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**Author**

Fick, Donna Marie

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Acute Confusion Among Hospitalized Elders

by

Donna Marie Fick

**DISSERTATION**

**Submitted in partial satisfaction of the requirements for the degree of**

**DOCTOR OF PHILOSOPHY**

**in**

Nursing

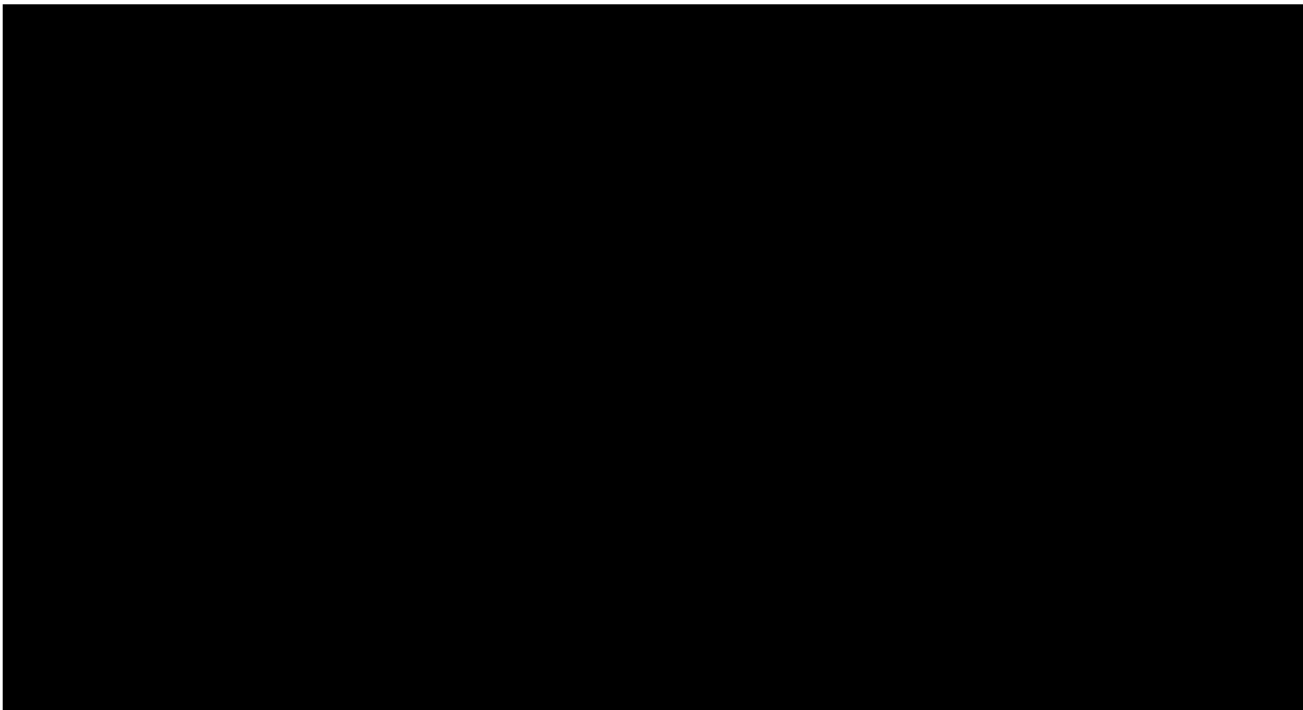
**in the**

**GRADUATE DIVISION**

**of the**

**UNIVERSITY OF CALIFORNIA**

**San Francisco**



### Dedication

This research is dedicated to my parents Herb and Olivia Birkenhauer and to my husband Jim. My parents while parenting nine children, still had time to take me to the nursing home on Sunday afternoons, always made me feel loved, and encouraged education, making this day possible for me. My husband Jim gave me constant love, support, and daily encouragement.

### Acknowledgement

I have been fortunate to be in a profession that I enjoy, and I look forward to a lifetime of learning from patients, families, and colleagues. I would like to acknowledge all of my nursing teachers, patients, and colleagues who have inspired me to continue learning while fostering my interest in research, especially Dr. Martha Pride who was my chairman and professor at Berea College in Berea Kentucky, Dr. Ann McCracken who first introduced me to the field of Gerontology, Dr. Terry Fulmer who continues to be an excellent mentor and friend, and Dr. Jeanie Kayser-Jones who has been a dedicated advisor, and who teaches qualitative research and aging by example. Lastly I want to thank the patients, families, and members of the nursing and medical staff that participated in my study.

## Abstract

Donna Marie Fick  
Confusion Among Hospitalized Elders

The purpose of this ethnographic study was to explore the recognition and management of acute confusion in hospitalized elderly persons. The specific research questions were: 1) How do nurses, families, and other health care workers recognize and respond to acute confusion in an elderly person? 2) What is the experience of the elderly person who develops acute confusion while in the hospital? and (3) What factors (e. g. medical diagnoses, medications, use of physical restraints, environment, interaction with the caregiver) are associated with acute confusion superimposed on dementia?

Twenty patients were observed in-depth and families, nurses, and physicians were interviewed. Of the study population, 13 out of 20 ( 65%) were African American, reflecting the population served by this institution. Their mean age was 80.6, their mean education level was 7 years. The prevalence of delirium in this study was 60%. The incidence, or new onset, of delirium was 30%. The presence of delirium was associated with new onset incontinence, mini-mental state scores, depression, weight loss, and the burden of co-morbidity. The three major findings of this study are: 1) delirium superimposed on dementia is poorly understood and unrecognized by health care professionals, 2) compared to elderly patients with delirium, persons with delirium super-imposed on dementia were discharged from the hospital not fully recovered from the delirium and were re-admitted to the hospital in less than thirty days, 3) factors in the hospital environment (physical environment, culture, communication) seem to interact with baseline patient vulnerability.

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## Chapter I: Introduction

### Purpose of Study

The purpose of this ethnographic study is to explore delirium and its management in hospitalized elderly persons. Analysis of the confusion episode, observation of the patient and members of the hospital staff, interviews of families and members of the staff, quantitative measure of function and mental status, and chart review have been used to obtain data.

The specific aims of this study are to describe 1) the recognition of delirium by nurses and physicians; 2) how nurses respond to an event of delirium; 3) the management of delirium by members of a nursing staff; 4) the management of delirium by physicians; 5) the experience of confusion by elderly patients in an acute care hospital; 6) delirium superimposed on dementia; and 7) delirium in the absence of dementia. I shall use the term *dementia* to refer to progressive chronic confusion, and *delirium* to refer to acute confusion.

### Significance

The significance of delirium and dementia is manifold. First, the number of persons with dementia in this country is increasing. At least 4% of those over age 65 have a dementing illness, and the cumulative risk of developing dementia by age 80 is approximately twenty percent (Evans, Funkenstein, & Albert, 1989). Increasing age is a major risk factor for the development of Alzheimer's disease (AD) and related dementias (Katzman & Jackson, 1991). A study of elders living in the community of Boston estimated the prevalence of Alzheimer's disease to be 10.3% in those 65 years and older, 21% in those 75-84 years old, and 48% for those 85 years and older (Evans, Funkenstein, & Albert, 1989).

Second, delirium is associated with poor outcomes for both patients and families. It is associated with an increased length of hospital stay, increased nursing care, decreased ability to function, delayed rehabilitation, with being admitted to a nursing home, and with

death (Levkoff, Safran, & Cleary, 1992; Thomas et al., 1988). Although delirium may be potentially reversible, several studies have shown a poor long-term prognosis or symptoms that persist beyond hospitalization (Francis & Kapoor, 1992; Levkoff, Besdine, & Wetle, 1986).

Third, the monetary cost of delirium and dementia is high. According to a 1993 progress report from the National Institute on Aging, Alzheimer's disease costs the nation an estimated \$90 billion per year, including medical bills, nursing home costs, home care costs, and lost productivity. The estimated cost of caring for one person with AD is \$47,000 each year. The disease may last from eight to twenty years and may result in significant costs to families and society (National Institutes of Health, 1993; National Institutes of Health, 1994).

While much is known about the high incidence of delirium in the hospitalized elderly, few studies have explored nursing management and recognition of demented elderly who develop delirium while hospitalized. However, research on confusion is important to the field of nursing and to elderly people and their families. Preventing delirium in hospitalized elders or detecting it earlier and managing it could prevent further mental and physical decline in the elderly and save health care dollars.

