DAILY ORIENTATION PROGRAM'S EFFECT ON HOSPITALIZED ELDERLY MEDICAL PATIENTS PREDICTED TO BE AT RISK FOR AN ACUTE CONFUSIONAL STATE

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ABSTRACT

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Hospitalization for many elderly patients produces stimuli which may not be easily integrated with previous experiences. A response to these stimuli by the elderly patients has been linked to the development of acute confusional states (ACS). Therefore, the study's purpose was to examine the effect of a daily orientation program on hospitalized elderly medical patients predicted to be at risk for developing ACS.

Between October, 1986, and February, 1987, an experimental study using a 2 x 2 x 5 factorial design with repeated measures was conducted in a 132-bed federal hospital located in the southwestern United States. A sample of 40 alert volunteer subjects was selected from a population of hospitalized male United States veterans 65 years of age or older.

On admission day, medical patients admitted to the study were randomly assigned either to an experimental or control group and were given both the Confusion Risk Factor Interview (CRFI) and the Mini-Mental State Examination (MMSE). The CRFI determined if the subjects were at high or low risk level for ACS, and the MMSE determined mental status. Subsequently, in the mornings on the next four consecutive hospital days, the high and low risk experimental subjects received the daily orientation program. Each evening on the same four days, all subjects were given the MMSE. The study design concluded when 20 had been assigned to the experimental group and 20 to the control group and the subjects were evenly divided into the two risk levels.

A three-factor analysis of variance with repetition over one factor was employed for the study. No main effects were found; however, one simple main effect between the treatment levels and risk levels was found. Therefore, Newman-Keuls technique was applied to the daily mean MMSE scores.

No acute confusion occurred among the subjects in any group; however, the experimental low risk group had significantly better mental status scores than the control low risk group. No such effect was found among the high

risk groups. In this investigation the elderly patient at low risk for ACS improves in mental status with a daily nursing intervention.

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CHAPTER 1

INTRODUCTION

Hospitalized elderly persons are not only physically ill but are rushed through a busy hospital system where they see many unfamiliar people and machines and experience changes in sleeping and eating habits. These dramatic changes produce unusual stimuli which may not be integrated easily into an elderly person's previous experiences (Caldwell & Hegner, 1972; Wahl, 1976; Wolanin & Phillips, 1981). The response to hospitalization for many elderly patients is linked to the development of acute confusional states (Wahl, 1976; Wolanin & Phillips, 1981). Since acute confusional states (ACS) are associated with a high mortality rate, nurses must find the elderly patients at risk and use a progressive intervention to contribute to the prevention of ACS (Foreman, 1986). A nursing intervention for the hospitalized elderly patient predicted to be at risk for ACS will be examined in this study.

Problem of Study

The problem of the study is "What is the effect of a daily orientation program on hospitalized elderly medical

patients predicted to be at risk for developing an acute confusional state?"

Justification of the Problem

Elderly patients occupy 38% of all beds in non-federal, short-stay hospitals in the United States (National Center for Health Statistics, 1980). Of the elderly medical-surgical patients cognitively intact on hospital admission, between 30% and 50% may develop ACS at some time during hospitalization (Foreman, 1986; Gillick, Serrell, & Gillick, 1982). The development of ACS in an elderly patient is stressful for the patient and the family and causes frustration among the hospital staff (Castledine, 1982). However, more serious consequences result when the hospitalized elderly patients become confused. One of the most significant obstacle in the medical treatment of the elderly person is development of ACS (Remakus & Shelly, 1981). Furthermore, ACS in an elderly person must be considered a poor prognostic sign (Lipowski, 1983). Among the elderly patients who develop confusion, Hodkinson (1973) found that one in four died within a month of admission. This mortality rate was twice as high as that of nonconfused patients. In support for Hodkinson's findings, Seymour, Henschke, Cape, and Campbell (1980) found in their study that 18% of hospitalized

confused elderly patients died. Finally, Freedman (1983) stated that confusion among the elderly patients is a costly geriatric health problem in both loss of lives and financial burdens.

Although acute confusion complicates hospitalization and may result in death, little research exists concerning ACS in the elderly patient. In fact, no official statistics on the frequency of confusion exist in the United States although studies have been conducted regarding the occurrence of ACS (Lipowski, 1980a). In addition, epidemiological data on confusion among the elderly are extremely limited, and information concerning the sociological and ethnic factors is basically nonexistent (Liston, 1982).

In addition to limited research, numerous labels for confusional states are found throughout the literature. For example, delirium, brain failure, and organic brain syndrome also are used for the term confusion (Foreman, 1986). Generally, acute states of confusion are separated from chronic confusion or dementia although the onset and course of both forms are unclear clinically (Foreman, 1986; Paterson, 1984). Sugden and Saxby (1985) stated that acute confusion may occur in demented patients; however, dementia is quite different from ACS.

Current nursing research focusing on ACS may be divided into four approaches: (1) observation, (2) prediction, (3) prevention, and (4) treatment. Wolanin (1977), using the observational approach, recorded and separated behaviors of institutionalized confused persons charted by both physicians and nurses. Wolanin (1977) established the dimensions of confusion into two separate behavioral categories: cognitive inaccessibility and social inaccessibility. Dodd (1978) also used observations to describe and classify confusion into three levels: disorientation, delirium, and confusion. Finally, Nowakowski (1980) used case studies to describe the phenomenon she labelled as disorientation.

The second research approach, prediction, is a step beyond simple description or observation (Foreman, 1986). Prediction can offer the nurse the opportunity to intervene prior to the development of ACS (Foreman, 1986). However, research has not established the predisposing factors necessary or sufficient for the development of ACS. In current research, three areas are being examined in various combinations and relationships to ACS: (1) physiological states, (2) psychological states, and (3) environmental factors (Foreman, 1986).

Only one nursing study has focused on prediction of ACS in the hospitalized elderly patient (Williams,

Campbell, Raynor, Musholt, Mlynarczyk, & Crane, 1985). Two models were developed for predicting ACS. The first model used admission variables for predicting confusion among elderly postsurgical hip patients. A second model used treatment and clinical progress information to predict confusion on a day-to-day basis. Among the elderly surgical patients, 51.5% experienced confusion postoperatively. Age, errors on a mental status examination, and pre-injury hospital activity levels were found to be significant in the first model used to predict confusion. In the second model, advanced age, errors on the mental status examination, and urine elimination dysfunction were found to be significant in predicting confusion.

Foreman (1986) states that the Williams et al. (1985) study suggests that core predictors for ACS may be present. However, the ability of the models to predict confusion was not as accurate as clinical experts. Predictors were not derived from the judgment of the clinical experts but from mathematical models (Foreman, 1986). Consequently, Foreman (1986) questions the value of the variables derived by Williams et al. (1985). Presently, no other published instrument or model that attempts to predict the occurrence of ACS in hospitalized patients could be located by this researcher.

Prevention, the third approach in research, has been studied on a limited basis by nurses. However, suggestions for preventing ACS appear regularly in articles and books concerning hospitalized geriatric patients (Burnside, 1980; Caldwell & Hegner, 1972; Foreman, 1984; Heiple, 1985; Nowakowski, 1980; Wahl, 1976; Weymouth, 1968; Wolanin, 1983). Williams, Campbell, Raynor, Mlynarczyk, and Ward (1985) prevented the occurrence of confusion in some elderly hip fracture patients with no known history of mental dysfunctions by focusing on six problem areas: "strange environment, altered sensory input, loss of control and independence, disruption in life pattern, immobility and pain, and disruption in elimination patterns" (p. 332). ACS were reduced from 51.5% in the control group to 43.9% in the experimental group by providing nursing interventions specific to the problem areas.

The final approach in research, treatment, is a shared effort by the entire health team (Lipowski, 1983; Wolanin & Phillips, 1981). As the organic causes are identified and corrected, if possible, the nurse provides a supportive environment and symptomatic care for the confused patient (Foreman, 1984; Wolanin & Phillips, 1981). Reality orientation used by nurses and other therapists is one type of treatment designed to reduce confusion in elderly

persons (Burton, 1982). Effectiveness of this treatment, however, is in question because the results and subjects are not comparable across studies (Burton, 1982). Furthermore, Williams et al.'s (1985) study of hospitalized elderly patients had limited success in using specific nursing intervention with reality orientation in significantly reducing ACS (Foreman, 1986). Presently, no specific effective protocol for treating ACS can be found in the literature.

In conclusion, little is understood or known about ACS. Foreman (1986) states that limited research effort toward the confused elderly patient has been made because the topic is uninteresting to the researchers. In addition, many problems exist in the current research base because samples are small, measurement techniques lack standardization, and the etiology and characteristics of ACS vary among individuals. However, if elderly patients occupy 38% of the hospital beds in the short-stay hospitals in the United States (National Center for Health Statistics, 1982), the phenomenon of ACS will not disappear. Nursing research can add to the understanding of ACS and eventually may help nurses working in the hospital to predict the elderly patient at risk for ACS and to intervene successfully. Consequently, this study with a theoretical base will focus on two of the four research

approaches discussed: prediction and prevention of ACS among elderly medical patients.

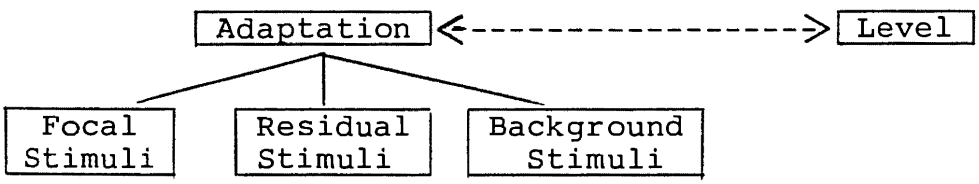
Theoretical Framework

The theoretical foundations for this study are based on the adaptation-level theory proposed by Helson (1964). The theory focuses on factors which are both internal and external to an individual. The factors affecting an individual are stimuli which are divided into three main classes: (1) The focal stimuli are factors in the immediate environment; (2) The background stimuli are past sensory and sociological experiences; and (3) Residual stimuli are the internal physical and emotional factors of the individual. These three classes of stimuli are pooled to determine the adaptation-level of an individual. Therefore, the product of both internal and external factors is regarded as adaptation, an active dynamic adjustment process. Since adaptation is an active process, the greater the impact of stimuli on the individual, the greater the response to it. Hence, any responses to the stimuli reflect the combination of the stimuli and the state of the individual (Helson, 1964).

Adaptation is determined with level, a measurement of activity in units of rate and amount. Higher rates are taken to indicate greater amounts. Therefore, an

individual in space and time uses all dimensions of stimuli to formulate a level of activity. Thus, a proposition of this theory is that "every state of adaptation corresponds to a given level of activity. Conversely, a level of activity is a reflection of the state of adaptation" (Helson, 1964, p. 55). The concepts of stimuli, adaptation, and level are diagrammed in Figure 1.

Figure 1. Diagram of the adaptation-level theory.



Activity level is revealed through the nervous system, hormonal activity, and/or sensorimotor activity. An individual's level of activity also is reflected by sensory processes, judgement, affectivity and expression of attitudes, learning, habits, intelligence, and thinking. Level of activity may be expressed using numerous measurements such as physical units, frequency of responses, numbers of individuals answering in a specific way, scale values from frequencies or physical measures, or any other method used in present day research. Measurement of an activity level for any given variable is not identical, especially if various formulas are used by

different researchers (Helson, 1964). In the field of psychology, Helson (1964) used the example of various personality types because they are identified by activity levels.

Adaptation-level is determined by the pooling of the three classes of stimuli and measured by the level of activity. Helson (1964), however, stated the class of stimuli is far less important than the contribution of that stimuli to the level of activity. Therefore, actual division of stimuli is managed by the researcher and depends on the organization of the study. For example, what is background stimuli one moment may become focal stimuli in another moment. Assignment to classes is made by the role the stimuli play in the study (Helson, 1964).

Stimuli affect an individual adapted to events that have occurred in the past. An individual's internal state depends on previous internal conditions and on external situations. An individual's methods of adaptation to the environment and organic changes depend on attitudes, values, ways of structuring experience, judgements of physical, aesthetic and symbolic objects, intellectual and emotional behavior, learning, and interpersonal relationships (Helson, 1964).

Finally, adaptation-level is a weighted mean of both external and internal stimuli. Therefore, sufficient

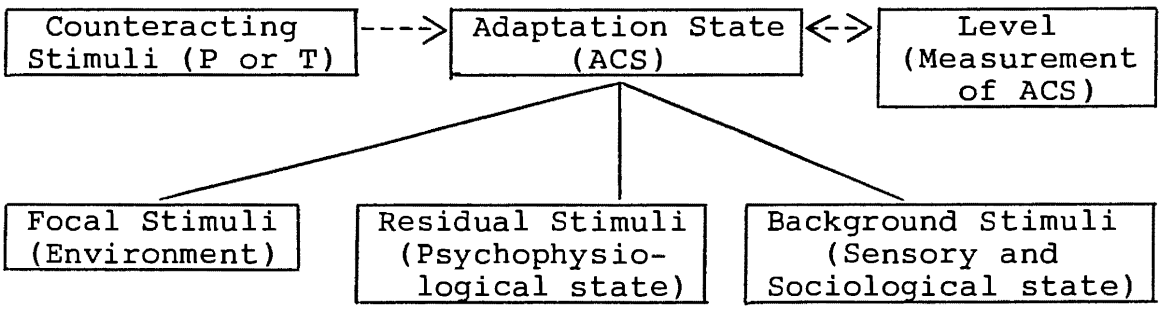
stimuli from one class may be offset by sufficient stimuli from the other classes. Some may even serve to prepare an individual to react to a future stimuli. The individual utilizes stimuli and information received in order to adapt to the current situations. Adaptation, however, is a mechanism to introduce the individual to changes in the environment. If the same stimulation is continuous, adaptation counteracts the stimulation's effects or neutralizes the stimulation (Helson, 1964).

Based on Helson's (1964) framework, the identification and measurement of variables related to acute confusional states (ACS) is possible. The three types of stimuli are factors related to development of ACS and may be classified into an individual's present environment, past experiences, and physical and psychological state. In addition, ACS in a hospitalized individual may be viewed as reflections of a state of adaptation and as a measurable level of activity. Thus, the scores obtained from instruments used to measure the traits of ACS may reflect the individual's state of adaptation.

The therapeutic techniques used in preventing or treating ACS may be pictured as the counteracting stimuli which assist an individual to adapt to intense stimuli produced by hospitalization. Figure 2 illustrates the

phenomenon of ACS and its prevention or treatment using Helson's framework.

Figure 2. Phenomenon of acute confusional state and its prevention or treatment (P or T).

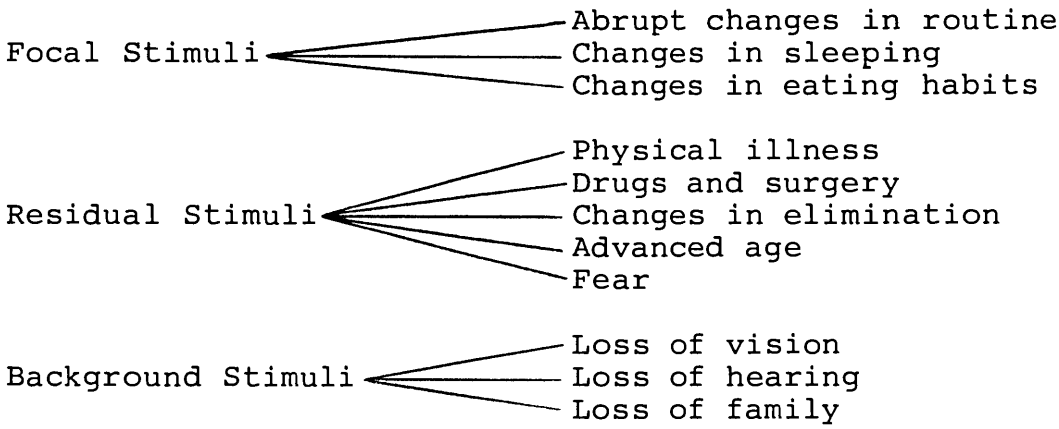


The specific focal, residual, and background stimuli linked to phenomenon of ACS among elderly persons are identified in the literature. A short discussion and illustration in Figure 3 provide the view of this researcher.

Intense environmental stimuli such as abrupt changes or alterations in routine daily patterns and changes in sleeping and eating habits are found in elderly persons experiencing ACS (Caldwell & Hegner, 1972; Castledine, 1982; Foreman, 1984; Patrick, 1967; Trochman, 1978; Wolanin & Phillips, 1981). Examples of this type of environmental stimuli include relocation into a new residence or hospitalization (Wolanin, 1978).

Physical and psychological changes are stimuli related to the development of confusion. Physical illnesses such

Figure 3. Adaptation-level stimuli and variables related to ACS.



as congestive heart failure, infections, renal disease, nutritional deficits, and electrolyte imbalances are believed to cause acute mental changes in the elderly (Caldwell & Hegner, 1972; Castledine, 1982; Foreman, 1984; Freedman, 1983; Heiple, 1985; Maletta, 1982; Morris & Rhodes, 1972; Remakus & Shelly, 1981; Sugden & Saxby, 1985; Wahl, 1976).

Williams et al. (1985) studied 57 elderly patients with no previous mental disorders in the hospital for fractured hips and discovered that stimuli such as recent physical injuries, urinary catheters, incontinence, and urinary retention related to an increase in confusion levels. Alterations in elimination and pain (Wolanin & Phillips, 1981) and low levels of activity prior to hospitalization have been found to be stimuli for the development of ACS (Williams et al., 1985). Wolanin (1977)

correlated a slightly elevated serum blood urea nitrogen with confused behavior in her study of 30 patients diagnosed with confusion. Carino (1976) found in her study of 20 intensive care unit (ICU) patients that the disoriented patients appeared fearful and withdrawn, and the oriented patients appeared confident and cooperative. In addition, Raymond, Conklin, Schaeffer, Newstadt, Matloff, and Gray (1984) found that the mental acuity of 31 coronary artery bypass surgical patients dropped significantly more than 16 other patients who underwent less dramatic cardiovascular surgery.

Advanced age and ingestion of specific drugs also are related to the development of ACS. Carino (1976) found in an intensive care hospital unit that the mean age of the 10 confused patients was 75.5 as compared to the 62.2 for 10 nonconfused patients. Chisholm, Deniston, Igrisen, and Barbus (1982) and Morse and Litin (1969) found the elderly persons in a general hospital were the patients who were confused. Frequently, elderly patients are prescribed drugs known to be intense stimuli for ACS (Ahronheim, 1982; Comfort, 1979; Freedman, 1983; Heiple 1985; Lipowski, 1980a; Liston, 1982; Shaw, 1982; Wolanin, 1983).

Background stimuli or the sensory and sociological factors are linked also to the development of confusion. Carino (1976) found that 100% of the patients who became

disoriented in an intensive care unit had both hearing and vision losses and did not use corrective sensory devices. In Wolanin's (1977) study of 30 chronically confused elderly patients, hearing and visual losses were present among the subjects. This finding also is supported by Hodkinson (1973) who found both hearing and visual impairment associated with decreased scores on a mental status examination. Sociologically, Carino (1976) found that 70% of the confused patients in her study were single or widowed. Only 40% of the disoriented patients had visits from family as compared to 100% of the oriented patients.

The characteristics of ACS as the level of activity in adaptation-level theory also are described in the literature. Acute confusional states as defined by the World Health Organization (1978) and the term delirium defined by the American Psychiatric Association (APA) (1982) are viewed as synonymous; therefore, the characteristics of both labels are used in this study as level of activity of ACS.

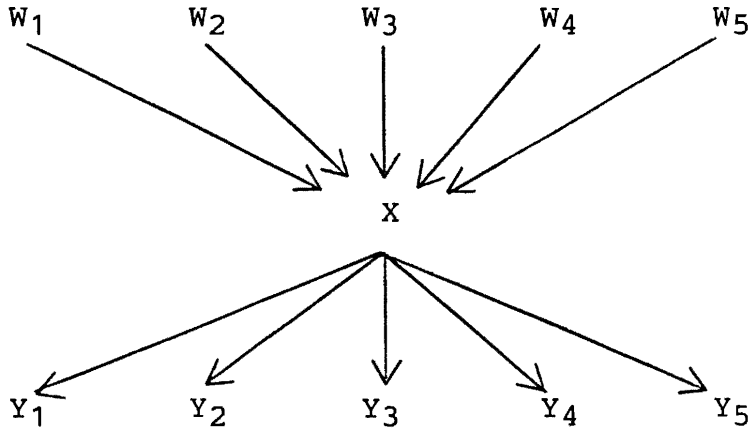
One level of activity in ACS is perceptual disturbances such as hallucinations and misinterpretation or illusions are activities displayed by an individual with ACS (APA, 1982; Ban, 1978; Caldwell & Hegner, 1972; Castledine, 1982; Freedman, 1983; Morris & Rhodes, 1972;

Sugden & Saxby, 1985; Trochman, 1978; Weeks-Shaw, 1900; Wolanin, 1983). Incoherent speech may accompany perceptual disturbances as an activity which characterizes an acute confusional state (APA, 1982; Caldwell & Hegner, 1972; Freedman, 1983; Foreman, 1984; Maletta, 1982; Morris & Rhodes, 1972; Wolanin, 1983).

Other activities related to ACS are a disturbance in sleep-wakefulness cycle with insomnia or drowsiness (APA, 1982; Ban, 1978; Burnside, 1981; Freedman, 1983; Patrick, 1967), disorientation to time, place, and person, and a lack of recent memory (APA, 1982; Caldwell & Hegner, 1972; Maletta, 1982; Morris & Rhodes, 1972; Shaw, 1982; Sugden & Saxby, 1985; Wolanin, 1983). Other characteristic activities of ACS are its quick development and fluctuation of intensity over time (APA, 1982; Bayne, 1978; Burnside, 1981; Caldwell & Hegner, 1972; Freedman, 1983; Wolanin, 1983). ACS as a state of adaptation with specific stimuli and levels of activity were arranged into a model using Blalock's (1969) format of combining the inventory of causes with the inventory of effects. In this case, the causes are the stimuli related to ACS, and the effects are the activity levels displayed by an individual with ACS. Figure 4 presents the model of acute confusional states.

Although levels of activity are described vividly in the literature, methods of measurement of the activity are

Figure 4. Model of Confusion (X) combined causes (W) with the inventory of effects (level of activities) (Y) of the phenomenon of confusion. W_1 = focal stimuli (environmental factors); W_2 = residual stimuli (physical factors); W_3 = residual stimuli (psychological factors); W_4 = background stimuli (sociological factors); and W_5 = background stimuli (sensory factors). X = confusion. Y_1 = perceptual disturbances; Y_2 = disorientation; Y_3 = memory loss; Y_4 = rest/sleep disturbance; and Y_5 = fluctuation over time.



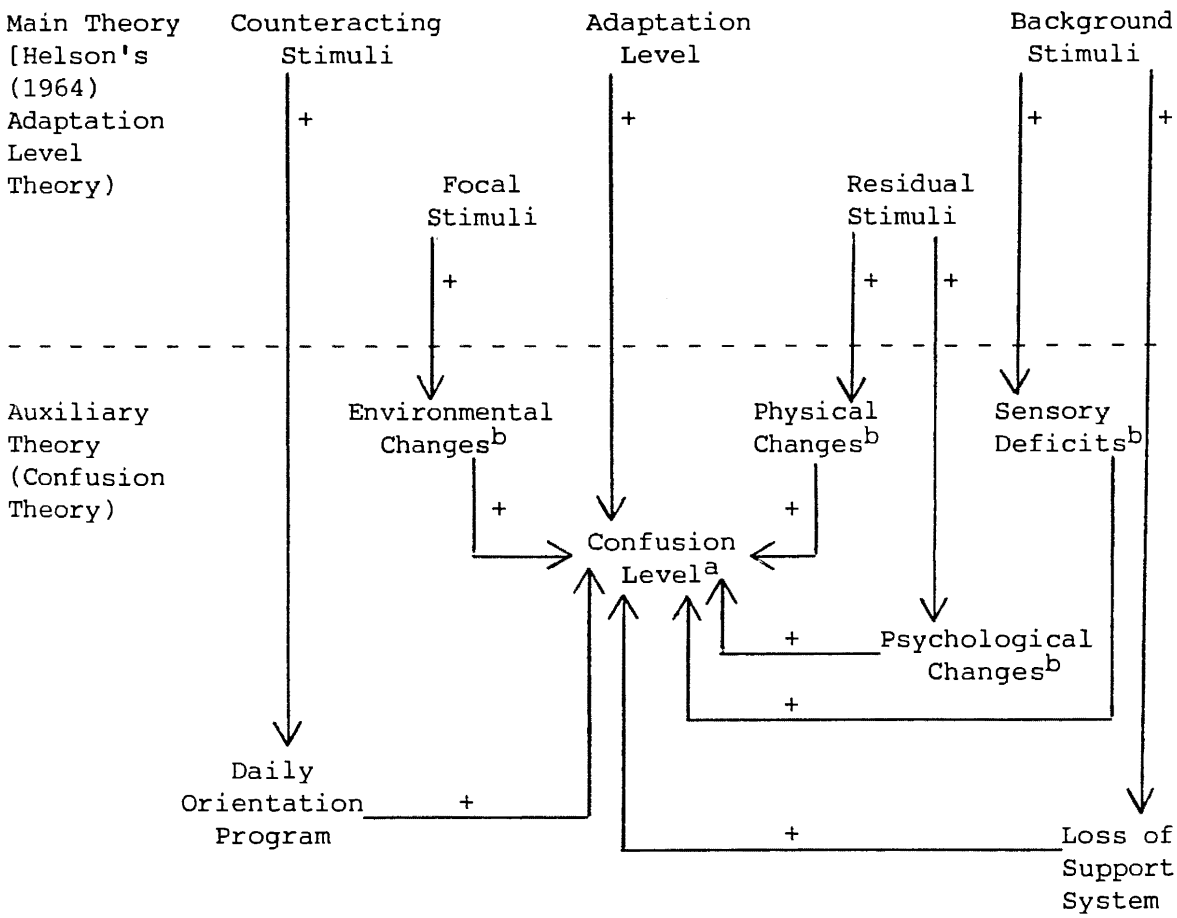
very limited. Compos (1984) stated that confusion and disorientation are measured by organic impairment only while ignoring other cognitive performance. Mental status examinations measure orientation and memory but seldom evaluate other variables such as depression or anxiety which also plague the elderly patient. Compos (1984) also questions the motivation of older patients to perform well on cognitive tests. No instruments were found in the literature to measure sleep/wakefulness or perceptual disturbances.

The nursing techniques used in preventing ACS may be viewed as the counteracting stimuli which assist an

individual to adapt to intense stimuli created by hospitalization (Figure 2). Campbell, Williams, and Mlynarczyk (1986) suggest that establishing meaning to the hospital environment, providing adequate sensory input, and restoring a sense of control for the hospitalized elderly patient provides stimuli to counteract those related to the development of ACS. Other counteracting stimuli are restoring normal life patterns of activities, relieving pain, and reducing inactivity. Reality orientation therapy is also a suggestion in counteracting the stimuli related to the development of confusion (Burton, 1982; Budd & Brown, 1974).

