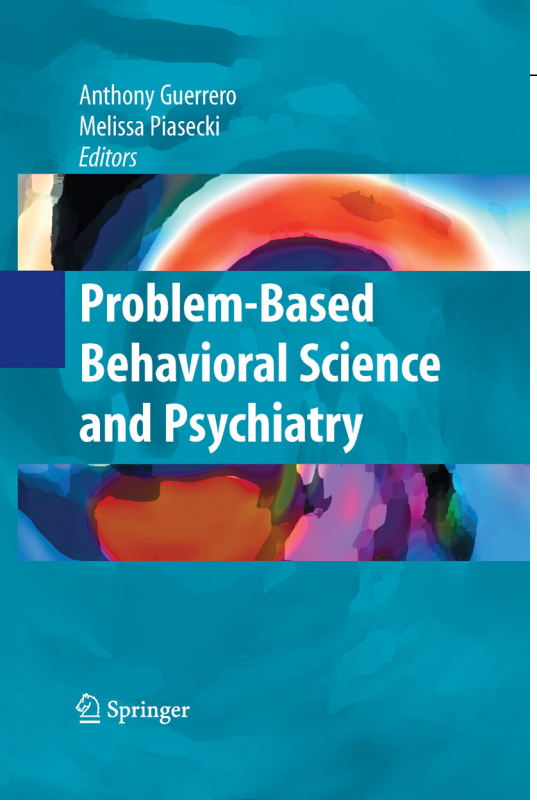
Anthony Guerrero
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Editors
Problem-Based
Behavioral Science
and Psychiatry
Springer

Anthony Guerrero · Melissa Piasecki
Editors

Problem-Based Behavioral Science and Psychiatry

Foreword by Richard T. Kasuya

Springer

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We dedicate this book to our parents, with love.
Celina and Reuben Guerrero
Joan and Leo Piasecki

Foreword

Learning behavioral science is an important part of becoming physicians. More and more, professional and accrediting organizations are explicitly endorsing the necessity of physicians being skilled and well trained in these areas.

Physicians themselves are increasingly aware of the importance of behavioral health and psychiatric issues in their practices. Whether one intends to practice in a primary care or subspecialty area, an appreciation of behavioral health issues and basic principles of psychiatry is critically necessary. In addition to topics that are more specific to the practice of psychiatry, the authors of this textbook have chosen to cover a range of topics important to all aspects of clinical medicine, including culture, violence, physician–patient relationships, adherence and substance abuse. Almost any practicing physician will admit that effectively addressing these types of behavioral issues is among the more challenging of the tasks they face.

Teaching and learning about psychiatry and behavioral sciences can be difficult. Basic textbooks do not easily connect their lessons with the complexity of clinical reality. Students cannot easily find the clinical importance from classroom lectures. Even clinical clerkships in psychiatry have difficulty exposing students to the breadth of clinical experiences they need to learn about.

This long overdue book holds the promise of becoming a solution to these challenges. The study of psychiatry and the behavioral sciences is perfectly matched with the problem-based learning methods utilized in this book. Problem-based learning (PBL) is a widely utilized approach to learning that involves the detailed study of patient cases, with a primary goal of identifying topics for self-study relevant to the cases. This approach helps students find meaning in learning a wide variety of topics and provides an opportunity to apply new knowledge to clinical situations. Through understanding the cases, they learn psychiatry.

For those familiar with the PBL process, this book offers a welcome resource in the area of behavioral sciences and psychiatry. Students are sometimes reluctant to vigorously pursue a study of behavioral issues. They often cite a difficulty in finding reliable, evidence-based resources for their independent learning. Unlike the biological and clinical sciences, where there are scores of readily available textbooks, review articles and web-based resources, students often report frustration with the relative dearth of medical student-friendly resources in the behavioral sciences. This

book represents a significant addition to student learning resources in behavioral health and should become a familiar and well-worn companion to students in PBL environments.