## Chapter II: Literature Review

### Incidence of Delirium

Delirium is characterized by rapid onset, a fluctuating course, disordered attention, and an organic, reversible etiology (DSM-IV, 1994). Delirium has been studied primarily in hospitalized elderly patients, in whom it occurs frequently. In studies of postoperative patients, the incidence of delirium ranges from 42% to 53% in orthopedic and hip-fracture patients, and from 19% to 68% in cardiac patients (Andrew, & Tetrault, 1968; Gustafson, Brannstrom, Norberg, Bucht, & Winblad, 1991; McClish, Williams, Campbell, Raynor, Musholm Mlynarczyk, & Crane, 1985; Owens & Hutelmyer, 1982).

In recent studies of hospitalized medical-surgical patients delirium ranged from 25% to 38% (Foreman, 1989; Inouye, Viscoli, Horwitz, Hurst, & Tinetti, 1993; Morency, Levkoff, & Dick 1994; Schorr, Levkoff, Lipsitz, Reilly, Cleary, Rowe, & Evans, 1992; ). This wide variation in the occurrence of confusion is likely due to errors in measurement, differing criteria for diagnosis, or faulty definitions of concepts. Many studies do not separate incidence from prevalence cases or use an established measurement tool to measure delirium.

### Recognizing Delirium

Detecting delirium is important as it is often the first or only sign of an acute illness or of the worsening of a medical condition (Foreman, 1986; Francis & Kapoor, 1992; Lipowski, 1990). Despite the high incidence of delirium in the elderly and the mortality associated with it, it is frequently unrecognized or misdiagnosed. In several studies, delirium in about half of the patients went unrecognized by nurses and physicians. Nurses are often the first health professionals to recognize and report delirium (Inouye, 1993; Levkoff, Saffran, Cleary, Gallops, & Phillips, 1988; Palmateer, & McCartney, 1985). In a study of 432 medical-surgical patients, confusion was most often mentioned in the medical record by nurses, but was not identified as an acute change with a reversible cause (Pompei, Foreman, Cassel, Alessi, & Cox, 1995).

### Risk Factors for Delirium

Studies that identify factors associated with or predictors of delirium usually focus on 1) baseline characteristics present when the patient is admitted, or 2) events that occur during the hospitalization that may cause or worsen the delirium. Most studies focus on investigating demographic and physiologic variables as the causes of delirium. Generally patients who are older, are more severely ill, have existing cognitive impairment, or who are undergoing surgery, are at higher risk of developing delirium (Baker, Wiley, Kokman, Chandra, & Schoenberg, 1995; Foreman, 1989; Pompei, Foreman, Rudberg, Inouye, Braund, & Cassel, 1994; Schor, Levkoff, Lipsitz, Reilly, Cleary, Rowe, & Evans, 1992; Williams, Campbell, Raynor, Mushholt, Mlynarczyk, & Crane, 1985).

For each of the eight reviewed studies, (see Appendix A review of the literature tables) presents citations, designs, sampling methods, measurement of the variables, measurement tools used, and results. A 1994 study by Pompei, Foreman, Rudberg, Inouye, Braund, and Cassel used a cross-sectional study design with a non-probability convenience sample to determine the rate of delirium in two hospitals, to contrast the clinical outcomes of patients with and patients without delirium, and to identify clinical predictors of delirium. The Pompeii study found prevalence rates of delirium of 15% and 26% at both sites. Subjects with delirium had longer hospital stays and an increased risk for death in the hospital. An impaired mental state, the burden of co-morbidity, depression, and alcoholism were found to be independent predictors of delirium.

This study has limitations that arise from the use of differing criteria for selecting patients at the different sites. The Chicago site had stricter exclusion criteria for subjects, excluding persons with dementia and those who could not consent for themselves.

Another recent nursing study of confusion in the acute care setting investigated 843 patients at two different time periods after a facility relocated (Shedd, Kobokovich, & Slattery, 1995). The prevalence of confusion, according to nurses' judgments ranged from 4% to 14%. The nurse researcher asked each nurse whether any of their patients were

confused, then completed a data collection tool for each identified patient using an adapted Confusion Assessment Method (CAM). The mean length of stay (LOS) was 31 days for confused patients and 14 days for those who were not confused. The mean age of the patients was 59. Restraints were used on 38% of the confused patients during the current shift; eight of these patients also had sitters. Two limitations of this study were the reliance on nurses to identify confused patients and the use of the CAM to assess chronically and acutely confused patients. The CAM is for assessment of acute confusion and relying on nurse may have caused the researchers to miss cases of confusion that are not recognized by the nurses.

A 1996 study by Inouye and Charpentier prospectively developed and validated a predictive model for delirium based on precipitating factors during hospitalization, then examined the interrelationship of these predictors with baseline vulnerability. Delirium developed in 18% of the development cohort and five independent predictors for delirium were identified: use of physical restraints, malnutrition, more than three medications added during hospitalization, use of bladder catheter, and any iatrogenic event. Iatrogenic events were defined using standard criteria and included such things as pulmonary edema, hospital acquired infections (urinary tract infections), and unintentional injury. Each risk factor preceded the development of delirium by more than 24 hours (Inouye & Charpentier, 1996, p. 853).

The descriptive studies that have been reviewed focus primarily on baseline characteristics of patients and physiologic variables as risk factors for or predictors of delirium. Foreman found ten variables that were risk factors for the development of confusion including hyponatremia, hypokalemia, and mean arterial blood pressure. Infection is another common cause of delirium (Francis, Martin, & Kapoor, 1990; Levkoff, Safran, Cleary, Gallopp, & Phillips, 1988). Foreman (1989) is the only prospective study that investigates other non-physiologic variables such as the presence of clocks and calendars in the room and nurse ratings of confusion as predictors of confusion.

### Consequences of delirium

An episode of delirium is a serious event. Delirium often indicates the worsening of a medical condition or the onset of an acute illness. Delirium is associated with increased length of hospital stay, increased nursing care, decreased functional status, delayed rehabilitation, nursing home placement, and death (Levkoff, Safran, & Cleary, 1992; Thomas, Cameron, & Fahs, 1988).

Mortality is high for elderly people who experience delirium. Within two years after an episode of delirium, 15%-30% of patients had died (Inouye, 1993; Thenhaus, 1990). In a study by Conn (1991), the mortality rate of elderly persons with delirium was double that of controls during a thirty-day period.

### Studies of Intervention for Delirium

Only a few studies of delirium have investigated interventions intended to prevent delirium, or to manage it once it occurs. In one intervention study in Sweden, oxygen was administered post-operatively for 103 consecutive patients who were then compared to 111 consecutive patients who did not get oxygen therapy. The incidence of delirium (47.6%) was lower in the intervention group compared with that of the control group (61.3%) (Gustafson, Brannstrom, Berggren, Ragnarsson, Sigaard, Bucht, Reiz, Norberg, & Winblad, 1991).

A 1994 randomized controlled trial of hospital patients 75 years of age or older followed patients with delirium at one, two, four, and eight weeks (Cole, Primeau, Bailey, Bonnycastle, Masciarelli, Engelsmann, Pepin, and Ducic, 1994). The patients were randomly allocated to the treatment group (42) or to the control group (46). Outcome measures were mental state determined by using the Short Portable Mental Status Questionnaire (SPMSQ); behavior; use of restraints; length of stay; and where the patient had been discharged to after hospitalization. Much of the information about outcomes was obtained from reviewing the chart rather than by observation. Use of restraints was measured by whether the nurses' notes indicated that restraints were used.



A limitation of this intervention study by Cole and colleagues was that the investigators did not separate prevalence and incidence cases of delirium. The sample of 42 in the treatment group may have been too small to detect a statistical difference, and the intervention protocol was too general. In addition, controls may have been contaminated if staff nurses who read the protocol used the interventions on the control patients.

#### Delirium Superimposed on Dementia

The phenomenon of delirium superimposed on dementia has been little studied owing to difficulties in measurement. Many studies of persons with delirium exclude persons with dementia (Foreman, 1993). Numerous studies, however, have found that pre-existing cognitive impairment, errors on a mental status test, or the presence of dementia, are risk factors for developing delirium (Pompei, Foreman, Rudberg, Inouye, Braund, & Cassell, 1994; Schorr, Levkoff, Lipsitz, Reilly, Cleary, Rowe, & Evans, 1992; Williams, Campbell, Raynor, Musholm, Mlynarczyk, & Crane, 1985).

A retrospective chart review of 122 cases of Alzheimer's disease (AD) applied DSM-III-R criteria to screen for delirium. Twenty-five percent of these patients were found to have had a single episode of delirium in the hospital during the course of their AD (Baker, Wiley, Kokmen, Chandra, & Schoenberg, 1995). A 1992 study followed patients two years after an episode of delirium. Although mortality risk was nearly doubled for those with a case of delirium, this effect was largely explained by pre-existing functional and cognitive impairment (Francis & Kapoor, 1992).

