

## CHAPTER 10

# EVALUATING HEALTH CLAIMS IN ALTERNATIVE MEDICINE

No one likes to be sick, feel unwell, catch an illness, or have a disease. Most of us would (and do) go to great lengths, spending large amounts of time and huge sums of money, to avoid illness. In the United States alone, best estimates are that we spend close to \$3 *trillion* per year on health care, or about \$10,000 per person (World Health Organization, n.d.). Although this number will obviously vary among countries, especially those with socialized medicine, health care costs nonetheless are a significant portion of most developed countries' total spending, around 8% to 10% of gross domestic product (GDP) in western Europe and South Africa, for example.

Given the trillions and trillions of dollars spent on health care every year, it seems imperative to make sure that this money is used wisely, both for the benefit of the individual consumer and the overall health of the world's economy. An especially pertinent question from a scientifically skeptical viewpoint is this: Does this treatment work for the problem? The answer to this question underlies this chapter and the next two, where we will carefully examine the claims and evidence for a variety of treatments that fall under the umbrella term of "complementary and alternative medicine (CAM)"<sup>1</sup> used to treat physical and mental health problems. Before doing that, though, we need to have some solid operational definitions in place for the often-confusing litany of terms that are thrown about when discussing this topic.

## DEFINING TERMS AND LEVELS OF EVIDENCE

The National Center for Complementary and Integrative Health (NCCIH) offers guidance in helping people sort out the various terms and meanings. Broadly speaking, alternative medicine and complementary medicine are those "health care approaches developed outside of mainstream Western, or conventional, medicine" (NCCIH, n.d.) Alternative practices are used in place of conventional methods, whereas complementary practices are used together

<sup>1</sup> Others who are a bit less generous than we are use the term "so-called alternative medicine" to refer to these practices. We will let our readers work out that acronym for themselves.

with conventional methods. More recently, many CAM proponents have begun using the term “integrative” health care to describe “conventional and complementary approaches together in a coordinated way” (NCCIH, n.d.).

## Evidence-Based Practice

Contrast these definitions with that of evidence-based practice (EBP). EBP has been defined as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients” (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). Another definition describes it as “healthcare practice that is based on integrating knowledge gained from the best available research evidence, clinical expertise, and patients’ values and circumstances” (Dickersin, Straus, & Bero, 2007). In the real world, this often translates into using medicines, therapies, and diagnostic assessment methods that have been demonstrated to be effective via well-controlled clinical trials. Although a relatively new term, the concept of EBP dates back over 2,000 years to Hippocrates: “There are in fact two things, science and opinion; the former begets knowledge, the latter ignorance.” As the father of Western medicine, Hippocrates realized that good, quality evidence was needed to be able to declare treatments effective (Singh & Ernst, 2008).

Unfortunately, most practitioners throughout history have not practiced what Hippocrates preached, instead relying on personal beliefs and anecdotes to guide their use of various medicines and techniques. But with the arrival of scientifically informed and tested medicine, EBP has “revolutionized medical practice, transforming it from an industry of charlatans and incompetents into a system of healthcare that can deliver such miracles as transplanting kidneys, removing cataracts, combating childhood diseases, eradicating smallpox and saving literally millions of lives each year” (Singh & Ernst, 2008, p. 7). Indeed, the earliest practitioners of EBP were responsible for challenging some very well-established and, in hindsight, horrendous practices, including bloodletting and ingesting mercury (a toxic heavy metal) as a cure for any illness. Physicians and nurses, such as Ignaz Semmelweis and Florence Nightingale, were key in the fight for improved sanitary conditions in hospitals by letting the data and evidence guide their practices, rather than tradition and authority.<sup>2</sup>

## Levels of Evidence

One thing you will notice in the preceding operational definitions is that EBP refers to a method of making decisions, whereas CAM refers to a type of treatment. In other words, EBP starts with the patient and asks what is

<sup>2</sup> Sadly, despite being guided by evidence and having large amounts of data to support their ideas both were ridiculed by physicians of the day, who took great offense to their suggestions and attacked them in print and verbally. Those cognitive biases we covered in Chapter 5 have always been with us.

