Alzheimer's Disease And Hospice Care: A Biopsychosocial Model Approach

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ALZHEIMER'S DISEASE AND HOSPICE CARE
A Biopsychosocial Model Approach

Submitted in Partial Fulfillment of the Requirements for Graduation with Honors to the Honors Scholars Program at Carroll College, Helena, Montana

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To my director, Valerie Gager, I think a congratulations is in order because you are finally done working on this blasted thesis with me. The hugs you gave me when I was in tears and sure I could write no more made this document happen. Its high caliber is due almost entirely to you continually challenging me to do a little more, write a little better. Thanks for making me rise to the occasion.

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PREFACE

In deciding on a topic for my senior thesis, I did some extended reflection about my time at Carroll and my life to this point. During this thought process, I struggled deeply with the seeming incompatibility between my field of choice, biology, and the interest from my time at Carroll, the Honors Scholars Program. It was my heartfelt desire to use my thesis as the showcase of my time at Carroll, and I have tried to be a well-rounded student from the beginning. I have chosen to do this thesis through the Honors Scholars Program to give me the creative liberties to allow the document to take the direction I wish for it—a full circle of life between medicine and the humanities. I would hope that this work will be of interest to those who may read it as it has been of interest to me in my life. If it benefits future generations, I will be happy. If not, I am satisfied anyway as the effect it has had on my future is immeasurable.

The document is designed for "lay people." That is, I wrote it specifically for family members of people with Alzheimer's disease in an effort to explain some of the things that happen during the course
of the disease. I also wrote it as a potential care plan for terminally ill patients, particularly those with Alzheimer's disease, so that a patient or family member might have a basis to start from when approaching a physician about using the biopsychosocial model approach to treatment. Finally, I wrote it as a tribute to hospice care and the effect they have on terminally ill patients.

Because this is not a doctoral thesis, there are, of course, other areas that need to be researched. I would like to see more in depth research into the cost effectiveness of some of the alternative areas of care for Alzheimer's patients: day care programs, nursing home placements, etc. I also think there could be more extensive research into the supports and drawbacks of the biopsychosocial model and the medical community's objections to the model. One of the problems with this aspect of the paper is that little has been printed in journals about the biopsychosocial model and, as such, little has been printed in objection to it. I think as the curricular reform in medical school education continues to take place, this topic will find ever increasing popularity amongst the medical community.
I. INTRODUCTION

Imagine this scenario. Your beloved grandmother has recently started to forget simple things. She has, in the past, never been one of those forgetful people; thus, you are concerned by her behavior now. You try many things to help, including taking her to different physicians who all tell you that she has Alzheimer's disease. They suggest a range of medications, none of which seems to make a difference. Eventually, as the disease progresses, she forgets even your name or how to put her shoes on and tie them. She has to be put in a nursing home because you can no longer adequately care for her. She dies in the facility, alone and afraid. If only you had known that there were ways to help her at home with her Alzheimer's disease, you could have preserved her dignity in death.

Alzheimer's disease has been described by Ronald Hamdy as one of the most terrible diseases in history because it kills the mind and then it kills the body (vii). According to the American Association of Retired Persons (AARP), Alzheimer's disease is the fourth leading cause of death for adults after heart disease, cancer, and stroke (Parke-Davis Pharmaceuticals 1). An estimated four
million Americans have Alzheimer's disease, nearly three-and-a-half million of whom are over the age of sixty-five. Further, it is estimated that ten percent of all people over the age of sixty-five will develop the disease, and for those over the age of eighty-five, the percentage grows to approximately forty-seven percent. (Parke-Davis Pharmaceuticals 1). As members of the "baby boom" generation rapidly approach age sixty-five, the occurrence of the disease is likely to come to crisis level.

With such an overwhelming projected rate of growth, the reason for a healthy adult's preoccupation with Alzheimer's disease is obvious. Because the disease affects the brain and its functions, understanding how a normal brain works helps one to understand how Alzheimer's disease affects the people who suffer from it. To understand the progression of the disease, I will first examine normal brain anatomy and functions and then contrast these with the process of a brain affected by Alzheimer's disease. Second, the document will look at present methods of evaluating Alzheimer's disease and the clinical manifestations of the disease in a three-stage process.
Third, typical clinical interventions for the patient and classical support systems for patients and their families will be summarized.

Alzheimer's disease causes degeneration not only biologically but socially in its victims. As a terminal illness, sufferers must deal with the physical as well as emotional consequences of the disease. The medical community should treat Alzheimer's patients using the proposed biopsychosocial model that many hospices use to approach the treatment of a terminal illness. To demonstrate the benefits of my proposed application of the biopsychosocial model, a deeper look into the history and development of hospice care and its benefits for terminally-ill patients will be examined. Two methods of treatment, the biomedical model and the biopsychosocial model, will then be compared and contrasted. Finally, my proposed biopsychosocial model for patients with Alzheimer's disease will be explained and anticipated objections to the model will be rebutted. After the presentation of my arguments, the proposed implementation of the biopsychosocial model administered in a hospice program will be shown to be the most humane treatment for Alzheimer's disease patients and therefore should be adopted by the medical community.
1. Cerebral Hemisphere  
2. Diencephalon  
3. Brain Stem  
4. Cerebellum  
5. Medulla Oblongata

Figure 1. Five Regions of the Brain
II. NORMAL BRAIN FUNCTION

IIA. BRAIN ANATOMY

The brain comprises approximately one hundred forty billion cells, of which twenty billion are cells involved in data processing known as "neurons". Each of these neurons has up to fifteen thousand direct physical connections with other brain cells. The brain can be divided into five regions (Figure 1): the cerebrum, the diencephalon, the brain stem, the cerebellum, and the medulla oblongata. In addition, the regions of the brain contain four ventricles that are connected within the brain regions to allow for cerebrospinal fluid to circulate throughout the brain: paired lateral ventricles (cerebrum), third ventricle (diencephalon), and fourth ventricle (brain stem).

Each part of the brain plays an important role in receiving and processing sensory signals and producing motor responses to those signals. The cerebrum localizes and interprets sensory inputs and controls voluntary skilled skeletal muscle activity. The diencephalon houses the relay stations that conduct impulses to and from the cerebral neocortex and lower motor centers. The diencephalon also
<table>
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<th>Region</th>
<th>Function</th>
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<tr>
<td>Cerebral Hemispheres</td>
<td>Cortical gray matter localizes and interprets sensory inputs, controls voluntary and skilled skeletal muscle activity, and functions in intellectual and emotional processing; basal nuclei are subcoritcal motor centers important in initiation of skeletal movements.</td>
</tr>
<tr>
<td>Diencephalon</td>
<td>Thalmic nuclei are relay stations in the conduction of (1) sensory impulses to cerebral cortex for interpretation, and (2) impulses to and from cerebral cortex and lower (subcortical) motor centers, including cerebellum; thalamus is also involved in motor processing. Emotional brain is a functional system involving cerebral and diencephalon structures that mediates emotional responses.</td>
</tr>
<tr>
<td>Brain Stem</td>
<td>Conduction pathway between higher and lower brain centers located here; superior and inferior colliculli are visual and auditory reflex centers and house subcortical motor centers. Also relays information from the cerebrum to cerebellum.</td>
</tr>
<tr>
<td>Cerebellum</td>
<td>Processes information received from the cerebral motor cortex and from the proprioceptors and visual equilibrium pathways, and provides &quot;instructions&quot; to cerebral motor cortex and subcortical motor centers that result in proper balance and posture and smooth coordinated skeletal muscle movements.</td>
</tr>
<tr>
<td>Medulla Oblongata</td>
<td>Conduction pathway between higher brain centers and spinal cord; site of decussation of the pyrimidal tracts; houses visceral nuclei controlling heart rate, blood vessel diameter, respiratory rate, vomiting, coughing.</td>
</tr>
</tbody>
</table>

Figure 2. Functions of the Regions of the Brain
houses the hypothalamus, which is the chief integration center of the autonomic, or involuntary, nervous center. The brain stem is the conduction pathway between higher and lower brain centers, housing the visual and auditory reflex centers. The cerebellum processes information received from the cerebral motor cortex for proper balance, erect posture, and smooth, coordinated skeletal muscle movements. The medulla oblongata serves as the conduction pathway between higher brain centers and the spinal cord. A more complete list of functions is outlined in Figure 2.