#### Dementia Literature Review

Dementia is the general term used for a form of cognitive impairment that is progressive, occurring over a period of months to years. The primary deficit in dementia is impaired short-term memory that progresses to impaired use of language, impaired ability to function in activities of daily living, and eventually to death.

Persons with dementia develop multiple cognitive deficits manifested by both memory impairment and one or more of the following: 1) aphasia, 2) apraxia, 3) agnosia, or 4)

impaired executive functioning. For a diagnosis of dementia, these cognitive deficits must be sufficient to impair social or occupational functioning and must be characterized by gradual onset and continued cognitive decline (DSM-IV, 1994). It is also necessary to rule out potentially reversible causes of cognitive impairment including drugs, depression, alcohol, metabolic disorders, vascular insufficiency, nutritional deficiencies, tumor, trauma, and infection (Weiner, 1991).

Alzheimer's disease accounts for over 60% of all dementias in the U. S. (Katzman & Jackson, 1991). A diagnosis of probable or possible AD can be made based on a medical history, a thorough physical exam, and an assessment of mental state using established measures (McKhann, Drachman, Folstein, Katzman, Price, & Stadlan, 1984). Many clinicians also recommend a complete blood work-up and a computerized tomography (CT) or magnetic resonance image scan before the diagnosis is determined (Katzman & Jackson, 1991). This assists in ruling out such reversible causes of cognitive impairment as hypothyroidism, vitamin B12 deficiency, electrolyte imbalance, and intracranial masses. Recommended tests for an evaluation of dementia include: use of an standardized instrument for assessment of mental state, computerized tomography (CT) for ruling out structural lesions, laboratory evaluation of a complete blood count, vitamin B12 levels, tests of thyroid function, a blood chemistry panel, and screening for inflammatory and infectious diseases such as neurosyphilis and human immunodeficiency virus (HIV). (Geldmacher & Whitehouse, 1996; Despite the obvious difficulties, the accuracy of AD diagnosis has improved significantly in the past decade and approaches 90%-95% in many studies when confirmed by autopsy (Katzman & Jackson, 1991; McKhann et al., 1984).

AD and related dementias cause a progressive loss of cognitive and physical functioning and often are accompanied by behavioral and personality changes. Weight loss and depression are also significant, with major depression occurring in 10%-20% of persons with dementia and a depressed mood occurring in more than 60% of individuals (Katzman & Jackson, 1991; Weiner, 1991).

Other dementias' include Pick's disease, Huntington's disease, Progressive supranuclear palsy, Parkinson's disease, and Multi-infarct dementia. Multi-infarct dementia (MID) is the second most common form of dementia and is the result of multiple areas of brain tissue infarction. Individuals with MID often have a history of hypertension, diabetes, stroke, or cardiovascular disease. The progression of MID is more incremental than that of AD, with episodes of delirium and variable deficits. An additional 10%-20% of individuals with dementia have a mixed form of dementia, with a combination of AD and MID and therefore are the most difficult group to diagnose (Geldmacher & Whitehouse, 1996; Morley & Solomon, 1994; Weiner, 1991).

Another type of dementia is the Acquired Immunodeficiency syndrome (AIDS) dementia complex. AIDS, which infects and kills T-lymphocytes, affects the CNS directly, and affects brain function due to direct CNS invasion and to opportunistic infections of the CNS and other organ systems. AIDS dementia is becoming a common type of dementia. In one study, about 25% of early AIDS patients had subclinical cognitive impairment and about one-third met the criteria for AIDS dementia complex (Weiner, 1991, P. 88).

#### Dementia and Education Studies

All but one of the reviewed studies described in tables 2 and 3 in Appendix A support the hypothesis that dementia risk is increased with low education or that decreasing education is associated with greater severity of disease at presentation. Most of these studies also support the hypothesis that education or occupation offers a protection against dementia by providing a set of skills or brain reserve that allows individuals to cope longer before the dementia is clinically manifested (Moritz & Petitti, 1993; Osterweil, Mulford, Sydulko, & Martin, 1994; Stern, Gurland, Tatemichi, Tang, Wilder, & Milieu, 1994).

There is increasing recognition of the multi-factorial nature of complex phenomena such as dementia and of the role of socioeconomic variables in the progression of dementia and in its detection. Education may provide biological or psychological protection from the

onset of the signs and symptoms of dementia, but there are probably many factors that affect the relationship of dementia and education.

It is clear from this and other reviews that clinicians should not look in isolation at neuro-psychological tests or patients' mental states to diagnose dementia. Social and psychological factors appear to interact in a complex manner with neuro-biological changes. Researchers need to address other variables that may delay dementia, prevent it, or help protect against it for certain individuals, and they need to describe the other variables that affect the development of delirium superimposed on dementia.

The preceding studies highlight the multi-factorial aspect of confusion and the possible role of socio-economic factors. The review of the literature on dementia highlights important issues for investigating confusion, including (a) finding sensitive measures for measuring delirium and dementia, (b) selecting variables related to outcomes, (c) defining the concepts and constructs, (d) measuring important variables related to the outcome of interest, and (e) linking the theory and methods in the study.

Future longitudinal analyses will indicate whether we can use education level to predict those who will decline, improve, or stay stable. Such information on the association of education and dementia could help health care professionals and sociologists to plan interventions and guide policy.

#### Summary

In summary, several of these studies identified such risk factors for delirium as medications, electrolyte imbalances, age, and acute illness (Inouye et al., 1994). A few of the studies measured such psychosocial and environmental factors as depression, interactions with others, the presence of orienting objects (clocks and calendars in room), and social support (Foreman, 1989; Pompeii et al., 1994). The intervention studies did not adequately control for such confounding factors as underlying illness, non-physiologic variables, and education level.

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Research on delirium concerns four main areas: (1) identifying causes of delirium that are amenable to early treatment or to prevention; (2) examining the phenomenon of delirium superimposed on dementia and the reasons why some patients with delirium also develop dementia? Is it that an early dementia had just not yet been detected until the stress caused by hospitalization, or does delirium precipitate dementia, and can we measure and prevent this phenomenon? Why do patients with dementia develop delirium more often than persons without dementia?); (3) learning how health care workers recognize, respond to, and manage an hospitalized older person with delirium and dementia; and 4) discovering what the relationship is between such baseline factors as dementia or illness that make an individual vulnerable and factors and stresses in the environment.

#### How Present Study Will Build On Previous Research

The phenomenon of confusion and other neuro-degenerative diseases in the elderly is the new frontier in health care research. Both need sensitive measurement methods and additional research in the diagnosis, treatment, prevention, and management of the signs and symptoms of confused states in the elderly.

Despite our attempts to use clear terminology and diagnostic criteria that separate dementia and delirium, the distinction may not be as definite as previously suspected. There are still no adequate criteria to clearly define delirium superimposed on dementia. This phenomenon needs to be further described, and precipitating factors for delirium superimposed on dementia must be identified.

In numerous studies, baseline cognitive impairment and dementia have been found independent predictors of delirium. Other variables found to predict delirium are increasing age, severity of illness, BUN/creatinine levels, medications, and electrolyte imbalances (Foreman, 1992; Francis, Martin, & Kapoor, 1990; Pompei, Foreman, Rudberg, Inouye, Braund, and Cassel, 1994).

As we begin to challenge the ways in which we have traditionally analyzed and treated dementia and delirium, the association of education with Alzheimer's disease suggests that

the same physiological brain reserve that delays or prevents AD may contribute to the development of delirium in some individuals. That possibility may guide studies that look at non-biological factors that may be involved in dementia and delirium and that may affect the physiological brain reserve threshold. Given the mortality rate associated with delirium, preventing delirium in persons with dementia could delay further mental and physical decline.

Few studies in nursing have explored nurses' management and recognition of confusion in-depth, and I know of no published qualitative studies that have examined confusion in the context of acute care. This study will contribute new knowledge about confusion in the hospitalized elderly by qualitatively examining confusion occurring in the hospital environment and the recognition of delirium in persons with dementia.

#### Preliminary Studies

A pilot study was conducted to explore the phenomenon of confusion and delirium in persons with dementia as it occurs in the hospital environment. This was a qualitative ethnographic study that used two strategies for collecting data 1) observation of patients and nurses (participant observation); and 2) interviews with members of the nursing staff. Data were collected over a period of seven months.

