Part VI

PERSPECTIVES
40
THE BIOMEDICAL MODEL AND THE BIOPSYCHOSOCIAL MODEL IN MEDICINE

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Introduction
The “biomedical model” (BMM) and the “biopsychosocial model” (BPSM) are contrasting conceptual models or frameworks that organize our thoughts, knowledge, and experience in medicine and clinical practice. The BMM has been the dominant model, understanding disease and clinical knowledge and practice in terms of biomedical science, and the BPSM was put forward, especially in the writings of George Engel (Engel 1977, 1981), as a criticism and corrective, urging more serious inclusion of psychological and social factors into our thinking. This chapter discusses both models, with emphasis on the latter.

The BPSM has had substantial resonance and impact on discussion concerning medicine and health care. Yet proponents often bemoan the fact that this shift in thinking has not been more robust, leaving the BMM too dominant (Smith et al. 2013). Coming to clear consensus about the reasonableness of the proposed shift to the BPSM and what is at stake is complicated both by these models having several components, and by ambiguity or uncertainty about just what these models are and what is involved in their adoption. Thus care must be taken in characterizing these models.

The BMM and BPSM are often said to be “models of disease,” structuring how we think about disease, primarily in the sense of what the causes of a disease are, but also concerning whether the disease itself is seen or defined in biomedical or biopsychosocial terms. The BMM sees disease in terms of underlying biochemical or physiological alteration. In contrast, the BPSM sees disease as resulting from the interaction of these biomedical factors with psychological and social factors. The psychological factors brought into play include occurrent psychological features such as emotions, anxiety levels, and behaviors, as well as more permanent features of personality and lifestyle. The social factors can include personal and family relationships and support systems, cultural views, community, environment, and socio-economic status. (This dovetails with recent important work concerning the “social determinants of health” [Marmot and Wilkinson 2005].)

One point of ambiguity concerns what these models are models of: the models are referred to sometimes as models of disease and other times as models of illness. Just how one distinguishes disease and illness will complicate the analysis here, but typically the latter is seen as including
the patient’s subjective experience and is also more likely to involve its evaluative assessment. (For example, a person may have a disease process going on in one, but one that is not (yet) noticed; this would not constitute the person being ill.) Whether we mean a model of disease or of illness, and how we define these two, will affect the meaning and significance of the claim that there are psychosocial factors as causes.

Other questions that arise concerning the meaning and implications of these models are the following. The BMM’s focus on the biomedical causes of disease and the question of whether higher-level causes are taken seriously raise certain broad philosophical questions. For example, the BMM is likely to be viewed as reductionistic, and so raises questions about reductionism, holism, and emergent properties. Is our medical science and our knowledge of medical practice ultimately reducible to or best understood in terms of underlying physical and chemical sciences? Or does an understanding exclusively in terms of such lower-level sciences provide a distorted picture? Should we endorse a “holism,” positing laws, explanations, entities, or properties that are not reducible to or explainable by reference to those of the lower-level sciences? In addition, the BMM, focusing on physiology and biochemistry, might be seen as the more “scientific” view; this raises conceptual and evaluative questions about what counts as science, and as good science.

Central to the importance of this topic is, of course, the fact that which model one embraces has an impact on a number of matters of practice: diagnosis, explanation, prognosis, treatment, prevention, patient management more generally, and consequently on research about all of these things. The BPSM proponents argue that “concentration on the biomedical and exclusion of the psychosocial distorts perspectives and even interferes with patient care” (Engel 1977: 131) and that the BPSM encourages a more nuanced and perhaps more humanistic approach to the doctor-patient encounter, information gathering, and communication. Specifically, the two models suggest different implications for the data one needs to collect in order to make decisions about diagnosis and patient management. From the BMM perspective, lab tests etc. are seen as the most objective, as probing deeper into the medical reality, and thus as providing the most reliable and useful information. The BPSM perspective emphasizes more the reports from patients, including reports of subjective experiences.

Note that clinicians need to explain not just the presence or absence of disease but also such things as susceptibility to the disease, presentation of a disease in an individual patient, and severity and course of the illness. The BPSM-trained physician will also seek psychological and social explanations of certain matters that are themselves psychosocial, such as the patient’s “adoption of the sick role” or visit to the physician in the first place (and the timing of these things). These will help in interpreting patients’ statements, in judging how much of the patient’s story has been told, and in encouraging patients to provide information that will be useful for diagnosis and management.

