

10

FROM BIOPSYCHOSOCIAL MODEL TO PATIENTOLOGY

Hoyle Leigh, M.D.¹

Professor of Psychiatry
University of California, San Francisco, and
Fresno VA Medical Center

BIOPSYCHOSOCIAL MODEL : THE MUDDLE

George Engel coined the term, "biopsychosocial model" (1977), as an alternative to the prevailing disease model that he called the "biomedical model". While recognizing the contributions that the biomedical model made to the development of modern medicine, Engel objected to the "dogma" of biomedical model on the grounds that it is reductionistic, mechanistic, and dualistic. In its stead, Engel proposed the biopsychosocial model that takes into account the psychological and social variables as well as the biological in the experience of the patient of the disease, the *illness*. In addition, he also proposed that conditions of life constitute significant variables in *influencing a disease process*.

The biopsychosocial model has found wide acceptance among psychiatrists and medical educators, but has been criticized as being too time consuming (Joynt, 1980), and often not very practical (Sadler & Hulgus, 1990). There is evidence that medical students and residents clearly prefer the scientific elegance of the biomedical rather than biopsychosocial notions of illness (Silverman et al, 1983). What are the reasons that biopsychosocial model is seen to be more time consuming, less practical, and less appealing than the biomedical model?

I believe that the reasons include: (1) conceptual confusion about the role of grand-theories, particularly about the mind-body problem and the role of general systems theory in the model, (2) conceptual confusion about what the biopsychosocial model is a model of, leading to (3) conceptual confusion about whom the biopsychosocial model is for, and (4) a lack of an operational technique of applying the model crisply. In this essay, I shall discuss each of these problems and describe a more systematic operational approach in implementing a practical biopsychosocial model for the patient.

Engel's biopsychosocial model implicitly has two components, a model of the disease

¹Correspondence: Department of Psychiatry, UCSF-Fresno, 2615 E. Clinton Ave, Fresno, CA 93703

and a model of the illness. Disease in this sense denotes the abnormality at the biological level, and illness is the distressing experience of the person together with the symptoms emanating from the disease (Feinstein, 1974; Leigh & Reiser, 1992). There has been much confusion because of the ambiguity concerning whether biopsychosocial model is a model of disease or of illness.

The theoretical underpinning of Engel's model is Bertalanffy's general systems theory (1968). General systems theory posits that the universe is made up of various levels of systems and subsystems, and each level interacts with other levels of organization. Therefore, disease processes in the cellular level are affected by processes in the person level events (psychological events), which are in turn affected by social events. Of course, the arrow of interaction in the other direction, i.e., cellular changes affecting psychological events is the familiar biomedical model.

Long before George Engel, Hippocrates wrote, "The visiting physician must consider the attitude, wind direction, purity of water supply, and the season of the year before making diagnosis. In order to cure the human body, it is necessary to have a knowledge of the whole of things". The idea that the personality system and the environment affect disease processes long antedates the advent of the biopsychosocial model. Wise physicians have always practiced a form of biopsychosocial model, whether it is called that or not. Psychosomatic medicine developed as a field of scientific enquiry concerning this interface between psychological states (personality system) and biologic pathogenesis. Consultation-liaison psychiatry evolved as a specialized area of the application of psychiatric concepts and skills in treating medical patients with emotional problems (Leigh & Reiser, 1977). Consultation-liaison psychiatrists have attempted to practice the biopsychosocial model in treating patients with varying degrees of success. For example, by emphasizing the personality dimension of the patient (such as the need for attention, splitting, idealization, etc) as requiring attention on its own, consultation-liaison psychiatrists have helped their medical colleagues manage difficult borderline patients, regardless of their disease.

While both psychosomatic medicine and consultation-liaison psychiatry contributed much to our understanding of the interface between the mind (personality system) and the body (biological system), I believe they also contributed to the conceptual confusion concerning the biopsychosocial model. George Engel, an internist and psychosomaticist, espoused a general systems interaction between the biological system and the personality system in all disease processes (1980), essentially an expansion of the psychosomatic concept in the tradition of Franz Alexander (1950). It should be noted, however, that psychosomatic concepts in the form of "psychological factors participating in the pathogenesis of a physical disease" apply only for some but not all diseases. Even in those diseases, understanding the psychological factors responsible does not necessarily result in an effective management plan. For example, even if it were true that conflicts over dependency needs and striving toward independence may play a role in the pathogenesis of peptic ulcer, the treatment of the ulcer is more efficacious through a course of antibiotics and histamine blockers, rather than the psychiatric remake of the personality which may take decades. And no psychological understanding or treatment would be more effective in a patient with ventricular fibrillation (even if it may be caused by anger and frustration mobilizing a fight/flight reaction resulting in circulatory changes causing myocardial infarction and electrical instability, as in the case of famous Mr. Glover²) than a defibrillator.