The setting was a medical-surgical unit with the majority of patients having orthopedic problems, and being more than 65 years old. The patients on this unit are cared for by Registered Nurses and certified nurses' aides. An RN is usually paired with one nurses' aide; together they typically care for eight or nine patients on the evening shift.

Analysis was done using line by line coding of data and development of themes and categories. The pilot data explored nurses' attitudes toward confused patients and nurses' recognition and management of confusion.

After coding the fieldnotes and interviews, I developed several major themes that I linked together to begin thinking about the theoretical aspects of the data. I developed three

categories from the data: recognizing confusion, factors contributing to confusion, and managing confusion.

The themes I discovered about confusion management and recognition are the cost of caring for persons with confusion; the effect of the environment on confusion; amount of time available; the pressure for maintaining the safety of the hospitalized patient; controlling patients with restraints; communication and interdisciplinary collaboration about confusion; staffing difficulties; the labeling of patients; nurses' attitudes and beliefs about confusion; and the lack of nursing knowledge about chronic and acute confusion. I will discuss a few of these themes.

### Environment

Environment was a theme that emerged in the interviews and while observing patients and nurses. In an interview, a thirty-nine -year-old registered nurse stated:

Number one is taking them out of their usual environment and surroundings. The routine is different than [sic] what they are used to at home. Things are totally different in the hospital . . . there's no place like it; bathing, eating, medications are different; it's an alien environment. And I think a lot of times it is just being in a new environment. A lot of times they are from a nursing home and come straight in [sic] the hospital. I mean they wake up in a totally new environment. . . .

### Cost

Cost emerged as an important category and was mentioned by all the nurses interviewed. The cost of interventions to manage confusion combined with pressure from hospital administration to cut costs and make a profit were discussed as factors that influenced decisions. The nurses interviewed provided observations and narratives about staffing, financing of medical treatment, and organizational policy. These aspects of the organizational environment affected the recognition and management of confusion in older adults and the nurses' decisions to use restraints to manage confusion. This quote from a

registered nurse illustrates different standards of care for the aged and the rationing of care to older patients;

Umm, I hate to say it but if (he/she were) a younger one they (the physicians and nurses) would be more aggressive just to find out why the person is confused. With the elderly it is like, okay, we can always put them in the skilled nursing facility (SNF) for a couple weeks, but a younger person doesn't have that kind of thing in their insurance . . . they would also have more family that would be more pressing and getting the doctors more into it.

And when asked how the nurse manages confusion, she stated, "There's no time, staffing, or money for a lot of it." Another RN stated:

Confused patients take a lot more time and available resources; for instance, if you need a sitter versus having restraints. Unless the family pays for it, the hospital budget is an obstacle. It makes my night a lot harder . . . there is no budget for them (sitters), unless they are a suicide risk or the family offers to pay.

When asked, "Do you know the reasons for that?" she said, "They don't have any money, they keep telling us cost is number one. . . . I wish we could use sitters before restraints, but I understand that is money, and that's not what anyone wants to pay for."

### Safety

For the management of confusion, nurses felt the need to keep patients safe and explained they thought restraints were their first and only effective option.

"Using restraints seem to be basically the only option a lot of times that we have . . . . I will restrain patients to keep them from getting out of bed and falling . . . The biggest problem is safety, pulling out NG tubes, climbing out of bed, risk of dislocating their hip, keeping them safe. I don't like to use restraints as my first line of defense. . . . "

This theme of restraints as a first line of defense seemed to be related to the perceived need to keep the patient safe from falling. Safety became more important than the concern



for individual care and the conflicted feeling about restraining an elder. This was seen in data from both interviews and observation.

### Staffing

Staffing was another theme that came out when nurses discussed caring for confused patients:

A lot of times we've got like [sic] a team where we got nine or ten patients and we have four patients who are totally confused; if they could try and make it so like one team doesn't have all the totally confused patients . . . it gets difficult . . . like when someone says your confused patient is in that room and you're trying to think; I have four [confused]; now, which one are they talking about?

### Interdisciplinary Collaboration

Nurses also discussed communication and collaboration with doctors; in most cases this was communication about restraining the patient and keeping him or her from falling or interfering with invasive devices such as surgical drains. I called this interdisciplinary collaboration. The first nurse interviewed talked about a recent patient she had cared for: "I had an orthopedic patient who was confused. He had gotten out of bed and pulled out his hemovac. I called the doctor and Doctor P. said, 'I hope you have him restrained.' No talk of the cause of the confusion, but I don't always blame the doctors; the nurses need to be more assertive."

The nurses were not able to articulate how they recognized different types of confusion in the patient, and several indicated that they were not able to differentiate between delirium and dementia when caring for confused patients. In the participant observation, nurses did not treat an incident of acute confusion as if it were reversible. None of the nurses or nurses' notes reported a confusion as having an organic cause or reported a search for a specific, reversible cause.

The interviews and observations did not indicate that nurses see confused behavior in the elderly as an emergency or life-threatening event, even though mortality is higher in

confused patients compared to patients without confusion (Weddington, 1982). The confusion was frequently laughed or joked about, seen as a nuisance or as normal behavior for an older person. If the confusion is not reported or recognized as acute and reversible, a delay in treatment may lead to a worsening of function or death.

These concerns for maintaining safety in an older hospitalized person are coupled with staffing levels (Table 4) that leave little time for individualized care. There are also data that indicate that the nurses feel pressure from administrators to cut hospital costs. In addition the nurses' attitude towards normal aging and knowledge of confusion, affected their ability to recognize and manage confusion. These elements of the environment, attitude and lack of knowledge, determine the level of intervention that the nurse chooses, and the ultimate outcome of confusion management. This was a small pilot study, and there were not adequate data to generate a theory, but the data build on existing theories of environment and individualizing care.

The pilot results support the theory of the Individualized versus Controlled Care model for caring for the cognitively impaired (Talerico, 1995). In the individualized care model, controlling care where the caregiver or nurse has a need to keep the patient safe at all costs is contrasted with individualized care, where the nurse attempts to understand the behavior and to expand his or her perception of normal behavior.

Table 4

Confusion Pilot Study Participant Observation Data

Date and Shift	Staffing Level	Number of Patients	Percent Patients over 65 y/o	Most Common Diagnosis
11/2/95 evening	3 RN 3 NA	25 pts (1RN:8)	missing	missing
11/27/95 evening	3 RN 3 NA	25 pts (1:8)	64% (16)	17% (6) pneumonia
12/17/95 days	6 RN 3 NA	36 pts (1:6)	75% (27)	missing
9/29/95 evening	3 RN 3 NA	26 pts (1:9)	missing	missing
2/15/96 evening	3 RN 3 NA	26 pts (1:9)	69% (18)	33% (6) orthopedic

11/2/95  
 11/27/95  
 12/17/95  
 9/29/95  
 2/15/96

In the controlling model, the nurse sees safety as the overriding concern in protecting the patient and in continuing the institutional treatments without interference. In the individualized care model, the nursing intervention is analyzed by benefit versus burden, and safety is not the number one goal. The nurses in the pilot study, influenced by their organizational environment, had safety and cost containment as their goals and not individualized care.

The pilot data also support environmental theory. Kayser-Jones (1992) illustrates how multiple factors in the cultural, physical, organizational, psycho-social, personal, and supra-personal environments may affect the person to whom restraints are applied. This framework may also be applied in the case of the confused person with functional, cognitive, physiological, and sensory-perceptual disabilities. This framework has been used in other studies of the elderly including a study that examined predictors of restraint use on nursing home residents (Sullivan-Marx, 1995).

Several environmental factors that Kayser-Jones (1992) identified were recurring themes in the interviews about nurses' recognition and management of confusion, including a) staffing and acuity levels, b) organizational policy regarding the use of sitters, c) financing, d) physical environment, and e) nurses' attitudes and beliefs. An additional feature of organizational environment seen in the pilot study was the environment of interdisciplinary collaboration. How, and whether the nurses and physicians are able to communicate about the patient and to collaborate on management appear to be important variables.

### Theoretical Framework: Environment and Aging

Nursing theories define environment as a concept central to nursing and as one of the domains of nursing (person, health, nursing, and environment), yet few nursing studies have investigated the relationship between aging and environment (Kayser-Jones, 1989). Nursing theorists may regard the environment as the immediate surroundings, a source of stimuli, an interactional process, or as part of a society or culture.

Chopoorian (1986) urges nurses to develop a new concept of environment and to go beyond the person as the central focus of nursing interventions and suggests that nurses "develop a consciousness of environment as social, economic, and political structures; of environment as human social relations; of environment as everyday life. . . .[B]y considering the dynamics of each and their interrelationship[s] we arrive at a more comprehensive view of the internal processes of the social world of human interaction..." (Chopoorian, 1986, p. 47).

