# Interfacing Biological-Behavioral Concepts into Psychiatric Nursing Practice

Deborah Antai-Otong, MS, RN, CNS, PMHNP, CS, FAAN
Margaret Brackley, PhD, RN, CS

## CHAPTER OUTLINE

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| Major Behavioral Models                       |                                  |
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### History of the Biological-Behavioral Dichotomy

#### Major Neurobiological Models

- The Central Nervous System
- Neurodegenerative Processes
- Neurochemical Processes
- Neuroendocrinology
- Psychoneuroimmunology

#### Genetics

- Twin, Adoption, and Family Studies
- Environmental Factors
- Genetics and Addiction
- Genetic Research

#### Major Behavioral Models

- Clinical and Practice Issues
- Nursing Interventions
- Psychiatric Nursing Education

### The Role of the Nurse

- The Generalist Nurse
- The Advanced-Practice Psychiatric Registered Nurse

### Related Research
Competencies

Upon completion of this chapter, the learner should be able to:

1. Identify major paradigms of mental disorders.
2. List major aspects of the central nervous system and its relationship to mental disorders.
3. Describe the role of genetics in the predisposition of mental disorders.
4. Discuss brain function and its impact on human behavior.
5. Understand the human response to acute and chronic stress.
6. Explain the interrelationships between mind, brain, and hormones.
7. Develop a plan of care using biological and behavioral interventions.

Key Terms

Amygdala: A nucleus in the limbic system or medial temporal lobe that affects neuroendocrine and behavioral functions. It also plays a role in behaviors, including eating, drinking, and sexuality, and the emotions linked to these behaviors. It plays a role in the emotional significance of events or memories and governs the level of hippocampal activity accordingly. Consequently, a traumatic or overwhelming event is permanently etched into the memory, whereas irrelevant events are immediately ignored.

G-proteins: Part of the cell’s second messenger system in the plasma involved in sending signals from regulatory chemicals such as hormones and neurotransmitters to target cells.

Genetic Vulnerability: The relationship between genetic and enzymatic defects and vulnerability to mental illness. Genetic function is influenced by prenatal and environmental factors that activate intricate biochemical processes and affect behavior. A number of researchers have attempted to explore the relationship between genetic factors and mental disorders using twin, adoption, and family studies.

Hippocampus: Located in the medial temporal lobe, it is an important site for the formation and storage of immediate and recent memories, and it is influenced by the amygdala emotional rating of an event. This part of the brain is damaged by Alzheimer's disease.

Hypothalamus: Combined with the pituitary gland, thyroid gland, adrenal glands, gonads, and the pancreas, the hypothalamus forms the major regulatory system and is involved in the biological aspects of behavior. The hypothalamus-pituitary-adrenal axis (HPA) is important in understanding certain mental disorders. The hypothalamus regulates autonomic, endocrine, and visceral integration and is surmised to be the foundation of the limbic system and the brain center for emotions and certain behaviors such as eating, drinking, aggression, and sexuality. Information in the hypothalamus is modulated by ascending sensory pathways, hormones, and descending pathways of the cerebral cortex.

Kindling: The electrophysiological process that over time produces an action potential after repetitive subthreshold stimulation or progressive sensitization of a neuron. This concept is thought to play a role in recurrent mood disorders.

Neuroendocrinology: The study of how the neural and endocrine systems work together to maintain homeostasis. Communication between these systems is involved in biological and behavioral responses. Major organs of the neuroendocrine system are the hypothalamus, the pituitary, thyroid, and adrenal glands; the gonads; and the pancreas.

Protein Kinase C (PKC): A group of enzymes that activate other enzymes.

Psychoneuroimmunology: The study of the role of the immune system in health and illness in the face of biological and psychosocial stress. This field is a developing knowledge about the interconnectedness of the nervous system and the immune system.

Reinforcers: Personal, complex, learned, and biochemical rewards that are used to modify maladaptive behavior. Reinforcers can be positive, negative, or punishing, and are personally determined.

Twin Studies: Researchers attempt to explore the relationship between genetic factors and mental disorders using these studies that usually include monozygotic or single ovum and dizygotic or two ovum twins. Twin studies are helpful in isolating genetic and environmental influences and determining preventive and precipitating factors.
When the U.S. Congress proclaimed the 1990s to be the “Decade of the Brain,” the families of mentally ill clients welcomed this new perspective of mental disorders. In the past, parents and siblings were thought to be responsible for many mental illnesses, during which time clinicians sought to explain these disorders solely in a behavioral context. As a consequence, family members felt demoralized and were blamed for their loved one’s illnesses. Recently, however, neurobiological and genetic research findings have helped clinicians and researchers begin to understand the biological component of mental illness, particularly in terms of brain function and dysfunction, genetics, immunology, and endocrinology. Clients, families, and mental health professionals are hopeful about the potential impact of neurobiological studies on mental illnesses. These studies are also likely to improve quality of life and provide possible cures for serious mental disorders (U.S. Congress, 1989).

Advances in neurobiology and neuroendocrinology reflect the sweeping biotechnological findings of brain mapping, imaging, and scanning. Studies have demonstrated the underlying biological bases of schizophrenia, bipolar disorder and other mood disorders, anxiety disorders, dementia, and the aging process. Likewise, the use of psychopharmacologic agents has produced remarkable results, such as decreased side effects, decreased exacerbation of symptoms, improved quality of life, and increased treatment adherence in clients with severe schizophrenia, bipolar disorder, pervasive developmental disorder, depression, and anxiety disorders.

More importantly, advances in neurobiology and neuroscience offer unprecedented opportunities for the expansion and strengthening of the scientific underpinnings of mental health research. Presently, researchers are using molecular and genetic mechanisms to identify genes and proteins that give rise to mental illness. They are also discovering that they can modify these neurobiological alterations by using psychopharmacologic and environmental interventions. These data provide novel targets for the development of pharmacologic agents and psychotherapies for mental disorders. They also afford clients with a plethora of interventions (Hyman, 1998; NIMH, 1998).

Many symptoms or behaviors observed in people with mental illness are linked to underlying biological factors. Disturbances in mood, cognitions, sensory-perceptual responses, aggression and other impulse control, and social interactions are examples of behaviors that have been linked to biological abnormalities or disruption.

The purpose of this chapter is to explore major concepts of the biological-behavioral interface and its impact on psychiatric nursing practice. The chapter also identifies client outcomes from nursing interventions that meet the complex needs of the mentally ill.

**HISTORY OF THE BIOLOGICAL-BEHAVIORAL DICHOTOMY**

Novel expansion of neurobiological technology emphasizes the need to explain the biological-behavioral phenomena and its relationship to mental illness. The interrelatedness of biology and behavior is not a new concept. It has its beginnings as far back as the fourteenth century stemming from the works of Hippocrates, who explained the concept of mental illness as a process of the brain rather than a spiritual event. He surmised that the brain gave rise to pleasure, joy, sorrow, pain, and grief and contributed to disturbances in affect or mood. Although his early description of the tenuous balance of four humors (blood, phlegm, and yellow and black bile) and their relationship to mood disorders proved inaccurate, his premise that maladaptive behaviors arise from complex biological processes was accurate.

