Re: Magnetic therapies

Source: http://sci.tech−archive.net/Archive/sci.med.diseases.lyme/2005−02/0377.html

---

a_weisman_at_yahoo.com
Date: 02/09/05

Date: 9 Feb 2005 06:47:21 −0800

Spontaneous Remission and the Placebo Effect
http://quackwatch.org/04ConsumerEducation/placebo.html

Spontaneous Remission and the Placebo Effect
Stephen Barrett, M.D.
When someone feels better after using a product or procedure, it is natural to credit whatever was done. However, this is unwise. Most ailments are self−limiting, and even incurable conditions can have sufficient day−to−day variation to enable quack methods to gain large followings. Taking action often produces temporary relief of symptoms (a placebo effect). In addition, many products and services exert physical or psychologic effects that users misinterpret as evidence that their problem is being cured. These "Dr. Feelgood" modalities include pharmacologically active herbal products, quack formulas adulterated with prescription drugs, colonic irrigations (which some people enjoy), bodywork, and meditation. Scientific experimentation is almost always necessary to establish whether health methods are really effective. Thus it is extremely important for consumers to understand the concepts of spontaneous remission and the placebo effect.

Spontaneous Remission
Recovery from illness, whether it follows self−medication, treatment by a scientific practitioner, or treatment by an unscientific practitioner, may lead individuals to conclude that the treatment received was the cause of the return to good health. As noted by Medical historian James Harvey Young, Ph.D.:

John Doe does not usually realize that most ailments are self−limiting and improve with time regardless of treatment. When a symptom goes away after he doses himself with a remedy, he is likely to credit the remedy with curing him. He does not realize that he would have gotten better just as quickly if he had done nothing! Thousands of well−meaning John and Jane Does have boosted the fame of folk remedies and have signed sincere testimonials for patent medicines, crediting them instead of the body's recuperative power for a return to well−being. . . .

The unscientific healer does not need to observe the restraints of reputable medicine. Where true medical science is complex, the quack

can oversimplify. . . . Where ailments are self−limiting, the quack makes nature his secret ally [1].

It is commonly said that if you treat a cold it will disappear in a week, but if you leave it alone it will last for seven days. Even many serious diseases have ups and downs. Rheumatoid arthritis and multiple sclerosis are prime examples. On rare occasions, even cancer can inexplicably disappear (although most testimonials for quack cancer remedies are based on faulty original diagnosis or simultaneous administration of effective treatment).

Quackery's victims are not the only ones who can be fooled by the placebo effect, spontaneous remissions, and other coincidental events. The gratitude and adulation of people who think they have been helped can even persuade charlatans that their methods are effective!

The Placebo Effect
The power of suggestion has been demonstrated by many investigators in a variety of settings. In a classroom, for example, a professor sprayed plain water about the room and asked the students to raise their hands as soon as they detected an odor. Seventy−three percent managed to smell a nonexistent odor.

Persons with a dominant or persuasive personality often have considerable impact on others through their ability to create confidence, which enhances suggestibility. Many individuals who are taken in by a charlatan later tell their doctors, "But he talked to me; he explained things; he was so nice."

Individuals who are psychologically susceptible to suggestion often feel better under the influence of counseling or reassurance. Several years ago, an airline flight attendant told me, "I take a multivitamin pill that Consumer Reports says is useless. But I don't care. It makes me happy."

Gullibility and wishful thinking are common human characteristics. People are willing to believe in untrue things in varying ways and to varying degrees. Even scientifically sophisticated people may respond to the power of suggestion.

In medicine the effect of suggestion is referred to as the "placebo effect." The Latin word placebo means "I shall please." A placebo effect is a beneficial response to a substance, device, or procedure that cannot be accounted for on the basis of pharmacologic or other direct physical action. Feeling better when the physician walks into the room is a common example.

A placebo may be used in medicine to satisfy a patient that something is being done. By lessening anxiety, placebo action may alleviate symptoms caused by the body's reaction to tension (psychosomatic symptoms). In certain circumstances, a lactose tablet (sugar pill) may

relieve not only anxiety but also pain, nausea, vomiting, palpitations, shortness of breath, and other symptoms. The patient expects the "medication" to cause improvement, and sometimes it does.

