TOWARD AN IMPROVED BEHAVIORAL MEDICINE[1,2,3,4]

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ABSTRACT

Never before have the challenges for behavioral medicine been more exciting or more urgent. Because most health problems have their roots in behavioral causes, the role of behavioral medicine is paramount in public health. The challenges focus both on issues related to the way researchers interact, set priorities, and conduct research, as well as priority areas for future research. The principles include a need for more theoretical diversity and critique of theory, more inclusiveness, more cost-consciousness, an acceptance of failure as a fundamental part of behavioral science, and a greater commitment to international health. The priorities encompass a greater focus on basic behavioral science, more attention to the study of risk perception, more study of the problems of children and aging populations, and an urgent need for proven, proactive interventions. Actualization of these principles could help behavioral medicine researchers and practitioners to achieve a much greater impact in improving the public's health both in the U.S. and abroad.

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INTRODUCTION

It is especially appropriate that the theme of the 1996 International Society of Behavioral Medicine meeting was an international one. Never in the history of behavioral medicine has the field been better able to benefit from and contribute to the cascading achievements in health and basic sciences worldwide.

To meet the needs of an increasingly complex and interdependent universe of beliefs and behaviors and to reap the benefits of unprecedented advances in knowledge about the causes of disease—these are the challenges we face. These challenges require a more carefully articulated behavioral medicine—a behavioral medicine with clear, operating principles.

It's a world, meteorologists and mathematicians tell us, in which a butterfly in China can flutter its wings and dramatically change the weather in Richmond, Virginia. A tobacco executive in Winston Salem, North Carolina, can launch a marketing campaign and kill millions in China. Like it or not, we face global opportunities and global responsibilities. How can we learn from and contribute to the physicians and molecular geneticists and health practitioners around the world? How can we, in the words of Walt Whitman, encompass multitudes?

I have proposed ten principles of advancement for the field of behavioral medicine. The first six principles concern how we view our world and how we behave as individuals, as colleagues and competitors, and as an organization. The other four are areas of science on which we need to focus. Here is a preview: (a) We need to establish, wherever necessary, and support, wherever possible, an environment that combines healthy and critical discourse with the encouragement of theoretical diversity; (b) We must continue to strive for inclusiveness; (c) We must become more cost-conscious in our research; (d) We must move from intellectual protectionism and isolationism to an expansionist, all-embracing international perspective; (e) We need to accept failure as a necessary part of the scientific endeavor and more the norm than the exception; (f) We must be part of the solution of public health problems and of social problems; (g) We must pay more attention to the health of our children and aging population; (h) We need more understanding of basic mechanisms; (i) We need to pay more attention to the study of risk perception; and (j) We must refine proactive interventions if we are to have a public health impact. Let me now turn to each of these principles.

PRINCIPLES OF ADVANCEMENT

We Need to Establish, Wherever Necessary, and Support, Wherever Possible, an Environment That Combines Healthy Discourse with the Encouragement of Theoretical Diversity

This is critical to providing an environment that promotes innovation. Sir Peter Medawar observed that, "Criticism is the most powerful weapon in any methodology of science; it is the scientist's only assurance that he need not persist in error. All experimentation is criticism. If an experiment does not hold out the possibility of causing one to revise one's views, seeing why it should be done at all is hard" (1).

Louis Pasteur said, "Worship the spirit of criticism."

Our field, and especially our theory, improves when it is subjected to the most rigorous and candid scrutiny. Theory is not theology, and we should not expect ourselves, our students, or our colleagues to accept our theories as articles of faith. We need theory builders, but we also, every bit as much, need theory questioners.