In conclusion, the researcher used the constructs of Helson's adaptation-level theory to develop an auxiliary theory of confusion. In Figure 5, Blalock's (1969) format for a theory is used to display the linkage between adaptation-level theory and an auxiliary theory of confusion. The main constructs in the adaptation-level theory are linked to the variables or empirical indicators in the auxiliary theory of confusion. In this study, the empirical indicators or variables are measured by the Confusion Risk Factor Interview (Appendix A). The level of activity is measured by the Mini-Mental State Examination (MMSE) developed to test orientation and memory (Folstein, Folstein, & McHugh, 1975) (Appendix B). The counteracting

Figure 5. Blalock (1969) format for a theory. The + represents a positive relationship between the constructs and the empirical indicators.



a Measured by the Confusion Risk Factor Interview (CRFI)
b Measured by the Mini-Mental Status Examination (MMSE)

stimuli in this study are the activities in the Daily Orientation Program (Appendix C).

Assumptions

For the purposes of this study, these assumptions were made.

1. Illness and hospitalization are major stimuli which impinge upon an individual's previous adaptation level.
2. Acute confusional state is a state of adaptation reflected by a level of activity.
3. Sufficient influence of one class of stimuli may be counteracted by sufficient emphasis on other classes of stimuli.
4. The pooled effect of background, focal, and residual stimuli may predict adaptation level.
5. Aspects of acute confusional state may be measured objectively and repeatedly.

Hypotheses

For purposes of this study, these hypotheses were tested.

Theoretical Hypotheses

1. Hospitalized elderly medical patients who are predicted to be at high risk for experiencing acute confusional states and who receive a daily orientation program will

have fewer mental changes than hospitalized elderly medical patients who do not receive the daily orientation program.

2. Hospitalized elderly medical patients who are predicted to be at low risk for experiencing acute confusional states and who receive a daily orientation program will have fewer mental changes than hospitalized elderly medical patients who do not receive the daily orientation program.
3. Hospitalized elderly medical patients regardless of the risk level for experiencing acute confusional states who receive a daily orientation program will have fewer mental changes than hospitalized elderly medical patients who do not receive the daily orientation program.

Research Hypotheses

1. Hospitalized elderly medical patients who have high Confusion Risk Interview scores on admission day and who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who have high Confusion Risk Factor Interview scores and who do not receive the daily orientation program.

2. Hospitalized elderly medical patients who have low Confusion Risk Interview scores on admission day and who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who have low Confusion Risk Factor Interview scores and who do not receive the daily orientation program.
3. Hospitalized elderly medical patients regardless of their Confusion Risk Interview scores on admission day who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who do not receive the daily orientation program.

Definitions of Terms

These terms are described for use in this study.

Acute confusional state (ACS) is theoretically defined as a reflection of the state of adaptation of an individual derived from the pooling of focal, residual, and background stimuli. The empirical definition of ACS is a "transient, global, cognitive impairment of abrupt onset and relatively brief duration, accompanied by diurnal fluctuation of simultaneous disturbances of the sleep-wake cycle, psychomotor behavior, attention and affect" (Foreman, 1986, p.

34). ACS occurs in some patients who are acutely ill, are experiencing stresses from losses, and are moved into a hospital (Sugden & Saxby, 1985).

Confusion Risk Factor Interview (CRFI) is defined theoretically as an instrument which pools focal stimuli (environmental factors), residual stimuli (physical and psychological factors), and background stimuli (sensory factors and sociological factors) to determine the adaptation level of an individual. Empirically, the CRFI is a researcher-developed instrument which assigns a score to the factors related to the development of acute confusional states. The more factors present, the higher the numerical score is on the CRFI.

The Mini-Mental State Examination (MMSE) is theoretically a measurement of level of activity. Empirically, the MMSE is a simplified test which assesses the cognitive functioning in an adult. Orientation, memory, and attention are tested in the first portion of the MMSE, and the ability to name, follow verbal and written commands, write a sentence spontaneously, and copy a complex polygon are tested in the second portion (Folstein, Folstein, & McHugh, 1975).

Hospitalized elderly medical patients are persons 65 years of age and older who have been admitted to an acute care hospital with a non-surgical medical diagnosis.

Daily Orientation Program is defined theoretically as stimuli with a sufficient impact to counteract stimuli known to be related to the development of acute confusional states. Empirically the program is a researcher-developed nursing intervention based on the research supported suggestions for preventing ACS in hospitalized elderly patients.

Limitations

The limitations of this study are:

1. This study included only a small number of hospitalized elderly medical patients from one medical-surgical federal hospital in the southwestern part of the United States; therefore, generalization is limited.
2. Although the subjects who volunteered for the study were selected according to specific criteria and randomly assigned to the experimental group and control group, unforeseen extraneous variables may have influenced the findings of this study.
3. Reliable and valid instruments for measuring the entire phenomenon of confusion are limited at this time.

4. The subject's daily contact with the same nurse conducting the Mini-Mental State Examination may actually improve the subject's daily mental status level; therefore, carry-over effect will be present.
5. The Confusion Risk Factor Interview is researcher-developed; therefore, it has had limited testing for validity and reliability.

Summary

The problem of this study is "What is the effect of a daily orientation program on hospitalized elderly medical patients predicted to be a risk for developing an acute confusional state?" The justification of the problem is discussed as is the theoretical framework for the study, the Helson's (1964) adaptation-level theory. The theory and its relationship with ACS are presented through five illustrations. The fifth illustration is an auxiliary theory of confusion developed by the researcher. Assumptions, both theoretical and empirical hypotheses, definitions of terms, and limitations of the study are presented.

CHAPTER 2

REVIEW OF LITERATURE

The review of the literature explores five aspects concerning the phenomenon of confusion: (1) the historical evolution of the terminology, (2) the theories used to explain confusion, (3) classification and characteristics, (4) the incidence and etiology, and (5) prediction, prevention and treatment. This discussion is concluded with a summary.

Historical Evolution of Terminology

A history of confusion reveals that this phenomenon has never existed without some international debate. The actual term confusion within the medical community did not exist until the 1800s when European medical leaders separated the concepts of mental illness and physical illness. After much debate, the medical diagnoses of dementia, psychosis, and delirium were separated, and definitions were clarified in the French and English medical literature (Berrios, 1981). At the same time, Grimm and Grimm (cited in Berrios, 1981) stated that the term confusion was being used in psychopathology and

stemmed from a condition known in psychiatry as associationism.

Berrios (1981) reported that Baron Dupuytren in 1834 used the term confusion to characterize the disorientation of nervous delirium. In France and Germany, confusion referred to an abnormal state consisting of a problem in organizing ideas. During the later part of the nineteenth century, confusion referred to chaotic thinking unassociated with an organic etiology. By 1892, confusion was considered a basic symptom often followed by physical symptoms, hallucinations, stupor and delusions, thus making it equivalent with delirium (Berrios, 1981).

Seglas (1894), a French physician, stated that mental confusion was only a common symptom in almost all forms of insanity but in various ways and degrees. Therefore, he classified confusion as a secondary symptom or a complication of a main illness. Seglas (1894) observed that an individual with confusion had a loss of words, repeated questions instead of giving answers, was unable to pay attention, was doubtful, forgot events, lacked spontaneous movements, needed much effort to move around, and was fully conscious at interval. Worcester (1889), an American physician, stated that an individual with delirium had little attention, ceased to appreciate his surroundings, failed to recognized familiar objects and

friends, had a consciousness full of hallucinations, illusions and delusions, and at intervals momentarily came back to consciousness. Seglas (1894) and Worcester (1889) seemed to describe the same phenomenon.

By 1911, Regis and Hernard (cited in Berrios, 1981) recognized that the term confusion had evolved through three distinct periods. First, confusion and dementia were considered the same; second, confusion was believed to be part of stupor, and finally, confusion evolved into a separate state. In 1920, Chaslin wrote that confusion was difficult to define in a few words; however, the main theme included great struggling by the patient to find his bearings in the midst of the exterior world and the interior world. Both worlds are chaotic from perceptional and ideational disorders which result in the loss of mental synthesis (Chaslin, 1920). Chaslin (1920) insisted that the patient tries to restore the synthesis. The confusion syndrome was found in patients with organic dysfunctions such as exhaustion, infections, malnutrition, and disorders of the digestive organs, liver, and kidneys (Chaslin, 1920). In 1920, confusion was linked to a clouding of the consciousness making it synonymous with delirium (Berrios, 1981).

The term delirium rather than confusion was used in nursing literature during the first half of this century.

Weeks-Shaw (1900) defined delirium as a temporary mental aberration occurring during fevers and exhausting diseases. Stoney (1908) wrote that delirium may be either quiet or busy. The ill patient was usually quiet and cunning during the doctor's visit and became destructively busy when the doctor was absent. Hawley (1908) defined delirium as a mental deviation due to disease; however, she assured the reader that delirium was not as severe as in the past primarily from the advancement in treatment of the precipitating diseases.

In 1912, Sanders stated that delirium was an acute mental disorder of two types, low muttering and wild. The W. B. Saunders Company advertised the book by Sanders (1912) as "undoubtedly the most complete and most practical work on nursing ever published. Everything about every subject with which the nurse should be familiar is detailed in a clear cut, definite way" (Sanders, 1912, p. 885). The book was published in both London and Philadelphia; therefore, the term confusion was not used by nurses in English speaking areas (Sanders, 1912).

Harmer and Henderson (1939) wrote a textbook for nurses that conformed to the Curriculum Guide recommended by the National League of Nursing Education in 1937. Neither delirium nor confusion was listed in the index or defined anywhere in the text. However, Harmer and

Henderson (1939) recommended observing for "confusion of mind" when noting facts about the patient's family and social life (Harmer & Henderson, 1936, p. 222).

Although no nursing articles were found on delirium between 1908 and 1958, Doty (1946) wrote that nursing care was the most important part of treating a delirious patient described as confused and fearful. Finally in 1958, Cohen and Klein described the care for a patient with delirium in a nursing journal. In the article, delirium is defined as a major distortion of cerebral metabolism.

Acute confusion among young adults and elderly persons was being studied by the medical profession in the 1930s (Bruce, 1935; Robinson, 1939). However, the first article to appear in the English nursing literature concerning confusion in the elderly was in the 1960s (Nobbs, 1962). Patrick (1967) was the first nursing author in the United States to use the term confusion in a nursing article title. Her article focused on the care of the elderly.

Today, the terms delirium and confusional states are not clearly defined and the American classification is not helpful (Lipowski, 1967). For example, McCown and Wurm (1965) published an article concerning disorientation of geriatric patients in nursing homes. However, the term disorientation is the term used to describe delirium, Taber, 1943, 1965; Thomas, 1981). Gerdes (1968) stated

that the terms confusion and delirium were not synonymous. She described delirious patients as hyperactive and confused patients as hypoactive. In the same year, Morris and Rhodes (1972) stated that disorientation is a prominent feature of confusion without mentioning delirium. Dodd (1978), even though she stated little agreement existed as to definition of terms, established an assessment tool to assess the confused patient. In her assessment tool, confusion, disorientation, and delirium are distinguished clearly. Consequently, the lack of clear definitions muddled the nursing literature in the late 1960s and 1970s making it impossible to determine how the terms confusion, delirium, and disorientation were defined in nursing.

Internationally, the terms are not clearly defined either. The World Health Organization (WHO) (1978) lists the term delirium under acute confusional state in a classification of diseases called transient organic psychotic conditions. Acute confusional state is defined as a reversible state of clouded consciousness, confusion, disorientation, illusions, and often vivid hallucinations due to toxic, infectious, metabolic, or systemic disturbance. However, the American Psychiatric Association (APA) (1982) lists delirium's characteristics as clouding of consciousness, illusions or hallucinations, disturbance of sleep-wakefulness cycle, disorientation, and memory

impairment. Etiologically, delirium is related to an organic disturbance. Both classifications appear similar, yet no agreement exists between WHO, APA, or other authors, leaving the terminology in the literature varied, inconsistent and overlapping (Foreman, 1986; Lipowski, 1967, 1983).

In conclusion, the term confusion evolved from the 1800s into this century with considerable debate, lack of clarity, and a stereotyped view (Berrios, 1981). Confusion, delirium, and disorientation are often used as synonymous terms. Lipowski (1980a, 1980b) and Liston (1982), both American authors, feel that the term confusion is used indiscriminately in today's literature. Berrios (1981) suggested the historical reason for the indiscrimination and overlapping of terms is related to the 1800s separation of delirium from the mental diseases of psychoses. The separation led to the neglect of confusion and delirium because they no longer provided a paradigm for psychoses. Consequently, definitions are unclear and a stereotyped view is the standard.

Theories Used to Explain the Phenomenon of Confusion

Before discussing the classification, characteristics, prediction, prevention, and/or treatment of acute confusional states, the phenomenon must be examined

conceptually and theoretically. Berrios (1981) reviews the conceptual development of delirium and confusion in several steps.

1. In the nineteenth century, delirium was separated from a term delusion.
2. Delirium was redefined as a disturbance of consciousness with an organic etiology.
3. The organic etiology separated delirium from the functional insanities.
4. In the nineteenth century, confusion evolved first to constitute a narrow intellectual notion resulting from a disturbance of synthesis accompanying either organic or functional states.
5. Confusion was used in French psychiatry the same way delirium was used in British psychiatry.
6. The evolution of confusion demonstrated the nineteenth century psychiatrists' attempts to show that psychological dysfunction was characterized by acute organic states.
7. Disorientation developed into a concept in the late nineteenth century and was considered an unreliable clinical feature.
8. Confusion may acquire new usefulness in the twentieth century and support from empirical evidence.

However, in 1980, Lipowski saw the term confusion as nonscientific; therefore, he preferred the term delirium because it encompasses confusion. He admitted that the term confusion is often used in today's literature when discussing the mental changes in the elderly (Lipowski, 1980a). By 1984, Lipowski used the terms delirium and acute confusional states synonymously in an article discussing the development of the phenomenon. Consequently, the terms delirium and acute confusional states (ACS) are used synonymously in this review.

Little attempt has been made to explain the confusion from a theoretical point of view with the lack of clarity and stereotyping of the phenomenon. A few nursing researchers, however, have explained confusion through the use of existing theories. No one theory has been selected by nurses to explain confusion, and opinions vary widely in the literature. Many authors simply do not discuss a theory in relationship to confusion.

Carino (1976) examined the behavior of confused patients in the intensive care unit of a hospital. She used Dorothy Johnson's Behavioral System Model of nursing practice. In the model, man is viewed as a system with a collection of behavioral subsystems which interrelate to form a whole person or behavioral system. The model is concerned with re-establishing or maintaining the

behavioral system within a range of states when behavioral instability threatens. Johnson (1968) states that the behavioral system is regulated and controlled by many factors of a biological, psychological and social nature. Therefore, Carino (1976) studied the behaviors of a confused patient.

With a theory of holism developed by Goldstein in 1939, Wolanin and Phillips (1980) discuss confusion as catastrophic behavior as compared to preferred behavior. Catastrophic behavior is evident when man is unable to equalize a scale balancing between excitation from stimuli and constancy. Catastrophic behavior is characterized by "somatic and observable manifestations such as . . . apathy, anxiety, withdrawal and confusion" (Wolanin & Phillips, 1981, p. 14). Elderly people may display catastrophic behavior and, in fact, are vulnerable to the behavior because of the nature of aging. Stimuli from outside produce either ordered or catastrophic behavior. Wolanin and Phillips (1980) believe behavior is influenced by environmental stimuli including perceptual activity and sociological and cultural factors.

Nowakowski (1980) looked at the Bowen theory to define a confused person in terms of solid self. Solid self is the part of self which accepts responsibility for decisions. The more dependent the individual is on support

from his environment the more his behavior is dependent on factors outside self. Nowakowski (1980) sees the health care system and many family members as overly involved in helping a disoriented patient. Therefore, Nowakowski (1980) in her practice encourages active participation of disoriented patients to develop a more solid self.

Presently, the theory development in explaining confusion is an unexplored research area. However, in the current nursing literature, the term confusion, is linked to specific aberrant behaviors specifically displayed by elderly persons (Weymouth, 1968; Wolanin & Phillips, 1980).

Classifications and Characteristics

Numerous articles discuss the classifications and characteristics of confusion among the elderly; however, most reiterate information rather than present clinical studies (Liston, 1982). Also, the progress in distinguishing conditions has been hampered by "terminological chaos and lack of explicit diagnostic criteria" (Lipowski, 1983, p. 1426). However, the following section discusses the variety of information and view concerning acute confusional states.

Delirium is listed by the APA (1982) under the classification of the mental disorders called organic brain syndromes (OBS) (APA, 1982; Lipowski, 1980b; Liston, 1982).

The basic characteristics of OBS are "impairment of orientation, memory, all intellectual functions, judgment, and lability and shallowness of affect" (Lipowski, 1980a, p. 32). This impairment arises from cerebral dysfunction regardless of cause. Psychotic symptoms and disturbed behavior also may be present (Lipowski, 1980a). However, names for delirium or OBS vary from author to author (Liston, 1982). Liston (1982) listed 20 different terms used for organic brain syndromes, acute confusional states, and delirium. Some of the more common terms included acute brain failure, reversible dementia, acute organic reaction, acute organic psychosis, reversible toxic psychosis, toxic confusional state, and cerebral insufficiency syndrome (Liston, 1982).

Only one study attempted to clarify the terminology. Wolanin (1977), using a qualitative design, studied institutionalized confused elderly patients to establish a definition for confusion in the context that nurses use the term to describe patients' behaviors. The question she tried to answer in the study was "What behavior do nurses and doctors notice in the patient who is termed confused?" (Wolanin, 1977, p. 69). No clear research supports the definition of confusion; therefore, confusion was defined as behavior seen in the eye of the beholder. The setting

of the study was a large nursing home where one-half of the residents were labelled confused.

The sample included chart records of 30 residents who (1) were confused according to the personnel and head nurse, (2) were conscious and able to speak English, (3) were over the age of 65, and (4) had been living at the facility for at least three weeks. Seventy percent of the sample were diagnosed as having chronic brain syndrome, and 65% were women. The stay in the nursing home ranged from 26 to more than 600 days, and 70% of the residents had stayed longer than 100 days.

Wolanin (1977) recorded behaviors listed by both physicians and nurses in resident's charts. Nouns, adjectives, and verbs used in describing behaviors were divided into two categories: cognitive inaccessibility and social inaccessibility. Cognitive inaccessibility included behaviors which interfere with intellectual function or intellectual competence. Social inaccessibility included behaviors which interfere with cooperation with others. Wolanin (1977) never found a definition for confusion. In addition, the terminology, cognitive and social inaccessibility, have not been used by other nursing authors.

OBS are found primarily in persons over the age of 65. OBS, at one time called senility, were considered a normal

part of aging; however, the syndromes now are linked to organic causes (Bayne, 1978; Comfort, 1979; Hellebrandt, 1978; Maletta, 1982). In the 1980s, chronic organic brain syndromes called dementias are separated from acute states. Dementia is defined as slowly developing global defect in cognitive function which causes a change in memory, affect, judgment, orientation, intellect, and social adjustment. The onset is uncertain; however, it probably is present for months before it is detected (Freedman, 1983). Persons with dementia usually do not complain of a memory loss; therefore, a family member recognizes the problem. Senile Dementia--Alzheimer's type is the most frequently found of all dementias and affects at least 50% of individuals receiving long-term care in the United States (Wolanin, 1983). The term confusion is used for patients with advanced dementia with symptoms including short retention span, impaired immediate recall, disorientation in time and place, and misinterpretation of the present situation (Kral, 1975).

Kral (1975) points out, however, that the acute type of confusion which exists among the aged people occurs in persons without signs of dementing processes. The acute form of confusion is precipitated by various conditions creating stress on the aging organism and takes an acute course. Acute refers to the reversibility of the syndrome

(Lipowski, 1980a). Consequently, the abrupt occurrence related to a medical disease separates the acute syndrome of confusion from the dementias (APA, 1982; Foreman, 1986; Freedman, 1983; Heiple, 1985; Kral, 1975).

Characteristics of ACS are described by both nursing and medical authors. Acute confusional states are manifested usually when an organic disturbance is present (APA, 1982; Bruce, 1935; Chaslin, 1920; Foreman, 1984; Lipowski, 1980a, 1980b, 1983; Maletta, 1982; Sanders 1912; Seglas, 1894); therefore, confusion is a secondary symptom (Freedman, 1983; Seglas, 1894; Worchester, 1889). However characteristics of confusion also may appear independently and in almost all forms of insanity (Chaslin, 1920; Seglas, 1894).

The framework used to discuss the characteristics of acute confusion is the APA (1982) diagnostic criteria for delirium since no clear distinction exists between the two terms and the diagnostic criteria are accepted at the current time. The five diagnostic criteria for delirium are:

1. Clouding of consciousness or reduced clarity of awareness of environment,
2. At least two of the following changes, perceptual disturbance, incoherent speech, disturbance of

sleep-wakefulness cycle, and increased or decreased psychomotor activity,

3. Disorientation and memory impairment,
4. Clinical features developing over a short period of time and fluctuating over the course of a day, and
5. A specific organic factor related etiologically to the disturbance.

Clouding of consciousness is one of the first characteristics identified in confusion. Berrios (1981) stated that in the 1800s, confusion referred to chaotic thinking in general. Seglas (1894) found in his observations that the patient is lost in his own words and does not recognize familiar objects or people who surround him. He also found that the confused patient was unsure of his own appearance. In agreement with Seglas (1894), Lipowski (1980a) stated that disorders of cognition such as acquisition, processing, storage, and retrieval of information about one's self, body, and environment are essential for the diagnosis of delirium or confusion. Lipowski (1980a) also supports the APA (1982) diagnostic criteria by listing the characteristics related to clouding of consciousness: (1) Impaired awareness of self and surroundings and their relationship, (2) Disturbance of attention, and (3) Impairment of direct thinking, increased

or decreased alertness. The current criteria of clouding of consciousness stems from Chaslin's (1920) belief that the main idea in confusion is the struggle to find one's bearings in the midst of the exterior and interior world.

The concept of consciousness has acquired scientific respectability (Lipowski, 1967). Consciousness may be defined as "that state of an organism which enables cognitive processes to occur" (Lipowski, 1967, p. 230) and be viewed as a continuum going from full awareness to unconsciousness. Within the continuum is clouding of consciousness defined as a "potentially-reversible global impairment of cognitive processes of variable extent" (Lipowski, 1967, p. 230). Lipowski (1967) stated that a tendency exists to discuss various changes in consciousness as a homogeneous group of phenomena; however, differentiation is necessary in this vague field. A descriptive delineation of cognitive perceptual abnormalities may define various altered states of consciousness (lipowski, 1967).

By 1980, Lipowski disagreed with the use of clouding of consciousness as a description of confusion. He suggested the term abnormal thinking be used as a criterium for confusion rather than clouding of consciousness (Lipowski, 1980b). In 1983, Lipowski again criticized the use of the vague term clouding of consciousness.

Consequently, he suggested using the terms attention and wakefulness. Thus, delirium may be defined as a disorder in attention; therefore, the patient shows diminished ability to respond to stimuli selectively, to mobilize, and to sustain and shift attention at will" (Lipowski, 1983, p. 1428). The nursing literature has no clear delineation of altered states of conscious.

Other prominent characteristics of ACS are perceptual disturbances including hallucinations and misinterpretation or illusions (APA, 1982; Ban, 1978; Caldwell, 1972; Castledine, 1982; Freedman, 1983; Heiple, 1985; Lipowski, 1980; Morris & Rhodes, 1972; Sugden & Saxby, 1985; Trochman, 1978; Weeks-Shaw, 1900; Wolanin, 1983). External stimuli often are incorporated as the perceptual disturbances; consequently, dreams and fantasy are blurred with reality (Lipowski, 1980a). A wrinkle in the sheets can become a snake and a dropped bedpan can be rifle shot (Cohen & Klein, 1958).

Thinking becomes labored, incoherent, and slow or rapid when the uncontrolled thoughts of hallucinations interrupt usual thought patterns. Hallucinations are usually visual; however, auditory hallucinations may occur. The patient either becomes frightened or embarrassed by hallucinations or takes them as fact and reacts accordingly. A patient may call out, shout, or reach

toward hallucinated figures or attempt to escape from them. Fear, anger, helplessness, and longing may be experienced in response to hallucinations and evidenced in facial expressions, gestures, motions, and speech (Cohen & Klein, 1958; Lipowski, 1980a).

Sometimes perceptual disturbances are accompanied by incoherent speech (APA, 1982; Caldwell, 1972; Foreman, 1984; Freedman, 1983; Maletta, 1982; Morris & Rhodes, 1972; Wolanin, 1983). Lipowski (1980) feels that incoherent speech is only a vague reference to the characteristics of ACS. Descriptions of incoherent speech are listed in the literature. Some severely delirious patients just mutter, oblivious to surroundings and unresponsive to verbal stimuli (Lipowski, 1980). Early in this century, nurses classified delirium according to the form of speech used by the patient. Low muttering delirium was characterized by "disconnected, irrational speech, restless impulses, and impaired will" (Sanders, 1912, p. 703). However, wild delirium was characterized by incoherent, rapid, noisy speech (Sanders, 1912). In today's culture, incoherent or slurred speech is associated with either drunkenness or confusion; however, incoherent speech is not mutually exclusive to these two conditions (Wolanin & Phillips, 1981).

Another common characteristics of ACS is a disturbance in the sleep-wakefulness cycle with insomnia or drowsiness (APA, 1982; Ban, 1978; Burnside, 1981; Freedman, 1983; Lipowski, 1980b; Patrick, 1967). Normally an awake person is able to mobilize, focus, sustain, and shift attention in response to internal or external stimuli. However, in delirium, attention is altered in all of its aspects resulting in a disturbance of wakefulness. A delirious patient tends to be distracted readily by irrelevant stimuli and is likely to display unpredictable spontaneous fluctuations in attention. Therefore, a disturbance in wakefulness is the inability to direct mental processes and to respond to stimuli in a selective focused and sustained manner. Both observers and patients have referred to delirium as a twilight state between sleep and full wakefulness (Lipowski, 1984). Lipowski (1984) believes that a disturbance in wakefulness is an essential feature of delirium. However, the APA (1982) only lists it as one of several characteristics of delirium.

Disturbance in sleep is characterized by day-night reversal (Freedman, 1983). In the daytime, the patient is drowsy and sleepy whereas at night the patient is awake, restless, and agitated (Lipowski, 1983). In the first part of the twentieth century, nurses observed this trait of delirium occurring at night (Weeks-Shaw, 1900, Hawley,

1908). More recently the night development of sleep-wakefulness disturbances has been labelled the "sundown syndrome" and reported by staffs of hospitals and nursing homes (Freedman, 1983; Heiple, 1985; Trochman, 1978; Wolanin & Phillips, 1983). Heiple (1985) stated that the sundown syndrome needs to be examined because the subject has been neglected in research.