Many studies suggest that placebos can relieve a broad range of symptoms. In many disorders, one third or more of patients will get relief from a placebo. Temporary relief has been demonstrated, for example, in arthritis, hay fever, headache, cough, high blood pressure, premenstrual tension, peptic ulcer, and even cancer. The psychologic aspects of many disorders also work to the healer's advantage. A large percentage of symptoms either have a psychologic component or do not arise from organic disease. Hence, treatment offering some lessening of tension can often help. A sympathetic ear or reassurance that no serious disease is involved may prove therapeutic by itself. Psychologist Barry Beyerstein, Ph.D., has observed:

Pain is partly a sensation . . . and partly an emotion. . . . Anything that can allay anxiety, redirect attention, reduce arousal, foster a sense of control, or lead to . . . reinterpretation of symptoms can alleviate the agony component of pain. Modern pain clinics put these strategies to use every day. Successful quacks and faith healers typically have charismatic personalities that make them adept at influencing these psychological variables that can modulate pain. . . . But we must be careful that purely symptomatic relief does not divert people from proven remedies until it is too late for them to be effective [2].

Confidence in the treatment −− on the part of the patient and the practitioner −− makes it more likely that a placebo effect will occur. But the power of suggestion may cause even a nonbeliever to respond favorably. The only requirement for a placebo effect is the awareness that something has been done. It is not possible to predict accurately or easily a particular patient's reaction to a placebo at a particular moment. However, the psychologic predisposition to respond positively to placebos is present to some extent in most people. Some are very likely to obtain relief from placebos in a wide variety of situations, whereas others are very unlikely to do so. Most people's response lies somewhere inbetween.

Another factor that can mislead people is selective affirmation −− a tendency to look for positive responses when improvement is expected. As former National Council Aghainst Health Fraud president William T. Jarvis, Ph.D., has noted:

A culturally significant setting can also produce a potent effect, as folk healers know well. Effective settings can be as divergent as the trappings of an oriental herb shop to Asians, a circle of witchcraft paraphernalia to a primitive tribesman, or the atmosphere of a modern clinic to a modern urban American. Social expectations can also play a role, as occurs in stoic cultures where people are taught to endure pain and suffering without complaining. . . .

Operant conditioning can occur . . . when behavior is rewarded. . . . Thus, people with a history of favorable responses to treatment are more apt to react well to the act of treatment [3].

Moreover, says Dr. Jarvis:

People suffering from chronic symptoms are often depressed, and depression often produces symptoms that the patient attributes to the underlying disease. If the quack's promises make the patient feel hopeful, the depressive symptoms may resolve, leading the patient to conclude −− at least temporarily −− that the quack's approach has been effective against the disease [4].

Responses to the treatment setting can also be negative ("nocebo effects"). In one experiment, for example, some subjects who were warned of possible side effects of a drug were given injections of a placebo instead. Many of them reported dizziness, nausea, vomiting, and even mental depression. A recent review of 109 double−blind drug trials found that the overall incidence of adverse events in healthy volunteers during placebo administration was 19% [5].

Placebo responses, such as feeling less pain or more energy, do not affect the actual course of the disease. Thus placebo responses can obscure real disease, which can lead to delay in obtaining appropriate diagnosis or treatment.

The placebo effect is not limited to drugs but may also result from procedures [6]. Devices and physical techniques often have a significant psychologic impact. Chiropractors, naturopaths, and various other nonmedical practitioners use heat, light, diathermy, hydrotherapy, manipulation, massage, and a variety of gadgets. In addition to any physiologic effects, their use can exert a psychologic force that may be reinforced by the relationship between the patient and the practitioner. Of course, devices and procedures used by scientific practitioners can also have placebo effects.

Ethical Considerations
Doctors are confronted by many people who complain of tiredness or a variety of vague symptoms that are reactions to nervous tension. Far too often, instead of finding out what is bothering them, doctors tell them to take a tonic, a vitamin, or some other type of placebo.

A recent study has challenged the widely held view that the placebo effect is a major factor in the outcome of clinical trials. Most placebo−controlled trials compare the active treatment with a placebo, not with no treatment. This design cannot distinguish an effect of placebo from the natural course of the disease, regression to the mean (the tendency for random increases or decreases to be followed by observations closer to the average), or the effects of other factors. After analyzing 114 randomized trials that had a "no−treatment" group in addition to active treatment and placebo groups, the authors

concluded:

Placebos appeared to produce modest benefit in studies of pain and in other studies where the outcome being measured was similarly subjective.
Some of the reported benefit may be the result of placebos may be the result of patients wishing to please their doctors.
There is no justifiable placebo use outside of clinical trials [7].
An accompanying editorial stated that placebo use should be sharply reduced but may still be justified in carefully selected situations where pain relief is needed [8]. The study also casts doubt on the widely promoted notion that "alternative methods" may work by stimulating a placebo effect

Quacks who rely on the placebo effect pretend that (a) they know what they are doing, (b) they can tell what is wrong with you, and (c) their treatment is effective for just about everything. Many of their patients play the equivalent of Russian roulette. Medical doctors who use vitamins as placebos may not be as dangerous, but they encourage people to habitually use products they don't need. Because most people who use placebos do not get relief from them, their use is also a financial rip−off.

