471–476.
26. Bellavite P, Ortolani R, Pontarollo F, et al. Immunology and homeopathy. 4. Clinical studies – Part 2. *Evidence-based Complementary and Alternative Medicine: eCAM*, 2006; 3: 397–409.
27. Schneider B, Klein P, Weiser M. Treatment of vertigo with a homeopathic complex remedy compared with usual treatments: a meta-analysis of clinical trials. *Arzneimittelforschung*, 2005; 55: 23–29.
28. Rognon M, Begaud B, Engel P, et al. Impact of physician preferences for homeopathic or conventional medicines on patients with musculoskeletal disorders: results from the EPI3-MSD cohort. *Pharmacopepidemiol. Drug Saf*. 2012, 21:1093-101.