Increased or decreased psychomotor activity is another characteristic behavior of persons with ACS. Psychomotor behavior refers to voluntary and involuntary motor activities which are predominately hypoactive or hyperactive and may shift unpredictably between these extremes. The hypoactive patient appears inert and lethargic, speaks slowly and hesitantly, does not initiate movements readily, and is generally sluggish in total motor behavior. The hyperactive patient has a variety of semi-purposive erratic motions and vocalizations of laughing, wailing, calling for help, or cursing. Examples of common semi-purposive movements include groping, flapping aimlessly, tossing about, and picking at the bedclothes. Sometimes a patient may even mimic his or her customary activities or occupation (Lipowski, 1984).

Abnormal psychomotor may be associated with emotional disturbances such as fear, excitement, depression, apathy, irritability, rage, or euphoria. An autonomic nervous

system response of tachycardia, flushed face, sweating, dilated pupils, or elevated blood pressure usually accompanies the emotional responses. Facial features also tend to reflect the patient's dominant emotional state. The emotional state may vary during the same day or even the same hour. A fearful patient may attempt escape whereas an angry and aggressive patient may assault people around him (Lipowski, 1984).

The most common emotional disturbance in the elderly, depression, can be mistaken for confusion in the clinical setting because the symptom of pronounced sadness is absent. The clinical picture of depression in an elderly patient may be dominated by perceptual disturbances, sleep disturbances, psychomotor retardation, agitation, and anxiety (Comfort, 1979; Freedman, 1983; Maletta, 1982; Wolanin, 1983; Wolanin & Phillips, 1981). Depressed elderly people often give the impression of being confused; therefore, the syndrome often is referred to as pseudo-senility or pseudodementia (Comfort, 1979; Maletta, 1982). However, theoretically confusion and depression are separated clearly even if the clinical picture of both is similar (Wolanin & Phillips, 1981).

Disorientation and memory loss are listed as the third diagnosing criteria for delirium by the APA (1982). Disorientation and memory loss are important aspects of

confusion (Caldwell & Hegner, 1972; Maletta, 1982; Morris & Rhodes, 1972; Shaw, 1982; Sugden & Saxby, 1985; Wolanin, 1983). Disorientation is defined as the inability to estimate direction or location or to be cognizant of time or persons (Thomas, 1981). Memory refers to registration, retention, and retrieval of recent and remote memories (Lipowski, 1984).

The concept of spatiotemporal orientation developed in the late 1800s (Berrios, 1981). Maintenance of spatiotemporal orientation depends on an intact cognitive function (Lipowski, 1984). Orientation of time is the ability to correctly state the day of the week and the date and time of day. Place orientation is correct identification of where one is situated and space orientation is the ability to follow some familiar route and recognize topographical relationships of a location. Orientation for person is the ability to identify one's own name and to recognize familiar people. Disorientation occurs in reference to time, place, space, and other people (Lipowski, 1984; Taber, 1943, 1965; Thomas, 1981). Examples of disorientation include mistaking a nurse for a relative and the hospital for home or a hotel. A person may have difficulty in finding his room or getting lost in familiar surroundings. However, disorientation is not diagnostic in the absence of other features of delirium

(Lipowski, 1984; Kral, 1975). Nursing articles used the term disorientation as synonymous with either acute confusional states or dementia (Carino, 1976; Castleberry & Seither, 1982; McCown and Wurm, 1965; Nowakowski, 1980; Wahl, 1976). Berrios (1981) suggested that the inconsistency occurred in part because the term disorientation carries the burden "clouding" which is a fundamental feature of acute confusional states in English psychiatry.

Examples of definitions for disorientation in the nursing literature include several. Carino (1976) defined a disoriented patient as one who exhibits psychotic like behaviors of delirium, confusion, paranoid hallucinations, delusions, or illusions. This shows Carino (1976) used disorientation to include delirium or confusion. Nowakowski (1980) defines disorientation using three variables: (1) nurse's personal experience, (2) the theoretical framework used to explain the phenomenon, (3) the ability to objectively observe the phenomenon. She never directly defined the term disorientation. Wahl (1976) does not define disorientation either; however, she considers it more than a psychologic phenomenon. According to Wahl (1976), the disruption of important relationships can cause both social and psychologic disorientation. Castleberry and Seither (1982) stated that disorientation

connotes a psychotic disorder. They felt the concept of disorientation has not been described in the nursing literature for the reason of general indifference within the profession of nursing. However, evidence demonstrates no agreement exists for the meaning of disorientation in the nursing literature.

Memory impairment relates to disorientation and is considered an important factor in acute confusional states (APA, 1982). Wolanin and Phillips (1980) feel that loss of memory is a crucial component of confusion and goes along with distractability of the patient. Dodd (1978) felt that loss of memory is present in all cases of acute confusion.

The fourth diagnostic criteria for acute confusional states is the characteristic of quick development and fluctuation over time (APA, 1982; Bayne, 1978; Burnside, 1980; Caldwell & Hegner, 1972; Freedman, 1983; Wolanin, 1983). In 1939, Robinson pointed out in his studies of 10 delirious patients that the mental picture of the patients was fluctuating. Periods of complete lucidity always were present. However, patients with dementia had constant mental symptoms with delusions which were fixed and lucidity was rare (Robinson, 1939). Lipowski (1982) stresses that a complete health history of the patient is needed to determine if the symptoms develop quickly and fluctuate over time. The final diagnostic criterium for

acute confusional states according to the APA (1982) is the presence of an etiology related to specific organic factors. The final criterium is discussed in the section titled "Etiology and Incidence of Acute Confusional States."

In summary, the APA (1982) diagnostic criteria for acute confusional states are specific; however, Lipowski (1983) feels some of the criteria need to be reworded. The nursing literature has not been very specific in its use of terminology; however, nurses are distinguishing the categories of acute and chronic organic brain syndromes (Wolanin, 1983). Often acute and chronic OBS may be difficult to distinguish clinically (Foreman, 1986).

Etiology and Incidence of Acute Confusional States

Acute confusional states must be related etiologically to a specific organic factor according to the diagnostic criteria of the APA (1982). Therefore, this section is a discussion of the etiology and incidence of acute confusional states.

In the last century, Seglas (1894) published a complete list of somatic conditions associated with mental confusion including general weakness, malnutrition, fever, loss of weight, digestive difficulties, urinary tract difficulties, cramps in muscles, trembling, imbalance of

eyes, catatonia (stupor), pains throughout the body, and irregular sleep patterns. Both Seglas (1894) and Worcester (1889) stated that mental confusion is only a symptom of a disease process, not a disease in itself. Chaslin (1920) listed malnutrition, exhaustion, disorders of the digestive organs, of the liver, of the kidneys, and superinduced infections as causes of mental confusion.

Nurses in the early part of this century also equated mental confusion (delirium) with physical disorders such as exhaustion, low vitality following shock or profuse hemorrhage, and high temperature (Sanders, 1912; Weeks-Shaw, 1900). Sanders (1912) reported that the drug toxicity of alcohol, belladonna, and stramonium, a drug related to atropine, hyoscyamus, a drug similar to belladonna, and others were linked to confusion.

Bruce (1935) reported incidence of acute confusional states in his practice which appeared to stem from the following physical problems: initial stages of typhoid prior to elevation of temperature, cholecystitis, pneumonia, infected uterus after childbirth, high leukocyte counts, proteus in the urine, and a lowering of the blood sugar. With the variety of apparent causes, Bruce (1935) admitted he was unable to determine the true cause of mental confusion, but he felt the cause of the acute confusional states would be discovered through research.

Prior to the 1930s, Robinson (1939) stated that mental confusion in elderly persons was felt to be entirely from vascular disease and secondary structural change. However, Robinson (1939) noticed the symptoms of confusion listed in an older person were identical to those of a younger person. He studied 16 patients over the age of 50 who were admitted to a neurological hospital with the clinical picture of confusional psychosis or delirium. Ten patients had only delirium and the other six had delirium as a complication of another psychotic condition. Of the 10 patients with delirium, only one had a history of adjustment difficulties and the others had lived stable successful, middle-class lives. In each case, important factors stood out: (1) Rapid onset of symptoms following some physical illness or operative procedure were present; (2) The mental picture was fluctuating; (3) The symptoms were not constant and delusions were changing and unfixed; (4) Many intervals of almost complete lucidity were observed; (5) The patients were sick; and (6) Nocturnal restlessness occurred in every patient every night during the first weeks of hospitalizations.

The six remaining patients had two distinctly different components to their mental picture: (1) The onset was insidious, and (2) The mental symptoms were more constant. In addition, the delusions were more fixed,

hallucinations and lucidity were rare and the patients were not physically ill. All 16 patients were treated with infusions of 10% dextrose, and six patients with basic confusion were relieved of their delirium; however, their basic symptoms remained. Nine of the 10 cases diagnosed with infections were relieved of delirium when the infectious state was cured. Robinson (1939) concluded that vascular changes cannot be discounted in elderly patients; however, other causes which are corrected may relieve the elderly persons of delirium.

Doty (1946) followed 1,044 patients hospitalized in the divisions of internal medicine, surgery, obstetrics, and gynecology. About half or 537 of the patients were between 40 and 84 years of age. In this group, 78 patients had delirious reactions. In the younger group of 507 patients between the ages of 12 and 40, only 20 patients had delirium. The older patients' delirium related to disturbed brain physiology and occurred about four times more frequently than in the younger patients (Doty, 1946).

Doty (1946) further found that a difference in incidence in the two age groups directed interest to the concurrent physical conditions. The conditions in the older patients usually occurred in later life. The older patients' disorders listed in decreasing incidence were cardiac disease, postoperative states, pneumonia, hepatic

cirrhosis, malignancy, fractures of bones, uremia, eye conditions, and hypertensive encephalopathy. The younger patients' disorders included toxic reactions to drugs, postoperative and postpartum states, uremia, and mastoiditis (Doty, 1946).

Age and a wide range of physical disorders are considered predisposing factors to acute confusional states (Kral, 1975; Lipowski, 1984; Liston, 1982). Furthermore, authors agree that the "development of delirium varies considerably among individuals and across time" (Liston, 1982, p. 54). Physiological factors may include systemic and/or cerebral diseases including (1) neoplasms, (2) cerebral vascular disease, (3) infection, (4) head trauma, (5) acute and post-acute states involving seizures, lesions, and electroconvulsive therapy (Ahronheim, 1982; Kral, 1975; Lipowski, 1984; Liston, 1982). Other physiological factors related to acute confusional states may include (1) cardiovascular disease related to decreased cardiac output and/or hypotension, (2) metabolic disorders related to hypoxemia, electrolyte disturbance, acidosis, alkalosis, hepatic disease, uremia, endocrinopathies, and malnutrition (Ahronheim, 1982; Ban, 1978; Foreman, 1984; Freedman, 1983; Gerdes, 1968; Greer, 1982; Lipowski, 1984; Liston, 1982).

Seymour, Henschke, Cape, and Campbell (1980) studied 71 elderly patients over the age of 70 who had been admitted as emergencies on three general medical units. The purpose of the study was to investigate the incidence and etiology of acute confusional states in physically ill old people. Upon admission, the elderly patients were given a 10-item mental status questionnaire and blood was drawn to determine the patient's serum hematocrit and biochemical profile. The initial admission assessment was repeated after a week of hospitalization. A final assessment was made at discharge or after death when the outcome of the admission and final diagnosis were recorded. The biochemical profile was enhanced when a dehydration score was devised with a maximum score of +7 and a minimum score of -2. The dehydration scale was derived through an assessment of tongue and skin dryness, the systolic blood pressure, the hematocrit, blood urea nitrogen (BUN), the osmolarity of the blood, body weight, and presence or absence of edema.

The 71 patients were divided into three groups according to the mental status of the patient: (1) Forty-three had normal mental status, (2) Eleven were classified with acute confusional states according to history of symptoms and improvement over the week in the hospital, and

(3) Seventeen were classified with dementia according to health history.

Although age did not correlate with the initial mental scores, the initial blood tests did. The BUN was significant between $p = .005$ and .01; sodium was significant between $p = .005$ and .01; osmolarity was significant between $p = .01$ and .05; and creatinine was significant at $p = .05$. The hematocrit and the potassium level were not significant. The dehydration scale and BUN/creatinine ratio both correlated negatively with the mental status exam significantly higher in the patients with acute confusional state than in the patients with a normal mental status. The ACS group had various diagnoses, but three out of the 11 had a primary diagnosis of dehydration, and two of the three patients had fecal impactions. The investigators concluded that a low mental status score is associated with dehydration and volume depletion when it occurs within the context of acute confusional state (Seymour, Henschke, Cape, & Campbell, 1980).

Acute confusional states may develop from factors not directly related to changes in the physiological functions. Ingestion of exogenous toxins is known to be related to mental changes. Examples of these toxins include alcohol, medications, heavy metals, solvents, insecticides,

pesticides, and carbon monoxide (Liston, 1982). Overall, drug toxicity is the best known cause of acute confusion among the elderly because of the numerous illnesses and changes related to bodily functions (Liston, 1982). Drugs related to confusional states among the elderly are classified in the following groups: (1) Psychotherapeutic agents, (2) anxiolytics (anxiety relieving drugs), sedatives, and hypnotics, (3) opiate agonists, (4) anticonvulsants, (5) cardiac glycosides, (6) antimanic agents, (7) antiparkinsonian agents, and (8) histamine H_2 receptor antagonists and dopomine receptor agonists (Ahronheim, 1982; Ban, 1978; Bayne, 1978; Liston, 1982, McEvoy, 1985).

Often several psychotherapeutic agents are prescribed concurrently to elderly patients. These agents may produce a potential for anticholinergic toxicity with symptoms which include confusion. Blazer, Federspiel, Ray, and Schaffner (1983) studied the claims files of persons over the age of 65 in the Tennessee Medicaid program to analyze the number and types of anticholinergic medications prescribed to both the long-term residents in the state's nursing homes and a comparable group of ambulatory persons.

The ambulatory group was found to be a lower risk of anticholinergic toxicity than the nursing home population. Of the 5,902 patients in the nursing homes, 59% received at

least one drug with anticholinergic properties during the year whereas, of the 5,730 ambulatory patients, only 23% received anticholinergic drugs. In addition, 17% of the nursing home residents could have been given three or more anticholinergic drugs concurrently. In this study, the potential for anticholinergic toxicity was illustrated by the high frequency of concurrent use of two or more anticholinergic agents. Between 21% and 32% of patients residing continuously in nursing homes for a year and between 11% and 13% of the comparable ambulatory group were taking two or more drugs with anticholinergic properties. This data suggested that a substantial number of older adults are at risk for anticholinergic toxicity with an even greater risk among patients residing in nursing homes.

The development of acute confusional states in elderly persons is associated with trauma and infections with febrile states (Ahronheim, 1982; Kral, 1975; Lipowski, 1984; Liston, 1982). In addition, burns, surgery, multiple injuries, and bone fractures are often predisposing events related to the development of confusion (Kral, 1975; Liston, 1982). Williams, Holloway, Winn, Wolanin, Lawler, Westwich, and Chin (1979) found in a study of 170 elderly patients with a median age of 78.8 that evidence of acute confusion was manifested in 51.1% of the sample after they had undergone surgical repair for a fractured hip.

Physiological changes, injury, surgery, and ingestion of various drugs may cause acute confusional states. Although the presence of one or more of these factors is necessary for the development of acute confusion, they are not always sufficient for ACS to occur (Lipowski, 1983). Therefore, authors agree that psychological, environmental, sensory, and sociological factors also relate to the phenomenon of confusion (Freedman, 1983; Kral, 1975; Lipowski, 1967, 1983; Maletta, 1982; Remakus & Shelly, 1981; Wahl, 1976; Wolanin & Phillips, 1981). Several research articles support these authors.

Morse and Litin (1969) studied 60 patients over the age of 30 years during their postoperative course. Patients were considered for the study if they were noted by the surgical or nursing staff to be disoriented to time, place, or person representing impairment orientation, memory, intellectual function, and judgment in this study. Psychiatric evaluations were performed initially and periodically during hospitalization until the patient returned to normal mental status or was dismissed from the hospital. A checklist of items was evaluated as factors contributing to the development of confusion. A control group of 57 patients without postoperative confusion was studied similarly during the same period. Each patient was matched closely with a confused patient with regard to type

of operation and age. The latter two items were used as influential factors of delirium. The type of surgery was matched by organ systems and divided into three general groups: (1) cardiovascular, (2) open and closed heart procedures, (3) orthopedic, and (4) miscellaneous groups. Patients with operations on the central nervous system, eye, ear, nose, and throat surgery, and obstetrical cases were excluded. Age and sex were not evenly distributed between both extremes of age. Confusion was present in 55% of the patients 60 years of age or older. Sex was not matched; however, no significant difference was found between the sexes.

Specific organ surgical factors were found to be significantly different at the $p < .05$ level between the groups. The confused patients had more surgical procedures lasting four hours, had more frequent emergency surgeries, had more postoperative complications, were taking more than five drugs after the operation and had more than two units of blood postoperatively. Some non-organic factors also were found to be significantly different at $p < .05$ between the groups. Only the confused group of patients had six patients who were disoriented prior to surgery. The confused group had a higher number of patients with visual disorders and partial deafness, greater preoperative fear

and more than two previous surgical procedures (Morse & Litin, 1969).

Psychiatric factors also related to the confused patients and were found statistically different at $p < .05$. Following psychiatric examinations and a study of the histories, the confused group included a higher number of patients with a history of alcoholism, depression, a family member with psychosis, gastrointestinal disorders, insomnia, organic brain syndrome, paranoid personality, psychiatric treatment, psychosis, and retirement problems. Socioeconomic classes were not significant on the lower end of the scale; however, 14% of the non-confused patients were in the highest economic level and only 2% of the confused patients were on that level. No clear relationship existed between the development of confusion and the following factors: marital status, race, religious affiliation, blood type, use of preoperative medication, anesthetic agent, single versus multiple rooms, postoperative narcotic analgesia, preoperative knowledge of diagnosis, prognosis of disease, or presence of relatives at the time of operation. The researcher admitted that the selection of patients may have magnified the difference between the two groups because a patient was not considered confused until the professional staff clearly identified the patient as disoriented, allowing more transient

disorders to go unnoticed. Furthermore, the bias of the researcher may have influenced some of the judgments (Morse & Litin, 1969).

Hodkinson (1973) studied newly hospitalized elderly patients to evaluate medical factors related to confusional states and dementia. The subjects were placed in one of three groups using past history and a mental status examination given within the first four days after admission. The subjects were tested two more times during hospitalization. The three groups were (1) mentally normal (187 subjects), (2) dementia (257 subjects), and (3) confusional (144 subjects). The mental status examination consisted of a survey of facts normally known by the patients including the time, date, one's address, recognition of persons, and other common factors. The maximum score was 34, and a minimum was 25 for the normal group. The subjects placed in the confusional group had a score less than 25 and a recent history of confusion. The subjects placed in the dementia group also had a score less than 25 with a history of confusion for more than three months. The median age for the confusional and dementia group was 80; therefore, matching of mentally normal subjects was done.

Score changes were calculated and examined in relationship to variables related to the subject's health

status. The confusional group scores rose 61% and fell only 9% during hospitalization. Hodkinson (1973) suggested the rise in mental status scores indicated the subjects had experienced toxic confusional states. The confusional group was found to have more severe illnesses than the mentally normal group. In addition, 32% of the confusional group experienced incontinence of urine and 10% incontinence of both urine and feces. On the other hand, only 9.5% of the mentally normal group were incontinent of urine and 0.5% were incontinent of both urine and feces. The dementia group had higher percentages than either of the other two groups. In addition, only 48% of the subjects in the confusional group had normal hearing and only 56% had normal hearing. In the mentally normal group the subjects over 70% had both normal hearing and vision. Psychiatric considerations were not explored.

Medical diagnoses significantly related to confusional states were pneumonia, cardiac failure, urinary infection, carcinomatosis, and depression. Prognosis also was found to be related to the subject's mental state. The mentally normal subjects had the best prognosis; however, the confusional group had the highest mortality. Of the subjects found confused on admission, 25% died within a month of the admission; whereas the mentally normal subjects had half the mortality rate at 12.5%. The

confusional group had a better prognosis and discharge rate than the dementia group.

Carino (1976) studied 10 oriented and 10 disoriented intensive care unit (ICU) patients to determine if differences existed in the control the patients exhibited over the environment. The disoriented patient was defined as one who exhibits psychotic like behaviors of delirium, confusion, paranoid hallucinations, delusions, or illusions. The investigator made direct observations of the patients' behaviors in ICU. A patient who became disoriented after being admitted to ICU was admitted to the study and placed into the disoriented group. Any patient who remained oriented after 72 hours in ICU was admitted to the oriented group. Patients admitted to ICU with a diagnosed neurological condition affecting levels of consciousness were excluded from the study.

The disoriented group and oriented group characteristics varied. The mean age of the oriented patients' group was 62.2; however, the mean age of the disoriented patients' group was 75.7 showing that the older patient experienced more disorientation. However, the mean number of days spent in ICU for the oriented group was 7.7 and the disoriented group spent 7.6 Eight surgical and two medical patients made up the oriented group and

five surgical and five medical patients made up the disoriented group.

Perception of the environment or the patient's orientation to the person, place, and time was observed. The oriented group perceived the environment 100% of the time; whereas only 33% of the disoriented group perceived the environment. Only 40% of the disoriented patients were visited by family, but 100% of the oriented patients were visited. Asking and responding to assistance by the staff also differed among groups. The oriented patients asked for help and defined their needs 100% of the time; however, the disoriented patients asked for help only 60% of the time and defined their needs only 40% of the time. Control of eliminative functions was not maintained by either group. Sensory losses which included both hearing and vision impairment were assessed in 100% of the disoriented patients. None of the disoriented patients were observed using corrective devices in the ICU. Only 50% of the oriented patients had sensory defects, and all but one were observed wearing sensory aides such as glasses and hearing aides in ICU (Carino, 1976).

Acute confusional states of the aged persons is believed also to be a reaction of the acute stress (Kral, 1975; Wolanin & Phillips, 1981). Most people experience the feelings of acute total confusion which accompany major

stressors, but the confusion is momentary and intermittent. In elderly persons, however, the confusion may persist because they have compromised or aged brain support and fewer physical and social resources (Kral, 1975; Wolanin & Phillips, 1981). Elderly persons admitted to a hospital or nursing home face major stressors including (1) threats to life and health, (2) discomforts, (3) economic concerns, (4) deprivation of intimacy or loss of physical closeness, (5) enforced idleness, (6) restriction of movement and absence of personal privacy, (7) separation from usual environment (8) fear of a loss of family status or role, (9) unpredictable perceptions of caregivers, (10) fear of being talked into something not wanted, (11) awareness of personal degeneration, (12) feelings of being forgotten, and (13) feelings that confinement will never end and that time drags (Wolanin & Phillips, 1980). Studies support confusion as a side effect of hospitalization, a major stressor for the elderly patient.

Gillick, Serrell, and Gillick (1982) examined 502 general medical patients for effects of hospitalization unrelated to diagnosis of therapy of acute illness. Of the 502 patients, 429 patients were under the age of 70 and 173 were at least 70 years of age. The elderly patients were identified as being at high risk of developing psychophysiological symptoms. The high risk individuals

were followed on four general medical wards, and data were collected only for the period that hospital care was being given to the patients by the ward team. Data were collected on four functional symptoms including confusion, not eating, falling, and incontinence. Four forms of medical intervention also were studied including the use of psychotropic medications, restraints, nasogastric tubes, and foley catheters. In addition, six complications sustained after admission were followed including deep vein thrombophlebitis, pulmonary embolus, aspiration pneumonia, urinary tract infection, septic shock, and fractures. Data were obtained from the medical records, nursing notes, and by attendance at nursing reports. Patients eliminated from the study included those with certain illnesses on admission: (1) altered mental status (psychosis, acute dementia), (2) catastrophic illness (coma, cardiac arrest, septic shock), or (3) neurological disorders (stroke, delirium tremens, subarachnoid hemorrhage, subdural hematoma, meningitis). In addition, patients diagnosed with catastrophic illness or neurological disorder during hospitalization also were eliminated.

Overall, 14.9% of the sample had one or more functional symptoms. In the younger group, 8.8% displayed at least one functional symptom; however, in the older group 40.5% demonstrated at least one functional symptom.

The researcher stated that the older group was strongly associated with the development of functional symptom ($p < .00001$), however, not with organic symptoms ($p = .29$). Infection was the only organic symptom which was identified as having a significant relationship with confusion. Confusion in the younger group was displayed in 3.6% of the patients; however, 29.5% of the elderly group demonstrated functional confusion. Therefore, age is found to be strongly associated with the development of confusion. A logistic regression statistical model was used to determine if a relationship existed between the functional symptoms, as the dependent variables, and sex, race, institution of origin, length of hospitalization, and number of drugs received during the hospitalization as the independent variables. Male patients and nursing home residents were found to be more prone to the development of functional symptoms at the $p = .06$ and $p = .05$ level, respectively. The other demographic variables and variables reflecting severity of illness were not associated with functional symptoms. The researchers concluded that whether hospitalization itself actually induced psychophysiologic symptoms cannot definitely be answered by the study. Recommendations were made for a randomized controlled study of hospital versus nursing home care to determine whether hospitalization alone, acute illness alone, some

combination of the two or some unidentified factor causes symptom formation. In addition, the researchers recommend that alternatives to hospitalization be sought when medically feasible since debilitating symptoms are related to hospitalization in the older patients (Gillick, Serrell, & Gillick, 1982).

Chisholm, Denston, Igrisan, and Barbus (1982) examined the prevalence of acute confusion in elderly hospitalized patients. The researchers felt that an unnecessary incidence, prevalence, and severity of confusion among elderly was occurring and that factors contributing to confusional states were susceptible to nursing intervention. Three data collection tools were developed: (1) an interview tool to determine the presence of confusion, (2) a protocol to assess potential causal factors of confusion, and (3) a checklist for recording degrees of confusion. Registered nurses on each shift were asked to place a check mark in the appropriate column to indicate the degree of confusion. Each patient's mental status was documented for at least one week unless the patient was discharged or expired before the study period ended. A daily prevalence rate was defined as the number of patients aged 60 or over who were judged confused at any time during a 24-hour period per 100 patients. However, the definition was unclear because the researchers studied

only 99 patients. In addition, degree of confusion was not defined; however, the terms mild, moderate, and severe were used to classify the patients if confusion developed. No standardized tool was used in the study. Even with the lack of clarity of the definitions, 55 patients out of the 99 patients were judged to have some period of acute confusion during hospitalization. Only five of the 55 patients were confused on admission, and only two became confused during the first 24 hours after admission. Development of confusion ranged from admission up to 41 days of the hospital stay. Severity varied widely and confusion ratings varied from shift to shift of individual patients. The researchers concluded that the rate of confusion was low; however, they did not compare the findings with any type of standard or previous research. High staff-patient ratios, a high degree of caring and concern, and stability of the staff were believed to be factors for the perceived low prevalence rate (Chisholm, Denston, Igrisan, & Barbus, 1982).