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the best evidence for what will help to achieve a particular outcome (e.g., symptom relief or disease avoidance). As such, from the standpoint of a practitioner using EBP, there are not “alternative” or “conventional” treatments. Instead, there are three types of treatments, each with varying levels of evidence for its use or nonuse:

- Evidence-based treatments (EBTs)—those procedures, medications, and the like that have been reliably shown to cause improvement in various symptoms
- Non-EBTs—those procedures, medications, and the like that have been shown *not* to cause improvement in various symptoms
- Poorly studied treatments (PSTs)—those procedures, medications, and the like that have not been studied well enough to determine their impact on various symptoms, or for which there is conflicting evidence regarding their effectiveness


It is crucial to be aware of which treatments improve what symptoms, as not all treatments are equally effective for treating everything. Contrary to the claims of snake-oil salesmen of the 1800s and 1900s, who offered various tinctures and concoctions as a cure-all for anything that ails you, there are no treatments that will act as a panacea and fix all disease or illnesses. Likewise, a medication or procedure that is effective at treating one problem is not guaranteed to work for others, so claims for treatment must be evaluated individually. To illustrate this point, we can take a look at antibiotics. Undoubtedly one of the triumphs of modern medicine, antibiotics of various kinds are effective at treating a wide range of problems caused by bacteria. So, although they are EBTs for *Streptococcus* or *Staphylococcus* infections, antibiotics are simultaneously non-EBTs for viral infections, such as influenza or the common cold. For yet another problem, antibiotics also could be a PST. As we see in the next chapters, this is an important point to keep in mind when examining CAM.

A final aspect to consider in the discussion between EBT, non-EBT, and PST is that the categories are not static. In other words, treatments can move from “mainstream” to “alternative” and vice versa. This can lead to significant confusion, such as when a practice formerly labeled as CAM because of a lack of research on its effects is soundly examined in controlled trials and found to actually be effective. For example, the NCCIH website provides a list of “10 most common complementary health approaches among adults” for the year 2012. Topping the list is “natural products” (vitamins and supplements), followed by “deep breathing.” But as we will see in the next chapter, there are a number of herbal supplements that have been repeatedly found to be useful for the treatment of specific problems. Likewise, the impact of “deep breathing” (often called diaphragmatic breathing) has


been well studied and found to help improve pulmonary functioning in asthmatics  be a good stress reducer. So deep breathing is an EBT for several problems, and as such could be considered in treatment plans developed by a practitioner using EBP for those specific problems.

## Changing Names and Kinds

This confusion among EBT, non-EBT, and PST has led to significant shifts in how certain governmental agencies in the United States discuss CAM. For instance, the National Institutes of Health (NIH)-sponsored NCCIH was formed in 1991 as the “Office of Alternative Medicine (OAM),” changed its name to the “National Center for Complementary and Alternative Medicine (NCCAM)” in 1998, and then changed it again to the current “National Center for Complementary and Integrative Health” in 2014. This appears to be, at least in part, due to the negative associations people may have with the term “alternative medicine.” Indeed, on the current version of their website it is actually difficult to find the word “alternative” used by the organization to discuss any of the practices described on their site, which is a major shift from the past. In fact, they say that “True alternative medicine is uncommon. Most people who use nonmainstream approaches use them along with conventional treatments” (NCCIH, n.d.).

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What is not detailed, though, is why NCCIH continues to describe treatments that should fall into the non-EBT category (for example, acupuncture or homeopathy) as being in the PST or even EBT categories, while describing EBT procedures or methods as being “complementary.” As Australian performer Tim Minchin says in his brilliant *beat poem Storm*, “By definition (I begin), alternative medicine (I continue) has either not been proved to work or been proved not to work. Do you know what they call alternative medicine that’s been proved to work? Medicine.” This conflation of various treatments with varying levels of evidence, lumping them together as “CAM” does no one any good, particularly those seeking effective health care options.

