

Barriers to the Integration of New Evidence in Medicine: The Importance of Context

JOHN A. ASTIN

In the current issue of *Arthritis Care & Research*, the study by Pradhan and colleagues (1) suggests that training in the skill of mindfulness (what they and others have defined as “moment-to-moment, non-judgmental awareness” [2]) may benefit patients with rheumatoid arthritis (RA). While the investigators failed to find significant changes in RA disease activity as measured by the Disease Activity Score 28-joint assessment, the 35% reduction in psychological distress at 6-month followup is not insignificant, particularly given the considerable mood disturbance and psychological effects that can accompany pain-related conditions such as arthritis. Although the study was likely underpowered and limited by the lack of an active control condition, the fact that positive changes were observed at 6 months (and were, in fact, more pronounced than those seen at the postintervention assessment) suggests that the intervention, and not merely some nonspecific (placebo/expectancy) factor, was responsible for the symptom improvements observed.

These positive changes in mood and psychological well-being are consistent with data from other studies of the potential value of mindfulness-based interventions to reduce stress and help patients cope more effectively with the mental, emotional, and physical challenges that frequently accompany chronic health conditions (3). Pradhan and colleagues’ findings also lend support to the growing evidence base encouraging the use of an array of psychological interventions to improve mood and quality of life in patients with arthritis and other pain-related conditions (4,5). For example, a meta-analysis published in 2002 (4) found that the adjunctive use of psychological interventions (such as multimodal cognitive-behavioral interventions that teach skills for stress management, pain coping, and relaxation) improves clinical outcomes such as pain, function, and quality of life in patients with RA. Similar data exist for osteoarthritis, indicating that psychosocial

behaviorally based interventions consistently improve treatment outcomes (6).

In spite of such findings and the growing epidemiologic, basic science, and clinical evidence base pointing to the complex interplay of biologic, psychological, and social factors’ influence upon human physiology and health (7–9), research suggests that psychosocial factors continue to be overlooked or frequently missed in clinical encounters (10,11), and as a rule continue to be underemphasized in medical education (12,13). Studies also suggest that empirically supported behavioral/mind-body interventions for such common health problems as pain and insomnia are used by only a minority of patients with these conditions (14).

An example of this apparent disconnect between the evidence base (linking mental-emotional factors and physical health outcomes, including arthritis) and the actual attitude and practice patterns of physicians can be seen in some recent work carried out by a research group of which I am a member. In a national survey of physicians in primary care and several selected primary care specialties, we found that only 20% of physicians and 12% of rheumatologists indicated that the inclusion of psychosocial/mind-body methods would lead to significant improvements in patients with arthritis (15). Data from a national survey of interns and residents parallel these findings, with only 23% stating that such methods would lead to significant improvement in arthritis treatment (12).

In light of such findings, the obvious question arises: why, particularly in an era of so-called evidence-based medicine, is this growing evidence base that points to the clinical utility of behavioral/mind-body therapies and the influence of psychological factors on human health and physiology failing to be integrated into the way medicine is being taught and practiced?

It is important to point out that despite the belief that medical practice should be grounded in solid scientific evidence, the generation of such evidence, while often necessary, is frequently insufficient to actually change clinical practice. In an effort to shed light on the possible factors that influence whether or not physicians adopt new knowledge, Cabana et al (16) reviewed 76 studies that examined obstacles to clinical guideline adherence. In their review, factors impacting physicians’ attitudes included a lack of agreement regarding the clinical guide-

John A. Astin, PhD: California Pacific Medical Center, San Francisco.

Address correspondence to John A. Astin, PhD, California Pacific Medical Center, 2200 Webster Street, Room 503, San Francisco, CA 94115. E-mail: john@integrativearts.com.

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line's interpretation or implementation, lack of outcome expectancy (e.g., the belief that guideline adoption will not lead to the desired patient outcomes), lack of self-efficacy (e.g., physicians believe they cannot carry out the recommended practice), and the inertia of previous practice (e.g., lack of motivation to change, strength of prior habits and routines). Several external barriers were also identified including environmental constraints (e.g., lack of time, insufficient resources) and certain patient factors (e.g., difficulty reconciling patient desires or preferences with guideline recommendations) (16).

Haines and Donald (17) discussed a number of theoretical barriers to change, and divided them into 2 broad categories: environmental and personal. Environmental factors can include elements of clinical practice (e.g., time), education (e.g., continuing medical education opportunities), the health care system (e.g., managed care policies), and the society (e.g., influence of the media). Personal factors can be those associated with practitioners (e.g., obsolete knowledge, influence of various opinion leaders, beliefs about innovation) and factors associated with patients (e.g., cultural beliefs that influence preferred choices of care).