We need to create an environment where we can debate without fear and where we can debate because we care for truth. As scientists, we must, above all, be truth-seekers. As Cuomo put it, "We need to get beyond the beguiling simplicities and sound bites, blow away the smoke, take down the mirrors, and assert the truth when we find it" (2). We need the truth-seekers. As a case in point, the recent debate about the Transtheoretical Model (TTM) is healthy and necessary. It is a way to make an exciting theoretical model even better by subjecting it to scrutiny and by offering up

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alternative explanations, as John Pierce has done in proposing addiction variables as an explanation for the observed effects (3). We need Jim Prochaska and his colleagues, but we also need rigorous, fair critiques of the TTM or any other theory (4,5). It is a lesson we can learn from our colleagues in math and physics. It is true, as Kurt Lewin said, that there is nothing as useful as a good theory. But critiques of theory are an essential part of the process and a long-accepted tradition in the physical sciences.

This environment of openness and acceptance of theoretical diversity is inextricably linked to excellence. As John Gardner said, "We must learn to honor excellence in every socially accepted human activity, however humble the activity, and to scorn shoddiness, however exalted the activity. An excellent plumber is infinitely more admirable than an incompetent philosopher (or behavioral scientist). The society that scorns excellence in plumbing because plumbing is a humble activity and tolerates shoddiness in philosophy because it is an exalted activity will have neither good plumbing nor good philosophy. Neither its pipes nor its theories will hold water" (6).

Behavioral medicine must encourage the dialogue that builds excellence. In the last few years, there has been a "hardening of the theories" that, like hardening of the arteries, is unhealthy. Occasionally, dogmatism creeps in—it's not always so clear what is good and bad science. We must encourage our scientists and practitioners to question both theory and practice. But we must do that with tact, rigor, and fairness.

We Must Continue to Strive for Inclusiveness

One strength of the Society of Behavioral Medicine (SBM) has been its disciplinary inclusiveness. It is diversity that has given and continues to give SBM its strength. We need to cultivate and nourish that diversity of disciplines if our science is to prosper. But we also need to strive for more ethnic and cultural diversity. Our science and SBM need to be multiethnic, multicultural, multidisciplinary, and multinational.

SBM must be a mirror of how we do science today, and more and more, it should be and must be as a member of a multidisciplinary team. The Yale Conference on Behavioral Medicine recognized nearly 20 years ago the need for interdisciplinary collaboration (7). More recently, David Abrams wrote that interdisciplinary integration helps us rethink our biases (8). Behavioral medicine—our very name is multidisciplinary.

This emphasis on diversity and inclusiveness must extend to the populations we study and serve. Whether we are formulating or testing our theories, our interventions, or our skills, we do know how well they hold when we extend them to non-majority populations. Often, the very methods that serve us well with one population fail us with another population. We must adapt, adopt, tinker, tailor, and even jettison our instruments and interventions as we reach beyond the familiar.

As McGinnis and Foege stressed, neither unhealthy behaviors nor avoidable mortality are evenly distributed (9). To have an impact on public health anywhere in the world, we must reach beyond familiar borders. We must embrace diversity.

We Must Become More Cost-Conscious in Our Research

This is especially true at a time when the National Institutes of Health (NIH) budget is likely to be flat in years to come, although we were fortunate this year. Dr. Varmus, head of the U.S. NIH, described it as "steady state." We must think about research funding as a finite resource. Over the last decade, bigger has become better in behavioral medicine. It is true that many of our studies ask big questions that need big funding. Yet, science may advance as well or better by asking more finite questions that can be answered more quickly and efficiently. We have sometimes erred by investing in a few big studies rather than in a greater number of smaller studies. The outcome of incremental, small studies may be large advances in science.

We Must Move from a Protectionist and Isolationist Perspective to an Expansionist, All-Embracing, International Perspective

We must see ourselves, no matter how trite it may sound, as part of the global village. We are all connected to one another, and advances in technology are breaking down the barriers internationally and within our own society. In a world where 500 million of us living today will one day die of smoking-related diseases, we must see our responsibility as global rather than merely local. We cannot be blind to a federal policy that with one hand seeks to protect our children from tobacco and with the other hand forces other nations to accept our tobacco—nations whose children have no such protection. This often requires taking what Biglan has called the contextualist perspective in which we consider the larger environment in which behavior occurs (10).