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This naming shift and confusion isn’t the only change that NCCIH has made, though. During its time as OAM and NCCAM, the organization listed five main types of CAM that it was studying or supporting research for, which were:

- Whole medical systems (e.g., homeopathy, naturopathy, Ayurvedic medicine, and traditional Chinese medicine, Bach flower remedies)
- Mind–body medicine (e.g., meditation, prayer, art therapy, music therapy)
- Biologically based practices (e.g., herbal and dietary supplements)
- Manipulative and body-based practices (e.g., chiropractic, massage, craniosacral therapy)
- Energy therapies (e.g., Reiki, acupuncture, therapeutic touch, electromagnetic therapy)

With the change in name, though, came a change in grouping, moving from five to two categories and a catch-all:

- Natural products (e.g., herbs, vitamins, minerals, probiotics, and other dietary supplements)
- Mind and body practices (e.g., yoga, chiropractic manipulation, massage, meditation, acupuncture, relaxation, hypnotherapy, movement therapies)
- Other complementary health approaches (includes naturopathy, homeopathy, traditional Chinese medicine, Ayurvedic medicine, and anything else that doesn't fit in the preceding two categories)

However they are grouped, the discerning scientifically minded physician, clinician, or other health care provider (and you, dear reader, by the end of this book) will see that there is a mix of EBT, non-EBT, and PST in the NCCIH's groupings and discussion of CAM. Treatments that have been well studied and supported (such as relaxation techniques) are placed side by side with both highly pseudoscientific non-EBTs (such as acupuncture, as we will) as well as PSTs (such as probiotics<sup>3</sup>). Given this conflation, we find it more effective to talk about the level of evidence available to support a given treatment for a given condition, rather than just lump medicine and therapy into CAM or conventional categories.

## GLOBAL USE OF CAM

Over the last 70 or so years, medical science has made enormous strides in improving the health of the planet's population. From the worldwide eradication of smallpox, which has saved an estimated 5 million lives annually, to the almost total erasure of deaths in developed countries from diseases like diphtheria, measles, mumps, rubella, and polio (United Nation's Children's Fund [UNICEF], n.d.), the success of scientifically guided medicine is undeniable. And that is just from the successful implementation of vaccines and routine immunizations! The major causes of death in developed countries have shifted massively over the past 100 years, moving from infectious diseases to "lifestyle" diseases such as heart disease or cancer. People have a longer life span than at any point in history, thanks in no small part to medical breakthroughs such as antibiotics, innovative surgeries, organ transplants, and more. It would seem that trust in "conventional" medicine should be exceedingly high, that the public would be clamoring for increasing amounts of it compared to any other form of treatment.

<sup>3</sup> Although there is an increasingly large amount of both basic and clinical research examining the impact of the microorganisms living in our gut with our physical and mental health, many of the health claims for ingestion of probiotic supplements are at this point not well supported.

Interestingly, though, during this same time period, there has been a steady rise in the use of CAM across the globe. Public acceptance and use of various non-EBTs or PSTs that are grouped under the CAM umbrella appear to have steadily increased since the 1970s, from an average of 14% of people in 1970 to over 32% by the 2010s (Frass et al., 2012). The most commonly used specific treatments worldwide are chiropractic manipulation, homeopathy, herbal medicines, acupuncture, and massage (most of the surveys did not include questions on “energy medicine,” so the rates of their usage are not well known).

Such high use rates aren’t cheap, either. Most recent findings put out-of-pocket costs for CAM in the United States at around \$34 billion per year (NIH, 2009). Add that to the estimates of \$7 billion spent in the United Kingdom each year, the \$3.1 billion in Australia, the \$320 million per year in South Africa, or the billions upon billions spent in other countries on treatments that have little to no evidence supporting their use (Mpinga et al., 2013) and it begins to look like a huge amount of money could be put to much better use. So (one might ask), why would people spend so much money on things that don’t work? Wouldn’t they realize these treatments were ineffectual and turn to something else for help? The answer to those questions is a bit complicated, but as we see in the next section, it boils down to “because they do work, just not for the reasons people think they do.”

