

## **Homeopathy: Efficacy and Evidence Base**

There are many misconceptions about homeopathic medicine. One of them is that it is not scientific but a chimera, at best. It is dismissed by skeptics without considering the evidence justly. Science is supposed to be a method and not an ideological end in itself. Many so called scientists have taken their pseudo-scientific practices to increase their stock value or advance their career rather than answer the right questions ethically and objectively. There are still many unanswered yet answerable questions about homeopathy only if we can approach them honestly.

From a historical standpoint, Samuel Hahnemann, the founder of homeopathy, actually followed the scientific principles and methods of his time. He was an innovator in the area of experimentation of chemical compounds in the healthy; he and his family were the first subjects. He recorded his observations very meticulously, and his observations are the basis for the development of homeopathic medicine to this day. His observations, indications, and directions have remained constant for over two hundred years and applied by thousands of homeopaths around the world without any changes; this gives weight to the reliability of his observations.

There is no other branch of medical therapeutics that can claim this degree of stability. However, to bring homeopathy to current times we will need to perform more rigorous and repeated testing of the technique. The definition Hahnemann gave to homeopathy, “*similia similibus curentur*” in latin, means: “let like cure like”. Homeopaths look for a similarity between the patient’s symptoms and the remedy to use for the treatment.

The second principle of homeopathy, the minimum dose, involves the use of the smallest dose necessary to see a response in the patient. This principle influenced conventional medicine during the 19<sup>th</sup> century and moved regular physicians to use this principle, still in practice today. A corollary to this principle is the use, in homeopathy, of extremely diluted substances as dosages; these preparations reach concentrations beyond what is measurable according to current scientific methods. This is the most controversial aspect of homeopathy.

Before we enter the discussion about the clinical research validating homeopathy it is important to present evidence from other, non-clinical, areas of biological research. There are thousands of research studies published on the biological effects of ultra diluted concentrations of substances. This phenomenon is called “hormesis”, or DDRE (dose dependant reverse effects). According to these observations, there is a biological stimulation with moderate dosages and inhibition with large dosages of chemically or biochemically active compounds.

Research has been performed in plants and animals, in particular, with the conclusion that, in fact, there is a biological effect using substances that are diluted beyond Avogadro’s number and therefore with no remaining molecules of the original substance. All of this research has been carried out by researchers who are not affiliated to the homeopathic community in any way, and actually, have disclaimed that their research has

anything to do with it. (Merizalde B, “Samuel Hahnemann, Hormesis and a probable mechanism of action of homeopathic remedies”, Am J of Homeopathic Med, Winter, 1995, 249-254)

A recent publication in the journal Lancet took a series of published studies to draw statistical analysis and conclusions. They concluded that: ‘there was weak evidence for a specific effect of homoeopathic remedies, but strong evidence for specific effects of conventional interventions. This finding is compatible with the notion that the clinical effects of homoeopathy are placebo effects’. (Shang A., et al: “Are the clinical effects of homeopathy placebo effects? - Comparative study of placebo-controlled trials of homeopathy and allopathy”, Lancet 2005;366:726-32)

A closer assessment of the researcher’s methodology shows that their analysis is full of errors in judgment, whether willful or not. Even though the authors stated the studies were matched they were not. The homeopathic studies were always of higher quality according to conventional standards; and, as it is well known, higher quality studies will tend to result in negative findings more frequently.

These researchers “cherry picked” the studies they wanted to present and chose studies they considered of “high quality” yet do not present any sensitivity analysis performed on the over 110 studies they reviewed to determine that level of quality. Sensitivity analysis is the study of how the variation in the output of a model (numerical or otherwise) can be apportioned, qualitatively or quantitatively, to different sources of variation.

To perform a valid sensitivity analysis a conscientious researcher uses various perspectives in order to analyze the data and achieve the conclusions. These authors, obviously, took the criteria -“larger”- after the fact; since those were the studies that were negative, with the exclusion of the other higher quality articles (21) showing positive results, the conclusions are biased. This is prejudice against homeopathy, plain and simple.