Because the cerebrum is the region of the brain that Alzheimer's disease affects most predominantly, a more detailed view will help one to understand the biological changes that occur in a diseased patient. The cerebrum of the brain is divided into the left and right hemispheres. The hemispheres, which are responsible for integrating the sensory signals and sending a return message, are connected by the corpus callosum. The corpus callosum is a large bundle of nerves that allows for the two hemispheres to pass signals back and forth to communicate with each other. The cerebrum can be
<table>
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<tr>
<th>Lobe</th>
<th>Function</th>
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<tbody>
<tr>
<td>1. Frontal</td>
<td>The primary motor cortex allows control the movements of the skeletal muscles. The premotor cortex controls the learned motor skills of a repetitious or patterned nature. It also coordinates the movements of several muscle groups. Broca's area is the special motor speech area responsible for the muscles of the tongue, throat, and lips.</td>
</tr>
<tr>
<td>2. Parietal</td>
<td>The gustatory complex is found here and is involved in the perception of taste stimuli. The general interpretation area, responsible for storing complex memory patterns associated with sensation, is also located here.</td>
</tr>
<tr>
<td>3. Temporal</td>
<td>The auditory and olfactory cortices are found in this lobe. They are responsible for synthesizing the sensations from hearing and smelling respectively. This lobe also houses Wernicke's area which is used to understand written and spoken language both familiar and unknown.</td>
</tr>
<tr>
<td>4. Occipital</td>
<td>This lobe houses the primary visual cortex in addition to the visual association area. The primary area receives the stimulation and the association area processes the signal in light of past visual experiences to enable recognition of object.</td>
</tr>
</tbody>
</table>

Figure 3. Functions of the Lobes of the Brain
further divided into four lobes: frontal, occipital, temporal, and parietal.

Each lobe has a specialized function. The frontal lobe contains the primary motor cortex which controls voluntary movements of skeletal muscles. The occipital lobe houses the primary visual cortex which allows an individual to see. The temporal lobe contains the primary auditory cortex and the olfactory complex which are the hearing and smelling mechanisms, respectively, for the body. The parietal lobe houses the gustatory cortex which functions as the taste mechanism. A more detailed list of functions can be found in Figure 3.

The outside covering of the cerebrum, the neocortex, makes up about forty percent of the human brain. The neocortex is only about one-and-a-half to three centimeters thick and covers a surface area of up to twenty-five hundred centimeters. The neocortex enables individuals to perceive, communicate, remember, understand, appreciate, and initiate voluntary movements—all qualities associated with conscious behavior.
Figure 4. Structures in a Neuron
IIB. SIGNAL PATHWAY FROM CELL TO BRAIN

The sensory signals need to reach the brain first to be processed. The whole central nervous system is composed of the same type of cells as the brain—neurons. Each neuron (Figure 4) has a body, a stem (axon), and continuing branches (dendrites). The dendrites bring sensory stimulation to the neuron cell body to be processed. The signal then travels via the axon to the brain, a major component of the central nervous system (Figure 5). Obviously, one cell does not connect from the peripheral parts of the body to the brain. Thus, the nerve cells must be in contact with each other to form a chain of cells through which the impulse travels. The signal needs some facilitation to pass from cell to cell up the chain. When the electrical impulse reaches the edge of the cell, it stimulates the production and release of chemical compounds called "neurotransmitters."

Neurotransmitters are responsible for carrying the signal from cell edge to cell edge across an area known as a "synapse". In a healthy person, these neurotransmitters are produced at a level necessary for the nervous system to function normally.
1. Brain
2. Spinal Cord

Figure 5. Components of the Central Nervous System
Acetylcholine, an important neurotransmitter, is normally present in various parts of the nervous system and is involved in the establishment of memories in the neocortex of the brain.

IIIC. SIGNAL PROCESSING IN THE BRAIN

The brain receives and processes stimuli in the primary and secondary levels of the cerebrum (Figure 6). The primary level is responsible for receipt of the signal, and the secondary level integrates the signal to produce a motor response. For example, in order for a person to say a written word or name an object, the image must be projected onto the visual cortex of the occipital lobe. The image is then carried forward to the association area of the parietal lobe and passed to the motor speech area, resulting in a verbal response.

III. DIFFERENCES IN AN ALZHEIMER'S DISEASE BRAIN

An Alzheimer's patient can show several anatomical differences in the brain. First, the neocortex can shrink, which causes a phenomenon known as "cortical atrophy." Second, the atrophy may be accompanied by enlarged ventricles that can be indicative of dementia such as Alzheimer's disease. Third, in an Alzheimer's
Figure 6. Primary and Secondary Levels of the Cerebrum
patient, the production of neurotransmitters such as acetylcholine is often inhibited. Finally, an Alzheimer's patient will likely show disruption in the structures associated with receiving and processing signals in the brain. These disruptions cause an inability to recognize familiar objects or symbols, or difficulty in naming objects, which can lead predominantly to impairment in memory and speech (Hamdy 30). As the disease progresses, the frontal lobe, primarily responsible for higher cortical functions, and its connections may deteriorate. This degeneration can result in behavioral changes, such as loss of initiative, spontaneity, and the ability to plan and organize behavior (Hamdy 42).

III.A. EVALUATION OF ALZHEIMER'S DISEASE

Because of these behavioral changes, the patient must undergo an extensive evaluation to assess the cause of these changes. The most beneficial evaluation incorporates information available from the medical, neurological, and social history of the patient with the findings of standard clinical psychological procedures. These procedures include interviews with the patient, family, and friends; observation of behavior; and examination of mental capacities.
Extensive research has been done to further the diagnosis of Alzheimer's disease. In 1987, scientists found four different cognitive tests that differentiate between a patient with a senile dementia and a normal elderly subject. These cognitive tests do not distinguish between different types of dementia such as Alzheimer's disease, vascular dementia, and others associated with neurological disorders (Sloan 46). Cognitive screening tests, however, can provide helpful measures of the rate of mental deterioration in a patient with dementia. In essence, the cognitive screening tests provide a relative scale that does not quantitate the spread of disease initially; however, they do provide a base line comparison to help judge progression of the disease over time.

An additional difficulty with evaluating and/or diagnosing Alzheimer's disease is, while scientists can measure the effects of the disease, the only clear, concrete method of diagnosis is to identify characteristic lesions in the brain by autopsy. This means that a physician cannot be one hundred percent certain of the accurate diagnosis of the disease until the patient is deceased. Another complicating factor is that so many of the dementias present similar
symptoms that many physicians misdiagnose the disease. These misdiagnoses can lead to improper treatment with the use of medications different from what might benefit the patient the most.

In addition to problems diagnosing the disease, the etiological basis of the degenerative changes in Alzheimer's disease is still unknown. From the time the disease was first discovered in 1907, Alois Alzheimer, while peering at a section of brain, wrote, "'Scattered through the entire cortex, especially in the upper layers, one found the deposition of a peculiar substance in the cerebral cortex'" (Lavretsky 80). This substance is now called a "neuritic plaque," which takes many years to form. However, recent discoveries indicate that understanding the genesis of neuritic plaque may help scientists to understand the pathogenesis of the disease. The plaque consists of a central core surrounded by abnormal neurons and cellular debris. These plaques interfere with normal communication in the brain and prevent signals from traveling unimpeded back and forth in the central nervous system.

Two recent studies have also found that there is a correlation between some genetic mutations and increased rates of Alzheimer's
disease. While a recent study by the Alzheimer's Association has shown that a mutation in chromosome twenty-one leads to higher rates of Alzheimer's disease, the increased rate seems to be true only in people who are classified as "early onset of disease." Early onset of disease means a patient displays signs and symptoms of the disease before the age of forty. Research done at Duke University has found a linkage between Alzheimer's disease and a mutation in chromosome nineteen. Further studies are being done to determine the significance of both findings (Lavretsky 84).

An Alzheimer's disease patient may also demonstrate impeded microtubule function, which has also been named as a potential cause of the disease. An impaired microtubule system could account for some of the characteristic abnormalities of Alzheimer's disease such as neuritic plaques, loss of neurons, and abnormalities of neurotransmitters. Eleanor Lavretsky, a research psychopharmacologist, proposes that:

an impairment of the microtubule system, regardless of the cause, leads to [1] impaired cellular function and the effects accumulate with time[,] and eventually [2] threshold levels sufficient for the manifestation of the
symptomatic behaviors and neuropathological changes characteristic of Alzheimer's disease (Lavretsky 86).

While investigation into the cause of the microtubule impairment is still occurring, the possibility that the impairment could explain some of the symptoms of Alzheimer's disease is clear.