I call the notion that problems originating in the personality system can best be treated through a technique directed at that system *isodimensional fallacy*. In fact, general

²Engel, 1980

systems theory would predict that intervention at any dimension might be as efficacious as one in another dimension if one only knew how to do it effectively. It is in the area of prevention that identifying the origin of a problem finds the best use.

GENERAL SYSTEMS THEORY, QUANTUM THEORY, AND THE MIND-BODY PROBLEM

Is the general systems theory necessary for the biopsychosocial model, as Engel implies? It may be useful to consider which aspect of the biopsychosocial model requires general systems theory. One aspect of Engel's biopsychosocial model is that psychological factors affect a physical state. This is at the level of observation, hypothesis generation, and hypothesis testing. Just as the observation that the presence of lead in the environment is associated with certain neurologic conditions led to the determination of lead poisoning as a disease, so can a psychosomatic sequence be established without a grand theory. How about the notion that the subjective experience of illness must be considered together with disease? The concept of illness behavior (Mechanic, 1962) antedates Bertalanffy by six years.

Does the general systems theory necessarily debunk the "dogma" of the biomedical model? Engel argues that the biomedical model is reductionistic and dualistic. General systems theory does offer the concept of emergence. *Emergence* involves the notion that there are certain properties that characterize the system as a whole and which no system component has (Bunge, 1977); such properties cannot be predicted by studying the components alone. Many adherents of the biopsychosocial model believe that the mind (or the meaning system) is an emergent phenomenon, and therefore cannot be fully understood by studying the brain alone.

According to Sperry (1969, 1980), mental phenomena have dynamic emergent properties arising from cerebral excitation, which are different from and more than material brain processes. Once generated from neural events, the higher order mental patterns and programs are proposed to have their own subjective qualities and progress, operate and interact by their own causal laws that cannot be reduced to neurophysiology. Popper and Eccles (1977) maintain that mental processes are emergent relative to physical processes but believe in a dualism where the relationship of the brain to the body is that of computer to programmer, with the self-conscious mind playing a superior interpretive role. Suffice it to say that general systems theory does not necessarily lead to psychobiological monism. It should be obvious, also, that biomedical reductionism is not dualism. In fact, reductionism is, in a true sense, always monistic.

Mind-body identity theory, historically formulated by Spinoza, Leibnitz, Russell, and others, has gained considerable acceptance. This theory postulates that the nature of an event (or phenomenon) is neither mental nor physical, but the event referred to by any given mental term is identical to the event referred to by some physical term. It is the way of experiencing conceptualizing, and describing it that belongs to one or the other of the mind-body dichotomy. Goodman (1991) proposed the organic unity theory as a synthesis of the biopsychosocial model and the mind-body identity theory by describing corresponding general systems equivalent levels between the "conceptual network of physical terms (e.g. atoms-organ-nervous system-person behavior-society)" and the "conceptual network of mental terms (e.g. person experience)". According to this theory, each event involved in the etiology, pathogenesis, symptoms, and treatment of disorders is both biological and psychological.

What is the nature of awareness in psychophysical unity? Software written by binary language is both patterns of magnetic or optical properties as well as information, as defined

with the interacting entity (without interaction, no communication, and no information). How do these entities become interactional (communicational)? Such interaction may be inherent in nature, as matter and antimatter "know" to annihilate each other upon encounter. Psychological awareness, although a subset of communication (interaction), might arise as an emergent phenomenon in a complex system of lower level interactions. Perhaps, as a critical mass of uranium will start a chain reaction, a "critical mass" of "proto-awareness" might result in a series of events leading to what we call awareness. To the extent that humans can hardly guess at the experience of "awareness" of beings such as photons, electrons, or, for that matter, dogs and chimpanzees, a true description of others' awareness may be an impossible task. Nevertheless, whether mental or physical, it appears to me that information is exchanged at all levels of organization in the cosmos.