Roslaniec and Fitzpatrick (1979) tested for mental changes in 25 elderly medical patients between the age of 65 and 89 hospitalized in an acute care setting. The researchers hypothesized that the elderly patient would experience significant changes in all components of mental status including level of consciousness, orientation,

attention/concentration, memory, higher cognitive functions during four days of hospitalization. The patient's mental status was evaluated the afternoon of the admission day and then again on the fourth hospital day. The mental status of each patient was determined with a researcher-developed 20-minute assessment tool. During a six-week period, patients who met the criteria of the study and agreed to be interviewed a admission day and the fourth hospital day were admitted to the study.

A *t* test was used to compare the admission mental status scores with the fourth day mental status scores. Significant deterioration ($p < .05$) was found in level of consciousness, orientation, and abstract reasoning among the patients. However, no significant changes occurred in the attention, concentration, or achievement on calculations. Memory impairment approached significance. The researchers stated that the level of consciousness score changed only one point on an eight-point scale; consequently, the change may be difficult for nurses to identify clinically. However, disorientation was more evident and easier to identify clinically (Roslaniec & Fitzpatrick, 1979).

Millar (1981) studied 100 elderly surgical patients before and after surgery to evaluate psychiatric morbidity. Of the 100 patients, 49 were men and 51 were women and the

age range was 65 to 88 years. Patients were interviewed preoperatively using a standardized psychiatric interview and a standard cognitive test. Details about the patient's post-operative condition were obtained by interviewing the nurse in charge and reviewing the patient's chart and nursing cardex for any recorded evidence of psychiatric abnormalities. Nurses used written guidelines provided by the researcher for record keeping in the cardexes. The patients were interviewed on the second and fourth post-operative days using the cognitive test and questions about mood, pain, sleep, and general progress.

The researcher divided the findings into two major categories of psychiatric morbidity, intellectual impairment and affective impairment. Preoperatively, five patients were found to have some intellectual impairment, and eight patients had mild psychiatric illnesses including depression, anxiety, poor concentration, sleep disturbances, headaches, excess concern about physical health, and fears of the hospital and surgery. Postoperatively, nine patients over 80 and 23 patients between the ages of 65 and 79 had some form of psychiatric illness. Three patients had mild depression, and 14 patients had some intellectual impairment including some degree of clouding of consciousness with disorientation. Other symptoms included poor memory and concentration,

impaired grasp, misidentification of people, misperception, and visual hallucination (Millar, 1981).

Unlike Gillick et al. (1982), Millar linked 11 of the patients with the intellectual impairment to physical changes such as abnormal electrolytes, cardiovascular problems, and respiratory problems. Also, intellectual impairment was the first sign of pneumonia, and in six other patients, mental changes were likely the first indication of physical complications. Significant associations were found with the morphine, use of intravenous infusions, and insertion of urinary catheters. Psychiatric illness was associated with ages over 80, malignancy or biliary tract disease, and a prescription of at least five drugs after operations.

Like Gillick et al. (1982), Millar (1981) found infection to be associated with mental changes. No association was found between postoperative intellectual impairment and the patient's psychiatric history, family psychiatric history, higher ratings on the preoperative standardized interview, impaired intellectual performance before surgery, more than 12 hours spent in the recovery room or intensive care unit, a history of physical illness, and preoperative cigarette, alcohol or psychotropic drug use. The chi-square statistical test with one degree of freedom was used to determine the various associations.

Significance for this study was considered to be at the $p < .05$ level. Millar (1981) concluded that a preoperative intellectual assessment may assist the clinician to find patients with an acute reaction to hospitalization and surgery.

Illness, hospitalization, and surgery have been shown to be related to the development of acute confusional states; however, eventual death may also be linked to the phenomenon. Weddington (1982) examined 116 charts of medical-surgical patients seen on psychiatric consultation during a six-month period. Patients were observed to be either depressed, delirious, or confused prior to the psychiatric consultation. The APA (1982) criteria for diagnosing organic mental diseases were used to determine the diagnoses. The patients were primarily female, unmarried, physically ill, and poor. The disorders involved depression, acute confusional states, and personality disorders. The largest group of patients was 19 diagnosed with adjustment disorder with depressed mood, and the next largest group of patients was 15 diagnosed with acute confusion. Of the 116 patients, seven died within one year after the psychiatric consultation. Of the seven who died, six had been diagnosed with an organic mental disorder, and five of the patients met the APA (1982) criteria for delirium or acute confusional states.

All five patients were over the age of 65 and died within three months after the psychiatric consultation. Therefore, one-third of the patients diagnosed with confusion died whereas only one of the depressed patients died. Only three charts contained any reference to the patient's prognosis or addressed the issue of mortality. The psychiatric consultants made reference to prognosis in only one of the 15 cases of delirium (Weddington, 1982).

Weddington (1982) concluded that the retrospective chart review may be limited. However, he did recommend that the confused patients probably are best managed on medical and surgical floors rather than on psychiatric units; therefore, they have access to the medical and nursing expertise necessary for the management of rapidly changing physiologic condition.

Nurses have studied specific groups of surgical patients and the postoperative changes in cognitive ability. Raymond, Conklin, Schaeffer, Newstadt, Matloff, and Gray (1984) found that the mental acuity of 31 coronary artery bypass (CAB) surgical patients dropped significantly more than the control group made up of 16 less dramatic cardiovascular surgery patients. The CAB group had a mean age of 56, and the control group had a mean age of 60, and both groups had a mean education level of 14 years. Each patient was given a set of examinations which took

approximately two hours to complete. The set of examinations were given two days before surgery, at discharge (within one or two weeks after surgery), and later after surgery (within six to eight weeks after surgery).

The set of examinations included the Wechsler Adult Intelligence Scale (WAIS), the Symbol Digit Modalities Test, the Buschke Word List Test, the Benton's Visual Retention Test, the Raven's Colored Progressive Matrices Test, the Taylor Manifest Anxiety Scale, the Zung Depression Scale, and a mental state and neurological examination (Raymond et al., 1984). Differences in the scores within the groups were identified by using an analysis of variance for repeated measures with the Tukey test. Level of significance was place at $p < .05$. Analysis of covariance was used to evaluate differences in scores between groups.

Early after surgery re-examination of the patients showed that the CAB group's scores dropped significantly on the WAIS IQ, the symbol digit modalities test, and the Buschke word list test. The control group's scores did not drop. No changes occurred in either group for the Benton's visual retention test or the Raven's colored progressive matrices test. Late after surgery re-examination showed that both groups' scores had improved from the preoperative

examination scores. However, the CAB group did not exceed the preoperative values on the Buschke memory test. The researchers suggest the improvement may be from test practice effects on both groups. Neither group showed clinically significant depression according to the Zung depression scale. On the Taylor anxiety score, the CAB patients had higher anxiety before surgery than after, and the control group showed no change in their scores.

The researchers stated that difficulties in cognition early after coronary bypass surgery may cause problems since the patients are required to follow a complicated medical regimen. However, it was shown that the cognitive impairment is temporary and that nursing care and instruction may be modified to accommodate the changes (Raymond et al., 1984).

In summary, acute confusional states occur in the hospital in physically ill older adults. Studies have shown that these adults may have major illnesses, major surgery, less family support, sensory losses, and chemical imbalances. However, no study found the exact reason or combination of reasons why some elderly patients develop acute confusion and others do not. In addition, studies vary in the use of tools, criteria for admission to studies, statistical treatment and research design. The studies are limited in sample size and focus varies among

researchers. The basic definitions of terminology still are not consistent among studies (Foreman, 1986; Lipowski, 1980a, 1980b).

Prediction, Prevention, and Treatment

Acute confusional states are recognized as detrimental to patients and families and frustration to the nursing staff (Castledine, 1982). Although definitions of the phenomenon vary, theories are basically nonexistent, and research designs are difficult, nurses are attempting to predict, prevent, and/or treat acute confusional states.

In 1894, Seglas suggested that a confused patient's attention must be gained by explaining to the patient what he has been through and why he must try to concentrate on the questions asked. Seglas (1894) suggested that the clinician use much personal contact and express interest in the patient's recovery. In 1935, Bruce confessed that confused patients may recover with no more than good nursing care. Weeks-Shaw (1900) stated the nurse must be kind and gentle, yet firm and vigilant. Physical restraint was seldom necessary, and the room was to be kept quiet and dark. In addition, Sanders (1912) stated that the delirious patient required watching even when the symptoms were mild. Symptoms change abruptly; consequently, a means for quick restraint should always be at hand. The chief

treatment is to support the patient's strength (Sanders, 1912).

Prevention of confusion is a frequent subject of nursing articles. Patrick (1967) states that communication must be maintained with the elderly patient to keep them from becoming confused. Techniques include having family remain close to the patient and keeping clocks and calendars available to the patients. If the patient becomes confused, the nurse can give the patient correct information about the environment. Touch and direct eye contact when speaking with the patient also is suggested as an intervention or prevention for confusion. Patrick (1967) warns against the use of sedating drugs and physical restraints. She cites a case in which a patient was relieved of confusion when restraints were removed. Social isolation is another factor which contributes to confusion. Frequent contacts with the patient provide stimulation and communication to combat the confusion. Cohen and Klein (1958) emphasized that the nurse is the key figure in the care of the delirious patient. The nurse's calm acceptance of the behavior and attention to safety are the key elements to good nursing care (Cohen & Klein, 1958).

Weymouth (1968) believes the nurses judge the behavior and the conversations of an elderly person as confused rather than attempt to determine the true meaning of the

behavior or conversation. Clear communication with the elderly patient and assistance toward independence may reduce the amount of confusion seen by the nurse. Wolanin and Phillips (1981) agree with Weymouth (1968) and believe that the confused elderly person's behavior has meaning and should be explored.

Acute confusional states have been shown to occur in postoperative patients especially after cardiac surgery. Therefore, Budd and Brown (1974) studied 31 patients to determine if the nurse can reduce the incidence of postcardiotomy delirium in ICU with the use of a specific reorientation procedure. The reorientation procedure included providing orientation to the ICU, the day's date, information to the patient on his physical progress, and addressing the patient by name. The procedure was organized and administered on an individual basis according to the patient's greatest need.

The patient's ages were between 23 and 63. The first 15 patients assigned to the study became the control group and were not given the reorientation procedure. The second 16 patients assigned to the study became the experimental study and were given the procedure. Delirium was documented through the ICU nurses' observations and recordings on a researcher-developed tool.

The student's t test was used to compare the differences between the number of delirious periods in the control and experimental group. The researchers reported a significant difference although the actual level of significance was at the p = .06 level. Behavior manifestations related to delirium were counted and compared by groups using the student's t test. The behavioral manifestations included restlessness, hostility, abusiveness, inappropriate laughter, and withdrawal. The experimental group had significantly fewer behavioral manifestations compared to the control group with a p = .003. The researchers concluded postoperative nursing intervention for the cardiac surgical patient reduces the incidence of delirium. Recommendations included providing a program that is meaningful to the patients. The reorientation program needs to be implemented on a planned, organized, and consistent basis. The question raised by the study: What is meaningful to the cardiac surgical patient?

Williams, Holloway, Winn, Wolanin, Lawler, Westsick, and Chin (1979) studied acute confusion among 91 hospitalized, elderly, surgically-repaired hip-fracture patients. This was first study to examine the relationship of acute confusional states among the elderly to general nursing. Its purpose was (1) to determine the controllable

nursing activities which appear to prevent acute confusion in elderly patients, (2) to designate nursing activities preformed in response to signs of acute confusion exhibited by the elderly, (3) to determine factors not under the control of the nurses which contribute to the risk of developing acute confusion, and finally, (4) to discover any agreement between the patient's and nurses' perceptions of the patient's mental status.

During the research, the subjects were interviewed on the first, third, and fifth postoperative days using researcher-developed tools to test memory, orientation, perception, and ability to follow direction. Stepwise multiple regression was used to examine the variables of memory, behavior, and the patient's report of his mental clarity. The researchers were unable to determine what independent nursing activities help prevent confusion or are used in response to acute confusion. However, activities which correlated with the level of memory and which were under partial control of nurses were mobility, urinary elimination, environmental orienting devices such as a time piece or television, room placement, and administration of narcotics and tranquilizers. Greater mobility was associated with better memory test scores and problems with urinary elimination were associated with lower memory scores. This study found that men and

patients with fever are most prone to confusion for the first few days after surgery. The researcher recommended conducting an experimental study to determine if nursing interventions can make a difference (Williams et al., 1979).

Williams, Campbell, Raynor, Mushots, Mlynarczyk, and Crane (1985) studied 170 hospitalized elderly patients 60 years of age or older with traumatic hip fractures and no medically-validated history of chronic mental impairment. The purpose of the study was to identify factors which put elderly hip-fracture patients at risk for confusion based on their prehospital characteristics and admission data and then to identify risk factors associated with the treatment and hospitalization. Two prediction models were developed and tested in the study. The factors examined in the first model included prehospital and admission data and the second used inhospital data. Other data collected included giving a mental status test, questioning patients about personal background, and recording of lab values.

Patients were interviewed on admission day and followed each day through the fifth postoperative day to obtain self-reported and observational data. Confusion scores were obtained through record review, questions addressed to the patient's primary caregiver and observation of the patient. Chi square and one-way

analysis of variance were used to determine the variables influencing confusion on certain postoperative days. Multiple logistic regression analysis was used to predict a patient's category of confusion.

Of the 170 patients, 51.5% manifested confusion during the five-day postoperative period. The variables related to confusion found significant at the $p < .05$ level were age, mental status score with three or more errors, and limited preinjury activities. However, the prediction ability for confusion of the first model was only 54%. Kappa values showed that nurses predicted confusion 38% better than chance and the model only predicted 12% better than chance. The researchers stated that the model is mechanical and could not surpass the inferences of skilled clinicians.

The factors revealed by a second model that predicts confusion scores on a day-to-day basis were (1) the preceding day's confusion score, (2) age, (3) mental status scores on admission, and (4) urinary dysfunctions such as incontinence or retention of urine. Overall, the most important predictor was the preceding day's confusion score.

The confusion scores were found to have no statistical relationship with serum sodium on postoperative day 1, tranquilizers and sedatives on the day of surgery, and the

environmental score for both the day of surgery and the first postoperative day. The effect of the previous day's confusion score was removed statistically from the second model's predictive factors and revealed three new variables related to confusion. These variables included the prehospitalization activity level, the amount of narcotics received the day before begin tested for confusion, and the previous day's mobility level. Amount of narcotics and mobility were found to be jointly significant; however, separate analysis of these two variables showed no significance. The second model also indicated that an increased use of narcotics was associated with a decrease of confusion (Williams et al., 1985).

Williams, Campbell, Raynor, Mlynarczyk, and Ward (1985) used the two models for predicting confusion developed by Williams et al. (1985) to conduct a quasi-experimental study with a nonintervention sample of 170 patients and an intervention sample of 57 patients. The study tested "whether the incidence of confusion in elderly patients with hip fractures and with no prior history of mental impairment could be reduced by specific nursing interventions" (Williams, Campbell, Raynor, Mlynarczyk, & Ward, 1985, p. 330).

A procedure which provided nursing approaches focused on six problem areas: "strange environment, altered

sensory input, loss of control and independence, disruption in life pattern, immobility and pain, and disruption in elimination patterns: (Williams, Campbell, Raynor, Mlynarczyk, & Ward, 1985, p. 332). The nursing approaches were taken from the literature, experience, discussions with orthopedic and gerontological nurses, and results from the first phase of the study testing the two models.

The data on the patients were obtained when researchers discussed the patients with the primary care provider and validated the codes recorded for confusional behaviors. The level of confusion was assessed with the Short Portable Mental Status Questionnaire (SPMSQ). The SPMSQ elicits information about memory orientation, ability to relay information about current events, and mathematical reasoning.

The first group, the nonintervention group, included 170 patients. The researchers then oriented the nursing staff to the intervention procedures to be provided to the patients in the experimental group. The second group, the intervention group, included 57 patients. A psychiatric nurse visited some of the patients in the experimental group to test whether a further drop in confusion would occur if a constant person listened to patient concerns and reinforced the staff's efforts in maintaining mental clarity.

The incidence of acute confusion among the patients with an average age of 74 was reduced to 43.9% in the experimental group as compared to 51.5% in the control group (Williams, Campbell, Raynor, Mlynarczyk, & Ward, 1985). However, no significant difference in the incidence of confusion occurred among patients seen by the nurse visitor (n = 30) compared with those not seen by her (n = 25). The nonintervention group of patients stayed an average of one day longer in the hospital than the intervention group. Intervention was more effective in preventing short severe episodes of confusion and was most effective from admission through the third postoperative day. By the fourth and fifth postoperative day, the two groups of patients exhibited less confusion. The researcher stated that it was difficult to determine which activity or environmental manipulation most influenced the outcome of the study because approaches were individual.

Nagley (1986) used a quasi-experimental design to determine if selected nursing actions are effective in preventing acute confusion in hospitalized elderly medical patients. The study included 60 patients over the age of 65 who could speak English, hear conversational speech, and had adequate vision to see the print on the clocks and calendars used in the study. The SPMSQ was used as the measure of confusion. Patients making less than four

errors on the tool were included in the study to exclude patients who were confused prior to admission.

The nursing intervention was provided to the 30 experimental patients located on one nursing unit. On another nursing unit, 30 patients in the control group did not receive the intervention. Nurses on the experimental unit were given a training session on how to provide the experimental treatment to the patient and how to score the data sheet. The nursing interventions specific for the experimental patients included providing comfort measures, maintaining fluid intake and daily weights, providing range of motion and ambulation, using functional sensory aids, providing privacy and access to personal possessions, television, and over bed light. A nurse-patient interaction was provided daily when no other nursing actions were carried out.

An analysis of covariance showed no difference between the experimental and control group's scores on the SPMSQ. A t test was done on the mean SPMSQ scores. Again, no difference was found between the groups on either admission day scores and the fourth day scores. The researcher found no presence of confusion in either the control group or experimental group. In addition, the researcher was unsure whether the specific interventions were carried out by the

nurses on the experimental unit and not carried out by the nurses on the control unit.

Finally, the researcher stated that perhaps she missed the impairments in mental status between admission and the fourth hospital day. In the study by Williams et al. (1985), the patients in both groups had similar mental status by the fourth and fifth postoperative days.

In summary, the study of acute confusion among the hospitalized elderly patients has been limited in the field of nursing. Foreman (1986) stated that the incidence or symptoms of ACS were reduced in some of the studies; however, confusion persists at a significant level in some studies. However, Nagley (1986) did not find any confusion among the experimental or control group. No true experimental study has been conducted to test nursing interventions' effects on the incidence of acute confusional states.

Summary

Acute confusional states have been studied very little compared to other phenomenon in nursing. The term was developed in the 1800s and has evolved very little since that time. Measurement of acute confusional states is not standardized; therefore, researchers have developed many tools to investigate the state. The lack of a theory to

explain confusion, the variety of tools used by researchers, and the limitations of standardized tools to measure confusion have hampered the ability of researchers to compare findings, therefore, slowing the progress in the prevention and/or treatment of acute confusion states.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The purpose of this study was to determine the effect of a daily orientation program on hospitalized elderly medical patients predicted to be at risk for developing an acute confusional state. The design of the study was a 2 x 2 x 5 factorial design with repetition over one factor (Glass & Hopkins, 1984). The design involved a random assignment of volunteers to either an experimental or control group with a determination of the subject's level of risk for developing an acute confusional state (ACS).

A diagram for the 2 x 2 x 5 factorial design with repetition over one factor is illustrated in Figure 6. The present study met the criteria for the 2 x 2 x 5 factorial design with repetition over one factor as follows:

1. Three basic factors were present in the design.
    a. The first factor was the treatment variable divided into treatment or experimental groups and no treatment or control groups (E_1 and E_2 and C_1 and C_2 in Figure 6). Subjects were randomly assigned to the groups (R in Figure 6).

b. The second factor was a blocking variable divided into two levels, low and high (L and H in Figure 6).

c. The third factor was the time variable divided into five even intervals.

2. The dependent variable was measured over the five time intervals (0 in Figure 6 in each row).

3. The dependent variable was measured before the treatment was applied (0_1 in Figure 6 on each row).

4. The independent variable was the treatment given to the experimental groups (X in Figure 6 on the experimental rows).

Figure 6. Diagram of the 2 x 2 x 5 factorial design with repetition over one factor.

		E_1	O_1	XO	XO	XO	XO
L	R						
		C_1	O_1	O	O	O	O
		E_2	O_1	XO	XO	XO	XO
H	R						
		C_2	O_1	O	O	O	O

The blocking variable was a score earned by each subject on the Confusion Risk Factor Interview (CRFI). A

predetermined cut-off score of 19 points was used to determine the subject's risk level placement. The dependent variable for the study was a Mini-Mental State Examination (MMSE) score obtained from each subject on admission day and the next four consecutive hospital days. The independent variable, a daily orientation program, was provided daily to the experimental group over four hospital days. A diagram of this study without the time factor is presented in Figure 7.

Figure 7. Diagram of the basic experimental 2 x 2 factorial design.

	Experimental Group (1)	Control Group (2)
(1) Low Risk	Receives daily orientation	Does not receive daily orientation
(2) High Risk	Receives daily orientation	Does not receive daily orientation

Figure 8 shows the extended 2 x 2 x 5 factorial design with repetition over one factor as follows:

1. The random assignment to the control or experimental groups,
2. The blocking variable, risk level, and

3. The dependent variable, the MMSE scores, obtained over time.

Figure 8. Illustration of the full 2 x 2 x 5 factorial design with repetition over one factor.

		Days in the Hospital				
		Admission	1	2	3	4
(1) Low Risk	Experimental Group Random Assignment	MMSE score	MMSE score	MMSE score	MMSE score	MMSE score
	Control Group	MMSE score	MMSE score	MMSE score	MMSE score	MMSE score
(2) High Risk	Experimental Group Random Assignment	MMSE score	MMSE score	MMSE score	MMSE score	MMSE score
	Control Group	MMSE score	MMSE score	MMSE score	MMSE score	MMSE score

Setting

The study was conducted in a 132-bed, 100,000 square-foot, federal hospital in a rural southwestern area of the United States. The subjects were located on two third-floor nursing units. Nursing Unit A generally admitted patients with these disorders: (a) cancer, (b) hepatic dysfunctions, (c) gastrointestinal dysfunctions, (d)

diabetes, (e) hypertension, and (f) chronic pain. Nursing Unit B generally admitted patients with these disorders: (a) respiratory dysfunctions, (b) cardiac dysfunctions, (c) gastrointestinal dysfunctions, and (d) surgical overflow patients. Each hospital unit with a centrally-located nursing station had beds arranged into private and semi-private rooms, and four-bed wards. Windows and a lavatory were located in each room. Bathroom facilities were shared by the patients; however, a few private rooms had separate bathrooms.

Population and Sample

The population consisted of hospitalized elderly United States military veterans, 65 years of age and older, living in rural areas of northern Texas, western Oklahoma, and eastern New Mexico. Veterans 65 years of age and older constitute 27.3% of the total hospital's patient population with a usual monthly total patient turnover rate of 400%. Patients needing hospitalization were interviewed by a nurse and examined by a doctor in the outpatient clinic. Hospital unit assignments for patients were made by the admission office according to the medical diagnosis and available bed space. Some of the persons admitted to the hospital from the outpatient clinic were unaware that the clinic visit would result in a hospital admission.

The persons in the actual sample of the study were admitted to either of the two third-floor nursing units between October, 1986, and February, 1987, from the described population. Forty volunteer subjects comprised the sample. The criteria for a participating subject was as follows:

1. The subject was admitted to the medical service in non-critical condition.
2. Consent was obtained to participate in the study.
3. The subject was able to hear, read, write, and understand English.
4. The subject had at least six years of formal education.
5. The subject had no current history of alcoholism, street drug dependency, and/or a chronic mental deficiency documented in his chart.
6. The subject was considered legally competent by the hospital admission office at the time of admission.
7. The subject was a male 65 years of age or older.
8. The length of hospital stay for the subject was expected to be at least four days according to the physician assigned to his care.

Protection of Human Subjects

The protection of human subjects occurred in the following ways.

1. The Human Research Review Committee at Texas Woman's University critiqued the study to consider subject protection, and approval was obtained to conduct the study (Appendix D).
2. The Texas Tech University Health Science Center Institutional Review Board critiqued the study to consider subject protection, and approval was obtained to conduct the study (Appendix E).
3. The Research and Development Committee at the hospital critiqued the study to consider subject protection, and approval from the hospital was obtained to conduct the study (Appendix F).
4. Each potential subject was approached by the researcher who introduced herself and gave an oral description of the study. Each subject was informed that participation in the study was voluntary and whether he participated or not would not affect the care he would receive. In addition, he was told that the interview and questions on admission day might be somewhat tiring. If family members with the subject were concerned about the content of the interview or

mental examination, they were allowed to look over both instruments before the interviewing process began. The subject was told that the information given the researcher would be known only by the researcher and would not be shared with any other staff member or family. Confidentiality was assured by assigning numbers rather than names to all data forms. The subject's name, address, and research number was placed on a separate research data form (Appendix G). The researcher asked the subject if he would like to receive his scores on the daily examination and/or the results of the study.

5. To safeguard the data and the subject's confidentiality, each subject's interview and mental examination forms were carried in a $9\frac{1}{2}$" by $12\frac{1}{2}$" heavy brown envelope and kept with the researcher at all times. No envelope was stored on a hospital unit or anywhere in the hospital. Family members were not present during the interviewing process or mental statis examination; however, visitation rights were observed. The subject's scores on the mental status examinations were hand delivered or mailed to each subject in a confidential mailing envelope. No actual scores

were given to a family member during or after the study.

6. A Consent Form was signed by each subject participating in the study. Each subject received a copy of the Consent Form at the time the original copy was signed (Appendix H).
7. The "Part 1 - Agreement to Participate in Research by or under the Direction of the Veteran's Administration," VA Form 10-1086, also was signed by each subject and placed in his chart as a permanent record in accordance with the standards of the Veteran's Administration (Appendix I).

Instruments

Two separate instruments were used in this study. The first instrument was the Confusion Risk Factor Interview, and the second was the Mini-Mental Status Examination. This section describes the characteristics and the testing of both instruments.

Confusion Risk Factor Interview

The Confusion Risk Factor Interview (CRFI) was developed by the researcher specifically for this project. The interview guide consists of risk factors related to the development of acute confusion. The risk factors found through an intense literature review and interviews with

nurses and elderly persons were clustered into categories according to the adaptation-level theory. Thus, the interview's categories were as follows: (1) focal stimuli (environmental factors), (2) background stimuli (sociological and sensory factors), and (3) residual stimuli (physical and psychological factors). A score was assigned to each risk factor in the interview guide under the three categories. Adaptation-level is a pooling of all three categories of stimuli; therefore, the total score earned on the CRFI also denotes the pooling of stimuli.

Three methods used to ascertain the risk factors from a subject were (1) direct questions, (2) nursing observations, and (3) medical records. All three methods were incorporated into the CRFI. To avoid redundancy, some of the information gathered from the Demographic Information Form (Appendix J) were used to score the CRFI.

