Quotidian Medical Epistemology

Robert Bass
Department of Philosophy
Coastal Carolina University
P.O. Box 261954
Conway, South Carolina 29528
rbass@coastal.edu

My title may suggest that I will address the activities of medical professionals as they go about their daily business of diagnosis, prescription and treatment. Certainly, that deserves attention, but it is not my target here. My concern is, on the one hand, with typical consumers of health and medical information,[1] and, on the other, with the problems such consumers face in understanding, interpreting and applying the information available to them.

As I conceive average consumers, they are normally concerned with their own and their families' health. They probably have health insurance and are reasonably well-educated, though not specialists in any medical field. They are willing to consider taking reasonable steps, including dietary or lifestyle changes, for the sake of their health. Judging from the volume of health advice, news, products and advertising, there must be many such people. It is to their interests, their concerns, and their level of understanding that most medical and health journalism and advertising is directed.

Consider now that almost daily, there are news reports about medical breakthroughs, new discoveries, and new studies. The long-suspected link between Lifestyle Choice X and Disease Y has been confirmed. Or disconfirmed. Or, disconcertingly, *both*.

Understandably, such reports may be confusing or worse to average consumers of health

---

[1] My concern is not, in the first instance, with medical and health professionals—with doctors, pharmacists, various licensed therapists, medical researchers, nutritionists and so on. Their role and preparedness to fulfill their role-related duties may be considered later, but my main concern is with ordinary citizens.

information. In some cases, the conduit delivering medical and health information to its ultimate consumers runs through medical professionals. This provides some filtering of the available information as well as its possible enrichment by the inclusion of sources that typical consumers would not consult, such as medical or scientific journals. Thus, when a doctor prescribes a medication or therapy, advises exercise, or urges dietary changes, consumers rely upon the advice in the conviction that professional judgments are more to be trusted than their own. In part, this may be doubted, but it is unlikely that the greater reliability of professional judgment is entirely an illusion.

However, medical and health advice is often not routed so directly through professionals, nor is it reasonable to expect that it always will be. Newspapers, magazine articles, popular books, and internet resources are among the conduits. The absence or reduction of professional oversight leaves greater room for doubt, both as to the reliability of the information and as to the appropriateness of its application. Hence it is reasonable to suppose that greater gains in health might be achieved if available medical and health knowledge were better marshaled and more consistently acted upon.

As examples of the puzzles that average consumers of health information face, consider the following reports, all of which appeared within the last six years:

- "Coffee May Protect Against Diabetes," according to WebMD.[2]
- "Cutting caffeine may help control diabetes," according to a recent study conducted at Duke University.[3]
- Dr. Jonathan Goldfarb, of Southern Illinois University's School of Medicine, warns that exposure to "[t]he sun's ultraviolet rays . . . results in wrinkling and increases the risk of skin cancer," and that "more than 7,000 individuals in the United States will die of melanoma this year. That's a higher number than those people who are expected to die of lymphoma and Hodgkin's disease." He recommends the use of sunscreens to avoid

---

[2] See <http://diabetes.webmd.com/news/20061025/coffee-may-protect-against-diabetes>, accessed 11 March 2008.

[3] See <http://www.tamilstar.com/news/health/article_5073.shtml>, accessed 11 March 2008.

dangerous exposure.[4]

- Research published in January 2008 in the *Proceedings of the National Academy of Sciences* indicates that exposure to sunlight may have a significant effect in reducing cancer.[5] Other recently reported research suggests that sunscreen protection "may actually contribute to far more cancer deaths than it prevents."[6]
- According to the National Osteoporosis Foundation, adults need 1000 to 1200 milligrams of calcium daily, from supplements if necessary, to support bone health.[7]
- Two recent large studies, published respectively in *The Lancet* and the *British Medical Journal*, found no benefit in reduction of fractures for takers of calcium supplements when compared to takers of a placebo.[8] In addition, the most recent edition of the United Nations' FAO/WHO report on *Vitamin and mineral requirements in human nutrition*, suggests that the mean calcium requirement for adults is 520-840 milligrams daily[9] and found that "hip fracture rates are higher in developed countries where calcium intake is high than in developing countries where calcium intake is low."[10]

Some of these puzzles are easily resolved. For example, close reading of the reports relevant to the first pair of claims will show that regular coffee drinkers are less likely to develop diabetes, but that those who already have the disease are harmed, because the caffeine raises their blood glucose. Though the result is a bit surprising, there is no conflict. For someone patient enough and careful enough, the reconciliation can readily be found. Assuming the studies are otherwise reliable, the implied advice—at least with respect to diabetes—is reasonably clear: Avoid caffeine if you're already diabetic, but in moderate amounts it may do you good if you do not already have the disease.