Several environmental risk factors have also been reported as having a role in the onset of Alzheimer's disease. For example, head trauma can cause the formation of lesions similar but not identical to the lesions found in the brain of an Alzheimer's disease patient. Since Alzheimer's disease involves the loss of synapses, increased head trauma would naturally lead to increased potential for Alzheimer's disease because damaged synapses result from head trauma.

While no solid conclusions can be made about the effects of environmental risk factors, much is known about the actual disease process. The Alzheimer's disease process can be divided into three clinical stages as identified by Hamdy (111). Stage 1, which generally lasts between one and three years, is characterized by the
following signs:

1. Poor short-term memory
2. Impaired acquisition of new information
3. Mild anomia
4. Personality change.

Of these signs, the most apparent clinical manifestation of Alzheimer's disease is memory deficit.

There are three different types of memory: immediate (remembering for a few seconds), short term (remembering for a few minutes or hours), and long term (remembering for a few years). In Stage 1 of Alzheimer's disease, short-term memory is impaired but long-term memory is preserved. The main difference between a patient who suffers memory loss as a result of Alzheimer's disease and one who suffers normal memory loss associated with aging is that, with Alzheimer's disease, the memory loss is apparent in all aspects of the patient's life, whereas with a healthy person, the memory loss would not affect the common everyday aspects of life (e.g., remembering his or her child's name or how to get to work).

When the memory loss first becomes a problem for an Alzheimer's
patient, he or she can usually compensate by making notes to help remember things.

Another one of the earliest manifestations of Alzheimer's disease is the inability to acquire and retain new information and to integrate it with previously acquired knowledge. This problem tends to manifest itself when the patient is at work learning new skills. Because of the short-term memory impairment, it is difficult for the patient to combine new information with other pertinent, previously-learned skills. A sudden change in a person's environment also causes problems, as the patient is not able to adjust quickly to the new surroundings to feel comfortable. The discomfort of the patient generally displays itself as anger and confusion. This manifestation of the disease is generally short-lived and the patient usually reorients quickly and easily with short conversation.

The Alzheimer's disease patient in Stage 1 may also struggle with oral communication. Anomia, the inability to find the right word, is a characteristic feature of Alzheimer's disease. Early on, the patient with anomia has problems remembering only that with which
he or she does not come into regular contact. This difficulty can generally be easily compensated for by paraphrasing.

The Stage 1 Alzheimer's disease patient may appear normal to people who do not know him or her. This stage tends to be difficult because the patient is still aware of the decrease in capabilities and yet cannot understand or cope with the complexity of the situation.

Stage 2 of Alzheimer's disease, which lasts between two and ten years, is characterized by the following signs:

1. Profound memory loss, both long-term and recent
2. Significant impairment of other cognitive parameters: anomia, agnosia, apraxia, and aphasia
3. Severe impairment of communication and judgment.

The short-term memory loss experienced in Stage 1 has extended into both recent and long-term memory. A patient in Stage 2 has difficulties remembering even the simplest of recent things, and also experiences problems recalling events and people from his or her past.

Anomia from Stage 1 can develop into agnosia, a condition in which the patient not only is unable to remember the name of
something, but also now cannot recognize it. For example, an Alzheimer's patient might see a spoon and think it is a key. The patient would try to use the spoon as if it were actually a key. This situation is worsened by apraxia, the patient's inability to concentrate for short periods. The final manifestation in terms of cognitive parameters is the development of aphasia, the impairment of language that prevents the patient from understanding what he or she hears and thus interferes with the patient's ability to respond verbally. Eventually, this condition requires extensive effort by the caregivers because the patient's needs and wants must be guessed at rather than known clearly.

In Stage 2, the patient's ability to communicate is severely impaired. The patient may be restless because of his or her inability to communicate with the outside world. The patient frequently becomes apathetic in this stage, because he or she has no insight into the disease or what is occurring. In addition, the patient's capacity to make rational, well-thought-out judgments is hindered by the inability to synthesize new information or to recall previously acquired information.
This apparent personality change is only one of the many behavioral changes that Alzheimer's patients display. Frequently, a sufferer exhibits mood changes manifested in loss of interest, loss of energy, and depression. These mood changes can become more drastic when patients begin to develop behaviors such as stubbornness, resistance to care, suspicion of others, use of abusive language, acting in response to delusions or hallucinations, and angry outbursts triggered by apparently trivial events.

Because of these behaviors, patients with Alzheimer's disease are frequently prescribed potent sedatives and tranquilizers. These drugs magnify the patient's natural restlessness and wandering. The sedatives affect the patient's normal sleep cycles. Thus, Alzheimer's patients frequently exhibit the reversal of day and night sleep patterns.

Stage 3, which lasts between eight and twelve years, is notable for the following features:

1. Severe impairment of all cognitive functions
2. Physical impairment involving unsteadiness, repeated falls, and reduced mobility
3. Total loss of ability to care for oneself.

As the disease progresses, a patient loses insight into his or her memory deficit and is no longer aware of it.

In addition to the memory deficit, the patient experiences almost complete inability to communicate with others. Further, the patient can almost never be reoriented. The patient has difficulty compensating for the difficulties with speech, as the anomia, agnosia, apraxia, and aphasia extend to items and concepts frequently encountered in everyday life.

Gross intellectual impairment is clearly obvious in Stage 3. The patient is not able to recognize him or herself, much less family members. As the disease progresses, the patient becomes completely dependent upon other people for the proper care necessary to do normal everyday things. This inability to carry out normal daily tasks is a clinical condition called "self-neglect." Attention is no longer paid to simple things like combing one's hair or washing one's face. In addition, the patient is not even conscious of these problems.
These three stages briefly explain the general progression of Alzheimer's disease. While no clear-cut divisions can be drawn, Hamdy's model is fairly accurate and is used in the medical community regularly. The disease is characteristically irreversible and slowly progressive. Death is not usually caused by the disease itself. Instead, most Alzheimer's patients die from septicemia, a complication of infection.

IV. CLINICAL APPROACHES TO ALZHEIMER'S DISEASE TREATMENT

Alzheimer's disease became front-page news several years ago when former President Ronald Reagan acknowledged publicly that he was suffering from the disease. Since then, an estimated three-hundred million dollars has been poured into research of this progressive, irreversible disease (Sloan 40). While the new research is potentially exciting for people who have not yet developed the signs and symptoms of Alzheimer's disease, it has not shed any new light on easing the suffering of those who have already been diagnosed with the disease. Still, several clinical approaches to treatment have aided the lives of those with Alzheimer's disease. When specialists
speak about the treatment of Alzheimer's disease, they generally refer to five goals: managing or preventing behavioral symptoms, improving cognitive functions, slowing or stopping the progression of the disease, delaying the onset of symptoms, and preventing the disease all together. I will use these divisions in discussing the present clinical approaches to treatment.

IVA. MANAGING OR PREVENTING BEHAVIORAL SYMPTOMS

An Alzheimer's disease patient tends to display four behavioral problems, namely, suspicion, agitation, depression, and wandering. Traditionally, the patient with these symptoms has been treated using drugs such as antidepressants for neuropsychiatric disorders. In the United States, there are twenty-four anti-depressants from which a physician can choose; however, each drug is associated with a range of side-effects from shortening of attention span to sleeping all the time (Sloan 46).

On the other hand, a good deal of progress has been made in the development of non-pharmaceutical treatments for behavioral symptoms. Peter Rabins, MD and Director of Geriatric Psychiatry at Johns Hopkins University School of Medicine, states:
There's a much wider appreciation of how important the environment is in affecting the behavior and mood of Alzheimer's patients, and there's a greater recognition of the need for regularly-scheduled activity, both as a way of keeping patients psychologically and physically healthy, and as a way of decreasing behavioral symptoms (Advances 3).

An environment that is familiar to the patient can help make him or her feel at ease. For example, if the patient is surrounded by pictures of his or her loved ones, he or she might recognize these people and feel comfortable in the environment. This disorientation leads to the behavioral problems listed above. In addition, a regular schedule gives predictable repetition that the patient can rely on, thus providing comfort during the routine of an Alzheimer's disease patient.

IVB. TREATMENT OF COGNITIVE SYMPTOMS

Because memory loss is a consistent symptom of Alzheimer's disease, it has been the primary target for treatment of cognitive symptoms. While replacement of acetylcholine was never considered to have potential as a cure for Alzheimer's disease, researchers believe that a patient's memory and other abilities may remain unaffected, at least for a longer period of time, if the patient were to
take acetylcholine supplements (Sloan 67).