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## PLACEBOS, REGRESSIONS, AND THEIR EFFECTS

As mentioned previously, physicians and other health care providers who use EBP rely on the findings from valid and reliable research studies (think back to Chapter 2) to decide what is most likely to work in the treatment of a patient’s problems. Two of the main reasons that good research is so critical to the development of EBTs is (a) how easily bias can creep into our everyday decision making (as discussed in Chapter 5) and (b) how influenced we are by powerful social forces, such as advertising (as discussed in Chapter 6). But a particularly salient third reason why strongly controlled research is needed in health care is because of something called the placebo effect.

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### The Placebo Effect

As we have repeatedly seen throughout this book, people’s beliefs can have a powerful impact on how they process the information that they are exposed to. But belief, it turns out, can have not just a major effect on one’s mind, but also on one’s body. A placebo can refer to any type of sham or inactive medical treatment or procedure. The most commonly used placebos are “sugar pills” (pills with no actual medication in them, just fillers) or fake infusions (an injection that contains only sterile water), although

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there have been placebo surgeries and other procedures used in various research. The placebo effect is defined as “the measurable, observable, or felt improvement in health or behavior not attributable to a medication or invasive treatment that has been administered” (Carroll, 2015). In the real world, this would mean that someone would be unknowingly given a false treatment (thinking it is the real thing) and then show improvement *even though he or she has not gotten any active treatment*. It’s the grown-up equivalent of a parent kissing your scraped knee and telling you that makes it feel better, so you stop crying because the pain has gone down.

Admittedly, this sounds ridiculous at first, but decades of research have shown that placebos (Latin for “I will please”) can in fact have numerous powerful effects (Goldacre, 2010). Although these effects seem to be more pronounced in subjective (the patient reporting on if they feel better) rather than objective tests (blood tests), they have been demonstrated across a wide range of conditions. Most susceptible to the placebo effect appear to be pain (acute and chronic), depression, asthma, sleep problems, and irritable bowel syndrome. To take asthma as one example, people using placebo inhalers did not have an objectively measured increase in lung functioning, but nonetheless reported (subjectively) that they could breathe more easily after using the sham inhaler.

There are a number of reasons, both biological and psychological, why people would respond to a placebo despite the lack of active ingredients. On the biological side of things, there have been a number of studies that have shown that taking placebos can change what is happening in the brain and body (Benedetti, 2014). This includes causing the production of endogenous (or naturally occurring) cannabinoids and opioids<sup>4</sup> as well as numerous other brain changes, from increased activation in the prefrontal cortex to the active release of dopamine. In other words, there are measurable physiological changes that, in many cases, match those changes that occur when given the real, active treatment.

Psychologically, the expectations and perceptions of the person taking the placebo become very important. When you take a drug or have a procedure done, you have expectations about how this will impact your functioning. These expectations then color your perception of how you feel and impact your behavior. Take, for example, alcohol. Even if you have never actually imbibed yourself, you likely have expectations for how people behave when they are intoxicated. Researchers over the past 40 years have found that drinking what you are told is alcohol, even when it is actually nonalcoholic, causes you to “act” drunk. For example, people act more aggressively, show more interest in erotic or violent books and videos,

<sup>4</sup> That’s right, your brain naturally produces chemicals similar to what you ingest from marijuana and morphine. That’s the entire reason ingesting those substances causes the effects they do—because we already have receptors for chemically similar things in our brain. Your brain is like your own personal drug dealer!



become more sexually aroused, and even have memory problems (Assefi & Garry, 2002). One's expectations about the effects of drinking alcohol cause large changes in one's perceptions and behavior.

This is further illustrated by contrasting the placebo effect with what's called the *nocebo effect*. You can take an inert pill and, if told that it reduces pain, you will feel less pain when administered a small electric shock. However, you could be given the exact same inert pill and be told that it increases pain, and you will then report feeling more pain when administered a small electric shock. This is the nocebo effect—when something negative happens or you feel worse after receiving a sham treatment because you expect to feel worse.