In more recent times, Sigmund Freud contributed to neurobiology in the late 1800s through the phase of his work known as the neurological phase. Freud sought to establish a relationship between neural mechanisms, behavior patterns, and cognitive distortions. Freud and others sought to understand psychopathology in relation to disturbances of specific areas of brain dysfunction. Ultimately, this work has led to the recent plethora of neurobiological research and discoveries.

The search for the ideal treatment for mental illness found a major breakthrough in the discovery of tranquilizers in the 1950s. These agents relieved clients with varied symptoms of mental illness such as intense anxiety, agitation, delusions, and hallucinations. Some of the tranquilizing agents uncovered during this era included the phenothiazines, such as chlorpromazine (Thorazine), the first of the medications that was effective in treating behavioral manifestations of schizophrenia. Other tranquilizers induced major behavioral and biological changes in the mentally ill, thus generating further clues to the biological aspects of mental illness.

Newer psychotropics have emerged since the 1950s that have proven effective in the treatment of various mental disorders, such as schizophrenia and mood, anxiety, and addictive disorders (see Chapter 28, Psychopharmacologic Therapy). Over the past decade the effectiveness of these agents has increased because of improvements made in their ability to target behavioral manifestations of the complex neurobiological processes, such as those located in the hypothalamus and other regions in the limbic system. Psychotropics appear to act on neurochemical mechanisms that modify or alter or interfere with behavioral patterns. Examples include selective serotonergic reuptake blocking agents such as fluoxetine (Prozac) and sertraline (Zoloft), which are used to treat major depression, eating, impulsivity, and anxiety disorders, and atypical neuroleptics such as...
cognitive impairment is strongly associated after left hemi-
particularly among older adults. Researchers also submit that
mental illness or cognitive impairment may be linked to depressive disorders,
processes may arise from underlying general medical con-
cognitive and affective impairment. More importantly, these
Degenerating processes may occur at any age, leading to
illness or vice versa; that is, underlying functional or struc-
tural disorders contributing to mental illness may cause neuro-
transmitter and neuroendocrine abnormalities.

The brain shrinks with age and loses a considerable num-
number of neurons after the fifth decade of life. Despite these
neuronal changes, there is no definitive evidence of mental
or cognitive decline associated with aging. Some researchers
suggest that the brain adapts to aging by preserving an
abundance of nerve cells rich in acetylcholine in nerve-
transmitter pathways between the hippocampus and the
cerebral cortex. These maturational changes are linked with
higher cortical function (e.g., “wisdom”). Deterioration of
these neurons is linked with degenerative processes such as
those found in dementia associated with Alzheimer’s disease
(AD) (Mesulam & Geula, 1991; Pickering-Brown et al., 2002).

Contemporary data suggest that these neurons die more
rapidly than normal neurons and become sensitive to bio-
chemical stress, which often leads to proteins that adhere
together and form damaging clumps called fibrils and free
radicals. Eventually, the concentration of fibrils and free rad-
icals—the cumulative theory—increases and destroys the
cells (Heintz, 2000). Recently, researchers exploring the cause
of neurodegenerative diseases, such as Alzheimer’s disease,
questioned the cumulative death or “one-hit” or single-event
hypothesis and submit that neuronal death occurs ran-
domly. The “one-hit” model or theory suggests that a single
event activates a mutant steady on the neuron that results in
cellular death. Random cell death supposedly arises from
 genetic mutations that alter proteins. These proteins have
not been identified at this time (Clarke et al., 2000).

Other researchers have explained Alzheimer’s disease and
other frontal lobe dementia as a degeneration of cholin-
ergic fibers that arise from the nucleus basalis of structures
innervating the cortex and hippocampus and ultimately
causing neuronal death. Death of cortical neurons in the
hippocampus, cortex, and parietal and temporal lobes inter-
rupts pathways and loss of information storage and retrieval.
Eventually, these structural alterations correlate with cog-
nitive decline and produce classic symptoms of AD. Prominent behavioral changes and symptoms of AD include
executive deficits, language difficulties, and inattentiveness.

Although AD is probably the most well-described neu-
rodegenerative disease, other non-Alzheimer’s forms of
dementia are associated with progressive degenerative
processes of the frontal and temporal lobes. Frontotemporal
dementia (FTD) is characterized by personality and behav-
ioral changes. Major symptoms are similar to AD and
include impaired word comprehension and naming; recog-
nition disorders, including facial and object; progressive
speech difficulties (aphasia), particularly when it affects the
left frontotemporal lobe primarily (Pickering et al., 2002;
Snowden, Neary, & Mann, 1996) (See Chapter 16).

MAJOR NEUROBIOLOGICAL MODELS

To understand the neurobiological models of mental ill-
nesses and their implications for nursing, one must be famil-
lar with the structure and function of the central nervous
system (CNS) and its neurochemical processes. One also
needs some basic knowledge of neuroendocrinology, psy-
choneuroimmunology, and genetics. Each of these models
has widespread implications for behavioral and psycho-
pharmacologic and non-pharmacologic interventions rele-
vant to nursing practice.

The Central Nervous System

The central nervous system acts as the body’s primary infor-
mation processing system, gathering data about the internal
and external environments. It is the most complex of human
systems, governing emotional and behavioral as well as
biological processes. It consists of the brain, the spinal cord,
and the peripheral nervous system. Highly developed net-
works of specialized cells work together to integrate a vari-
ety of stimuli to respond appropriately to internal and
external needs.

Diverse conditions, such as mental illness, trauma, aging,
and degenerative processes, influence brain function.
Abnormalities in neurotransmitter production or absorption,
neuroendocrine response, immunology responses, and
genetic predisposition all appear to contribute to mental dis-
orders. It has not been clearly established whether neuro-
transmitter or neuroendocrine abnormalities cause mental
illness or vice versa; that is, underlying functional or struc-
tural disorders contributing to mental illness may cause neuro-
transmitter and neuroendocrine abnormalities.

Neurodegenerative Processes

Degenerating processes may occur at any age, leading to
cognitive and affective impairment. More importantly, these
processes may arise from underlying general medical con-
ditions or their treatments. For example, many medications
used to treat medical conditions contribute to a depressed
mood. Also, for years health providers have recognized that
cognitive impairment may be linked to depressive disorders,
particularly among older adults. Researchers also submit that
cognitive impairment is strongly associated after left hemi-
spheric stroke and intellectual impairment (Downhill &
Robinson, 1994; Kase et al., 1998). Finally, the link between
mood disturbances, such as depression and adverse out-
comes in heart disease, specifically myocardial infarction,
is well documented and accounts for half of the cases in
those recovering from myocardial infarctions (Glassman &
Shapiro, 1998; Ziegelstein, 2001).