The CRFI included three categories and five factor areas with a total of 94 individually scored risk factors or items, some of which were mutually exclusive. Forty-one items were direct questions for the subject and 53 items were scored from the subject's medical records, demographic information, and/or from nursing observations. A subject received a numerical score from individual items only if that risk factor was present. If a risk factor was absent, zero score was assigned to that item. A risk factor was

either present or absent; therefore, only nominal data were obtained. A total score for the interview may be calculated by adding each item's score to all other item's scores.

Validity

Validity has been established for the CRFI through content analysis and two pilot studies. This section is a discussion of the validation techniques.

In the fall of 1985, content validity was established for the items on the CRFI through a content analysis by three gerontology nursing experts known for their knowledge in the area of mental confusion. Each nursing expert independently rated each item's relevance as a risk factor in the development of acute confusion:

1. +1 indicated a great relevance.
2. -1 indicated little relevance.
3. 0 indicated an inability to decide on a degree of relevance (Waltz, Strickland, and Lenz, 1984).

Therefore, each item accumulated a score from the expert's ratings on a seven-point scale with a possible range from a maximum of +3 to a minimum of -3. If an item earned at least a +2, a 71.3% agreement existed among the experts. Therefore, the item's relevance as a risk factor for the development of confusion was established, and the item was

retained. If an item earned less than +2, the item was deleted from the CRFI. As a result of the content analysis, 42 of the original 130 items were deleted leaving 88 items. In addition, six new items were added on recommendation by two of the three experts making a total of 94 items for the CRFI.

Another nationally-known nursing expert rated the total tool after the first content analysis. Several editorial changes were suggested to aid the elderly person's understanding of the direct questions. However, she felt that the tool did identify the risk factors for the development of mental confusion. One item on the CRFI was altered following the expert's recommendation that oxygen saturation level be determined using an oximeter rather than awaiting an arterial blood gas analysis. An arterial blood gas analysis is not ordered for all patients; therefore, the expert's recommendation was adopted. A Biox 11 oximeter was available to the researcher for the study.

Construct validity was established by examining contrasting groups and the predictive ability of the CRFI (Waltz, Strickland, & Lenz, 1984). First, a younger group of men, not prone to acute confusional states, served as a comparison group for an older group of men at risk for developing acute confusional states (Williams, et al.,

1979). The scores obtained on the CRFI by a sample of 15 men between the ages of 40 and 60 were compared with the scores obtained by a sample of 15 men between the ages of 70 and 90. Since the data from the CRFI were rankable, the Mann-Whitney U test was used (Siegel, 1956). When the two groups of 15 scores were compared, the U was found to be 75 with 9 tied groups indicating no significant difference between the groups. The younger group's mean CRFI score was 16.067, and the older group's score was 19.333 with a mean difference of 3.267. The younger gruop's scores were similar to the older group's scores; therefore, a true comparison group for the CRFI was not used.

The CRFI's ability to predict a decrease in mental acuity during hospitalization was tested with the Spearman Rank Correlation. The CRFI scores for both the younger and older groups were compared to the daily MMSE scores obtained from admission to the fifth hospital day. A subject in the older group received a subscore on his CRFI total score related to his age and a subject in the younger group did not. Therefore, a correlation was conducted between the MMSE scores and the CRFI scores both with and without age calculated into the older subject's score. Table 1 displays the findings of the sets of correlations.

Without age considered in the CRFI, the MMSE scores were significant only on admission day, $p < .05$, and the

fifth hospital day, $p < .01$. When age scores were included in the score, a significant correlation, $p < .05$, occurred each hospital day. The MMSE scores on admission day and the fifth hospital day were significant at $p < .01$. All r_s were negative indicating that as the CRFI score rose, the MMSE score decreased.

Table 1

Correlation Between Daily MMSE Scores and the CRFI Scores with and without Age Scores from the Older Group

		Correlation Coefficients (r_s)	
Day	No. in Group	Without Age	With Age
Admission	30	-.408	-.467**
1	27	-.315	-.405*
2	26	-.284	-.410*
3	21	-.193	-.373*
4	19	-.371	-.471*
5	16	-.617**	-.710**

Note. r_s corrected for ties.
**$p < .01$
*$p < .05$

Construct validity has been established in two of the three areas planned: (1) The CRFI has a theoretical base in the adaptation-level theory, and (2) Predictive ability

was demonstrated with significant correlations between the MMSE score and the CRFI, particularly when the age is included in the score. Therefore, the pooling of stimuli may reflect adaptation level. The comparison group chosen for the elderly hospitalized patient proved not to differ significantly from the elderly patient.

Reliability

Interrater reliability was established by having two researchers each score a CRFI simultaneously. While one researcher conducted the interview and scored the instrument, the other researcher remained in the room, listened to the interview, and also scored the instrument. The two researchers alternated as the main interviewer with a total of 30 subjects. Prior to stating the described process, one practice session was held so that any problems with this technique were resolved. According to the Spearman Rank Correlation, the interrater reliability between two sets of CRFI scores was highly significant with an N of 30 and r_s of .945. The test-retest method was not used for this instrument because acutely ill medical patients fatigue easily and may change in physical status after hospital admission. These two factors could alter the patient's ability to answer the questions consistently in just a short period of time.

The reliability of the Biox II oximeter was determined by comparing the true arterial blood percent of oxygen saturation and the oximeter's readings of four subjects. A true percentage scale was present; therefore, the Pearson Product Moment Correlation was used to test reliability (Glass & Hopkins, 1984). The correlation between the oximeter and the arterial blood percent of oxygen saturation was an r of .9146. The extremely high correlation indicated the oximeter was reliable.

Mini-Mental State Examination

The second instrument used in the study was the Mini-Mental State Examination (MMSE), a simple, short cognitive mental status examination. The MMSE includes 11 questions, requires only 5 to 10 minutes to administer, and may be used serially and routinely (Folstein, Folstein, & McHugh, 1975). The tester using the MMSE may be a medical resident, nurse, or even a volunteer. The actual format of the MMSE is divided into two parts. The first part tests the patient's orientation, memory and attention with a maximum score of 21. The second part with a maximum score of 9 tests the patient's ability to name, follow verbal and written commands, write a sentence spontaneously, and copy a complex polygon (Appendix B). Permission was obtained

from the authors to use the MMSE in this study (Appendix K).

The MMSE was chosen for this study for these reasons (Folstein, Folstein, & McHugh, 1975):

1. Administration is extremely easy for a nurse.
2. Pass or fail score need not be discussed with the subjects.
3. The actual score may be used statistically without attempting to diagnose an actual cognitive state.
4. No time limit is required for the elderly subject.
5. The instrument maintains a stable reliability and validity when used serially or frequently.

Validity

The validity of the MMSE was established using 206 patients with several types of cognitive dysfunctions and 63 normal persons. Validity was established by comparing cognitively impaired subjects with cognitively intact subjects. With a total possible score of 30, the mean score for dementia patients was 9.7; for depressed patients with cognitive impairment, 19.0; and depressed patients, 25.1. The mean score for cognitively intact subjects was 27.6. The mean scores were different and agreed with the level of the subject's cognitive dysfunction. The findings were unaffected by age related factors as shown by giving

the examination to depressed patients both under and over the age of 60. The mean score of patients under the age of 60 was 24.5, and for those over the age of 60, it was 25.7. These scores were not significantly different (Folstein, Folstein, & McHugh, 1975).

Reliability

The reliability of the MMSE was shown through a 24-hour or 28-day retest by single or multiple examiners. When the MMSE was given twice by two examiners 24 hours apart, the Pearson *r* was found to be .827. When elderly and demented patients were tested twice with an average of 28 days apart, there was no significant difference between the test scores (Folstein, Folstein, & McHugh, 1975).

Limitations of the MMSE

Anthony, LeResche, Niaz, VonKorff, and Folstein (1982) examined the limitation of the MMSE as a screening test for dementia and delirium among 97 hospitalized patients. When judged against a research psychiatrist's standardized clinical diagnosis of delirium or dementia, the MMSE was found to be 87% sensitive and 82% specific in detecting dementia and delirium with a cut-off score of 23/24. A false positive ratio was found to be 39%; however, all false positive scores related to subjects with less than nine years of education and an age of 60 years or older.

If a score of 0 to 23 indicates cognitive impairment, then 34% of the 97 patients were cognitively impaired on the day of admission to the ward. Anthony et al. (1982) felt that these values support the MMSE as a screen for dementia and delirium among hospital patients. However, orientation to time, attention, calculation, recall, and copy design are related to the patient's education level and age level.

The MMSE may yield a false positive score with persons among the general population; therefore, the Pearson Product-Moment Correlation was calculated between the admission day MMSE scores and the education levels of the 15 subjects in both the younger and older groups studied for the reliability and validity of the CRFI. In the older group the r was .308, a non-significant coefficient. In the younger group, the r was .501, significant coefficient at $p < .10$. The older group's years of education had a mean of 9.667 with no significance between education levels and the admission MMSE scores. Therefore, this study used subjects with no fewer than six years of formal education.

First Pilot Study

The first pilot study was conducted from November 20 to December 10, 1985, at a general hospital in northern Texas for the purpose of establishing validity and

reliability of the Confusion Risk Factor Interview (CRFI). The hospital consented to have the study conducted in the facility, and three physicians granted verbal permission for the researcher to approach their hospitalized patients. Two other physicians allowed the researcher to approach their hospitalized patients only after the physicians had given their individualized consent.

Since the CRFI had never been used on hospitalized patients, the researcher selected an available sample of medical patients who were (1) willing to participate in the study, (2) considered competent at the time of admission, (3) had no current history of alcoholism, street drug dependency, and/or mental deterioration, and (4) could hear, read, write, and understand English. Patient names were obtained through the hospital's admission office. If the patient consented to be in the study, the CRFI was conducted in the patient's room on admission day. Following the interview, the MMSE was administered. Then, on each consecutive day for at least two days, each patient was given the MMSE again.

The final sample included only four white protestant female patients between the ages of 65 and 82 with a mean age of 76.5. No men were admitted to the hospital by the physicians during the data collection phase of the study. Reliability for the CRFI was not established because the

sample was too small. The interview took between 20 and 30 minutes to complete, and the MMSE took between five and seven minutes to complete. The subjects had no complaints following the interview; however, some items required rewording at the time of the interview for the subjects to understand the statements in the CRFI. Three of the patients were discharged, and one patient died on the third day of hospitalization. The MMSE scores were mailed to the two subjects requesting test results.

The CRFI scores were correlated with the MMSE scores to determine if the CRFI had construct validity. Since a high CRFI score indicated a high risk of developing mental confusion and a low score on the MMSE indicates cognitive impairment, a negative correlation was expected. The Spearman Rank Correlation was calculated between the CRFI scores and the admission, first, and second day MMSE scores. The coefficients were as follows:

1. Admission day, $r_s = -.55$,
2. First day, $r_s = -.55$, and
3. Second day, $r_s = -.85$.

Although negative correlations were present and a trend may have been present, the sample was too small for complete confidence in the statistical results. Consequently, further testing with a larger sample was planned.

Following the pilot test, the CRFI was altered according to the findings on the content analysis and each item rewritten for clarity. The suggestions made by the fourth nursing expert also were incorporated into the instrument. In addition, 10 doctoral nursing students reviewed the tool for clarity resulting in more editorial and format changes.

Second Pilot Study

The second pilot study was conducted on the Confusion Risk Factor Interview (CRFI) to establish (1) interrater reliability, (2) construct validity, and (3) a cut-off score between high risk and low risk CRFI scores. The pilot test was conducted with a sample of 30 in May, June, and July, 1986 in a 132-bed federal hospital in northwestern Texas. Permission to conduct the study was given by the hospital's Research and Development Committee and the Institutional Research Board representing the hospital.

While permission was being obtained from the subject, some family members of the older patients were very concerned about the question that were being asked in the interview and the mental examination. In all cases, concern was alleviated simply by allowing the family member to look over the two instruments. Available volunteer

medical patients were used to test the CRFI. The CRFI again took between 20 to 30 minutes and the MMSE took 5 to 7 minutes to administer. Each required minimal effort from the patients. Twenty-six subjects requested the results of the MMSE: therefore, the results were released to the subjects at the end of their involvement in the study either at the hospital or by mail.

Reliability and validity were established with the pilot test. The maximum score which may be earned on the CRFI is 82; however, a score that high is unlikely. Therefore the cut-off score was determined by examining the mean score of the sample for the older group. Subjects with a score of 19 or greater were considered in the high risk group and those with a score of 18 or lower were considered to be in the low risk group. Several editorial changes were made in both the CRFI and the Demographic Data Form following the pilot test to increase the ease of administration.

Pilot Test for the Daily Orientation Program

The Daily Orientation Program was developed from Campbell, Williams, and Mysckuszik's (1986) strategies for manipulating contributing factors related to the development of ACS. The program was given by the researcher to four hospitalized elderly male patients

between 8:30 a.m. and 11:00 a.m. for four consecutive days following hospital admission. Visitors were not allowed in the hospital until afternoon; therefore, no visitors were present during the daily programs. Prior to giving the program to each patient, his chart and cardex were reviewed so that the researcher was well informed of the patient's daily schedule, medications, and therapies. In addition, a 24-hour report concerning the subject's health status was obtained from the registered nurse assigned to his care.

A copy of the daily orientation program was taken to the patient's room so that the program could be followed carefully to avoid any omissions. The program conducted with each patient took approximately 20 minutes. When patients wanted to speak with the researcher longer than the 20 minutes, the researcher politely excused herself to keep the program as similar as possible for each patient. If the patient did not want to speak to or ask questions of the researcher during any part of the 20 minutes, the researcher remained seated in a chair next to the subject's bed prepared to answer questions until the 20 minutes had elapsed.

The weather report given to the patients was obtained at approximately 8:00 a.m. each day from the local free telephone time and weather service. When the patient was engaged in personal care or a therapy, the researcher

returned at a later time. In addition, if the television was on in the patient's room, the researcher asked to turn it off. If the patient was extremely interested in the program on television, the researcher returned at the program's conclusion. No changes were made in the daily orientation program.

Method of Data Collection

Prior to data collection, the researcher met with both the physicians and nurses working on the medical units to assure them that patient care would not be interrupted. The exact intervention used in the study was not shared with the nurses or physicians to avoid attempts by other professionals to imitate the specific intervention. The nursing intervention was shared with the staff following the study if the results of the study indicated its value.

From Monday through Friday, names of men admitted to the medical service were obtained from the hospital's admission office. When a patient was admitted to the medical service in a noncritical condition with a birthdate on or before 1921, the researcher reviewed his chart. Then the subject's physician was asked about the patient's health history and expected length of hospital stay. If the patient was to remain in the hospital for at least four days and met the criteria for the study, the researcher

approached the patient in his room to introduce herself. The researcher explained her presence and explained the general purpose of the study. If the patient remained interested in learning more about the study, the researcher explained the subject's activities in the study. The selected subjects were considered competent and not confused; therefore, the term confusion or acute confusional states were omitted from the explanation.

When the subject agreed to participate in the study, the researcher asked a licensed nurse to witness a re-explanation of the study including the rights and privileges of the subject. Then the nurse witnessed the subject signing both consent forms. Following this procedure the nurse also signed both consent forms.

Between 3:00 p.m. and 8:00 p.m. on admission day, the CRFI and the MMSE were administered to the subject by the researcher when no other person was in the room. If the subject was on a ward, the curtains were drawn to provide some privacy. A rest period was provided between the CRFI and the MMSE if the subject appeared tired or requested a rest period. Each subject was randomly assigned to either the experimental group or the control group. The subject was informed as to his group assignment.

If assigned to the experimental group, the subject was visited two times during each hospital day, one time by the

researcher in the morning between 8:30 a.m. and 11:00 a.m. to receive the daily orientation program and one time in the evening between 3:00 p.m. and 8:00 p.m. to be given the MMSE. If assigned to the control group, the subject was visited once daily by the researcher between 3:00 p.m. and 8:00 p.m. to be given the MMSE. Subjects were admitted to the study until 20 patients were in both the experimental and control groups. The subjects in the experimental and control groups were placed either in the high or low risk group according to the CRFI score obtained on admission day.

Analysis of the Data

The 2 x 2 x 5 factorial design with repetition over one factor used a fixed effects three-factor analysis of variance to test the three hypotheses. The first factor was the treatment level; the second factor was the risk level; and the third factor was the mental status examination scores obtained on admission day and on four consecutive hospital days over time. The subjects were nested in the treatment and the risk factor levels.

The main effects and interactional effects of the study were determined by first setting up an ANOVA summary table. The sum of squares and degrees of freedom were determined from the MMSE scores for the treatment level

groups, risk level groups, and days in the hospital. Frequencies, means, and percentages described the sample's demographic information. Interactional sums of squares were determined between the scores of (1) the treatment level groups and the risk level groups, (2) the treatment level groups and the days in the hospital, (3) the risk level groups and the days in the hospital, and finally (4) the treatment level groups, the risk level groups, and the days in the hospital. The sums of squares from within each cell or error were determined. The expected mean squares were determined by using the Fixed-Effects Model to establish appropriate *F* ratios to test the three hypotheses.

The power of the analysis of variance for this study was examined. A requirement to determine the power of the test statistic, *F* ratio, is to have fixed effects, a characteristic of this study. The standard treatment of power has an index related to *F*, the standard deviation of the standardized means. The *F* is one-half the *d*, the range of standardized means. The medium *F* equalled to .25 is used for most research in the behavioral sciences. The sample size requirement for a study to have a power of .80 with an alpha at .05 for an *F* at .25 is an *n* equal to 39 and an *N* equal to 195 (Cohen, 1977). With a total of 40

subjects and 200 MMSE scores, this study met the requirements for a power of .80.

Summary

The purpose of this study was to determine the effects of a daily orientation program on hospitalized elderly medical patients predicted to be a risk for developing an acute confusional state. A 2 x 2 x 5 factorial design with repetition over one factor is explained and illustrated. The instruments used in the study, Confusion Risk Factor Interview and the Mini-Mental State Examination, are discussed including reliability and validity. Protection of human rights, the pilot studies, and the method of collecting data are outlined and explained. Data analysis includes descriptive statistics from the sample's demographic information and a factorial analysis of variance. The power of the analysis of variance is stated.

CHAPTER 4

ANALYSIS OF DATA

The problem of the study was: What is the effect of a daily orientation program on hospitalized elderly medical patients predicted to be at risk for developing an acute confusional state? A 2 x 2 x 5 factorial design with repetition over one factor was used to answer the question proposed. The factors included (1) the random assignment of subjects to either the control or experimental group, (2) the high or low risk level determined by the Confusion Risk Factor Interview (CRFI), and (3) the MMSE scores obtained over a five-day period. The statistical analysis of the data was done with a statistical package, the StatView 512+ for the 512 K Macintosh computer (Feldman, 1986).

Research hypotheses for the study were:

1. Hospitalized elderly medical patients who have high Confusion Risk Factor Interview scores on admission day and who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who have high

Confusion Risk Factor Interview scores and who do not receive the daily orientation program.

2. Hospitalized elderly medical patients who have low Confusion Risk Factor Interview scores on admission day and who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who have low Confusion Risk Factor Interview scores and who do not receive the daily orientation program.
3. Hospitalized elderly medical patients regardless of their Confusion Risk Factor Interview scores on admission day who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who do not receive the daily orientation program.

The following sections are a description of the sample and a discussion of the findings related to the MMSE scores and each of the three hypotheses. A summary concludes the chapter.

Description of the Sample

Forty-four male subjects were admitted to the study and randomly assigned to either the experimental or the control group; however, four subjects were dropped from the study. One patient completed the procedures for the study

but was omitted because at the time of admission the subject was unable to state any part of the date or his location. This 88-year-old subject was able to answer the questions on the CRFI, subtract by sevens accurately, and was viewed as oriented on admission by both the nursing staff and his physician. Several days following this subject's admission, a social worker wrote on the chart that his family had admitted that he was often confused at home. The subject, however, was visited regularly by the researcher because she had promised to see him prior to knowing he was confused.

The second patient dropped from the study developed acute congestive heart failure on the first hospital day and was taken to the intensive care unit in critical condition. A third patient died from a sudden massive cerebral vascular accident on the third day of the study. A fourth patient was discharged two days prior to completing the daily requirements of the study.

The remaining 40 subjects completed all the requirements for the study. The subjects with a CRFI score of 19 were placed in the high risk groups and subjects with a CRFI score of 18 or less were placed in the low risk groups. The subjects dropped from the study produced an even division among the high and low risk groups.

The subjects' ages ranged from 65 to 85 years with a mean of 70.85 years. Eighteen of the subjects were between the age of 65 and 69; fifteen were between 70 and 75; five were between 76 and 80; and two were between 81 and 85 years of age. Further breakdown showed that the mean age of the control subjects was 70.9 and of the experimental subjects was 70.8 with a mean difference of only 0.1. The division of ages in the risk level was similar. The high risk group's mean age was 71.45, and the low risk group's mean age was 70.25 with a mean difference of 1.2. Table 2 lists the age levels among the subjects.

Table 2

Distribution of Age Levels Among the Subjects

Age Range From	To	Number	Percent
65	69	18	45.0
70	75	15	37.5
76	80	5	12.5
81	85	2	2.5
Total		40	100.0

Ethnic representation in the sample was (1) Caucasians, 32 or 80%; (2) Blacks, 5 or 12.5%; and (3)

Mexican-Americans, 3 of 7.5%. Religious affiliation was (1) Protestants, 90%, and Catholics 10%. All subjects had a religious affiliation.

The greatest number (65%) of the subjects were married with 17.5% widowed more than a year. No subjects were separated legally or for unusual circumstances. Table 3 shows the marital status among the subjects.

Table 3

Marital Status of the Subjects

Status	Number	Percent
Married	26	65.0
Single	1	2.5
Divorced	4	10.0
Separated	0	0.0
Apart/spouse	0	0.0
Widowed > year	7	17.5
Widowed < year	2	5.0
Total	40	100.0

The persons offering personal and emotional support for the subjects varied; however, 24 (60%) of the subjects looked to their spouses for support and 10 (25%) of the subjects looked to friends for support. Other than

spouses, family members usually were selected less often than a friend for a subject's support system. Table 4 displays persons who offered emotional support for the subjects.

Table 4

Persons Offering Emotional Support to Subjects

Person	Number	Percent
Spouse	24	60.0
Child	2	5.0
In-law	0	0.0
Brother/sister	1	2.5
Other relatives	2	5.0
Friend	10	25.0
Institution	0	0.0
No one	1	2.5
Total	40	100.0

Among the subjects, 37 (92.5%) lived in their own apartments or homes; one (2.5%) lived with a family member; and two (5%) lived in nursing homes. Most subjects were self-sufficient as demonstrated by the high number living in their own apartments or homes.

Education levels varied widely. Fourteen (35%) of the subjects were high school graduates; whereas 17 (33.5%) never finished high school. Only 4 (10%) of the subjects had as little as a sixth grade education. Nine of the subjects had some college courses; however, only one subject was a college graduate. The control group's mean years of education was 10.05 years with a standard deviation of 2.9, and the experimental group's was 11.15 with a standard deviation of 2.434. The mean difference was 1.1. Table 5 lists the levels of education.

Table 5

Education Levels Among the Subjects

Level	Number	Percent
Elementary (6 years)	4	10.0
Junior high (7-9 years)	10	25.0
Partial high school	3	7.5
High school graduate	14	35.0
Some college	8	20.0
College graduate	1	2.5
Total	40	100.0

Note. High school graduates had completed either 11 or 12 grades.

All subjects were retired and veterans of either World War I or World War II. The occupations prior to retirement among the subjects were diversified. Table 6 lists the past occupation of the subjects.

Table 6

Occupations Prior to Retirement Among the Subjects

Occupation	Number	Percent
Unskilled	8	20.0
Skilled	13	32.5
Professional	5	12.5
Self-employed	10	25.0
Military	4	10.0
Total	40	100.0

Skilled occupations such as carpentry, plumbing, welding, and heavy equipment were jobs held by 13 (32.5%) of the subjects. Self-employment represented 10 (24%) of the subjects' previous occupations. Farming was the most frequently listed occupation of self-employment. Only 4 (10%) had military careers, and 8 (20%) had unskilled jobs.

The subjects came from a rural region of the country spreading over approximately 90,000 square miles. Exactly half of the subjects was from one of two cities with

populations of 175,000 and separated by a distance of 125 miles. The other half was from towns smaller than 50,000 in population. In the rural region, the distance a subject traveled from his home to be admitted to the hospital was sometimes great (Table 7).

Table 7

Distance Traveled from Home to Hospital

Miles	Number	Percent
1 - 20	17	42.5
21 - 40	2	5.0
41 - 60	2	5.0
61 - 80	2	5.0
81 - 100	5	12.5
Over 100	12	30.0
Total	40	100.0

Twelve (30%) of the subjects traveled over 100 miles to get to the hospital and 17 (42.5%) of the subjects traveled no more than 20 miles to get to the hospital. The remaining subjects traveled between 20 and 100 miles to get to the hospital.

After admission, 25 (62.5%) of the subjects stated they had expected to be admitted to the hospital from the

outpatient clinic; however, 15 (37.5%) of the subjects had not expected to be admitted. After admission to the hospital, the subjects were admitted to one of the three types of units: (1) 13 subjects were in private rooms, (2) 15 subjects were in semi-private rooms, and (3) 12 subjects were in four-bed wards. Table 8 illustrates the division of the subjects among the bed units.

Table 8

Location of Subjects in Three Types of Bed Units

Unit	Number	Percent
Private	13	32.5
Semi-private	15	37.5
Ward	12	30.0
Total	40	100.0

Reasons for admission to the hospital were classified into nine major areas. Table 9 lists the reasons for admission, the number admitted for each reason, and the percentage of subjects admitted for each reason.

Subjects with pneumonia and chronic obstructive pulmonary disease made up 30% of the admissions; whereas 22.5% of the admissions were subjects receiving chemotherapy for various forms and stages of cancer. Only

12.5% of the subjects were admitted for cardiac dysfunction although other subjects did have cardiac disease. Several subjects had diabetes, but none were admitted directly for diabetes.

Table 9

Reasons for Hospital Admission Among Subjects

Reason	Number	Percent
Cardiac dysfunction	5	12.5
Pneumonia[a]/COPD	12	30.0
Diabetes	0	0.0
Chemotherapy for CA[b]	9	22.5
GI disturbance	4	10.0
Pain	2	5.0
Terminal CA	2	5.0
New diagnosis/CA	5	12.5
Hypertension	1	2.5
Total	40	100.0

a COPD is chronic obstructive pulmonary disease.
b CA is cancer.
c GI is gastrointestinal.

In summary, the sample's ages, ethnicity, religious affiliations, marital status, personal support systems, living situations, education level, past occupations,

distances from home to the hospital, and hometown populations were described. Types of units, types of admission, and reasons for admission also were described.