Modern quantum theory presents us some intriguing notions of the mind. Quantum mechanics places the conscious observer at the center of reality. It is a quantum theory maxim that "No phenomenon is a phenomenon unless it is an observed (or recorded - resulting in some irreversible change) phenomenon". Until observation has occurred, reality exists only as potentials or probabilistic waves. At the instant of observation, however, the wave function collapses into a reality according to the orthodox Copenhagen interpretation (Bohr, 1958), or the universe splits into a number of possible universes according to the many worlds hypothesis (Everett, 1973; Wolf, 1988). Consciousness, though arising as a result of brain processes, may be regarded as a cosmic process of creation (as the choices it makes are not locally determined but cosmically inherent) that produces events or reality (Stapp, 1993). Such events, or the observation-induced collapse of the wave function into particles, seem to supercede the barriers of space-time. Einstein proposed an experiment which tried to show what he considered to be a failing in quantum theory: Suppose two particles arising from an interaction are flying apart at the speed of light. According to quantum theory, if one quality of the particle is observed at a later time (say, particular spin - left), at one place by observer A, another observer B, observing the other particle (say, 20 light years away from observer A) must observe the complementary quality that is being observed by A. As it is purely by chance that A would observe the spin of "left", until the moment of observation of A, the spin of B is indeterminate. But once A is observed, B's spin can be nothing but "right", which Einstein considered to be "spooky action at a distance" at speeds faster than light (The Einstein-Podolsky-Rosen Paradox, 1935). Later reformulation of the EPR experiment (Bell's Inequality, 1964) that was carried out by Aspect (1982) proved the quantum theory predictions over Einstein's objections. It should be pointed out, however, that the quantum theory predictions do not presuppose "communication faster than light". It simply shows a cosmic connectedness or unity beyond spacetime separation. One way of looking at this is to consider the two particles not to be separate at all, but a part of a whole (a single wave). Some consider the universe to be a single wave.

The conscious mind may be equated with the universal creative process that invents new realities de novo through the collapse of the wave function that selects one reality out of many potential realities, or through the participation in the one universe among many other universes in the many worlds interpretation of quantum mechanics. In the latter, of course, there would be individual consciousnesses in each of the many universes that would be aware of the realities of the split-off universe. In any case, modern quantum theory revives the notion of the "free will" as an important player in our realities. In playing a role as to when and how observation is done, free will (or an illusion thereof) influences the way reality occurs (wave function collapses), or it may choose (for this time) the universe in which awareness occurs among the many possible universes at any juncture of its exercise.

In this regard, it may be useful to ponder about the role of the *observing physician* in the diagnosis and treatment of disease, and in patient care. What is the role of a patient's

ication, and no information).
 al)? Such interaction may be
 each other upon encounter.
 interaction), might arise as
 el interactions. Perhaps, as a
 "mass" of "proto-awareness"
 reness. To the extent that
 of beings such as photons,
 cription of others' awareness
 sical, it appears to me that
 mos.
 ions of the mind. Quantum
 y. It is a quantum theory
 observed (or recorded -
 rvation has occurred, reality
 f observation, however, the
 Copenhagen interpretation
 e universes according to the
 ousness, though arising as a
 of creation (as the choices
 produces events or reality
 use of the wave function into
 a proposed experiment
 tum theory: Suppose two
 eed of light. According to
 er time (say, particular spin
 ng the other particle (say,
 ntary quality that is being
 e the spin of "left", until the
 t once A is observed, B's
 ooky action at a distance"
 n Paradox, 1935). Later
 54) that was carried out by
 ein's objections. It should
 ics do not presuppose
 nectedness or unity beyond
 he two particles not to be
 sider the universe to be a
 ative process that invents
 hat selects one reality out
 one universe among many
 mechanics. In the latter, of
 any universes that would
 ce, modern quantum theory
 realities. In playing a role
 ereof) influences the way
 his time) the universe in
 any juncture of its exercise.
 e of the *observing physician*
 is the role of a patient's

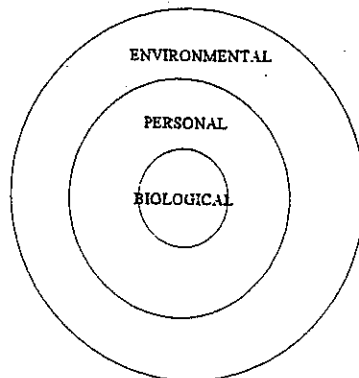
will to live, that may arise out of an interaction between the patient and the physician and/or the family and friends? The practice of medicine may truly be a creative process. The interaction between the physician and the patient creates new paths of reality for both participants.

