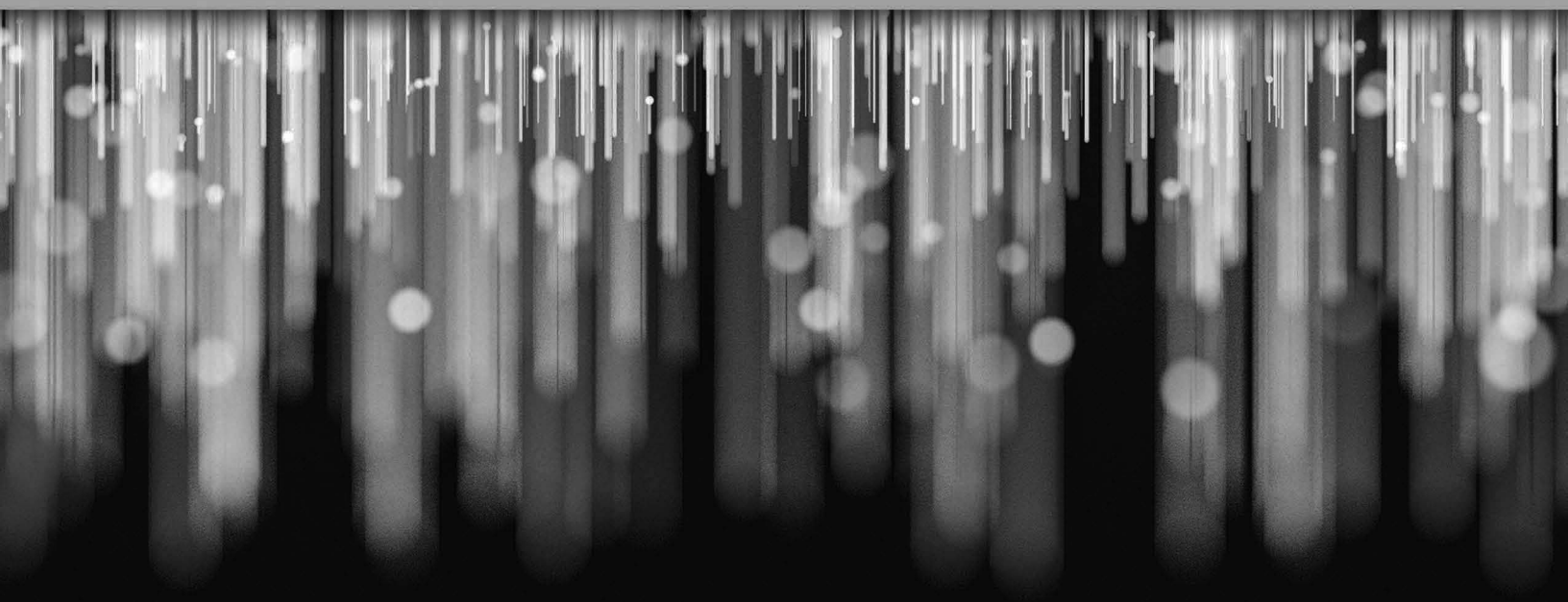
Morgan | Townsend

DAVIS ADVANTAGE for

Psychiatric Mental Health Nursing

TENTH EDITION



F.A. DAVIS

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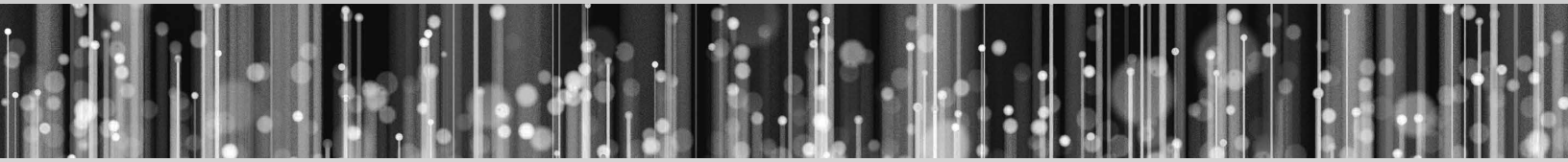

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In memory of Dr. Fred Frese, who relentlessly shared his knowledge and experience and will always be remembered as a fierce advocate for those with mental illness. In appreciation of his wife, Penny Frese, who, through her work as the founder of Red Flags National, continues to promote the need for education and institutional protocols within schools to build skills in resilience, recognition of early symptoms of mental illness, and informed support networks for responding to individual needs.

—Karyn Morgan

FRANCIE

God made sisters for sharing laughter and wiping tears

–Mary Townsend

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Karyn I. Morgan

My husband, Jim, and children and grandchildren, Kerry and Ryan, Tina and Jonathan, Meghan, Matthew, and Catherine for showing me what life is truly all about.

Mary C. Townsend

Contents

To the Instructor

The impact of the COVID-19 global pandemic put a spotlight on psychiatric and mental health concerns in ways we could not even imagine a mere six months ago. The need for confident nurses —well-versed in assessment and intervention across a broad spectrum of mental health disorders —has perhaps never been higher. To that end, in this edition of *Psychiatric Mental Health Nursing*, we felt it was imperative to present a new chapter, **Caring for Patients with Mental Illness and Substance Use Disorders in General Practice Settings,** to highlight why every nurse—regardless of the care setting—needs the knowledge and skills necessary to support and treat clients with mental health disorders, wherever they are encountered.

Additionally, the onset of COVID-19 challenged faculty and students across the globe to migrate almost overnight from in-person, "brick-and-mortar" classroom settings to online and distance education. Recognizing those challenges, with this edition of the textbook we are pleased to provide a complete teaching and learning package, including an exciting new online resource, *Davis Advantage for Psychiatric Mental Health Nursing*. Davis Advantage provides a wide array of online activities, animations, and assessments, designed specifically for distance learning, with a dashboard of metrics delivered seamlessly to faculty and students alike.

Prior to COVID-19, as faculty we were already aware of dangerous trends related to suicide and addiction, especially opioids. Current federally endorsed initiatives, such as the Zero Suicide Initiative (2012) and HEAL (Helping to End Addiction Long-term) (2018), underscore the continuing magnitude of these two mental health issues and make clear that nurses practicing in any arena need a strong foundation in psychiatric mental health nursing care. Perhaps as never before, many nurse leaders see this period of mental health-care reform as an opportunity for nurses to expand their roles and assume key positions in education, prevention, assessment, and referral. Nurses are, and will continue to be, in key positions to assist individuals to attain, maintain, or regain optimal emotional wellness.

As it has been with each new edition of *Psychiatric Mental Health Nursing*, the goal of this tenth edition is to bring to practicing nurses and nursing students the most up-to-date information related to neurobiology, psychopharmacology, and evidence-based nursing interventions. This edition includes changes associated with the latest (fifth) edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*.

The Teaching and Learning Package: Davis Advantage

How students learn is constantly evolving, as they consume and process information in new ways. As instructors, we can be no less prepared, and must be ready to provide instruction online, in ways that are engaging and dynamic. Relying on the textbook alone to support an active classroom leaves a gap. ***Davis Advantage for Psychiatric Mental Health Nursing*** fills that gap with the following resources:

- **A Strong Core Textbook** that provides the foundation of knowledge that today's nursing students need to pass the NCLEX and enter practice prepared for success.
- **Online Student Tools** to learn and practice the content in an engaging, interactive format. **Pre-Assessment Quizzes** test students on their comprehension of a key topic and then give them a **Personalized Learning Plan** to work through that is based on their strengths and weaknesses. Students are engaged in an interactive experience that uses multimedia content to help spark connections and bring concepts to life. Once they complete the interactive experience, **Post-Assessment Quizzes** assess their comprehension of the material.
- **Online Instructor Resources** create a dynamic classroom experience that is tailored to students' needs. Results from the pre-and-post-assessments are available to faculty, in aggregate or by student, and inform a **Personalized Teaching Plan** that faculty can use to deliver a targeted classroom experience. Faculty will know students' strengths and weaknesses *before* they come to class and can spend class time focusing on where students are struggling. Turn-key, easy to implement in-class activities are provided to help create an active, hands-on learning environment that helps students connect more deeply with the content. NCLEX-style questions from the **Instructor Test Bank** and **PowerPoint** slides that correspond to the textbook chapters are referenced in the Personalized Teaching Plans.

- **Davis Edge** online quizzing assesses understanding, using an adaptive format with NCLEX-style questions. Faculty can set up a review and remediation system to take a constant pulse of classroom performance, with student results available in real-time to easily identify areas of weakness. Comprehensive rationales for all answer options are provided for students and explain why an answer is correct or incorrect.

Updated or New Content in the Tenth Edition Text

- All content has been updated to reflect the current state of the discipline of nursing.
- All nursing diagnoses are current with the NANDA-I *2018–2020 Nursing Diagnoses Definitions and Classifications*.
- A new chapter, Chapter 21, Caring for Patients with Mental Illness and Substance Use Disorders in General Practice Settings, reinforces the need for generalist nurses to be skilled in adequate screening and referral of patients with mental health issues.
- **Communication Exercises** are included in Chapters 12, Crisis Intervention; 16, Suicide Prevention; 20, The Recovery Model; 22, Neurocognitive Disorders; 23, Substance-Related and Addictive Disorders; 24, Schizophrenia Spectrum and Other Psychotic Disorders; 25, Depressive Disorders; 26, Bipolar and Related Disorders; 27, Anxiety, Obsessive-Compulsive, and Related Disorders; 30, Eating Disorders; 31, Personality Disorders; 34, Survivors of Abuse or Neglect; and 36, The Bereaved Individual; as well as online Chapter 42, Issues Related to Human Sexuality and Gender Dysphoria. These exercises portray clinical scenarios that allow the student to practice communication skills with patients. Examples of answers appear in an appendix at the back of the book.
- Additional **"Real People, Real Stories," features** include interviews conducted by one of the authors, Karyn Morgan, in which individuals discuss their experience of living with a mental illness and their thoughts on important information for nurses to know. These discussions can be used with students to explore communication issues and interventions to combat stigmatization and to build empathy through understanding individuals' unique experiences. "Real People, Real Stories" interviews are in Chapters 7, Therapeutic Communication; 16, Suicide Prevention; 23, Substance-Related and Addictive Disorders; 24, Schizophrenia Spectrum and Other Psychotic Disorders; 25, Depressive Disorders; 26, Bipolar and Related Disorders; 30, Eating Disorders; 32, Children and Adolescents; 37, Military Families; and 42, Issues Related to Human Sexuality and Gender Dysphoria.
- Chapters 39, Cultural and Spiritual Concepts Relevant to Psychiatric-Mental Health Nursing, and Chapter 42, Issues Related to Human Sexuality and Gender Dysphoria, have been moved from the text to online chapters.
- Content has been added to several chapters to integrate concepts on **trauma-informed care.**
- The term *patient* is used to refer to the recipient of nursing care and the term *client* is used to describe individuals in a broader concept of the individual who accesses a variety of mental health-related services. The purpose is to add consistency, particularly with concepts such as "patient-centered care," one of the six Quality and Safety Education for Nurses (QSEN) criteria.
- Chapter review questions are now differentiated as review of concepts or **Clinical Judgment Questions** and are written to appear like **NCLEX test questions** for consistency with **The National Council of State Boards of Nursing**'s Next Gen test plan slated for implementation in 2022.
- **QSEN icons (in addition to the existing QSEN Teaching Strategy boxes)** have been added selectively throughout chapters to highlight content that reflects application of one or more of the six QSEN competencies (patient-centered care, evidence-based practice, teamwork and collaboration, maintaining safety, quality improvement, and informatics).
- **Communication icons and clinical pearls** appear throughout the text that highlight tips for improving therapeutic communication.
- **Chapter 4, Psychopharmacology,** describes each class of psychoactive substances. Lists of commonly used agents (along with generic and trade names, half-life, and dosage ranges) can be found in the chapters that discuss specific disorders. For example, a list of commonly used antipsychotic agents appears in Chapter 24, Schizophrenia Spectrum and Other Psychotic Disorders. These lists also appear online at DavisPlus.
- **Updated and new psychotropic drugs** approved since the publication of the ninth edition are included in the specific diagnostic chapters to which they apply.

Features That Have Been Retained in the Tenth Edition

The concept of **holistic nursing** is retained in the tenth edition. An attempt has been made to ensure that the physical aspects of psychiatric-mental health nursing are not overlooked. In all relevant situations, the mind-body connection is addressed.

Nursing process is retained in the tenth edition as the tool for delivery of care to the individual with a psychiatric disorder or to assist in the primary prevention or exacerbation of mental illness symptoms. The six steps of the nursing process, as described in the American Nurses Association's *Standards of Clinical Nursing Practice,* are used to provide guidelines for the nurse. These standards of care are included for the *DSM-5* diagnoses, as well as those on the aging individual, the bereaved individual, survivors of abuse or neglect, and military families, and as examples in several of the therapeutic approaches. The six steps are as follows:

Assessment: Background assessment data, including a description of symptomatology, provides an extensive knowledge base from which the nurse may draw when performing an assessment. Several assessment tools are also included.

Diagnosis: Nursing diagnoses common to specific psychiatric disorders are derived from analysis of assessment data.

Outcome Identification: Outcomes are derived from the nursing diagnoses and stated as measurable goals.

Planning: A plan of care is presented with selected nursing diagnoses for the *DSM-5* diagnoses, as well as for the elderly client, the bereaved individual, victims of abuse or neglect, military veterans and their families, the elderly homebound client, and the primary caregiver of the client with a chronic mental illness. The planning standard also includes tables that list topics for educating clients and families about mental illness. Concept map care plans are included for all major psychiatric diagnoses.

Implementation: The interventions that have been identified in the plan of care are included along with rationales for each. For each chapter in Unit 4, Nursing Care of Patients with Alterations in Psychosocial Adaptation, case studies are included to assist the student in the practical application of theoretical material. Unit 3, Therapeutic Approaches in Psychiatric Nursing Care, describes in detail nursing interventions for a variety of high-volume or high-risk patient problems. In addition, this section of the textbook speaks to the differentiation in scope of practice between the basic-level psychiatric nurse and the advanced practice–level psychiatric nurse.

Evaluation: The evaluation standard includes a set of questions that the nurse may use to assess whether the nursing actions have been successful in achieving the objectives of care.

Following are additional features in this edition:

- **Internet references** for each *DSM-5* diagnosis, with website listings for information related to the disorder.
- **Tables that list topics for patient/family education** (in the clinical chapters).
- **Boxes that include current research studies** with implications for evidence-based nursing practice (in the clinical chapters).
- **Tables that assign nursing diagnoses to patient behaviors** (diagnostic chapters).
- **Taxonomy and diagnostic criteria from the *DSM-5* (2013).** These criteria appear in selected chapters throughout the text.
- **Updated references throughout the text.** Classical references are distinguished from general references.
- **Boxes with definitions of core concepts** appear throughout the text.
- **Movie Connections** boxes at the end of selected chapters identify films relevant to the chapter topic.
- **Comprehensive glossary.**
- **Answers to end-of-chapter review questions** (Appendix A).
- **Answers to communication exercises** (Appendix B).
- **Sample patient teaching guides** (online at www.davisplus.com).
- **Website.** An F.A. Davis/Townsend website that contains additional nursing care plans that do not appear in the text, links to psychotropic medications, concept map care plans, and neurobiological content and illustrations, as well as student resources, including practice test questions, learning activities, concept map care plans, and client teaching guides.

Davis Edge Online Progressive Quizzing

Davis Edge is an online platform that affords faculty and students access to over 1,000 NCLEX-style questions, with complete and detailed rationales for all correct answers and incorrect distractors. Davis Edge provides faculty with a powerful assessment tool that seamlessly integrates with learning management systems and gradebooks. As students take quizzes in Davis Edge, the system provides data back to faculty as well, tracking student progress and reporting on areas of student strength and weakness (as individuals and at the cohort level) to assist with remediation. These tools empower instructors to continuously take the vital signs of their students' performance—Davis Edge's real-time analysis helps indicate when students are struggling with course content, so faculty can more quickly and easily identify, monitor, and support at-risk individuals, as well as track overall class trends. All questions in Davis Edge are completely different from those in the faculty test bank, so that quizzing and examinations are separate experiences. For students, the Davis Edge

platform offers nearly endless opportunities to ensure that they comprehend and retain the information presented in the textbook. The program also provides integrated access to the e-book version of the text, so students can quickly look up and refresh their knowledge base as a part of their quizzing experience.

Additional Educational Resources

Faculty may also find the teaching aids that accompany this textbook helpful. These Instructor Resources are located at www.davisplus.com:

- **Multiple choice questions** (including new format questions reflecting the latest NCLEX blueprint)
- **Lecture outlines** for all chapters
- **Learning activities** for all chapters (including answer key)
- **Answers to the Critical Thinking Exercises** from the textbook
- **PowerPoint Presentation** to accompany all chapters in the textbook
- **Answers to the Homework Assignment Questions** from the textbook
- **Case studies for use with student teaching**

Additional chapters on theories of personality development, cultural and spiritual issues, relaxation therapy, complementary and psychosocial therapies, issues related to human sexuality and gender dysphoria, and forensic nursing are presented online at www.davisplus.com.