Kleffel (1991) examined the research that dealt with the environment from 1961 through June 1990. Of the 54 articles found, 53 addressed only the immediate environment of the patient, family, or nurse. Kleffel points out that this view is limited and urges nurses to expand their view of environment to the social, political, economic, and cultural conditions that produce health and illnesses (Kleffel, 1991).

Numerous studies by social gerontologists have shown that the quality of the environment influences the success of older persons attempts to adapt to living in institutional settings (Moos 1980; Grant, 1989, Kayser Jones, 1989). Kayser-Jones, building on the work of others (Lawton, 1982; Moos, 1980), developed a conceptual model of environment to study the quality of long-term care; the importance of the environment in the care of the institutionalized aged; falls; and the use of restraints (Kayser-Jones, 1989,1992). This environmental model of confusion in the elderly allows one to study environment from an individual, family, social, organizational and physical perspective.

#### Environmental Press

Research on person and environment often focuses on environmentally caused changes in behavior from a psychological or sociological perspective. Psychology often investigates interpersonal relationships as part of the environment. Environmental press is an environmental theory that helps explain our response to the environment from a physical, sociological, and psychological perspective. Environmental press may consist of

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multiple demands (physical, personal, social, etc.) that the environment places upon the individual.

This view makes it difficult to classify and operationalize environment for the testing of theories. Lawton (1982) classifies environmental aspects his model as

1. Personal environment: significant relationships of an individual (family, friends, significant others).
2. Supra-personal environment: characteristics of all persons in physical proximity (predominant race, sex, or mean age of community).
3. Social environment: the norms, values, and institutions operating in the individual's sub-group or culture.
4. Physical environment: the extra-personal, extra-social aspects of the environment (Lawton, 1982, p. 40).

In Lawton's model of aging, behavior is a function of the competence of the individual and the environmental press of the situation. Adaptation is dependent on a combination of the press of a given magnitude or strength and an individual's given level of competence. Competence in Lawton's model refers to biological health, sensory-perceptual capacity, motor skill, cognitive capacity, and ego strength.

Lawton's model is an interesting framework, given the research on the connection between both the educational level and occupation on the development of Alzheimer's disease (AD) (Moritz & Petitti, 1993; Osterweil, Mulford, Syndulko, & Martin, 1994; Stern, Gurland, Tatemichi, Tang, Wilder, & Milieu, 1994). Level of education and lifelong occupation may increase an individual's ability to withstand greater environmental press before manifesting clinical signs of confusion. Despite epidemiological studies that attempt to simplify the association of education with AD, it is possible that higher levels of education and other factors in the environment may lead to a lower incidence of AD.

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## Environment and Stress

Another model similar to Lawton's environmental press theory that is used in planning care for persons with dementia is the Progressively Lowered Stress Threshold Theory (PLST). The PLST model was developed by nurse-researchers in Iowa after work on symptom clusters and behavioral states in confused elders. Environment is a key concept in that model (Hall & Buckwalter, 1987). This theory was derived using knowledge about behavior and physiologic responses of Alzheimer's patients and theories of stress, adaptation, and coping (Hall, p. 130, 1994). This theory is also supported by biological theories that suggest that AD is caused or exacerbated by stress or an abnormal stress control system (Deshmukh & Deshmukh, 1990; Orrell & O'Dwyer, 1995 ).

The PLST is a conceptual framework that allows one to operationalize key concepts of environmental theory. The PLST model proposes that individuals with dementia need their environmental demands to be decreased or otherwise modified owing to declining cognitive and functional abilities.

In the PLST model, both environmental stressors (noise, activity) and internal stressors (pain, infection) are demands that may make the person with dementia anxious and agitated. Using this model, the Iowa group is teaching caregivers in several different settings to reduce the stressors and avoid or manage problematic behavior (Gerdner, Hall, & Buckwalter, 1995, in press).

The Iowa researchers categorized losses associated with cognitive decline into four groups: (1) cognitive or intellectual losses; (2) affective or personality changes; (3) planning losses that lead to a decline in ability to plan and perform functional activities; and (4) "loss" of the stress threshold, which results in dysfunctional behavior or agitation. In the Iowa model, persons with dementia display three main types of behavior: baseline, anxious, and dysfunctional. In the PLST model normal or baseline behavior is a calm state in which the person is able to communicate needs and to respond to communication from others (socially accessible), and is aware of and oriented to the environment (cognitively

accessible). Anxious behavior occurs when the person with dementia experiences stress. At that point, however, the caregiver is still able to maintain contact with the patient. When too much stress is present, the patient becomes increasingly anxious until the stress threshold is exceeded, resulting in agitated behaviors and client inaccessibility (Hall & Buckwalter, 1987; Hall, 1994, p. 130).

### Hospital Environment

The acute care environment is an important factor in the development and management of acute confusion in the elderly. The physical environment in the hospital may include such things as the noise level, the number of beds in patients' rooms, the presence of windows in the room, the presence of clocks and calendars in the room, decorations, lighting, and the presence or use of physical restraints.

Investigators have begun to look at a few of these environmental factors. In one study by Foreman (1989), the number of orienting objects in the immediate environment was associated with increased confusion. The result was the opposite of what one may expect, but this factor was measured by counting up the number of orienting objects in the immediate environment, including calendars, clocks, televisions, radios, newspapers, and personal photos. The factor was operationalized without consideration to the possibility of differences in meaning and function for different individuals and without measures of how the objects were actually used or not used. Foreman also examined personal environment and found hospitalized elderly who developed confusion had fewer interactions with significant others.

Few studies have focused on environmental variables because quantitatively measuring the acute care environment can be difficult. Other studies with institutions have erroneously believed variables such as nursing home size and profit versus non-profit status represent meaningful environmental dimensions (George & Maddox, 1989). Despite the difficulties in assessing the effect of the environment, researchers should not ignore the association of environment and confusion in the elderly. It may be that patients who



already have some existing cognitive impairment have a lower "stress threshold" before they are pushed into acute confusion.

### Cultural Environment

The cultural environment of the hospital may include such things as attitudes, beliefs, and knowledge about aging. Health care personnel may expect the elderly to be confused, so they may ignore confusion or not recognize a reversible phenomenon such as delirium.

Cultural and organizational factors in the acute care environment also influence management of confusion. For example, the use of restraints is commonly accepted in hospitals, though they are discouraged and no longer used routinely in long-term care. Restraints and other forms of enforced immobility may be an important factor of the environment.

In the pilot study, several environmental factors that Kayser-Jones (1992) identifies in her research were recurring themes in the interviews on nurses' recognition and management of confusion, including staffing and acuity levels, organizational policy regarding the use of sitters, financing, physical environment, and nurses' attitudes and beliefs. Another feature of organizational environment is the environment of interdisciplinary collaboration.

### Macro-environment

Obstacles to managing confusion in the older adult go beyond the hospital walls to the macro-environment, including the health care changes affecting care of patients along the continuum. Part of the macro-environment is the financing and changing structure of healthcare delivery. These changes may affect the management and prevention of confusion in the elderly. Many hospitals now have capitated contracts with the health maintenance organizations, which means the hospital is given a pre-determined amount of money per member to care for that member and if the hospital goes beyond that amount it loses money on that individual.

In a capitated environment patients are in the acute care setting only a short period of time and may be discharged home with a new onset of confusion. There is not adequate time to evaluate the confusion if the goal is an early discharge to save managed-care dollars. Patients may be discouraged from pursuing a specialty evaluation for their confusion. Care of older persons with confusion is increasingly being shifted to family and friends who have fewer care choices available, as privatization forces many government supported programs to close their doors.

#### Linking of Theory with Method

Despite the attempt to use clear terminology that separates dementia from delirium the difference may not be as definite as previously suspected, and the factors that lead to or worsen confusion are still unknown. The reviewed studies indicate that social and psychological factors appear to interact in a complex manner with neuro-biological changes.

The gaps and challenges in the area of acute confusion concern two main areas: (1) Identifying causes of acute confusion that are amenable to early treatment and prevention, and (2) examining the phenomenon of the association of dementia with delirium. The challenge of linking environmental frameworks to the study of confusion in the elderly will be in defining how the important features of environment will be measured.

Environment is difficult to measure. This researcher proposes the use of a qualitative method to describe the environment and the context of confusion in hospitalized elders. The current proposal, building on the work of Chopoorian (1986), Lawton (1982), Kayser-Jones (1992), and others is based on an environmental model and the progressively lowered stress threshold. This model illustrates how multiple factors in the cultural, physical, organizational, psycho-social, personal, supra-personal, collaborative, and macro environments may affect the hospitalized elder (Chopoorian, 1986; Hall, 1994; Kayser-Jones, 1989, 1991, 1992,1993; Lawton, 1982).