This is called “data dredging” to derive the conclusion you want to achieve “a priori”. The authors included in their study only 8 studies, homeopathic, which were uncited and anonymous, which had no report on the number of patients, or their diagnosis, and which conclude that homeopathy is the same as placebo.

Another succinct criticism to the Lancet review has to do with the “Quorum”, a consort of guidelines for publishing scientific metanalysis of trials. The authors miss all points of the guidelines of this document even though these guidelines were published in the same journal, The Lancet, and was published, while other research, homeopathic, was been rejected even though it was of high quality, because of homeopathy’s supposed “implausibility”!

In the analysis, homeopathy starts from a weaker position in terms of evidence base. All of the allopathic (conventional) studies to which these trials were compared came out of “phase four” trials, which means that the medicines had gone through already a number

of rigorous and systematic pharmacological trials before they were used in clinical trials. The evidence of homeopathy is historical and coming, perhaps, from outdated scientific methodologies, with a different set of parameters. So, the comparison of these different types of trials is uneven. There are other issues having to do with specific and non-specific effects of alternative medicine trials as well, which need to be taken into consideration.

Another error in their evaluation is their use of only the studies' "internal validity", which is the extent to which a study measures what it purports to measure. They did look at double blinding, for example, and the homeopathic trials showed a high quality in this respect. However, there was no external validity measure, which is the degree to which the study measures something that can be found in the "real world".

In their assessment of the use of homeopathic treatment in upper respiratory affections the authors acknowledge that the results justify a conclusion for efficacy of the homeopathic remedies, but they dismiss these results imputing bias on the part of the investigators. Surprisingly, the homeopathic trials are generally of higher quality than the matched trials of conventional medicine they chose for comparison, and show less heterogeneity than the group of patients in the conventional studies. So the question that remains is: who is biased, really?

One of the studies Shang, et al., chose as of "high quality", with high internal validity, involved the treatment of children with asthma and how the homeopathic treatment changed their quality of life (White A et al.: "Individualised homeopathy as an adjunct in the treatment of childhood asthma: a randomised placebo controlled trial", *Thorax* 2003;58:317-321)

The authors of the study didn't find a difference between the real homeopathic remedy and placebo in the identified variable, quality of life. But the authors fail to point out that these children could not improve on that parameter because it was already within a normal range at the time of the patient's point of entry into the study. In fact, the children included in this study were in general healthier than average children!

Therefore, the "internal validity" measurement for the study suffered from what is called a "ceiling effect", which means the patients could not improve beyond the level assessed since they were already there! Interestingly, all the other measures of severity in asthma symptoms did show improvement with the homeopathic treatment. This "high quality" study did not have any external validity and the observations which could have validated the treatment were minimized. Isn't this a sign of bias?

In another study the authors directed parents to give their children one of three commonly prescribed homeopathic remedies, without a physician prescription. The researchers did not find a difference in the clinical condition of the children after twelve weeks. What the researchers neglect to point out is that those children, enrolled in the study, were healthier than the average group of children and there was nothing significant for them to have treated! For the children to have improvement in their quality of life they would have to

have a higher than 100% improvement; therefore, this study has no internal validity either. (Steinsbekk A, et al: “Self-treatment with one of 3 self-selected ultramolecular homeopathic medicines for the prevention of upper respiratory tract infections in children- A double blind-randomized controlled trial”. *Br J Clin Pharm* 2005 59:447-55)

A study published also in the *Lancet*, a metaanalysis, shows the references with internal validity, number of patients and outcome. It is completely transparent, with confidence intervals and odds ratio (the changes of the treatment being better than placebo, equal to, or less than placebo).

In this study, most studies show effects above the placebo response with a reliable confidence interval. In this evaluation, 40 % of trials show patients responding to homeopathy clearly beyond the placebo response; 39% show a positive trend; and 10% show a negative trend, but none of the trials are on the negative side of the line as far as the confidence interval. The chances that homeopathy will help the patient is two to three times the effect of placebo. (Linde, et al: “Are the clinical effects of homeopathy placebo effects? A meta-analysis of placebo controlled trials. *Lancet* 1997; 350: 834-43”)

In marked distinction with the previous authors these researchers configured the data in various ways to assure reliability, and they showed a positive result in the homeopathic trials. This is a clearly robust data arrived at by modern, standard, scientific and statistical standards.