It is hoped that the revisions and additions to this tenth edition continue to satisfy a need within psychiatric-mental health nursing practice. The mission of this textbook has been, and continues to be, to provide both students and clinicians with up-to-date information about psychiatric-mental health nursing. The user-friendly format and easy-to-understand language, for which we have received many positive comments, have been retained in this edition. We hope that this tenth edition continues to promote and advance the commitment to psychiatric/mental health nursing.

Karyn I. Morgan

Mary C. Townsend

UNIT

1

Basic Concepts in Psychiatric-Mental Health Nursing

1 The Concept of Stress Adaptation

CORE CONCEPTS
Adaptation
Maladaptation
Stressor

CHAPTER OUTLINE

KEY TERMS

adaptive responses
fight-or-flight syndrome
general adaptation syndrome
maladaptive responses
precipitating event
predisposing factors

OBJECTIVES

After reading this chapter, the student will be able to:

1. Define *adaptation* and *maladaptation.*
2. Identify physiological responses to stress.
3. Explain the relationship between stress and "diseases of adaptation."
4. Describe the concept of stress as an environmental event.
5. Explain the concept of stress as a transaction between the individual and the environment.
6. Discuss adaptive coping strategies in the management of stress.

HOMEWORK ASSIGNMENT

Please read the chapter and answer the following questions:

1. How are the body's physiological defenses affected when under sustained stress? Why?
2. In the view of stress as an environmental event, what aspects are missing when considering an individual's response to a stressful situation?
3. In their study, what event did Miller and Rahe (1997) find produced the highest level of stress reaction in their participants?
4. What is the initial step in stress management?

Psychologists and others have struggled for many years to establish an effective definition of the term *stress.* This term is used loosely today and still lacks a definitive explanation. Stress may be viewed as an individual's reaction to any change that requires an adjustment or response, which can be physical, mental, or emotional. Responses directed at stabilizing internal biological processes and preserving self-esteem can be viewed as healthy adaptations to stress.

Roy (1976), a nursing theorist, defined an **adaptive response** as behavior that maintains the integrity of the individual. Adaptation is viewed as positive and is correlated with a healthy response. When behavior disrupts the integrity of the individual, it is

perceived as maladaptive. **Maladaptive responses** by the individual are considered to be harmful or unhealthy.

Various 20th-century researchers contributed to several different concepts of stress. Three of these concepts are stress as a biological response, stress as an environmental event, and stress as a transaction between the individual and the environment. This chapter includes an explanation of each of these concepts.

CORE CONCEPT

Stressor

A biological, psychological, social, or chemical factor that causes physical or emotional tension and may contribute to the development of certain illnesses.

Stress as a Biological Response

In 1956, Hans Selye published the results of his research on the physiological response of a biological system to an imposed change on the system. Since his initial publication, his definition of stress has evolved to "the state manifested by a specific syndrome which consists of all the nonspecifically induced changes within a biologic system" (Selye, 1976). This combination of symptoms has come to be known as the **fight-or-flight syndrome.** Schematics of these biological responses, both initially and with sustained stress, are presented in Figures 1–1 and 1–2. Selye called this phenomenon the **general adaptation syndrome.** He described three distinct stages of the reaction:

1. **Alarm reaction stage:** During this stage, the physiological responses of the fight-or-flight syndrome are initiated.

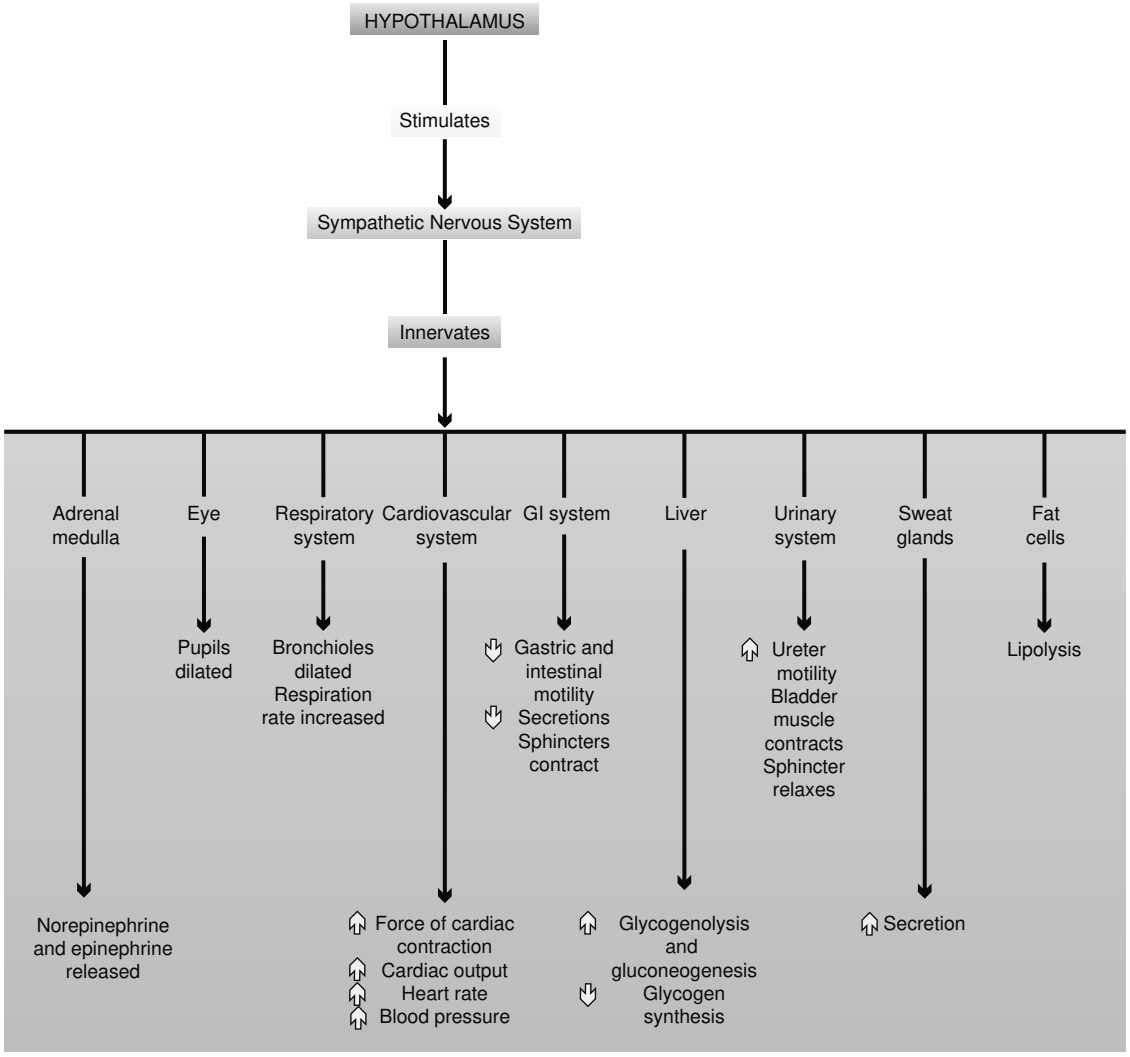

FIGURE 1–1 The fight-or-flight syndrome: The initial stress response.

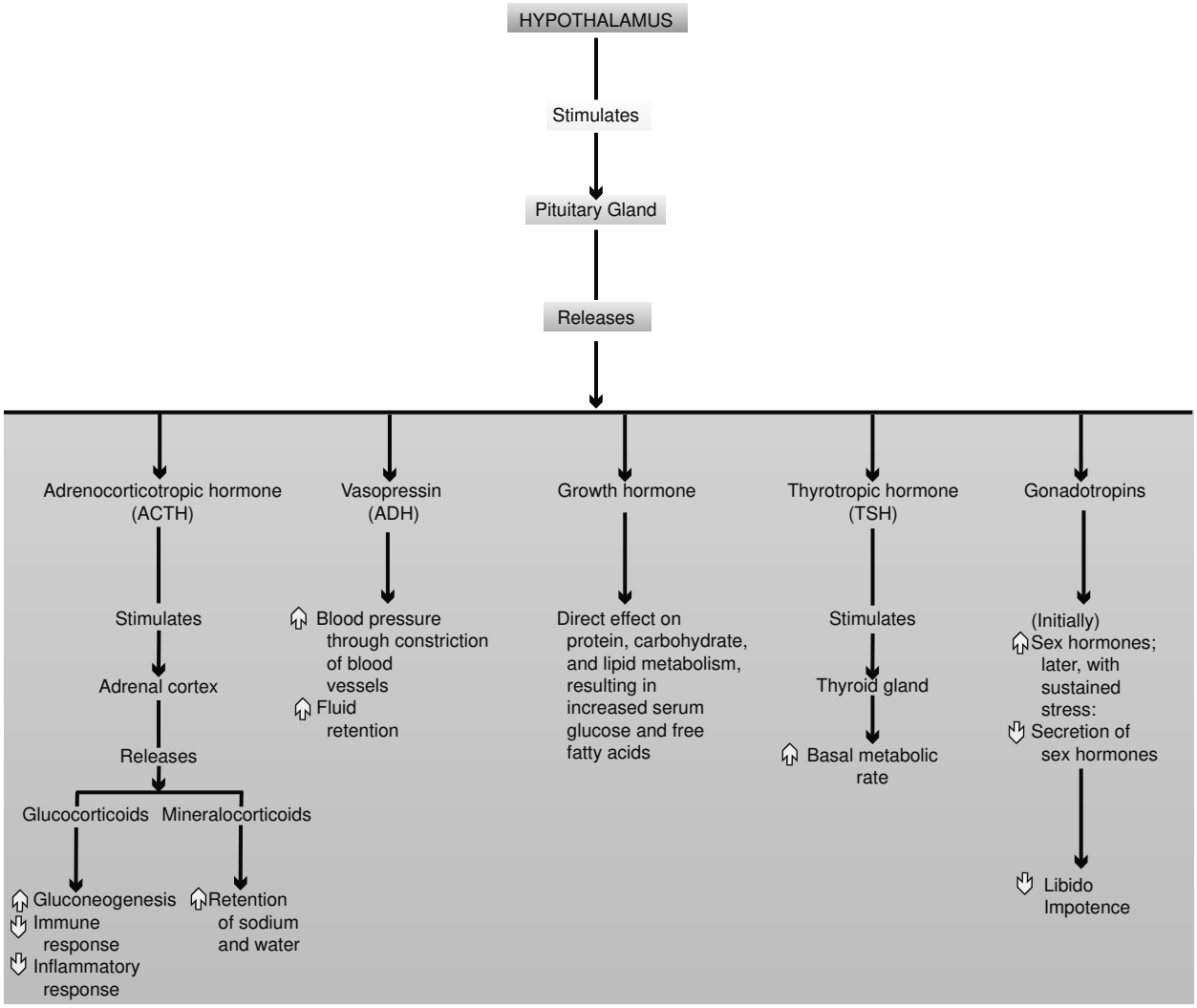

FIGURE 1–2 The fight-or-flight syndrome: The sustained stress response.

2. **Stage of resistance:** The individual uses the physiological responses of the first stage as a defense in the attempt to adapt to the stressor. If adaptation occurs, the third stage is prevented or delayed. Physiological symptoms may disappear.
3. **Stage of exhaustion:** This stage occurs when the body responds to prolonged exposure to a stressor. The adaptive energy is depleted, and the individual can no longer draw from the resources for adaptation described in the first two stages. Diseases of adaptation (e.g., headaches, mental disorders, coronary artery disease, ulcers, colitis) may occur. Without intervention for reversal, exhaustion, and in some cases even death, ensues (Selye, 1956, 1974).

The fight-or-flight response undoubtedly served our ancestors well. Those *Homo sapiens* who had to face the giant grizzly bear or the saber-toothed tiger as part of their struggle for survival must have used these adaptive resources to their advantage. The response was elicited in emergency situations, used in the preservation of life, and followed by restoration of the compensatory mechanisms to the preemergent condition (homeostasis).

Selye performed his extensive research in a controlled setting with laboratory animals as subjects. He elicited the physiological responses with physical stimuli, such as exposure to heat or extreme cold, electric shock, injection of toxic agents, restraint, and surgical injury. Since the publication of his original research, it has become apparent that the fight-or-flight syndrome of symptoms occurs in response to psychological or emotional stimuli just as it does to physical stimuli. Psychological or emotional stressors are often not resolved as rapidly as physical stressors, so the

body may be depleted of its adaptive energy more readily than it is from physical stressors. The fight-or-flight response may be inappropriate or even dangerous in our modern lifestyle in which stress has been described as a pervasive, chronic, and relentless psychosocial state. When the stress response becomes chronic, the body's persistent aroused condition for extended time periods increases an individual's risk for disease.

CORE CONCEPT

Adaptation

Adaptation is the process by which an individual's response to change results in preservation of individual integrity or timely return to equilibrium.

Stress as an Environmental Event

A second concept defines stress as an "event" that triggers an individual's adaptive physiological and psychological responses. The event creates change in the life pattern of the individual, requires significant adjustment in lifestyle, and taxes available personal resources. The change can be either positive, such as an outstanding personal achievement, or negative, such as being fired from a job. The emphasis here is on *change* from the existing steady state of the individual's life pattern.

Miller and Rahe (1997) have updated the original Social Readjustment Rating Scale devised by Holmes and Rahe in 1967 to reflect an increased number of modern stressors. Just as in the earlier version, numerical values are assigned to various common life events based on the stress these events create. In their research, Miller and Rahe found that women react to life stress events at higher levels than do men, and unmarried people gave higher scores than married people for most of the events. Younger participants rated more events at a higher stress level than did older participants. A high score on the Recent Life Changes Questionnaire (RLCQ) places the individual at greater susceptibility to physical or psychological illness. The questionnaire may be completed considering life stressors within a 6-month or 1-year period. Six-month totals equal to or greater than 300 life change units (LCUs) or 1-year totals equal to or greater than 500 LCUs are considered indicative of a high level of recent life stress, thereby increasing the individual's risk of illness. The RLCQ is presented in Table 1–1.

It is unknown whether stress overload merely predisposes a person to illness or actually precipitates it, but there does appear to be a link (Amirkhan, 2012).

TABLE 1–1 The Recent Life Changes Questionnaire

LIFE CHANGE EVENT	LCU
HEALTH	
An injury or illness which:	74
Kept you in bed a week or more, or sent you to the hospital	
Was less serious than above	44
Major dental work	26
Major change in eating habits	27
Major change in sleeping habits	26
Major change in your usual type/amount of recreation	28
WORK	
Change to a new type of work	51
Change in your work hours or conditions	35
Change in your responsibilities at work:	
More responsibilities	29
Fewer responsibilities	21
Promotion	31
Demotion	42
Transfer	32
Troubles at work:	
With your boss	29
With coworkers	35
With persons under your supervision	35
Other work troubles	28
Major business adjustment	60
Retirement	52
Loss of job:	
Laid off from work	68
Fired from work	79
Correspondence course to help you in your work	18
PERSONAL AND SOCIAL	
Change in personal habits	26
Beginning or ending school or college	38
Change of school or college	35
Change in political beliefs	24
Change in religious beliefs	29

Continued

TABLE 1–1 The Recent Life Changes Questionnaire—cont'd

LIFE CHANGE EVENT	LCU
Change in social activities	27
Vacation	24
New, close, personal relationship	37
Engagement to marry	45
Girlfriend or boyfriend problems	39
Sexual difficulties	44
"Falling out" of a close personal relationship	47
An accident	48
Minor violation of the law	20
Being held in jail	75
Death of a close friend	70
Major decision regarding your immediate future	51
Major personal achievement	36
HOME AND FAMILY	
Major change in living conditions	42
Change in residence:	
Move within the same town or city	25
Move to a different town, city, or state	47
Change in family get-togethers	25
Major change in health or behavior of family member	55
Marriage	50
Pregnancy	67
Miscarriage or abortion	65
Gain of a new family member:	
Birth of a child	66
Adoption of a child	65
A relative moving in with you	59
Spouse beginning or ending work	46
Child leaving home:	
To attend college	41
Due to marriage	41
For other reasons	45
Change in arguments with spouse	50
In-law problems	38
Change in the marital status of your parents:	
Divorce	59
Remarriage	50
Separation from spouse:	
Due to work	53
Due to marital problems	76
Divorce	96
Birth of grandchild	43
Death of spouse	119
Death of other family member:	
Child	123
Brother or sister	102
Parent	100
FINANCIAL	
Major change in finances:	
Increased income	38
Decreased income	60
Investment and/or credit difficulties	56
Loss or damage of personal property	43
Moderate purchase	20
Major purchase	37
Foreclosure on a mortgage or loan	58

LCU, life change unit.

Source: Miller, M.A., & Rahe, R.H. (1997). Life changes scaling for the 1990s. *Journal of Psychosomatic Research, 43*(3), 279-292, with permission.