Findings

The three hypotheses in the study were tested with data based on the daily MMSE scores obtained from each of the 40 subjects from admission day to the fourth consecutive hospital day. Consequently, the analysis of variance with repeated measures used 200 actual scores. Subjects were randomly assigned to the treatment groups and placed in either the high or low risk groups according to the CRFI scores. Therefore, the subjects and thus the MMSE scores were arranged into four research groups: (1) the low risk control group, (2) the high risk control group, (3) the low risk experimental group, and (4) the high risk experimental group.

Statistical Analysis of the MMSE Scores

Each group's mean MMSE score from admission day to the fourth hospital day is listed in Table 10. The low risk experimental group had the highest mean score, 29.5 on the fourth hospital day. The low risk control group had the lowest mean score, 25.9, on admission day.

The entire sample's daily mean MMSE scores were determined for a view of the minimum and maximum scores,

Table 10

Daily Mean MMSE Scores of Research Groups

Day	Experimental		Control	
	High	Low	High	Low
Admission	27.5	28.0	26.8	25.9
Day 1	27.6	28.4	27.4	27.2
Day 2	27.4	28.2	27.4	27.0
Day 3	26.9	29.0	27.9	26.6
Day 4	26.7	29.5	27.9	27.1
Total	27.22	28.62	27.48	26.76

Note. N = 40

ranges, variances, and standard deviations. Table 11 displays these samples' daily mean MMSE scores.

As indicated in Table 11, the greatest range of scores, 11, occurred on admission day, and the shortest range, 6, occurred on both the first and third hospitals days. The greatest variance in the scores occurred on admission day with a 5.895 and the least occurred on the first hospital day with a 2.859. The lowest mean was on admission day with 27.08, and the highest mean was on the fourth hospital day with 27.8, perhaps evidencing some carry-over effects of the MMSE. The mean difference for the entire sample, however, was only .72 representing an

overall mean change of less than one point over the five day period.

Table 11

Sample's Daily Mean MMSE Scores

	Admission	Days in the Hospital 1	2	3	4
Mean	27.05	27.650	27.625	27.600	27.800
Standard deviation	2.428	1.688	1.970	2.010	2.151
Variance	5.895	2.849	3.881	4.041	4.626
Minimum	19.000	24.000	22.000	24.000	23.000
Maximum	30.000	30.000	30.000	30.000	30.000
Range	11.000	6.000	8.000	6.000	7.000

Note. N = 40

A perfect score for the MMSE was 30; whereas a score from 0 to 23 indicated cognitive impairment (Anthony et al., 1982). The highest score for each of the five days represented was a 30; however, the lowest score, 19, was reported on admission day. Consequently, the criterion of mental alertness on admission was not met by the subject. Another score of 22 made by a subject in another group also was accepted on admission day. The two subjects inadvertantly remained in the study. The researcher

routinely did not add up the scores on admission day when the subjects were found oriented to place, time, person, could follow directions, and were recognized as oriented by both the nurses and the subject's physician. Both low scores were discovered only after each subject had completed the study. At that time the daily MMSE scores were calculated for the confidential report given to each subject. Both subjects made the lowest MMSE score on admission day.

The MMSE's limitations were of concern with the sample because advanced age and a limited education may produce a false positive score in the MMSE (Anthony et al., 1982). The sample of subjects had ages ranging from 65 to 84 and education levels ranging from sixth grade to a college education. Therefore, before calculating the analysis of variance, two Pearson Product-Moment correlations were conducted between the subject's daily MMSE scores and the actual ages and years of education. Table 12 displays the findings of the correlations.

According to the information presented in Table 12, no significant correlations were found between the daily MMSE scores and the age or education level of the subjects. The highest r was between admission day and years of education; however, with an N = 40, it cannot be considered

Table 12

Correlation Coefficients of Daily MMSE Scores and Age and Education

Day	Age of Subject (r)	Years of Education (r)
Admission	.041	.202
1	.128	.143
2	.018	.048
3	-.047	.210
4	.086	.184

Note. With N = 40, correlation coefficient r at an alpha of .05 is .264.

significant. Therefore, these two variables in this sample may not have played a strong role in the study.

Analysis of variance with repeated measures was calculated using the sample's MMSE scores. The results are given in Table 13.

The ANOVA summary table reveals a significant interactional effect ($p = 0.0291$) between treatment level (A) and the risk level (B). A profile of the interaction is diagrammed in Figure 9 using each group's mean score from Table 10. The post hoc test, Newman-Keuls technique, was used to find the simple main effects of the two

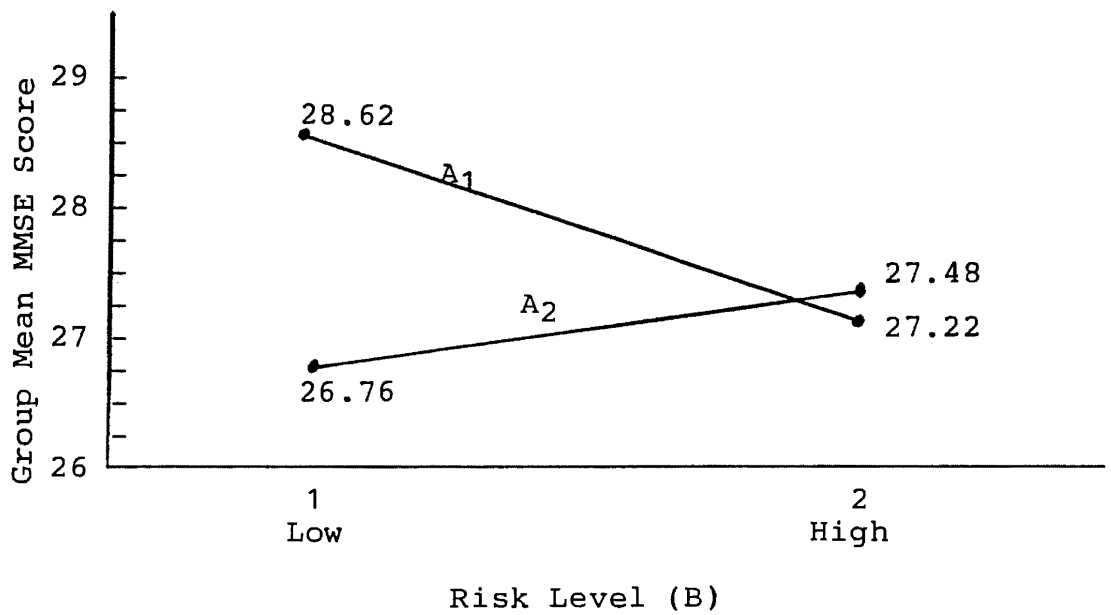
Table 13

Analysis of Variance (ANOVA) Summary Table of MMSE

Source	df	Sum of Squares	Mean Square	F test	p value
Treatment level (A)	1	28.125	28.125	2.359	.1333
Risk level (B)	1	4.205	4.205	.353	.5563
AB	1	61.605	61.605	5.167	.0291*
Subjects with groups	36	429.260	11.924		
Repeated measure (C)	4	13.220	3.305	1.712	.1506
AC	4	6.100	1.525	.790	.5336
BC	4	8.720	2.180	1.129	.3452
ABC	4	14.320	3.580	1.854	.1217
C x subjects with groups	144	278.040	1.931		

a df = degrees of freedom

Figure 9. Profile for the treatment level (A) and risk level (B) interaction.



A_1 = Groups who received Daily Orientation Program
A_2 = Groups who did not receive Daily Orientation Program

factors, treatment and risk level. After the group means in Table 10 were ranked and the necessary data were taken from the ANOVA summary table (Table 13), the Newman-Keuls technique was carried out.

The highest ranked pairwise contrasts were systematically computed to find the Studentized Range Statistic q to determine significance. A q of 3.811 was found between the scores of low risk experimental and control groups with a significance at $p < .05$. No statistical difference, however, was found between the mean scores of the ihgh risk experimental and control groups.

The results in the ANOVA summary table (Table 13) and the results of the Newman-Keuls technique provided information to reject or fail to reject the three research hypotheses.

Hypothesis 1

Hypothesis 1 stated that hospitalized elderly medical patients who have high Confusion Risk Factor Interview scores on admission day and who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who have high Confusion Risk Factor Interview scores and who do not receive the daily orientation program. In Table 13, results indicate that neither the treatment level (A) with an $F = 2.359$ and $p = .1333$ nor the risk level (B) with an $F = 0.353$ and a $p = .5563$ were significant in the study. Therefore, the overall or main effects of treatment level and risk level were not significant.

The interaction effect, however, between treatment level (A) and risk level (B) was $F = 5.167$ with a $p = .0291$. The Newman-Keuls technique indicated that an interactional effect occurred only on the low risk level. The pairwise contrast for the high risk experimental group was not significantly different from the high risk control

group. The high risk experimental subjects' mean MMSE scores were not improved by the daily orientation program. Hypothesis 1 which stated that the high risk experimental group would have better MMSE scores than the control group is not tenable, and thus is rejected in the study.

Hypothesis 2

Hypothesis 2 states that hospitalized elderly medical patients who have low Confusion Risk Factor Interview scores on admission day and who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who have low Confusion Risk Factor Interview scores and who do not receive the daily orientation program. The interactional effect between treatment level and the risk level according to the Newman-Keuls technique demonstrated that the low risk experimental group benefitted significantly from the daily orientation program. Figure 9 displays the high mean score of the low risk experimental group in relationship to the low risk control group. Therefore, Hypothesis 2 which states that hospitalized elderly medical patients with low CRFI scores who receive the daily orientation program will have higher MMSE scores than elderly medical patients with low CRFI

scores who do not receive the program may be accepted as tenable in this study.

Hypothesis 3

Hypothesis 3 states that hospitalized elderly medical patients regardless of their Confusion Risk Factor Interview scores on admission day who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who do not receive the daily orientation program. Examination of the ANOVA summary (Table 13) discloses the main effect of repeated measures (C) with an $F = 1.712$ at $p = .1506$ was nonsignificant. The interactional effect between risk level (B) and repeated measures (C) with an $F = 1.129$ at $p = .3452$ also was nonsignificant. Treatment level (A) and repeated measures (C) with an $F = .79$ at $p = .5336$ also was nonsignificant. The interactional effect of the treatment level, risk level, and repeated measures with an $F = 1.854$ at $p = .1217$ was found nonsignificant. The combination of risk level, treatment level, and repeated measures made no significant difference in the study. Consequently, Hypothesis 3 is not tenable; therefore, it is rejected.

Summary of Findings

The description of the sample included the subject's ages, ethnicity, religious preferences, marital status, personal support system, living situations, education levels, hometown populations, distances from home to the hospital, reasons for admission, types of unit, and types of admission. The average subject was about 70 years of age, married, Caucasian, Protestant, and had a high school education. Most subjects looked to a spouse for personal support and lived in their own homes or apartments. Before retirement, the majority of the subjects was engaged in a skilled job or self-employment.

More than one-half of the subjects had a planned admission with an admitting diagnosis of either pneumonia related to chronic obstructive pulmonary disease or chemotherapy for a previously diagnosed cancer. One-third of the subjects were admitted to a private room, another third to a semi-private room, and the final third to a four-bed unit.

Prior to calculating the analysis of variance, the mean daily MMSE scores were compared. The subject's daily MMSE scores were correlated with age and years of education to determine if these variables may have influenced the findings of the study. No significant correlations were found.

Of the three hypotheses proposed for the study, only Hypothesis 2 was tenable. The low risk experimental group's mean MMSE scores were significantly better than the low risk control group's mean MMSE scores. Both Hypotheses 1 and 3 are rejected in the study. The high risk experimental group's mean scores did not differ significantly from the high risk control group's mean scores.

CHAPTER 5

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

The question proposed for the study was: What is the effect of a daily orientation program on hospitalized elderly medical patients predicted to be at risk for developing an acute confusional state? To answer the question, three research hypotheses were developed.

1. Hospitalized elderly medical patients who have high Confusion Risk Factor Interview scores on admission day and who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who have high Confusion Risk Factor Interview scores and who do not receive the daily orientation program.
2. Hospitalized elderly medical patients who have low Confusion Risk Factor Interview scores on admission day and who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who have low Confusion Risk Factor Interview scores and who do not receive the daily orientation program.

3. Hospitalized elderly medical patients regardless of their Confusion Risk Factor Interview scores on admission day who receive the daily orientation program will have higher Mini-Mental State Examination scores than hospitalized elderly medical patients who do not receive the daily orientation program.

The following sections summarize the study and discuss the findings and conclusions. Recommendations for further study are also included.

Summary

The tenability of the three hypotheses was tested with an experimental study conducted from October 1, 1986 to February 23, 1987. Between these dates, names of medical patients were obtained each working day from the admission office of a 132-bed federal hospital. Patients 65 years or older with a noncritical medical diagnosis, no current history of alcoholism, drug addiction, or chronic mental deficiency, and an expected hospital stay of at least four days were asked to become volunteer subjects for the study.

The subjects were randomly assigned either to the control or experimental group. In addition, the Confusion Risk Factor Interview (CRFI), an instrument which the researcher developed and tested, was administered to all subjects on admission day. Then, according to the

numerical score received on the CRFI, the subjects were placed in either a high or low risk level group providing a blocking variable in the design of the study.

Both the high and low risk level experimental subjects were given a daily orientation program each morning on the four consecutive hospital days following hospital admission. The high and low risk level control subjects were not offered the daily orientation program.

In late afternoon or evening of each hospital day, all subjects were given the MMSE, a reliable and valid instrument designed to test an adult for cognitive dysfunction (Folstein, Folstein, & McHugh, 1975). Five MMSE scores, one for each hospital day, were obtained from each subject. Means and frequency distributions were used to describe the sample. Analysis of variance with repeated measures over one factor was used on the 2 x 2 x 5 experimental design.

Forty-four subjects were admitted to the study; however, four subjects were dropped from the study because of critical illness, history of confusion, discharge, and death. The 40 male subjects remaining in the study were between the ages of 65 and 85 with an education ranging from sixth grade to college. The majority of the subjects were married and looked to a spouse for emotional support. Half were from cities with a population of 175,000, and

half were from small towns with a population less than 50,000. More subjects had planned than unplanned hospital admissions. The subjects were admitted either to a private room, semi-private room, or a four-bed ward on the two medical units in the hospital.

A total of 200 MMSE scores were analyzed and presented in an ANOVA summary table. Only one significant F test was revealed in the ANOVA--an interaction between the risk levels and the treatment. With the post hoc test, the Newman-Keuls technique, the simple main effects were determined. Results indicated that the low risk experimental group had a significantly better mean MMSE score than the low risk control group. No interactional effects were present between the high risk experimental and control groups. In addition, no interactional effects were present in the repeated measures involving all groups. Therefore, Hypotheses 1 and 3 failed to be accepted; however, Hypothesis 2 was accepted in the study.

Discussion of Findings

The findings for the study were compared to findings from other studies related to acute confusional states. Caution, however, must be taken in comparing the results of studies involving the hospitalized elderly patient and the development of acute confusional state. The major reasons

are: (1) Definition of acute confusional states is not solidified in the literature; (2) Admission criteria for the subjects' mental status, age, and state of psychological and physiological health differ from study to study; (3) Instruments for the measurement of mental status range from standardized psychological tests to researcher-developed instruments in studies; (4) Time for measuring the mental status of the hospital patients varies from study to study; and (5) Nursing intervention techniques are unique to each study.

Wolanin (1977) studied institutionalized confused elderly to establish a definition for confusion in the context that nurses use the term to describe patients' behaviors. Wolanin (1977) felt that the definition of confusion was probably a behavior seen in the eye of the beholder. Perhaps, confirmation of this definition was illustrated in the present study. An 88-year-old subject admitted and then dropped from this study was recommended by both nurses and his physician on his admission day because he appeared oriented. Although he was able to answer the questions on CRFI, he was unable to state the date or his location. However, two subjects with an admission MMSE score below 23 remained in the study because each was able to state the date and his location. The

nurses and a physician recommended these subjects for the study because they also viewed the subjects as oriented.

In each instance, the nurses and physicians felt the subject was oriented; however, one of the three subjects was found disoriented. Disorientation or a lack of orientation is one of the diagnosing criteria for delirium (APA, 1982). The criteria of disorientation were found as the most frequently rated criteria for confusion in Simpson's (1984) study of 207 physicians' and nurses' responses to a list of the symptoms and signs of confusion. Three-fourths (75%) of medical personnel felt that disorientation implied confusion. Spatiotemporal orientation maintenance depends on an intact cognitive function (Lipowski, 1984). Therefore, the subject omitted from the study had lost his spatiotemporal orientation suggesting a limited cognitive function. The subjects remaining in the study maintained orientation, yet had low admission MMSE scores. Consequently, a patient's orientation and mental status may be difficult to judge in the clinical setting without a reliable and valid mental status examination.

The sample came from one federal institution and included only veterans of both World Wars I and II. These subjects' daily mean MMSE scores ranged from 27.05 to 27.80 out of a perfect score of 30. The sample included subjects

over the age of 65 and 35% with a ninth grade education or less. No correlation was found between MMSE scores and subject's age or years of education. The findings correspond to Folstein et al.'s (1975) study of the MMSE. The cognitively intact subjects had an average mean MMSE score of 27.6, and findings were unaffected by the subject's age (Folstein et al, 1975). On the contrary, Anthony et al. (1982) found that the MMSE sometimes yielded a false positive score with persons having less than nine years of formal education and an age of 60 years or older among the general population.

Perhaps the veterans may be separated from the general population. Of the subjects in the present study, 32.5% had skilled jobs, and 25% were self-employed; yet 17 or almost half of the subjects never completed high school. In addition, 92.5% of the subjects were living in their own homes or apartments. The veterans, on the whole, probably had better opportunities for training, employment, and housing following World War II than the general population. These opportunities subsequently added to the veteran's level of education. Working at a skilled job or operating a business and owning one's home over a course of 40 years perhaps allowed the sample's subjects to score well on the MMSE without the benefit of more formal education.

Other studies examining acute confusional states in nonfederal hospitals have included both male and female patients and both surgical and medical patients (Carino, 1976; Chisholm et al., 1982). The present sample included only male veteran medical patients. Currently, no other study has used only male subjects; however, males have been found more prone to confusion than females in other studies (Gillick et al., 1982; Williams, Holloway, et al., 1979).

Nagley (1986) studied only medical patients over 65 years of age and excluded patients who were confused prior to admission. These subjects were similar to the subjects in the present study, however, included both males and females. The quasi-experimental study separated the experimental subjects from the control subjects by hospital units. This present study randomly assigned the control and experimental subject to treatment groups.

Risk levels for the development of acute confusion are unique to the present study. The CRFI was created with a theoretical base and from findings in other studies examining acute confusional states among hospitalized elderly patients (Carino, 1976; Gillick, Serrell, & Gillick, 1982; Millar, 1981; Roslaniec & Fitzpatrick, 1979; Seymour et al., 1980; Williams, Holloway, et al., 1979; Williams, Campbell, Raynor, Mlynarczyk, & Ward, 1985; Williams, Campbell, Raynor, Musholt, Mlynarczyk, & Crane,

1985). The sociological, psychological, physical, sensory, and environmental factors which were found statistically significant in relationship to ACS in other studies were given numerical scores by the CRFI. The high and low risk levels were used as a blocking variable; therefore, the effect of the nursing intervention on the high and low risk subjects was identified specifically in the present study. Neither Nagley (1986), Williams, Campbell, Raynor, Mlynarczyk, and Ward (1985), nor the present study found a significant difference in the mental status of an entire group of experimental subjects given specific nursing interventions. The blocking variable, risk level, allowed separation of the experimental elderly patients, thus improving the precision of the experiment and decreasing experimental error.

Measurement of mental status varies widely from study to study, which makes comparisons of studies difficult. The present study used the MMSE which tests orientation, memory, attention, and ability to follow directions, write a sentence, and copy a polygon. Other recent studies used the Short Portable Mental Status Questionnaire (SPMSQ) which tests memory, orientation, the ability to relay information about current events, and mathematical reasoning (Nagley, 1986; Williams, Campbell, Raynor, Mlynarczyk, & Ward, 1985). An MMSE score between O and 23

indicates cognitive dysfunction; however, the SPMSQ score with more than four errors indicates some cognitive dysfunction. The SPMSQ scoring system separates levels of cognitive dysfunction; whereas the MMSE does not. Consequently, comparing the results of studies using different mental status examinations may generate inaccurate conclusions. For example, the subjects in the current study with an admission MMSE score less than 26 and more than 23 may have been unacceptable in Nagley's (1986) study. Nagley (1986) found no confusion among either the experimental or control groups of medical patients. Basically, the same was true in the present study, but the actual level of mental status among subjects is incomparable because the two studies used different mental status examinations.

Roslaniec and Fitzpatrick (1979) also studied elderly medical patients between 65 and 89 years of age. The mental status of the subjects was determined with a researcher-developed 20-minute assessment tool. The researchers found significant deterioration in the level of consciousness, orientation, and abstract reasoning after four days of hospitalization; however, the present study found no deterioration in mental status among subjects. Roslaniec and Fitzpatrick (1979) reported no scoring system

for the mental status assessment tool; therefore, any comparison of the two studies also may be inaccurate.

Time for the measurement of mental status of the elderly patients varies from study to study as do the instruments. Daily measurement of mental status of the elderly subjects was found in only one other study (Williams, Campbell, Raynor, Mlynarczyk, & Ward, 1985). Although the time of mental status measurement was similar to the present study, the subjects in the other study experienced trauma and surgery rather than a medical illness. Fifty-one percent of the control subjects, and 43% of the experimental subjects experienced acute confusion in the first few days following surgery according to the measurement of mental status. By the fourth and fifth postoperative day, however, no difference in mental status was seen between the groups. Contrary to the findings in the study of surgical subjects, the present study found no acute confusion among the medical subjects at any time in the study.

Nagley (1986) measured mental status only on admission day and the fourth day finding no significant difference in the experimental and control groups on either day. Nagley (1986) felt changes in mental status may have been missed between admission and the fourth day. Roslaniec and Fitzpatrick (1979) also tested each subject's mental status

on admission and the fourth hospital day finding some mental deterioration on the fourth day. The present study's daily measurements of mental status are dissimilar to other studies using medical patients; therefore, the comparisons are limited.

Nursing interventions provided in studies related to elderly patients at risk for acute confusion or decreased mental acuity are unique to the individual studies. The intervention for the present study, the daily orientation program, was developed by the researcher and provided by the researcher. The focus of the program was primarily to provide information, comfortable environment, adequate sensory input, and physiopsychological support for the subject. The program made a significant difference in the mental status of the low risk experimental group. In some other studies using nursing interventions providing information and a comfortable environment, mental status also was improved among experimental subjects at some time during hospitalization (Budd & Brown, 1974; Williams, Campbell, Raynor, Mlynarczyk, & Ward, 1985). Nagley (1986) found no difference in the control and experimental groups; however, she admitted that the specific interventions were conducted by the unit nurses. Therefore, the researcher doubted that the actual interventions were received by the experimental group (Nagley, 1986).

Few studies have examined the effect of a nursing intervention among hospitalized elderly patients at risk for acute confusion. No study has been replicated although variables related to acute confusional states revealed in earlier studies have been used in recent studies providing a basis for better research control. The present study randomly assigned subjects to treatment groups, a step only possible after previous studies found a wide range of controllable variables. Comparisons are limited, but foundations are being generated for further research.

Conclusions and Implications

Generalizations may be made beyond the sample because the subjects were randomly assigned to groups and the statistical power was .80 for the ANOVA in the study. The sample, however, included only male veterans hospitalized in a federal hospital; therefore, generalization may be kept within the federal hospital setting among male subjects.

No acute confusional states developed over the course of the hospitalization among subjects in this study. The mean MMSE scores from admission to the fourth hospital day only varied slightly, indicating that hospitalization, in general, did not raise or lower the mental status of the subjects. An inadvertent discovery was made while this

study was being conducted. Three subjects recommended by the staff nurses and physicians proved to have admission MMSE scores below 23. In fact, two of the subjects with an admission score below 23 were not identified as having some cognitive dysfunction until the subjects had completed the requirements of the study. The subject excluded, however, was disoriented, and the two subjects retained were not. Disorientation as a characteristic of confusion rather than more subtle traits related to cognitive dysfunction implies confusion (Simpson, 1984). Therefore, the assessment of cognitive functioning in an elderly hospitalized patient may be inaccurate without a valid and reliable mental status examination scored at the time of assessment.

Among the subjects, 92.5% still lived in their own homes or apartments in small cities or rural areas; 60% of the subjects were still married, and 17.5% were widowed more than a year. Therefore, the subjects in the study remained responsible for paying taxes, utility bills, and other major expenses requiring continuous intact cognitive function. The subjects lived in familiar surroundings in slower paced neighborhoods and faced few stimuli. Therefore, adverse environmental stimuli prior to admission were at a minimum. Also in the sample, 45% were between 65 and 69 years of age making the mean age approximately 70, and none were critically ill.

Consequently, the majority of the sample were not extremely old, remained in their own homes in a rural area, were married, and had noncritical illnesses. These traits are not generally identified as characteristic of a confused patient. For example, Carino (1976) found the mean age of the disoriented subjects in ICU was 75.7. In addition, Hodkinson (1973) found the median age of 80 among confused patients who had more severe illnesses than the nonconfused patients. Therefore, the sample in the present study lacked some of the major characteristics identified in confused patients; consequently, the sample as a whole may have lacked major risk factors related to acute confusional states.

The risk levels used in the study, however, successfully separated the subjects by identifying those who responded well to a nursing intervention. The low risk subjects receiving the daily orientation program had significantly better mental status than the control group; however, the high risk experimental subjects had no better mental status than the control group. Although the sample was not typical of subjects at extreme risk for confusion, the high risk subjects had more physical, psychological, sensory, and sociological factors related to risk of developing confusion than did the low risk subjects.

Why the lack of improvement among the high risk group is unclear. The high risk group's actual energy level for answering the questions on the MMSE may have been less than that of the low risk group. However, the low risk control group did not improve in mental status. One would assume the low risk control group had as much energy to answer questions as the low risk experimental group. Therefore, the improved mental status among the low risk experimental subjects may be based on a positive relationship between the low risk experimental subjects and the researcher. The low risk experimental group may have had the energy to respond to the relationship by answering the questions on the MMSE accurately; whereas the high risk experimental group may have had less interest or energy in maintaining a positive relationship with the researcher than the low risk group.

In summary, the sample in the present study was cognitively intact during the entire study with a daily mean score of 27. Consequently, a mean score of 28.62 for the low risk experimental group may or may not indicate much mental status improvement in an actual clinical setting. As shown in this study, disoriented subjects cannot be identified readily; therefore, doubts are raised that clinicians can decipher easily the finer levels of cognition without a mental status examination.

Furthermore, the specific reasons for the improved mental status among the low risk and not the high risk experimental subjects remain only speculative.

Implications can be made from the results of the study. When reading the literature, one gets the impression that a significant portion of hospitalized elderly patients, alert on admission, deteriorate mentally or become confused over the course of hospitalization. For the elderly surgical or the critically ill medical patient, mental deterioration may occur; however, in the present study acute confusion states were not found among male veterans cognitively intact on admission. The mental status among the subjects remained the same throughout the four hospital days although the time beyond the fourth hospital day cannot be included.