There is also increasing work showing that not just the treatment, but how you deliver the treatment can have a major impact on the strength of the placebo effect. For instance, Ted Kaptchuck, a professor at Harvard Medical School, has shown that placebos given to patients by researchers who are friendly, comforting, and show interest in the patient's personal life work much better than the same placebo given in an abrupt way with little interaction. This "care effect" appears to greatly enhance the strength of a placebo. You can further enhance it just by changing physical properties of the placebo. Giving a placebo in a capsule rather than as a pill appears to have a stronger effect. Giving the same placebo as an injection produces a still stronger effect. Other work has shown that the more expensive a placebo is, the better it appears to work; plainly packaged placebos work less well than ones in fancy boxes. Color also has an impact—red pills work better as stimulants and blue pills work better as depressants (as long as your culture associates red with activity and blue with relaxation). Presentation matters in most areas of life, and it appears to matter an enormous amount when it comes to placebos (Goldacre, 2008).

## Regression to the Mean in Health

In addition to the placebo effect, a particularly frequent way that bias can creep into our decision making about health care is something we discussed in Chapter 5, called regression to the mean (RTM). In technical terms, "RTM is a statistical phenomenon that occurs when repeated measurements are made on the same subject or unit of observation" (Barnett, van der Pols, & Dobson, 2004). Plainly stated, RTM refers to the idea that when a measurement shows something having moved to an extreme degree in one direction, it will most likely move back (regress) toward "normal" (the mean) across repeated measurements. To use a health care example, say that you have a headache: It starts small (not far from the mean of "no headache"), but then builds over time until it becomes unbearable (an extreme value from the mean). At that point, you take some type of treatment (aspirin, let's say).

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Soon, you feel better and have less of a headache (a regression toward the mean).

In this example, there are three potential explanations for why your headache went away. It could be that taking the aspirin truly had the effect of decreasing your pain levels. Or it could be that the aspirin had a placebo effect because you have been conditioned to feel less pain after taking medicine and expect that to be the case. Or it could be that the pain level would have decreased regardless of what you did, and that you are confusing correlation with causation—that's RTM at work in a health situation. Without properly controlled study any one of these explanations is plausible.

So research has shown that placebos can change your physiology, your behavior, and your cognitions. It's no wonder, then, that the placebo effect needs to be very carefully controlled for when conducting studies to examine whether or not a particular treatment works. We also need to control for the tendency of problematic symptoms to regress across time and become better with no intervention before we can say that a particular treatment works. In fact, almost all treatments can "work," by which we mean "cause an effect." What we have to ask ourselves, though, is not "does this treatment work?" but instead "does this treatment work better than a placebo?" and "would this condition naturally improve over time, even with no intervention?"

Those questions are the keys, it turns out, to examining so much in the realm of alternative and complementary medicine. When no good research exists, or the research of equal quality is contradictory, we have a PST. If something reliably works better than a placebo and/or the healing effects of time, then it can truly be said to have an active effect and thus falls into the realm of EBT. When, instead, well-controlled studies find that a treatment is no better than a placebo control, it moves into the non-EBT category. This type of viewpoint will let us examine the benefits or failings of a particular type of CAM, rather than just dismiss all of the treatments that sometimes fall under that term.

## THE BLIND RESEARCHING THE BLIND

Because of the placebo effect and the phenomenon of RTM, studies that examine treatment outcomes need to be very carefully designed so that we don't see a relationship when one is not actually there. This typically means that we need randomized, placebo-controlled, *double-blind* procedures in place to control for these effects. It is only by relying on high-quality clinical trials of these kinds that we begin to truly understand which treatments do and do not have an evidence base. But what does this look like in the real world?