Individuals differ in their reactions to life events, and these variations are related to the degree to which the change is perceived as stressful. Life changes questionnaires have been criticized because they do not consider the individual's perception of the event. These types of instruments also fail to consider cultural variations, the individual's coping strategies, and available support systems at the time when the life change occurs. Amirkhan (2012) developed a tool to assess stress overload that attempts to correct for these limitations by asking a series of 30 questions that all begin with "In the past week have you felt…" followed by choices such as calm, inadequate, depressed, and others. The emphasis in this tool is on the individual's perception of events rather than on the events themselves. Although the approaches to assessing for stress and vulnerability vary, it is clear that positive coping mechanisms and strong social or familial support can reduce the intensity of stressful life changes and promote a more adaptive response.

Stress as a Transaction Between the Individual and the Environment

The concept of stress as a transaction between the individual and the environment emphasizes the *relationship* between internal variables (within an individual) and external variables (within the environment). This concept parallels the modern concept of disease etiology. No longer is causation viewed solely as an external entity; whether or not illness occurs depends also on the receiving organism's susceptibility. Similarly, to predict psychological stress as a reaction, the internal characteristics of the person in relation to the environment must be considered.

Precipitating Event

Lazarus and Folkman's seminal theory (1984) defines stress (and potentially illness) as a psychological phenomenon in which the relationship between the person and the environment is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being. A **precipitating event** is a stimulus arising from the internal or external environment and perceived by the individual in a specific manner. Determination of an event as stressful depends on the individual's cognitive appraisal of the situation. *Cognitive appraisal* is an individual's evaluation of the personal significance of the event or occurrence. The event "precipitates" a response on the part of the individual, and the response is influenced by the individual's perception of the event. The *cognitive response* consists of a primary appraisal and a secondary appraisal.

Individual's Perception of the Event

Primary Appraisal

Lazarus and Folkman (1984) identify three types of primary appraisal: irrelevant, benign-positive, and stressful. An event is judged *irrelevant* when the outcome holds no significance for the individual. A *benign-positive* outcome is one that is perceived as producing pleasure for the individual. *Stress appraisals* include harm or loss, threat, and challenge. *Harm* or *loss* appraisals refer to damage or loss already experienced by the individual. Appraisals of a *threatening* nature are perceived as anticipated harms or losses. When an event is appraised as *challenging,* the individual focuses on potential for gain or growth rather than on risks associated with the event. Challenge produces stress even though the emotions associated with it (eagerness and excitement) are viewed as positive, and coping mechanisms must be called upon to face the new encounter. Challenge and threat may occur together when an individual experiences these positive emotions along with fear or anxiety over possible risks associated with the challenging event.

When stress is produced in response to harm or loss, threat, or challenge, a secondary appraisal is made by the individual.

Secondary Appraisal

The secondary appraisal is an assessment of skills, resources, and knowledge that the person possesses to deal with the situation. The individual appraises the situation by considering the following:

- Which coping strategies are available to me?
- Will the option I choose be effective in this situation?
- Do I have the ability to use that strategy in an effective manner?

The interaction between the primary appraisal of the event that has occurred and the secondary appraisal of available coping strategies determines the quality of the individual's adaptation response to stress.

Predisposing Factors

A variety of elements influence how an individual perceives and responds to a stressful event. These **predisposing factors** strongly influence whether the response is adaptive or maladaptive. Types of predisposing factors include genetic influences, past experiences, and existing conditions.

Genetic influences are those circumstances of an individual's life that are acquired through heredity. Examples include family history of physical and psychological conditions (strengths and weaknesses) and temperament (behavioral characteristics present at birth that evolve with development).

Past experiences are occurrences that result in learned patterns that can influence an individual's adaptation response. They include previous exposure to the stressor or other stressors, learned coping responses, and degree of adaptation to previous stressors.

Existing conditions incorporate vulnerabilities that influence the adequacy of the individual's physical, psychological, and social resources for dealing with adaptive demands. Examples include current health status, motivation, developmental maturity, severity and duration of the stressor, financial and educational resources, age, existing coping strategies, and a caring support system. Hobfoll's conservation of resources theory (Hobfoll, 1989; Hobfoll, Schwarzer, & Chon, 1998) adds that as existing conditions (loss or lack of resources) exceed the person's perception of adaptive capabilities, the person not only experiences stress in the present but also becomes more vulnerable to the effects of stress in the future due to a "weaker resource reservoir to call on to meet future demand" (Hobfoll et al., 1998, p. 191). All of the preceding concepts and theories are foundational to the transactional model

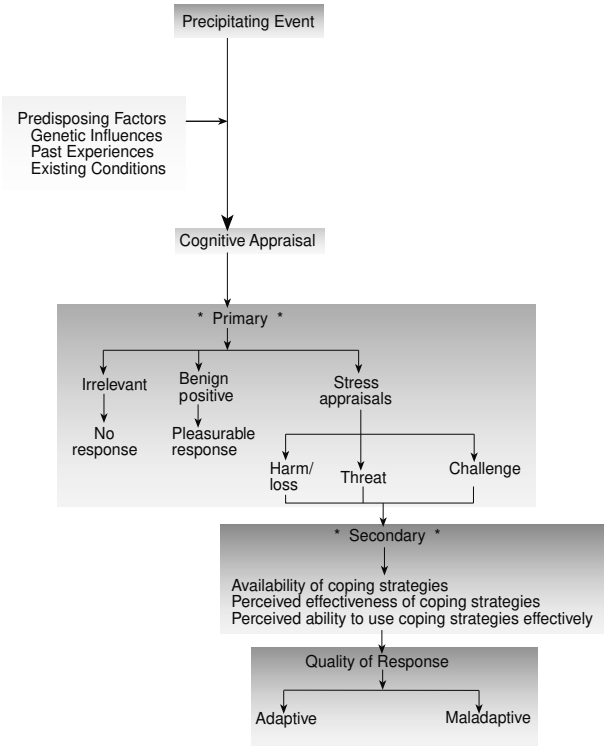

FIGURE 1–3 Transactional model of stress and adaptation.

of stress and adaptation that serves as the framework for the process of nursing in this text. A graphic display of the model is presented in Figure 1–3.

CORE CONCEPT

Maladaptation

Maladaptation is the process by which an individual's response to change results in disruption of individual integrity or in persistent disequilibrium.

Stress Management*

The growth of stress management into a multimillion-dollar-a-year industry attests to its importance in our society. Stress management involves the use of coping strategies in response to stressful situations. Coping strategies are adaptive when they protect the individual from harm (or additional harm) or strengthen the individual's ability to meet challenging situations. Adaptive responses help restore homeostasis to the body and impede the development of diseases of adaptation. Positive adaptation, particularly in response to adversity, has also been referred to as *resilience*.

*Some stress management techniques are discussed at greater length in Unit 3 of this text and in the Complementary and Psychosocial Therapies chapter available online.

Responses are considered maladaptive when the conflict goes unresolved or intensifies. Energy resources become depleted as the body struggles to compensate for the chronic physiological and psychological arousal experienced in response to the stressful event. The effect is a significant vulnerability to physical or psychological illness. One key to stress management is to identify factors and practices that contribute to adaptive coping and resilience.

Adaptive Coping Strategies

Awareness

The initial step in managing stress is awareness—to become aware of the factors that create stress and the feelings associated with a stressful response. Stress can be managed only when one recognizes the signs that it is occurring. As an individual becomes aware of stressors, he or she can choose to omit, avoid, or accept them.

Relaxation

Individuals experience relaxation in different ways. Some people relax by engaging in gross motor activities, such as sports, jogging, and physical exercise. Others use techniques such as breathing exercises and progressive relaxation. A discussion of relaxation therapy may be found online at Davis*Plus*.

Meditation

Meditation has been shown to produce a lasting reduction in blood pressure and other stress-related symptoms when practiced for 20 minutes once or twice a day (Scott, 2016). The practice of mindfulness meditation is foundational to many psychosocial interventions aimed at reducing anxiety and improving engagement in problem-solving. Meditation involves assuming a comfortable position, closing the eyes, casting off all other thoughts, and concentrating on a single word, sound, or phrase that has positive meaning to the individual. It may also involve concentrating on one's breathing or other mindfulness practices. The technique of meditation is described in detail online at Davis*Plus*.

Interpersonal Communication

As previously mentioned, the strength of an individual's available support system is an existing condition that significantly influences his or her adaptation when coping with stress. Sometimes just "talking the problem out" with an empathetic individual can interrupt escalation of the stress response. Writing about one's feelings in a journal or diary can also be therapeutic.

Problem-Solving

Problem-solving is an adaptive coping strategy in which the individual is able to view the situation objectively

(or to seek assistance from another individual to accomplish this if the anxiety level is too high to concentrate) and then apply a problem-solving and decision-making model such as the following:

- Assess the facts of the situation.
- Formulate goals for resolution of the stressful situation.
- Study the alternatives for dealing with the situation.
- Determine the risks and benefits of each alternative.
- Select an alternative.
- Implement the alternative selected.
- Evaluate the outcome of the alternative implemented.
- If the first choice is ineffective, select and implement a second option.

Pets

Studies show that those who care for pets, especially dogs and cats, are better able to cope with the stressors of life (Mayo Clinic, 2018). The physical act of stroking a dog's or cat's fur can be therapeutic, giving the animal an intuitive sense of being cared for and providing the individual the calming feeling of warmth, affection, and interdependence with a reliable, trusting being. Studies have also shown that individuals with companion pets demonstrate improvements in heart health, allergies, anxiety, and mental illnesses such as depression (Casciotti & Zuckerman, 2019; Donehy, 2017).

Music

Studies have shown multiple benefits of listening to music, including relieving pain, improving motivation and performance, improving sleep, enhancing blood vessel function, reducing stress, relieving symptoms of depression, improving cognition, and easing recovery in stroke patients (Christ, 2013; WebMD, 2017).

Summary and Key Points

- Stress has become a chronic and pervasive condition in the United States.
- Adaptive behavior is a stress response that maintains the integrity of the individual with a timely return to equilibrium. It is viewed as positive and is correlated with a healthy response.
- When behavior disrupts the integrity of the individual or results in persistent disequilibrium, it is perceived as maladaptive. Maladaptive responses by the individual are unhealthy.
- A stressor is defined as a biological, psychological, social, or chemical factor that causes physical or emotional tension and may be a factor in the etiology of certain illnesses.
- Hans Selye identified the biological changes associated with a stressful situation as the fight-or-flight syndrome. Selye called the general reaction of the body to stress the "general adaptation syndrome," which occurs in three stages: the alarm reaction stage, the stage of resistance, and the stage of exhaustion.
- When individuals remain in the aroused response to stress for an extended period of time, they become susceptible to diseases, including headaches, mental disorders, coronary artery disease, ulcers, and colitis.
- Stress may also be viewed as an environmental event, which results when a change from the existing steady state of the individual's life pattern occurs. When an individual experiences a high level of life change events, he or she becomes susceptible to physical or psychological illness.
- Limitations of the environmental concept of stress include failure to consider the individual's perception of the event, coping strategies, and available support systems at the time when the life change occurs.
- Stress is more appropriately expressed as a transaction between the individual and the environment that is appraised by the individual as taxing or exceeding his or her resources and endangering his or her well-being.
- The individual makes a cognitive appraisal of the precipitating event to determine the personal significance of the event or occurrence.
- Primary cognitive appraisals may conclude that an event is irrelevant, benign-positive, or stressful.
- Secondary cognitive appraisals include evaluation by the individual of skills, resources, and knowledge to deal with the stressful situation.
- Predisposing factors influence how an individual perceives and responds to a stressful event. They include genetic influences, past experiences, and existing conditions.
- Stress management involves the use of adaptive coping strategies in response to stressful situations in an effort to impede the development of diseases of adaptation.
- Examples of adaptive coping strategies include developing awareness, relaxation, meditation, interpersonal communication with caring other, problem-solving, pets, and music.

For additional resources, please visit **www.fadavis.com**

Review Questions

1. When assessing whether a client is exhibiting adaptive responses to stressors, the nurse must recognize which of the following?
   a. Adaptive responses are those that preserve the integrity of the individual.
   b. Adaptive responses eliminate all stressors.
   c. Adaptive responses can only be achieved through intensive therapy.
   d. Adaptive responses are whatever the client perceives them to be.
2. Why is stress management so important in one's overall health?
   a. Stress-related disorders strengthen the immune system.
   b. Sustained response to stress can increase vulnerability to a variety of diseases and maladaptive coping responses.
   c. Relaxation exercises are effective in preventing disorders such as depression and suicide.
   d. All of the above.
3. Elena has just received a promotion on her job. She is very happy and excited about moving up in her company, but she has been experiencing anxiety since receiving the news. The nurse accurately assesses her primary appraisal of the situation as which of the following?
   a. Benign-positive
   b. Irrelevant
   c. Challenging
   d. Threatening
4. Which of the following statements by a client are examples of adaptive coping mechanisms?
   a. "I like to take the edge off by having a few drinks."
   b. "I need to pay more attention to my calorie intake because I gained 10 pounds in the last month."
   c. "When the stress gets to be too much, I feel better after I kick the dog."
   d. "I try to stay away from people because it's less stressful than arguing with everybody."

Clinical Judgment Questions

5. A client reports hearing on last night's evening news that 25 people were killed in a tornado in south Texas, but appears to express no anxiety in response to this stressful situation. Which of these actions by the nurse is a priority?
   a. Ask where the client lives.
   b. Assess the client's perception about the relevance of this event.
   c. Encourage the client to use adaptive coping skills to help others through this tragedy.
   d. Ask where the client grew up.
6. A client regularly develops nausea and vomiting when she is faced with a stressful situation. Which of the following should be considered when attempting to identify predisposing factors associated with Cindy's response? (Select all that apply.)
   a. Identify what happened right before she had the most recent episode of nausea and vomiting.
   b. Consider genetic influences.
   c. Identify any existing physical conditions that might make the client more vulnerable to respond in this way.
   d. Explore past experiences that may have resulted in this becoming a learned response.
7. A client comes to the mental health clinic with reports of anxiety and depression. Regarding the transactional model of stress and adaptation, which of the following are important nursing actions when assessing his complaints? (Select all that apply.)
   a. Evaluate the client's perception of precipitating events.
   b. Ask the client about past stressors and degree of positive coping abilities.
   c. Assess the client's existing social supports.
   d. Evaluate the client's physical strength.
   e. Monitor the client's temperature.

8. A client says to the nurse, "I think that meditation might be a good thing for reducing anxiety but I've never learned how to do it." Which of these would be the most appropriate response by the nurse?
   a. Instruct the client that antianxiety medication must be taken before engaging in meditation.
   b. Ask why the client never learned this method of relaxation.
   c. Educate the client about the evidence supporting pet therapy as the most effective psychosocial coping mechanism.
   d. Educate the client about how to engage in mindfulness meditation.
9. A client tells the nurse, "My spouse and I got into a big fight and I just stormed out because I didn't know what else to do." Which action by the nurse is a priority at this point?
   a. Encourage the client to seek legal advice from a divorce lawyer.
   b. Ask the client to describe the spouse's side of the story.
   c. Affirm the client's response as the most appropriate way to reduce anxiety in such situations.
   d. Assist the client to describe the event.
10. A new client tells the nurse at the mental health clinic, "I was so stressed out after work today and trying to get to my appointment here on time that I started having chest pain." Which action by the nurse is a priority at this point?
   a. Offer the client antianxiety medication as prescribed.
   b. Assess the client's physical status including vital signs.
   c. Reinforce that since the client arrived on time there is nothing to worry about.
   d. Help the client to identify adaptive coping mechanisms for dealing with stress.

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2 Mental Health and Mental Illness: Historical and Theoretical Concepts

CORE CONCEPTS
Anxiety
Grief

CHAPTER OUTLINE

KEY TERMS

anosognosia
anticipatory grieving
bereavement overload
defense mechanisms
- *compensation*
- *denial*
- *displacement*
- *identification*
- *intellectualization*
- *introjection*
- *isolation*
- *projection*
- *rationalization*
- *reaction formation*
- *regression*
- *repression*
- *sublimation*
- *suppression*
- *undoing*

grief
mental health
mental illness
neurosis
psychosis

OBJECTIVES

After reading this chapter, the student will be able to:

1. Discuss the history of psychiatric care.
2. Define *mental health* and *mental illness.*
3. Discuss cultural elements that influence attitudes toward mental health and mental illness.
4. Describe psychological adaptation responses to stress.
5. Correlate adaptive and maladaptive responses to the mental health/mental illness continuum.

HOMEWORK ASSIGNMENT

Please read the chapter and answer the following questions:

1. Explain the concepts of *incomprehensibility* and *cultural relativity.*
2. Describe some symptoms of panic anxiety.
3. Jane was involved in an automobile accident in which both her parents were killed. When you ask her about it, she says she has no memory of the accident. What ego defense mechanism is she using?
4. In what stage of the grieving process is the individual with delayed or inhibited grief fixed?

The consideration of mental health and mental illness has its basis in the cultural beliefs of the society in which the behavior takes place. Some cultures are quite liberal in the range of behaviors that are considered acceptable, whereas others have little tolerance for behaviors that deviate from the cultural norms.

A study of the history of psychiatric care reveals some shocking truths about past treatment of individuals with mental illness. Many were kept in

control by means that today could be considered abuse.