### Chapter III: Methods

The purpose of this study is to explore the recognition and management of acute confusion in hospitalized elderly persons. This study proceeded in three phases (Appendix B). Phase one was intensive observation of patients and staff members in a hospital, focusing on general observations and the daily routine. In phase two efforts focused on observing patients with acute confusion; and on identifying informants. Interviews and event analysis (an in-depth description and analysis of a specific event) were focused on describing confusion in the hospitalized elderly person. Phase three consisted of the analysis of data.

#### Research Problem

The specific research questions are: 1) How do nurses, families, and other health care workers recognize and respond to acute confusion in an elderly person? 2) What is the experience of the elderly person who develops acute confusion while in the hospital? and (3) What factors (e. g. medical diagnoses, medications, use of physical restraints, environment, interaction with the caregiver) are associated with acute confusion superimposed on dementia?

#### Design

I used a ethnographic prospective design to study this problem. Ethnography is "the work of describing a culture . . .to understand another way of life from the native point of view . . . . Ethnography means learning from people" (Spradley, 1979, p.3).

Ethnography is a qualitative research method used to understand the culture of a people and to discover meaning and experiences as perceived by the individuals under study. The data collected and the analysis are from the emic perspective, or the viewpoint of the study subjects. A cultural system or sub-culture such as a hospital or unit in a hospital may also be investigated (Brandiet, 1994; Leininger, 1985). Ethnography also puts the phenomenon of confusion into a context, placing observations into a larger perspective that is particularly important for complex problems (Fetterman, 1989).

As an ethnographer, I attempted to adopt a holistic perspective to provide a comprehensive picture of the phenomenon of confusion in hospitalized elders. To create a picture of the whole, I collected data from multiple sources including participant observation; interviews with patients, and staff and family members; and daily testing of mental state, as well as the daily observation of 20 patients. This design allowed me to integrate the statistics with an in-depth, detailed description and analysis of a small number of cases of confusion. This approach seemed appropriate, since previous research using quantitative measures has focused on a large number of subjects and has not investigated in-depth delirium super-imposed on dementia.

### Setting

This research was conducted at a 550-bed non-profit, state-supported teaching hospital in the southeastern United States. The facility provides primary and tertiary care for the indigent people in the region. Approximately 22% of patients have Medicaid insurance at this facility. Only 15% of the hospital's inpatient population were over the age of 65 years during the time of this study. The chief operating officer of the hospital stated that in the past year they have increased from 11% managed care penetration to 17% in the area.

It is also a regional trauma center with five intensive care units and eight medical-surgical units. After a period of general observation, patients were selected from one of three units: general internal medicine, family medicine, and orthopedics. These units had the greatest amount of older patients and general medical-surgical patients. The intensive observation and patient selection occurred on these units. In addition to the urban area that it serves it is also the primary tertiary care referral center for a ten county surrounding rural area. It was common during the course of the study to encounter patients and families who were commuting 3-5 hours to see their loved ones in the hospital or to seek care for themselves.

The hospital is in the downtown area of a medium sized city within a block of two of other hospitals and a nursing home. The hospital, clinic buildings, and administrative

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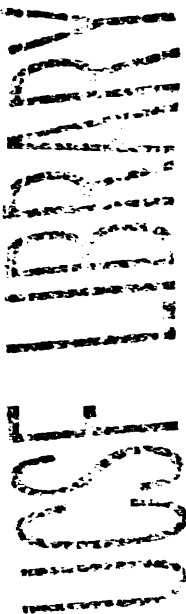
buildings are situated on several city blocks. It is an academic teaching hospital with Schools of Dentistry, Nursing, Pharmacy, and Medicine, and a library and research building. The older and newer sections of the hospital are connected by glass walkways as are the ambulatory care clinic building and the Veterans Administration hospital that is across a small street. It is not immediately apparent by looking which are the older and newer sections, as none of it appears very new from the outside. The earliest hospital that is still a part of the facility was a hospital called General by some. This was the hospital for the poor of the city. One of the nurses remarked that many patients still call it General or know what one is talking about when one gives them directions to the General part of the hospital. It has one of the oldest medical schools in the South, established in the 1820s. During the course of the study, several patients also referred to it as "the general".

### Sample

Purposive sampling was used for this study. Purposive sampling is a form of non-probability sampling in which the researcher decides whom to sample, based on the research problem (Jorgenson, 1989, p. 50). In purposive sampling, the researcher selects a participant according to the needs of the study and initially may choose to interview those with a broad general knowledge of the topic. As the study progresses, those with specific experience or knowledge are selected (Morse, 1991, p. 129).

The sample was selected after a period of four weeks of intensive observation. The goal of the purposive sampling was to select a small number of cases to allow for in-depth analysis of the episode of confusion (event analysis). For comparison, this study also selected seven patients who were not confused.

The sample of subjects was selected as the study progressed and was guided by the data collection, the confusion cases, and by the researcher's sense of who might make a good informant, able to reflect and to provide detailed information about a particular incidence of confusion. Thirteen family members, six nurses, and five physicians (total N=24 ) were interviewed about confusion events.



### Exclusion Criteria

Patients were excluded if they (a) had been in the hospital more than 36 hours; (b) were in for a known short-stay procedure such as chemotherapy, a blood transfusion, or dialysis; (c) had a head injury or psychiatric diagnosis; or (d) were admitted for terminal or palliative care only. This study did not exclude persons with dementia or pre-existing delirium. Subjects were not excluded on the basis of race or sex.

### Inclusion Criteria

Patients were included if they (a) were on one of the selected units and were over the age of 65; (b) spoke English; and (c) experienced a confusion or were comparison cases.

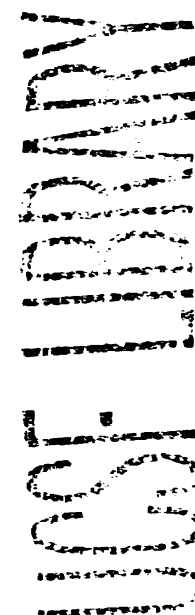
### Method of Access

Institutional review board (IRB) approval was obtained from the facility and from the University of California, San Francisco.

### Consent Process

I approached individual subjects in the hospital or clinics for permission to interview and observe them and for permission to look at their medical records. The project was explained to all potential subjects. If they agreed to participate, they were given a consent form to read and sign. The consent form was also read to all potential subjects (patient, family, or staff members) since many of them did not read or write.

Obtaining consent from confused persons requires careful consideration. In many of the cases, consent was obtained from the guardian or next of kin for those who were legally unable to sign for themselves. The chart was checked for guardianship or conservatorship. Subjects retained the right to revoke consent at any time. Once the subjects consented and were known to meet the inclusion criteria, they were enrolled into the study. All subjects were inducted into the study within 36 hours of entering the hospital.



## Procedures For Data Collection and Analysis

### Phase I: How Participant Observation Data Were Obtained

The participant observer comes to a social situation both to engage in activities appropriate to the situation and to observe the activities, the people, and the physical aspects of the situation. There are many types of participant observers, ranging from those who engage in complete participation to those who engage only in passive participation. These types differ in their involvement both with people and in the activities that they observe (Spradley, 1980, p. 58).

In order to maintain the naturalness of the setting, I strove for a balance between being an insider and an outsider and between participating and observing. That was easier to do than it had been in my pilot study, since in this study I was new to the facility and staff did not know me in another role as they had done in the pilot study. I spent six weeks making general observations to immerse myself in the setting. That period was to observe a wide variety of activities in the hospital on all three shifts; to meet the different "actors" in the environment; to describe the physical, cultural, and organizational environment; and to identify subjects.

During phase one, participant observation, I was at the hospital six to ten hours per day for five days a week, and two hours a day on weekends, observing between 6 AM and 11 PM in order to observe on all three shifts for shift change communications, and to look for similarities and differences between shifts. Spending much time at the hospital was a key data collection method in this phase.

During phase two, I was at the hospital at least once per day to identify and observe patients with delirium and to induct patients into the study. Except on weekends, I observed confused patients several times per day. On weekends, I observed the subjects one time per day. I spent the greatest percentage of time on evening shift to be present when most of the admissions take place and where I predicted most of the participants would be entered into the study.

### Writing Fieldnotes

I wrote a condensed account of what I observed. These accounts were words, phrases, or unconnected sentences that I recorded on the spot (whenever possible) so that it was easier to expand them after leaving the field.