There have been some criticisms to this analysis, like the fact that it lumps together homeopathic trials of various kinds. This is not a valid criticism because homeopathy has the right to be defended as a whole as it is attacked as a whole. In fact, the authors separated the various trials into particular diseases and specialties and the data still showed positive results!

There can be a fair criticism and that is the “file drawer effect” in which smaller studies, which show negative effects do not get published based on “positive bias”. Nevertheless, this also happens in studies with conventional approaches. However, no matter this fact there would need to be about ten times as many negative studies, than there are currently published, to reverse the current positive data in favour of homeopathy.

This analysis actually shows, contrary to what various schools of homeopathy claim, that all of the styles (single remedy, complex, high and low potency), worked equally well. They all worked above the confidence interval, above the placebo effect. Of course, the conclusion is that there needs to be more research done to confirm the results.

Another study, completely independent, and sponsored by the European Commission Homeopathic Medicine Research Advisory Group, came to very similar conclusions to the Linde et al. study. They used only randomized controlled studies with concrete, predefined, outcome measures. This makes the study even more rigorous. (Cucherat M. et al. Evidence of clinical efficacy of homeopathy: A meta-analysis of clinical trials; *Eur J Clin Pharmacol* 2000; 56:27-33)

What this proves is that, no matter what the data shows, scientists and researchers in particular, who have a hard time accepting factual data that may contradict their particular paradigm and will fight irrationally to maintain their point of view, no matter how erroneous; there is ample historical precedence for this kind of behaviour. This phenomenon has been called the “cognitive dissonance” effect, where individuals will overlook, ignore, or discount data that contradicts their conceptual framework.

From the clinical arena, a study was conducted in an intensive care unit in patients with more severe pathology, sepsis, which carries a 50% mortality rate. The researchers had seventy patients treated with individualized remedies and the results showed statistical significance in favour of the homeopathic remedies working better than placebo, when looking at survival and severity of disease. The effect of the homeopathic treatment on these patients was dramatic. (Frass M et al. Adjunctive homeopathic treatment in patients with severe sepsis: a randomized, double-blind, placebo-controlled trial in an intensive care unit. *Homeopathy* 2005;94; 75–80).

This is a very inexpensive intervention which can save lives. This is an area of distress in conventional medicine since the survival of patients in this area is not good. Survival in these patients, treated with conventional medicine, has not changed in the last twenty years, even with modern advances in medicine.

Another study showed that patients treated at 72 h postpartum, had mean Hb levels remained similar after homeopathy (12.7 versus 12.4) compared to significant decrease in placebo group (12.7 versus 11.6;  $p < 0.05$ ). These results are remarkable, considering that the patients who received the homeopathic remedy happened to be more vulnerable to haemorrhages because of being primiparous, had more episiotomies, and had bigger babies, which are actually negative indicators, and the patients should have done worse clinically, and yet, they responded positively. (Oberbaum M et al. The effect of the homeopathic remedies *Arnica montana* and *Bellis perennis* on mild postpartum bleeding - A randomized, double-blind, placebo-controlled study - Preliminary results. *Comp Ther Med* 2005;13; 87-90).

However, there are positive studies in favor of homeopathy which need to be looked at with caution. Some studies may have poor randomization and the groups receiving placebo may not be comparable, because one group may be more ill, with more problems, which will make the results biased.

In some studies, the results between homeopathy and placebo may not show significant results when compared to each other, but a secondary variable, like the intake of analgesics after surgery, may be significantly reduced in the patients taking homeopathy. (Stevinson C. et al. Homeopathic arnica for prevention of pain and bruising: randomized placebo-controlled trial in hand surgery. *J R Soc Med* 2003; 96:60-65.)

This indicates that perhaps homeopathic remedies work at a more subtle, perhaps subjective, level which can be seen only if the whole picture, with all the variables, is taken into consideration. Absence of proof is not proof of absence; it may just be a lack of thoroughness in the exploration of variables.