This chapter deals with the evolution of psychiatric care from ancient times to the present. **Mental health** and **mental illness** are defined, and the psychological adaptation to stress is explained in terms of the two major responses: anxiety and grief. Behavioral responses are conceptualized along the mental health/mental illness continuum.

Historical Overview of Psychiatric Care

Primitive thoughts regarding mental disturbances varied and were often rooted in cultural and religious beliefs. Some cultures thought that an individual with mental illness had been dispossessed of his or her soul and wellness could be achieved only if the soul was returned. Others believed that evil spirits or supernatural or magical powers had entered the body. The "cure" for these individuals involved a ritualistic exorcism to purge the body of these unwanted forces. This purging often consisted of brutal beatings, starvation, or other torturous means. Still other cultures considered that the individual with mental illness may have broken a taboo or sinned against another individual or God, for which ritualistic purification was required or various types of retribution were demanded. The association of mental illness with demonology led to some individuals with mental illness being executed.

These ancient beliefs dwindled with increasing knowledge about mental illness and changes in cultural, religious, and sociopolitical attitudes. Around 400 BC, the work of Hippocrates was the first to place mental illness in a physical rather than supernatural context. Hippocrates theorized that mental illness was caused by irregularity in the interaction of the four body fluids: blood, black bile, yellow bile, and phlegm. He called these body fluids *humors* and associated each with a particular disposition. Disequilibrium among these four humors was often treated by inducing vomiting and diarrhea with potent cathartic drugs.

During the Middle Ages (AD 500 to 1500), the association of mental illness with witchcraft and the supernatural continued to prevail in Europe. During this period, many people with mental illness were set to sea alone in sailing boats with little guidance to search for their lost rationality, a practice from which the expression "ship of fools" was derived. But in Middle Eastern countries, mental illness began to be perceived as a medical problem rather than a result of supernatural forces. This notion gave rise to the establishment of specialized hospital units and residential institutions specifically designed for clients with mental illness. They can likely be considered the first asylums for individuals with mental illness.

Colonial Americans tended to reflect the attitudes of the European communities from which they had emigrated. Particularly in the New England area, individuals were punished for behavior attributed to witchcraft. In the 16th and 17th centuries, institutions for people with mental illness did not exist in the United States, and care of these individuals was a family responsibility. Those without family or other resources became the responsibility of the communities in which they lived and were incarcerated in places where they could not harm themselves or others.

The first hospital in America to admit clients with mental illness was established in Philadelphia in the middle of the 18th century. Benjamin Rush, often called the father of American psychiatry, was a physician at the hospital. He initiated the provision of humanistic treatment and care for clients with mental illness. But although he included kindness, exercise, and socialization in his care, he also employed harsh methods such as bloodletting, purging, various types of physical restraints, and extremes of temperatures, reflecting the medical therapies of that era.

The 19th century brought the establishment of a system of state asylums, largely the result of the work of Dorothea Dix, a former New England schoolteacher who lobbied tirelessly on behalf of the mentally ill population. She was unwavering in her belief that mental illness was curable and that state hospitals should provide humanistic therapeutic care. This system of hospital care for individuals with mental illness grew, but the mentally ill population grew faster. The institutions became overcrowded and understaffed, and conditions deteriorated. Therapeutic care reverted to custodial care in state hospitals, which provided the largest resource for individuals with mental illness until the initiation of the community health movement of the 1960s (see Chapter 35, "Community Mental Health Nursing").

The emergence of psychiatric nursing began in 1873 with the graduation of Linda Richards from the nursing program at the New England Hospital for Women and Children in Boston. She has come to be known as the first American psychiatric nurse. During her career, Richards was instrumental in the establishment of a number of psychiatric hospitals and the first school of psychiatric nursing at the McLean Asylum in Waverly, Massachusetts, in 1882. This school and others like it provided training in custodial care for clients in psychiatric asylums—training that did not include the study of psychological concepts. Significant change in psychiatric nursing education did not occur until 1955, when incorporation of psychiatric nursing into the curricula became a requirement for all undergraduate schools of nursing. This new curriculum emphasized the importance of the nurse–patient relationship and

therapeutic communication techniques. Nursing intervention in the somatic therapies (e.g., insulin and electroconvulsive therapy) provided impetus for the incorporation of these concepts into the profession's body of knowledge.

With the increasing need for psychiatric care in the aftermath of World War II, the government passed the National Mental Health Act of 1946. This legislation provided funds for the education of psychiatrists, psychologists, social workers, and psychiatric nurses. Graduate-level education in psychiatric nursing was established during this period. Around the same time, the introduction of antipsychotic medications made it possible for clients with psychoses to more readily participate in their treatment, including psychological therapies.

Knowledge of the history of psychiatric-mental health care contributes to the understanding of the concepts presented in this chapter and those in the online chapter (available at www.DavisPlus.com), which describe the theoretical models of personality development according to various 19th- and 20th-century leaders in the mental health movement. Modern American psychiatric care has its roots in ancient times. A great deal of opportunity exists for continued advancement of this specialty within the practice of nursing.

Mental Health

A number of theorists have attempted to define the concept of mental health. Many of these concepts deal with various aspects of individual functioning. Maslow (1970) emphasized an individual's motivation in the continuous quest for self-actualization. He identified a "hierarchy of needs," with the most basic needs requiring fulfillment before those at higher levels can be achieved and with self-actualization defined as fulfillment of one's highest potential. An individual's position within the hierarchy may revert from a higher level to a lower level based on life circumstances. For example, an individual facing major surgery who has been working to achieve self-actualization may become preoccupied, if only temporarily, with the need for physiological safety. A representation of this needs hierarchy is presented in Figure 2–1.

Maslow described self-actualization as being "psychologically healthy, fully human, highly evolved, and fully mature." He believed that self-actualized individuals possess the following characteristics:

- An appropriate perception of reality
- The ability to accept oneself, others, and human nature
- The ability to manifest spontaneity
- The capacity for focusing concentration on problem-solving
- A need for detachment and desire for privacy
- Independence, autonomy, and a resistance to enculturation
- An intensity of emotional reaction
- A frequency of "peak" experiences that validate the worthwhileness, richness, and beauty of life
- An identification with humankind
- The ability to achieve satisfactory interpersonal relationships
- A democratic character structure and strong sense of ethics
- Creativeness
- A degree of nonconformance

Jahoda (1958) identified a list of six indicators that are a reflection of mental health:

1. **A positive attitude toward self:** This indicator refers to an objective view of self, including knowledge and acceptance of strengths and limitations. The individual feels a strong sense of personal identity and security within his or her environment.
2. **Growth, development, and the ability to achieve self-actualization:** This indicator correlates with whether the individual successfully achieves the tasks associated with each level of development (see Chapter 31, "Personality Disorders" and online Chapter 38, "Theoretical Models of Personality Development"). With successful achievement in each level, the individual gains motivation for advancement to his or her highest potential.
3. **Integration:** The focus of this indicator is on maintaining equilibrium or balance among various life processes. Integration includes the ability to adaptively respond to the environment and the development of a philosophy of life, both of which help the individual maintain a manageable anxiety level in response to stressful situations.
4. **Autonomy:** This indicator refers to the individual's ability to perform in an independent, self-directed manner. He or she makes choices and accepts responsibility for the outcomes.
5. **Perception of reality:** Accurate reality perception is a positive indicator of mental health. It includes perception of the environment without distortion as well as the capacity for empathy and social sensitivity—a respect and concern for the wants and needs of others.
6. **Environmental mastery:** This indicator suggests that the individual has achieved a satisfactory role within the group, society, or environment and is able to love and accept the love of others. When faced with life situations, the individual is able to strategize, make decisions, change, adjust, and adapt. Life offers satisfaction to the individual who has achieved environmental mastery.

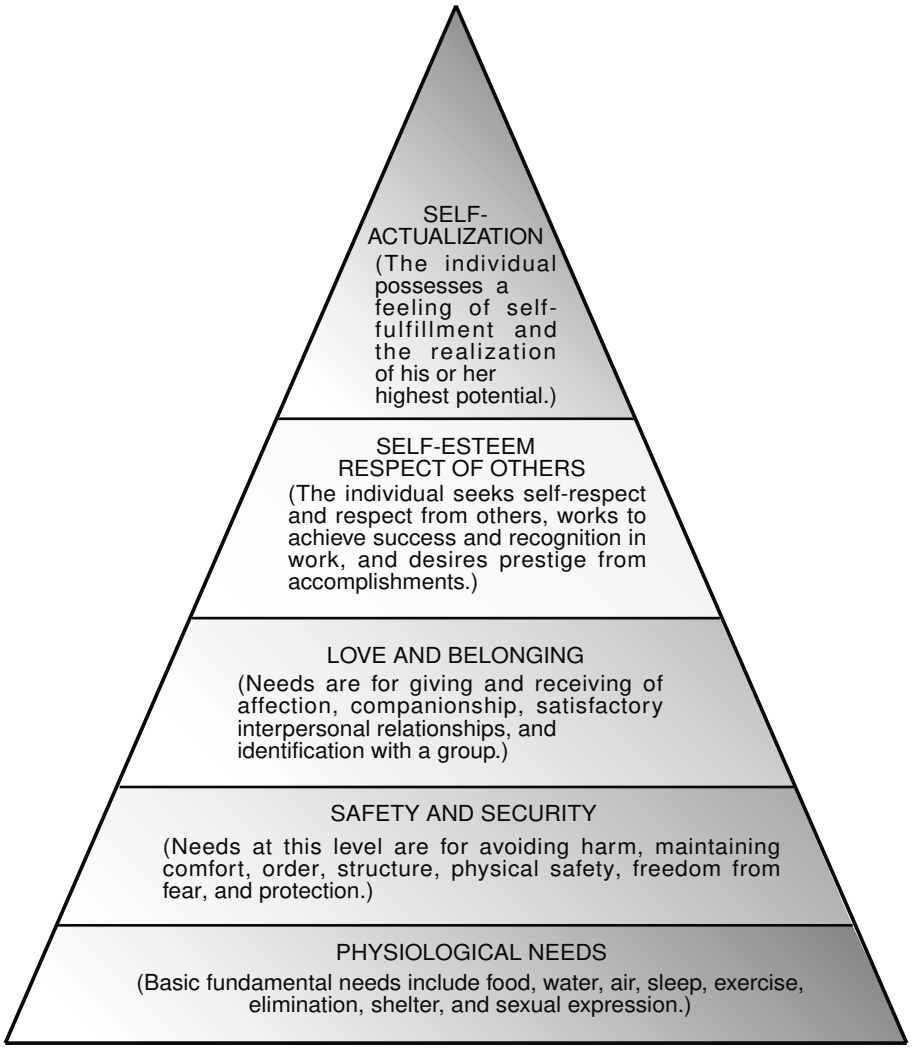

FIGURE 2–1 Maslow's hierarchy of needs.

Robinson (1983) offers the following definition of mental health:

> A dynamic state in which thought, feeling, and behavior that is age-appropriate and congruent with the local and cultural norms is demonstrated. (p. 74)

Expanding on this concept, mental health may be viewed as a relative state that occurs along a continuum of thoughts, feelings, and behaviors that are all part of the human psychological experience and are influenced by the perceived magnitude of stressors in interaction with adaptive capabilities.

In keeping with the framework of stress and adaptation, this text will use a modification of Robinson's definition of mental health. Thus, *mental health* will be defined as "the successful adaptation to stressors from the internal or external environment, evidenced by thoughts, feelings, and behaviors that are age-appropriate and congruent with local and cultural norms."

Mental Illness

Arriving at a universal concept of mental illness is difficult because of the cultural factors that influence such a definition. However, certain elements are associated with individuals' perceptions of mental illness, regardless of cultural origin. Horwitz (2010) identifies two of these elements as (1) incomprehensibility and (2) cultural relativity.

Incomprehensibility relates to the inability of the general population to understand the motivation behind an individual's behavior. When observers are unable to find meaning or comprehensibility in behavior, they are likely to label that behavior as mental illness. Horwitz states, "Observers attribute labels of mental illness when the rules, conventions, and understandings they use to interpret behavior fail to find any intelligible motivation behind an action" (p. 17). The element of *cultural relativity* considers that these rules, conventions, and understandings are conceived within an individual's

own particular culture. Behavior that is considered "normal" and "abnormal" is defined by one's cultural or societal norms. Therefore, a behavior that is recognized as evidence of mental illness in one society may be viewed as normal in another society, and vice versa.

The American Psychiatric Association (2013), in its *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5),* defines mental disorder as

> a syndrome characterized by clinically significant disturbance in an individual's cognitions, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. Mental disorders are usually associated with significant distress or disability in social, occupational, or other important activities. An expected or culturally approved response to a common stressor or loss such as the death of a loved one is not a mental disorder. (p. 20)

In this text, and in keeping with the transactional model of stress and adaptation, mental illness is characterized as "maladaptive responses to stressors from the internal or external environment, evidenced by thoughts, feelings, and behaviors that are incongruent with the local and cultural norms and that interfere with the individual's social, occupational, and/or physical functioning."

Psychological Adaptation to Stress

All individuals exhibit characteristics associated with both mental health and mental illness at any given point in time. Chapter 1, "The Concept of Stress Adaptation," describes how an individual's response to stressful situations is influenced by physiological factors, his or her personal perception of the event, and a variety of predisposing factors such as heredity, temperament, learned response patterns, developmental maturity, existing coping strategies, and support systems of caring others.

Anxiety and grief have been described as two primary psychological response patterns to stress. A variety of thoughts, feelings, and behaviors are associated with each of these response patterns. Adaptation is determined by the degree to which the thoughts, feelings, and behaviors interfere with an individual's functioning.

CORE CONCEPT

Anxiety

A feeling of discomfort and apprehension related to fear of impending danger. The individual may be unaware of the source of his or her anxiety, but it is often accompanied by feelings of uncertainty and helplessness.

Anxiety

Feelings of anxiety are so common in our society that they are almost considered universal. Anxiety arises from the chaos and confusion that exists in the world. Fear of the unknown and conditions of ambiguity allow anxiety to take root and grow. Low levels of anxiety are adaptive and can provide the motivation required for survival. Anxiety becomes problematic when the individual is unable to prevent his or her response from escalating to a level that interferes with the ability to meet basic needs.

Peplau (1963) described four levels of anxiety: mild, moderate, severe, and panic. It is important for nurses to be able to recognize the symptoms associated with each level to plan for appropriate intervention with anxious individuals.

- **Mild anxiety:** This level of anxiety is seldom a problem for the individual. It is associated with the tension experienced in response to the events of day-to-day living. Mild anxiety prepares people for action. It sharpens the senses, increases motivation for productivity, and results in a heightened awareness of the environment. Learning is enhanced, and the individual is able to function at his or her optimal level.
- **Moderate anxiety:** As the level of anxiety increases, the extent of the perceptual field diminishes. The moderately anxious individual is less alert to events occurring in the environment. The individual's attention span and ability to concentrate decrease, although he or she may still attend to needs with direction. Assistance with problem-solving may be required. Increased muscular tension and restlessness are evident.
- **Severe anxiety:** The perceptual field of the severely anxious individual is so greatly diminished that concentration centers on one particular detail only or on many extraneous details. Attention span is extremely limited, and the individual has difficulty completing even the simplest task. Physical symptoms (e.g., headaches, palpitations, insomnia) and emotional symptoms (e.g., confusion, dread, horror) may be evident. Discomfort is experienced to the degree that virtually all overt behavior is aimed at relieving the anxiety.
- **Panic anxiety:** In this most intense state of anxiety, the individual is unable to focus on even one detail in the environment. Misperceptions are common, and a loss of contact with reality may occur. The individual may experience hallucinations or delusions. Behavior may be characterized by wild and desperate actions or extreme withdrawal. Human functioning and communication with others is ineffective. Panic anxiety is associated with a feeling of terror, and individuals may be convinced that

they have a life-threatening illness or fear that they are "going crazy," are losing control, or are emotionally weak. Prolonged panic anxiety can lead to physical and emotional exhaustion and can be a life-threatening situation.

A synopsis of the characteristics associated with each of the four levels of anxiety is presented in Table 2–1.

Behavioral Adaptation Responses to Anxiety

A variety of behavioral adaptation responses occur at each level of anxiety. Figure 2–2 depicts these behavioral responses on a continuum of anxiety ranging from mild to panic.

Mild Anxiety

At the mild level, individuals employ any of a number of coping behaviors that satisfy their needs for comfort. Menninger (1963) described the following types of coping mechanisms that individuals use to relieve anxiety in stressful situations:

- Sleeping
- Yawning
- Eating
- Drinking
- Physical exercise
- Daydreaming
- Smoking
- Laughing
- Crying
- Cursing
- Pacing
- Nail biting
- Foot swinging
- Finger tapping
- Fidgeting
- Talking to someone with whom one feels comfortable

Undoubtedly, there are many more responses too numerous to mention here, considering that each individual develops his or her own unique ways to relieve mild anxiety. Some of these behaviors are more adaptive than others.