On reflection, even that bit of advice may not be readily available to typical consumers. The report about the effects of coffee in preventing diabetes came from 2006, while the study indicting it for its effect upon blood glucose was dated in 2008. Many consumers are likely to have read the second while vaguely remembering the first, without ever comparing details. They

---

[4] See <http://news.siu.edu/focalpoint/aug2002/story5.html>, accessed 11 March 2008.
[5] See Moan et al. 2008.
[6] See <http://www.msnbc.msn.com/id/7875140/>, accessed 12 March 2008.
[7] See <http://www.nof.org/prevention/calcium_and_VitaminD.htm>, accessed 14 March 2008.
[8] See <http://www.rtgconsultants.com/seniorcitizen-articles/calcium.html>, accessed 14 March 2008.
[9] Food and Agriculture Organization/World Health Organization 2004, 72.
[10] Food and Agriculture Organization/World Health Organization 2004, 78.

are apt simply to be confused. It is also likely that some consumers will see one and not the other, with the predictable result that some diabetics will be raising their blood glucose in the thought that coffee is good for diabetes, while some non-diabetics—who might otherwise consume moderate quantities of coffee—will be abstaining and thus raising their risk for the disease in the conviction that they're doing all they can to avoid it. Certainly, it would be difficult to estimate *net* gains and losses, but there is little reason to suppose the balance positive.

Further, this is a case in which the apparent conflict admits of a ready reconciliation.[11] For many other cases, no such ready reconciliations are available.[12] These facts call for reflection in a variety of ways. First, it is likely that they contribute to inferior health outcomes, and the ways in which that may come about should be recognized. Second, if anything can be done to improve said health outcomes, an important step is recognizing the sources of the problem. Why is it that medical news is so frequently confusing? Third, once we have something in the way of diagnosis, we will be better prepared to consider what can be done in the way of amelioration.

The Costs of Conflicting Advice

Before proceeding, we should ask whether, and if so how, the availability of conflicting health information contributes to worse health outcomes. There are several sources of concern.

The most basic concern is the problem of mistaken consumer reliance. It includes both

---

[11] Whether the reconciliation is *correct* is an additional question, the answer to which I do not know. When there is an apparent conflict, there are several possibilities. First, the conflict may be reconcilable if there is some way the apparently conflicting claims can both be true. Then there is the question whether the reconciliation *is* correct, that is, whether the claims are in fact true under the given interpretation. In the absence of a correct reconciliation, the possibilities are that only one of the conflicting claims is true or that both are false.

[12] Some of the conflicts may be due to physiological differences among test subjects. We know that some obvious differences have been overlooked in the past. Doctors, for example, have treated women as if their risk factors and susceptibility for heart disease were essentially the same as in the case of men, despite the well-known fact that women have fewer heart-attacks than men. There may well be other physiological differences relevant to treatment regimens that are not so obvious as sex.

failure to take action on the basis of available and appropriate health advice as well as reliance upon inappropriate or misleading health advice. There are multiple routes to mistaken consumer reliance. Most depend upon the fact that, almost daily, new studies are reported contradicting or overturning the results of previous studies. For the ordinary consumer of health advice, this may engender mistaken reliance in several ways.[13]

First, there is simply an enormous amount of health information, of widely varying quality, available to the average consumer. This leads to the problem of information overload. A great deal of information, even if it were all reliable, might well prove unhelpful. It would prove unhelpful if it were all ignored. It also would prove unhelpful even if not ignored if it were inapplicable to the consumer's situation.[14] Thus, even in the best case, with nothing but reliable information disseminated, the information might not improve health outcomes. The wealth of information may for some prove too much to sort out and may be ignored by consumers on the ground that they are unable to figure it all out anyway.