References

Young JH. Why quackery persists. In Barrett S, Jarvis WT, editors. The Health Robbers: A Close Look at Quackery in America. Amherst, N.Y., 1993, Prometheus Books.
Beyerstein BL. Testing claims of therapeutic efficacy. Rational Enquirer 7(4):1−2, 8, 1995.
Jarvis WT. Arthritis: Folk remedies and quackery. Nutrition Forum 7:1−3, 1990.
Jarvis WT. Personal communication to Dr. Stephen Barrett, Dec 18, 2001.

Rosensweig P and others. The placebo effect in healthy volunteers: Influence of experimental conditions on the adverse events profile during phase I studies. Clinical Pharmacology and Therapeutics 54:578−583, 1993.
Turner JA and others. The importance of placebo effects in pain treatment and research. JAMA 271:1609−1614, 1994.
Hrobjartsson A, Gotzsche PC. Is the placebo powerless? An analysis of clinical trials comparing placebo with no treatment. NEJM 344:1594−1602, 2001.
Bailar JC III. The powerful placebo and the Wizard of Oz. NEJM 344:1630−1632, 2001.
Testimony against the Access to Medical Treatment Act (H.R. 746)
http://quackwatch.org/07PoliticalActivities/moore.html

Testimony against the
Access to Medical Treatment Act (H.R. 746)
Thomas J. Moore

On February 4 and 12, 1998, the House of Representatives Government Reform and Oversight Committee held hearings on the Access to Medical

Treatment Act, a bill intended to prevent government "interference" with unscientific practitioners. Mr. Moore was the only witness who testified against the bill. This was his prepared statement.

Should consumers, especially those with a serious or life threatening illness, have the right to any drug or alternative medicine even though it has not been proven safe and effective and approved by the Food and Drug Administration?

Let me tell a story of what could happen if that were the case. In this age of media hype, it is plausible that literally millions of Americans could be persuaded to take a pill every day that they hoped would prevent cancer −− especially if it included some natural ingredient or a vitamin.

Suppose that long after millions of people were popping this cancer prevention pill, proper, expensive randomized clinical trials were finally conducted to see if the hoped for benefits in fact existed.

Now suppose that those clinical trials−the only real scientific evidence we have whether drugs work or not −− showed that these anti−cancer pills either didn't work at all −− or actually caused lung cancer. Millions of Americans would be spending their hard earned money on a remedy that at best was ineffective−and at worst could give them cancer.

Am I telling you a fanciful, alarmist story? This is a true story. It already happened −− and the treatment involved was beta−carotene supplements. Like so many new drug treatments, it sounded promising but proved to be worthless or harmful when tested [1,2].

Humans have dreamed of powerful medicines since the dawn of history. But for most of the last seven thousand years consumers were mostly victims of hazardous, poisonous, or merely unpleasant drugs. The era of modern beneficial drugs began only a few decades ago when society began to insist that drugs be tested for safety and efficacy in well controlled clinical investigations. Real progress began only when we used randomized clinical trials to separate beneficial drugs from those that were worthless or harmful.

This morning you have heard some dramatic stories from individuals who believe they were greatly helped −− perhaps saved −− by a treatment that is not available in the United States. The question therefore is should Americans have access to a medical treatment if there are individuals who can personally testify that it is valuable?

The most simple test case would be a remedy for obesity. Here seems to be a treatment every consumer can judge. Either you lose weight or you don't. Suppose for our test case that the FDA had approved the drugs−so

they had been subject to at least modest levels of safety testing. Should not then the consumer−and not government regulators or health authorities−be the judge this treatment?

You all ought to know the answer to this question. This episode also happened, and the result may turn out to be one of the greatest drug disasters that our nation has experienced. Last September the diet drugs Pondimin and Redux were hastily withdrawn after the FDA received evidence that an astonishing 31% of the people tested showed some evidence of damage to their heart valves [3,4]. At the time, more than 5 million Americans were taking these drugs.

Did the consumers notice? Could they judge for themselves? They could not. Until it became very severe, the heart damage had no symptoms. Did their doctors notice? They did not. Pondimin was on the market for more than 20 years before two alert medical workers in North Dakota noticed something suspicious. What is the first lesson of the diet drug debacle?