We Need to Accept Failure As a Part of the Scientific Endeavor and More the Norm Than the Exception

Our basic science colleagues are accustomed to a frequency of so-called "failure" that would traumatize most of us. We must see proof of the null hypothesis as a contribution to science and not as a personal or professional failure. Again, as Medawar said, "There is no certain way of telling in advance if the daydreams of a life dedicated to the pursuit of truth will carry a novice through the frustration of seeing experiments fail and of making the dismaying discovery that some of one's favorite ideas are groundless" (1). And let us recall, as Robert Kennedy said, "Those who dare to fail can achieve greatly." We too must dare to fail if we are to succeed.

We Must Be Part of the Solution of Public Health Problems and of Social Problems

We must see ourselves, our lives, and this organization as enablers of improved public health. We must be driven here by the epidemiology of disease and risk factors. In the U.S., these risk factors tell us that the greatest causes of death and disability are behavioral factors.

But we also need a social perspective. Even as we share the excitement of new technologies, we must remember that two-thirds of the world's adults have never received a phone call; 50 million Americans are uninsured at some point during the year. We must not turn away from them. We also must recognize that most premature death, disease, and disability in the developed world usually are caused by what we do or fail to do. We need to keep a social perspective on behavioral medicine.

We Must Pay More Attention to the Health of Our Children and Our Aging Populations

In child health, the deficiencies are perhaps most glaring. Three thousand American children become regular smokers every day, and more children are overweight and sedentary than ever. That is to say nothing of the war, disease, famine, and violence children face here and abroad. We have failed our children. Evidence from the American Health Foundation's Know Your Body studies as well as other investigations have demonstrated a

number of disturbing trends in the health status of our children (11). Consider these facts about children in the U.S:

- At least 50% of U.S. children have one or more risk factors for heart disease.
- Most children ages 10–17 do not engage in recommended levels of vigorous physical activity.
- Fat accounts for approximately 36% of total calories among U.S. children, one-third of which (12% of total calories) is saturated fat.
- Eighty-seven percent of high school students do not eat adequate amounts of fruit or vegetables.
- Seven percent of 8th graders, 13% of 10th graders, and 19% of 12th graders are daily smokers.

We, as an organization, must invest more effort advocating for the health of children and developing more effective strategies for preventing and modifying unhealthy behaviors. Here is a place where our younger investigators most notably can make a difference. We need a better understanding of the pathway to unhealthy behaviors, and we need effective interventions.

Moving toward the other end of the spectrum, we must pay more attention to the problems of aging—not the aged or elderly but rather the process of growing older. For example, the NIH portfolio on estrogen replacement therapy and menopause includes only a handful of psychosocial studies. With 30 million postmenopausal women today and the baby boomers right behind, we must begin to devote more of our energies to studying the psychosocial sequelae of aging.

We Need More Understanding of Basic Behavioral Mechanisms

This is consistent with the emphasis of the 1978 Yale conference on basic mechanisms and understanding the disease processes under study (7). At every level of behavioral medicine, we need to invest more in basic science. At the most academic level, we ourselves need to know more of the basic science involved in behavioral medicine problems if we are to intervene in ways that matter. David Abrams observed that the clinical and public health sciences can inform the basic sciences about what kind of animal simulation studies to conduct, and the reverse is also true. Basic science can confirm mechanisms and produce more sensitive multivariate measures and markers (8).

In a number of areas, including smoking cessation, we have oversold the extent to which our interventions are ready for mass dissemination. Saul Shiffman (12) showed us that quit rates have remained steady in our interventions for some time. Only more basic behavioral research will help us develop the effective tools that can be disseminated.