A second problem can be called *faddishness*. If studies can be cited on all sides of disputed issues, there may be a tendency for people, so far as they pay attention at all, to pick and choose according to prior predilection. They will believe and cite and rely practically upon those studies and health claims that mesh with their predilections. To whatever extent this is the case, it is doubtful that the available information is contributing to better health outcomes. Those more fortunate in their predilections will fare better, but, arguably, would have fared better in

---

[13] One way, which I shall not address, though it is of considerable importance is the way that advertising of prescription drugs creates a demand for them among people lacking qualifications to consider their risks and benefits—especially their relative risks and benefits, as compared to other products—but who pressure their physicians to prescribe them. This is an important theme of Abramson's sobering *Overdosed America* (2005).

[14] In fact, of course, it is wildly over-optimistic to suppose that the available health information is all reliable.

any case. Others, with less fortunate predilections, will achieve worse health outcomes.[15]

Third, not all studies are created equal, and it may be difficult for consumers of health information to sort out the differences. A common problem is that a study may be small and therefore potentially misleading. To illustrate the point, the smaller the number of coin-flips, the greater is the likelihood that one will get all heads. About one out of eight series of three coin-flips will give you all heads, whereas, if you increase the number of coin-flips to, say, ten flips, then less than one in a series of a thousand will turn up all heads. (Increase the number to a hundred, and you can safely predict that it will never happen in the future of the universe!) The point is simple: aberrant results are more likely the smaller the sample size. Something that is entirely neutral in health effects may, in different small studies, appear neutral, dangerous or beneficial. Undoubtedly, this is a fact which is exploited by those with a commercial interest in a certain result. Numerous small studies can be supported, but only those with the "right" results released. A likely example of this is the case of Michael Zemel who conducted small studies, funded by the dairy industry, that seemed to show that consumption of dairy products promoted weight loss among dieters. These studies were made the basis of an advertising campaign touting the benefits of dairy for dieters, but the ad campaign was pulled in response to a complaint that the preponderance of the evidence showed no positive effect of dairy consumption upon weight loss.[16] Since medical news may provide limited or no information about sample sizes and since, even with information, some consumers may not understand the important difference between small and unrepresentative versus large and representative studies,

---

[15] Why should it not be said that those with less fortunate predilections would likely have fared worse in any case—so the net effect of mixed health information upon those prone to faddishness is zero? That's possible, but it assumes that no significant portion of those with unfortunate predilections would have changed their practices had they had correct information, disconfirming the appropriateness of their predilections, without the confusion generated by misleading information or reporting.

[16] For the complaint, see Kursban 2005. For the upshot, see Severson 2007.

then to the extent that this is true, superior health outcomes will be largely a matter of luck. Those who happened to believe studies of high quality will fare better. Those who happened to believe misleading studies will fare worse.

Fourth, inability to distinguish between the quality of different studies may support a more general tendency simply to distrust the pronouncements of science. Genuinely well-supported claims are lumped together with the ephemera of medical headlines, and are doubted equally. This is unfortunate, so far as useful and health-promoting information is available.

Sources of Conflict

A central thread running through these forms of the problem is that there is much conflicting, but apparently credible, health information available to the consumer. Perhaps, in principle, medical professionals should be able to sort it all out, but their theoretical ability to do so, first, may not translate well to practice and second, is not relevant to the many who may often pay attention to health news without consulting their physicians. Why is there so much conflict, or at least so much apparent conflict? Finding reasons for the prevalence of such conflicting claims may begin to suggest proposals for reform. Several reasons can be identified.

First, there are academic pressures that result in the publication or dissemination of initial or preliminary results. Academics and researchers are often in highly competitive fields and are judged in part by the number of their publications. Inevitably, that means that if an initial or preliminary result, perhaps from the early stages of a research project, is intriguing, there will be pressure to publish or at least announce it. I may already have provided an example of this kind: the study showing coffee-drinking diabetics had higher blood glucose was very small, with only

ten subjects, monitored over three days.[17] That particular result *may* hold up. Larger studies may follow bearing out what that study found, but, in general, the more initial or preliminary the report, especially if only small numbers of test subjects were involved, the more likely it is that subsequent results will not bear out the early reports.