Along these same lines, my colleagues and I have recently completed work on a multiyear, National Institutes of Health-funded project, the purposes of which were to shed light on potential barriers to physicians' recognition of the role that psychosocial factors can play in health, and to illuminate the value of behavioral/mind-body therapies in the treatment of many common medical conditions. Through this work (12,15,18) we identified a number of factors, many of which parallel those identified by Cabana et al in their review (16). These included: 1) physicians' lack of knowledge of the evidence base supporting psychosocial/mind-body approaches; 2) physicians' sense that they lack professional competence to effectively address psychosocial issues; 3) the perception that there is insufficient time, and that it is frequently not economically practical to address such issues; 4) inadequate exposure to the role of psychosocial/mind-body factors in medical school and residency training; and 5) the tendency to view medical conditions as either purely biologic or purely psychological in nature, rather than recognizing the complex interplay of biopsychosocial factors that influence most health conditions.

In our surveys of physicians, medical students, and residents, we also observed that women were significantly more likely than men (almost 2:1) to indicate that psychosocial factors were important to address in diagnosis and treatment. Women also reported finding greater satisfaction when they engaged patients about such issues and were significantly more likely to report using and/or referring patients out to mind-body therapies such as relaxation, psychological counseling, and meditation to treat many common conditions (15).

As can be seen from the above findings as well as those cited by Cabana et al and Haines and Donald (16,17), physicians' decisions about which treatments and diagnostic factors they employ are influenced by undoubtedly complex and highly variable sources. Therefore, just as it is crucial for medicine to consider the complex array of

biopsychosocial factors underlying the conditions they see and treat (19), we would do well to apply the same contextual lens to our understanding of why medicine is frequently slow to translate new evidence as it emerges. In order to understand why the biopsychosocial model has not been well integrated in medicine in spite of decades of research pointing to its importance, we must look at the question from a more multifactorial/"integral" (20) perspective.

In an era of so-called evidence-based medicine, we must bear in mind that the emergence of any piece of evidence (whether it be the intriguing data reported here by Pradhan et al or some other finding) is occurring not in a vacuum, but within a complex set of attitudinal, ideological, societal, economic, and cultural contexts (both implicit and explicit). These contexts no doubt influence whether or not, and to what extent, such findings are considered interesting, important, or valid, and whether they are ultimately translated into medical training and practice.

Interestingly, the focus of the intervention tested by Pradhan et al (i.e., mindfulness) is quite instructive here. For example, one way to understand the practice of mindfulness and its potential value in pain management and affect regulation is that it involves the development of greater awareness of the contexts (cognitive, emotional, and social) that are acting to influence the perception and experience of what we call "pain." For example, the sensations or data one labels as "painful" are interpreted both conceptually ("I don't want this pain to be here," "I can't believe this is happening to me") and emotionally ("I'm afraid this pain will persist and become disabling," "I'm angry that this is happening to me"). And such interpretations can significantly influence how such sensations are ultimately experienced, how much disability they give rise to, and how much one suffers physically and psychologically as a result of them.

With respect to the interpretation of new data such as those presented by Pradhan et al, we as clinicians, researchers, and policy makers would be well served to apply some of the very same principles of mindfulness that Pradhan et al tested in their study. Namely, we should endeavor to become as self-reflective, conscious, and aware as we can of the attitudinal and ideological contexts and frameworks we are bringing to the reading of such data. For example, are there certain assumptions we hold regarding the nature and causes of physical pain? Do we subscribe to particular beliefs that might make us more or less skeptical about the extent to which psychological-emotional factors can actually impact human physiology including pain and its perception? Do we believe that psychological experiences represent a valid domain of inquiry, or do we think that such phenomena are too soft (not concrete enough) to be considered scientifically valid and reliable? Do we believe that clinicians are too constrained by systemic factors (i.e., managed care limits on time and reimbursement) to be able to actually apply such findings? Do we think that addressing the psychosocial dimension of a patient's experience in the course of treating conditions such as arthritis is not something that rheumatologists or internists should even be trained to address (i.e., such care should be left to the psychologists or psy-

chiatrists)? Were we to begin to apply such findings in our work with patients, would we have any concerns about how our professional peers would view us? These are just a few of the many possible interpretive frameworks that could be operating whenever we are exposed to new information or data.