Sporadic AD: The “One Hit” Model

Researchers have proposed a hypothesis that suggests that
the brain adapts to aging by having an abundance of nerve
cells rich in acetylcholine that act as neuro-transmitter path-
ways between the hippocampus and the cerebral cortex. These
maturational changes are linked with higher cortical func-
tion (e.g., “wisdom”). Deterioration of these neurons is linked
with degenerative processes such as those found in dementia
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nition disorders, including facial and object; progressive
speech difficulties (aphasia), particularly when it affects the
left frontotemporal lobe primarily (Pickering et al., 2002;
Snowden, Neary, & Mann, 1996) (See Chapter 16).
Managing and searching for a cure for AD and other neurodegenerative disorders is complex owing to a lack of knowledge about their exact etiology. Recent data (de la Torre, 2002) indicate that it should be classified as a vascular disorder rather than a neurodegenerative disorder. More data are needed to understand the etiology of these complex conditions. No drug on the market is totally effective in the treatment of AD or in altering its progressive course. Drugs that prolong the life of existing cholinergic neurons, such as donepezil (Aricept) or galantamine hydrobromide (Reminyl) may delay clinical decline in clients who suffer from AD (Othmer, Othmer, & Othmer, 1998; Wahlund, 1996).

**Neurochemical Processes**

Neural regulation is based on a complex network of transmitter pathways that are sensitive to fluctuation of transmitter and hormonal balance. Neurotransmitters initially interact with receptor terminals of the postsynaptic cell membrane, resulting in either inhibitory or excitatory response. The type of neurotransmitter and receptors determine the nature of the response. Norepinephrine, dopamine, acetylcholine, and serotonin are examples of excitatory transmitters, whereas amino acids, such as gamma-aminobutyric acid, are examples of inhibitory transmitters. Abnormal concentrations of these substances are associated with impulsivity and mental disorders such as depression, anxiety, addictive disorders, and schizophrenia. Antidepressants, neuroleptics, anxiolytics, and other pharmacologic agents act on the neurotransmitters to increase or decrease their release, ultimately modifying relative concentration to improve the symptoms of mental disorders (see Chapter 28, Psychopharmacologic Therapy). Nurses must understand the neurochemical and systemic impact of the medication they administer whether treating mental or concurrent medical illnesses. In this way, optimal responses will more often be achieved.

**Neuroendocrinology**

Neuroendocrinology, the study of neural and endocrine systems, indicates that these systems work together to maintain normal body function or homeostasis. These systems communicate through biofeedback mechanisms to establish a basis for all biological and behavioral responses. The neuroendocrine system contains the hypothalamus, pituitary gland, thyroid gland, adrenal glands, gonads, and pancreas.

The hypothalamic-pituitary-adrenal (HPA) axis is particularly important in the response to threat or stress. The HPA axis provides a cascade of processes governing positive and negative control at various areas, consequently modulating energy and cellular activity throughout the body (Campeau, Day, Helmreich, Kollack-Walker, & Watson, 1998). Abnormalities in the HPA axis are known to contribute to, and are diagnostic of, functional psychosis, phobias, bipolar disorder, and depressive and anxiety disorders (Coryell & Tsuang, 1992; Kessler, 1997; Nelson & Davis, 1997; Wolkowitz & Reus, 1999) (see Chapter 11 and Figure 11–1).

It is important for nurses to be aware of the endocrine-neural influences of mental disorders to better assess for and understand underlying pathology and potential treatment.

**Psychoneuroimmunology**

The immune system plays a key role in the development of infections and tumors when it is underactive, and in the development of allergies and autoimmune diseases when it is overactive (Borysenko, 1987; Solomon, 1987). It is now becoming clear that the immune system plays a role in health and illness in the face of biological and psychosocial stress as well. This relatively new field of *psychoneuroimmunology* is a developing knowledge concerned with the interconnections between the nervous system and the immune system.

Each cell in a human body contains a marker that identifies the cell as part of “self.” Any material that does not contain this marker is identified as foreign antigen. The immune system serves the body by first detecting and protecting it from invasion of antigens. One way in which it may do this is through humoral immunity by producing antibodies to destroy or neutralize the foreign body. The character of the antigen and the specific antibody are stored in the memory of the immune cells, so that response to another attack is more rapid and rigorous.

The immune system may be chronically activated as occurs in a stress response, or it may fail to recognize the self-marker and attack itself such as in autoimmune diseases. An attack is mounted against “non-self” material, and when the immune system fails to differentiate self from non-self, it can attack itself such as in autoimmune diseases like systemic lupus erythematosus (SLE).

The manner in which the immune system works has many implications for psychiatric nurses. Research has long shown that negative life events and stress affect health (Monroe & Simons, 1991). Recently, psychiatric illnesses, notably affective disorders and panic disorders (Brambilla et al., 1992) have been linked to immune dysfunction. Continued research in this area is critical. The National Institute of Nursing Research has called for research development in the area of immunoincompetence as well as for interventions that bolster appropriate immune response.

**Genetics**

Numerous research studies confirm the relationship between genetic and enzymatic defects and genetic vulnerability to mental illness. For most mental disorders—schizophrenia, bipolar disorder, and pervasive developmental disorder—the site involving genes, acting at distinct times in brain development in vast regions of the brain, interfaces with epigenetic and environmental influences. Clearly, genetic function is influenced by prenatal and environmental factors that activate intricate biochemical processes, which may, in turn, affect behavior and increase the likelihood of mental disorders (Cowan, Kopinsky, &
A leading area of concern for nurses is identifying clients environmentally factors. (Field, 1998; Francis, Caldji, Champagne, Plotsky, & Meaney, 1999; Gorwood, Batel, Ades, Hamon, & Boni, 2000).

**Twin, Adoption, and Family Studies**

A number of researchers have attempted to explore the relationship between genetic factors and mental disorders using twin, adoption, and family studies. Twin studies are helpful in isolating genetic and environmental influences and in determining preventive and precipitating factors. These studies usually include monozygotic (MZ) or single-ovum and dizygotic (DZ) or two-ova twins. Adoption studies try to determine the impact of environmental factors on genetic expression. These studies generally examine and compare biological and adoptive parents of affected subjects and those of healthy biological and adoptive control subjects. Family studies contrast the occurrence of mental disorder among relatives of affected subjects and assess the relevance of heredity (Kaplan & Sadock, 1998; Lohr & Bracha, 1992).

Genetic theories regarding the cause of schizophrenia date back to Kraepelin in the early 1900s, who observed that bizarre behavior was commonly found in families of clients with schizophrenia. Twin, adoption, and family studies consistently link genetic, individual vulnerability, and psychosocial stressors with manifestations of schizophrenia; pervasive developmental disorders; mental retardation; dementias; and affective, addictive, and other disorders (Amir et al., 1999; Kendler & Prescott, 1999; Lyons et al., 1998; Sullivan, Neale, & Kendler, 2000; Tsuang, Stone, & Faraone, 2000).