Mild-to-Moderate Anxiety

Sigmund Freud (1961) identified the ego as the reality component of the personality, governing problem-solving and rational thinking. As the level of anxiety increases, the strength of the ego is tested, and energy is mobilized to confront the threat. Anna Freud (1953) identified a number of **defense mechanisms** employed by the ego in the face of threat to biological or psychological integrity. Some of these ego defense mechanisms are more adaptive than others, but all are used either consciously or unconsciously as protective devices by the ego to relieve mild-to-moderate anxiety. They become maladaptive when used by an individual to such a degree that there is interference with the ability to deal with reality, effective interpersonal relations, or occupational performance. Maladaptive use of defense mechanisms promotes disintegration of the ego. The major ego defense mechanisms identified by Anna Freud are summarized in Table 2–2.

Moderate-to-Severe Anxiety

Anxiety at the moderate-to-severe level that remains unresolved over an extended period can contribute to a number of physiological disorders. The *DSM-5* (APA, 2013) describes these disorders under the category "Psychological Factors Affecting Other Medical Conditions." The psychological factors may exacerbate symptoms of, delay recovery from, or interfere with treatment of the medical condition. The condition may be initiated or exacerbated by an environmental situation that the individual perceives as stressful. Measurable pathophysiology can be demonstrated. It is thought that psychological and behavioral

TABLE 2–1 Levels of Anxiety

LEVEL	PERCEPTUAL FIELD	ABILITY TO LEARN	PHYSICAL CHARACTERISTICS	EMOTIONAL AND BEHAVIORAL CHARACTERISTICS
Mild	Heightened perception (e.g., noises may seem louder; details within the environment are clearer) Increased awareness Increased alertness	Learning is enhanced	Restlessness Irritability	May remain superficial with others Rarely experienced as distressful Motivation is increased
Moderate	Reduction in perceptual field Reduced alertness to environmental events (e.g., someone talking may not be heard; part of the room may not be noticed)	Learning still occurs but not at optimal ability Decreased attention span Decreased ability to concentrate	Increased restlessness Increased heart and respiration rates Increased perspiration Gastric discomfort Increased muscular tension Increase in speech rate, volume, and pitch	A feeling of discontent May lead to a degree of impairment in interpersonal relationships as individual begins to focus on self and the need to relieve personal discomfort

Continued

TABLE 2–1 Levels of Anxiety—cont'd

LEVEL	PERCEPTUAL FIELD	ABILITY TO LEARN	PHYSICAL CHARACTERISTICS	EMOTIONAL AND BEHAVIORAL CHARACTERISTICS
Severe	Greatly diminished; only extraneous details are perceived, or fixation on a single detail may occur May not take notice of an event even when attention is directed by another	Extremely limited attention span Unable to concentrate or problem-solve Effective learning cannot occur	Headaches Dizziness Nausea Trembling Insomnia Palpitations Tachycardia Hyperventilation Urinary frequency Diarrhea	Feelings of dread, loathing, horror Total focus on self and intense desire to relieve the anxiety
Panic	Unable to focus on even one detail within the environment Misperceptions of the environment common (e.g., a perceived detail may be elaborated and out of proportion)	Learning cannot occur Unable to concentrate Unable to comprehend even simple directions	Dilated pupils Labored breathing Severe trembling Sleeplessness Palpitations Diaphoresis and pallor Muscular incoordination Immobility or purposeless hyperactivity Incoherence or inability to verbalize	Sense of impending doom Terror Bizarre behavior, including shouting, screaming, running about wildly, clinging to anyone or anything from which a sense of safety and security is derived Hallucinations, delusions Extreme withdrawal into self

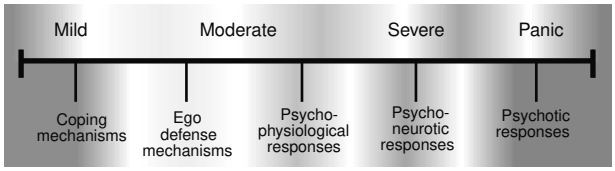

FIGURE 2–2 Adaptation responses on a continuum of anxiety.

factors may affect the course of almost every major category of disease, including cardiovascular, gastrointestinal, neoplastic, neurological, and pulmonary conditions.

Severe Anxiety

Extended periods of severe repressed anxiety can result in psychoneurotic behavior patterns. **Neurosis** is no longer considered a separate category of mental disorder. However, the term is still used in the literature to describe the symptomatology of specific disorders and to differentiate from behaviors that occur at the more serious level of *psychosis*. Neuroses are psychiatric disturbances characterized by excessive anxiety that is expressed directly or altered through defense mechanisms. It appears as a symptom such as an obsession, compulsion, phobia, or sexual dysfunction (Sadock, Sadock, & Ruiz, 2015).

The following are common characteristics of people with neuroses:

- They are aware that they are experiencing distress.
- They are aware that their behaviors are maladaptive.
- They are unaware of any possible psychological causes of the distress.
- They feel helpless to change their situation.
- They experience no loss of contact with reality.

The following disorders are examples of psychoneurotic responses to anxiety as they appear in the *DSM-5:*

- **Anxiety disorders:** Disorders in which the characteristic features are symptoms of anxiety and avoidance behavior (e.g., phobias, panic disorder, generalized anxiety disorder, and separation anxiety disorder).
- **Somatic symptom disorders:** Disorders in which the characteristic features are physical symptoms for which there is no evident organic pathology. Psychological factors are judged to play a significant role in the onset, severity, exacerbation, or maintenance of the symptoms (e.g., somatic symptom disorder, illness anxiety disorder, conversion disorder, and factitious disorder).
- **Dissociative disorders:** Disorders in which the characteristic feature is a disruption in the usually integrated functions of consciousness, memory, identity,

TABLE 2–2 Ego Defense Mechanisms

DEFENSE MECHANISM	EXAMPLE	DEFENSE MECHANISM	EXAMPLE
COMPENSATION Covering up a real or perceived weakness by emphasizing a trait one considers more desirable	A physically disabled boy is unable to participate in football, so he compensates by becoming a great scholar.	**RATIONALIZATION** Attempting to make excuses or formulate logical reasons to justify unacceptable feelings or behaviors	A patient tells the rehab nurse, "I drink because it's the only way I can deal with my bad marriage and my worse job."
DENIAL Refusing to acknowledge the existence of a real situation or the feelings associated with it	A woman drinks alcohol every day and cannot stop, failing to acknowledge that she has a problem.	**REACTION FORMATION** Preventing unacceptable or undesirable thoughts or behaviors from being expressed by exaggerating opposite thoughts or types of behaviors	A student hates nursing and only attended nursing school to please her parents. During career day, she speaks to prospective students about the excellence of nursing as a career.
DISPLACEMENT The transfer of feelings from one target to another that is considered less threatening or that is neutral	A patient is angry with his physician, does not express it, but becomes verbally abusive with the nurse.	**REGRESSION** Retreating in response to stress to an earlier level of development and the comfort measures associated with that level of functioning	When a 2-year-old is hospitalized for tonsillitis, he will drink only from a bottle, even though his mother states he has been drinking from a cup for 6 months.
IDENTIFICATION An attempt to increase self-worth by acquiring certain attributes and characteristics of an individual one admires	A teenager who required lengthy rehabilitation after an accident decides to become a physical therapist as a result of his experiences.	**REPRESSION** Involuntarily blocking unpleasant feelings and experiences from one's awareness	A trauma victim is unable to remember anything about the traumatic event.
INTELLECTUALIZATION An attempt to avoid expressing actual emotions associated with a stressful situation by using the intellectual processes of logic, reasoning, and analysis	A woman's husband is being transferred with his job to a city far away from her parents. She hides anxiety by explaining to her parents the advantages associated with the move.	**SUBLIMATION** Rechanneling of drives or impulses that are personally or socially unacceptable into activities that are constructive	A mother whose son was killed by a drunk driver channels her anger and energy into being the president of the local chapter of Mothers Against Drunk Driving.
INTROJECTION Integrating the beliefs and values of another individual into one's own ego structure	Children integrate their parents' value system into the process of conscience formation. A child says to a friend, "Don't cheat. It's wrong."	**SUPPRESSION** The voluntary blocking of unpleasant feelings and experiences from one's awareness	"I don't want to think about that now. I'll think about that tomorrow."
ISOLATION Separating a thought or memory from the feeling, tone, or emotion associated with it	A young woman describes being attacked and raped without showing any emotion.	**UNDOING** Symbolically negating or canceling out an experience that one finds intolerable	A man is nervous about his new job and yells at his wife. On his way home he stops and buys her some flowers.
PROJECTION Attributing feelings or impulses unacceptable to one's self to another person	A man who is addicted to alcohol blames his wife for his excessive drinking.		

or perception of the environment (e.g., dissociative amnesia, dissociative identity disorder, and depersonalization-derealization disorder).

Panic Anxiety

At this extreme level of anxiety, an individual is not capable of processing what is happening in the environment and may lose contact with reality. **Psychosis** is defined as a significant thought disturbance in which reality testing is impaired, resulting in delusions, hallucinations, disorganized speech, or catatonic behavior. The following are common characteristics of people with psychoses:

- They exhibit minimal distress (emotional tone is flat, bland, or inappropriate).
- They are unaware that their behavior is maladaptive.
- They are unaware of any psychological problems (**anosognosia**).
- They are exhibiting a flight from reality into a less stressful world or one in which they are attempting to adapt.

Examples of psychotic responses to anxiety include schizophrenic, schizoaffective, and delusional disorders.

CORE CONCEPT

Grief

Grief is a subjective feeling of sorrow and sadness accompanied by emotional, physical, and social responses to the loss of a loved person or thing.

Grief

Most individuals experience intense emotional anguish in response to a significant personal loss. A loss is anything that is perceived as such by the individual. Losses may be real, in which case they can be substantiated by others (e.g., death of a loved one, loss of personal possessions), or they may be perceived by the individual alone, unable to be shared or identified by others (e.g., loss of the feeling of femininity following mastectomy). Any situation that creates change for an individual can be identified as a loss. Failure (either real or perceived) also can be viewed as a loss.

The loss or anticipated loss of anything of value to an individual can trigger the grief response. This period of characteristic emotions and behaviors is called *mourning*. The "normal" mourning process is adaptive and is characterized by feelings of sadness, guilt, anger, helplessness, hopelessness, and despair. Indeed, the absence of mourning after a loss may be considered maladaptive.

Stages of Grief

Kübler-Ross (1969), during extensive research with terminally ill patients, identified five stages of feelings and behaviors that individuals experience in response to a real, perceived, or anticipated loss:

Stage 1—Denial: This is a stage of shock and disbelief. The response may be one of "No, it can't be true!" The reality of the loss is not acknowledged. Denial is a protective mechanism that allows the individual to cope in an immediate time frame while organizing more effective defense strategies.

Stage 2—Anger: "Why me?" and "It's not fair!" are comments often expressed during the anger stage. Envy and resentment toward individuals not affected by the loss are common. Anger may be directed at the self or displaced on loved ones, caregivers, and even God. There may be a preoccupation with an idealized image of the lost entity.

Stage 3—Bargaining: During this stage, which is usually not visible or evident to others, a "bargain" is made with God in an attempt to reverse or postpone the loss: "If God will help me through this, I promise I will go to church every Sunday and volunteer my time to help others." Sometimes the promise is associated with feelings of guilt for not having performed satisfactorily, appropriately, or sufficiently.

Stage 4—Depression: During this stage, the full impact of the loss is experienced. The sense of loss is intense, and feelings of sadness and depression prevail. This is a time of quiet desperation and disengagement from all association with the lost entity. It differs from *pathological* depression, which occurs when an individual becomes fixed in an earlier stage of the grief process. Rather, stage 4 of the grief response represents advancement toward resolution.

Stage 5—Acceptance: The final stage brings a feeling of peace regarding the loss that has occurred. It is a time of quiet expectation and resignation. The focus is on the reality of the loss and its meaning for the individuals affected by it.

Not all individuals experience each of these stages in response to a loss, nor do they necessarily experience them in this order. Some individuals' grieving behaviors may fluctuate and even overlap between stages.

Anticipatory Grief

When a loss is anticipated, individuals often begin the work of grieving before the actual loss occurs. Most

people reexperience the grieving behaviors once the loss occurs, but preparing for the loss in advance can facilitate the process of mourning, actually decreasing the length and intensity of the response. Problems arise, particularly in anticipating the death of a loved one, when family members experience **anticipatory grieving** and complete the mourning process prematurely. They disengage emotionally from the dying person, who may then experience feelings of rejection by loved ones at a time when this psychological support is so necessary.

Resolution

The grief response can last from weeks to years. It cannot be hurried, and individuals must be allowed to progress at their own pace. In the loss of a loved one, grief work usually lasts for at least a year, during which the grieving person experiences each significant anniversary or holiday for the first time without the loved one present.

Many factors may prolong the length of the grief process. If the relationship with the lost entity was marked by ambivalence or if there had been an enduring love–hate association, reaction to the loss may be burdened with guilt. Guilt lengthens the grief reaction by promoting feelings of anger toward oneself for having committed a wrong against or behaved in an unacceptable manner toward a lost loved one. He or she may even feel that the negative behavior contributed to the loss.

Anticipatory grieving may shorten the grief response in individuals who are able to work through some of the feelings before the loss occurs. If the loss is sudden and unexpected, mourning may take longer than it would if individuals were able to grieve in anticipation of the loss.

Length of the grieving process is also affected by the number of recent losses experienced by an individual and whether he or she is able to complete one grieving process before another loss occurs. This is particularly true for elderly individuals who may experience numerous losses in a span of a few years, including spouse, friends, other relatives, independent functioning, home, personal possessions, and pets. Grief accumulates into a **bereavement overload,** which for some individuals is perceived as difficult or even impossible to overcome.

The process of mourning may be considered resolved when an individual is able to regain a sense of organization, redefine his or her life in the absence of the lost person or object, and pursue new interests and relationships. Disorganization and emotional pain have been experienced and tolerated. The individual is able to remember and accept both the positive and negative aspects associated with the lost entity. Preoccupation with the lost entity has been replaced with a renewed energy and new resolve about ways to keep the memory of the lost one alive. Most grief, however, does not permanently disappear but will reemerge from time to time in response to triggers such as anniversary dates (Sadock et al., 2015).

Maladaptive Grief Responses

Maladaptive responses to loss occur when an individual is not able to satisfactorily progress through the stages of grieving to achieve resolution. These responses usually occur when an individual becomes fixed in the denial or anger stage of the grief process. Several types of grief responses have been identified as pathological, including those that are prolonged, delayed, inhibited, or distorted. The *prolonged* response is characterized by an intense preoccupation with memories of the lost entity for many years after the loss has occurred. Behaviors associated with the stages of denial or anger are manifested, and disorganization of functioning and intense emotional pain related to the lost entity are evidenced.

In the *delayed* or *inhibited* response, the individual becomes fixed in the denial stage of the grieving process. The emotional pain associated with the loss is not experienced, but anxiety disorders (e.g., phobias, somatic symptom disorders) or sleeping and eating disorders (e.g., insomnia, anorexia) may be evident. The individual may remain in denial for many years until the grief response is triggered by a reminder of the loss or even by an unrelated loss.

The individual who experiences a *distorted* response is fixed in the anger stage of grieving. In the distorted response, all the normal behaviors associated with grieving, such as helplessness, hopelessness, sadness, anger, and guilt, are exaggerated out of proportion to the situation. The individual turns the anger inward on the self, is consumed with overwhelming despair, and is unable to function in normal activities of daily living. Distorted grief reactions may culminate in pathological depression.

Mental Health/Mental Illness Continuum

Anxiety and grief have been described as two primary responses to stress. In Figure 2–3, both of these responses are presented on a continuum according to the degree of symptom severity. Disorders as they appear in the *DSM-5* are identified at their appropriate placement along the continuum.