Clearly, cultivating greater mindfulness or awareness of our particular interpretive frameworks, biases, and beliefs is important in furthering our understanding of the factors that may serve as potential barriers to the incorporation of new knowledge in medicine. But developing such self-reflection and awareness may also have far-reaching implications in how we view our patients and ultimately deliver care to them. As noted by Epstein (21), we are constantly interpreting the data our patients bring to us (their stories, their symptoms, and their concerns) from the perspective of the conceptual frameworks, values, biases, and prior assumptions we hold, as well as with whatever emotional reactions we may have. Although we may aspire to be objective in our reading of medical literature and the data our patients present to us, our capacity for such objectivity is frequently constrained by certain subjective realities, which are often operating outside of conscious awareness (i.e., are more tacit than explicit). Our values, our beliefs, and our emotional needs (e.g., desire for approval, discomfort with uncertainty or lack of controllability) will, to paraphrase the words of Anaïs Nin, often cause us to see the world (including ourselves and our patients) not simply as it is, but as we are.

REFERENCES

1. Pradhan EK, Baumgarten M, Langenberg P, Handwerker B, Gilpin AK, Magyari T, et al. Effect of mindfulness-based stress reduction in rheumatoid arthritis patients. *Arthritis Rheum* 2007;57:1134–42.
2. Kabat-Zinn J. Mindfulness-based interventions in context: past, present, and future. *Clin Psychol Sci Pract* 2003;10:144–56.
3. Grossman P, Niemann L, Schmidt S, Walach H. Mindfulness-based stress reduction and health benefits: a meta-analysis. *J Psychosom Res* 2004;57:35–43.
4. Astin JA, Beckner W, Soeken K, Hochberg MC, Berman B. Psychological interventions for rheumatoid arthritis: a meta-analysis of randomized controlled trials. *Arthritis Rheum* 2002;47:291–302.
5. Astin JA. Mind-body therapies for the management of pain [review]. *Clin J Pain* 2004;20:27–32.
6. Lorig K, Holman H. Arthritis self-management studies: a twelve-year review. *Health Educ Q* 1993;20:17–28.
7. Kiecolt-Glaser JK, McGuire L, Robles TF, Glaser R. Emotions, morbidity, and mortality: new perspectives from psychoneuroimmunology. *Annu Rev Psychol* 2002;53:83–107.
8. McEwen BS. Protective and damaging effects of stress mediators [review]. *N Engl J Med* 1998;338:171–9.
9. Rozanski A, Blumenthal JA, Kaplan J. Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy [review]. *Circulation* 1999;99:2192–217.
10. Hall JA, Stein TS, Roter DL, Rieser N. Inaccuracies in physicians' perceptions of their patients. *Med Care* 1999;37:1164–8.
11. Roter DL, Stewart M, Putnam SM, Lipkin M Jr, Stiles W, Inui TS. Communication patterns of primary care physicians. *JAMA* 1997;277:350–6.
12. Astin JA, Sierpina V, Clarridge BR. Integration of the biopsychosocial model: perspectives of medical students and residents. *Acad Med*. In press 2007.
13. Waldstein SR, Neumann SA, Drossman DA, Novack DH. Teaching psychosomatic (biopsychosocial) medicine in United States medical schools: survey findings. *Psychosom Med* 2001;63:335–43.
14. Wolsko PM, Eisenberg DM, Davis RB, Phillips RS. Use of mind-body medical therapies. *J Gen Intern Med* 2004;19:43–50.
15. Astin JA, Soeken K, Sierpina VS, Clarridge BR. Barriers to the integration of psychosocial factors in medicine: results of a national survey of physicians. *J Am Board Fam Med* 2006;19:557–65.
16. Cabana MD, Rand CS, Powe NR, Wu AW, Wilson MH, Aboub PA, et al. Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA* 1999;282:1458–65.
17. Haines A, Donald A. Making better use of research findings. *BMJ* 1998;317:72–5.
18. Astin JA, Goddard T, Forsy K. Barriers to the integration of mind-body medicine: perceptions of physicians, residents, and medical students. *Explore (NY)* 2005;1:278–83.
19. Engel GL. The need for a new medical model: a challenge for biomedicine. *Science* 1977;196:129–36.
20. Astin JA, Astin AW. An integral approach to medicine. *Altern Ther Health Med* 2002;8:70–5.
21. Epstein RM. Mindful practice. *JAMA* 1999;282:833–9.