Not only does it take systematic testing to discover whether drugs work, it also takes systematic scientific study to discover serious adverse effects that are potentially harming millions of people. If we don't have the proper safety system in place, people will be harmed for years or decades. In their potential to harm millions of people there are few rivals for drug treatments −− whether they are mainstream prescription drugs or alternative remedies. This is exactly why society has erected the safeguards now being examined in this hearing.

Another aspect of the issue today is more difficult. Should people with advanced cancer, or Parkinsons Disease or full−blown AIDS have the right to any treatment they choose? Some of these people might not live long enough for the kind of drug testing I believe so important to protecting the public. Should they not be entitled to take any risks they choose?

On the surface, the case for individual liberty seems compelling. However, another example will illustrate the dark problems underlying this seemingly straightforward idea.

Suppose you are dying of cancer, and I offer you this ghoulish shell game. In one of my hands, I have hidden a treatment that might save your life. In the other hand, is a quack medicine that will make you so sick you can hardly get out of bed, and will hasten your death. I can give you a free choice. But which hand holds the lifesaving drug? The left hand? Or the right hand?

This is not a meaningful choice. Without extensive drug testing we just can't tell which hand holds a dangerous poison, and which conceals the life saving drug. Without proper testing even a potentially life saving treatment may be harmful if given in the wrong dose, or to the wrong patients. I want people to have choices too. But they should be real

choices, involving scientific data about how much harm and good various treatment alternatives can be expected to achieve.

We have only one proven solution. We need public policies to promote more drug testing, not still more new loopholes that could endanger the heath and safety of millions of people.

Some may ask, "But aren't people going denied a life−saving treatment for the several years it takes for human testing and drug evaluation?" My answer is that we don't know that it is a life−saving drug until it is tested. Even if proven life−saving, we can't truly hope to save lives until we have done enough testing to know how to use it properly. The history of modern drug treatment includes many cases of valuable drugs that proved ineffective or harmful because they were used in the wrong patients, or at the wrong time in the progression of a disease [5,6]. Until it is tested, and we know how to use it, a drug cannot properly considered a life−saving treatment.

Alternative medicines pose special problems that deserve the attention of this committee. They are falling between the cracks of the system we have devised to search for new medicines. Large drug companies are expected to invest millions of dollars in the elaborate drug testing we wisely require. In return they are granted patents that are so lucrative that a single blockbuster drug can sustain an entire multinational pharmaceutical giant. This system has provided many beneficial medicines, but at a price. Only large firms can afford the extensive testing required by law. Large organizations tend to follow conventional thinking; daring innovators often work alone or in small firms. It is certainly possible there are neglected therapies that involve common molecules or natural ingredients that cannot be readily patented. Also there may be promising scientific avenues of advance that were ignored or abandoned by mainstream medical research and its partners in the pharmaceutical industry. The tiny office in the National Institutes of Health devoted to alternative therapies doesn't have even a fraction of the resources needed to investigate the most promising leads.

What is needed is money and a structure to target research and assign priorities. The funds could be come from general tax receipts −− as do the funds for the National Institutes of Health. Or the research could be financed by a small tax paid by industry. I believe that consumers would be willing to pay an extra amount to insure they got a product that might benefit their health rather than harming it. The policy problem is to figure out how to get the necessary scientific testing done. The solution is not to expose more Americans to untested and possibly ineffective or harmful compounds.

Finally, I would like to address the issue of the FDA and experimental cancer treatments. My main concern is that there is already too much experimental treatment of cancer patients rather than not enough.

A survey by the General Accounting Office showed that 23% of all cancer patients receive an experimental treatment; another GAO study estimated that about 56 percent of cancer patients receive a drug for off−label use −− which can be considered quasi−experimental use of an approved drug [7,8]. Despite the billions we spend on research and treatment, the mortality rate from cancer is higher today than it was in 1970, despite dramatic declines in most other major causes of death [9]. The use of so much experimental treatment may be one important reason we have had such disappointing results. Does the U.S. Congress want to expose more patients to experimental cancer agents without the safeguards required for formal National Cancer Institute protocols or human drug testing studies under FDA supervision?

Finally, some people seem to believe that heartless FDA bureaucrats are somehow keeping valuable drugs away from people in life or death situations. I have published articles and books filled with criticism of the FDA, detailing many failings and numerous ways it could do a better job. But I also am here to testify that after 20 years in Washington I have not found a group of more capable public servants more sincerely dedicated to protecting the American public. By the large, they work at a thankless task under very difficult circumstances, and I for one, have great respect for their efforts.