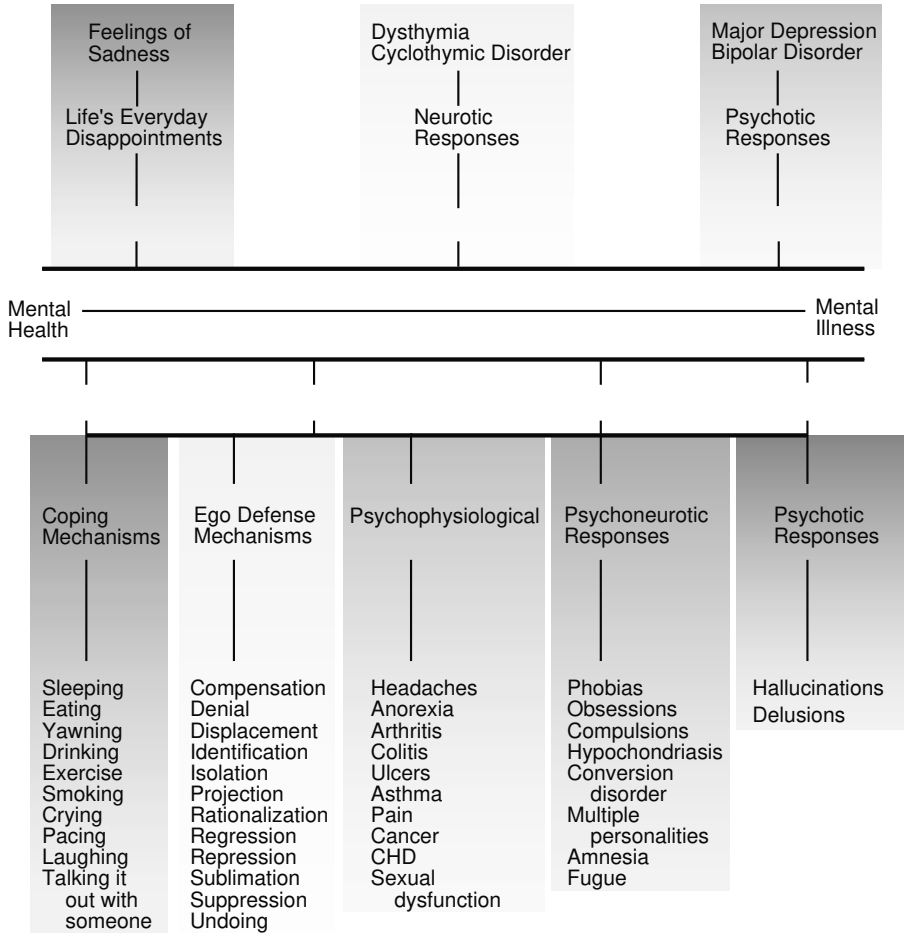

FIGURE 2–3 Conceptualization of anxiety and grief responses along the mental health/mental illness continuum.

Summary and Key Points

- Psychiatric care has its roots in ancient times when etiology was based in superstition and ideas related to the supernatural.
- Treatments were often inhumane and included brutal beatings, starvation, or torture.
- Hippocrates associated insanity and mental illness with an irregularity in the interaction of the four body fluids (humors): blood, black bile, yellow bile, and phlegm.
- Conditions for care of the mentally ill have improved, largely because of the influence of leaders such as Benjamin Rush, Dorothea Dix, and Linda Richards, whose endeavors provided a model for more humanistic treatment.
- Maslow identified a hierarchy of needs that individuals seek to fulfill in their quest to self-actualization (one's highest potential).
- For purposes of this text, the definition of *mental health* is "the successful adaptation to stressors from the internal or external environment, evidenced by thoughts, feelings, and behaviors that are age-appropriate and congruent with local and cultural norms."
- Most cultures label behavior as mental illness on the basis of incomprehensibility and cultural relativity.
- When observers are unable to find meaning or comprehensibility in behavior, they are likely to label that behavior as mental illness. The meaning of behaviors is determined within individual cultures. For purposes of this text, *mental illness* is defined as "maladaptive responses to stressors from the internal or external environment, evidenced by thoughts, feelings, and behaviors that are incongruent with the local and cultural norms, and that interfere with the individual's social, occupational, and/or physical functioning."
- Anxiety and grief have been described as two primary psychological response patterns to stress.
- Peplau defined anxiety by levels of symptom severity: mild, moderate, severe, and panic.
- Behaviors associated with levels of anxiety include coping mechanisms, ego defense mechanisms, psychophysiological responses, psychoneurotic responses, and psychotic responses.

- Grief is described as a response to the loss of a valued entity. A loss is anything that is perceived as such by the individual.
- Kübler-Ross, during extensive research with terminally ill patients, identified five stages of feelings and behaviors that individuals experience in response to a real, perceived, or anticipated loss: denial, anger, bargaining, depression, and acceptance.
- Anticipatory grief is grief work that begins and sometimes ends before the loss occurs.
- Resolution is thought to occur when an individual is able to remember and accept both the positive and negative aspects associated with the lost entity.
- Grieving is thought to be maladaptive when the mourning process is prolonged, delayed, or inhibited, or becomes distorted and exaggerated out of proportion to the situation.
- Distorted grief reactions may contribute to the development of pathological depression.

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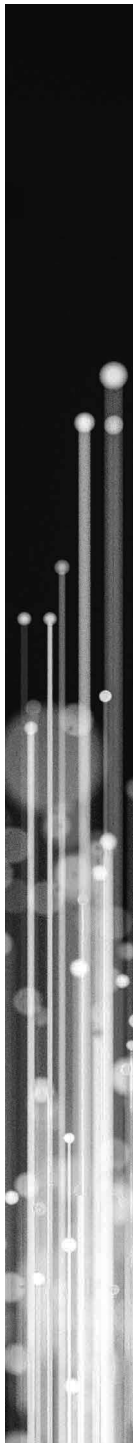
Review Questions



1. Three years ago, Anna's dog, Lucky, her pet for 16 years, was killed by a car. Since that time, Anna has lost weight, rarely leaves her home, and talks excessively about Lucky. Anna's behavior would be considered maladaptive for which of the following reasons?
   a. It has been more than 3 years since Lucky died.
   b. Her grief is too intense over the loss of a dog.
   c. Her grief is interfering with her functioning.
   d. Cultural norms typically do not comprehend grief over the loss of a pet.
2. Anna states that Lucky was her closest friend, and since his death, no one can ever replace the relationship they had. According to Maslow's hierarchy of needs, which level of need is not being met?
   a. Physiological needs
   b. Self-esteem needs
   c. Safety and security needs
   d. Love and belonging needs
3. Anna's daughter notices that Anna appears to be listening to another voice when just the two of them are in a room together. When questioned, Anna admits that she hears someone telling her that she was a horrible caretaker for Lucky and did not deserve to ever have a pet. Which of the following best describes what Anna is experiencing?
   a. Neurosis
   b. Psychosis
   c. Depression
   d. Bereavement
4. Anna, who is 72 years old, is at the age when she may have experienced several losses in a short time. What is this called?
   a. Bereavement overload
   b. Normal mourning
   c. Isolation
   d. Cultural relativity
5. Anna has been grieving the death of Lucky for 3 years. She is unable to take care of her normal activities because she insists on visiting Lucky's grave daily. What is the most likely reason that Anna's daughter has put off seeking help for Anna?
   a. Women are less likely than men to seek help for emotional problems.
   b. Relatives often try to normalize behavior rather than label it mental illness.
   c. She knows that all older people are expected to be a little depressed.
   d. She is afraid that the neighbors will think her mother is "crazy."

6. Lucky's accident occurred when he got away from Anna while they were taking a walk. He ran into the street and was hit by a car. Anna cannot remember the circumstances of his death. This is an example of what defense mechanism?
   a. Rationalization
   b. Suppression
   c. Denial
   d. Repression

Clinical Judgment Questions

7. A client with a history of schizophrenia is brought to the emergency department by police who report that she was knocking down food displays at a grocery store and yelling that the food is all poisoned. The client reports to the nurse the she has no idea why she was brought to the emergency department because "there is nothing wrong with me." Which of these actions by the nurse demonstrates good clinical judgment?
   a. Instruct the police officer that this client should be incarcerated because there is nothing that can be done in an emergency department.
   b. Document that the client is manifesting suspicious ideation and anosognosia.
   c. Ask the doctor to order gastric lavage because the client reports having been poisoned.
   d. Instruct the client that the food is not poisoned and there is something very wrong with her.
8. During a primary care physician appointment, a client who has been a widow for 7 years reports to the nurse that she does not want to wake up in the morning and feels there is nothing left for her. Which of these actions by the nurse is a priority?
   a. Listen empathically and encourage the client to find some activities to increase socialization.
   b. Encourage the client to discuss this with her physician.
   c. Assess the client for symptoms of depression and suicide risk.
   d. Instruct the client that grief takes a long time to resolve but that she will be feeling better soon.
9. A client who has arrived at the health clinic for diabetic education is perspiring, wringing his hands, and states, "I'm so anxious about giving myself shots I can hardly breathe. I don't know what to do." Which of these actions by the nurse demonstrates good clinical judgment?
   a. Assist the client in relaxation exercises before commencing diabetes education.
   b. Instruct the client that it is not hard to give oneself a shot and commence teaching.
   c. Assess the client further for symptoms of anxiety.
   d. Cancel diabetic education and encourage the client to reschedule when he feels less anxious.
10. A client who was admitted to the psychiatric unit for major depressive disorder reports to the nurse, "Ever since my daughter died by suicide 10 years ago, I can't stand to be around my friends. They just don't get it!" Which of these actions by the nurse demonstrates good clinical judgment?
    a. Affirm that other people cannot possibly provide adequate support in circumstances like these.
    b. Assist the client to explore the connection between grief and anger.
    c. Tell the client that her friends are doing the best they can and she should try to accept their support.
    d. Ask the client to describe how her daughter killed herself.

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UNIT 2

Foundations for Psychiatric-Mental Health Nursing

3 Concepts of Psychobiology

CORE CONCEPTS
Genetics
Neuroendocrinology
Psychobiology
Psychoneuroimmunology
Psychopharmacology

CHAPTER OUTLINE

KEY TERMS

axon
cell body
circadian rhythms
dendrites
genotype
limbic system
neuron
neurotransmitter
phenotype
receptor sites
synapse

OBJECTIVES

After reading this chapter, the student will be able to:

1. Identify gross anatomical structures of the brain and describe their functions.
2. Discuss the physiology of neurotransmission in the central nervous system.
3. Describe the role of neurotransmitters in human behavior.
4. Discuss the association of endocrine functioning to the development of psychiatric disorders.
5. Describe the role of genetics in the development of psychiatric disorders.
6. Discuss the correlation of altered brain function to various psychiatric disorders.
7. Identify diagnostic procedures used to detect alteration in biological functioning that may contribute to psychiatric disorders.
8. Discuss the influence of psychological factors on the immune system.
9. Describe the biological mechanisms of psychoactive drugs at neural synapses.
10. Recognize theorized influences in the development of psychiatric disorders, including brain physiology, genetics, endocrine function, immune system, and psychosocial and environmental factors.
11. Discuss the implications of psychobiological concepts for the practice of psychiatric-mental health nursing.

HOMEWORK ASSIGNMENT

Please read the chapter and answer the following questions:

1. A dramatic reduction in which neurotransmitter is most closely associated with Alzheimer's disease?
2. Anorexia nervosa has been associated with a primary dysfunction of which structure of the brain?
3. Many psychotropic medications work by blocking the reuptake of neurotransmitters. Describe the process of *reuptake.*
4. Which psychiatric disorder may be linked to chronic hypothyroidism?

In recent years, increased emphasis has been placed on the organic basis for psychiatric illness. This "neuroscientific revolution" studies the biological basis of behavior, and several mental illnesses are now considered physical disorders resulting from malfunctions or malformations of the brain. That some psychiatric illnesses and associated behaviors can be traced to biological factors does not imply that psychosocial and sociocultural influences are completely discounted. For example, there is evidence that *psychological* interventions influence brain activity in a way similar to that of psychopharmacological intervention (Collerton, 2013; Flor, 2014; Mason, 2017). Other evidence indicates that lifestyle choices, such as marijuana use, can precipitate mental illness (psychosis) in individuals with genetic vulnerability (National Institutes of Health, 2018). Ongoing research will build a better understanding of the complex interplay of neural activities within the brain and interaction with one's environment.

The systems of biology, psychology, and sociology are not mutually exclusive—they are interacting systems. This interaction is clearly indicated by the fact that individuals experience biological changes in response to environmental events. One or several of these systems may at various times explain behavioral phenomena.

This chapter focuses on the role of neurophysiological, neurochemical, genetic, and endocrine influences on psychiatric illness. An introduction to psychopharmacology is included (discussed in more detail in Chapter 4, "Psychopharmacology"), and various diagnostic procedures used to detect alteration in biological function that may contribute to psychiatric illness are identified. The implications for psychiatric-mental health nursing are discussed.

CORE CONCEPT

Psychobiology

The study of the biological foundations of cognitive, emotional, and behavioral processes.

The Nervous System: An Anatomical Review

The Brain

The brain has three major divisions, subdivided into six major parts:

1. Forebrain
   a. Cerebrum
   b. Diencephalon
2. Midbrain (Mesencephalon)
3. Hindbrain
   a. Pons
   b. Medulla
   c. Cerebellum

Each of these structures is discussed individually. A summary is presented in Table 3–1.

Cerebrum

The cerebrum consists of a right and left hemisphere and constitutes the largest part of the human brain. The two hemispheres are separated by a deep groove but remain connected to each other by a band of 200 million axons (nerve fibers) called the *corpus*

TABLE 3–1 Structure and Function of the Brain

STRUCTURE	PRIMARY FUNCTION
I. FOREBRAIN	
A. Cerebrum	Composed of two hemispheres connected by a band of nerve tissue that houses a band of 200 million axons called the *corpus callosum.* The outer layer is called the *cerebral cortex.* It is extensively folded and consists of billions of neurons. The left hemisphere appears to deal with logic and solving problems. The right hemisphere may be called the "creative" brain and is associated with affect, behavior, and spatial-perceptual functions. Each hemisphere is divided into four lobes.
1. Frontal lobes	Voluntary body movement, including movements that permit speaking, thinking and judgment formation, and expression of feelings
2. Parietal lobes	Perception and interpretation of most sensory information (including touch, pain, taste, and body position)
3. Temporal lobes	Hearing, short-term memory, and sense of smell; expression of emotions through connection with limbic system
4. Occipital lobes	Visual reception and interpretation

Continued

TABLE 3–1 Structure and Function of the Brain—cont'd

STRUCTURE	PRIMARY FUNCTION
B. Diencephalon	Connects cerebrum with lower brain structures
1. Thalamus	Integrates all sensory input (except smell) on way to cortex; some involvement with emotions and mood
2. Hypothalamus	Regulates anterior and posterior lobes of pituitary gland; exerts control over actions of the autonomic nervous system; regulates appetite and temperature; regulates visceral responses to emotional situations and body rhythms such as mood changes and sleep–wakefulness cycles
3. Limbic system*	
II. MIDBRAIN (Mesencephalon)	Responsible for visual, auditory, and balance ("righting") reflexes
III. HINDBRAIN	
A. Pons	Regulation of respiration and skeletal muscle tone; ascending and descending tracts connect brainstem with cerebellum and cortex
B. Medulla	Pathway for all ascending and descending fiber tracts; contains vital centers that regulate heart rate, blood pressure, and respiration; reflex centers for swallowing, sneezing, coughing, and vomiting
C. Cerebellum	Regulates muscle tone and coordination and maintains posture and equilibrium

*The limbic system consists of medially placed cortical and subcortical structures and the fiber tracts connecting them with one another and with the hypothalamus. It is sometimes called the "emotional brain"—associated with feelings of fear and anxiety; anger and aggression; love, joy, and hope; and with sexuality and social behavior. As research has advanced our understanding of the connectivity in brain structures, it has become difficult to define the boundaries of the limbic system.

callosum. Because each hemisphere controls different functions, information is processed through the corpus callosum so that each hemisphere is aware of the activity of the other.

The surface of the cerebrum consists of gray matter and is called the *cerebral cortex*. The gray matter is composed of neuron cell bodies that appear gray to the eye. These cell bodies are thought to be the actual "thinking" structures of the brain. The *basal ganglia,* four subcortical nuclei of gray matter (the striatum, the pallidum, the substantia nigra, and the subthalamic nucleus), are found deep within the cerebral hemispheres. They are responsible for certain subconscious aspects of voluntary movements, such as swinging the arms when walking, gesturing while speaking, and regulating muscle tone (Scanlon & Sanders, 2018).

The cerebral cortex is identified by numerous folds called *gyri* and deep grooves between the folds called *sulci*. This extensive folding extends the surface area of the cerebral cortex to permit the presence of millions more neurons than could be accommodated without the folds (as is the case in the brains of some animals, such as dogs and cats). Each hemisphere of the cerebral cortex is divided into the frontal lobe, parietal lobe, temporal lobe, and occipital lobe. These lobes, which are named for the overlying bones in the cranium, are identified in Figure 3–1.

The Frontal Lobes

Voluntary body movement is controlled by impulses through the frontal lobes. The right frontal lobe controls motor activity on the left side of the body, and the left frontal lobe controls motor activity on the right side of the body. The frontal lobe may also play a role in emotional experiences, as evidenced by changes in mood and character after damage to this area. The prefrontal cortex (the front part of the frontal lobe) plays an essential role in the regulation and adaptation of our emotions to new situations and may have implications for moral and spiritual responses (Sadock, Sadock, & Ruiz, 2015). Neuroimaging tests suggest there may be decreased activity in the frontal lobes (as well as temporal, parietal, and subcortical structures) in people with chronic schizophrenia (Lyall, Kubicki, & Shenton, 2017).

The Parietal Lobes

The parietal lobes manage somatosensory input, including touch, pain, pressure, taste, temperature, perception of joint and body position, and visceral sensations. The parietal lobes also contain association fibers linked to the primary sensory areas through which interpretation of sensory-perceptual information is made. Language interpretation is associated with the left hemisphere of the parietal lobe.