When possible and appropriate, quotations were used for verbatim accounts recorded in the field. I entered an expanded account into the computer within two to six hours of leaving the field, and immediately after when possible. I kept a micro-cassette tape recorder in my car and I would audiotape fieldnotes, memos, or reflections after leaving the field. I have used these techniques in previous studies.

### Phase II: Interviews and Analysis of Confusion Events

#### Interviews

The interviews began in phase two. The sampling, described earlier was intended to select those whom I considered the best respondents to the research questions. Individuals who were observed caring for confused persons were the focus of the interviews. It was felt that by interviewing nurses who cared for patients who were confused or observed by the investigator this would allow the data to be integrated for analysis of the confusion event. Semi-structured interview guides were used (Appendix C), but the interviews were flexible enough to allow for richer data and were revised as the study progressed. The nursing staff interview guide was also used and revised in the pilot study.

Subjects were interviewed in a time and in a place that was convenient for them. A private conference room or office was reserved for interviews within the hospital. Interviews lasted between 40-60 minutes for members of the nursing staff and for physicians, and 30-90 minutes for families. Six family members were interviewed more than once.

The interviews were recorded on audiotape and were transcribed verbatim into the computer. Six of the family interviews were not recorded on tape. Notes were kept on



how things were said and on nonverbal responses. Those were saved on the hard disk in the computer and stored on a back-up floppy disk that was stored in a locked file cabinet.

### Event Analysis

In addition to participant observation and in-depth interviews, event analysis was used to study the event of confusion. Event analysis provides an in-depth, detailed description of a specific event. An event analysis form (Appendix D) was used to organize the data analysis.

Event analysis began in the second phase of observation to prospectively follow confused patients and to observe the event of confusion as it unfolded in the hospital environment. Event analysis and interviews were taking place simultaneously in this phase. Demographic information and key variables were also collected on the event analysis form for the comparison cases .

### Protocol for Enrolling Subjects

The procedure for identifying potential subjects including printing the inpatient census of patients over the age of 65 daily. Patients also were observed on the units daily for the development of delirium, and members of the nursing staff were requested to page me when patients were admitted with confusion or when they developed confusion. The head nurse of each unit and the attending physician of each medical or surgical service were also given an explanation of the study in person or by telephone. I met five of the head nurses and three of the attending physicians in person for an informal meeting in phase one. Those meetings were recorded as fieldnotes. Confusion events were defined by the presence of delirium as defined by the Confusion Assessment Method CAM (Appendix E). These subjects with delirium were the focus of the event analysis, and they underwent a test of their mental state.

For each subject, demographics and chart data were completed. A Folstein mini-mental state exam (MMSE Appendix F) and Confusion Assessment Method (CAM) form were completed on each enrolled subject within 24 hours of enrollment. The Cornell

depression scale (Appendix G) and Katz Activities of Daily Living (ADL) scale (Appendix H) were completed within 36-48 hours of enrollment.

### Operational definitions

#### Mental State

Mental state in this study was defined as memory, speech, thinking, language, orientation, attention, and level of consciousness. Mental state was measured using the Folstein Mini-Mental State Exam, and delirium was measured by the Confusion Assessment Method (CAM). Test-retest reliability of the Folstein mental status instrument ranges from .56 to .98, and inter-rater reliability has not been less than .82 (Anthony, Leresche, Niaz, VonKorf, & Folstein, 1982; Folstein et al., 1975).

The CAM is a screening tool that allows persons without formal psychiatric training to quickly and accurately identify delirium. It uses DSM-III-R criteria to diagnose delirium and requires both an acute onset and inattention and either disorganized thinking or an altered level of consciousness in order to screen positive for delirium. This tool has been shown to have a sensitivity between 94% and 100%, a specificity between 90% and 95%, and inter-observer reliability of  $k$ , 0.81 to 1.0 (Inouye et al., 1990; Pompei, Foreman, Cassel, Alessi, & Cox, 1995).

#### Depression

Depression is difficult to detect in persons with cognitive impairment because of the overlap of symptoms. The Cornell depression scale is a 19-item instrument that was developed for use with dementia patients and has established reliability and validity. Scores on this instrument may range from 0 to 34, and a score of  $> 5$  is positive for minor depression, and 12 or  $>$  is probable major depression (Alexopoulos, Abrams, Young, & Shamoian, 1988). The scale has high interrater reliability ( $k$  0.67), internal consistency (alpha coefficient =0.84), and sensitivity (Alexopoulos, Abrams, Young, & Shamoian, 1988). In a study of depression during AD that tested the Hamilton Depression Rating Scale (HDRS) and the Cornell Scale for Depression in Dementia (CSDD), both

scales yielded a sensitivity of .90, and the Cornell had a specificity of .75 versus 0.63 for the Hamilton (Vida, Des Rosiers, Carrier, & Gauthier, 1994).

Dementia was defined by a chart diagnosis of dementia, or by cognitive deficits manifested by memory impairment and one or more of the following: 1) aphasia, 2) apraxia, 3) agnosia, and/or 4) impaired executive functioning. For the diagnosis of dementia, these cognitive deficits must be sufficient to impair social or occupational functioning and must be characterized by gradual onset and a patient's continued decline (DSM-IV, 1994). In the family interview, a Modified Blessed Dementia scale (questions in Appendix B family interview) was used to assess whether the patient met the DSM-IV criteria. In addition the patient must have had a MMSE score less than 24.

#### Function

Function was measured by the Katz Index of Activities of Daily Living (ADL). This six-item instrument measures the functional ability and dependence of patients in bathing, using the toilet, continence, transferring, dressing, and eating. It was completed by observation and by asking members of the nursing staff about the present ADL function of the individual. It may be administered in about five minutes and has established reliability and validity (Kane & Kane, 1981).

#### Co-morbidity

Co-morbid conditions were classified according to a taxonomy originally devised by Kaplan and Feinstein (1974) then assigned a weighted index that takes into account both the number and seriousness of different co-morbid diseases. The index assigns weights for each conditions that a patient has. The total equals their score. The higher the co-morbidity index, the higher their risk of death. The weighted index was a significant predictor ( $p < 0.0001$ ) of one year survival. This method was developed and validated by Charlson, Pompei, Ales, and MacKenzie (1987) in a study of 607 patients. This method was used because it assesses the presence and absence of certain co-morbid conditions as well as their severity.

## Phase III Data Analysis

### Quantitative Analysis

Demographic and quantitative information from the event analysis form was entered into a relational database, Filemaker Pro, then later loaded into SPSS statistical analysis software. Delirious patients were placed into two groups based on the presence or absence of dementia. Demographic, functional, medical, social, and psychiatric variables were compared using t tests for continuous variables. Chi-square statistic was used to compare dichotomous descriptors. SPSS was used for all calculations and analyses.

### Qualitative Analysis

Event analysis of confusion focused on observations of what happened; on who recognized the confusion and when; on when the event first occurred; on how was the event evaluated and managed; on the key individuals involved; on how the different health care providers communicated about the confusion event; on what the family's role was; and on what the outcome was?

Twenty patients were included in the event analysis for confusion. Using the event analysis form and the participant observation and interview data, I have attempted to describe in rich detail the response, recognition, and management of a hospitalized elder who develops delirium.

Qualitative analysis included continuing analysis of fieldnotes and interviews and open coding of data to develop concepts, categories, themes, and case vignettes. Line-by-line coding of the fieldnotes and interviews was done, and memos were written as the data collection proceeded. Open coding was followed by axial coding. Axial coding, a grounded theory technique of analysis, begins to put the data back together in new ways by making connections between a category and its sub-category, and focuses on a phenomenon and the conditions or context that give rise to it (Strauss & Corbin, pp. 96-115, 1990).

In an ethnographic study, the investigator is analyzing data throughout the study to structure later data collection and to construct patterns. Ethnographers study social situations or, "a stream of behaviors (activities) carried out by people (actors) in a particular location" (Streubert & Carpenter, 1995, p. 104). A first step in the analysis was a domain analysis of the confusion event, asking who persons involved in the situation are and what the relationships are. After this beginning analysis I further refined the data by making selected observations to identify the dimensions of contrast by asking, "In what way are these two things different?" For example, "In what ways are nurses' and physicians' recognition of delirium different in persons with and without dementia?" This aided in identifying missing attributes for future selected observations and interviews (Spradley, 1980; Streubert & Carpenter, 1995).

The final stage of analysis required that I totally immerse myself in the data to identify recurrent patterns or patterns that had not yet become apparent. Qualitative data were organized by listing analyzed domains and themes and by completing an inventory of examples and analyzing confusion cases.