To this point, the most useful strategy to augment acetylcholine in the brain of an Alzheimer's patient has been to inhibit its natural breakdown. The enzyme that normally breaks down acetylcholine to allow its parts to be reused is called "acetylcholinesterase." An Alzheimer's patient is commonly treated with acetylcholinesterase inhibitors, which work by slowing the natural breakdown of acetylcholine, thereby allowing more of this important neurotransmitter to be present. These drugs have been only mildly successful because, in Alzheimer's disease, the widespread degeneration of neurons takes place throughout the cerebral neocortex. Thus, while the brain has higher levels of the neurotransmitter present, the neurons that use the neurotransmitter to pass signals are already missing or degenerated beyond use.

IVC. SLOWING THE PROGRESSION OF ALZHEIMER'S DISEASE

Because of the degeneration of neurons in the brain, slowing the progression of Alzheimer's disease can be approached in two ways: disarming the culprits that are attacking neurons, or fortifying...
neurons so they are better able to withstand an assault of any kind.

The five basic mechanisms of neuron death include:

1. Deterioration of the outer membrane of the cell
2. Decline in the cell's ability to carry out routine energy production and repair operations [metabolism]
3. Injury from free radicals, reactive molecules that are by-products of normal cell energy production, but that are usually cleaned up by the body
4. Excitotoxic damage, a chain reaction in which neurons become overstimulated
5. Disruption of the normal balance of calcium between the inside and outside of nerve cells [neurons]

(Advances 4).

Even though the specific triggers of such mechanisms are not known, identifying methods to block them or protect against their effects might allow the nerve cells to live longer.

IVD. PREVENTING OR DELAYING ALZHEIMER'S DISEASE

To prevent Alzheimer's disease, the factors that place people at risk must be understood and taken into account. As the risk factors are identified, researchers can learn how to translate the risk factors into the biological processes that bring about slow but relentless degeneration of nerve cells in the regions of the brain associated with thought, speech, memory, and emotion. Studies are currently being done to determine whether an Alzheimer's patient has a genetic
predisposition that makes him or her more susceptible to environmental agents or to developing the disease naturally (Lavretsky 87).

Since almost all cases of Alzheimer's disease strike a person late in life, another strategy to lessen its impact would be to delay the onset of symptoms. Right now, studies are being done to determine if there is a genetic marker for people who will develop Alzheimer's disease so that doctors might be able to intervene in the disease process and prevent the onset of symptoms by at least five years (Lavretsky 88). Because the mean age of onset is sixty-five, the number of patients who presently suffer from Alzheimer's disease would be cut drastically with more people dying of natural causes.

V. CLASSIC SUPPORT SYSTEMS FOR ALZHEIMER'S DISEASE PATIENTS AND THEIR FAMILIES

VA. ALZHEIMER'S ASSOCIATION

While the new research in Alzheimer's disease shows promising results for clinical treatment of the disease, both the patient and his or her family still need to have support systems in place to help them understand the consequences of Alzheimer's disease.
Such support comes from organizations like the national Alzheimer's Association, established in 1980 to fight the disease, to assist caregivers, and to inform the public. This privately funded, volunteer-based organization is dedicated to pursuing research for the prevention, cure, and treatment of Alzheimer's disease and to providing support and assistance to individuals with Alzheimer's disease and their families. Today there are two-hundred-twenty chapters in fifty states, more than eighteen hundred support groups, and thirty-five thousand volunteers (Parke-Davis Pharmaceuticals 10).

The Alzheimer's Association's programs and services include research, public policy, education, family support, nursing home and in-home patient care, respite care, and autopsy assistance. In addition, the Association publishes a quarterly newsletter for six-hundred-fifty thousand readers nationwide and distributes educational videos. It also publishes manuals for health and social service professionals on such topics as nursing home care for persons with Alzheimer's disease.

**VB. FAMILY SUPPORT GROUPS**
Family support groups, sponsored by organizations such as the Alzheimer's Association, help family caregivers by giving the family members a chance to share their feelings with others who face the same daily struggle. Members of such groups frequently discuss successes and failures, helping each member to learn from the experiences of others. The support group also provides a forum through which families learn about and locate community resources. Most importantly, family members receive encouragement and moral support from others who understand the hard work involved in being a caregiver.

VC. ADULT DAY PROGRAMS

Many families choose alternatives to providing care in their own home. Some use Adult Day programs that provide planned activities, recreation, health care, physical therapy, occupational therapy, and speech therapy to patients with Alzheimer's disease. Adult Day programs are offered in community centers, retirement homes, nursing facilities, hospitals, and religious centers.
**VD. NURSING HOME PLACEMENT**

Other families choose to place the Alzheimer's patient in a nursing home. In fact, sixteen-hundred nursing homes in the United States provide specialized care units for those patients who suffer from Alzheimer's disease (Parke-Davis Pharmaceuticals 17). Generally, these care units consist of a separate floor or wing of a nursing home. Usually, Alzheimer's units focus on companionship and supervision in a safe, pleasant environment. With staff trained to deal with the behavior of Alzheimer's patients, the special unit fits a person's needs rather than trying to make the person fit into the facility.

**VE. HOSPICE CARE**

An increasing trend in the treatment of an Alzheimer's patient is to allow the patient to stay at home for as long as possible. To assist in the process of dying at home, many families use the services of hospices to care for their loved ones. The word "hospice" is a derivation from the Latin word for "hospitality," and its concept can be traced back as far as ancient Greek and Roman times. Hospitality was given religious importance during these times because it was a
sign of a philanthropic nature (Metzger 254). The Greeks believed that Zeus was the "protector and friend of strangers;" thus, no one dared deny hospitality when asked. Because hospitality usually meant providing a place for travelers to stay, there are references in such Greek classics as the Odyssey where the gods commanded lodging be provided, "Sleep...all mortal men,...and you shall have my everlasting thanks" (Homer, 14:283-284). Because the Greeks and Romans traveled so much from place to place, dependence on hospitality increased so that discriminating travelers could separate themselves from the lower-class clientele of the local inns (Metzger 254). Hospitality soon became one of the most highly praised virtues.

In Hebrew times, the extension of hospitality remained an unwritten law that was eventually documented in the Torah. As the covenant made between God and the Israelites requires, "You shall not oppress an alien, since you were once aliens yourselves in the land of Egypt" (Exodus 23:9). The Hebrews believed that God had protected and cared for them in the foreign land; thus, it was their responsibility to care for strangers who were also under similar protection from God. Travelers came to expect hospitality, and
people who refused to provide it were often punished. In the story of Sodom, "the punishment came upon the sinners only after forewarning from the violence of the thunderbolts. For they justly suffered for their own misdeeds, since indeed they treated their guests with the more grievous hatred" (Wisdom 19:13). The fear of punishment like this caused people of that era to offer hospitality to travelers.

Hospitality is also part of Jesus' teaching in the New Testament. He uses the concept to illustrate the importance God places on human mercy, such as in the story of the Good Samaritan, which is frequently used to demonstrate the value hospitality has in God's eye. In addition, Jesus preached his gospels from private homes that were extending hospitality to him and his followers. In fact, those who refused to offer hospitality were seen to be rejecting the gospel (Metzger 254). Those who extended hospitality were demonstrating a practical means of how to share in the preaching of the Gospel. John tells his followers that they will find grace with God by providing hospitality, "And you will do a good thing if, in a way that please God, you help them to continue their journey" (3 John 1:6). Thus,
Christians held providing hospitality in high regard as a way to stay in good grace with God.

In modern times, the Catholic Church still stresses the importance of hospitality in a new form: caring for the terminally ill. Included in its doctrine on "Respect for the Dignity of Persons," the Catholic Church requires that "The dying should be given attention and care to help them live their last moments in dignity and peace" (Catechism 2299). In an effort to ensure this respect, a new movement started in medicine for the care of those who were dying—the present concept of "hospice" was born.

In 1967, St. Christopher's Hospice, a Catholic institution in London, England, became the first medical facility to apply the word specifically to specialized care for dying patients. While the American hospice movement began in the late 1960s, the Connecticut Hospice, established in 1974, provided the first physical place for hospice care for the terminally ill in the United States. The physical places were necessary because people did not yet believe that dying in the home was appropriate yet. These early hospice programs grew out of a belief that mainstream medicine was not adequately meeting the
medical, social, and spiritual needs of the terminally ill ("The Basics" 2).

Today, the term "hospice" refers to "a steadily growing concept of humane and compassionate care which can be carried out in a variety of settings--in patients' homes, hospitals, nursing homes, or freestanding inpatient facilities" ("The Basics" 4). This care comes in many forms: nursing care, services of an interdisciplinary team of health care professionals, short-term inpatient care, medical appliances and supplies, physical and occupational therapies, and speech language pathology services ("Basic" 7). In addition, hospices provide bereavement counselling services to the family for up to a year following the patient's death.