For those new to the PBL process, this book will also serve as a useful guide to approaching clinical problems. By working through the case studies in this book, the reader will not only be able to learn important material related to psychiatry and the behavioral sciences but also develop a systematic approach to life-long learning that will serve them well in their clerkships and beyond.

In addition to providing opportunities to work through clinical vignettes in a problem-based learning format, the authors incorporate other useful and practical learning tools such as mechanistic case diagramming and the bio-psycho-social-cultural-spiritual formulation. In the long term, readers will benefit as much from these exercises as they will from learning the content within the pages of this book. The authors have also incorporated content areas for the United States Medical Licensing Examinations, making this textbook relevant for preparation and review for these examinations. So, in many ways, this book represents a learning tool as much as a content resource.

I am also particularly encouraged to see that a number of the contributors to this book are themselves graduates of PBL medical schools. Their experiences should provide them with a unique and valuable perspective in what they have chosen to offer in the pages that follow.

Readers will find the methodology and approaches offered in this book to be refreshing and educationally rewarding. I hope that this text will prove to be the first of a number of books that skillfully and thoughtfully blend authoritative content with effective problem-based learning exercises.

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Part I
Introduction

Chapter 1
How to Use This Book

Anthony P.S. Guerrero, Melissa Piasecki, and Nathanael W. Cardon

Welcome to *Problem-Based Behavioral Science and Psychiatry*. In this chapter, our aims are to illustrate how the problem-based learning process works so that you can apply it to the other cases in this textbook.

The goals of this chapter are:

1. To provide the reader with a guided experience on "how to use this textbook"
2. To review basic principles of problem-based learning and the rationale for why this approach is used
3. To illustrate, with a sample case, the processes of
   (a) "Progressive disclosure"
   (b) Identifying facts/problems, hypotheses/differential diagnoses, additional clinical information needed, and learning issues
   (c) Thinking about underlying neurobiology and other physiological mechanisms to understand the signs and symptoms of a case
4. To review the more generic process of bio-psycho-social-cultural-spiritual formulation, in order to understand the various perspectives offered by patient cases

Because a textbook is not the same as a patient encounter or face-to-face small group discussion, we are not claiming to represent problem-based learning (PBL) in a pure or "authentic" form (Barrows, 1986,2000). However, we hope to integrate many of the principles and potential benefits of PBL into this textbook.

PBL, as described by Norman and Schmidt (1992), aims to endow learners with the skills of clinical reasoning, cooperative learning, and patient-based integration of knowledge. In its ideal form, it begins with an initial free-inquiry process, in which learners explicitly discuss hypotheses and additional lines of investigation. This is followed by a period of self-directed learning and a synthesis and application of information back to the case. The student then has an opportunity to critically evaluate the initial clinical reasoning process. Because PBL attempts to integrate information from multiple disciplines, all phases of the process emphasize attention

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to the biological, behavioral, and populational aspects of the case. Certain articles (Guerrero, 2001; Guerrero et al., 2003) have discussed how certain learning tools can be used to ensure that beneficial PBL processes actually occur in the course of studying a case. We will illustrate these tools, including "mechanistic case diagramming," as part of this sample case.

When compared to traditional learning methods, PBL may enhance the application of concepts to clinical situations, long-term retention of knowledge, and lifelong interest in learning (Norman and Schmidt, 1992). It has been shown to improve student and faculty satisfaction and educational outcomes in numerous clinical disciplines, including family medicine, pediatrics, obstetrics, and psychiatry (Washington et al., 1999; McGrew et al., 1999; Kaufman and Mann, 1999; Curtis et al., 2001; Nalesnik et al., 2004; McParland et al., 2004). Furthermore, we believe that psychiatry and the behavioral sciences, because of the inherently integrative and holistic approaches of these subject areas, are particularly well suited for study in a PBL format (Frick, 2005; Zisook, 2005). Peters et al. (2000) reports on the longitudinal outcomes of a randomized controlled trial and concludes that the New Pathways Program at Harvard Medical School—of which PBL is one important component—improved students' interpersonal skills and humanistic approach to patient care, with no loss in medical knowledge.