In conclusion, I believe the central issue before the committee today is not access to treatment, but assuring that the proper and necessary drug testing is conducted to insure that both mainstream medical therapies and alternative medicines help rather than harm people. That is easier said than done. But with sound public policies, we can move towards this goal. However, if Congress abandons the essential safeguards of drug testing, there is no limit to the harm that may occur.

References

1. Omenn GS and others. Effects of a combination of beta carotene and vitamin A on lung cancer and cardiovascular disease. New England Journal of Medicine 334:1150−1155, 1996.
2. Hennekens CH and others. Lack of effect of long−term supplementation with beta carotene on the incidence of malignant neoplasms and cardiovascular disease. New England Journal of Medicine 334:1145−1149, 1996.
3. HHS News. FDA Announces withdrawal of Fenfluramine and Dexfenfluramine. U.S. Department of Health and Human Services, Food and Drug Administration, Office of Public Affairs, September 15, 1997.
4. Department of Health and Human Services, Food and Drug Administration, Division of Pharmacovigilance and Epidemiology. FDA analysis of cardiac valvular dysfunction with use of appetite suppressants. briefing paper. Undated.
5. Concorde Coordinating Committee. Concorde: MRC/ANRS randomized double−blind controlled trial of immediate and deferred zidovudine in symptom−free HIV infection. Lancet 343:871−881, 1994.
6. Echt, DS and others. Mortality and morbidity in patients receiving

Encainide, Flecainide or placebo. New England Journal of Medicine 324:781−788, 1991.
7. United States General Accounting Office. Off−Label Drugs: Initial Results of a National Survey. Washington, D.C.: U.S. General Accounting Office. GAO/PEMD−91−12BR, February, 1991.
8. United States General Accounting Office. Off−Label Drugs: Reimbursement Policies Constrain Physicians in their Choice of Cancer Therapies. Washington. D.C.: U.S. General Accounting Office GAO/PEMD−91−14, September. 1991.
9. Moore, TJ. Look at the mortality rates: The 'War on Cancer' has been a bust. The Washington Post; July 23. 1997, editorial page.
10. Moore TJ. Deadly Medicine: Why Tens of Thousands of Heart Patients Died in America's Worst Drug Disaster. New York: Simon & Schuster, 1995.
11. Moore, TJ. Prescription for Disaster. The Hidden Dangers in Your Medicine Chest. New York: Simon & Schuster, 1998.

About the Author

Mr. Moore, a senior fellow at the George Washington University's Center for Health Policy Research, specializes in issues involving prescription drug safety. His writings have appeared in many magazines and newspapers. His most recent book is Prescription for Disaster: the Hidden Dangers in Your Medicine Cabinet, an examination of the risks of prescription drugs and the performance of the safety system intended to control those risks. His previous book, Deadly Medicine: Why Tens of Thousands of Heart Patients Died in America's Worst Drug Disaster, was a case study exploring why a family of drugs for irregular heartbeats was so widely used without researchers and regulators realizing the drugs frequently caused cardiac arrest. He has testified before Congress and lectured at universities and other research institutions about drug safety and other issues involving the medical care system. Before turning to full−time research and writing on health policy issues in 1988, he was a national correspondent in Washington for the Knight−Ridder newspaper chain. He also has worked on the staff of the U.S. Senate.

Some Notes on the Nature of Science

http://quackwatch.org/01QuackeryRelatedTopics/science.html

Some Notes on the Nature of Science

Joe Schwartz, Ph.D.
Stephen Barrett, M.D.

The scientific method offers an objective way to evaluate information to determine what is false. The late astronomer Carl Sagan, Ph.D., has pointed out that "Science is a way of thinking much more than it is a body of facts [1].

A 1998 National Academy of Sciences book contains a superb chapter that distinguishes between facts and theories and between scientific beliefs and faith [2]. Although the book focuses on evolution, its reasoning is equally applicable to health−related issues. The book states:

In scientific terms, "theory" does not mean "guess" or "hunch" as it does in everyday usage. Scientific theories are explanations of natural

phenomena built up logically from testable observations and hypotheses.
. . .

Scientists most often use the word "fact" to describe an observation. But scientists can also use "fact" to mean something that has been tested or observed so many times that there is no longer a compelling reason to keep testing or looking for examples. . . .

Usually "faith" refers to beliefs that are accepted without empirical [observed] evidence. Most religions have tenets of faith. Science differs from religion because it is the nature of science to test and retest explanations against the natural world. Thus, scientific explanations are likely to be built on and modified with new information and new ways of looking at old information. This is quite different from most religious beliefs.