It may be that epistemology is inevitably reduced to psychology or linguistics for the only way for humans to "know" is through the "mind" and to communicate the knowledge is through language (Gregory, 1988). Perhaps, for humans, knowledge has to begin with the notion that "mind" is inherent in all things, just as the history of an intimate contact with photons and/or energy is inherent for any object that exists in a photograph.

At a more practical level, a systems concept that is useful in medical practice is the distinction between the matter-energy processing system and the information processing system. In a computer, the former represents the hardware, the latter the software. In humans, the body is the matter-energy processing system; the mind, the information processing system. Of course, there is great overlap between the systems - each system is made of the same "stuff", obeys the same physical laws, and, indeed, some hardware in computers are also information processing components, and in humans, DNA's are certainly both packets of chemicals as well as information, just as the magnetism on a computer disk is both a physical property as well as packets of information. Diagnosing which system is awry is an important step in repairing the problem.

Then, what about the notion of emergence? Emergence would be an important subject of research if we can show that certain degrees of complexity or kinds of interaction of components predictably produces "emergent" phenomena, as might be the case with the famed computer program, "life". If this term were to be used to attempt to close the door to investigating the components of a phenomenon (reductionistic research), it would find scientific company with the words, "divine" and "sacred".

LEVELS OF ORGANIZATION



A GENERAL SYSTEMS ANALYSIS OF THE BIOPSYCHOSOCIAL MODEL: WHAT IS BIOPSYCHOSOCIAL MODEL A MODEL OF?

The term, biopsychosocial model, gave rise to much conceptual confusion because it failed to follow its own implicit basic thrust - levels of organization. Thus the model was at times used to indicate that psychosocial

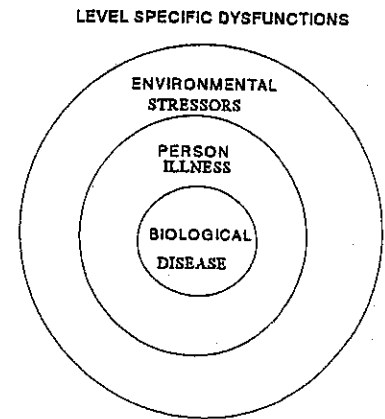
factors such as stress may participate in the pathogenesis of disease (biological level), and at other times to state that an understanding of the experience of the patient including sociocultural factors are important in his/her reaction to disease (person level). What is the biopsychosocial model a model of?

Biopsychosocial approach in medicine can be used for three different entities - the disease, the illness, and the patient. A general biopsychosocial approach could be used for two additional entities - the person, and the society/environment.

Biopsychosocial Model of Disease

The crux of this model is the disease, the biological abnormality, which may be caused/influenced significantly by events occurring at a higher level, such as psychological conflicts (person level) and environmental stress (environmental level). This is the only

biopsychosocial model that may seem to be in conflict with the reductionistic biomedical model in that the disease may not be completely understood by studying the subsystems alone. Nevertheless, if reductionistic studies can identify the subsystem changes (such as immunosuppression) associated with a more macrosystem change (such as stress), the conflict may be more apparent than real. This field is the subject matter of classical psychosomatic medicine. It is important to note that this model is *not necessarily useful for all diseases*. In fact, a major task for the investigator is to define the diseases and pathogenetic mechanisms for which the biopsychosocial model would be useful.

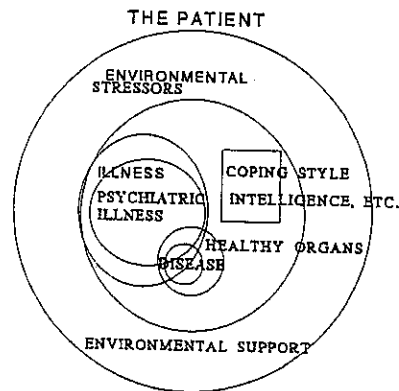


Biopsychosocial Model of Psychiatric Illness

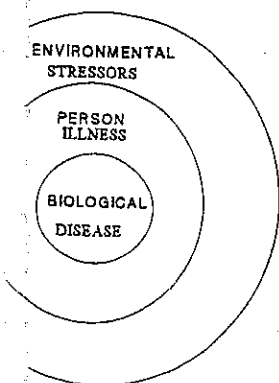
The central point of this model is the illness or disorders at the level of the person. This includes abnormalities in behavior, mood, cognition and perception. These disorders, usually categorized as psychiatric or mental, are almost always a result of interactions among the three levels (dimensions) of the person - biological components, personal (psychological) level, and the environmental (social) level. Anxiety, depression, substance use problems, and psychosis are examples. The task of the investigator is to tease out the various pathways for illness in each of the levels and the patterns of interaction among levels.