Michael Bishop, who shared with Harold Varmus the Nobel Prize for his work on retroviruses, wrote recently that, "a genetic paradigm has provided a powerful view of cancer. The seemingly countless causes of cancer—tobacco, sunlight, asbestos, chemicals, viruses, and many others—all these may work in a single way, by playing on a genetic keyboard, by damaging our DNA. An enemy has been found, and we are beginning to understand its lines of attack" (13). We cannot continue to examine behavioral factors in isolation from genetics. At the most extreme case, behavior may be caused by genes. Yet more often, there will be interactions with unhealthy behaviors, such as smoking, and genes that may predispose some people to harm. Richard Surwit's research on the genetic basis for some kinds of diabetes is especially exciting.

If we are going to link our behavioral interventions to genetic research, we ourselves need to take the time to learn some basic genetics. We probably need to read more widely than our basic science colleagues. For example, for those of us in cancer, it means such journals as *Annals of Behavioral Medicine. Health Psychology,* and *American Journal of Public Health,* as well as *Cancer, Journal of the American Medical Association, New England Journal of Medicine, Preventive Medicine, Science,* and *Cancer Research.* We need to think about new ways of training our students, who are growing up in this field which has become a bridging science between basic and applied research.

If we take cancer as an example of the case for a behavioral interface with genetics, consider the fact that as many as 1 in 300 women may be carriers of genetic mutations for hereditary breast cancer. There is much to learn about how to use genetic information and how to help people make informed decisions about genetic testing (14). The work of our colleagues Caryn Lerman and Robert Croyle is an excellent start in these areas (15,16). At Duke, Eric Winer and I are leading a study to determine whether a tailored approach to providing consent information can improve comprehension and reduce anxiety in women making choices about genetic susceptibility testing for BRCA1.

Another study led by Caryn Lerman, Tracy Orleans, Janet Audrain, and others is an example of how genetics and behavioral medicine can be married in an extremely productive manner (17,18). Their work is an outgrowth of the discovery of the biomarkers for lung cancer susceptibility, such as the CYP2D6 enzyme which is responsible for metabolizing the antihypertension drug debrisoquine and is believed to metabolize tobacco carcinogens as well. Feedback about the CYP2D6 genotype marker may be especially useful for motivational feedback because only 10% of smokers will have the low-risk phenotype (19). Personalizing biological marker feedback may be a powerful technique to propel early-stage smokers into action. Smokers exposed to susceptibility feedback had stronger beliefs about the benefits of quitting smoking and enhanced risk perceptions.

But even as we share our basic and clinical colleagues' excitement about the new world offered up by genetic advances, we must be careful scientists, asking about the role behavior plays and raising the ethical and legal questions as well. We must find the place for behavioral medicine in this new biomedical paradigm.

Ellen Gritz and Tom Moon developed a superb model to examine the relationship between biologic and behavioral factors (20). This model is excellent because it shows how we as behavioral scientists can think about where in the biologic process to intervene.

Norman Anderson developed a related model to show the integration of the biobehavioral factors that affect health. His model encourages us to examine the multifactorial nature of health (21). We will not develop the appropriate interventions if we do not identify the right causes.

What we need are more studies at the intersection of public health and basic science. One good example is research being conducted at Duke by Frank Keefe and Dr. Phyllis Kornguth to understand the underlying basis of mammography-related pain. In a series of rigorous studies using more sensitive and valid measures of mammography pain than previous studies, they have shown that this is indeed a problem of public health importance. But they went back to the basics to reexamine the issue in a new way. In doing so, they learned that some assumptions about mammography pain are incorrect. In fact, more women experience this pain than previously documented (22).

We Need to Pay More Attention to the Study of Risk Perception

In 1995, the Commission on Behavioral and Social Sciences and Education of the National Research Council singled out risk as an important area for further study (23). They pointed out that people take shortcuts in decision-making that often lead to risky choices. As a society, we are inundated with the risk of the week. People overestimate uncommon risks, such as food additives, and underestimate more common risks, such as the hazards associated with smoking. We need to find better ways to help people assess risk and correct misperceptions about risk.