Therefore, "belief" is really not an appropriate term to use in science, because testing is such an important part of this way of knowing. If there is a component of faith to science, it is the assumption that the universe operates according to regularities. . . . This "faith" is very different from religious faith.

The following ideas can help you evaluate information you encounter about science and health.

Science is a truth−seeking process. It is not a collection of unassailable "truths." It is, however, a self −correcting discipline. Such corrections may take a long time −− the medical practice of bloodletting went on for centuries before its futility was realized −− but as scientific knowledge accumulates, the chance of making substantial errors decreases.
Certainty is elusive in science, and it is often hard to give categorical "Yes" or "No" answers to scientific questions. To determine whether bottled water is preferable to tap water, for example, one would have to design a lifelong study of two large groups of people whose lifestyles were similar in all respects except for the type of water they consumed. This is virtually impossible. We therefore have to rely on less−direct evidence in formulating many of our conclusions.
It may not be possible to predict all consequences of an action, no matter how much advance research has been done. When chlorofluorocarbons (CFCs) were introduced as refrigerants, no one could have predicted that 30 years later they would have an impact on the ozone layer. If something undesirable happens, it is not necessarily because someone has been negligent.
Any new finding should be examined with skepticism. Healthy skepticism does not mean unwillingness to believe. Skeptics base their beliefs on scientific proof and do not swallow information uncritically.
No major lifestyle change should be based on any one study. Results should be independently confirmed by others. Keep in mind that science does not proceed by "miracle breakthroughs" or "giant leaps." It plods along, taking many small steps, slowly building towards a consensus.

Studies have to be carefully interpreted by experts in the field. An association of two variables does not necessarily imply cause and effect. As an extreme example, consider the strong association between breast cancer and the wearing of skirts. Obviously, wearing skirts does not cause the disease. Scientists, however, sometimes show an amazing aptitude for coming up with inappropriate rationalizations for their pet theories.

Repeating a false notion does not make it true. Many people are convinced that sugar causes hyperactivity in children −− not because they have examined studies to this effect but because they have heard that it is so. In fact, a slate of studies has demonstrated that, if anything, sugar has a calming effect on children.

Nonsensical lingo can sound very scientific. An ad for a type of algae states that "the molecular structure of chlorophyll is almost the same as that of hemoglobin, which is responsible for carrying oxygen throughout the body. Oxygen is the prime nutrient and chlorophyll is the central molecule for increasing oxygen available to your system." This is nonsense. Chlorophyll does not transport oxygen in the blood.

There often are legitimate opposing views on scientific issues. But it is incorrect to conclude that science cannot be trusted because for every study there is all equal and opposite study. It is always important to take into account who carried out a given study, how well it was designed, and whether anyone stands to gain financially from the results. Be mindful of who the "they" is in "they say that . . . ." In many cases, what they say" is only gossip, inaccurately reported.

Animal studies are not necessarily relevant to humans, although they may provide much valuable information. Penicillin, for example, is safe for humans but toxic for guinea pigs. Rats do not require vitamin C as a dietary nutrient but humans do. Feeding high doses of a suspected toxin to test animals for short periods of time may not accurately reflect the effect on humans exposed to tiny doses over long periods of time.

Whether a substance is a poison or a remedy depends on the dosage. It makes no sense to talk about the effects of certain substances on the body without talking about amounts. Licking an aspirin tablet will do nothing for a headache, but swallowing two tablets will make the headache go away. Swallowing a whole bottle of pills will make the patient go away.

"Chemical" is not a dirty word. Chemicals are the building blocks of our world. They are neither good nor bad. Nitroglycerin can alleviate the pain of angina or blow up a building. The choice is ours.

Furthermore, there is no relation between the risk posed by a substance and the complexity of its name. "Dihydrogen monoxide" is just water.

Nature is not benign. The deadliest toxins known, such as ricin from castor beans or botulin from the Clostridium botulinum bacterium, are perfectly natural. "Natural" does not equal "safe," and "synthetic" does not equal "dangerous." The properties of any substance are determined by its molecular structure, not by whether it was synthesized by a chemist in a lab or by nature in a plant.