Second, there are commercial pressures in the media both to report results quickly and to simplify their presentation. The pressure for quick reporting by journalists, publications or news organizations is largely competitive pressure, to announce results that their audiences will be interested in before other suppliers competing for the same audience. That means that the academic pressure to report preliminary results is matched by commercial pressure to disseminate them. Further, the media are driven by their expected audience to simplify the presentation of results. Thus, significant qualifications that may have been included in the original study go unmentioned in the media presentation. Working researchers may produce an honest and non-misleading study, with appropriate qualifications and relevant expressions of uncertainty, but the version reported to the typical consumer may have emphasized—or presented nothing but—a dramatic and unqualified claim. The dramatic and unqualified claim may be one that the researchers themselves would repudiate or reject as a distortion of their work and its meaning, but they may have little independent access to the media to correct public misperception. This fact of the relative deafness of the media, and therefore of the general public, to detail, qualification and nuance, of course, applies not only to reports of initial results but also to subsequent or final results.

Third, there is a different set of commercial pressures that results in richly rewarding those who can claim to achieve significant improvements in health, especially with simple and

---

[17] See <http://www.tamilstar.com/news/health/article_5073.shtml>.

non-demanding steps. This both creates a market for such claims and draws suppliers, not all of them honest, to satisfy the demand.

What to Do

These factors, and there are no doubt more, help to explain the prevalence of conflicting or confusing health information. We have also identified ways in which such confusing information probably contributes to worse health outcomes, but questions remain as to what can be done. An even more basic preliminary question is whether anything can be done. Mentioned above was the fact that a possible response to conflicting medical and health news is just a general skepticism about science (or about medicine).

I shall assume, but not argue here, that such general skepticism is misplaced. By ordinary standards of evidence, there is little doubt about the benefit from modern medicine. Lives are healthier and longer due to medical treatment, medical research, and the availability of medical and health information.[18]

Even dismissing skepticism, the question remains as to what can be done. I do not imagine that I have a general solution, but an obvious starting point is the recognition that ameliorative proposals fall into two classes, those directed at somehow changing the behavior or interaction of institutions involved in delivering their information to the consumer and those that aim directly at improving the judgment of typical consumers. Unfortunately, there are no easy answers on either end.

Consider first the institutional end. We can agree that it would be better if the

---

[18] The skeptics are not entirely wrong, for the gains are less than one might suppose. According to David Wootton's recent history of medicine, taking account of earlier evidence and the best current estimates, only about twenty percent, or 6.7 out of the thirty years of increased life-expectancy since 1900 can be traced to medicine. The rest is due largely to improved sanitation, better nutrition, and greater regularity of food supply. Wootton 2007, 269-282.

information available to the general public were less confusing, less marked by conflicting reports and changing recommendations. The problem is figuring out a way to make it so, given that there is not a single monolithic agent or homogenous class of agents who can be directed, or perhaps required, to do better. Instead, there are many interacting agencies and institutions with differing objectives and subject to different pressures.

For example, one source of conflicting information discussed above lies in the publication or reporting of preliminary results. It might be suggested that researchers should be discouraged from their releasing preliminary results. However, in the absence of some kind of enforcement, making the practice general, those who refrain from such release will place themselves at a competitive disadvantage as compared to other researchers not so restrained.

Nor is it easy for media, catering to the tastes and sophistication of typical consumers, to resist demands for simplified and dramatic versions of any medical news that comes to them. In part, their market share depends upon it.[19]

A further factor is that there are undoubtedly some who profit directly from confusion and conflict. As long as scientific or medical matters are unsettled or appear unsettled, there is a market for their products. One need not be very cynical to suppose that some offering health advice are well-pleased that there is popular confusion about certain dietary regimes or health-related practices and are quite willing to add to it.