Neil Weinstein's research is exemplary in this regard. Weinstein developed the Precaution Adoption Model to reflect the processes that people undergo in responding to potential hazards (24). This accessible and useful model is quite complementary to the Stages of Change Model developed by Prochaska, DiClemente, and their colleagues. Research at Duke suggests that measures of subjective and objective risk may be useful in predicting stages of change.

We are learning from research led by Caryn Lerman that predisposing factors, such as a woman's coping style, may affect general distress in response to a breast cancer risk counseling intervention. A woman's education, coping style, and level of anxiety may affect how much she comprehends during the counseling process about breast cancer risk (25).

This study found an education by treatment group interaction such that the benefits of an individual session of breast cancer risk counseling were greater in terms of reducing breast cancer specific distress for those with a high school education or less. In addition, women with high baseline anxiety were less likely to show improvements in risk comprehension than those with low baseline anxiety. In both groups, monitors showed greater distress from baseline to follow-up. These kinds of results illustrate the potential benefit of counseling studies about cancer risk and also the complex nature of the effects.

If we cannot help people better evaluate risks, we may be seen by the public as not worthy of attention. The challenge is not only to identify risks. The challenge is to help people determine what risks are relevant to them and to set priorities about what actions they will take.

We Will Have to Refine Proactive Interventions if We Are to Have a Public Health Impact

Indeed, we will have to greatly improve our definition of proactivity. This is true whether we are talking about diet, smoking, cancer screening, or other problems. We cannot afford to wait for people to come to us. Abrams has articulated this very thoughtfully. He showed that an intervention that has a modest efficacy of 5% but reaches 80% of the population would double the impact of a clinical approach that is more effective but reaches far fewer people (for example, 40% impact) (6).

In our own studies, we demonstrated the effectiveness of proactive telephone counseling. In a five-year study conducted in a managed care organization, we demonstrated that proactive telephone counseling tripled the odds that a woman would obtain a mammogram at a counseling cost of $4.92 per mammogram obtained. The impact was especially great for women with household incomes less than $30,000 (26). We are now comparing telephone counseling against tailored print interventions in a study being conducted at the Kaiser Foundation Health Plan of North Carolina with the Health Communications Lab at the University of North Carolina and Blackwood Mountain Computing (who are collaborators). In a valuable study, Sue Curry and colleagues showed that proactive outreach telephone counseling increased rates of cessation among precontemplators (27).

Print proactive methods also are exciting. Jim Prochaska, Wayne Velicer, and colleagues showed that interactive computer feedback outperformed other interventions 18 months later (28). Vic Strecher and his colleagues (29), including Harm Hospers, Celette Skinner (30), and Marcy Campbell (31) have shown tailored communications to be an exciting, promising strategy for promoting behavior change.

The need for proactive strategies is especially important now that we have been successful in motivating many people to stop smoking, eat 5 A Day, and get mammograms and Pap tests. We need to build upon what we've learned in changing single health behaviors to the study of multiple health behaviors.

The proactivity will doubtless benefit from new technologies ranging from media that we are only beginning to imagine to the tailored health communications being developed by many of us. Advances in artificial intelligence, especially neural networks, can take us beyond our present rule-based expert systems for proactive behavioral intervention. Properly used, these new methods may grant us the ability to model and affect the many kinds of interpersonal interactions and the interaction with information associated with successful health behavior change.

But let me inject a strong cautionary note here. Like every other enterprise, we are going to be subject to pressures to substitute technology for people. We must remember that our methods should empower, support, and even redirect the efforts of the world's committed health care providers, counselors, outreach workers, and community leaders—not replace them. Behavioral medicine holds the tools to improve the health of populations. We have made substantial progress. Yet, the hard work lies before us.

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