Perceived risks are often different from real risks. Food poisoning from microbial contamination is a far greater health risk than trace

pesticide residues oil fruits and vegetables.
The human body is incredibly complex. Our health is determined by many variables, which include genetics, our diet, our mother's diet during pregnancy, stress, level of exercise, exposure to microbes, exposure to occupational hazards, and pure luck.
While diet clearly plays a role in the promotion of good health, the effectiveness of specific foods or nutrients in the treatment of diseases is usually overstated. Individual foods are not good or bad, although overall diet may be described as such. The wider the variety of foods consumed, the smaller the chance that important nutrients will be lacking. There is universal agreement among scientists that a high consumption of fruits and vegetables is beneficial.
About 80% of illnesses are self−limiting and will resolve in response to almost any kind of treatment. Often, a remedy will receive undeserved credit. Anecdotal evidence is unreliable, because positive results are much more likely to be reported than negative ones.
There is no goose that lays golden eggs. In other words, if something sounds too good to be true, it probably is. As H.L. Mencken once said, "Every complex problem has a solution that is simple, direct, plausible, and wrong."
References

Sagan C. The fine art of baloney detection. Parade Magazine, p 12-13, Feb 1, 1987.
National Academy of Sciences Working Group on Teaching Evolution. Teaching about Evolution and the Nature of Science. Washington, DC: National Academy Press, 1998.

_____

Dr. Schwarcz is director of McGill University's Office for Chemistry and Society. In addition to teaching chemistry at McGill, he hosts a weekly "phone−in" show about chemistry on Montreal radio station CJAD, writes a weekly column called "The Right Chemistry" in the Montreal Gazette, and has a regular TV feature entitled "Joe's Chemistry Set" on the Canadian Discovery Channel. The above list of 18 tips was adapted from a section of his book Radar, Hula Hoops and Playful Pigs, a collection of commentaries on the fascinating chemistry of everyday life.

Why Bogus Therapies Often Seem to Work

http://quackwatch.org/01QuackeryRelatedTopics/altbelief.html

Why Bogus Therapies Often Seem to Work
Barry L. Beyerstein, Ph.D.
Subtle forces can lead intelligent people (both patients and therapists) to think that a treatment has helped someone when it has not. This is true for new treatments in scientific medicine, as well as for nostrums in folk medicine, fringe practices in "alternative medicine," and the ministrations of faith healers.

Many dubious methods remain on the market primarily because satisfied customers offer testimonials to their worth. Essentially, these people say: "I tried it, and I got better, so it must be effective." The electronic and print media typically portray testimonials as valid evidence. But without proper testing, it is difficult or impossible to determine whether this is so.

There are at least seven reasons why people may erroneously conclude that an ineffective therapy works:

1. The disease may have run its natural course. Many diseases are self−limiting. If the condition is not chronic or fatal, the body's own recuperative processes usually restore the sufferer to health. Thus, to demonstrate that a therapy is effective, its proponents must show that the number of patients listed as improved exceeds the number expected to recover without any treatment at all (or that they recover reliably faster than if left untreated). Without detailed records of successes and failures for a large enough number of patients with the same complaint, someone cannot legitimately claim to have exceeded the published norms for unaided recovery.

2. Many diseases are cyclical. Such conditions as arthritis, multiple sclerosis, allergies, and gastrointestinal problems normally have "ups and downs." Naturally, sufferers tend to seek therapy during the downturn of any given cycle. In this way, a bogus treatment will have repeated opportunities to coincide with upturns that would have happened anyway.

3. The placebo effect may be responsible. Through suggestion, belief, expectancy, cognitive reinterpretation, and diversion of attention, patients given biologically useless treatments often experience measurable relief. Some placebo responses produce actual changes in the physical condition; others are subjective changes that make patients feel better even though there has been no objective change in the underlying pathology.

4. People who hedge their bets credit the wrong thing. If improvement occurs after someone has had both "alternative" and science−based treatment, the fringe practice often gets a disproportionate share of the credit.

5. The original diagnosis or prognosis may have been incorrect. Scientifically trained physicians are not infallible. A mistaken diagnosis, followed by a trip to a shrine or an "alternative" healer, can lead to a glowing testimonial for curing a condition that would have resolved by itself. In other cases, the diagnosis may be correct but the time frame, which is inherently difficult to predict, might prove inaccurate.

6. Temporary mood improvement can be confused with cure. Alternative healers often have forceful, charismatic personalities. To the extent

that patients are swept up by the messianic aspects of "alternative medicine," psychological uplift may ensue.