In randomized trials, you divide the entire group of people participating in the study randomly into two groups—the treatment and control groups. This is done to even out potential differences (gender, education level, symptom severity, comorbid problems, etc.) between the groups, making them more homogenous, or similar. The placebo-controlled aspect is fairly self-explanatory: you compare the new treatment (or the old treatment for a new problem) to a placebo, rather than nothing. Placebos should generally be matched in type to the active treatments for the best control. If your treatment is in pill form, the placebo needs to be a pill as well; if the treatment is a surgical procedure, then the placebo control needs to be surgical (in terms of making incisions on the body and stitching or closing them up, even if that is all that is done). To help control for regression effects, the placebos should last as long as the active treatment being studied.

In blinded studies, the trial participants (the people who have the condition being treated) are divided into two groups—active treatment and placebo control. They are “blinded” because they are not aware of which group they are in. In this way, you can control for the expectancy aspects of the placebo effect. However, in order to control for bias on the part of the treatment provider, truly excellent studies are double-blinded: neither the patient nor the researcher knows who is in the treatment rather than placebo group. In this way, the researchers will not be able to subtly bias the results by acting differently toward one group or the other.

When evaluating the evidence about a treatment’s effectiveness, whether CAM or conventional, this kind of randomized, placebo-controlled, double-blinded study is the gold standard. Studies that fail to meet these criteria are highly susceptible to bias and placebo effects, resulting in findings that show treatments to be effective when they actually are not. As we see in the next two chapters, these biases are critical when determining whether a CAM treatment is EBT, non-EBT, or PST for a particular condition.

## WHY IS CAM SO POPULAR?

As shown previously, complementary, alternative, or integrative health treatments are utilized by a very large number of people globally, even when they have ready access to more conventional approaches that are likely to be more effective for most problems. So why would you go with CAM, and perhaps choose something that’s known to be a non-EBT? Although the answer is multifaceted and differs among individuals, philosopher and scientific skeptic Robert Todd Carroll (2003) has collated a number of the most commonly seen reasons.

Top of the list is that there are no drugs or surgery in CAM. Many people have heard horror stories of surgeries gone wrong, or run from modern medication when they hear the litany of side effects that it may cause.





**FIGURE 10.2** "Singular effects of the universal vegetable pills on a greengrocer! A fact!".

Source: Courtesy of the Wellcome Library. Wellcome image V0011125. Color lithograph, 1831, by C. J. Grant, published by J. Kendrick, London. Reproduced under Creative Commons Attributions Only license (<http://creativecommons.org/licenses/by/4.0>).

medicine, which involves visiting a physician, paying your co-pay, getting a prescription, going to the pharmacy, paying another co-pay, and then finally going home to take your medication. This is especially salient in those countries (like the United States) without guaranteed access to medical care via socialized medicine, where one of the major causes of personal bankruptcy is excessive medical bills.

Turning to CAM can also be seen as a direct reaction to some of the failings of conventional medicine. For example, think about the last physician visit you had. For many of us, visiting a physician is not a pleasant

experience. We make an appointment weeks in advance, sit in the waiting room long past the time when we are supposed to be seen, have a rushed whirlwind of an encounter with the physician, and get sent home with a treatment that is likely to work but are not guaranteed to be effective. This is especially true with chronic or poorly understood conditions, when conventional physicians may not be able to uncover the cause (or causes) of your pain or discomfort. Many CAM practitioners, on the other hand, will spend extended periods of time with you as a patient, listening intently, providing reassurance and simple answers about what you need to do to get better.

Politics also comes into play for why people accept CAM as legitimate (even if research on a particular type shows otherwise). Many CAM practitioner groups have successfully lobbied to obtain governmental licensure and regulation. For instance, at the time of this writing all 50 U.S. states have licensure and regulation boards for chiropractors, 44 license practitioners to perform acupuncture, and 17 have license naturopaths. This provides a patina of approval for those practices, as states also license physicians, psychologists, dentists, and other conventional treatment providers. Combine this with a well-funded NCCIH under the umbrella of the U.S. federal government's NIH and the implicit authentication and seal of approval become more convincing.