To receive these services, the patient must first be referred to a hospice by his or her physician. The physician must certify that the disease is incurable by current medical treatments. Referrals to a hospice program are usually made to allow for care in the patient's home rather than in an in-patient medical facility. In essence, hospice care now allows the patient to die at home.
Some patients worry about whether their physician would support a decision to enter hospice care. Patients often express anxiety from a perceived disapproval of the physician for their desire to turn from conventional medicine. This may frequently be the case; however, since Medicare benefits began covering hospice treatment, some physicians have begun to utilize the service more often.

In 1982, Congress enacted legislation that enabled patients to receive hospice care at the expense of the Medicare program ("Basic" 8). To qualify, the Medicare beneficiary must have a terminal diagnosis with a prognosis of six months or less to live. Since the passage of this legislation, hospice has become a cost-effective way to provide comprehensive, palliative care to dying people (Bauer 2). In fact, a recent study comparing the relative cost of hospice care to conventional care for Medicare beneficiaries with cancer found that for every dollar spent on hospice patients, Medicare saved $1.52 in conventional expenditures (Bauer 3). Currently, the National Hospice Organization estimates that there are approximately twenty-six hundred hospices in the nation, of which about two thousand are Medicare-certified ("The Basics" 5).
While the adoption of hospice care for treatment of the terminally ill has increased, one might wonder why still only about twelve percent of the total deaths in the United States occur when a patient is under hospice care. Dr. Wayne Thalhuber believes, "physicians remain reluctant to refer patients to hospice because of the adjustment it takes to being part of an interdisciplinary team, or they may fear a loss of control over the patient's care, or they may not be aware of how beneficial hospice care is" (Bauer 1). The obvious cost effectiveness of treatment with Medicare coverage has helped physicians justify the decision to refer patients to hospice care. Yet the strongest argument for hospice may not be cost-effectiveness, but that it is a humane and compassionate way to deliver health care and supportive services to the terminally ill.

Hospices provide support for a person facing a life-threatening illness and a shortened life expectancy so he or she might live as comfortably as possible. The support consists of a "medically directed, interdisciplinary team of professionals and volunteers to meet the special needs arising from physical, psychological, spiritual, social, and economic stresses that accompany the final stages of
illness and dying" (Hospice of St. Peter's 17). The team generally consists of a physician, registered nurse, medical social worker, dietician, pharmacist, counselor, chaplain, home care aide, and many volunteers. In addition, the patient and his or her family members participate in decisions concerning treatment. The team approach provides a structure for all facets of health care to come together and work unitedly on a care plan for someone who is about to die.

In Helena, Montana, the St. Peter's Hospice team gathers every Wednesday morning for a weekly review of care plans of current patients. All members of the team are given an opportunity to report the previous week's happenings and to make suggestions for changes in the care plan. The medical director, Bernie Winter, a local M.D., is responsible for coordinating communication with the patient's individual physicians regarding the medical decisions. All other decisions about the care plan such as increased or decreased counseling visits are made by other members of the team. No change is made without the consent of all team members.

The care plan also takes into account the family members and their relationships with the patient. For example, the counselor might
schedule an appointment to meet with a son or daughter of a hospice patient to discuss his or her views on losing a parent and how those views might affect the patient's final time with the family. In addition, many volunteers may do everything from cleaning the patient's house to providing respite care to the patient so the primary family caregiver can have time out of the house.

While the team approach to patient care is one difference between hospice care and conventional health care, another difference is that hospice offers palliative, rather than curative, treatment. Because continued use of medically aggressive treatments for reasons other than pain control tend to lead a patient to believe falsely that the terminal illness could be cured, the patient must recognize and understand that the hospice philosophy, and thus care, centers on the quality of life, not the quantity of it. This means that patients must agree to stop all aggressive medical treatments that are being used to "cure" the disease, thus recognizing their disease is incurable. The main medical goal for hospice care is pain management. Treatments, such as chemotherapy and radiation, can be used only if they help in pain control ("Basic" 3).
By contrast, conventional health care tends to focus on treating the disease rather than the person. Consider the following example:

Mrs. B., a Medicare patient, comes to her doctor with the third cold in a month. Six weeks ago, she was diagnosed with terminal lung cancer, and she was given a prognosis of six months. She is scared about her upcoming death and how to relate to her family about all the changes occurring. Yet she senses that her physician wants to hear none of it. Her physician, growing tired of seeing her every time she has a runny nose, prescribes her an array of drugs for a cold. She leaves the office intimidated and angry that the doctor has not inquired about anything other than her runny nose and cough (Engel 79).

If Mrs. B had been referred to hospice right after diagnosis with terminal lung cancer, she would have been seen weekly by a hospice nurse. These visits allow the patient to develop a relationship of trust with the health care provider and empower the patient to express her feelings about the disease. The patient is the focus of the care, rather than the disease itself.

Hospice care also focuses on the family, something conventional health care rarely does. By providing resources for the family, the interdisciplinary team often provides the means for the family's emotional needs to be taken care of during the dying process.
of a loved one. Instead of just reacting to an established care plan, family members actively participate in the hospice team, thus empowering them to care for their loved one first-hand.

Because hospice care emphasizes the quality of life rather than the quantity of life, the focus shifts from prognosis of a few days or weeks of life to making sure the patient is as comfortable as possible during the final time before death. The patient, or family members if he or she is unable, sets the treatment priorities. Thus, comfort of the patient comes to the forefront. By moving the patient's desires to the top of the priority list, hospice care provides help and support to the patient and family twenty-four hours a day, seven days a week. Compassion is abundant throughout the duration of care.

This compassion is a necessary component for a "dignified death" that a hospice patient receives by dying at home. Conventional medicine does not allow for a dignified death because it does not treat the person as an individual with other than physical needs. By eliminating the consideration of the emotional and spiritual well-being of the patient, conventional medicine reduces a human being who is suffering to a disease process that can be treated with
drugs and technology. This devaluation of the human spirit makes the dying experience less humane than through treatment in a hospice environment.

The patient who is allowed to die at home through hospice care has the comfort of familiar surroundings rather than the informal environment of a hospital. Throughout the dying process, the hospice patient is counseled considering all aspects of the person: medical, social, psychological, and spiritual. One could venture to say that a hospice patient's death is most dignified because he or she has found peace within.

In summary, hospice care neither hastens death nor prolongs life. Instead, it affirms the life that is. Matt Malloy, the public relations manager for Caring Hearts, a hospice in St. Paul, Minnesota, says, "'We are not adding days to life, rather, we are adding life to days'" (Bauer 4). The interdisciplinary approach allows for all types of health care professionals to come together and, with the family, make a holistic care plan for the patient. The use of hospice care will continue to increase as the cost of medicine continues to rise and patients are sent home from hospitals sooner. Hospice provides
dignity for the terminally ill and tries to help patients come to grips with their illness. Finally, hospice also helps to heal the hurt in the family over the loss of a loved one.

VI. HISTORY OF THE BIOMEDICAL MODEL

Traditionally, physicians have turned away from alternative treatments such as hospice in favor of a method called the biomedical model to treat patients. The biomedical model focuses on the biology of the disease and how clinical medicine can treat it. The origins of the biomedical model can be traced back to the early 17th century, when the Christian orthodox prohibition against dissection of the human body was lifted. The Roman Catholic Church did so reluctantly, however, and stipulated that physicians had to agree to limit their attention to the body and leave the human's soul, morals, mind, and behavior to the Church (Reiser 44). The Church clearly believed that the human being's mind and body were two distinct entities, a concept rooted in Paul's distinction between flesh and spirit, and repeated in Augustine. Two philosophical views were manifested in the repeal of the prohibition: dualism and reductionism.

VIA. DUALISM
The philosophical view that fostered the development of the biomedical model is dualism. Dualism supports the conceptual separation of mind from body. In essence, the psychological realm is separate from the somatic realm. Dualism has existed from ancient times, when Plato determined that "the soul is the form of the body, just as the body is the matter of the soul" (Tarnas 61). The concept of dualism evolved throughout time, yet the basics of the idea remain the same. "The Christian dualism between spirit and matter, God and world, was gradually transformed into the dualism of mind and matter, man and cosmos: a subjective and personal human consciousness versus an objective and impersonal material world" (Tarnas 286). Dualism led to the development of the biomedical model because it gave the scientists philosophical justification for separating the treatment of the psychological (mind) from the disease (body).