There have other studies showing the effect of Arnica in the postoperative sequelae in patients undergoing plastic surgery. It was been found that the patients using the Arnica preparation have had about 50% quicker recovery and lesser sequelae than patients taking placebo. The study was performed at the University of California San Francisco, at the Dpt. of Plastic Surgery.

There is a significant body of research that shows that homeopathy has effect in particular clinical areas, like upper respiratory infections in children. One of the most significant studies was done at the Free University of Amsterdam, at the Pediatric Outpatient Clinic, with a large group of children from 18 months to 10 years of age. The children were stratified according to age (de Lange de Klerk Et al: "Effect of homoeopathic medicines on daily burden of symptoms in children with recurrent upper respiratory tract infections"; BMJ. 1994: 309; 1329-32).

The children treated were quite ill and suffered from symptoms 49 % of the time compared to 15% of the normal children. They have a higher degree of upper respiratory symptoms. The homeopathically treated children had lower numbers of adenoidectomies, number of antibiotics used, and number of sick days. However, both groups, placebo and homeopathy, improved overall, which brings up other questions regarding the clinical effect of the interpersonal components of the interview and other "non-specific" effects of the intervention. Nonetheless, the homeopathic treated showed significant improvements over the placebo.

A study done in France, not double blinded but clinical, involved over 500 children, who had about five episodes of upper respiratory infections per year. They were followed with and without homeopathic remedies. One group, about half the number of children, was treated by non homeopathic physicians and the other group by homeopathically qualified practitioners. Follow up parameters included the recurrence of the upper respiratory episodes, complications from the conditions, side effects, quality of life measures for both the children and their parents, and direct and indirect medical costs (Trichard M et al. Pharmacoeconomic comparison between homeopathic and antibiotic treatment strategies in recurrent acute rhinopharyngitis in children. Homeopathy 2005;94:3-9).

The homeopathically treated group had statistically significant better outcome measures than the one treated as usual. Because the group of people that seek homeopathic treatment probably tend to follow healthier lifestyles, including less smoking and better dietary approaches, these factors need to be controlled to assure they are not confounding; those controls were performed in this study. On the other hand, the children taking homeopathy tended to go to day care more often than the other group which increases exposure to infective agents.

Another study in children with non acute otitis media, with individualized choice of remedies, shows homeopathy to be effective in the treatment of this condition. It showed that children treated had better outcomes at 5 days, 2 and 6 weeks, with better symptom diary scores. This is considered as a pilot study and needs to be replicated at a larger scale (Jacobs J et al. Homeopathic treatment of acute otitis media in children: a preliminary randomized placebo-controlled trial. *Pediatr Infect Dis J* 2001; 20:177-183)

Another approach to the evaluation of the effects of homeopathy involves observation about how it works in the “real world”. In a study performed in Europe, where the standard approach recommended for the treatment of otitis media is to avoid antibiotics for the first few hours of the condition, children were offered homeopathic treatment instead. This was an open study and not double blinded. Nevertheless, according to the normal course of this condition, the children treated with homeopathic remedies recovered 2 ½ times faster than they would under usual circumstances (Frei H, Thurneysen A. Homeopathy in acute otitis media in children: treatment effect or spontaneous resolution? *Br Hom J* 2001; 90:180-182)

These results are important because, besides the consideration of the decrease in the pain and suffering of the patient and their families, there is also the cost savings from the use of antibiotics, disability, and the time off parents may have to take from work to take care of their sick child. These studies are easier to perform in Europe because of the greater numbers of homeopaths practicing homeopathy and therefore greater access and number of patients for the study. However, these studies are not randomized and there are some variables as mentioned above, which may skew the data when this population is compared with other, less health conscious, populations. A more balanced study needs to be performed in populations who are not self selected.

Nevertheless, these studies have been corrected with statistical regression analysis and the results hold, showing these patients can receive a more effective treatment for at the most, the same cost. It is possible that greater cost savings will become evident with longer follow-up studies. The cost, of course, will vary from country to country depending on how a particular health care system is organized.