For the BPSM, “(t)he most essential skills of the physician involve the ability to elicit accurately and then analyze correctly the patient’s verbal account of his illness experience” (Engel 1977: 132), whereas the BMM “encourages bypassing the patient’s verbal account by placing greater reliance on technical procedures and laboratory measurements” (Engel 1977: 132). The BPSM will also emphasize that we should become more conscious of and indeed study scientifically the very doctor-patient encounter process itself, with the end of making this process of diagnosis and patient care more effective.

It is worth noting that the two different models also have different implications for areas of research to be pursued more generally. Areas that the BPSM would promote include research on psychosomatic illness, psychoneuroimmunology, the placebo effect, health psychology, and the interconnection with research on the social determinants of health.
Origins of the Biomedical Model

The BMM has its origins in the success of reductionistic medicine, especially in the 19th century, including the germ theory. The resulting approach to medical science, focusing on underlying biological processes, led to dramatic success in theoretical understanding and in the ability both to detect and treat disease and illness and to improve health and life expectancy. This provided confidence in the view that proper scientific understanding and effective cures will require going to lower and lower (more mechanical) levels of explanation. It was encouraged further by reforms in medical education prompted by the Flexner Report in 1910, the emphasis of which was the importance of strengthening the scientific basis of medical training.

The biomedical model generalizes from this and “assumes disease to be fully accounted for by deviations from the norm of measureable biological (somatic) variables” (Engel 1977: 130). The hope is that biomedicine, as the appropriate “scientific” approach, will eventually get to the root of and resolve all of our health problems.

George Engel and the Biopsychosocial Model

Over the years there have often been critiques of contemporary medicine as being too focused on biological or reductive science, with too little focus on the doctor-patient relationship. These ideas were given an especially important articulation in a series of articles in the 1970s and 1980s by George Engel (1913–1999), professor of psychiatry and medicine at the University of Rochester (Engel 1977, 1981). Typically, people have this set of influential writings and discussions in mind when they discuss the BPSM in the medical literature, and this set of ideas is the focus of this chapter.

But similar ideas are discussed in the broader literature, often without reference to this specific work, not necessarily conceiving of things just as Engel does. After all, critiques have been made of a number of trends in modern medicine and medical practice (and by critics with several different perspectives): the failure to understand and take seriously the responses and concerns of patients, insufficient attention to the humanistic side of clinical care, inflexibility concerning alternative medicine practices, the unreflective overuse of technology and lab tests, the use of high-tech and invasive technologies, failure to give sufficient thought to quality of life, paternalistic practice and attitudes, and even the profit motive. (Engel does note, for example, the complaint that “physicians are lacking in interest and understanding, are preoccupied with procedures, and are insensitive to the personal problems of patients and their families,” as well as that they are seen as “cold and impersonal” [Engel 1977: 134].) Thus the critiques of modern, scientific medicine have a variety of aspects, much but perhaps not all captured by Engel’s discussion.

Again, the value of the psychosocial aspects has been recognized over the years, and there have been changes in both education and practice. There is nevertheless frustration over the limited nature of these changes.

Initial discussion of the BPSM arose in part from a crisis in psychiatry in the 1960s about whether it is in fact on firm scientific footing, and concerning whether psychiatry should attempt to ensure its scientific status by dealing exclusively with diseases rooted in defects of the brain, or whether it should instead admit that it is something distinct from medicine per se (Engel 1977: 129–130). But Engel was quite explicit that medicine as a whole was in crisis. For him, the tensions in psychiatry were not to be resolved by deciding between molding it to the medical model or allowing it to go its own way. Rather, the BMM was “no longer adequate for the scientific tasks and social responsibilities of either medicine or psychiatry” (Engel 1977: 129). All of medicine should be re-conceptualized and take more seriously the psychosocial
factors at play. (Although much discussion continues to occur about the BPSM within psychiatry, the present chapter focuses on the case of medicine generally.)