7. Psychological needs can distort what people perceive and do. Even when no objective improvement occurs, people with a strong psychological investment in "alternative medicine" can convince themselves they have been helped. According to cognitive dissonance theory, when experiences contradict existing attitudes, feelings, or knowledge, mental distress is produced. People tend to alleviate this discord by reinterpreting (distorting) the offending information. If no relief occurs after committing time, money, and "face" to an alternate course of treatment (and perhaps to the worldview of which it is a part), internal disharmony can result. Rather than admit to themselves or to others that their efforts have been a waste, many people find some redeeming value in the treatment. Core beliefs tend to be vigorously defended by warping perception and memory. Fringe practitioners and their clients are prone to misinterpret cues and remember things as they wish they had happened. They may be selective in what they recall, overestimating their apparent successes while ignoring, downplaying, or explaining away their failures. The scientific method evolved in large part to reduce the impact of this human penchant for jumping to congenial conclusions. In addition, people normally feel obligated to reciprocate when someone does them a good turn. Since most "alternative" therapists sincerely believe they are helping, it is only natural that patients would want to please them in return. Without patients necessarily realizing it, such obligations are sufficient to inflate their perception of how much benefit they have received.

Buyer Beware!
The job of distinguishing real from spurious causal relationships requires well designed studies and logical abstractions from large bodies of data. Many sources of error can mislead people who rely on intuition or informal reasoning to analyze complex events. Before agreeing to any kind of treatment, you should feel confident that it makes sense and has been scientifically validated through studies that control for placebo responses, compliance effects, and judgmental errors. You should be very wary if the "evidence" consists merely of testimonials, self−published pamphlets or books, or items from the popular media.

Related Topics
Spontaneous Remission and the Placebo Effect
Common Questions about Science and "Alternative" Health Methods
Why Extraordinary Claims Demand Extraordinary Proof
How Quackery Sells
Response to an Alt−Muddled Friend

———————

Dr. Beyerstein, a member of the executive council of the Committee for Scientific Investigation of Claims of the Paranormal (CSICOP), is a

biopsychologist at Simon Fraser University in Burnaby, British Columbia, Canada. A more detailed discussion of this topic is one of six superb articles on "alternative medicine" in the Sept/Oct 1997 issue of CSICOP's Skeptical Inquirer magazine, which costs $7.50. An introductory (six−issue) subscription at the special Internet price of $16.95 can be obtained by calling (800) 634−1610.

This article was posted on July 24, 2003.

Ways to Spot an Internet Bandit
http://quackwatch.org/04ConsumerEducation/BookContents/spotban.html

Fifteen Ways to Spot an Internet Bandit
by Daniel J. Barrett

>>From Bandits on the Information Superhighway

Hidden name or address. Don't conduct business with users unless they reveal their name, address, and phone number. Beware of users who try to buy or sell things using an anonymous email address *like anon12345@anon.penet.fi) or a post office box.
Uncheckable references. "As seen on Donahue!" "The subject of hundreds of newspaper articles!" These credentials sound impressive, but notice that you aren't given enough information (dates, newspaper names) to look them up.
Too much talk about money, not enough about the deal. Scammers try to blind you with dreams of becoming rich, so you won't notice the fine print. Watch out for bogus "profit charts" promising easy wealth.
"This is not a scam." Scammers say this all the time. They might even cite specific laws that "prove" their legality. Don't fall for this trick. A legitimate business doesn't spend time "convincing" you of its honesty.
Requests for your credit card number. Don't send your credit card number to anybody by email. If your mail software supports encryption, this can help protect the number, but it may not be foolproof. Some encryption techniques are better than others.
Pyramid shape. Are you asked to send money to (say) five people, who each send money to five more people, who each send money to five more people, and so on? Then you are very likely looking at an illegal pyramid scheme.
Spamming. People who post huge numbers of identical articles online are forcing you to pay the bill.
Too much knowledge about you. Take notice if a newfound "Net friend" suddenly knows details about you that you have not revealed.
LOTS OF CAPITAL LETTERS and punctuation!!! Be skeptical of ads that shout at you, like "MIRACLE CURE!!!" or "Learn how to make BIG $$$$$ MONEY in NO TIME AT ALL!!!!!
Pay before you play. The details of the offer are kept hidden until after you pay a fee. But what happens if the details turn out to be

junk? You lose. Remember that "money−back−guarantees" from strangers may be worthless.

Hidden costs. Watch out for ads that shout "it won't cost you a penny to get started" and then quietly charge you an "entrance fee."

"Secret" method available "only to a limited number of people." A typical scam ad reaches thousands or millions of users. That's a strange way to reveal a secret! Scammers accept a "limited number" of responses so they can close their business quickly and run away with people's money.

Requests for your password. Never reveal your password to anybody. Your system administrator never needs to ask you for it. If somebody asks you to change your password to a known word for"system testing," be immediately suspicious; this is a well−known cracker trick.

Unsolicited email. If you get email from a stranger out of the blue, offering to give or sell you something, treat it with suspicion.

Inappropriate questions. If a "Net friend" you hardly know starts asking very personal questions or tries to borrow money from you, be on your guard.