Biopsychosocial Model of Patient

This is the biopsychosocial approach to the person who has one or more of the entities described in the previous two models - disease and illness. It is important to note that this is a model of a person, as opposed to the previous two models which are models of disorders. The main area of understanding for this model is the experience of the person who is the patient, given a disease and/or an illness.



LEVEL SPECIFIC DYSFUNCTIONS



pathogenetic mechanisms for

the level of the person. This perception. These disorders, always a result of interactions biological components, personal Anxiety, depression, substance investigator is to tease out the patterns of interaction among

as one or more of the entities. It is important to note that this which are models of disorders. presence of the person who is the

The main area of concern is *not* whether the disease or illness is biopsychosocial in pathogenesis, but what *is to be understood biopsychosocially* in better *understanding and managing the person* who is the patient. A whole gamut of concepts now become relevant in this approach, including the patient's cultural background and expectations, habitual ways of dealing with pain and stress, personality and coping styles, intelligence, genetic endowments for resilience, etc. Successful management of any patient may hinge on a successful application of this model.

Non-medical Extensions of the Biopsychosocial Model: Person and Society

Biopsychosocial approaches can be used for a comprehensive understanding of normal events such as the person and the society. As an understanding of normal physiology is essential in understanding pathology and pathophysiology, a biopsychosocial understanding of the normal person and society, which might be represented in the broad fields of psychology and sociology, would greatly enrich the science and practice of psychiatry and medicine (Schwartz, 1982).

WHAT IS THE BIOPSYCHOSOCIAL MODEL FOR ?

Who should use biopsychosocial model at what level? Engel proposed the biopsychosocial model as a reaction to the biomedical model that he considered to be dehumanizing. He argued, "Medicine's crisis stems from the logical inference that since 'disease' is defined in terms of somatic parameters, physicians need not be concerned with psychosocial issues which lie outside medicine's responsibility and authority". He states, "...one authority urged that medicine concentrate on the 'real' diseases and not get lost in the psychosociological underbrush" (Engel, 1977). Engel, therefore, seems to have expanded the notion of 'disease' in his biopsychosocial model to include all disorders, from cellular diseases to psychiatric illness to (probably) social ills.

I have concluded, in the above section, that the biopsychosocial model has varying degrees of usefulness depending on whether it is a model of disease, illness, or the patient. This analysis is also helpful in defining the scope of the physician's role regarding each level of organization.

The biopsychosocial model of *disease* calls for the diagnosis and treatment of the somatic conditions underlying the illness (or distress). At this level, the biomedical model has had excellent success, and the biopsychosocial model is a complement to the biomedical model to the extent that environmental and symbolic factors may be contributing to the pathogenesis and/or maintenance of the biological disorder. The primary care physician plays the role of the primary diagnostician and treater, with the essential participation of the medical scientist. The medical specialist functions as consultant and referral resource. *The biopsychosocial model of disease, then, is primarily for the student of psychosomatic medicine.*

The biopsychosocial model of *psychiatric illness* calls for the diagnosis and treatment of the disorder (or psychiatric syndrome) that is almost always a final common pathway phenomenon primarily resulting in an experience of distress at the person level, which is determined by known and/or suspected factors in the biological, psychological, and environmental dimensions. At this level, the primary care physician plays an essential role in the recognition of the disorder and initial diagnosis and treatment or referral. The physician with expertise in biopsychosocial analysis and treatment of these disorders, the psychiatrist, plays the role of consultant and specialist. *The biopsychosocial model of psychiatric illness, then, is for the psychiatrist and the primary care physician.*

The biopsychosocial model of *patient* calls for an understanding of the person who is the patient and the experience of the person with the disease or psychiatric illness. An understanding of the patient's personality needs, his/her strengths as well as vulnerabilities in all biological, psychological, and environmental dimensions, and a formulation of a management approach that will be efficacious and acceptable both to the patient, family, and the medical care establishment, are important aspects of this model. This model, then, encompasses what has been called *the art of medicine*, but it is far more comprehensive than that. It strives to develop a systematic approach to the patient, a science for the art of medicine. Biopsychosocial model, advocated as a pragmatic pluralism of sciences (Sadler & Hulgus, 1990), is most applicable at this level. The primary care physician, the front-line clinical practitioner who tends to treat patients longitudinally, often including family members, almost by default utilize some aspects of this model. The challenge is how to systematize it so that the practice of this model is no longer a haphazard creation of art but a systematically learned skill. The psychiatrist, as an expert in biopsychosocial analysis and integration, would play a consulting role at this level.