Engel challenges the sharp line between psychiatry and the rest of medicine. In a discussion comparing diabetes and schizophrenia, he emphasizes that we should not think of the one as a somatic disease and the other as a mental disease; both sets of factors permeate both. Concerning diabetes, he notes that

while the diagnosis of diabetes is first suggested by certain core clinical manifestations, for example, polyuria, polydipsia, polyphagia and weight loss, and is then confirmed by laboratory documentation of relative insulin insufficiency, how these are experienced and how they are reported by any one individual, and how they affect him, all require consideration of psychological, social and cultural factors, not to mention other concurrent or complicating biological factors.

(Engel 1977: 131–132)

A question arises of whether one might understand the above claim (with its emphasis on how things are experienced) as really being about illnesses rather than diseases. Perhaps disease could remain within the BMM and illness be the domain of the BPSM. One response to this Engel would give is that proper medical practice simply does require attention not just to disease but also to illness. No one should practice medicine by focusing only on disease and not illness.

Perhaps the BMM is appropriate for medical science rather than medical practice, and the BPSM could reign in the latter realm. (It can be noted that medicine is not itself “a science” (which does not mean that it isn’t done scientifically), but instead a “practice,” one that appropriately makes use of various sciences, like biochemistry, virology, and neurophysiology [Munson 1981].) But how well can science and practice be separated? Medical research really has to be clinical (i.e., tied to practice). If attention to psychosocial causal factors is necessary for clinical practice, then it is crucial for the research that aims to aid that practice.

In any case, psychosocial factors play crucial roles not just in the experience of illness—as if this could be set aside as not part of medicine per se. They act as causes of disease, its course, and its severity.

What Sort of Things Are These Models?

Another source of ambiguity concerns the kind of thing the BMM and (especially) the BPSM are. They are usually called “models,” but sometimes “paradigms,” sometimes just “approaches” or even understandings of clinical practice. The terms “model” and “paradigm” have particular technical meanings that some might say are not met by the BMM and BPSM; this can be misleading and be a source of criticism. It does seem correct to say that the BPSM is not to be conceived as an attempt to be a scientific model to be tested and confirmed, though one could try to gain evidence about whether its adoption leads to better outcomes. It is also worth noting that the BMM and BPSM are ideal types, and that what approach a physician takes can be a matter of degree.

Engel describes the BPSM as providing “a blueprint for research, a framework for teaching, and a design for action in the real world of health care” (Engel 1977: 135). A different and broader sense of biopsychosocial could emphasize the interdisciplinarity of a given field of study. For instance: “Gerontology is an interdisciplinary field of study of the elderly, using a biopsychosocial approach to study aging from the perspectives of biology, medicine, nursing, social work, the social sciences and humanities” (McCullough 2004).
Epstein and Borrell-Carrio (2005) argue that while others have sometimes supposed the BPSM to be “an empirically verifiable theory, a coherent philosophy, or a clinical method,” in fact it should instead be viewed simply as “a vision and an approach to practice.” Then, when getting down to their recommendations, what these authors emphasize is a number of habits of mind that need to be inculcated. These include awareness of context, attentiveness, peripheral vision, curiosity, and informed flexibility. Epstein and Borrell-Carrio take themselves to be proponents of the BPSM tradition, but they are endeavoring to place things more concretely in a clinical context, and to avoid the implication that there is “an expectation that clinicians explore each level of the biopsychosocial hierarchy in each moment of each encounter” (430).

Scientific Basis and General Systems Theory

As suggested above, the BMM may appear to be the more “scientific” model, based in “hard sciences” such as biochemistry and physiology, and with more focus on empirically objective data. Yet the BPSM, particularly as articulated and developed by Engel, emphasizes its own scientific credentials. For one thing, by including these additional variables, the BPSM provides a more complete and accurate picture and thus improved understanding. Further, as mentioned earlier, the BPSM aims to expand the targets of scientific investigation to include the doctor-patient relationship.