Thus far, this may seem to be an argument that the institutional side of the problem cannot well be tackled piecemeal. Perhaps, the solution is some comprehensive regulation instead. Certain things could be declared illegal; others placed under professional oversight. The *prima facie* problem with this approach is just that it is a variant of what we are already

---

[19] I am not assuming here that dishonesty is at work, though that is certainly a possibility.

doing. Some kinds of treatment are legally defined in professionalized terms, such as practicing pharmacy or practicing medicine. Standards of training and certification are imposed, and so on. This is just a proposal to draw the line of what may be practiced without a license in a different place. First, it may be doubted that that is a fundamental solution, and second, and perhaps more importantly, there are powerful interests that would resist such moves and would probably make them impossible to implement.[20]

I do not think that matters are completely hopeless in the direction of institutional reform, but the more obvious moves do not appear promising. Something that might be helpful would be requirements of greater transparency in connection with research. Preliminary results, if released at all, should be clearly designated as preliminary, and all relevant underlying data should be available for reviewers to examine. A regulatory approach might push things in this direction, as might a concerted demand on the part of medical and scientific journals.

Beyond that, we can turn to considering the improvement of the typical consumer's judgment. The general problem here, exacerbated by the large number of confusing or contradictory claims about health and medicine, is just that the typical consumer is too credulous, too ready to believe what is purveyed to him. Unfortunately, there is no quick way to change that for the better.

Still, certain measures seem plausible, though unlikely to have large immediate effects. There is certainly room for trying to improve science education. People who have a better understanding of how science works, of the fact that results are tentative, but can be given increasing support as more evidence comes in, are less likely to alter their behavior with every change in the medical headlines. People who are generally more critical and more aware of the

---

[20] See Nestle 2002.

danger that small studies will be misleading will be less likely to attach much weight to a reported result until they know more about the quality of the underlying research. In turn, of course, a more sophisticated audience would alter the commercial pressures under which the media operate, so there would be reason to expect changes from that quarter as well, perhaps setting off a benign cascade of more critical consumers demanding better and more informative medical journalism, which would, in its turn, contribute to greater consumer sophistication.

Perhaps. In the best case, we can imagine ways in which the landscape of medical journalism and the information available to the average consumer is radically improved. What is difficult is to imagine a way to get there. For the present, the main lessons I have to draw are pessimistic and cautionary. Little is likely to change for the better, especially in the near term. What we can do is learn to be suspicious of health news that tells us what we want to believe and learn to demand and seek out serious evidence for surprising claims. That will not, except indirectly, do much about the enormous volume of confusing health information, but it will represent a step toward making ourselves wiser, more critical and more careful consumers of medical news and information, and better guardians of our own and our family's health.

References

Abramson, John. 2005. *Overdosed America: The Broken Promise of American Medicine*. 2nd ed. Harper Perennial.

Food and Agriculture Organization/World Health Organization. 2004. *Vitamin and mineral requirements in human nutrition : report of a joint FAO/WHO expert consultation, 2nd Edition*. Bangkok, Thailand: United Nations http://whqlibdoc.who.int/publications/2004/9241546123.pdf (Accessed March 14, 2008).

Kursban, Mindy. 2005. FDA Petition: Summary of Evidence on Dairy and Weight-Loss. http://www.pcrm.org/news/downloads/FDA_petition.pdf (Accessed March 30, 2008).

Moan, Johan, Alina Carmen Porojnicu, Arne Dahlback, and Richard B. Setlow. 2008. Addressing the health benefits and risks, involving vitamin D or skin cancer, of increased sun exposure. *Proceedings of the National Academy of Sciences* 105, no. 2:668-673.

Nestle, Marion. 2002. *Food Politics: How the Food Industry Influences Nutrition and Health*. 1st ed. University of California Press.

Severson, Kim. 2007. Dairy Council to End Ad Campaign That Linked Drinking Milk With Weight Loss. *The New York Times*, May 11 http://www.nytimes.com/2007/05/11/us/11milk.html?_r=2&adxnnl=1&oref=slogin&ref=us&adxnnlx=1207148908-lgAbuTSCwL9giBKr/9jhRA (Accessed April 2, 2008).

Wootton, David. 2007. *Bad Medicine: Doctors Doing Harm Since Hippocrates*. 1st ed. Oxford University Press, USA.