**VIB. REDUCTIONISM**

The theory of reductionism arose from the theory of dualism and contributed to the further development of the biomedical model. Reductionism assumes that a complex thing can best be understood by identifying and examining the component parts. A picture of the
whole can then be reconstructed. The theory arises from a belief that nature is composed of discrete entities reacting in a linear fashion, and thus encourages the tendency to invoke a cause-and-effect relationship when diagnosing a disease rather than an interactive one.

Descartes, a premier scientist and philosopher of his time, revolutionized the field of reductionism. In addition to Galileo and Newton, he developed a new science in which a "new world was opened to man within which his powerful intelligence could act with new freedom and effectiveness" (Tarnas 326). What this new intelligence did was to separate all those personal and spiritual qualities that had given human beings their sense of meaning from the operations of the day-to-day world. In effect, the reductionist world was "a machine, a self-contained mechanism of force and matter, devoid of goals or purpose" (Tarnas 326). A new phenomenon had occurred: mind and matter were separate realities.

The scientists' qualitative analysis of the world took away the aspects that seemed most intimate to the human experience--emotional, aesthetic, ethical, sensory, imaginative, and intentional.
This diminution of the human being furthered the ability of reductionism to determine the whole picture by studying the pieces. The analyzation of nature had lead to the analyzation of human beings as well, "For as reductionism was successfully employed to analyze nature, and then human nature as well, man himself was reduced" (Tarnas, 331). Although the reduction of man furthered the philosophical basis for the biomedical model, there would be inherent difficulties with the use of the model.

VII. LIMITATIONS OF THE BIOMEDICAL MODEL/DEVELOPMENT OF BIOPSYCHOSOCIAL MODEL

The limitations of the biomedical model due to the theories of dualism and reductionism should be clear. The reduction of the human body to pieces, and the separation of mind and matter, preclude acknowledging environmental effects on the health of a person. The reality then becomes that most patients get treated by health care professionals merely for the symptoms they display rather than for what could be causing them to manifest signs of the disease in the human body. The personal, human, psychological, and social aspects of health and disease are ignored by many of the health care
professionals, thus limiting the interaction between patient and physician. Reductionists further this limitation because they acknowledge only the biological origins of the disease, and dualists support the separation of the effects of these other factors on the biology of the disease process.

The biomedical model emerged because these theories isolated the understanding of the disease process and thus influenced the development of treatments. The model arises from the characteristic human desire to classify things into discrete antithetical categories: good versus bad, truth versus lie, hot versus cold. Similarly, the biomedical model classifies a disease as strictly biological in nature as opposed to psychological. The model is based on the premise that an apparently biological problem (in this case, a disease) can be most effectively treated by a purely scientific approach (in this case, a clinical treatment). However, it is impossible for any disease to be purely biological because other factors affect the health and well-being of the patient and thus affect the biology of the person.
By limiting the approach to treatment, use of the biomedical model hinders the discovery of many contributing circumstances that have indeed been shown to affect a disease process definition. For example, a man with a history of heart disease in his family presents himself at an emergency room complaining of severe chest pains. The medical work-up done using the biomedical model would show signs of a heart attack. The patient would be treated with medication and sent home with no further examination into the possible causes of the attack such as stress, emotional distress, anxiety, and many others.

Because the traditional biomedical model does not recognize these other factors, the standard medical school education does not provide courses that teach physicians the skills necessary to learn to integrate the study of the whole person into the field of medicine. To counter such problems, a new model of medicine was developed by George Engel in the early 1970s. The new model, called the "biopsychosocial model," permits scientific attention to the "psychosocial dimensions of medicine" (Reiser 44). These dimensions refer to the whole spectrum of psychological and social
Figure 7. The Hierarchical View of the Biopsychosocial Model
(Model from Engel 80)
issues that are involved in the physician's everyday understanding and care of the patient as an individual and as a social being. An example of the spectrum is demonstrated in the complaints that usually arise when a patient describes his or her relationship with the physician:

Doctors do not communicate well, they do not listen, they seem ignorant of or insensitive to personal needs and individual differences, they often neglect the person in their zeal to pursue diagnostic and treatment procedures (Reiser 45).

The patient's dependence on communication is clearly important. Physicians must learn to communicate well with their patients in order to develop a sense of trust.

Another way to distinguish the biomedical model from the biopsychosocial model is to describe "healthy." For those who follow the biomedical model, "healthy" merely means the absence of disease. For patients and those who follow the biopsychosocial model, "healthy" means to be able to get on with everyday tasks and to meet the challenges of life without pain, discomfort, or disability.

VIIA. LEVELS APPROACH TO MEDICINE
Figure 8. The Interactive View of the Biopsychosocial Model
(Model from Engel 81)
The biopsychosocial model allows for a "levels approach" to medicine. The levels approach is best explained as an integration of both a hierarchical and an interactive view. The hierarchical view (Figure 7) holds that each level is distinct from the others, with separate consideration given to each of the events occurring there. Each level, shown on the figure as a square, implies qualities and relationships distinctive for that level of organization, thus requiring criteria for study and explanation unique for that level. The interactive view (Figure 8) holds that each level is at the same time a component of higher levels. For example, person and two person are components of family and community. Engel's blending of the two views (Figure 9) creates a design where, as a whole, each level has its unique characteristics and dynamics; as a part, it is a component of higher and lower levels. Such a levels-oriented model overcomes the limitations of dualism and reductionism by integrating the psychic and the physical body to form a whole person for treatment.

With the biopsychosocial model proposed by Engel, overall health reflects a high level of intra- and intersystemic harmony. Disruption of such harmony may be initiated at any level, be it cell,
Figure 9. The Integrated Biopsychosocial Model
(Model from Engel 82)
organ, person, or community. Every change, therefore, becomes part of the history of each level (Reiser 48). In essence, the biopsychosocial model does not allow a return to the former state of health. Instead, it is a different intersystemic harmony than that which existed before the episode of illness. In addition, the illness can affect not only the patient, but also the family and community.

VIII. IMPLEMENTATION OF THE INTEGRATED BIOPSYCHOSOCIAL MODEL

The question becomes, how does one implement this sort of model? For years, medicine has been stuck in the thought process that the study of disease is science while the care of a patient is art. George Engel adamantly believes differently: "Behavior, feelings, human transactions, and relationships--and hence patient care--are indeed amenable to examination and study through application of the scientific method" (62). In the integrated biopsychosocial model, patient care encompasses all of the interpersonal and social transactions between the patient and the various health care providers. In this case, the majority of the responsibility continues to reside with the physician, as traditional medicine (and thus patients in
the medical process) depends on the physician to make independent
decisions about the care of the patient.

The ultimate goal of both a biomedical and a biopsychosocial
approach to patient care is that the basis for the decisions and the
means of their implementation be rendered in a consciously rational
manner (Reiser 62). The doctor's task then becomes identifying the
patient's psychological strengths and social resources and helping
him or her to make the best use of them. At the same time, the
doctor must also provide the emotional and practical support needed
to help compensate for a patient's existing weaknesses and
deficiencies. The decisions made and the actions taken by the
physician must maximize health while at the same time minimize
needless upset. In essence, the physician's approach to the patient
may be adapted to minimize distress and encourage self-confidence
and peace of mind.

Scientifically, this requires a different level of conceptualization
and a different strategy of investigation. Physicians must be
committed to explaining the disease fully rather than just diagnosing
it. Physicians must describe how the disease will affect all body parts
of the person, instead of just prescribing medication to treat it. Most importantly, physicians must include the patient in the decision-making process rather than making all the medical decisions alone.

IX. CARE PLAN FOR AN ALZHEIMER'S PATIENT USING THE BIOPSYCHOSOCIAL MODEL IN A HOSPICE PROGRAM

I have established the differences between a normal adult brain and the brain of an Alzheimer's disease patient. I have also examined hospice care for terminally ill patients and the use of the biopsychosocial model to treat those patients. The question then arises, How would the biopsychosocial model work specifically for Alzheimer's disease patients? To answer this question, I will examine the characteristics necessary for patients to benefit from the use of the integrated biopsychosocial model of treatment in a hospice program during the three stages of Alzheimer's disease set forth in Section IIIA. Because an Alzheimer's patient suffers from emotional, psychological, and social problems, in addition to the biological difficulties that are normally associated with the disease, it is essential that all these factors be taken into consideration when developing a care plan for the patient. While the biopsychosocial
model was developed by Engel, it has never been applied to an Alzheimer's disease patient. I will refer to the proposed application of the biopsychosocial model in the context of Alzheimer's disease as the "proposed biopsychosocial model" from this point forward.