It might be objected that this broadening of the scope of investigation cannot plausibly be said to involve a broader scientific project, on the grounds that the psychosocial factors at issue are themselves not adequately susceptible to such a rigorous or scientific approach. Perhaps the clinical encounter is more artful than scientific, requiring a humanistic element and the reliance on “clinical judgment,” something we cannot expect to be analyzed in terms of algorithms or science. Some BPSM proponents might endorse this as part of what this new model brings. The term “humanistic” is indeed often connected with BPSM, and the idea of an unanalyzable clinical judgment does come to mind in a context of integrating complex information from human interactions. But Engel’s central response to this dismissal of the BPSM’s scientific project would be that this comes from too narrow a view of what it is to study things scientifically. It is true that inclusion of the psychosocial factors makes things more complex, and the regularities concerning them will be less universal and more “patchy.” But this does not mean that they cannot be usefully or scientifically addressed, or that we are left simply with a humanistic intuition. After all, similar things can be said of biomedical science relative to physics and chemistry, and yet this gives us no reason to conclude that biomedical science is not scientific (Schaffner 1993: chapter 3). Of course, this shows that there is no “in principle” argument against adopting the BPSM along these lines; it remains possible to argue that, for pragmatic reasons, this extra complication is not warranted.

But there is another way in which Engel stresses that the BPSM is scientific, namely by placing it within the framework of “general systems theory” (von Bertalanffy 1968), thus applying to medicine a theoretical development from biological science more generally. General systems theory highlights the fact that nature is organized into a hierarchy of levels, and emphasizes the importance of seeing both the way in which these levels are relatively autonomous and how they are interconnected. This perspective lets us represent and study both the component parts and the more complex organized wholes, as well as their interactions.

The following provides the hierarchy or system of organizational levels, organized from highest (or most complex and encompassing) to lowest (Engel 1981: 105):

BIOSPHERE
SOCIETY-NATION

449
CULTURE-SUBCULTURE (age, sex, class, religion, education, economic, etc.)
COMMUNITY (health care, work, neighborhood, social, recreational, etc.)
FAMILY (nuclear, extended)
TWO-PERSON (doctor, family member, coworker, friend, etc.)
PERSON (experience and behavior)
NERVOUS SYSTEM
ORGANS/ORGAN SYSTEMS
ORGANELLE
CELL
TISSUE
MOLECULE

Levels higher up are composed of those lower down. The BMM uses only the lower half of the continuum, from the person (or individual organism) down through its component parts. This reductive stance of the BMM emphasizes that these lower levels adequately explain that which occurs at the higher levels, that this is what proper explanations consist in, and that this is where we should focus our attention. The BPSM—in line with the general systems theory approach—takes seriously that the whole range of levels in the hierarchy is at least potentially relevant to explanations of something at any particular level, and it emphasizes that there is interaction; features at one level help explain the higher levels, but also higher levels sometimes explain things at lower levels (as with biological function and contribution to goals). As a result, understanding and effective practice require that one pay attention to, understand, and explore each of the levels.

Note that this view does not require endorsing holism—nor does Engel endorse this, worrying that it too can lead to dogma. In particular, it doesn’t require rejecting an ontological or metaphysical thesis about reductionism—that the structure of the world really is such that the higher levels are fully constituted by and can be given an explanation in terms of the lower levels. For instance, one could hold that in principle there could exist an account, in terms of underlying biology, of psychiatric disorders as well as of psychological precursors to (somatic) diseases. But even if so, this would not change what is important for clinical practice or even genuine scientific understanding. Explanation in terms of lower levels of organization can sometimes be enlightening, but it is not always better: sometimes it will not be possible, sometimes it will be too complicated to be intelligible, sometimes it will not lead to useful questions to explore, and sometimes it will distract us.

Myocardial Infarction Case

Engel illustrates a number of themes with an extended discussion of a relatively ordinary medical case involving a patient with a myocardial infarction (MI), illustrating psychosocial factors that physicians need to track and understand, as well as the ways in which knowledge about such things as the patient’s personality traits is crucial in interpreting what he says about his cardiac pain.

Here is a very brief description of the case (Engel 1981: 107 ff.): a 55-year-old man is brought to the ER with symptoms similar to those he had six months prior when he had an MI. We learn about the present event that the man is in denial about having a heart attack as he first experiences the symptoms, that an employer has persuaded him to allow her to take him to the hospital, and that his behavior and decisions are affected by a number of worries, including concerning his family, related to his felt need to be in control.
As Engel notes, "(t)he information that the patient resisted acknowledging illness and had to be persuaded to seek medical attention, especially in the face of a documented heart attack six months earlier, reveals something of this man’s psychological style and conflicts" (Engel 1981: 108). Subsequent features of the case illustrate how this is important: after an apparent recovery, the patient goes into ventricular fibrillation. Engel makes the case that this is not just part of the natural course of what was going to happen (even if he had not gone to the hospital—with the implication that he was very lucky to have gotten to the hospital), but instead resulted from his losing confidence in the staff and his control over the situation when, after staff members have difficulty carrying out an arterial puncture, they run out to look for help without communicating with him.