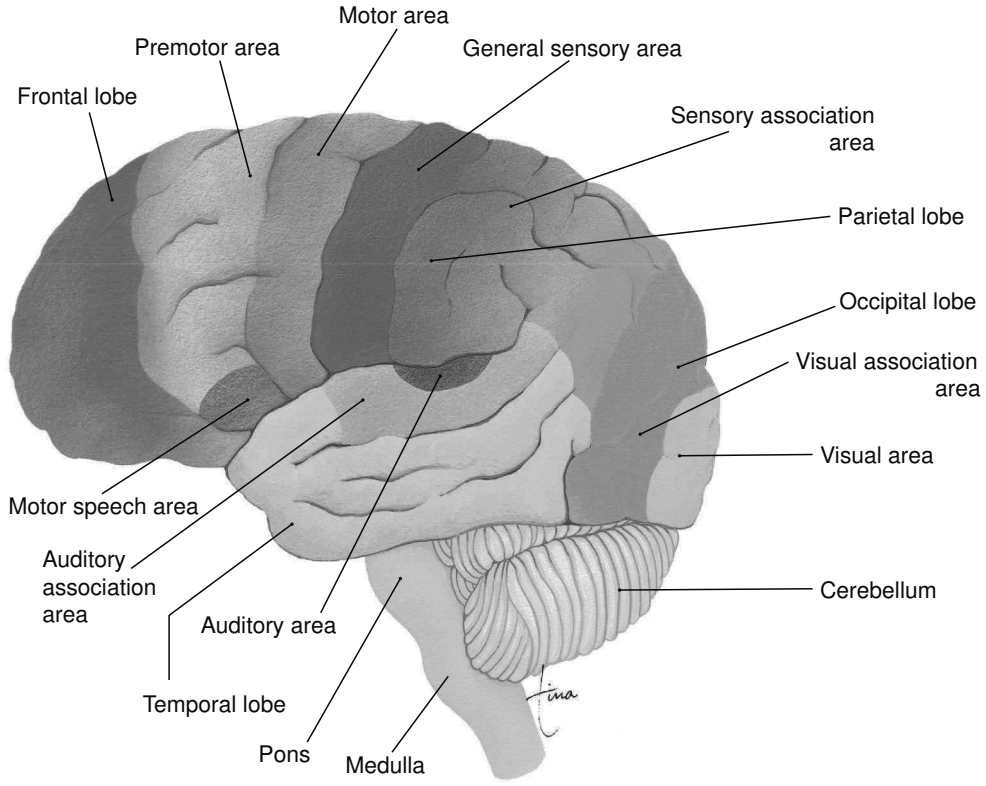

FIGURE 3–1 Left cerebral hemisphere showing some of the functional areas that have been mapped. (From Scanlon, V.C., & Sanders, T. [2018]. *Essentials of anatomy and physiology* [8th ed.]. Philadelphia: F.A. Davis Company, with permission.)

The Temporal Lobes

The upper anterior temporal lobe is concerned with auditory functions, and the lower part is dedicated to short-term memory. The sense of smell has a connection to the temporal lobes, as the impulses carried by the olfactory nerves end in this area of the brain. The temporal lobes also play a role in the expression of emotions through an interconnection with the limbic system. The left temporal lobe (along with the left parietal lobe) is involved in language interpretation.

The Occipital Lobes

The occipital lobes are the primary area of visual reception and interpretation. Visual perception, the ability to judge spatial relationships such as distance and to see in three dimensions, is also processed in this area. Language interpretation is affected by the visual processing that occurs in the occipital lobes.

Diencephalon

The second part of the forebrain is the diencephalon, which connects the cerebrum with lower structures of the brain. The major components of the diencephalon include the thalamus and the hypothalamus, which are part of a neuroanatomical loop of structures known as the **limbic system** (sometimes called the emotional brain because these structures are associated with regulation of emotions). Commonly associated structures are identified in Figure 3–2.

Thalamus

The thalamus integrates all sensory input (except smell) on its way to the cortex. This integration allows for rapid interpretation of the whole rather than individual perception of each sensation. The thalamus is also involved in temporarily blocking minor sensations so that an individual can concentrate on one important event when necessary. For example, an individual who is studying for an examination may be unaware of the clock ticking in the room or another person entering because the thalamus has temporarily blocked these incoming sensations from the cortex. The impact of dopamine in the thalamus is associated with several neuropsychiatric disorders.

Hypothalamus

The hypothalamus is located just below the thalamus and just above the pituitary gland and has the following diverse functions:

1. **Regulation of the pituitary gland:** The pituitary gland consists of two lobes—the posterior lobe and the anterior lobe.
   a. The *posterior lobe* of the pituitary gland is actually extended tissue from the hypothalamus. The

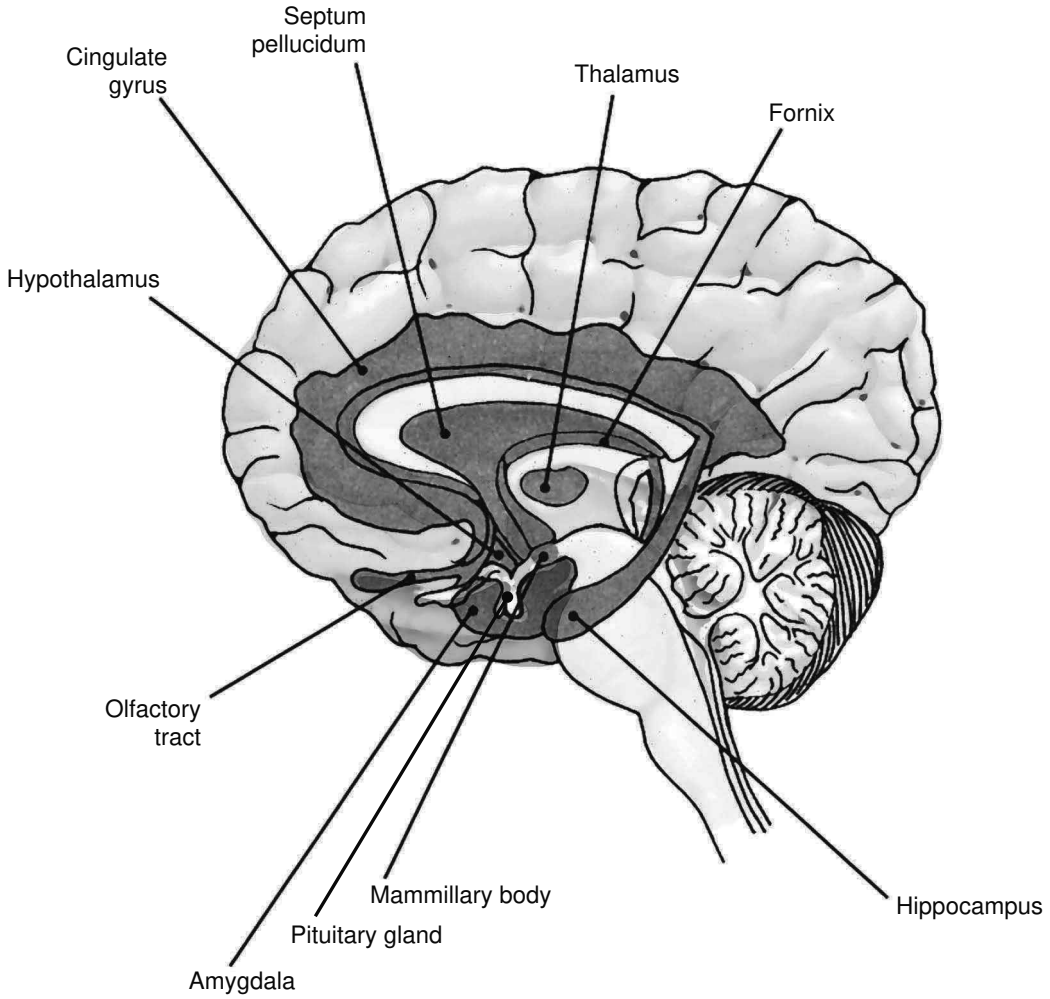

FIGURE 3–2 Structures of the limbic system. (From Scanlon, V.C., & Sanders, T. [2011]. *Essentials of anatomy and physiology* [6th ed.]. Philadelphia: F.A. Davis Company, with permission.)

posterior lobe stores antidiuretic hormone (ADH), which helps to maintain blood pressure through regulation of water retention, and oxytocin, the hormone responsible for stimulation of the uterus during labor and the release of milk (along with prolactin) from the mammary glands. Both ADH and oxytocin are produced in the hypothalamus. When the hypothalamus detects the body's need for these hormones, it sends nerve impulses to the posterior pituitary for their release.

b. The *anterior lobe* of the pituitary gland consists of glandular tissue that produces several hormones used by the body. These hormones are regulated by *releasing factors* from the hypothalamus. When the hormones are required by the body, the releasing factors stimulate the release of the hormone from the anterior pituitary, and the hormone in turn stimulates its target organ to carry out its specific functions.

2. **Direct neural control over the actions of the autonomic nervous system:** The hypothalamus regulates the appropriate visceral responses during various emotional states. The actions of the autonomic nervous system are described later in this chapter.
3. **Regulation of appetite, temperature, and thirst:** Appetite may be triggered or inhibited depending on which networks in the hypothalamus are stimulated. Temperature is regulated through the hypothalamus as it senses internal and external temperature changes on the skin and in the blood. It then responds by triggering shivering or sweating to help maintain body temperature within the normal range. Thirst centers in the hypothalamus are stimulated by dry mouth or dehydration.
4. **Regulation of blood pressure:** Recent research has clarified the role of the hypothalamus in blood pressure regulation (Carmichael & Wainford, 2015). The hypothalamus, which acts as an interface

between the endocrine and nervous systems, coordinating signal transduction from central and peripheral stimuli, has been identified as a key component in the development of hypertension when activated. A wide variety of functional changes in the hypothalamus are associated with multiple forms of hypertension.

5. **Circadian rhythms (sleep and wakefulness cycles):** The output of the suprachiasmatic nucleus (SNC) of the hypothalamus promotes a state of arousal; as the output decreases, the onset of sleep is facilitated in a complex process that drives the homeostatic need for sleep. This process includes an intrinsic 24-hour timing system and response to light or darkness. SNC neurons along with other peptides also produce gamma-Aminobutyric acid (GABA) (Moore, 2019).

Limbic System

The limbic system is a group of structures typically identified as including the amygdala, mammillary body, olfactory tract, hypothalamus, cingulate gyrus, septum pellucidum, thalamus, hippocampus, and fornix, which, through communication with the hypothalamus, control several autonomic, endocrine, and somatic functions. This system has been called the "emotional brain" because of its association with feelings of fear and anxiety; anger, rage, and aggression; love, joy, and hope; and with sexuality and social behavior. The amygdala seems to be a primary gateway for processing novel and ambiguous emotional stimuli, particularly related to fear, anxiety, and panic. As our knowledge of the complex interconnections within the brain has advanced, it has become more difficult to identify clear boundaries for the limbic system.

Mesencephalon (Midbrain)

Structures of major importance in the mesencephalon, or midbrain, include nuclei and fiber tracts. The mesencephalon extends from the pons to the hypothalamus and is responsible for integration of various reflexes, including visual reflexes (e.g., automatically turning away from a dangerous object when it comes into view), auditory reflexes (e.g., automatically turning toward a sound that is heard), and righting reflexes (e.g., automatically keeping the head upright and maintaining balance).

Pons

The pons is a bulbous structure that lies between the midbrain and the medulla as part of the brainstem (Fig. 3–1). It is composed of large bundles of fibers and forms a major connection between the cerebellum and the brainstem. The pons is a relay station that transmits messages between various parts of the nervous system, including the cerebrum and cerebellum. It contains the central connections of cranial nerves V through VIII and centers for respiration and skeletal muscle tone. The pons is also associated with sleep and dreaming.

Medulla

The medulla is the connecting structure between the spinal cord and the pons, and all of the ascending and descending fiber tracts pass through it. The vital centers are contained in the medulla, and its functions include regulation of heart rate, blood pressure, and respiration. The medulla contains reflex centers for swallowing, sneezing, coughing, and vomiting, as well as nuclei for cranial nerves IX through XII. The medulla, pons, and midbrain form the structure known as the *brainstem.*

Cerebellum

The cerebellum is separated from the brainstem by the fourth ventricle but is connected to it through bundles of fiber tracts (Fig. 3–1). The cerebellum is associated with involuntary aspects of movement such as coordination, muscle tone, and the maintenance of posture and equilibrium.

Nerve Tissue

The tissue of the central nervous system (CNS) consists of nerve cells called *neurons* that generate and transmit electrochemical impulses. The structure of a neuron is composed of a cell body, an axon, and dendrites. The **cell body** contains the nucleus and is essential for the continued life of the neuron. The **dendrites** are processes that transmit impulses toward the cell body, and the **axon** transmits impulses away from the cell body. The axons and dendrites are covered by layers of cells called *neuroglia* that form a coating, or "sheath," of myelin. *Myelin* is a phospholipid that provides insulation against short-circuiting of the neurons during their electrical activity and increases the velocity of the impulse. The white matter of the brain and spinal cord is so called because of the whitish appearance of the myelin sheath covering the axons and dendrites. The gray matter is composed of cell bodies that contain no myelin.

Classes of Neurons

The three classes of neurons are afferent (sensory) neurons, efferent (motor) neurons, and interneurons. The *afferent neurons* carry impulses from receptors in the internal and external periphery to the CNS, where they are then interpreted into various sensations. The *efferent neurons* carry impulses from the CNS to *effectors* in the periphery, such as muscles (that respond by contracting) and glands (that respond by secreting).

Interneurons exist entirely within the CNS, and 99% of all nerve cells belong to this group. They may carry only sensory or motor impulses, or they may serve as integrators in the pathways between afferent and efferent neurons. They account in large part for thinking, feelings, learning, language, and memory.

Synapses

Information is transmitted through the body from one neuron to another. Some messages may be processed through only a few neurons, whereas others may require thousands of neuronal connections. The neurons that transmit the impulses do not actually touch each other. The junction between two neurons is called a **synapse.** The small space between the axon terminals of one neuron and the cell body or dendrites of another is called the *synaptic cleft.* Neurons conducting impulses toward the synapse are called *presynaptic neurons,* and those conducting impulses away are called *postsynaptic neurons.*

Chemicals that act as **neurotransmitters** are stored in the axon terminals of the presynaptic neuron. An electrical impulse through the neuron causes the release of this neurotransmitter into the synaptic cleft. The neurotransmitter then diffuses across the synaptic cleft and combines with **receptor sites** that are situated on the cell membrane of the postsynaptic neuron. The type of combination determines whether or not another electrical impulse is generated. If an electrical impulse is generated, the result is called an *excitatory response,* and the electrical impulse moves on to the next synapse, where the same process recurs. If an electrical impulse is not generated by the neurotransmitter–receptor site combination, the result is called an *inhibitory response,* and synaptic transmission is terminated. Activity at the neural synapse is relevant in the study of psychiatric disorders because excessive or deficient activity of neurotransmitters influences a variety of cognitive and emotional symptoms. The synapse is also believed to be the primary site of activity for psychotropic drugs.

The cell body of the postsynaptic neuron also contains a chemical *inactivator* that is specific to the neurotransmitter released by the presynaptic neuron. When the synaptic transmission has been completed, the chemical inactivator quickly inactivates the neurotransmitter to prevent unwanted, continuous impulses until a new impulse from the presynaptic neuron releases more of the neurotransmitter. Continuous impulses can result in excessive activity of neurotransmitters such as dopamine, which is believed to be responsible for symptoms such as hallucinations and delusions seen in people with schizophrenia. A schematic representation of a synapse is presented in Figure 3–3.

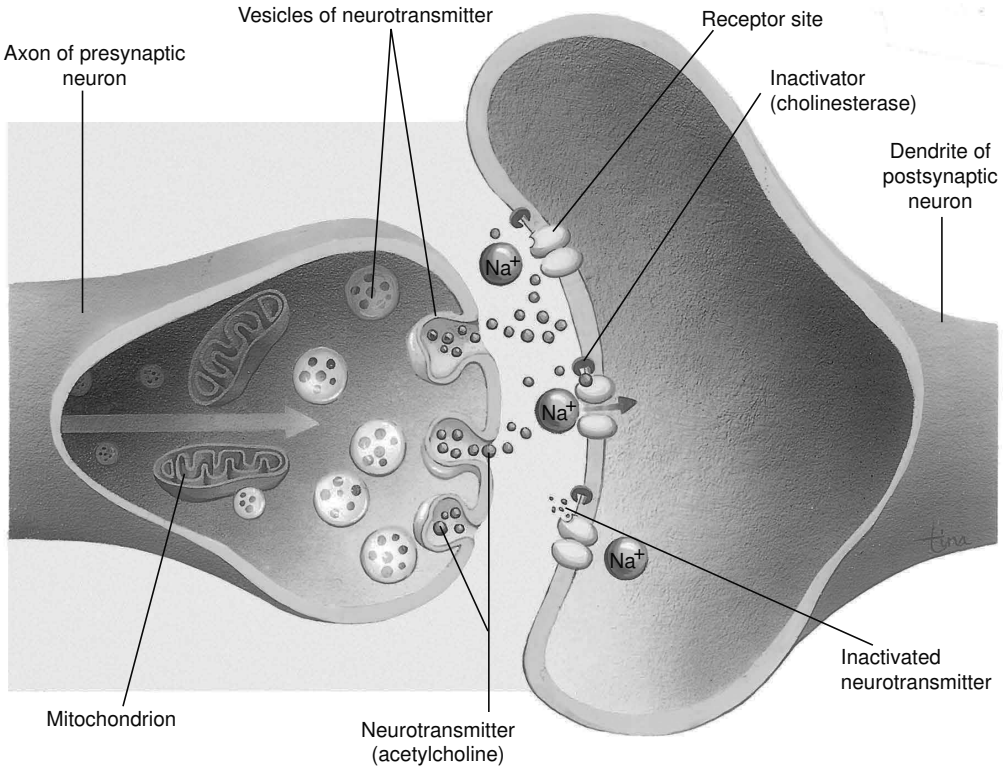

FIGURE 3–3 Impulse transmission at a synapse. The arrow indicates the direction of electrical impulses. (From Scanlon, V.C., & Sanders, T. [2018]. *Essentials of anatomy and physiology* [8th ed.]. Philadelphia: F.A. Davis Company, with permission.)