The biopsychosocial model of the patient, then, is primarily for the primary care physician and the psychiatrist.

OPERATIONALIZING THE BIOPSYCHOSOCIAL MODEL

In spite of the apparent popularity of the term, biopsychosocial, there is little evidence that the advent of the model has had much impact in the practice of medicine. Even in psychiatry, there is controversy as to how useful the biopsychosocial model actually is (Fink, 1988). The diagnostic and statistical manual (DSM) of the American Psychiatric Association since its third edition clearly adopted the multidimensional approach of the biopsychosocial model in diagnostics. Nevertheless, the "axes" of the DSM often seem incoherent to our medical colleagues (Leigh et al, 1982). Axis I and II are psychiatric disorders, Axis III is medical disorder, and Axis IV and V are not disorders at all but stressors and levels of functioning. A much more coherent approach would be to specify disorders in the biological, psychological, and social dimensions as implied by the biopsychosocial model.

Another reason the biopsychosocial model has not achieved much practical use has to do with the conceptual confusion already mentioned, i.e., what it is a model of. Biopsychosocial model of the disease has only limited application, whereas that of the psychiatric illness and the patient are necessary part of clinical practice.

As long as biopsychosocial model remains a purely conceptual desideratum, it is unlikely to be useful in medical practice, especially with the present-day emphasis on efficiency. The usefulness of the model may nevertheless be demonstrated in terms of patient satisfaction and efficacy of management if the model of the patient could be operationalized in such a way that it could be used easily in busy clinical practice.

Defining the level of the biopsychosocial approach as being the person level is the first step in operationalizing the model. Leigh, Feinstein, and Reiser developed an operational technique for the model at the person level, which they call *The Patient Evaluation Grid* (Leigh, Feinstein, & Reiser, 1980; Leigh & Reiser, 1992). The Patient Evaluation Grid (PEG) consists of the three dimensions (levels) of the patient (biological, personal, and environmental) intersected by three time contexts (current, recent, and background). The nine squares formed by this grid represent the areas of investigation and understanding for the whole patient.

The Patient Evaluation Grid has been computerized (Leigh, 1994) - a clinician can input into a database the items requested by the computer, then the computer will print out

ling of the person who is
 or psychiatric illness. An
 as well as vulnerabilities
 and a formulation of a
 to the patient, family, and
 model. This model, then,
 more comprehensive than
 a science for the art of
 alism of sciences (Sadler &
 physician, the front-line
 often including family
 The challenge is how to
 ahazard creation of art but
 psychosocial analysis and

the primary care physician

social, there is little evidence
 of medicine. Even in
 model actually is (Fink,
 n Psychiatric Association
 each of the biopsychosocial
 seem incoherent to our
 tric disorders, Axis III is
 but stressors and levels of
 disorders in the biological,
 social model.

much practical use has to
 what it is a model of.
 ion, whereas that of the
 ctice.

conceptual desideratum, it is
 present-day emphasis on
 strated in terms of patient
 ent could be operationalized
 ce.

the person level is the first
 developed an operational
 the Patient Evaluation Grid
 Patient Evaluation Grid
 biological, personal, and
 ent, and background). The
 tion and understanding for

gn, 1994) - a clinician can
 the computer will print out

THE PATIENT EVALUATION GRID (PEG)

	CURRENT CONTEXT	RECENT CONTEXT	BACKGROUND CONTEXT
BIOLOGICAL DIMENSION	PHYSICAL EXAM, LAB DATA CURRENT SYMPTOMS & SIGNS	ONSET OF SYMPTOMS, SIGNS, LAB TESTS, CHANGES IN PHYSICAL STATUS	CONSTITUTION, GENETIC ENDOWMENT, EARLY DISEASES
PERSONAL DIMENSION	MENTAL STATUS, CURRENT MOOD, CURRENT EXPECTATIONS	PRESENT ILLNESS, CHANGES IN MOOD, ADAPTATION TO ILLNESS	COPING STYLES, PERSONALITY, INTELLIGENCE, EDUCATION
ENVIRONMENTAL DIMENSION	SIGNIFICANT OTHER, SUPPORTIVE FIGURES, STRESSORS, PHYSICAL ENVIRONMENT	LIFE CHANGES, STRESSORS, CONTACT WITH HEALTH CARE SYSTEM	CULTURAL HERITAGE, EARLY FAMILY ENVIRONMENT