We will illustrate the problem-based learning process as applied to cases in this textbook. Typically, each chapter will begin with an introductory paragraph for a case. An example has been provided below.

Case Vignette 1.1.1 Presenting Situation: Melanie Crystal

Melanie Crystal is a 39-year-old woman who is the single mother of a 17-year-old boy. She was referred for psychiatric assessment at the local emergency room because a police officer on foot patrol found her crying and confused in a nearby parking lot. She is tearful and hostile. She told the screening nurse that she would kill herself "at the first opportunity." On screening for substance use, she stated that she used "dope." Needle marks were visible on both arms.

At this point, the student will see the following sign, which is a prompt to "Proceed with the PBL process" before moving on to the remainder of the case.

Please proceed with the problem-based approach!

Learning from these cases will be maximized if the student carefully digests all components of the case and engages in the clinical reasoning processes that a clinician uses to effectively evaluate and manage the case. For example, in the case above, it may be worthwhile to:

1. Highlight or underline the facts.
2. Specifically identify the clinical signs and symptoms that are present, as these are likely to be the relative "endpoints" of a mechanism that must be subsequently understood. Below we show a graphical way of identifying signs and symptoms through use of boxes.

   Melanie Crystal is a 39-year-old woman who is the single mother of a 17-year-old boy. She was referred for psychiatric assessment at the local emergency room because a police officer on foot patrol found her crying and confused in a nearby parking lot. She is tearful and hostile. She told the screening nurse that she would kill herself "at the first opportunity." On screening for substance use, she stated that she used "dope." Needle marks were visible on both arms.
3. Organize these findings as shown in Table 1.1 (blank samples are provided for photocopying in Appendix).
4. Use this grid to guide the clinical reasoning process that will guide further evaluation and management of the case.

Obviously, there will be variations in the specific items one will choose to put under each of the columns. The main principles to follow are:

1. To develop specific hypotheses, ask the question "What are the possible *mechanisms* (biological or otherwise) behind the signs and symptoms present in the case?" In this text we emphasize the neurological and physiological mechanisms that are known to be associated with normal and pathological behavior.
2. Additional clinical information ("What do you want to know next?") reflects your hypotheses and should follow a logical clinical organization.

In this textbook, the use of the clinical reasoning process will prompt or answer many of the questions in the rightmost column. Each clinical case includes text coverage of the learning issues likely to be most relevant to medical student learners. Therefore, if this sample chapter were an actual textbook chapter, it might contain sections on:

- The mechanisms behind abnormal mood and confusion
- The mechanisms of action of common illicit drugs
- Definitions of child abuse and neglect

Some chapters offer high-density tables and figures to illustrate mechanisms of action. Examples include: the mechanism of psychotic symptoms (see Fig. 20.1) and the mechanism of action of common substances of abuse (see Table 19.1).

With an effective clinical reasoning process, the subsequent sections of the case will address items in the "what do you want to know next" column. A sample continuation of the case vignette is shown below.

Table 1.1 Grid to guide the clinical reasoning process that will guide further evaluation and management of the case

What are the facts?	What are your hypotheses?	What do you want to know next?	What specific information would you like to learn?
39-year-old woman Single mother of a 17-year-old boy Referred for psychiatric assessment at her local ER Found by police officer at a nearby parking lot Crying/tearful Confused Hostile Stated she would kill herself Used "dope" Needle marks	Drugs: ? Cocaine or methamphetamine ? Heroin (IV) Other psychiatric disorders Abnormal brain activity: • Limbic system • Other places? Sadness Possible neglect of the 17-year-old minor Delirium Endocarditis	*HPI*: What exactly does she mean by "dope?" Was she having any symptoms even before using drugs? Does she have any other symptoms—disturbed sleep, disturbed appetite, hallucinations *PMH*: Other medical illnesses HIV test? *FH*: Other psychiatric illnesses *SH*: Can anyone else care for the 17-year-old son? *Exam*: Vital signs (Tachycardic? Hypertensive?) Heart murmur? Mental status: 1. Speech 2. Thought process 3. Perceptions 4. Is she homicidal? *Lab*: urine toxicology	What are the mechanisms behind confusion and abnormal mood? Which drugs can be used intravenously? What defines neglect or abuse of a 17-year-old minor?