Noncritically ill medical patients alert on admission remain alert. Therefore, an elderly male veteran may be expected to make his own decisions from information concerning a medical diagnosis, medications and therapies. Consequently, when providing care to an elderly medical veteran, a nurse may remember he is as alert as the general population. Therefore, he expects appropriate information concerning his care just as any patient in the general population expects from a health team. In addition, the male veteran's educational level or age probably has little

relationship with his true ability to comprehend information or his situation. Family members may be included; however, the male veteran tends to be responsible for himself.

In this study, the daily orientation program, divided into focal background, and residual stimuli, provided three levels of nursing care to the male veteran. An information level supplied facts concerning regular routines, medications, diagnostic tests, and therapies on a daily basis. A physical level assisted with plans for daily mobility, enhancement of sensory perception, and provisions for regular elimination and dietary needs. The final level was a daily interaction between the subject and a personal nurse visitor. The subjects were given time to express feelings and concerns about health, family or lack of family, and plans for eventual death. The three levels of care improved mental status in the low risk experimental subjects. Perhaps, the subjects had more information to assimilate and thus reduced stress related to the environment, physical care, and emotional state.

Since a portion of the elderly subjects in the study improved in mental status, a nurse may provide care similar to the daily orientation program for the hospitalized elderly patients. However, the key to the success of the program may have been the daily contact with the same

person. Therefore, primary nursing care rather than the team approach may be more helpful for the elderly. In addition, elderly medical patients may respond with an improved mental status if a geriatric clinical nurse specialist provided the daily orientation program rather than the general staff nurse who is responsible for many patients.

The Confusion Risk Factor Interview may evolve into a useful instrument for the nurse in identifying patients at risk for the development of acute confusional states. Therefore, with the knowledge that low risk alert patients responded significantly better to a daily program than the high risk alert patients, a nurse may take more time with the low risk patient. The CRFI may be used to find the extremely high risk subjects; however, an intervention for these subjects cannot be offered by this study.

Generally, the alert elderly male veteran admitted to a federal hospital can be expected to remain alert during hospitalization. His MMSE scores are equal to those of the cognitively intact general population. Therefore, the veteran will expect to receive appropriate information concerning his diagnosis and care and will assimilate the information without difficulty. A daily orientation program providing information, physical care, and

psychological support will benefit male veterans at low risk for confusion.

Specific nursing care for the elderly male veteran indicated by this study include (1) using a valid and reliable mental status examination for determining the elderly patient level of mental acuity rather than using guess work assessments, (2) using the primary care method rather than the team approach to provide daily contact with the same nurse, (3) providing a daily program with physical, sensorial, and emotional support aspects, (4) using a geriatric nurse clinical specialist on units with large numbers of geriatric patients to insure the daily program is conducted, and (5) selecting the alert medical patient at low risk for confusion to receive the daily program if nursing staff and time is limited. Finally, the nurse may offer the same information concerning the hospital routine and care to the elderly male medical patients as is offered to the general adult population.

Recommendations for Further Study

Research concerning acute confusional states among elderly hospitalized patients is in its infancy. Therefore, with guidance from past research, new research studies with strong research designs may focus on specific variables related to acute confusional states. Several

follow-up studies are suggested as a conclusion to the present study.

1. The Confusion Risk Factor Interview (CRFI) successfully separated subjects into high and low groups as indicated by the response of only the low risk group to the intervention; however, was this occurrence particular to the present study of elderly male veterans? Therefore, replication of the study is recommended.

2. A replication of the present study within a private or public hospital may reveal different findings especially if women are included in the sample. Educational levels may be more influential in the MMSE among nonveteran women who did not receive special training in the service or educational opportunities for employment following World War II. In addition, the risk factors in the environment of a private or public hospital may be more stressful than those for the veteran in a federal hospital.

3. The daily orientation program may or may not be of value in another study. The study may be duplicated; however, one researcher may provide the daily orientation program, and another conduct the daily MMSE. Therefore, the relationship between the subject and the researcher conducting the daily MMSE is limited more than in the present study.

4. The reliability and validity of the Confusion Risk Factor Interview could be studied to find answers for these questions:

a. Can the CRFI regularly predict the confusion level or mental status level of hospitalized elderly subjects?

b. Is the CRFI useful for patients other than the elderly patients?

c. What items can be omitted from the CRFI without jeopardizing its function?

Therefore, a methodological study with a large sample is suggested. The sample may be subdivided into groups according to major variables such as age, hospital setting, sex, mental status levels, and medical or surgical diagnosis. Predictive validity of the instrument may require several mental status assessment tools rather than just one. Reliability may be expanded to include test-retest format. The subjects may change the answers to the CRFI after experiencing hospitalization over several days. Determination of the instrument's internal consistency reliability using the alpha coefficient also would be appropriate. Isolation of factors specifically related to mental status change may be found within the CRFI.

In conclusion, the primary recommendation for the nursing studies of acute confusional states among hospitalized elderly patients is to select research

techniques and designs which allow for generalization beyond the sample. Consequently, research findings may be shared more easily and applied to further research studies.

REFERENCES

Ahromheim, J. E. (1982). Acute confusional states in the elderly. Seminars in Family Medicine, 3, 20-25.

American Psychiatric Association. (1982). Desk reference to the diagnostic criteria from diagnostic and statistical manual of mental disorder (3rd ed.). Washington, DC: Author.

Anthony, J. C., LeResche, L., Niaz, U., Von Korff, M. R., & Folstein, M. F. (1982). Limits of the 'mini-mental state' as a screening test for dementia and delirium among hospital patients. Psychological Medicine, 12, 397-408.

Ban, T. A. (1978). Organic problems in the aged: Brain syndromes and alcoholism, Journal of Geriatric Psychiatry, 11, 131-159.

Bayne, J. R. D. (1978). Management of confusion in elderly persons. Canadian Medical Association Journal, 118, 139-141.

Berrios, G. E. (1981). Delirium and confusion in 19th century: A conceptual history. British Journal of Psychiatry, 139, 439-449.

Blalock, H. M., Jr. (1969). Theory construction: From verbal to mathematical formulations. Englewood Cliffs, NJ: Prentice-Hall.

Blazer, D. G., Federspiel, C. F., Ray, W.A., & Schaffner, W. (1983). The risk of anticholinergic toxicity in the elderly: A study of prescribing practices in two populations. Journal of Gerontology, 38, 31-35.

Bruce, L. C. (1935). Physical symptoms of acute confusional insanity. Lancet, 1, 550-551.

Budd, S., & Brown, W. (1974). Effect of a reorientation technique on postcardiotomy delirium, Nursing Research, 23, 341-348.

Burnside, I. M. (1980). Wandering Behavior. In I. M. Burnside (Ed.), Psychosocial nursing care of the aged (2nd ed) (pp. 298-309). New York: McGraw Hill.

Burnside, I. M. (1981). Psychosocial issues in nursing care of the aged. Journal of Gerontological Nursing, 7, 689-694.

Burton, M. (1982). Reality orientation for the elderly: A critique. Journal of Advnaced Nursing, 7, 427-433.

Caldwell, E., & Hegner, B. R. (1972). Geriatric nursing: A study of maturity. Albany, NY: Delmar Publishers.

Campbell, E. B., Williams, M. A., & Mlynarczyk, S. M. (1986). After the fall--confusion. American Journal of Nursing, 86, 151-154.

Carino, C. M. (1976). Behavioral responses of disoriented patients compared to oriented patients in intensive care units (Doctoral dissertation, The Catholic University of America, 1976). Dissertation Abstracts International (University Microfilm No. 76-21,867)

Castleberry, K., & Seither, F. (1982). Disorientation. In C. Norris (Ed.), Concept clarification in nursing (pp. 309-323). Rockville, MD: Aspen Systems Corp.

Castledine, G. (1982, May 5). A confusing age-old problem. Nursing Mirror, p. 38.

Chaslin, P. M. (1920). Quelques mots sur la confusion mentale (Some words about mental confusion). Annales Medico-psychogique, 6, 356-366.

Chisholm, S. E., Deniston, O. L., Igrisen, R. M., & Barbus, A. J. (1982). Prevalence of confusion in elderly hospitalized patients. Journal of Gerontology Nursing, 8, 87-96.

Cohen, J. (1977). Statistical power analysis for the behavioral sciences (Revised ed.). New York: Academic Press.

Cohen, S., & Klein, H. K. (1958). The delirious patient. American Journal of Nursing, 58, 685-687.

Comfort, A. (1979). The myth of senility. Postgraduate Medicine, 65, 1320-1342.

Compos, R. G. (1984). Does reality orientation work? Journal of Gerontological Nursing, 10, 53-57, 60-61, 64.

Dodd, M. J. (1978). The confused patient: Assessing mental status. American Journal of Nursing, 78, 1501-1503.

Doty, E. J. (1946). The incidence and treatment of delirious reactions in later life. Geriatrics, 1, 21-26.

Feldman, D. S. (1986). StatView 512+ (Computer program). Calabasas, CA: Brain Power, Inc.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). 'Mini-mental state': A practical method for grading the cognitive state of patients for the clinician. Journal of Psychiatric Research, 17, 189-198.

Foreman, M. D. (1984). Acute confusional states in the elderly: An algorithm. Dimensions of Critical Care Nursing, 3,(4), 207-215.

Foreman, M. D. (1986). Acute confusional states in hospitalized elderly: A research dilemma. Nursing Research, 35, 34-38.

Freedman, M. L. (1983). Organic brain syndromes in the elderly. Postgraduate Medicine, 74(4), 165-176.

Gerdes, L. (1968). The confused or delirious patient. American Journal of Nursing, 68, 1228-1233.

Gillick, M. R., Serrell, M. A., & Gillick, L. S. (1982). Adverse consequences of hospitalization in the elderly. Social Science and Medicine, 16, 1033-1038.

Glass, G. V., & HoOpkins, K. D. (1984). Statistical methods in education and psychology (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Greer, M. (1982). Dementia: A major disease of aging. Geriatrics, 37, 101-107.

Harmer, B., & Henderson, V. (1939). Textbook of the principles and practice of nursing (4th ed.). New York: Macmillan.

Hawley, E. A. (1908). Manifestations of delirium in the night-time. American Journal of Nursing, 8, 757.

Heiple, P. (1985). Confusion. In M. M. Jacobs & W. Geels (Eds.), Signs and symptoms in nursing (pp. 1-34). Philadelphia: J. B. Lippincott Company.

Hellebrandt, F. A. (1978). Comment: The senile dement in our midst. The Gerontologist, 18, 68-70.

Helson, H. (1964). Adaptation-level theory. New York: Harper & Row Publishers.

Hodkinson, H. M. (1973). Mental impairment in the elderly. Journal of the Royal College of Physicians London, 7, 305-317.

Johnson, D. E. (1968). Theory in nursing: Borrowed and unique. Nursing Research, 17, 207-209.

Kral, V. A. (1975). Confusional states description and management. In J. G. Howell (Ed.), Modern perspectives in the psychiatry of old age (pp. 356-362). New York: Brunner, Maze.

Lipowski, Z. J. (1967). Delirium, clouding of consciousness and confusion. The Journal of Nervous and Mental Disease, 145, 227-255.

Lipowski, Z. J. (1980a). Delirium acute brain failure in man. Springfield, IL: Charles C. Thomas.

Lipowski, Z. J. (1980b). Delirium Update. Comprehensive Psychiatry, 21, 190-196.

Lipowski, Z. J. (1982). Differentiating delirium from dementia in the elderly. Clincial Gerontologist, 1, 3-10.

Lipowski, Z. J. (1983). Transient cognitive disorders (delirium, acute confusional states) in the elderly. American Journal of Psychiatry, 140, 1426-1436.

Lipowski, Z. J. (1984). Acute confusional states (delirium) in the elderly. In M. L. Albert (Ed.), Clinical neurology of aging (pp. 277-297). New York: Oxford University Press.

Liston, E. H. (1982). Delirium in the ages. Psychiatric Clinics of North America, 5, 49-66.

Maletta, G. J. (1982). Guidelines for detecting thought disorders in the elderly. Geriatrics, 37(7), 79-83.

McCown, P. P., & Wurm, E. (1965). Orienting the disoriented. American Journal of Nursing, 65, 118-119.

McEvoy, G. K. (Ed.) (1985). American hospital formulary services drug information 85. Bethesda, MD: American Society of Hospital Pharmacists, Board of Directors.

Millar, H. R. (1981). Psychiatric morbidity in elderly surgical patients. British Journal of Psychiatry, 138, 17-20.

Morris, M., & Rhodes, M. (1972). Guidelines for the care of confused patients. American Journal of Nursing, 72, 1630-1633.

Morse, R. M., & Litin, E. M. (1969). Postoperative delirium. American Journal of Psychiatry, 126, 388-395.

Nagley, S. J. (1986). Predicting and preventing confusion in your patients. Journal of Gerontological Nursing, 12, 27-31.

National Center for Health Statistics. (1982). Vital and health statistics: Utilization of short stay hospitals (DHHS Publication No. PHS 82-1725). Washington, DC: U.S. Government Printing Office.

Nobbs, K. L. (1962, September 21). Confusion in the elderly. Nursing Times, 58, 1190-1192.

Nowakowski, L. (1980). Disorientation--signal or diagnosis. Journal of Gerontological Nursing, 6, 197-203.

Paterson, J. (1984). The elderly confused patient. Australian Journal of Nursing, 14, 42-44, 59.

Patrick, M. L. (1967). Care of the confused elderly patient. American Journal of Nursing, 67, 2536-2539.

Raymond, M., Conklin, C., Schaeffer, J., Newstadt, G., Matloff, J. M., & Gray, R. J. (1984). Coping with transient intellectual dysfunction after coronary bypass surgery. Heart and Lung, 13, 531-539.

Remakus, B. L., & Shelly, R. M. (1981). How to prevent confusion in hospitalized elderly. Geriatrics, 36, 121-125.

Robinson, W. (1939). Acute confusional states of old age. Southern Medical Journal, 32, 479-486.

Roslaniec, A., & Fitzpatrick, J. J. (1979). Changes in mental status in older adults with four days of hospitalization. Research in Nursing and Health, 2, 177-187.

Sanders, G. J. (1912). Modern methods in nursing. Philadelphia: W. B. Saunders.

Seglas, J. (1894). De la confusion mentale primitive (From primitive mental confusion). Archives Generales de Medicene, 1, 538-549, 665-684.

Seymour, D. G., Henschke, P. J., Cape, R. D. T., & Campbell, A. J. (1980). Acute confusional states and dementia in the elderly, the role of dehydration, volume depletion, physical illness and age. Age Ageing, 9, 137-146.

Shaw, I. (1982, May 26). Coping with confusional states. Nursing Mirror, 14-17.

Siegel, S. (1956). Nonparametric statistics for the behavioral sciences. New York: McGraw-Hill.

Simpson, C. J. (1984). Doctors and nurses use of the word confused. The British Journal of Psychiatry, 145, 441-443.

Stoney, E. A. M. (1908). Practical points in nursing. Philadelphia: W. B. Saunders.

Sugden, J., & Saxby, P. J. (1985). The confused elderly patient. Medical Education (International), 2, 1022-1025.

Tabers, C. W. (Ed.) (1943). Taber's Cyclopedic Medical Dictionary (2nd ed.). Philadelphia: F. A. Davis.

Tabers, C. W. (Ed.) (1965). Taber's Cyclopedic Medical Dictionary (10th ed.). Philadelphia: F. A. Davis.

Thomas, C. L. (Ed.) (1981). Taber's Cyclopedic Medical Dictionary (14th ed.). Philadelphia: F. A. Davis.

Trochman, G. (1978). Caring for the confused or delirious patient. American Journal of Nursing, 78, 1495-1499.

Wahl, P. R. (1976). Psychosocial implication of disorientation in the elderly. Nursing Clinics of North America, 11, 145-155.

Waltz, C. F., Strickland, O. L., & Lenz, E. R. (1984). Measurement in nursing research. Philadelphia: F. A. Davis.

Weddington, W. W. (1982). The mortality of delirium: An underappreciated problem? Psychosomatics, 23, 1232-1235.

Weeks-Shaw, C. S. (1900). Textbook of nursing (2nd ed.). New York: D. Appleton and Company.

Weymouth, L. T. (1968). The nursing care of the so-called confused patient. Nursing Clinics of North America, 3, 709-715.

Williams, M. A., Campbell, E. B., Raynor, W. J., Jr., Mlynarczyk, S. M., & Ward, S. E. (1985). Reducing acute confusional states in elderly patients with hip fractures. Research in Nursing and Health, 8, 329-337.

Williams, M. A., Campbell, E. B., Raynor, W. J., Jr., Musholt, M. A., Mlynarczyk, S. M., & Crane, L. F. (1985). Predictors of acute confusional states in hospitalized elderly patients. Research in Nursing and Health, 8, 31-40.

Williams, M. A., Holloway, J. R., Winn, M. C., Wolanin, M. O., Lawler, M. L., Westwich, C. R., & Chin, M. H. (1979). Nursing activities and acute confusional states in elderly hip-fractured patients. Nursing Research, 28, 25-35.

Wolanin, M. O. (1977). Confusion study: Use of grounded theory as methodology. Communicating Nursing Research, 8, 68-75.

Wolanin, M. O. (1978). Relocation of the elderly. Journal of Gerontological Nursing, 4, 47-50.

Wolanin, M. O. (1983, July/August). Scope of the problem and its diagnosis. Geriatric Nursing, 227-230.

Wolanin, M. O., & Phillips, L. R. (1981). Confusion: Prevention and care. St. Louis: C. V. Mosby Company.

Worcester, W. L. (1889). Delirium. Journal of Insanity, 46, 22-27.

World Health Organization (1978). Mental disorders: Glossary and guide to their classification in accordance with the ninth revision of the international classification of diseases. Geneva: Author.

APPENDIX A

CONFUSION RISK FACTOR INTERVIEW

PART II

PART II
RISK FACTOR INTERVIEW FOR THE
HOSPITALIZED PATIENT

Patient's Research Number: ___ ___ ___ ___ ___
Date of Interview:_____Time of Interview:_____

Instructions for the Interviewer: Complete the following guide. Notice it is divided into specific factor areas for scoring. Just interview participant by moving through the guide without explaining the factor areas.

Key to Symbols Used in Guide

* indicates information is obtained from the subject's chart or Demographic Information Form.
\+ indicates information is obtained through nursing observations.

To score the Interview circle:

0 when participant answers a question with a NO.

1 when participant answers a question with a YES.
(Some questions are weighted with a higher number if answer is yes.)

Instructions for the participant: For this part of the interview, I will read some questions to you. Answer each question with a YES or a NO. After you finish answering all of the questions, I will check your vital signs, that is, your blood pressure, temperature, pulse and amount of oxygen you have in your blood. I also will check any equipment attached to you. During this interview, please feel free to ask for any question to be repeated and/or explained further.

Physical Factors:

		Yes	No
*Age:	65-70	1	0
	71-75	2	0
	76-80	3	0
	81-85	4	0
	86-90	5	0
	91-over	6	0

Interview

*Medical Diagnosis related to: (may be more than one)

	Yes	No
Pulmonary insufficiency	1	0
Cardiac insufficiency	1	0
Congestive heart failure	1	0
Cerebral vascular disorder	1	0
Hepatic insufficiency	1	0
Renal insufficiency	1	0
Transient ischemic attacks	1	0
Uncontrolled blood sugar levels	1	0
Hypothyroidism or hyperthroidism	1	0
Addison's disease or Cushing's syndrome	1	0
Heatstroke	1	0
Physical injury	1	0

(A1) Subscore_____

*Medications to receive while in hospital: (May be several)

Psychotherapeutic agent	1	0
Sedative, Hypnotic, Anxiolytic (Barbituates)	1	0
Opiate Agonist	1	0
Anticonvulsant	1	0
Cardiac Glycosides	1	0
Antimanic agent	1	0
Antiparkinsonian agent	1	0
Miscellaneous:		
Histamine H2 receptor antagonist	1	0
Dopamine Receptor Agonist(Reglan)	1	0

(A2) Subscore_____

Nutritional Status

*Have you gained at least 10 lbs in last 12 months?	1	0
*Have you lost at least 10 lbs in last 12 months?	1	0

		Interview
	Yes	No
Do you eat less than 7 hot meals a week?.....	1	0
Do you have difficulty chewing food from poor fitting dentures or few teeth?.....	1	0
If you skip drinking alcoholic beverages, do you get shaky or sick to your stomach?.....	1	0
*Admission Lab Work:		
Anemia		
Below normal Hgb?.....	1	0
Below normal Hct?.....	1	0
Serum electrolyte imbalance?..... (ie. sodium, potassium)	1	0
Serum biochemical imbalance?..... (ie. BUN, creatinine,glucose)	1	0
+Hypoxia (Oximeter < 88% of O_2 Sat).....	1	0
(A3) Subscore_____		

Elimination:

Do you accidently wet the bed or your your clothes?.....	1	0
When was your last BM?		
Less than 3 days ago (Score 0).....	1	0
Greater than 3 days ago (Score 1).....	1	0
(A4) Subscore_____		

Mobility:

Before admission:

Did you usually sit around at home because you are unable to walk well?.....	1	0
Have you been sitting a lot at home since you have been sick?.....	1	0

Interview

After admission:

	Yes	No
Are you required to stay in your bed since coming to the hospital? (Do not count bathroom privileges as out of bed activity)	1	0
Are you required to lie flat on your back?	1	0

(A5) Subscore_____

Sensory Factors

Do you have trouble hearing, even if you wear a hearing aid?	1	0
Do you have trouble seeing, even if you wear glasses?	1	0
Are you having discomfort from a chronic health problem?	1	0
Are you having discomfort from being too cold or too hot while in the hospital?	1	0
Are you having any discomfort from your present illness?	1	0
Are you going to miss the touch from your family or friends while in the hospital?	1	0
Are you going to miss the touch from a pet while in the hospital?	1	0

(B1) Subscore_____

Interview

Environmental Factors

	Yes	No
Is this the first time you have ever been in any hospital?	1	0
Is this the first time you have ever been in this hospital?	1	0
Are there noises in this room you are not use to hearing?	1	0
Are there odors in this room you are not use to smelling?	1	0
Is there a TV or radio that you can turn on in this room? (If no, score 1.)	1	0
Is there enough lighting in this room to see and read easily? (If no, score 1.)	1	0
Will you have difficulty knowing the date, day, or time in this room?	1	0
Can you see outdoors from your bed? (If no, score 1.)	1	0
Are there too many strangers coming into your room?	1	0
Will you miss any special lighting at night in your home that is not provided in the hospital?	1	0
Do you think it is hard to get around in this room, because it is unfamiliar?	1	0

	Interview	
	Yes	No
The smoking room opens at 5:00 AM and breakfast is served at 7:30 AM. Are these times different from your usual morning routine?	1	0
The smoking room closes at 10:30 PM and the bedtime around 9:00 PM. Are these times different from your usual evening routine?	1	0

(C) Subscore_____

Sociological Factors

Are you apart from a person or institution to whom you are very close?	1	0
*Single, living alone	1	0
*Widowed less than a year		
Female	2	0
Male	3	0
Have you moved to a new residence within the last year?	1	0

While in the hospital, will you:

Miss a usual visit from a friend or relative?	1	0
Miss a usual daily activity such as a job, walking, or household chores?	1	0
Have any personal visitors? (If no, score 1)	1	0
Have any personal phone calls? (If no, score 1)	1	0

(D) Subscore_____

	Interview Yes	No
Psychological Factors		
Before admission, did you:		
Feel depressed for at least 6 months?	1	0
Have trouble getting enough sleep?	1	0
Experience a physical injury within the last 24 hours?	1	0
Since admission to the hospital, are you:		
Frightened about being in the hospital?	1	0
Angry about being in the hospital?	1	0
Just learning that you have a new health problem?	1	0
Waiting to get new information about your health?	1	0
(E) Subscore_____		
Nursing Observations		
+Vital Signs		
Hypotension (systolic B/P below 95mm Hg)	1	0
Fever (101" F or more orally)	1	0
Hypothermia (97" F or less orally)	1	0
Tachycardia (pulse over 100/min.)	1	0
Bradycardia (pulse under 55/min)	1	0
Tachypnea (respirations over 22/min)	1	0
(A6) Subscore_____		

	Yes	Interview No
+New Touch Sensations		
Medical equipment attached to body. (Do not count arm band or gown)		
One piece	1	0
Two pieces	2	0
Three pieces	3	0
Four pieces	4	0
Five or more pieces	5	0
Dressings present (do not count bandaid)	1	0
Lying on plastic pad in bed	1	0
Side rail up on sides of bed	1	0

(B2) Subscore_____

Interview

Score Sheet

Physical Factors:

Subscores	(A1).....	_____
	(A2).....	_____
	(A3).....	_____
	(A4).....	_____
	(A5).....	_____
	(A6).....	_____
Subtotal.....		_____

Sensory Factors:

Subscores	(B1).....	_____
	(B2).....	_____
Subtotal.....		_____

Environmental Factors:

Subscore	(C).....	_____

Sociological Factors:

Subscore	(D).....	_____

Psychological Factors:

Subscore	(E).....	_____

Total Score..... _____

Check One Rank:

High____ (Score 19 or higher)
Low ____ (Score 18 or lower)

APPENDIX B

MINI-MENTAL STATE EXAMINATION AND INSTRUCTIONS FOR ITS ADMINISTRATION

Instructions for Administration of

Mini-Mental State Examination

Orientation

Ask for the date. Then ask specifically for parts omitted, e.g., "Can you also tell me what season it is?" One point for each correct.

Ask in turn "Can you tell me the name of this hospital?" (town, county, etc.). One point for each correct.

Registration

Ask the patient if you may test his memory. Then say the names of 3 unrelated objects, clearly and slowly, about one second for each. After you have said all 3, ask him to repeat them. This first repetition determines his (0-3) but keep saying them until he can repeat all 3, up to 6 trials. If he does not eventually learn all 3, recall cannot be meaningfully tested.

Attention and Calculation

Ask the patient to begin with 100 and count backwards by 7. Stop after 5 subtractions (93, 86, 79, 72, 65). Score the total number of correct answers.

If the patient cannot or will not perform this task, as him to spell the word "world" backwards. The score is the number of letters in correct order; e.g. dlrow=5, dlorw=3.

Recall

Ask the patient if he can recall the 3 words you previously asked him to remember. Score 0-3.

Instructions

Language

Naming: Show the patient a wrist watch and ask him what it is. Repeat for pencil. Score 0-2.

Repetition: Ask the patient to repeat the sentence after you. Allow only one trial. Score 0 or 1.

3-Stage Command: Give the patient a piece of plain blank paper and repeat the command. Score 1 point for each part correctly executed.

Reading: On a blank piece of paper print the sentence, "Close your eyes", in letters large enough for the patient to see clearly. Ask him to read it and do what it says. Score 1 point only if he actually closes his eyes.

Writing: Give the patient a blank piece of paper and ask him to write a sentence for you. Do not dictate a sentence, it is to be written spontaneously. It must contain a subject and verb and be sensible. Correct grammar and punctuation are not necessary.