**Environmental Factors**

Genetic factors do not account for all variances between heredity and mental illness. Such studies suggest that environmental factors are just as relevant as molecular-based genetic processes. Twin, adoption, and family studies tend to support this premise. Environmental factors include parental treatment or caregiving patterns, family structures, age spacing, and gender. These factors may buffer or protect genetically vulnerable clients (Berrittini, 2000; Field, 1998; Kendler, Kessler, Neale, Heath, & Eaves, 1993), so that people with a predisposition to a particular mental illness may not develop it because of exposure to protective environmental factors.

**Genetics and Addiction**

A leading area of concern for nurses is identifying clients at risk for alcoholism and other addictions. One possible explanation for substance abuse perhaps lies in the mesolimbic-mesocortical areas in the brain, which enhance dopamine and generate reward and reinforcement behaviors. A blend of biological and psychosocial factors places certain individuals at risk for addictive behaviors.

The role of genetic factors and alcoholism has generally been well supported by twin, family, and adoption studies. Biological or gene markers are found in dopamine receptors (Persico, Bird, Gabbay, & Uhl, 1996; Smith et al., 1992). More recent studies also implicate dysfunction of serotonergic transmission as a risk factor for excessive alcohol consumption and dependence (Gorwood et al., 2000; Heinz et al., 1998). In addition, certain behaviors are commonly seen in clients who abuse substances (Hill, Shen, Lowers, & Locke, 2000). Many people who have genetic predisposition for substance abuse may adhere to cultural or religious principles, or both, that never allow substance use; therefore, addiction will not occur even though the person has a vulnerability marker. Religious groups, such as Muslims and Mormons that forbid use of alcohol are believed to have fewer alcoholics than other religious groups. However, this finding does not mean that predisposition for addiction is not present in their genetic makeup. Researchers continue to explore the impact of genetics on mental illness and human behavior. The implications for finding clinical markers and detecting biological and psychosocial factors include searching for the cause of mental illness, identifying clients at risk, developing effective treatment, and preventing exposure to noxious factors that produce illness.

**Genetic Research**

Scientific studies involve identifying genes and proteins that appear to cause mental disorders and are clearly altered by psychopharmacologic agents and the environment. A key purpose of this clinical evidence is the development of novel pharmacologic agents. Efforts to hasten the development of novel treatment have necessitated the establishment of partnerships between biotechnology and pharmaceutical industries. The National Institute of Mental Health’s Mammalian Genetics and Genome studies are already making great strides in genetic research, and studies are being conducted that manipulate the mouse genome. These studies are allowing scientists opportunities to take genes out, alter them, and replace them, and through brain probing, understand brain function relevant to behaviors, cognition, and emotions with precision (Hyman, 1998, 1999; NIMH, 1998). Researchers are currently ambitiously involved in discovering “vulnerability genes” and in identifying the neural pathways that regulate mood, emotion, energy, and other mechanisms that are affected by bipolar disorder and other mental disorders. They also propose that these discoveries will be the bases of novel and clinical trials that integrate pharmacologic and psychosocial interventions that improve the quality of care and provide clients and insurers with evidenced-based outcomes (Hyman, 2000).
Newer technological advances in stem cell research that involve culturing brainstem cells have the potential for replacing any cell in the body. The great hope of medicine is that stem cells will one day be used as universal donor cells and offer cures to incurable diseases such as childhood diabetes, Alzheimer's disease, and spinal cord injury. Of course, these studies are controversial, but in the near future will offer cures for clients, families, and communities suffering from mental and physical disorders.

**MAJOR BEHAVIORAL MODELS**

Behavior represents an array of responses to internal and external stimuli. The behavioral approach to human activity assumes that behavior is influenced by specific interconnections between complex neural processes, heredity, environment, instinct, conditioning, and reinforcement. Behavior is directed toward meeting basic human needs. Most human behavior is voluntary and related to avoiding negative experiences—behavior is not simply stimulus-response interactions. Behaviors are generally reinforced by rewards for doing the right thing or punishment for doing the wrong thing. Human responses are directed either at goal attainment, such as asking for another piece of cake, or object avoidance, such as avoiding crowds or elevators. These responses are labeled either approach or avoidance of stimuli.

**Reinforcers** are used to modify maladaptive behavior and can be positive or negative. Reinforcers are personally determined. For example, it may be difficult to predict whether two people at a party where alcohol is served will drink: One may drink beer after beer regardless of the morning-after consequences, whereas the other may avoid alcohol altogether. Reinforcers account for the difference. One student may have a biochemical predisposition to alcohol and thus will gain reinforcement directly from it. Another student may avoid alcohol because parental drunkenness resulted his taking an oath not to drink. Or perhaps one of the people agreed to serve as the designated driver at this party and will be rewarded by drinking at the next. Perhaps both have a heavy workload the next day and cannot face the consequences of drinking. Good job performance is the reinforcer in this example. Evidently, reinforcers are personal, complex, learned, and may be biochemical.

Behavior is observable and offers clues about the brain's functioning in relation to internal and external stimuli. Internal stimuli include complex biological changes or disturbances, personality traits, perception, or temperament. Examples of external stimuli include developmental transitions, seasonal or circadian cycle changes, or other psychosocial stressors. Major behavioral theorists include Skinner, Bandura, and Walters (see Chapter 2, Concepts of Psychiatric Nursing).

**INTEGRATION OF BRAIN AND BEHAVIOR**

The interrelatedness of human behavior and brain function is complex. Neural processes that govern thirst, hunger, sex drive, aggression, and motivation are located in the hypothalamus and other areas in the limbic system. The brain analyzes internal and external stimuli as either irrelevant or threats, and this process is the basis of perception. Perceptions generate neural signals that either inhibit or arouse cellular innervations. Motor commands arise from these signals. Complex nerve cell activity along the spinal cord governs motor and behavioral patterns. Lesions or alterations in the limbic system or sensory-perceptual mechanisms generate maladaptive behavioral patterns, such as those seen in psychosis. Psychosis is believed to arise from biochemical and anatomical abnormalities that are manifested by vast behavioral responses, such as agitation, sensory-perceptual alterations, and social withdrawal.

Determining the origins and influences of behavior is difficult, but researchers continue to demonstrate more conclusive evidence of biological bases for mental illness. Determinants of various behavioral responses include psychosocial stress and neurobiological, genetic, and cultural factors. Appreciating the intricate link between psychosocial and neurobiological factors as causes of mental illness is critical to developing effective interventions, participating in research that integrates these concepts, and understanding the magnitude of technological advances.