Case Vignette 1.1.2 Continuation

Ms. Crystal was uncooperative with further questioning. Attempts to reach collateral informants were unsuccessful. On examination, vital signs were as follows: temperature 100.3 °F, pulse 106 per minute, blood pressure 142/88, respiratory rate 22 per minute. The remainder of the physical examination was unremarkable except for: thin appearance, poor dentition, and needle marks on her skin. Mental status

examination was remarkable for: poor cooperation and eye contact, mumbled rapid speech, labile and tearful affect, tangential thoughts, possible auditory hallucinations, and suicidal ideations.

Please proceed with the problem-based approach!

Once again, this is the prompt to analyze the case and complete the table as shown above.

Case Vignette 1.1.3 Conclusion

After admission to an inpatient unit, Ms. Crystal went to sleep and remained asleep for almost 14 hours. She was ravenously hungry and only marginally cooperative with measurements of vital signs or attempts at interview. She remained irritable and was verbally abusive to staff for the next day.

Three days later, Ms. Crystal became conversant with the staff. On the fourth day she was pleasant and social. She described her history of methamphetamine dependence beginning in her twenties, with 10 years of abstinence. She stated that she stopped going to meetings and "it only took one guy" who showed her the drug at his home. She reported that as soon as she saw and "smelled" methamphetamine, she began to have intense cravings and immediately relapsed. She has used daily for the last month or so and is not sure where her adolescent son is. She thinks he will be graduating from high school "one of these days."

The case and text discussion cover core curricular material relevant to the general subject matter. For example, if the goal of the chapter were to review methamphetamine abuse and dependence (please refer to Chap. 19), the following topics may be covered:

Epidemiology (including the recent epidemic, age groups affected, mortality statistics)
Differential diagnosis (including mood, psychotic, and other substance disorders)
Etiology and neurobiological mechanisms
Clinical findings (including cognitive changes, psychotic symptoms, motor symptoms, acute and secondary drug effects, and craving)
Treatment (psychosocial and pharmacological)
Social, cultural, and legal factors
Prognosis

Bio-psycho-social-cultural-spiritual Model

In all our teaching, we invite students to conceptualize patient problems by using a bio-psycho-social-cultural-spiritual formulation. This model is used throughout the psychiatric curriculum at the authors' institutions. The goal of these patient formulations is to consider the complexities of patient presentations and to drive treatment planning. Formulations help explain "how did this patient get to this psychiatric state at this time?"

What follows is a description of the components of the bio-psycho-social-cultural spiritual formulation (adapted from Kohlenberg and Piasecki, 2006). We have added prompts for the students to help them think about and organize clinical material. Students are encouraged to include each component in formulations.

This model generally includes the following:

Biological

Past:

Genetics:

- Consider whether any blood relatives have had psychiatric problems, substance use problems or suicide attempts/suicides. Is there a history of close relatives who have been hospitalized for psychiatric reasons? What kind of treatments did they get, and how did they respond?

History of pregnancy and birth:

- Consider pregnancy variables: Was there in utero exposure to nicotine, alcohol, medications, or illicit substances? Was there anything unusual about pregnancy?
- Note birth complications, such as prematurity, birth trauma, or extended periods of hospitalization.

Relevant previous illnesses:

- Consider any history of head injury, endocrine disorders (e.g., thyroid, adrenal), seizures, malignancies, or neurological illnesses.
- Consider potential lasting effects of past substance use on brain functions such as cognition, affective regulation, etc.