Autonomic Nervous System

The autonomic nervous system (ANS) is considered part of the peripheral nervous system. Its regulation is modulated by the hypothalamus, and emotions exert a great deal of influence over its functioning. For this reason, the ANS has been implicated in the etiology of a number of psychophysiological disorders.

The ANS has two divisions: the sympathetic and the parasympathetic. The sympathetic division is dominant in stressful situations and prepares the body for the fight-or-flight response (discussed in Chapter 1, "The Concept of Stress Adaptation"). The neuronal cell bodies of the sympathetic division originate in the thoracolumbar region of the spinal cord. Their axons extend to the chains of sympathetic ganglia where they synapse with other neurons that subsequently innervate the visceral effectors, resulting in an increase in heart rate and respiration and a decrease in digestive secretions and peristalsis. Blood is shunted to the vital organs and skeletal muscles to ensure adequate oxygenation.

The neuronal cell bodies of the parasympathetic division originate in the brainstem and the sacral segments of the spinal cord and extend to the parasympathetic ganglia where the synapse occurs either very close to or actually in the visceral organ being innervated. In this way, a localized response is possible. The parasympathetic division dominates when an individual is in a relaxed, nonstressful condition. The heart and respirations are maintained at a normal rate, and secretions and peristalsis increase for normal digestion. Elimination functions are promoted. A schematic representation of the ANS is presented in Figure 3–4.

Neurotransmitters

Although neurotransmitters were described during the explanation of synaptic activity, they are discussed here separately and in detail because of their essential roles in human emotion and behavior. Neurotransmitters are also central to the therapeutic action of many psychotropic medications.

Neurotransmitters are chemicals that convey information across synaptic clefts to neighboring target cells. They are stored in small vesicles in the axon terminals of neurons. When the action potential, or electrical impulse, reaches this point, the neurotransmitters are released from the vesicles. They cross the synaptic cleft and bind with receptor sites on the cell body or dendrites of the adjacent neuron to allow the impulse to continue its course or to prevent the impulse from continuing. After the neurotransmitter has performed its function in the synapse, it either returns to the vesicles to be stored and used again or is inactivated and dissolved by enzymes. The process of being stored for reuse is called *reuptake,* a function that holds significance for understanding the mechanism of action of certain psychotropic medications.

Many neurotransmitters exist in the central and peripheral nervous systems, but only a limited number have implications for psychiatry. Major categories include cholinergic neurotransmitters, monoamines, amino acids, and neuropeptides. Each of these is discussed separately and summarized in Table 3–2.

Cholinergic Neurotransmitters

Acetylcholine

Location: Acetylcholine was the first chemical to be identified as and proven to be a neurotransmitter. It is a major effector chemical in the ANS, producing activity at all sympathetic and parasympathetic presynaptic nerve terminals and all parasympathetic postsynaptic nerve terminals. It is highly significant in the neurotransmission that occurs at the junctions of nerves and muscles. Acetylcholinesterase is the enzyme that destroys acetylcholine or inhibits its activity.

In the CNS, acetylcholine neurons innervate the cerebral cortex, hippocampus, and limbic structures. The pathways are especially dense through the area of the basal ganglia in the brain.

Functions: Functions of acetylcholine are manifold and include sleep, arousal, pain perception, the modulation and coordination of movement, and memory acquisition and retention.

Possible Implications in Mental Illness: Cholinergic mechanisms may have some role in certain disorders of motor behavior and memory, such as Parkinson's disease, Huntington's disease, and Alzheimer's disease.

Monoamines

Norepinephrine

Location: Norepinephrine is the neurotransmitter that produces activity at the sympathetic postsynaptic nerve terminals in the ANS, resulting in fight-or-flight responses in the effector organs. In the CNS, norepinephrine pathways originate in the pons and medulla and innervate the thalamus, dorsal hypothalamus, limbic system, hippocampus, cerebellum, and cerebral cortex. When norepinephrine is not returned for storage in the vesicles of the axon terminals, it is metabolized and inactivated by the enzymes monoamine oxidase (MAO) and catechol-*O*-methyl-transferase (COMT).

Functions: The functions of norepinephrine include the regulation of mood, cognition, perception, locomotion, cardiovascular functioning, and sleep and arousal.

Possible Implications in Mental Illness: The activity of norepinephrine also has been implicated in certain mood disorders such as depression and mania, anxiety states, and schizophrenia (Sadock et al., 2015).

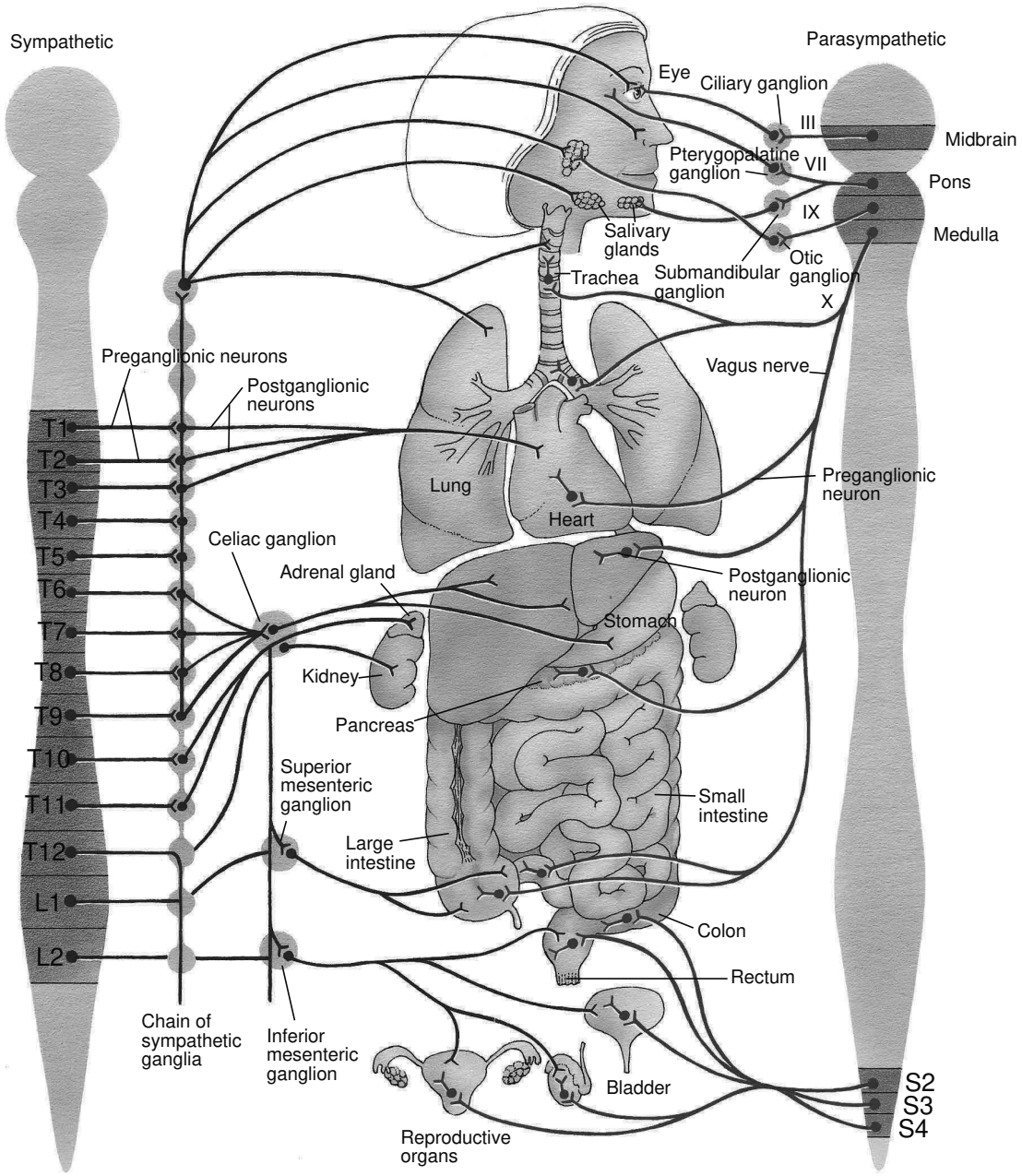

FIGURE 3–4 The autonomic nervous system. The sympathetic division is shown on the left, and the parasympathetic division is shown on the right (both divisions are bilateral). (From Scanlon, V.C., & Sanders, T. [2018]. *Essentials of anatomy and physiology* [8th ed.]. Philadelphia: F.A. Davis Company, with permission.)

Dopamine

Location: Dopamine pathways arise from the midbrain and hypothalamus and terminate in the frontal cortex, limbic system, basal ganglia, and thalamus. As with norepinephrine, the inactivating enzymes for dopamine are MAO and COMT.

Functions: Dopamine functions include regulation of movements and coordination, emotions, and voluntary decision-making ability, and because of its influence on the pituitary gland, it inhibits the release of prolactin (Sadock et al., 2015).

Possible Implications in Mental Illness: Increased levels of dopamine are associated with mania and schizophrenia. Decreased levels of dopamine have been associated with Parkinson's disease and depression. Dopamine may contribute to addictions.

TABLE 3–2 Neurotransmitters in the Central Nervous System

NEUROTRANSMITTER	LOCATION AND FUNCTION	POSSIBLE IMPLICATIONS FOR MENTAL ILLNESS
I. CHOLINERGICS		
A. Acetylcholine	*ANS:* Sympathetic and parasympathetic presynaptic nerve terminals; parasympathetic postsynaptic nerve terminals *CNS:* Cerebral cortex, hippocampus, limbic structures, and basal ganglia *Functions:* Sleep, arousal, pain perception, movement, memory	*Decreased levels:* Alzheimer's disease, *Huntington's* disease, Parkinson's disease *Increased levels:* Depression
II. MONOAMINES		
A. Norepinephrine	*ANS:* Sympathetic postsynaptic nerve terminals *CNS:* Thalamus, hypothalamus, limbic system, hippocampus, cerebellum, cerebral cortex *Functions:* Mood, cognition, perception, locomotion, cardiovascular functioning, and sleep and arousal	*Decreased levels:* Depression *Increased levels:* Mania, anxiety states, schizophrenia
B. Dopamine	Frontal cortex, limbic system, basal ganglia, thalamus, posterior pituitary, spinal cord *Functions:* Movement and coordination, emotions, voluntary judgment, release of prolactin	*Decreased levels:* Parkinson's disease and depression *Increased levels:* Mania and schizophrenia
C. Serotonin	Hypothalamus, thalamus, limbic system, cerebral cortex, cerebellum, spinal cord *Functions:* Sleep and arousal, libido, appetite, mood, aggression, pain perception, coordination, judgment	*Decreased levels:* Depression *Increased levels:* Anxiety states (there are seven different types of serotonin receptors, increased levels of some serotonin subtypes [5HT1A] have an antianxiety effect, and increased levels of others [5HT3] may increase anxiety [Elsworth & Roth, 2017])
D. Histamine	Hypothalamus, hippocampus, cortex, cerebellum, basal ganglia, spinal cord, retina *Functions:* Wakefulness; pain sensation and inflammatory response	*Decreased levels:* Depression *Increased levels:* Sleep disorders, anxiety, Alzheimer's disease, psychosis
III. AMINO ACIDS		
A. Gamma-aminobutyric acid	Hypothalamus *Functions:* Slowing of body activity	*Decreased levels:* Huntington's disease, anxiety disorders, schizophrenia, and various forms of epilepsy
B. Glycine	Spinal cord, brainstem *Functions:* Recurrent inhibition of motor neurons	*Toxic levels:* Glycine encephalopathy *Decreased levels:* Correlated with spastic motor movements
C. Glutamate and aspartate	Pyramidal cells of the cortex, cerebellum, and the primary sensory afferent systems; hippocampus, thalamus, hypothalamus, spinal cord *Functions:* Relay of sensory information and regulation of various motor and spinal reflexes; glutamate also has a role in memory and learning	*Decreased levels:* Schizophrenia *Increased levels:* Huntington's disease, temporal lobe epilepsy, spinal cerebellar degeneration, anxiety disorders, depressive disorders
D. D-Serine	Cerebral cortex, forebrain, hippocampus, cerebellum striatum, thalamus *Functions:* Binds at NMDA receptors and, with glutamate, is a coagonist whose functions include mediating NMDA receptor transmission, synaptic plasticity, neurotoxicity	*Decreased levels:* Schizophrenia

Continued

TABLE 3–2 Neurotransmitters in the Central Nervous System–cont'd

NEUROTRANSMITTER	LOCATION AND FUNCTION	POSSIBLE IMPLICATIONS FOR MENTAL ILLNESS
IV. NEUROPEPTIDES		
A. Endorphins and enkephalins	Hypothalamus, thalamus, limbic structures, midbrain, brainstem; enkephalins are also found in the gastrointestinal tract *Functions:* Modulation of pain and reduced peristalsis (enkephalins)	*Modulation* of dopamine activity by opioid peptides may indicate some link to the symptoms of schizophrenia
B. Substance P	Hypothalamus, limbic structures, midbrain, brainstem, thalamus, basal ganglia, spinal cord; also found in gastrointestinal tract and salivary glands *Function:* Regulation of pain	*Decreased levels:* Huntington's disease, Alzheimer's disease *Increased levels:* Depression
C. Somatostatin	Cerebral cortex, hippocampus, thalamus, basal ganglia, brainstem, spinal cord *Function:* Depending on part of the brain affected, stimulates release of dopamine, serotonin, norepinephrine, and acetylcholine and inhibits release of norepinephrine, histamine, and glutamate; also acts as a neuromodulator for serotonin in the hypothalamus	*Decreased levels:* Alzheimer's disease *Increased levels:* Huntington's disease

ANS, autonomic nervous system; CNS, central nervous system; NMDA, *N*-methyl D-aspartate.

Serotonin

Location: Serotonin pathways originate from cell bodies located in the pons and medulla and project to areas including the hypothalamus, thalamus, limbic system, cerebral cortex, cerebellum, and spinal cord. Serotonin that is not returned to be stored in the axon terminal vesicles is catabolized by the enzyme MAO.

Functions: Serotonin may play a role in sleep and arousal, libido, appetite, mood, aggression, and pain perception. The fact that both too much and too little serotonin have been associated with anxiety has led to the hypothesis that serotonin may modulate intense emotional states rather than influencing one kind of mood disruption. Further, there are seven different subgroups of serotonin receptors, which when activated result in different effects (Elsworth & Roth, 2017).

Possible Implications in Mental Illness: The serotoninergic (or serotonergic) system has been implicated in the etiology of certain psychopathological conditions including anxiety states, mood disorders, and schizophrenia (Sadock et al., 2015).

Histamine

Location: The role of histamine in mediating allergic and inflammatory reactions has been well documented. Its role in the CNS as a neurotransmitter has only recently been confirmed, and the availability of information on this function is limited. The highest concentrations of histamine are found within various regions of the hypothalamus.

Functions: Brain histamine regulates many physiological functions: neuroendocrine, circadian rhythms, the sleep–wake cycle, psychomotor activity, mood, learning, cognition, appetite, and eating behavior (Cacabelos, Torrellas, Fernández-Novoa, & López-Muñoz, 2016). The enzyme that catabolizes histamine is MAO.

Possible Implications in Mental Illness: Alterations in brain histamine are associated with several pathological conditions, such as epilepsy, stroke, anxiety, depression, psychosis, neurodegeneration, and neuroinflammatory processes (Cacabelos et al., 2016).

Amino Acids

Inhibitory Amino Acids

Gamma-Aminobutyric Acid

Location: Gamma-aminobutyric acid (GABA) has a widespread distribution in the CNS, with high concentrations in the hypothalamus, hippocampus, cortex, cerebellum, and basal ganglia of the brain; in the gray matter of the dorsal horn of the spinal cord; and in the retina. GABA is catabolized by the enzyme GABA transaminase.

Functions: Inhibitory neurotransmitters such as GABA prevent postsynaptic excitation, interrupting the progression of the electrical impulse at the synaptic junction. This function is significant when slowdown of body activity is advantageous. Enhancement of the GABA system is the mechanism of action by which the benzodiazepines produce their calming effect.