**Kindling**

Neurochemical changes are surmised to be associated with psychosocial stressors. Kindling is an example of a neurobiological response that is activated by significant early stress and losses. **Kindling** is the electrophysiological process that over time produces an action potential after repetitive subthreshold stimulation or progressive sensitization of a neuron. Clinical studies over the past 40 years have sought to discover the underpinnings of unipolar and bipolar disorders. Most findings suggest that monamine signaling and HPA axis dysregulation play integral roles in the pathophysiology of both mania and depression. Kindling and progressive sensitization to seizures come from the epilepsy literature and is a useful premise that explains neurobiological processes at the molecular and cellular levels and the genetic predisposition of mood dysregulation. Kindling appears to produce dramatic increases in membrane-associated protein kinase C and certain G-proteins (Post & Weiss, 1999).

**Protein kinase C (PKC)** is a group of enzymes that activate other enzymes. **G-proteins** are part of the cell's plasma membrane and are involved in sending signals from regulatory chemicals such as hormones and neurotransmitters to target cells. Collectively, PKC and G-proteins trigger a cascade...
of chemical reactions that produce target cells’ responses, and play roles in cellular proliferation, enzymatic reactions, and regulation of certain genes. Lithium and valproate acid regulate PKC activities and have efficacy in the treatment of acute mania (Berretini, 2000; Manji & Lenox, 2000; Post & Weiss, 1999). Early losses and trauma are examples of stressors that result in mood dysregulation and its chronic and recurrent course.

Early losses and traumas are thought to increase sensitivity at some receptor sites by activating biochemicals that impair responsiveness and increase vulnerability to future mood disorders. In other words, in early life, a psychosocial stressor, like the death of a parent, may precipitate a depressive episode. The next time a major psychosocial stressor occurs, depression is experienced again. At some point, after repeated recurrences, depressive episodes begin to occur without a precipitating stressor. The basis of this premise is encoding of a “long-standing trait marker” to affective illness that increases susceptibility to stress (Post, 1992). Feelings of helplessness are marked in people who have experienced repeated trauma (Maier & Seligman, 1976).

**Trauma**

Traumatic events across the life span are also tied to neurobiological and behavioral changes, frequently seen in clients with borderline personality, post-traumatic stress disorder, depression, and dissociative identity disorder. Responses to trauma are generally behavioral and biological. Clients experiencing trauma often experience flashbacks, intrusive thoughts, “being in a daze” numbing, anxiety, startle reactions, nightmares, and fatigue (American Psychiatric Association, 2000).

Traumatic events involve activation of brain regions related to perceiving and responding to a threat in which
the HPA axis has a principal role. The HPA axis is primarily responsible for the secretion of the two main stress hormones, cortisol and norepinephrine (NE). These mechanisms orchestrate a cascade of complex responses that include brain nuclei determining facial expression and the rate and depth of cardiac and respiratory patterns. These neurobiological and behavioral responses are modulated by the principal nucleus of the amygdala, which also acts as a powerful modulator of fear responses (Davis, 1994). Together the amygdala and hippocampus play “crucial roles” in the encoding and retrieval of memories, eventually activating neurochemicals that give rise to dissociative amnesia (Grillon, Southwick, & Charney 1996). The brain circuits involved in fear parallel a rapid and transitory response to environmental stimuli. The identification of neural substrates of fear have made it possible to appreciate the underpinnings of anxiety disorders (Coplan & Lydiard, 1998; Fanselow & LeDoux, 1999). This premise also underscores the biological and behavioral responses to trauma that are likely to be intense and goal-directed social isolation or withdrawal, startle response, alienation, irritability, and agitation.

In addition, trauma interferes with modulation of anxiety and aggression because of hyperarousal of the autonomic nervous system and heightened sensitivity to feelings or environmental stimuli. Persistent, severe distress is associated with increased risk for certain cancers and immunosuppressive disorders, such as autoimmune deficiency syndrome, biochemical changes in neurotransmitters, and endogenous opioid (endorphin) production and release. Presumably, during sustained stressful periods, immense quantities of neurotransmitters such as norepinephrine and dopamine are secreted, increasing the risk of chronic stress-related illnesses. With prolonged stimulation, repletion of neurotransmitters occurs, leading to receptor hyperstimulation and depletion of cortisol, consequently increasing the risk of post-traumatic stress disorder (Adamec, 1997; Anisman, Ritch, & Sklar, 1981; Shalev, 2000; Yehuda, McFarlane, & Shalev, 1998). In other words, when the stress response is turned on too long or too often, it cannot be turned off. This area of research has potential for nursing practice in the area of preventive health care. See Table 3–1 for the bioneurochemical and behavioral responses to severe stress.

Acute trauma or stress increases dopamine release and metabolism in certain brain centers, particularly the prefrontal cortex. Moreover, activated dopaminergic systems appear to be directly involved in mobilizing coping responses and play a major role in the development of post-traumatic stress disorder (Antelman, 1988; Charney, Deutch, Krystal, Southwick, & Davis, 1993). This may explain why trauma leads to lifelong consequences in susceptible persons. It also validates the consideration of both psychosocial stressors and neurobiological and behavioral responses in a holistic view of nursing.

Behavioral responses to dysregulation of certain neurotransmitters include social isolation, startle reactions, irritability, paranoia, distrust, and agitation. Serotonin is thought to modulate the activity of other neurotransmitters, resulting in behavioral and emotional responses (Blier & de Montigney, 1985).

Adaptation to trauma is related to a number of factors (van de Kolk, 1987a), including:

a. severity of stressor
b. genetic vulnerability
c. developmental stage
d. available support system

<table>
<thead>
<tr>
<th>BIOCHEMICAL RESPONSES</th>
<th>COGNITIVE APPRAISAL</th>
<th>POSSIBLE BEHAVIORAL RESPONSES</th>
</tr>
</thead>
</table>
| Forebrain
  Screens emotional responses to internal and external stimuli
  Links hypothalamus to environment to activate proper neurochemical responses (i.e., autonomic nervous system, neuroendocrine) | Irrelevant stimuli | Ignored, no responses |
| Hypothalamus
  Acts as principal ganglion
  Activates proper neurochemical responses (e.g., anterior pituitary to adrenal coA1ex) | Reappraisal of threat or danger | Calmness, decreased anxiety, fear, restlessness |
e. history of trauma
f. ego function (personality traits)

Similarly, adaptation to stress is generally related to a person's repertoire of coping behaviors. The severity of a stressor is determined by individual perception of the event.

The developmental stage during which the trauma is experienced influences the impact of the trauma. For instance, adults with adequate coping behaviors and support systems are likely to be less vulnerable to trauma than a child would be. Social systems during traumatic or stressful events act as buffers to sustain trust, security, and safety (Hendin, 1984; van der Kolk, 1987b). The emotionally abused 1-year-old child is more likely to experience difficulty forming trusting and healthy interpersonal relationships throughout the remainder of the life span than the battered housewife. Besides the developmental stage, other factors influence a child's response to trauma. Early traumatic experiences also interfere with normal growth and development tasks such as learning trust, self-esteem, and autonomy; influence adaptive responses throughout the life span; and increase the risk for biological and behavioral morbidity. These risk factors include being a female, being in close proximity or exposure to the event, the degree of personal injury, injury or death of a family member, parental psychopathology, lack of quality support system, and the degree of life threat (Lipschitz, Rasmussen, & Southwick, 1997b; Shaw, 1997; Shaw, Applegate, & Schoor, 1996).