One of the first problems encountered by an Alzheimer's disease patient is the stigma that sometimes follows the diagnosis of the disease. Because Alzheimer's disease has become a household word, individuals frequently have preconceived notions about how the disease process will work in every patient. Too many times people view Alzheimer's disease as a mental illness and therefore believe that the patient is merely going "crazy on his or her own accord," rather than suffering from a debilitating disorder. Other times, people automatically assume that an Alzheimer's patient is unsafe to him or herself and others as well. In fact, as we have seen, a patient in Stage 1 of Alzheimer's disease is easily reoriented to reality and is no threat to anyone. Adoption of the biopsychosocial model would help to overcome such blanket stereotypes by allowing each person and his or her particular circumstances to be taken into consideration when developing a care strategy that best helps the patient through
all aspect of the disease process. The biomedical model, on the other hand, does not allow for individual consideration but instead relies on general classifications of all Alzheimer's patients and treatment strategies derived from such categories.

In fact, the biomedical model only addresses clinical problems that a patient experiences in Stage 1, such as memory loss and muscle deterioration. As we have seen, a person in Stage 1 of Alzheimer's disease frequently suffers from poor short-term memory associated with lower levels of acetylcholine in the diseased brain. To help treat this deficiency, both models would use acetylcholinesterase inhibitors to prevent further breakdown of acetylcholine. The treatment of the patient using the biomedical model ends here. While this treatment may seem aggressive from the biopsychosocial standpoint, it actually helps the patient to communicate more clearly with the outside world and thus lessens the emotional stress placed on the patient.

My proposed biopsychosocial model suggests continued care of the individual by taking into consideration the psychological state of the Stage 1 patient. Because a patient who recognizes that he or she
is losing some memory could become irritated and upset, it is important to deal with the varying ranges of emotion by recognizing how this fluctuation affects the health and well-being of the diseased patient. Health care professionals using the proposed biopsychosocial model would compensate for the emotional impact on the health of the patient by training the caregivers to familiarize the patient with his or her surroundings. It might seem like the patient should already be familiar with his or her surroundings, however a Stage 1 patient has difficulty accommodating to any change. Thus, an activity such as moving the living room furniture could cause enough disorientation that the Stage 1 patient might be confused and upset. A caregiver who can reorient the patient by showing him or her exactly where the favorite chair has been moved is much more likely to have positive interactions with the patient.

To ease other problems associated with memory loss in Stage 1, it is also important for caregivers to provide the patient with word clues while in conversation with him or her. For example, if a guest comes to visit whom the patient has not seen for a long time, the caregiver should reintroduce the patient to the guest by mentioning
the relation of the visitor to the patient in addition to the name. A simple extra word or two can usually help a patient remember the person or situation, thus creating an atmosphere of familiarity.

In addition to training for word clues, the proposed hospice program using the biopsychosocial model would offer extensive training to the family members to help them understand the effects of the disease on the family system. Providing this information in advance allows for family members to feel more confident in dealing with the patient. If a family caregiver is at ease, the quality of care is likely to rise to a higher level of emotional support.

In addition to allowing the caregiver to be at ease, the proposed biopsychosocial model also helps the patient become more at ease with the symptoms that he or she is experiencing. For instance, an Alzheimer's disease patient in Stage 1 also suffers from an impaired ability to acquire new information. This deficiency might also be interpreted as the difficulty in facing new situations that accompanies memory loss. While this particular manifestation of the disease can be one of the most frustrating for a patient, he or she should be able to function at an adequate level in society as long as he or she is not
faced with new environments frequently. If a patient is accompanied by a familiar person on necessary trips to new places, the patient can often be easily oriented by the companion. This reorientation can occur if someone intervenes; however, the Stage 1 patient is generally incapable of doing the reorientation on his or her own.

A Stage 1 patient who suffers from anomia can also find relief through treatment with the proposed biopsychosocial model. Because Engel's biopsychosocial model recognizes that all levels, from the molecule to the organ to the two-person relationship, interconnect and affect each other, it is easy to see that a patient who has difficulties finding the correct word for something would be greatly assisted by the guidance and verbal cues of a caregiver. To be effective, the caregiver must respect the person's dignity and feelings when providing this assistance. The fact remains that the more people from various fields who are involved in the care of a particular individual, the more likely that the patient will have the support and care necessary to overcome problems like anomia in Stage 1 of Alzheimer's disease. While it might seem that too many people involved in the care of a patient could be overwhelming, the
Alzheimer's disease patient views each interaction individually, as the memory impairment prevents the association of events. Thus, the patient would not even know that he or she had seen so many people.

The proposed biopsychosocial model in a hospice environment makes transitions in choices for care as the patient progresses through the disease process. In Stage 2 of Alzheimer's disease, the symptoms have progressed beyond the point where simple interventions can help. Because the patient is much more confused and has many more difficulties communicating with other people, my proposed biopsychosocial model calls for health care professionals to provide a more proactive approach to care at this stage. The patient may be treated by a speech therapist, one of the members of an interdisciplinary team, for problems with agnosia, apraxia, and aphasia. These treatments include weekly meetings and verbal exercises to help the patient overcome these communication difficulties.

Additionally, when speech becomes too severely impaired, the patient may still be able to communicate by writing or typing.
messages. A simple intervention such as providing a typewriter allows the patient to feel adequate in conveying his or her thoughts and ideas while easing the stress on the family members trying to interpret different sounds. Because problems with speech are often associated with hearing difficulties, a hearing aid can benefit the Alzheimer's disease patient by providing assistance with distinguishing certain high frequency sounds from each other. This device not only helps the patient feel more relaxed, but also helps the family relate and communicate better with the patient.

An Alzheimer's disease patient in Stage 2 also usually suffers from a severe impairment of his or her judgment. My proposed biopsychosocial model calls for counselors and social workers to become involved with decision-making processes that involve matters of significant importance. For example, the counselors would advise the patient about the advantages and disadvantages of signing a living will to specify palliative treatment choices before the patient dies. This advising method helps the patient to make a rational, informed judgment despite the impairment due to Alzheimer's disease. In addition, the counselors provide the family members with
support and guidance concerning how to handle the behavioral changes of the patient.

In Stage 3 of Alzheimer's disease, the patient frequently becomes physically impaired. This impairment involves unsteadiness, repeated falls, and reduced mobility. Sometimes these impairments can be addressed by extensive work with a physical therapist. The physical therapist provides exercises that strengthen and improve muscle coordination. In addition, an occupational therapist is often employed to assist in modifying the tools of everyday living to the needs of an Alzheimer's disease patient. For example, the occupational therapist could modify a spoon by making the handle thicker, allowing the patient to hold the spoon and thus feed him or herself easier.

An Alzheimer's disease patient in Stage 3 also suffers from severe impairment of all cognitive functions. While these deficiencies are not easily accommodated for by any model, the biopsychosocial model does provide an understanding of the one-on-one care that the patient requires.
X. CARING FOR THE FAMILY MEMBERS

In addition to the above-mentioned services for patients, the proposed integrated biopsychosocial model would provide many services to family members. Keeping the levels concept in mind, we can see how the sociological environment of a diseased patient is greatly affected by the status of his or her family environment. The biopsychosocial model calls for health care professionals to provide support for family members by informing them first and foremost about the disease process to make them aware of the changes that will likely occur.

Second, the social workers and counselors who support the biopsychosocial model provide grief counseling for the family members as the patient is dying rather than only after the death has occurred. When the family members have this counseling, they are better able to handle their emotions and to express "goodbyes" to the patient. This healthy way of grieving takes some of the fear out of the dying process for family members.

Third, the biopsychosocial model encourages family members to be active in the decisions for treatment of their loved ones when
the patient can no longer make those decisions on his or her own. The dependence on a loved one creates an atmosphere of comfort during the early stage of the disease when the patient knows that he or she will be watched closely by a trusted person.

Finally, the biopsychosocial model, as applied in a hospice program, also creates healthy boundaries for in-home caregivers by providing respite care to the families. This respite care allows for the family members to have some time to themselves rather than having a patient relying on them twenty-four hours a day, seven days a week.