Another common reason is a misunderstanding of how science works. Over the past 100 years, we have seen enormous changes in how physicians and other health care providers deliver treatments, and what kind of treatments they deliver. Certainly, the history of scientific medical and mental health treatment is filled with things that are now known to be ineffective (prefrontal lobotomies, thalidomide, insulin shock therapy, stenting for stable coronary disease). Conventional health care is fallible, yes, but it is (like all of science) self-correcting. The reason we stopped using certain drugs or treatments is because we tested them and found them to not work! This stands in sharp contrast to most CAM, which offers simple answers to complex problems and does not change over time. For many people, the certainty offered by CAM practitioners is highly appealing.

Finally, many people continue to utilize CAM because, for them, it works! At least, it appears to work, resulting in pain or other symptom relief after treatment. What most people don't realize is how powerful the placebo effect can be, and that what they are paying for and why they are experiencing relief is not a result of their treatment, but a result of their belief in the treatment. Even in cases in which people are utilizing both conventional and CAM treatments (in the case of cancer, for example), they often attribute any success to CAM because of their faith in it working. As we discussed in detail in Chapter 6, you really can't trust your brain sometimes, and people seeking out CAM and extolling its benefits, even when the data show it not to be useful, is an excellent example.

## TIPS FOR AVOIDING NON-EBP IN HEALTH CARE

Evidence-based medications and treatments stand on their own scientific merit, whereas non-EBT often has to deceive people into purchasing and using it. Along with employing all your critical-thinking skills, here is a handy guide to avoiding being scammed by people peddling health cures that are less than evidence based. The Federal Trade Commission's Bureau of Consumer Protection (1999) provided a list of six typical phrases and techniques used to draw people into believing false claims about treatments:

- The product is advertised as a quick and effective cure—all for a wide range of ailments.
- The promoters use words like *scientific breakthrough*, *miraculous cure*, *exclusive product*, *secret ingredient*, or *ancient remedy*.
- The text is written in “medicalese”—impressive-sounding terminology to disguise a lack of good science.
- The promoter claims the government, the medical profession, or research scientists have conspired to suppress the product.
- The advertisement includes undocumented case histories claiming amazing results.
- The product is advertised as available from only one source.

It is especially good to be on your guard against non-EBT if you fit into a particular demographic. Research shows that the “typical” CAM user tends to be middle-aged, female, and of higher than average education and income. The CAM user is also likely to have multiple medical conditions, although these may or may not be serious in nature (Bishop & Lewith, 2010). Many less than ethical or non-evidence-based practitioners target those who have conditions that conventional medicine often fails at treating, such as multiple sclerosis, diabetes, obesity, dementia, chronic pain, depression, and various types of cancer. These are people who are desperate to find relief and often willing to try anything. Although we all want simple solutions and definitive answers to our health problems, the reality is that physical and mental health are complex issues that often have complex, complicated diagnoses and treatments. If you find yourself fitting into these categories, keep your critical-thinking toolbox close at hand.

## CONCLUSIONS

As Thomas Paine, U.S. constitutional author and founding father, once wrote: “To argue with a person who has renounced the use of reason is like administering medicine to the dead.” Between this chapter and the next

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two, we hope that any treatment you administer or take in the future will be evidence based rather than the alternative. Because of space constraints, we cannot cover every single type of CAM that a person might encounter throughout a lifetime. Instead, in the next two chapters we take a look at some of the most popular examples of CAM that claim to help with physical or mental health problems. These will be used to help illustrate some of the points discussed in this chapter and in the first half of the book, showing how to think critically about any CAM practices you might encounter.

### QUESTIONS FOR REFLECTION

1. Given that producers of pharmaceuticals can (and do) make plenty of money from patented medicines, would you think alternative medicine more or less plausible, in general?
2. What do you think is the most likely explanation for the popularity of alternative medicine? Have you ever used CAM? What was your reason?
3. What does the placebo effect tell us about how humans respond to medical interventions?
4. What is our best scientific methodology for demonstrating the efficacy of alternative medicine?

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AU: Please note that the reference National Center for Complementary and Integrative Health (2009) is not cited in the text so provide the in-text citation for the reference.