Neurological damage has also been detected in a number of abused children who have no symptoms of traumatic brain injury. Psychosocial factors such as chaotic and abusive environments are tied with delayed impaired CNS maturation such as attention deficit disorder (ADD) (Fish-Murray, Koby, van der Kolk, 1987).

Bowlby (1973) believed that early attachments and relationships with primary caregivers mediate maturation of the CNS, and that abuse impairs emotional and intellectual development. He noted the effect of early emotional bonding and formation of endorphins or endogenous opiates. Endorphins play a major role in managing severe stress, producing calmness, and buffering one from emotional pain (van der Kolk, Greenberg, Boyd, & Krystal, 1985; Kraemer, 1985). See Table 3–2 for biological-behavioral client outcomes, as incorporated into a nursing care plan. Understanding human response to trauma and other psychosocial stressors is critical to health maintenance. Pseudoseizures, abnormal electroencephalograms (EEGs), and clients with dissociative identity disorder have been associated with neurological trauma (Brende, 1984). Interventions that provide emotional support and empathy, modulate feelings, create trust, reduce anxiety, and promote a sense of control and power include various psychotherapies, cognitive-behavioral therapy, crisis intervention, stress management, and psychotropics. (See Chapter 30, Chapter 11, and Chapter 28 for in-depth discussions of these interventions.)

MAJOR PARADIGMS OF PSYCHIATRIC-MENTAL HEALTH NURSING

The recent explosion of research and knowledge in the area of neurobiology—involving advances in genetics brain mapping, imaging, and scanning—has opened up a fascinating world concerning the human brain and behavior. Psychiatric nursing educators and clinicians are challenged in their ability to integrate traditional psychiatric nursing and neurobiological concepts into nursing curricula and practice. Psychiatric nursing continues to struggle with integrating biological concepts into undergraduate and graduate curricula despite advances in neurobiology, neuroscience, and genetics. Overall, technological advances in neurobiological discoveries and other psychiatric nursing challenges offer vast opportunities to integrate biological and behavioral concepts into holistic interventions and improve the quality of life for the mentally ill.

Clinical and Practice Issues

Recent discoveries in the field of neurobiology continue to revolutionize the understanding and treatment of mental illness. Because psychiatric nurses work collaboratively for the most part, they cannot help but to be influenced by these advances and must continually stay abreast of new findings to communicate knowledgeably with other mental health professionals. Likewise, evidenced-based research should guide nursing practice. Obviously, nursing must not lose sight of its holistic tradition, taking all aspects of the client into consideration, including the spiritual, cultural, psychosocial, as well as the biological.

In spite of technological advances in neurobiology in understanding and treating mental illness, there has been some controversy and doubt over its relevance to psychiatric nurses. Peplau (1989) noted that specific mental disorders are difficult to explain as a “global or single entity” (p. 26) and determined that psychiatric nurses need to understand and treating mental illness, there has been some controversy and doubt over its relevance to psychiatric nurses. Peplau (1989) noted that specific mental disorders are difficult to explain as a “global or single entity” (p. 26) and determined that psychiatric nurses need to understand and treating mental illness, there has been some controversy and doubt over its relevance to psychiatric nurses. Peplau (1989) noted that specific mental disorders are difficult to explain as a “global or single entity” (p. 26) and determined that psychiatric nurses need to understand and treating mental illness, there has been some controversy and doubt over its relevance to psychiatric nurses. Peplau (1989) noted that specific mental disorders are difficult to explain as a “global or single entity” (p. 26) and determined that psychiatric nurses need to understand and treating mental illness, there has been some controversy and doubt over its relevance to psychiatric nurses. Peplau (1989) noted that specific mental disorders are difficult to explain as a “global or single entity” (p. 26) and determined that psychiatric nurses need to understand and treating mental illness, there has been some controversy and doubt over its relevance to psychiatric nurses. Peplau (1989) noted that specific mental disorders are difficult to explain as a “global or single entity” (p. 26) and determined that psychiatric nurses need to understand and treating mental illness, there has been some controversy and doubt over its relevance to psychiatric nurses. Peplau (1989) noted that specific mental disorders are difficult to explain as a “global or single entity” (p. 26) and determined that psychiatric nurses need to understand

Nursing Interventions

Historically, one of the major biological interventions used by psychiatric nurses involved assessing the need for prescribing and administering psychotropics to calm agitated
# Table 3–2

## Nursing Care Plan: The Client Experiencing Sensory–Perceptual Disturbances (Psychosis): Biological–Behavioral Client Outcomes

<table>
<thead>
<tr>
<th>OUTCOME IDENTIFICATION</th>
<th>NURSING ACTIONS</th>
<th>RATIONALES</th>
<th>EVALUATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. By [date], responds appropriately to internal/external stimuli.</td>
<td>1a. Establish rapport.</td>
<td>1a. Facilitates a trusting alliance and reduces anxiety and agitation.</td>
<td>Goal met: Client initially has difficulty trusting staff because of auditory hallucinations and persecutory delusions.</td>
</tr>
<tr>
<td></td>
<td>1b. Assess the presence of hallucinations and/or delusions (i.e., smiling or nodding head inappropriately).</td>
<td>1b. Enables nurse to assess basis of client behavior and responses.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1c. Decrease environmental stimuli.</td>
<td>1c. Reduces anxiety and risk of aggression.</td>
<td></td>
</tr>
<tr>
<td>2. By [date], verbalizes coherently to others.</td>
<td>2a. Give direct and concrete explanations.</td>
<td>2a. Decreases anxiety and increases coherence.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2c. Assist in self-care.</td>
<td>2c. Disturbed thought processes interfere with self-care.</td>
<td></td>
</tr>
<tr>
<td>3. By [date], exhibits decreased agitation.</td>
<td>3. Administer neuroleptic and observe for desired and adverse responses.</td>
<td>3. Neuroleptics are important to reduce hallucinations/delusions and agitation and improve thought process.</td>
<td></td>
</tr>
</tbody>
</table>

## Nursing Diagnosis: Impaired Social Interaction

<table>
<thead>
<tr>
<th>OUTCOME IDENTIFICATION</th>
<th>NURSING ACTIONS</th>
<th>RATIONALES</th>
<th>EVALUATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Initiates and interacts with others appropriately.</td>
<td>1. Designate staff for one-to-one relationships.</td>
<td>1. Decrease environmental stimuli and establish trusting relationships.</td>
<td>Goal met: Client is able to establish one-to-one alliance with several staff.</td>
</tr>
<tr>
<td>2. Verbalizes coherently with others.</td>
<td>2. Reinforce and validate clear communication.</td>
<td>2. Enables client to learn effective communication skills.</td>
<td></td>
</tr>
</tbody>
</table>