Another set of studies address the treatment of Attention Deficit Hyperactivity Disorder, a diagnosis which is currently considered to be reaching epidemic proportions. This particular study, performed in Switzerland, involved 115 children, more boys than girls, which is usually the case in the prevalence of this condition in the population. It used the standard diagnostic criteria and screening tools. The authors found positive response in 75% of the children, without the use of Ritalin, in a course of treatment of 3 ½ months. These children were treated according to a more classical homeopathic approach where the remedy selection is individualized according to the particular patient’s symptoms. (Frei H, Thurneysen A. Treatment for hyperactive children: homeopathy and methylphenidate compared in a family setting. *Br Hom J* 2001;90:183-188.)

This same group then decided to do a “cross-over” phase of the study and stopped the remedies. What they found was that, the children who had improved with homeopathy were selected randomly to receive the real medicine and placebo and they deteriorated when the placebo was given and then responded again when the remedy was reinstated; it is important to note that the study was double-blind. (Frei H et al. Homeopathic treatment of children with attention deficit hyperactivity disorder: a randomised, double blind, placebo controlled crossover trial. *Eur J Peds* 2005; 164:758-67.)

Another study, with a smaller group of children showed no significant difference between the real medicine and placebo, however, the authors didn't report the potency (strength) of the remedies used and it is not possible to determine if this could have been an obstacle in the adequate response of this group of children. On the other hand, they showed improvement in both groups, which begs the question of how much the particular clinical intervention was therapeutic in itself. (Jacobs J et al. Homeopathy for Attention-Deficit/Hyperactivity Disorder: A Pilot Randomized-Controlled Trial. *J Alt Comp Med* 2005; 11: 799–806)

In another published study of 500 consecutive cases of upper, and lower, respiratory and ear complaints, 281 patients were treated homeopathically and 176 treated conventionally, with data collected in 6 primary care sites in four countries, the practitioners chose to use either homeopathic or conventional treatment. The patient questionnaires showed that the severity of illness was equivalent in both treatment groups. There was an 83% efficacy in the homeopathic group versus 68% in the conventional group. There were less side effects and greater patient satisfaction in the homeopathically treated group. (Riley D. Open label trial of homeopathy vs conventional medicine for respiratory and ear complaints seen in primary care settings; *J Altern Complement Med* 2001; 7: 149-159)

It is important to distinguish efficacy and effectiveness. Efficacy corresponds to the findings in a control setting with standard research protocols; effectiveness refers to the findings in the day to day practice in the real world. This doesn't mean that the use of homeopathy in the real world doesn't permit the gathering of high quality and reliable information; in fact, there has been a significant amount of data collected systematically, especially in the European countries.

One particular study, commissioned by a large German health insurance company (Krankenkasse), compared cohorts of patients (adults and children) with common medical conditions consulting to homeopathic and conventional practitioners. The follow up was of about 6-12 months. The severity of the symptoms was evaluated both by the patients and the physicians: quality of life was assessed by the SF-36; and a comprehensive cost analysis was also performed. The total number of patients was 493, treated by 101 homeopathic and 56 conventional practitioners. The differences were significant with a final conclusion that patients who seek homeopathic treatment tend to have better overall outcomes with similar costs when compared to conventional treatment. (Witt C et al. Outcome and costs of homeopathic and conventional treatment

strategies: a comparative cohort study in patients with chronic disorders. *Comp Ther Med* 2005;13; 79-86)

A similar study performed in Germany, at the University of Freiburg, on the benefits of homeopathy and acupuncture, included 900 patients. There were medium to large changes in the SF-36, and these patients requested alternative treatment out of dissatisfaction with the conventional approaches in the treatment of their chronic illnesses. The changes were similar in the homeopathic and acupuncture treatments; and, the changes were seen particularly in the first six months of treatment. Overall, there was a moderate to high improvement. As the years went by, there was a decrease in the number of sick days and absence from work in the homeopathically treated patients. (Güthlin C et al. Measuring the effects of acupuncture and homoeopathy in general practice: An uncontrolled prospective documentation approach. *BMC Public Health* 2004; 4:6)

In a very important area of public health we find that homeopathic treatment is the only treatment that showed efficacy in the treatment of the flu, particularly during the epidemics of 1918-19. There is data collected from around the world and it has been found a concordance between the homeopaths in different countries on the particular remedies used to treat patients with the flu. The most common remedy was Gelsemium, followed by Baptisia, Eupatorium and Phosphorus.