Engel describes the course of the case in detail, using the biopsychosocial hierarchy to analyze the causal processes and the reasoning behind diagnosis and patient management: He presents a series of diagrams placing, at various levels in the hierarchy, the events and processes that were causal or that provide information from which to make (clinical) judgments about diagnosis, prognosis, and patient management. (The central nervous system level plays a key role, mediating several of the processes.)

The information about the patient’s concerns and psychological dispositions potentially relevant to the stability of his cardiovascular system—and in particular the meaning for the patient of the illness or symptoms—is shown to serve both proper understanding and patient prognosis and management. “Alert to the patient’s reluctance to submit to medical care, the physician would carefully monitor the patient’s reactions to the coronary care procedures” (Engel 1981: 120). Again, this has implications for what sorts of things doctors need to have knowledge of, notice, and explore—and this has obvious implications for training.

**Biomedical Model Responses to the Biopsychosocial Model**

One can hardly deny that there are psychosocial as well as biological aspects to the causation of disease and illness. Nonetheless, it is worth considering reasons for reluctance to give up the BMM. First, one might feel that, even if its description of the causal processes is incomplete, the BMM works well enough, because the further factors addressed by the BPSM have a relatively small impact, and that therefore, given the BMM’s advantages in terms of simplicity and scientific rigor, it is legitimate to leave these further details aside. Possibly this is arguable in some subfields or contexts more than others: for instance, the BMM may work well enough in diagnosis in oncology, but not in the case of diagnosis and patient management in the chronic illness that is increasingly part of health care.

Another line of thought raises doubts about how significant the new insights from the BPSM are, seeing it as mostly just offering advice about strategies in relation to the doctor-patient relationship. On this view, what’s valuable about the BPSM is not really about medical reasoning per se, and thus does not justify a whole new model or a major shift in thinking. Now, it is true that important parts of the motivation and argument for the BPSM are related to the doctor-patient relationship. For instance, it is recommended for its role in ensuring better communication with patients, both because the patient can then be a good source of diagnostic information and be more willing to cooperate, and also perhaps because doing so involves respectful and humane treatment of the patient (recalling the “humanistic” element). This, combined with the “habits of mind” suggestion above from Epstein and Borrell-Carrio, might suggest that the shift to the BPSM is centrally about stressing such things as empathy and compassion. These are valuable things, to be sure, but not, so this objection goes, so centrally about medicine or medical reasoning as to warrant a reconceptualization of our understanding of disease.
But it would not be a fair interpretation of the BPSM to see it as at root about things like compassion, empathy, and humaneness. For one thing, one could be compassionate and humane and yet fail to take up more specific tasks of examining carefully (indeed, scientifically) the psychosocial causes and evidence in the medical realm. These latter are basic to the BPSM. One is not supposed to fill in the gaps by “being nice,” but rather to take seriously that there is much to be gained (in accurate diagnosis, in patient management and outcome) if clinicians (and clinical researchers) pay genuine attention to the psychosocial aspects of the situation.

A related critique might emphasize as the real value of the BPSM its ability, through improved communication and trust, to contribute to improved patient compliance, and this again might be seen as peripheral advice about the doctor-patient encounter, but not really something about medical reasoning. But here what should be pointed out is that, while such “compliance” (or better, “adherence”) is in fact noted as a benefit of the BPSM, this is not something peripheral but instead a crucial part of good medical practice. We want to carry out medical practice in a way that is effective toward medicine’s goals (such as improved health outcomes). The specific regimens and actions chosen, and just how they are used, are crucial. Medical research may have developed a drug with the right chemical content to be known to be efficacious toward a certain health outcome, but matters such as the dosage and pharmacokinetics can make a difference to its effectiveness (and safety). Further, a drug regimen that requires patients to take pills fewer times a day may well result in patients being better able to adhere to the regimen, and this may result in better health outcomes. Similarly, strategies of patient communication that enhance diagnostic accuracy and adherence to treatment regimens can be seen to be part of scientific medical practice.