PATIENT EVALUATION GRID - MANAGEMENT FORM

	IMMEDIATE MANAGEMENT	LONG-TERM MANAGEMENT
BIOLOGICAL DIMENSION	TREATMENT OF DISEASE DRUG Rx OF DISTRESS (E.G. ANXIETY)	CHANGE IN DIET, PROPHYLACTIC DRUGS, ETC.
PERSONAL DIMENSION	PSYCHOTHERAPY OF DISTRESS, RELAXATION TECHNIQUES, EDUCATION, EXPLANATION	HEALTH PROMOTION MEASURES (E.G. EXERCISE, RELAXATION, HABIT CONTROL, ETC.)
ENVIRONMENTAL DIMENSION	HOSPITALIZATION, FAMILY EDUCATION, SOCIAL SUPPORT, VACATION, ENVIRONMENTAL CHANGE	ENHANCING SOCIAL SUPPORT, FURTHER EDUCATION, ENVIRONMENTAL CHANGE

both a narrative summary and a PEG³. On the basis of the PEG, the clinician can then generate a biopsychosocial management form in the same format. This leads to a truly operationalized biopsychosocial practice of medicine for the patient.

PATIENTOLOGY: TOWARD AN INTEGRATIVE STUDY OF THE PATIENT

A cursory perusal of the Patient Evaluation Grid would show that the state of our systematic understanding is the highest in the biological dimension, followed by those items in the personal dimension, with the environmental dimension factors being least systematically understood. Furthermore, attempting to find relevant literature and information in each dimension to construct a PEG is often a frustrating affair because much of the information assigned to the psychological and environmental dimension are not readily available to the primary physician.

An important task for medical science is to develop a systematic method of integrating and relating information in all of the three dimensions of the patient for optimal diagnosis and

³ This software is available from the author directly. For inquiries, write to Hoyle Leigh, MD, Department of Psychiatry, UCSF-Fresno, 2615 E. Clinton Ave, Fresno, CA 93703

management of the illness and disease. I believe that this integration would be best achieved through the development of an interdisciplinary discipline within medicine that might be called *patientology* (Leigh, 1980, 1981). Such a discipline would encompass within it consultation-liaison psychiatry, psychosomatic medicine, medical psychology, health psychology, medical sociology, medical social work, clinical nutrition, epidemiology, clinical diagnosis, medical anthropology, and even esthetics. The purpose of this discipline would be to integrate new information arising from dimension-specific disciplines (e.g., molecular biology and sociology) so that the information can be used in helping the patient, and to generate new questions concerning interdimensional relationships and influences. This integrative approach would not be an alternative to the reductionistic approach of the biomedical model, but a true complement to it. In teaching the physician how to best help the patient, patientology should be omnivorous and atheoretical, pluralistic and pragmatic—optimizing what is best of the science and art of medicine.

CONCLUSIONS

Biopsychosocial model as proposed by Engel suffers from conceptual confusion because of unnecessary grand-theorizing and lack of sharp focus on what it is a model of, and for whom it is useful. General systems theory is not essential for biopsychosocial model but provides potentially useful concepts such as levels of organization and "emergence". Quantum theory provides insights about the central role of consciousness and observation in the creation of reality as well as of cosmic connectedness. Biopsychosocial model is not an alternative to the biomedical model but a complement to it, with varying degrees of usefulness depending upon at what level it is focused. Biopsychosocial model of *disease* is of limited usefulness, while that of *psychiatric illness* and of *the patient* are indispensable for the primary care physician and the psychiatrist. For optimal patient care, biopsychosocial approaches at the person level should be systematized, operationalized, and computerized. The Patient Evaluation Grid, presented in this paper, is one such attempt.

I propose the designation of a new field of medicine, which I call *patientology*, that integrates knowledge and skills in the three dimensions of the patient. Patientology will make essential contributions in making medical science more comprehensive, medical practice more efficient *and* gratifying, and consumers more satisfied. In patientology, the art of medicine would find union with the science of medicine.