XI. BENEFITS AND DRAWBACKS OF TREATMENT USING THE BIOPSYCHOSOCIAL MODEL IN A HOSPICE PROGRAM

Treatment of terminally-ill patients, the side-effects of their diseases, and their family members require a specialized method that physicians using the proposed biopsychosocial model in a hospice program can provide. The advantages to care by an interdisciplinary team of health care professionals are evident. The team approach allows for all people involved in the care of a patient to have input in the general treatment decisions. The doctor is no longer looked upon
as the sole decision maker but instead as a peer to the other members of the team. While the physician still controls the medical decisions, spreading the responsibilities over a number of people relieves stress from the burden of being the sole person responsible for decisions regarding treatment.

Each health care professional also is relied upon to give his or her expertise in a particular field of specialty rather than being called upon rarely, if at all. Empowering each member of the team to specialize in his or her field and to cooperate with other health care professionals provides the patient with the most comprehensive, high-quality care possible.

The disadvantages of the model are practical ones. As the number of adults with Alzheimer's disease and other terminal illnesses increases, the need for more health care professionals is evident. The time involved in using an integrated approach to treatment is enormous due to the number of people who are involved in the care of the patient. Thus, the cost of having this many people involved in the care of one patient could be great. Scheduling care plan meetings with professionals from different fields can be a
logistical nightmare. The physician is likely to have the most difficulty with the biopsychosocial model of health care because it takes the sole control away from him or her. This loss of control can affect a physician's willingness to work as an equal rather than as a superior.

Some would argue that the biopsychosocial model imposes an impossible demand on the physician. Opponents say that the demand on the physician's time, the expectation of information competence needed for referral, and the drain on the emotional levels of the physician and his or her family are too complicated to overcome.

However, the model provides a conceptual framework and encourages a multi-faceted way of thinking that enable the physician to act compassionately in areas that until now were excluded from a clinical approach. In a sense, the proposed biopsychosocial model supports a complete philosophical reorientation from the dualist/reductionist mode of the biomedical model. To support such a reorientation from this model, the biopsychosocial physician is expected to have a moderate knowledge of the principles, language, and basic facts of the other disciplines involved in patient care;
however, he or she is not expected to be an expert in any of the fields. Tarnas envisions a shift from the traditional way of thinking by presenting, "the developing perspective...that the relation of the human mind to the world was ultimately not dualistic but participatory" (433). This new perspective benefits the patient because the whole person and his or her environment is taken into consideration. The dignity that this kind of care provides during the dying process is rooted in the Christian compassion found in Jesus' teaching on hospitality in the Bible.

The proposed biopsychosocial model is valid even in light of the time constraints on health care professionals because sharing the responsibility of treating the patient can lead to less time individually in the physician-patient relationship, but more time for the physician to see multiple patients. In addition, the negative attitudes of physicians toward participating in an interdisciplinary team could be modified if curricular changes in medical school educations occurred. Traditionally, physicians have been trained to "play God." That is, they are taught from the first day of medical school that they have all the right answers to medical problems and that they always know
best about decisions concerning treatment. One can see this attitude demonstrated when a medical student from the first day of medical school is referred to as "Doctor" before he or she has had a day of training. This premature conferral of a title implies power and knowledge that in fact are not present. This general attitude of superiority eventually may inhibit the work of the proposed interdisciplinary team and needs to be overcome for the benefit of the patient. Medical school educations must be focused on fostering the cooperative efforts of all members of the health care professions, not just of the physicians. While physicians are trained to work with teams in such situations as emergency surgery, the kind of teamwork used there must be extended to daily care of the terminally ill. This extension is achieved in the proposed biopsychosocial model.

Edmund Pellegrino supports this extension of teamwork when he calls for this imperative: “Medicine must become more humane, more infused with the spirit of liberal studies, and more willing to address itself to the metaphysical dichotomy between the arts and the sciences. Without it, medicine can be reduced to what the severest critics say it has already become--just another technology” (20). The
apparent dualism between the arts and the sciences needs to be overcome to provide an integrated approach to health care treatment. Until the dualism is reconciled, my proposal for a biopsychosocial model cannot be truly established because too many people will not recognize the benefits of such an approach. Thus, the patient will once again suffer from the preconceived notion of the physician that the arts and sciences cannot be unified.

To help accomplish this unification of the arts and the sciences, I believe that the educating bodies of physicians must advocate for a significant curricular change. The change must come from the physicians themselves so as to be accepted by the medical community at large. The change must not only be made in terms of the content of the courses taught to physicians but must also include a change in the manner in which they are taught.

Course content needs to be addressed. For example, in 1989, only one-third of the medical schools in the United States taught a mandatory ethics course (Pellegrino 27). Imagine what that means—two-thirds of the doctors in this country have not had formal medical ethical training and yet these individuals are making life and death
decisions every day in their jobs. The best solution would be to teach a fundamentals of ethics course and then to weave ethical dilemmas into the clinical teaching so as to show the medical students how the situations apply in real life.

Courses that provide integrated approaches to health care provide benefits because the physician-to-be is trained to look at things from a wide scope. Also, medical students who have experience with patient interaction as they are learning the clinical skills for assessment would develop a better bedside manner than those trained in a classroom for two years before exposure to a patient.

Until this curricular change occurs, the medical schools in the country will produce physicians trained to treat people on the basis of the biomedical model which clearly prevents an integrated approach to health care. Without this integrated approach to health care, the patient remains a victim of a system that has increased life expectancy only by treating the disease and has neglected treating the whole person.
While some physicians in the medical community might balk at this effort to integrate health care for the benefit of the patients, they should be reminded of words from the Hippocratic Oath that they swear to uphold before practicing medicine: "I will prescribe regimen for the good of my patients according to my ability and my judgment and never do harm to anyone." This promise is the clearest support for the implementation of the proposed biopsychosocial model. Protecting the greater good of the patient should be the first priority of the physician, and subscribing to the values of the proposed biopsychosocial model encourages the physician to do just that. Because a physician is a human being who makes mistakes just like everyone else, prescribing according to the best "of my ability and my judgment" might mean to specialize in a particular field and then offer his or her services to an interdisciplinary team and soliciting the ideas of others on the team. Being part of a health care team allows for a check and balance system in the treatment of a terminally ill individual.

Once the physicians are fully committed to the biopsychosocial approach, families must also become committed. With the wide-
spread geographical locations of many family members, and the need to work full-time to support a family, it might seem impossible to treat an Alzheimer's patient at home. However, through a thorough use of the community resources, a program for home health care could be implemented. A patient might go to an Adult Day program while the primary caregiver works. Then a hospice volunteer could come in at night to give the family member time off to go to a child's school play. One must not assume that the seemingly impossible just can't happen; we are merely challenged to become more creative with the resources we have. The proposed biopsychosocial model helps to identify and utilize the community resources.

I believe that, because death frightens people, many think that dying belongs in hospitals and the dead belong funeral parlors. However, by forcing the dying patient to leave the comfort of his or her surroundings, one merely alienates the patient and takes away from his or her dignity by insisting that the death take place in an institutional setting. There is an old saying that goes, "You are a product of the environment that you are in." Even patients who are in a coma respond to the sound and touch of familiar loved ones. The
same would hold true for an Alzheimer's patient; he or she might not know the surroundings, but the patient should respond to the same signals as someone in a coma.

The proposed biopsychosocial model also prevents the apparent alienation of the patient and allows him or her to die where it is most comfortable. While not all patients would want to die at home for fear of the stress on the family, my proposed biopsychosocial model merely says to put the patient's desires first.

XII. CONCLUSION

People who suffer from Alzheimer's disease undergo one of the most painful processes: realizing the fact that the mind is becoming dysfunctional, watching the deterioration occur, and knowing that there is nothing that can be done to stop or prevent it from happening is emotionally devastating to say the least. But there are support systems currently in place that can help to ease the physical pain of the symptoms. The Alzheimer's Association and hospice programs create support systems for patients and families alike that offer treatment of the whole person.
The apparent dualism between the arts and the sciences must be reconciled and a new health care model drawn from the reconciliation. The approach to patient care must become a participatory one rather than a dualistic one. This humane approach is rooted in the concepts of the Roman Catholic Church's "Respect for the Dignity of the Person" doctrine. In addition, the need to extend hospitality, and thus a hospice setting for the proposed approach, can be found in the Bible in both the Old and New Testaments. The importance of the biopsychosocial model of health care in a hospice program has been demonstrated, with the benefits far outweighing the disadvantages. Using my proposed model, the terminally ill patient, but particularly the Alzheimer's patient, has his or her biological, psychological, emotional, social, and spiritual needs cared for. Death can then become dignified. This respect for all facets of the individual is important because we all want to die in a dignified manner. By providing this model of care, we are doing unto others as we would have them do unto us.
BIBLIOGRAPHY