Present:

Current illnesses:

- Identify current illnesses and any direct impact they may have on psychiatric presentation.

Medications:

- Assess current medication regimen. Consider whether these medications have psychoactive effects (e.g., steroids, beta blockers, pain medications, benzodiazepines, serotonin-selective reuptake inhibitors, antipsychotics). Consider possible side effects of current medications. Note any noncompliance with medications.

Substances:

- Consider the influence of nicotine, alcohol, and illicit drugs on current psychiatric symptoms.
- Consider the possible effects of substance withdrawal.

Endocrine/hormonal:

- Consider the impact of onset of adolescence.
- Consider the impact of the menstrual cycle, pregnancy, postpartum period, menopause.

Psychological

Past:

- Comment on any past history of trauma (child abuse, combat, rape, serious illness), as well as resiliency (how the patient coped with trauma, e.g., through friends, family, religion).
- Consider the sources of positive self-image and positive role models.
- Comment on the patient's experience with loss.
- Comment on the patient's quality of relationships with important figures, such as grandparents, friends, significant teachers, or significant employers.
- Comment on how past medical problems, substance use, or psychiatric problems impacted the patient's development and their relevance to the patient today.

Present:

- Describe the recent events and experiences that precipitated the admission or appointment.
- What are the current stressors? Do they have any symbolic meaning?
- Assess and comment on coping skills, defense mechanisms, presence or absence of cognitive distortions.
- Consider current developmental demands on the person, such as marriage, divorce, birth, children leaving home, loss, aging, etc. What stage of development is the patient at now? Is it appropriate to chronological age?
- What is the developmental impact of the patient's illness?

Social

- How adequate is the patient's current support system?
- What is the current status of relationships with important figures?
- What are the possible peer influences?
- Consider the patient's current housing arrangement.
- Comment on vocational/financial status.
- Comment on any relevant legal problems.
- Consider the role of agencies (e.g., Veteran's Administration, Child Protective Services, Criminal Justice System) on the patient.

Cultural

- Comment on cultural influences and acculturative pressures that may impact the current situation.
- Comment on cultural influences on understanding of illness and/or help-seeking behavior.

Spiritual

- Comment on the role of spirituality in the patient's life.
- Is the patient affiliated with a spiritual community of some sort?
- How does spirituality contribute to the patient's ability to hope, his/her position on suicide if relevant, or his/her contact with a supportive community?

A sample formulation for Ms. Crystal would be as follows:

This is a 39-year-old woman with acute psychiatric symptoms. Biological factors that contribute to her presentation include the acute effects of methamphetamine on her mood and behavior. Methamphetamine is likely also contributing to her abnormal vital signs. There is no history of current or previous medical problems, family history of substance use disorder/mental illness or current medication use.

Psychologically, this patient has recently experienced a relapse. Cues for drug use included the sight and smell of the drug. She apparently lacked coping skills for resisting relapse. There is no information about recent stressors, past trauma, or relationship history. Her role as the mother of a 17-year-old has been seriously compromised but there is little information about how she perceives this. Her relationship with a man appears to be superficial and based on mutual drug use.

Socially, we have little information about her employment status, housing, legal situation, or social supports. She appears to have benefited from meetings in the past and may have been lacking the social support she needed to remain abstinent prior to her relapse.

Spiritually, we have little information about her history and current beliefs.

In addition, we believe that both pre-clerkship behavioral science students and clerkship psychiatry students can benefit from seeing a "big-picture" graphic representation of the formulation. This graphic uses arrows to detail how one aspect of the case leads to another and ultimately results in her presenting concerns. It also shows how the biological, psychological, and social/spiritual/cultural aspects are ultimately related and suggests how all knowledge learned (including basic neurobiological mechanisms) can be used to benefit the patient in the form of specific treatments (shown as circled items, connected to the rest of the diagram using dotted arrows). An example is shown in Fig. 1.1.