REFERENCES

- Alexander F: *Psychosomatic Medicine*, Norton, New York, 1950
- Aspect A, Dalibard J, Roger G: Experimental test of Bell's inequalities using time-varying analyzers
Physical Review Letters 49:1804, 1982
- Bell JS: On the Einstein-Podolsky-Rosen paradox
Physics Vol 1, 1964
- Bohr N: *Atomic Physics and Human Knowledge*
Wiley, New York, 1958

Bunge M: Emergence and the mind.
Neuroscience 2:501-509, 1977

Einstein A, Podolsky B, Rosen N: Can the quantum mechanical description of physical reality be considered complete?
Physiological Reviews 47:777, 1935

Engel GL: The need for a new medical model: a challenge for biomedicine
Science 196:129-136, 1977

Engel GL: The clinical application of the biopsychosocial model.
American Journal of Psychiatry 137:535-544, 1980

Everett III H: The theory of the universal wave function, in DeWitt B, Graham N (eds):
The Many Worlds Interpretation of Quantum Mechanics
Princeton University Press, Princeton, 1973, pp 3-140

Feinstein AR: *Clinical Judgment*
Huntington, New York, Robert E Krieger Publishing Co, 1974

Fink PJ: Response to the presidential address: Is "biopsychosocial" the psychiatric shibboleth?
American Journal of Psychiatry 145:1061-1067, 1988

Goodman A: Organic unity theory: The mind-body problem revisited
American Journal of Psychiatry 148:553-563, 1991

Gregory B: *Inventing Reality: Physics As Language*
John Wiley & Sons, New York, 1988

Joynt RJ: Introduction to the challenge of the biopsychosocial model
Psychosomatic Medicine 42:77, 1980 (supplement)

Leigh H, Feinstein AR, Reiser MF: The Patient Evaluation Grid: A Systematic Approach to Comprehensive Care
General Hospital Psychiatry. 2:3-9, 1980.

Leigh H, Reiser MF: *The Patient: Biological, Psychological, and Social Dimensions of Medical Practice, 3rd Edition*
Plenum Publishing Company, New York, 1992

Leigh H: Doctors, Patients, and Medicine (Editorial).
Archives of Internal Medicine 140:1277, 1980.

Leigh H: "Patientology" Exists (letter)
Archives of Internal Medicine 141:1101, 1981.

Leigh H, Price L, Ciarcia J, Mirassou MM: DSM III and Consultation-Liaison Psychiatry: Toward a Comprehensive Medical Model of the Patient.
General Hospital Psychiatry. 4:283-289, 1982.

Leigh H, Reiser MF: Major Trends in Psychosomatic Medicine:

The Psychiatrist's Evolving Role in Medicine.
Annals of Internal Medicine. 87:233-239, 1977.

Mechanic D: The concept of illness behavior
Journal of Chronic Disease 15:189-194, 1962

Popper KR, Eccles JC: *The Self and Its Brain - An Argument for Interactionism*
Springer International, Berlin, 1980

Sadler JZ, Hulgus YF: Knowing, valuing, acting: Clues to revising the biopsychosocial model
Comprehensive Psychiatry 31:185-195, 1990

Schwartz, GE: Testing the biopsychosocial model: The ultimate challenge facing behavioral medicine?
Journal of Consulting & Clinical Psychology 50:1040-1053, 1982

Schwartz MA, Wiggins O: Science, humanism, and the nature of medical practice: a phenomenological view
Perspectives in Biology and Medicine 28:331-361, 1985

Schwartz MA, Wiggins OP: Systems and the structuring of meaning: contributions to a biopsychosocial medicine
American Journal of Psychiatry 143:1213-1221, 1986

Silverman D, Gartrell N, Aronson, M, et al: In search of the biopsychosocial perspective: An experiment with beginning medical students
American Journal of Psychiatry 140:1154-1158, 1983

Sperry RW: the modified concept of consciousness
Psychological Review 76:532-536, 1969

Sperry RW: Mind-brain interactionism; mentalism, yes; dualism, no.
Neuroscience 5:195-206, 1980

Stapp HP: *Mind, Matter and Quantum Mechanics*
Springer Verlag, Berlin, 1993

von Bertalanffy L: *General Systems Theory*
George Braziller, New York, 1968

Wolf FA: *Parallel Universes*
Simon & Schuster, New York, 1988