The physician’s decision to choose one or the other of these strategies (perhaps based on the knowledge of her particular patient), and the effort put into research and development to generate a knowledge base about these alternatives, take into account psychological features of the process in the way recommended by the BPSM, and are rational in relation to the goals of attaining better patient outcomes. They are part of good medicine, and they can and should be taken into account by practitioners and examined scientifically by researchers.

Some further components to the debate can be seen by examining a recent defense of the BPSM. Smith et al. (2013) review concerns they see as explaining the BPSM’s limited uptake. One critique they discuss is that the BPSM is not a scientific model on grounds of its being too vague and not operationalizable. This critique alleges that the BPSM does not provide us with helpful advice, but, quite to the contrary, opens up the whole psychosocial realm as potentially relevant, leaving us completely unfocused, with the impossible task of looking at all information.

One general response could be that this critique incorrectly assumes that we must look at all psychosocial data indiscriminately, as if we have no theory or background knowledge to guide us in selection (rather as in the case of “narrow inductivism,” a naïve attempt to be objective by eschewing all theory and assumptions criticized by Hempel in Hempel 1966). But such a methodology does not follow from the BPSM. Especially as we do the research about the impact of various components of the doctor-patient interaction that the BPSM recommends, we will have a great deal of background knowledge that will aid us in this endeavor.

But while this response avoids the in-principle problem here, there remains an important challenge to specify just what advice the BPSM can provide. To this, Smith et al. (2013) provide a more concrete response, taking up the challenge to “operationalize” the model. They describe work done in creating and evaluating what has been called the “patient-centered interview.” Methods are specified for aiding practitioners both in gathering information and in handling emotion. These patient-centered interview techniques are grounded in assumptions...
about how psychosocial factors have substantial influence on the disease and illness of the patients. Smith et al. cite studies demonstrating the effectiveness of these interview methods. If these studies prove correct, then this can show one way to explore whether and in what ways the BPSM might be further or more explicitly integrated into the science, practice, and teaching of medicine. Leaving aside whether their specific proposals are adequate, this line of thought shows promise for making progress on this question of the operationalization, testing, and evaluation of aspects of the BPSM, and for following the BPSM in a concrete and scientifically grounded way. It is a worthy goal to try to gain evidence about the impact of various doctor-patient interaction techniques. The BMM and BPSM, and their comparison, can serve as guides for how to carry out this research, and this research can provide evidence of the utility of these models in different contexts.

**Conclusion**

The “biomedical model” and the “biopsychosocial model” offer different ways of organizing our understanding and experience in medicine and clinical practice. They differ in their conceptions of the causation of disease and illness, in their views about reduction and the relation of different sciences (such as how psychological and social causal processes connect with “lower-level” processes), and in how they understand the scope of science. And they provide different recommendations concerning such practical actions as information gathering, diagnosis, and patient management in clinical practice.

The BPSM was put forth as a response and corrective to the BMM, on the grounds both that it would more accurately capture medical reality and that it would improve patient care in terms of both effectiveness and ethical treatment of patients. On its face, the BPSM’s insistence on the relevance of the psychological and social causal factors is simply correct, and the ways the BPSM directs our thinking in clinical practice count as further reasons to adopt it. As noted, it has indeed been very influential. Yet proponents complain that the BMM remains entrenched in clinical practice, training, and research, that clinicians still give too little thought to psychosocial factors and view the real work to be at the biomedical level.

Such incomplete adoption might be explained by reference to unreflective inertia in medical training, involving a prejudice in favor of hard sciences as more prestigious or more scientific, along with a technical conception of medicine. Still, the reluctance and incomplete adoption might also be seen as understandable, in light of some of the considerations discussed above—the claim that the BMM could sometimes be a useful heuristic, and the fact that there is a certain amount of uncertainty about just what is entailed by adopting the new model, as well as precisely what advice it provides about specific practices. Hence, there is value to further thought about these things, as well as empirical research concerning the specific impacts of taking such particular concrete steps. Included here would be the proposals about the “patient-centered interview” referred to above by Smith et al. (2013). This is in line with Engel’s general suggestion that we study the processes involved in the doctor-patient relationship and their impacts.

**References**


**Further Reading**