While it is up to the readers to decide on the degree to which such an exercise suits their learning needs, the textbook chapters will provide such diagrams on some of the cases, in order to integrate knowledge learned in the chapter and to provide closure to the case vignettes, particularly those that cover major psychiatric illnesses and symptoms (e.g., substance use disorders, mood disorders, anxiety disorders, cognitive disorders, and eating disorders). It is our hope that this feature

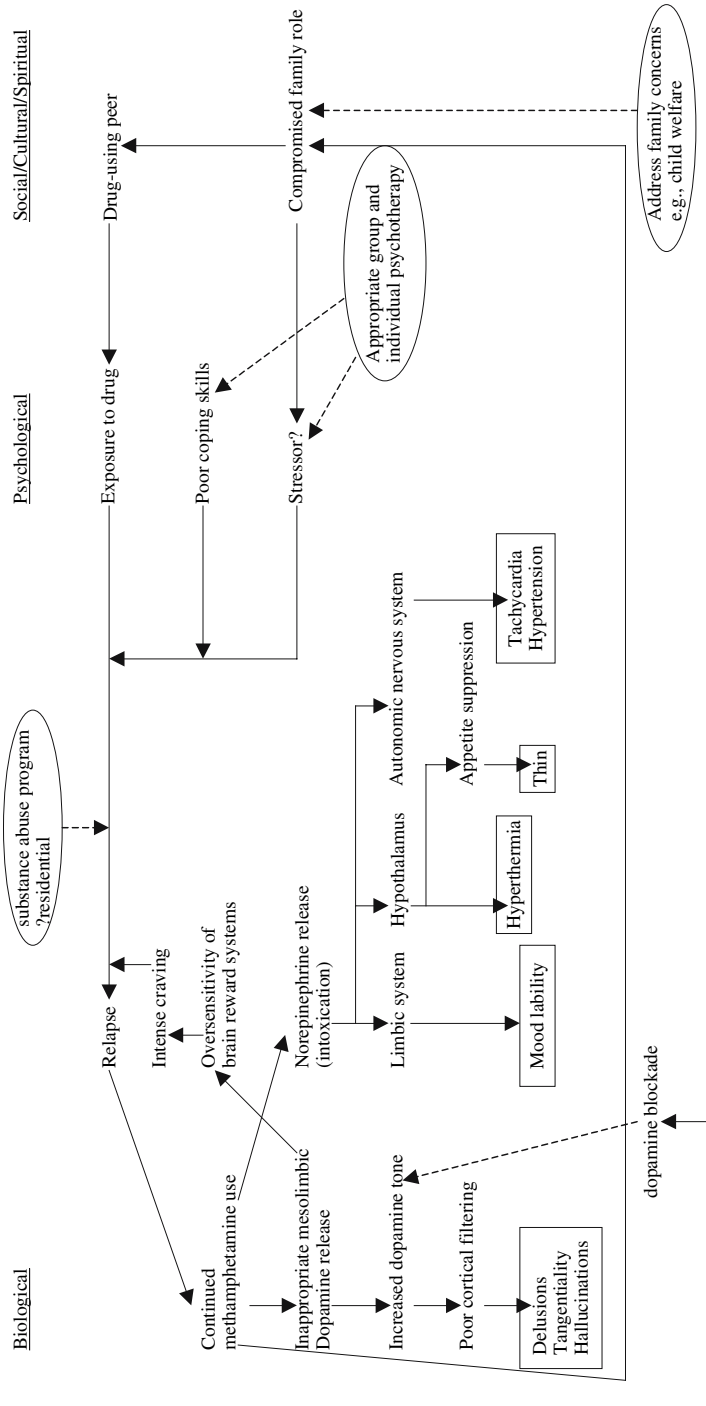

Fig. 1.1 Sample diagram to integrate knowledge and provide closure to case vignettes