Client continues to have difficulty interacting with some group members.
clients experiencing hallucinations and delusions. Recent neurobiological findings have promoted the creation of new psychopharmacologic agents that target specific areas of the brain to reduce symptoms and modify behaviors. Other research findings link gender, culture, and genetic and familial factors to the efficacy of these agents. Selective serotonin reuptake inhibitors such as sertraline (Zoloft) and serotonin-norepinephrine reuptake inhibitors such as venlafaxine (Effexor) are examples of these new antidepressants. The use of electroconvulsive therapy (ECT) is gaining renewed acceptance as an effective treatment modality for severe depression and various schizophrenic disorders. Electroconvulsive and other biological therapies also help severely depressed clients suffering from psychomotor retardation, social withdrawal, and suicidal ideations. Other examples of biological therapies include complementary therapies, such as St. John’s Wort for mild depression, rest-sleep manipulation for bipolar disorder, music or touch therapy in dementia, administration of full-spectrum lighting for seasonal affective disorder, and nutritional alterations in alcoholism.

Health promotion and primary prevention remain major nursing goals. These goals parallel managed health care concepts that emphasize cost-effective and evidenced-based health care. Prevention minimizes maladaptive behaviors and chronicity in high-risk clients and groups. The domain of psychiatric nurses lies in recognizing and assessing age-appropriate responses to developmental tasks, biological dysregulation, and changes that define health and illness across the life span. Understanding the realm of normal or adaptive responses to stress helps nurses identify abnormal or maladaptive responses and formulate evidenced-based outcomes and interventions that incorporate biological and behavioral concepts.

Client symptoms or behaviors allow the nurse to discern the client’s inner world that comprises biological and behavioral processes activated by internal and external stressors. Active listening and astute observation of verbal and nonverbal cues are key aspects of assessing client responses. For instance, the psychotic client may smile or talk inappropriately and have a disheveled appearance. These nonverbal cues link the nurse with complex neurobiological processes that affect the client’s behavior and effective treatment modalities.

Major treatment modalities include providing psychotherapy, behavioral modification, cognitive therapy; assessing the need for medications; administering, prescribing, and monitoring client responses to psychotropics; and facilitating sleep-rest, light-dark, exercise-relaxation, and nutritional aspects of care. These interventions integrate the biological and behavioral aspects of mental illness.

**Psychiatric Nursing Education**

The National League of Nursing has long stipulated that schools provide psychiatric nursing experiences for accred-
ing biological-behavioral concepts with present nursing education trends affords opportunities for novel approaches to psychiatric-mental health nursing education and clinical practice.

The ANA continues to support psychiatric nurses and advocates the integration of biological and behavioral concepts into nursing practice. The newest edition of A Statement on Psychiatric-Mental Health Nursing Practice (ANA, 2000) addresses enormous changes in psychiatric nursing and the health care delivery system. The ANA stresses the impact of rapid evolution of biological sciences and advances in technology on psychiatric nursing practice. This statement establishes that neurobiological advances and development of interventions promise more effective response for the mentally ill. Moreover, the ANA confirms the need for psychosocial interventions, such as psychotherapy, cognitive therapy, psychoeducation, crisis intervention, and administration and prescribing of psychotropics to help clients develop effective coping patterns. Finally, this publication provides an in-depth discussion of the Advanced-Practice Psychiatric Registered Nurse, which is useful in helping the public, legislators, and other professionals understand the role of the generalist and the advanced-practice role in psychiatric-mental health nursing.

THE ROLE OF THE NURSE

The generalist and advanced-practice registered nurse can use an array of biological and behavioral interventions to facilitate adaptive responses to internal and external stressors. Psychiatric nurses are faced with providing complex care that meets the holistic needs of clients in inpatient, ambulatory, primary care, and home health and community settings. These needs include psychosocial and biological factors that affect client behavior. Aggression, suicide, irritability, noncompliance, and social withdrawal are common behavioral responses to stress, which often arise from psychosocial and biological alterations.

The Generalist Nurse

The generalist or psychiatric-mental health nurse works with clients, families, groups, and communities and uses the nursing process to assess adaptive and maladaptive responses. This nurse understands the relationship between underlying biological processes, facilitates and reinforces adaptive coping patterns, and assesses and prevents further disability. Specific interventions encouraging health promotion and maintenance include psychoeducation, administration of psychotropic medications and monitoring client response, milieu therapy, and crisis intervention. These interventions occur during activities such as intake and screening, telecare, case management, and in diverse settings such as community and mental health centers, day hospitals, home health settings, and homeless shelters (ANA, 2000). Biological and psychosocial interventions enable the generalist psychiatric-mental health nurse to alter or modify maladaptive responses seen in various mental disorders, such as attention deficit disorders, psychosis, and depression.

A combination of biological and psychosocial interventions can be used in caring for a client who is experiencing psychosis. The psychotic client experiences perceptual disturbances, such as auditory hallucinations that lead to suspiciousness, and may result in irritability, social reclusiveness, and refusal to eat. Perceptual disturbances represent neurobiological phenomena that result in behavior in response to this internal and external stimuli. The client may act on the command of the hallucinations and step in front of a car or refuse to eat because “someone poisoned the food.” Assessing the nature of hallucinations is crucial to the client and staff’s safety. Administering a typical neuroleptic such as haloperidol (Haldol) or an atypical agent such as olanzapine (Zyprexa) are biological interventions that target certain neurotransmitters, specifically dopamine, that give rise to psychotic symptoms. The psychosocial intervention is a calm, firm approach that conveys empathy and provides the client with structure and limit setting. These interventions can work together to decrease hallucinations, delusions, and anxiety, and increase the client’s impulse control, thus reducing the risk of violent, aggressive behaviors (see Table 3–2 for the nursing care plan).

Behavioral patterns can be adaptive or maladaptive. The depressed adolescent may use maladaptive behavioral patterns such as alcohol, stealing, or quarreling, to manage internal emotional pain and to deal with psychosocial stressors of family pressures and school. Conversely, another adolescent may use adaptive responses and seek out family, friends, or clergy to verbalize feelings about a stressful situation. The nurse must operate on the premise that all behavior has meaning and can be clarified. Therefore, assessing behavioral responses to internal and external stimuli is a major nursing responsibility and involves collaborating with the client and other mental health professionals to develop effective interventions and evidenced-based outcomes.

The Advanced-Practice Psychiatric Registered Nurse

The role of the advanced-practice psychiatric registered nurse encompasses that of the generalist in addition to providing direct clinical care, such as psychotherapy and prescriptive authority. Advanced educational and clinical preparation enables the advanced-practice psychiatric registered nurse to assess complex problems and employ knowledge, skills, and clinical experience to alter or modify maladaptive responses in various clinical settings (ANA, 2000).