A newer remedy, “Oscillococcinum”™, has been researched for the treatment of the flu. The research published, about seven studies, has shown that homeopathic treatment is effective in the reduction in the duration of the disease. It doesn’t appear to work on prevention. (Vickers A, Smith C. Homoeopathic Oscillococcinum for preventing and treating influenza and influenza-like syndromes; Cochrane review: *Cochrane Library* 2001:1)

There is also the treatment of hay fever, rhinitis, and asthma with compounds produced according to homeopathic guidelines using the same substances that cause the patients symptoms. This approach is called “isopathy”, treating the illness with the same substance that causes the symptoms.

An interesting anecdote is that it was a homeopath, Charles Harrison Blackley, who first identified allergen deposits as the cause of allergic rhinitis in the later part of the nineteenth century; he actually collected airborne particles using a kite and then counted them. Homeopaths started using dilutions of substances that cause allergies at least 20 years before conventional medicine developed the allergen injections.

There have been a series of studies using data from skin tests for allergens and preparing remedies from the identified compounds according to homeopathic guidelines. The allergens used were individualized. The total number of patients was 253 and the results were highly significant statistically. The patients were evaluated using conventional methods to assess inspiratory flow rates. (Reilly D et al Randomised controlled trial of

homoeopathy versus placebo in perennial allergic rhinitis with overview of four trial series. *BMJ* 2000; 321:471-6)

In childhood diarrhea, there have been a series of studies showing that homeopathy is clearly positive in the reduction of symptoms and length of disease. (Jacobs J et al. Homeopathy for childhood diarrhea: combined results and meta-analysis from three randomized, controlled clinical trials; *Pediatr Infect Dis J*, 2003;22:229–34)

The homeopathic remedy *Rhus Toxicodendrum* (poison ivy) has been used in a double blind placebo controlled study of patients with fibromyalgia, whose symptoms corresponded to the symptomatology indicating such a remedy; about 25% of patients with fibromyalgia typically fit that picture. The results were positive in favor of homeopathy compared to placebo, with a decrease in symptoms and tender point count. (Fisher P et al Effect of homoeopathic treatment on fibrositis (primary fibromyalgia) *BMJ* 1989 299 365-6)

It is remarkable to note that the critics of homeopathy first protested that homeopathy could not work, then, after the Linde studies, the ones that accept the current data, moved the goal post and doubted that homeopathy would work any better than conventional treatment. There are not many studies comparing both treatments.

There are various difficulties in making such comparisons because often, conventional treatment is targeted towards a particular set of symptoms, while homeopathy requires a more integral assessment and will find particular changes in quality of life measures and improvements in general health. Of course, it is important to determine how much these changes are attributable to the consultation and not just of the action of the remedies.

In a particular study, to perform such a comparison, researchers compared a homeopathic gel made of a combination of *Symphytum*, *Rhus Toxicodendrum* and *Ledum*, and compared it with Piroxicam, a non-steroidal, topical gel for the treatment of rheumatoid arthritis. The patients using the homeopathic had twice as much decrease in the Visual Analog Scale for pain as did the conventional compounds, and had fewer side effects. (Van Haselen R, Fisher P: A randomised controlled trial comparing topical Piroxicam gel with a homeopathic gel in osteoarthritis of the knee. *Rheumatology*, 2000; 39:714-719 )

Another study using a topical application involved the use of a combination homeopathic remedy called “Traumeel” in children undergoing chemotherapy; chemotherapy tends to produce ulcers in the mouth and this stomatitis was treated with Traumeel, used five times per day for 14 days, or for 2 days after the symptoms had resolved. A greatly significant number of children using the homeopathic remedy did not get the mouth ulcers versus only one child in the placebo group. (Oberbaum M, et al: “A randomized, controlled clinical trial of the homeopathic medication TRAUMEEL S in the treatment of chemotherapy-induced stomatitis in children undergoing stem cell transplantation”; *Cancer*. 2001 Aug 1; 92(3):684-90).