Copying: On a clean piece of paper, draw intersecting pentagons, each side about 1 inch, and ask him to copy it exactly as it is. All 10 angles must be present and must intersect to score 1 point. Tremor and rotation are ignored.

MINI-MENTAL STATE

EXAMINATION

Patient Research Number: ___ ___ ___ ___ ___

Results requested by patient: Yes_____ No _____

Admission Date_____

Date of Test_____ Time of Test_____

Circle Day of test: Admission 1 2 3 4 5

Instructions: Administer as stated in directions attached to this test.

Maximum Score	Actual Score	
		ORIENTATION
(5)	( )	What is the (year) (season) (day) (date) (month)?
(5)	( )	Where are we: (state) (county) (town) (hospital) (floor)?
		REGISTRATION
(3)	( )	Name 3 objects: 1 second to say each. Then ask the patient all 3 after you have said them. Give 1 point for each correct answer. Then repeat them until he learns all 3. Count trials and record. No. of trials: 1 2 3 4 5 6

Maximum Score	Actual Score	
		ATTENTION AND CALCULATION
(5)	( )	Serial 7's. 1 point for each correct. Stop after 5 answers. Alternatively, spell "WORLD" backwards.
		RECALL
(3)	( )	Ask for the 3 objects repeated above. Give 1 point for each correct.
		LANGUAGE
(9)	( )	Name a pencil and watch (2 points).
	( )	Repeat the following "No ifs, ands, or buts." (1point).
	( )	Follow a 3-stage command: "Take a paper in your right hand, fold it in half, and put it on the floor"(3 points)
	( )	Read and obey the following: CLOSE YOUR EYES (1 point)
	( )	Write a sentence (1 point).
	( )	Copy design (1 point).
(30)	( )	Total Score

APPENDIX C

DAILY ORIENTATION PROGRAM

DAILY ORIENTATION PROGRAM

Research Number __ __ __ __ __

Date admitted to study_____ Date discharged from study_____

Focal Stimuli (Environmental Factors)

1. Greet patient, use his last name or his first name. Determine what name the patient prefers.
2. Open blinds on windows if wanted.
3. State day of the week, date and number of days patient has been in the hospital.
4. Ask patient about any family pictures seen in room. Ask patient about his past or present employment, job or hobbies.
5. Explain regular routine of hospital including bath and meal times. Discuss when medications and/or therapies will be given. State when any tests will be done also. (Use information from chart and kardex)
6. Help patient arrange room and bed area the way he wishes.
7. Explain the role of personnel that enter the room (ie. lab techniques, aids taking vital signs, nurses making rounds).
8. Explain or re-explain how to turn the radio or television on and off and how to get the nurse. Explain any other equipment in the room and whether it is to be operated by the staff or by the patient.. After first day, check to make sure patient still knows how to work equipment.

Background Stimuli (Sensory Factors)

1. Make eye contact with patient when speaking.

2. If patient has a hearing aid, assist him to put it on. Make sure the hearing aid is turned on and the volume is adjusted.
3. If patient has glasses for general vision improvement, assist him to put them on if comfortable.
4. Adjust lighting so that it is comfortable for the patient.
5. Touch patient's forearm or hand closest to the door of the room.
6. Help patient adjust any bed linen or pillows that may help him feel more comfortable. Talk about a position that provides the most comfort.
7. Ask the patient if he is too cold or too hot. Adjust the bed linens to provide a comfortable temperature. If the temperature of the room is extreme, call the maintenance department right after leaving the room.
8. Let patient know if any pain medication has been ordered for him and explain how he may obtain the pain medication. Explain the pain medication is to assist him to feel better and assure him it is alright to use the medication to relieve pain.

Residual Stimuli (Physical Factors)

1. Discuss patient's elimination needs.

   a. Determine if he has had a BM within the last 24 to 48 hours. If not, determine if patient has a private facility for elimination, provide portable toilet if patient cannot get to patients' restroom. Determine how the patient maintains bowel elimination. If the patient uses specific foods to aid in elimination, call the dietition to make referral. If the patient uses a laxative, notify the physician of the patient's needs. Explain the use of a bedpan if used.

b. Determine if he has been voiding without difficulty. Explain any type of catheter that may be used. Make sure the urinal is in a convenient location and is clean.

2. Discuss patient's mobility

   a. If patient is allowed to ambulate, ask patient to walk in the halls at least four times a day.

   b. If patient is confind to bed or chair, teach patient deep breathing techniques, teach patient active range of motion for arms, legs and the neck.

   c. If patient is not able to do range of motion, make sure it is done passively. (Range of motion will not be done when contraindicated)

Residual Stimuli (Psychological Factors)

1. Help patient discuss thoughts and feelings (make sure to maintain eye contact, touch forearm or hand, be seated close to patient).
2. Ask patient if he has any questions concerning his health or care. Allow him to talk as freely as he would like.
3. If patient brings up housing or financial problems, refer patient to social worker.
4. If patient tells you information or describes a hospital situation which is incorrect, clarify the information or situation for the patient.
5. Inform the patient that another program will be conducted the next morning. If the daily programs are completed, prepare the patient.

Record the questions asked by the patient:

_____

APPENDIX D

TEXAS WOMAN"S UNIVERSITY HUMAN SUBJECTS REVIEW COMMITTEE'S APPROVAL OF STUDY

TEXAS WOMAN'S UNIVERSITY
Box 22939, TWU Station
RESEARCH AND GRANTS ADMINISTRATION
DENTON, TEXAS 76204

HUMAN SUBJECTS REVIEW COMMITTEE

Name of Investigator: Virginia R. Sicola Center: Denton

Address: P.O. Box 7850 Date: 7-29-86

Amarillo, TX 79114-7850

Dear Virginia Sicola:

Your study entitled Daily Orientation Program's Effect on Hospitalized Older Medical Patients Predicted to be at Risk for an Acute Confusional State

has been reviewed by a committee of the Human Subjects Review Committee and it appears to meet our requirements in regard to protection of the individual's rights.

Please be reminded that both the University and the Department of Health, Education, and Welfare regulations typically require that signatures indicating informed consent be obtained from all human subjects in your studies. These are to be filed with the Human Subjects Review Committee. Any exception to this requirement is noted below. Furthermore, according to DHEW regulations, another review by the Committee is required if your project changes.

Any special provisions pertaining to your study are noted below:

_____Add to informed consent form: No medical service or compensation is provided to subjects by the University as a result of injury from participation in research.

_____Add to informed consent form: I UNDERSTAND THAT THE RETURN OF MY QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

_____The filing of signatures of subjects with the Human Subjects Review Committee is not required.

_X_Other: Re #4 and #5 on consent form - TWU cannot be held liable; However the V.A. may be. This should be understood by the investigator.

_____No special provisions apply.

cc: Graduate School
Project Director
Director of School or
Chairman of Department

Sincerely,

Chairman, Human Subjects Review Committee

10/82

APPENDIX E

TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER INSTITUTIONAL REVIEW BOARD'S APPROVAL OF STUDY

Texas Tech University Health Sciences Center
REGIONAL ACADEMIC HEALTH CENTER AT AMARILLO
SCHOOL OF MEDICINE / Department of Surgery
1400 Wallace Boulevard / Amarillo, Texas 79106-1797 / (806) 358-3101

August 22, 1986

Virginia R. Sicola, R.N.
6423 Mooregate
Amarillo, Texas 79109

Dear Virginia,

The TTUHSC Institutional Review Board for the Protection of Human Subjects is pleased to inform you that your protocol entitled "Daily Orientation Program's Effect on Hospitalized Older Medical Patients Predicited to be at risk for an Acute Confusional State" was approved on August 21, 1986 according to institutional guidelines and DHHS regulations provided the following change is made: 1) On page 4 of the consent form, change to Director of VA Medical Center, Mike Harwell, M.D. Please make this change on the original protocol and return it to my office as soon as possible.

Annual review is required and a questionnaire will be sent at the appropriate time. Members of the Board will be available for any questions which may arise about this study.

Sincerely,

Edwin D. Savlov, M.D.
Chairman
TTUHSC Institutional Review Board
for the Protection of Human Subjects

EDS/ml

Enclosure

APPENDIX F

HOSPITAL'S APPROVAL OF STUDY

Medical Center

6010 Amarillo Blvd., W.
Amarillo TX 79106

Veterans Administration

September 15, 1986

In Reply Refer To: 504/00

Virginia R. Sicola, R.N., M.S.
P.O. Box 7850
Amarillo, TX 79114

Dear Mrs. Sicola:

The TTUHSC Institutional Review Board for the Protection of Human Subjects and the Amarillo VA Medical Center Research and Development Committee both have approved your study entitled "Daily Orientation Program's Effect on Hospitalized Older Medical Patients Predicted to be at Risk for an Acute Confusional State." At this time; therefore, the VA Medical Center gives permission for you to conduct the named study in this institution.

Please keep the VA Medical Center informed of any problems encountered during your study. The Research and Development Committee will check monthly on your progress.

Sincerely,

R. MICHAEL HARWELL
Director

cc: Graduate Office
Texas Woman's University
Denton, TX

APPENDIX G

RESEARCH DATA FORM

Research Data Form

Patient's Name_____

Address:_____City:_____State:_____Zip:_____

Phone:_____

Research Number: __ __ __ __ __

Physician's Name:_____ Hospital Name:_____

Hospital Unit:_____ Room No.:_____ Bed No.:_____

Usual time visitors will be seeing patient: _____AM _____PM

Usual time for any scheduled therapy: _____AM _____PM

Date admitted to the study_____ Date discharged from study_____

Reason for discharge from study:

( ) A. Completed study
( ) B. Discharged from hospital
( ) C. Requested to be taken out of study
( ) D. Removed from study for physical reasons

Patient would like to receive the MMSE results: Yes ( ) No ( )

If yes, how:

( ) A. While in hospital
( ) B. Through the mail
( ) C. In outpatient clinic for next visit

Comments_____

APPENDIX H

CONSENT FORM FOR PARTICIPATION IN A RESEARCH STUDY

CONSENT FORM FOR PARTICIPATION IN A RESEARCH STUDY

RESEARCH TITLE: Daily Orientation Program's Effect on Hospitalized Older Medical Patients Predicted to Be at Risk for Mental Status Changes

PRINCIPAL INVESTIGATOR responsible for this research project is Virginia R. Sicola, phone 353-6204. The professor also taking responsibility for the principal investigator is Margaret T. Beard, Ph.D. at Texas Woman's University, phone (817) 898-2401 (Denton, Texas).

PURPOSE OF THE RESEARCH IS to see if a nurse, offering a daily orientation program, can reduce or prevent mental status changes in older hospitalized patients. In the study, half of the patients will receive the usual nursing orientation to the hospital and treatments. The other half of the patients will receive the usual nursing orientation to the hospital and treatments and a structured daily orientation program. Then daily, each patient will be asked a set of questions to check his mental status.

PROCEDURES which involve me in exact order are:

On Admission Day:

(1) A registered nurse will ask me questions in an interview about my physical ability like how well I see, my daily habits, my family, and my feelings about my illness and the hospital. The interview will take about 20 minutes to complete.

(2) I will have a rest period if I wish.

(3) A registered nurse will visit me again to ask me a set of questions to see if I can remember facts, write, and copy a picture. This will take about 5 to 7 minutes.

(4) Then I will be informed by a registered nurse whether I will be visited once or twice a day during the study.

On Each Hospital Day Following Admission (up to 4 days)

If visited once a day:

In late afternoon or early evening I will be asked the same set of questions I had on admission day to see if I can remember facts, write, and copy a picture. Again, this will take about 5 to 7 minutes.

If visited twice a day:

In the morning I will be given an orientation program including information about the day's date, weather, usual hospital activities, and my treatments. I will be assisted to arrange the area around my bed for my comfort throughout the day. Finally, I will be given some simple range of motion exercises. This will take about 15 to 30 minutes.

In late afternoon or early evening I will be asked the same set of questions I had on admission day to see if I can remember facts, write, and copy a picture. Again, this will take about 5 to 7 minutes.

EXPERIMENTAL PARTS are the specific structure and timing of the daily orientation program, the interview on admission day and the set of questions conducted by a registered nurse. These specific activities are usually carried out by the hospital nurses; however, the structured manner of the study will measure the helpfulness of the specific daily orientation program.

RISKS AND DISCOMFORTS which I may reasonably expect in the study may include tiredness or boredom from answering all the questions on the interview and the set of questions on admission. I may also experience tiredness or boredom from answering the same set of questions each day up 4 days. However, I may tell the nurse if I need to rest.

BENEFITS which I may reasonably expect from the study are three:

(1) I will be visited personally on admission day by a registered nurse. Also I will be visited by that same nurse daily while I am in the

hospital up to my 4th hospital day. This contact with the same nurse over a period of time may give me an opportunity to ask questions about my nursing care and may be seen as a break in a long hospital day.

(2) All procedure in this study may be conducted while I am in bed in my room. I am allowed to remain in any position of comfort I desire.

(3) I may request the scores I make on the set of questions I will be asked daily while I am in the hospital. By seeing my own scores, I will learn about my own ability to remember facts, write, and copy over several days while in the hospital.

OPTIONAL PROCEDURES or courses of treatment which might be more advantageous for me are none. I will receive all of the nursing care which I would receive if I were not in the study. The activities listed are extra while I am in the hospital.

MY MEDICAL RECORDS for the purposes of this research will be made available to only three nurses who are employed at VA Medical Center; Virginia Sicola, R.N., M.S., Carolyn Sparks, R.N., M.S., and Lena Hall, R. N., B.S.N.

CONFIDENTIALITY of records identifying me will be maintained in the following manner. The interview and the set of questions forms have only an identification number on them rather than my name. The researchers will keep my name on a separate page. The answers I give on interview and set of questions will be kept with the researchers only.

No other nurse, doctor, or family member will be able to see the answers. I will be alone when the nurse asks the set of questions to maintain my privacy. The nurse conducting the study will not interrupt a visit from another nurse, doctor, hospital personnel or visiter in the room.

MY ADDITIONAL COST due to participating in this study (over and above normal treatment cost) will be:

NOTHING

DURATION: The time which it will take for my participation in this study should be:

(1) One 20 minute period on admission day.

(2) One 5 to 7 minute period on admission day. (Total: 27 minutes)

(3) One 5 to 7 minute period on each hospital day up to the 4th hospital day. (Total: 28 minutes)

(4) One 15 to 30 minute period on each hospital day up to the 5th hospital day, if assisted to the group receiving the daily orientation program. (Total: 120 minutes)

VOLUNTARY PARTICIPATION: I do not have to be involved in this study. If I sign this form, it means I do wish to volunteer. If I change my mind later, I can discontinue my participation in this study at any time I choose and my withdrawal will not affect my future treatment at this institution.

NONCOMPENSATION CLAUSE: I understand that in the event of physical injury resulting from the research procedures described to me, that Texas Tech Health Science Center, Texas Woman's University, VA Medical Center, and their affiliates are not able to offer financial compensation nor to absorb the cost of medical treatment.

However, necessary facilities, emergency treatment, and professional services will be available to research subjects just as they are to the community generally. Further information about any of the above matters may be obtained from the Director of the VA Medical Center, Mike Harwell, at (806) 355-9703 in Amarillo, Texas.

VERBAL EXPLANATION: I have received an oral description of this study, including a fair explanation of the procedures and their purpose, any associated discomforts or risks, and a description of the possible benefits. An offer has been made to me to answer all questions about the study. I understand that my name will not be used in any release of the data.

_____ _____

Signature of the Subject Date

_____ _____

Signature of the Witness to Oral Presentation Date

CERTIFICATION BY PERSON EXPLAINING THE STUDY:

This is to certify that I have fully informed and explained to the above named person a description of the listed elements of informed consent.

_____ _____

Signature of Researcher Date

_____

Position

_____ _____

Witness Date

APPENDIX I

PART 1 - AGREEMENT TO PARTICIPATE IN RESEARCH BY OR UNDER THE DIRECTION OF THE VETERAN'S ADMINISTRATION

PART I-AGREEMENT TO PARTICIPATE IN RESEARCH
BY OR UNDER THE DIRECTION OF THE VETERANS ADMINISTRATION

DATE

1. I, _____, voluntarily consent to participate as a subject
(Type or print subject's name)

in the investigation entitled Daily Orientation Program's Effect on the Hospitalized Older
(Title of study)
Medical Patients Predicted to Be at Risk for Mental Status Changes

2. I have signed one or more information sheets with this title to show that I have read the description including the purpose and nature of the investigation, the procedures to be used, the risks, inconveniences, side effects and benefits to be expected, as well as other courses of action open to me and my right to withdraw from the investigation at any time. Each of these items has been explained to me by the investigator in the presence of a witness. The investigator has answered my questions concerning the investigation and I believe I understand what is intended.

3. I understand that no guarantees or assurances have been given me since the results and risks of an investigation are not always known beforehand. I have been told that this investigation has been carefully planned, that the plan has been reviewed by knowledgeable people, and that every reasonable precaution will be taken to protect my well-being.

4. In the event I sustain physical injury as a result of participation in this investigation, if I am eligible for medical care as a veteran, all necessary and appropriate care will be provided. If I am not eligible for medical care as a veteran, humanitarian emergency care will nevertheless be provided.

5. I realize I have not released this institution from liability for negligence. Compensation may or may not be payable, in the event of physical injury arising from such research, under applicable federal laws.

6. I understand that all information obtained about me during the course of this study will be made available only to doctors who are taking care of me and to qualified investigators and their assistants where their access to this information is appropriate and authorized. They will be bound by the same requirements to maintain my privacy and anonymity as apply to all medical personnel within the Veterans Administration.

7. I further understand that, where required by law, the appropriate federal officer or agency will have free access to information obtained in this study should it become necessary. Generally, I may expect the same respect for my privacy and anonymity from these agencies as is afforded by the Veterans Administration and its employees. The provisions of the Privacy Act apply to all agencies.

8. In the event that research in which I participate involves certain new drugs, information concerning my response to the drug(s) will be supplied to the sponsoring pharmaceutical house(s) that made the drug(s) available. This information will be given to them in such a way that I cannot be identified.

I_____
NAME OF VOLUNTEER

HAVE READ THIS CONSENT FORM. ALL MY QUESTIONS HAVE BEEN ANSWERED, AND I FREELY AND VOLUNTARILY CHOOSE TO PARTICIPATE. I UNDERSTAND THAT MY RIGHTS AND PRIVACY WILL BE MAINTAINED. I AGREE TO PARTICIPATE AS A VOLUNTEER IN THIS PROGRAM.

9. Nevertheless, I wish to limit my participation in the investigation as follows:

VA FACILITY	SUBJECT'S SIGNATURE
Amarillo Medical Center	
WITNESS'S NAME AND ADDRESS (Print or type)	WITNESS'S SIGNATURE
INVESTIGATOR'S NAME (Print or type)	INVESTIGATOR'S SIGNATURE
Virginia R. Sicola	

☐ Signed information sheets attached ☐ Signed information sheets available at Texas Tech Health Science Center, Amarillo

SUBJECT'S IDENTIFICATION (I.D. plate or give name - last, first, middle)

SUBJECT'S I.D. NO. | WARD

AGREEMENT TO PARTICIPATE IN RESEARCH BY OR UNDER THE DIRECTION OF THE VETERANS ADMINISTRATION

VA FORM 10-1086 SEP 1979

SUPERSEDES VA FORM 10-1086 JUN 1975, WHICH WILL NOT BE USED.

APPENDIX J

DEMOGRAPHIC INFORMATION FORM

PART I
RISK FACTOR INTERVIEW FOR
HOSPITALIZED PATIENTS

Demographic Information Form

Patient's Research No. ___ ___ ___ ___ ___

Date of Interview:_____Time of Interview_____

Instructions: Complete the following by obtaining information from the patient, chart, and/or the Reseach Data Form.

Instructions to the subject: There are two parts to this interview. In the first part you will tell me a few facts about yourself. The second part you will be answering questions about your physical ability and your feelings about being sick and being in the hospital. Feel free to ask me to repeat or explain any statement or question.

Personal Data:

Place appropriate number in code box at left.

( ) Date of Birth_____Age_____(Code with age categories on interview, Use number 7 if subject is from the younger group.)

( ) Sex: (1) Male (2) Female

( ) Weight (1) Gained over 10 lbs in last 12 months (2) Lost over 10 lbs in last 12 months (3) both (4) neither
Present weight_____lbs Weight 12 mos. ago____lbs

( ) Race: (1) Black (2) Caucasian (3) Mexican-American (4) Other

( ) Marital Status: (1) Married (2) Single (3) Divorced (4) Separated
(5) Apart from spouse for special circumstances
(6) Widowed for more than a year
(7) Widowed for less than a year

( ) Religious Affiliation: (1) Protestant (2) Catholic (3) Jewish (4) Other

( ) Level of Education: (1) Grade School (2) Jr. High School
(__ no. of years) (3) Partial High School (4) High School Graduate
(5) Some college courses (associate degree)
(6) College graduate (7) Post-graduate work

( ) Number of miles from home: (1)1-20 (2) 21-40 (3) 41-60 (4) 61-80
(5) 81-100 (6) Over 100

( ) Lives in a community with a population of: (1) over 150,000
(2)100,000-149,000 (3) 50,000-99,000
(4) less than 50,000

Present or past occupation_____

Hospital Data

( ) Admitted to hospital from which living situation: (1) own place
(2) family member's home (3) nursing home
(4) foster home

( ) Person or place that offers most personal support: (1) spouse
(2) son or daughter (3) in-laws
(4) brother or sister (5) other relatives
(6) friend (7) hospital or institution
(8) no one

( ) Type of unit in which bed is located: (1) private (2) semi-private
(3) ward

( ) Admission to the hospital was: (1) planned (2) unexpected

Health History: Injuries_____Years_____

Surgeries_____Years_____

Diseases_____ Years_____

Present Diagnosis (reason for admission):_____

Information Form

Medications

Name	Dose	Frequency	At-Home	In-Hospital
(1)_____	_____	_____	_____	_____
(2)_____	_____	_____	_____	_____
(3)_____	_____	_____	_____	_____
(4)_____	_____	_____	_____	_____
(5)_____	_____	_____	_____	_____
(6)_____	_____	_____	_____	_____
(7)_____	_____	_____	_____	_____
(8)_____	_____	_____	_____	_____
(9)_____	_____	_____	_____	_____
(10)_____	_____	_____	_____	_____
(11)_____	_____	_____	_____	_____
(12)_____	_____	_____	_____	_____

Continue medication list below if necessary.

APPENDIX K

LETTER TO AND RESPONSE FROM THE AUTHOR OF THE MINI-MENTAL STATE EXAMINATION

Virginia R. Sicola
P. O. Box 7850
Amarillo, Texas 79114
806 353-6204

May 12, 1986

Marshal F. Folstein, M.D.
The John Hopkins Hospital
Room 320, Osler
600 N. Wolfe St.
Baltimore, MD 21205

Dear Dr. Folstein:

This letter is to gain your permission to use the Mini-Mental State Examination (MMSE) with hospitalized elderly medical patients in my research at the Veteran's Administration Medical Center in Amarillo, Texas. The MMSE was recommended to me by another nurse researcher. The research is being conducted to complete my dissertation for the College of Nursing at Texas Woman's University.

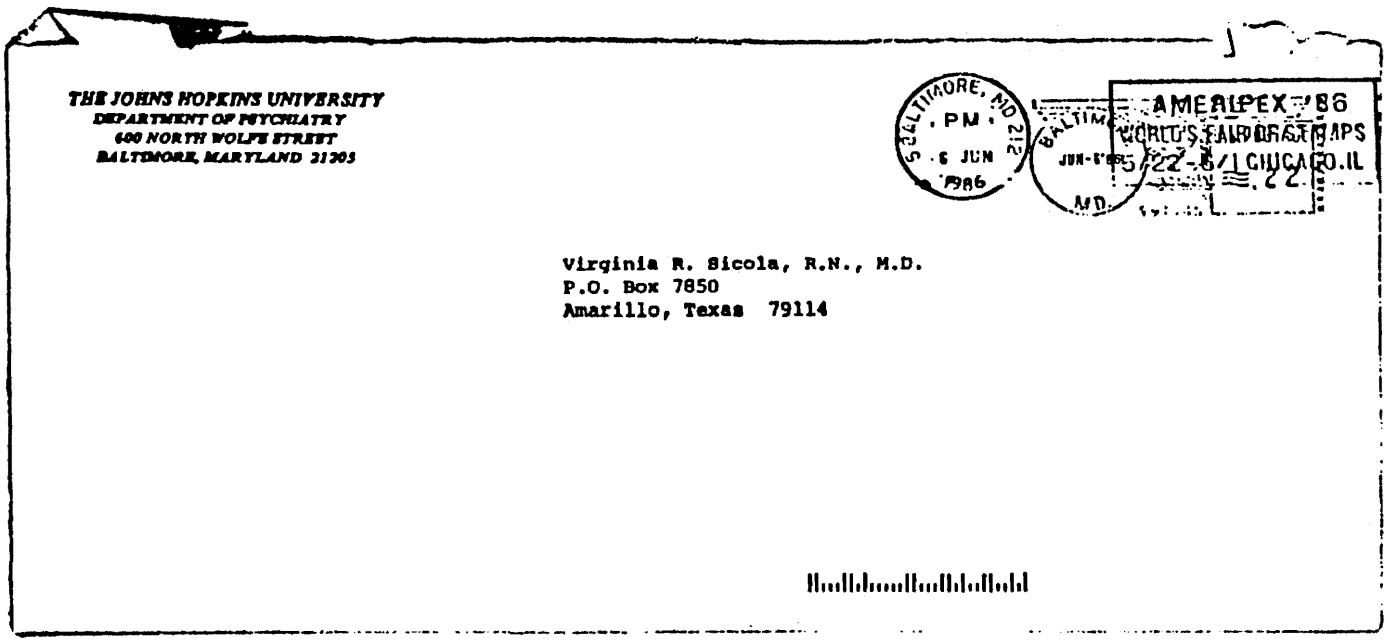
The purpose of the research is to determine if a daily orientation program provided to hospitalized elderly medical patients will reduce the incidence of acute confusional states. The MMSE will be used to objectively determine any daily cognitive changes in the patients. Patients known to have dementia will not be included in the study.

Thank you so much for your consideration. If you need more information concerning my research before you make a decision, please feel free to contact me.

Sincerely,

Virginia R. Sicola

Virginia R. Sicola, R.N., M.S.
Doctoral Candidate
Texas Woman's University



THE JOHNS HOPKINS UNIVERSITY
DEPARTMENT OF PSYCHIATRY
600 NORTH WOLFE STREET
BALTIMORE, MARYLAND 21205

BALTIMORE, MD 212
PM
6 JUN
1986

BALTIMORE
JUN-6
MD.

AMERIPEX '86
WORLD'S FAIR OF STAMPS
5/22-6/1 CHICAGO, IL

Virginia R. Sicola, R.N., M.D.
P.O. Box 7850
Amarillo, Texas 79114