Specific advanced-practice psychiatric registered nurse interventions include prescribing, administrating psychotropics, and evaluating client responses to various bio-
logical therapies such as psychotropics, electroconvulsive therapy, complementary therapies, phototherapy, and integrating them with behavioral strategies. Furthermore, conducting research study to assess client responses to behavioral and biological interventions is critical to evaluating and developing evidenced-based care.

Behavioral interventions offered by the advanced-practice psychiatric registered nurse include cognitive-behavioral therapy, progressive relaxation, guided imagery, psychotherapy, and psychoeducation. Various interventions depend on nurse-client collaboration that allows nurses to empower clients in understanding the basis of mental illness and create interventions that can alleviate symptoms and promote health maintenance.

**RELATED RESEARCH**

Psychiatric nurses are in the midst of a neurobiological explosion that provides vast opportunities to define and investigate client outcomes that integrate biological and behavioral concepts. Studies that compare the effectiveness of biological and behavioral interventions can also assist nurses in developing evidence-based outcomes that meet the complex needs of the mentally ill (refer to the Research Abstract). Survival of psychiatric nurses depends on the ability of educators, clinicians, and researchers to integrate biological and behavioral concepts into academic curricula and scope of practices. Evaluating student experiences that incorporate these concepts can generate data that direct students and practicing nurses.

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**RESEARCH ABSTRACT**

**FOOT ACUPRESSURE AND MASSAGE FOR PATIENTS WITH ALZHEIMER’S DISEASE AND RELATED DEMENTIAS**


**Study Problem/Purpose**

To determine the effects of foot acupressure and massage on wandering, pulse, respirations, and quiet time behaviors in patients with AD and other dementias.

**Methods**

The researchers used a quasi-experimental design with purpose sampling and random assignment of patients to experimental (n = 5) and control (n = 5) groups. The patients resided in an AD specialty care center. Subjects met the following criteria for inclusion: (a) required assistance with activities of daily living; (b) exhibited varying degrees of behavioral problems; (c) had disruptive verbal behaviors; (d) were independent with locomotion; (e) exhibited various wandering behaviors or other disruptive behaviors; and (f) had resided in the center for at least 3 months. A Behavioral Documentation Instrument (BDI) was used to collect narrative data; data were logged in immediately before and during the experiment by a nurse-massage therapist.

Foot acupressure and massage therapy was applied to the experimental group for 5 minutes on each foot during a 10-day treatment period. Treatment consisted of massage with long, smooth, rhythmic strokes of the entire foot and ankle, using clockwise movement of four acupressure points. Independent variables such as wandering, pulse, respirations, and quiet time for both groups were taken every 2 hours and recorded for the 10-day treatment period and 3 days after treatment. Scores were calculated for each variable to discern differences between treatment and baseline data with t-tests performed on the groups’ mean change scores.

**Findings**

The experimental group post treatment means decreased wandering, pulse, and respirations and an increase in quiet-time post treatment. However, these scores were not statistically significant by t-test.

**Implications for Psychiatric Nurses**

Despite the major limitation of a small sample size, psychiatric nurses can use acupressure and massage therapy, combining therapeutic touch and nursing presence to promote calmness and emotional support of clients experiencing AD and other dementias.
SUMMARY

- Advances in neurobiological research offer clinicians and researchers a greater understanding of the complexity of mental health and illness.
- The expansion of biological knowledge gives clients, families, communities, and psychiatric nurses hope for more effective treatment to improve their quality of life.
- The human experience arises from the complex interaction of the person’s neurobiological mechanism and the individual’s environment.
- The biological-behavioral interface of mental health and illness is complex and challenges nurses to integrate these concepts into practice, education, and research.

STUDY QUESTIONS

1. Mary, a 28-year-old college student, encounters a situation during her class that reminds her of a previous traumatic predicament. Her immediate reaction involves intense fear and immediately getting out of the situation. The most accurate description of her reactions reflects which neurobiological processes?
   a. The hypothalamus-pituitary-adrenal axis and amygdala
   b. Kindling, neurotransmitters
   c. Genetic predisposition
   d. Hippocampus

2. Mr. Murray presents in the mental health center complaining of “hearing voices,” and he is smiling and talking to himself during the assessment. The most appropriate explanation for his behavior involves which of the following?
   a. Dysregulation of a neurotransmitter such as dopamine
   b. Stressful home situation caused by frequent arguments with his mother
   c. Dopamine dysregulation and interpersonal conflicts
   d. Overmedication with neuroleptic and related side effects

3. You are assessing the new client who is brought in by her father, who reports that he is concerned about her behavior. As her nurse, which of the following is critical in making an appropriate assessment of this client?
   a. What kind of pressure has she been under lately?
   b. Describe her relationship with family members.
   c. How long has she lived with you?
   d. Is there a family history of mental illness?

4. Mikie, a 7-year-old boy is brought in by his parents, who report that he has been irritable and fearful since he witnessed his friend being viciously attacked by a dog several days ago. Which of the following is the most appropriate immediate response to the parents and child?
   a. Reassure the child and parents about the normalcy of his behavior.
   b. Encourage the parents to consider an antidepressant for their child.
   c. Refer them to a trauma counselor so the child can explain the impact on his life.
   d. Educate them about normal stress reactions.

5. Health maintenance is an integral part of psychiatric nursing practice. Which of the following interventions most accurately depicts health maintenance?
   a. The client who loses his job is seen in a crisis center.
   b. The anxious pregnant client who is referred for stress management.
   c. The client with acute psychosis is offered an injection of haloperidol.
   d. The client experiencing an acute panic attack is taught deep breathing exercises.

RESOURCES

Please note that because Internet resources are of a time-sensitive nature and URL addresses may change or be deleted, searches should also be conducted by association or topic.

Internet Resources

1. National Association of Clinical Nurse Specialists (NACNS)
   3969 Green Street
   Harrisburg, PA 17110
   (717) 234-6799
   http://www.nacns.org

2. American Nurses Association
   600 Maryland Ave, SW
   Suite 100 W
   Washington, DC 20024
   (202) 651-7000
   (800) 274-4262
   http://www.ana.org
REFERENCES


5. The American Heart Association National Center 7272 Greenville Avenue Dallas, TX 75231 (800) 242-8721 www.americanheart.org

6. Alzheimer’s Association 919 North Michigan Ave., Ste 1000 Chicago, IL 60611-1676 (800) 272-3900 www.alz.org

Professional Organizations Involved in Brain and Genetic Research

www.nimh.nih.gov National Institute of Mental Health

www.nature.com Nature

www.sciencemag.org/misc/e-perspectives.shtml Science on line


http://www.edc.gsp.h.pitt.edu/stepbd Epidemiology Data Center. STEP-BD. Systematic Treatment Enhancement Program for Bipolar Disorder


**SUGGESTED READINGS**