It is a fact that homeopathic medicine has become more popular since the 1970s, regardless of whether or not there is research backing the theory; people feel that it works. The Royal London Homeopathic Hospital did a survey of 493 patients to inquire for the reasons to seek homeopathic treatment. They found that the most significant reason for seeking this treatment was the concern about the side effects of conventional medicines either because they had suffered such effects or were afraid of having them; the second reason was the ineffectiveness of conventional approaches. This seems to be the case in other reports from different parts of the world. The third group of patients chose it because of personal preferences; what this means will need to be clarified in future research, but this is likely to do with philosophical or religious choices. (Sharples F, Van Haselen R, Fisher P: "NHS patients' perspective on complementary medicine". *Comp Ther Med* 2003; 11:243-248).

Research on the issue of safety of homeopathy has been performed through a world literature search for twenty years, between 1975 and 1995. The conclusion is that homeopathic medicine has a very low incidence of side effects. When the incidence of adverse effects is compared with placebo, the effects are slightly higher in the homeopathic group; however, those effects are minor and transient. A significant problem in assessing the side effects from homeopathic remedies involves the mistaken identity of the compounds, since they are often listed as homeopathic when in fact they are herbal. The main risks are indirect and mostly related to inadequately trained practitioners. (Dantas F, Rampes H. Do homeopathic medicines provoke adverse effects? -A systematic review". *Br Hom J* 2000;89: S35-38)

Besides the issue of proving homeopathy is that of improving homeopathy. For that purpose, researchers took on the task of performing a systematic literature review of homeopathic pathogenic trials, performed around the world between 1945 and 1995. These pathogenic trials, also called "provings", are the basis for the identification of the particular symptom pictures of substances, which will then be used for the selection of the concordant homeopathic remedy for the patient in clinical practice.

Most of the studies are small in the number of subjects, are of short duration, and the use of placebo control was found in 56% of the trials. There was great variability in the methods and the trials were of low quality. Therefore, this is an area where homeopathic medicine and research needs to improve significantly. (Dantas F, Fisher P, et al, A systematic review of the quality of homeopathic pathogenetic trials published from 1945 to 1995, *Homeopathy*. 2007 Jan; 96(1):4-16)

From a cost effectiveness standpoint, Smaller, a notable economist, has done actuarial costs on the use of complementary and alternative medicine in the treatment of disease, a study commissioned by the Prince of Wales' Foundation for Integrated Health, which has been published. In it he concludes that there is credible evidence that these treatments could very well reduce the financial burden on the healthcare system (The National Health Services in England).

Moving into the area of mechanism of action, a greatly controversial event occurred when Professor Jacques Benveniste published in 1988 an article in the journal Nature on the effect of highly diluted antiserum against IgE on human basophile degranulation, and proposing the concept of the “memory of water”. Besides the fact that the team sent to evaluate the research protocol had nothing to do with an appropriate or adequate scientific evaluation, because the individuals sent by the magazine to evaluate the claim were: a magician, a journalist, and a chemist, with no immunologists, the type of professional who would have been most suited to evaluate the procedures and results of the experiment; this research was not possible to replicate.

In the following years researchers have worked indefatigably on developing a reliable methodology using the same basic model, the degranulation of basophiles as triggered by IgE. In one particular model Histamine was used, which is a substance that normally triggers degranulation and induces the manifestation of allergy symptoms in sufferers. In fact, this model is closer to actual homeopathy, since Histamine is used homeopathically in the treatment of allergies. It is, of course, common to use the over-the-counter antihistamine drugs to treat allergies in the conventional treatment model.

Currently, the term “degranulation” has been replaced by the term “activation”. There are various ways of measuring the effect, in ways that are very reliable and replicable. There are, nevertheless, some particular variables that need to be controlled in order to have positive findings; for example, there is a great variability in the sensitivity of the donors of basophiles needed for the research. One particular research project reported negative findings when they used only one single donor with low sensitivity.

In one particular research project, four independent laboratories followed the same protocol and purchased supplies from the same suppliers. The studies were blind and the statisticians were also independent. They looked at degranulation but also other, more modern, parameters. The results were highly significant even though there was a variation between laboratories because of the diversity in donor sensitivity in the various populations in the countries where the tests were performed. An interesting component of the research is that the effect was partially blocked by conventional histamine antagonists-H2 blockers. (Belon P et al. Histamine dilutions modulate basophile activity; *Inflamm Res* 2004; 53:181-8)

Finally, what remains is a feasible hypothesis about how homeopathy might work. If you take a homeopathic remedy at a 30C ( $100^{-30}$ ) to a chemist they will say there is nothing but water, alcohol and lactose; however, if you take a computer floppy disk to get it analyzed you will get that it is nothing but ferric oxide and vinyl, even though it will have plenty of information stored physically, electromagnetically, not chemically. It appears that something analogous occurs with the homeopathic remedies. The structure of water is still a matter of controversy and still uncertain. The structure of water is very dynamic and has very rapid oscillations in the conformation of the molecules.

The current hypothesis states that: *“Water, and perhaps other polar solvents are, under certain circumstances, capable of storing information relating to substances with which they have previously been in contact, and subsequently transmitting this information to presensitized biosystems”*. (Fisher, 1995)

Presently there are two models to explain the phenomenon. The “Geometric” models postulate the formation of conglomerates, called “clathrates”, which are able to store information in bond lengths and angles; or by “isotopicity”, in which different isotopes form an ordered framework. All of the geometric models are probably wrong, because of the dynamic character of water.

The “Dynamic” model presents water bodies as having “coherent regions displaying stable laser-like behavior”. There is an underswell of credibility of this area of research since there are independent researchers from non-health related professions, like materials scientists. (Del Guidice E, Preparata G, Vitiello G. “Water as a free electric dipole laser”; Phys Rev Letts 1988; 61:1085-1088) (Roy R, Tiller W, Bell I, et al.; “The structure of liquid water; novel insights from materials research: potential relevance to homeopathy”; Materials Research Innovations Online, Volume 9-4, 557-608, [www.matrice-Technology.com](http://www.matrice-Technology.com))

There is another group of researchers who are identifying and confirming the structural irregularities in water. Using modern techniques, researchers have measured the thermoluminescence of ultra high dilutions of sodium and lithium chloride. After diluting the compounds to levels beyond Avogadro’s number in heavy water, which permits clearer measurements, the substances are cooled to the temperature of liquid Nitrogen and bombarded with X or Gamma rays, which excites the electrons. Because the electrons are negatively charged they create positively charged “holes” when they jump out of their quantum ground state. As the substance is permitted to warm up slowly the electrons return to their quantum ground state and release thermoluminescent energy which is then measured. The researchers concluded that these high dilutions have a spectrum similar to the more material, concentrated, dilutions of the same substances, even if the ultra high dilutions were made long ago. This is likely due to the breaking of hydrogen bonds, and this could be the mechanism of storage of information in water. (Rey L.: “Thermoluminescence of ultra-high dilutions of lithium chloride and sodium chloride”; Physica A 2003; 323:67-74).

As we can see there is a lot of data indicating that homeopathically prepared substances are effective and efficacious, will decrease pain and suffering significantly and is safe and cost effective. There is still a lot of work to be done to determine the way in which homeopathic remedies convey their therapeutic action to the body and what is the mechanism of action. It behoves us to endorse this wonderful treatment modality and continue supporting research to improve the practice of homeopathy.

Based on Dr. Peter Fisher’s presentation “Scientific Research on Homeopathic Medicine: Proving and Improving its Efficacy”, at the Joint American Homeopathic Conference, 2006. Transcribed and edited by Bernardo A Merizalde, M.D