Meaningful categories were coded and organized in the interviews and fieldnotes using the software program Ethnograph, and theoretical memos were written. Ethnograph is a multi-functional software system for the development, support, and management of qualitative data analysis projects (Miles & Huberman, 1994).

Data collection and analysis were simultaneous. I compared the new data with previous field notes and interviews, to identify recurring themes and to validate new themes. Through event analysis, cases of delirium without a previous diagnosis of dementia were compared with cases in which the individual had a diagnosis of dementia and developed delirium. In this way, themes and contrasts were identified about the recognition and management of these events of confusion in the subjects.

In case vignettes, I described cases of delirium and how the problem was responded to, recognized, and managed by families, members of the nursing staff, and physicians

within the context of the hospital environment. Memos on reactions or on my own thoughts about the observations and interviews were also kept in order to increase reflexivity and to identify personal biases.

### Human Subjects

There were no anticipated physical risks to the study participants in either the observation, interview process, or mental status testing. Confidentiality and anonymity were maintained with several procedures. First, codes rather than personal names were used to identify individuals in the field notes, interviews, and mental status measures, and on the database. Data was available only to the research staff. Second, notes were kept in a locked file cabinet. Published reports will not give information to identify sites or individuals.

Though this proposal has no obvious physical risks, some persons may feel anxiety or psychological discomfort from being interviewed. The applicant has used the Folstein mental status measurement since 1988 in over 1000 patients and used this experience during the testing and interview to make persons feel comfortable and maintain their dignity during testing. If subjects appeared uncomfortable during the interview, the interview was stopped.

## Chapter IV: Results

### Demographics of the Sample

The main individuals in the analysis of the confusion event included; the patients, patients' roommates, family members, nurses, nurses aides, desk clerks, physicians, physical therapists, and students. Of the 26 patients that met inclusion criteria and were approached for consent, three refused (11.5%), two consented in pre-op clinic, but were not admitted, and one consented then later dropped out of the study. Twenty patients in the final sample suffered events of confusion which were analyzed, or were used as comparison cases. Patients were selected from one of three units: general internal medicine, family medicine, and orthopedics. The procedure for sampling of both the patients and interviewees was purposive.

The investigator printed the daily census of all patients in house over the age of 65 years old seven days a week, then approached those who met the inclusion criteria, attempting to sample persons with and persons without dementia. Nine subjects were patients on the orthopedic service; five were from family medicine; four were from general internal medicine; and two were from general surgery. Individual patients fell into one of four groups: a) patients without dementia who developed delirium (4); b) patients with dementia who developed delirium (8); c) patients without dementia who did not develop delirium (7); and d) patients with dementia who did not develop delirium (1). The two main groups were persons with delirium super-imposed on dementia and persons without dementia who developed delirium. The discussion of findings will focus mainly on the delirium super-imposed on dementia group, the delirium in the absence of dementia group, and comparison with the group with no confusion. Those were the largest groups, and they were the focus of the primary research questions.

### Medical Care Delivery and Professional Staff

The facility is both a tertiary referral center for most of the state and the main teaching hospital for the region. There are several levels of practitioners in nursing and medicine. Attending physicians are faculty at the school of medicine and have teaching and clinical responsibilities. There are also residents or physicians in training, interns, and medical students. The residents provide most of the direct care. Residents are supervised by the attending physicians. There are also different levels of residents depending on what year they are at in their training and what specialty they are studying. Nursing care in this setting is provided by registered nurses (RN's), licensed practical nurses (LPNs), and certified nurse aides (NAs). Most of the members of the nursing staff (over 50%) are registered nurses.

### Staffing Levels

Staffing ratios for this hospital on the units where I observed were typically 4-5 patients per nurse on days and evenings. Staffing ratios were recorded at a minimum of twice a week during the study for the various shifts. Some of the units had one or two nurse aides on day shift, and those aides were assigned to either one or two nurses or to a group of nine to ten patients. A typical evening on one of the units was 2/6/97. The orthopedic unit on that particular day had 20 patients, four nurses, and one nurses' aide, so that their ratio for licensed nursing staff members to patients was 1:5 on evening shift. This ratio was sometimes 1:6. Sometimes they were not as busy as on the evening when I noticed that four nurses, a nurse aide and the clerk were all sitting at the front desk. The census that day was 18 patients for 4 nurses and 2 nurse aides. Two of the nurses had 4 patients each, and 2 had 5 patients. The nurse aides were each assigned a total of 9 patients each, and were assigned to work with a registered nurse.

Both the director of nursing and the head nurse considered their care delivery approach a modified form of primary nursing. On most units, nurses signed up for patients and attempted to take care of them every day that they worked. Only one of the units did not do



that. On the general medical unit nurses were assigned to specific rooms, not to specific patients. Evening shift on all of the units usually had an all-professional staff without a nurse aide on duty.

#### Characteristics of the Patient Population

Table 5 shows characteristics of all the hospitalized patients enrolled in the study who were the focus of the event analysis (N=20). Of the study population, 13 out of 20 (65%) were African American, reflecting the population served by this institution. Their mean age was 80.6, their mean education level was 7 years. Thirty percent of the patients were on Medicaid, and all were on Medicare. Most of these individuals were female (75%), lived at home (80%), and were dependent in one or more activities of daily living. Forty-five percent of patients were on ten or more scheduled or as needed medications while in the hospital, and their mean length of stay (LOS) was 6.5 days.

#### Prevalence of Delirium

The prevalence of delirium in this study was 60%. The incidence, or new onset, of delirium was 30%. Delirious patients had a mean length of stay (LOS) of eight days and a mean education level of eight years.

#### Dementia

Forty-five percent, or nine patients, met diagnostic criteria for dementia. Eight of these nine patients (89%) were delirious during their hospitalization.

#### Incontinence

Fifty percent (10/20) of the total sample were observed to be incontinent of urine. Only one of these patients was reported to be incontinent before coming in to the hospital. Of the 10 incontinent patients eight (80%) were patients with delirium super-imposed on dementia; one was a patient with dementia that did not develop delirium; and one was a patient with delirium in the absence of dementia.

Table 5

Patient Characteristics

Age	Educ. (yrs)	Race	MMSE	Dementia	Delirium	Sex	MMSE D/C*	Urine loss	Re- admit	LOS †
83	10	Black	19	yes	yes	F	16	yes	no	6
95	2	Black	14	yes	yes	F	15	yes	yes	11
91	5	Black	17	no	yes	F	27	no	no	3
76	15	White	27	no	no	F	30	no	no	7
71	12	White	25	no	yes	M	25	no	no	7
78	5	Black	26	no	no	F	28	no	no	7
84	10	Black	9	yes	yes	F	6	yes	yes	4
71	6	Black	26	no	no	F	26	no	yes	6
99	1	Black	15	yes	yes	F	11	yes	yes	4
72	10	White	18	no	yes	M	24	yes	no	20
88	8	White	9	yes	yes	F	0	yes	no	9
84	14	White	17	yes	yes	F	15	yes	no	6
83	5	Black	5	yes	yes	F	0	yes	yes	8
84	2	Black	25	no	no	M	26	yes	no	5
67	9	Black	0	yes	no	F	0	yes	no	5

74	5	White	14	yes	yes	M	15	yes	yes	6
85	7	Black	26	no	no	F	27	no	no	1
72	12	White	26	no	yes	F	30	yes	no	9
86	6	Black	20	no	no	F	24	no	no	2
69	5	Black	22	no	no	M	25	no	no	4

† Length of stay

\* Discharge mental status score

### Medications

The 20 patients were on a mean of nine medications (defined as scheduled and as-needed medications). Patients with delirium in the absence of dementia were on the greatest number of medications, with a mean of 11 versus a mean of nine medications for persons with delirium super-imposed on dementia. Patients without dementia or delirium were on a mean of eight medications. Several of the patients with delirium were on medications known to alter mental status such as benzodiazepines and narcotics. One 84 year old woman had a sudden drop in her mental state score from 17 to 10. This change occurred in less than 24 hours. She was also observed to be lethargic with disorganized, slurred speech, and decreased attention. When her chart was checked for medications she was found to be on scheduled MS Contin, a form of Morphine every eight hours. The pain service had written it as a standing order after her epidural was discontinued.

### Mini-Mental State Exam Scores

The mean mini-mental status exam score for the entire patient sample upon enrollment in the study was 18. Thirty was a perfect score. The lower the score the more severe the cognitive impairment. Generally a score of less than 24 for persons with greater than an eighth grade education suggests cognitive impairment. The initial mental status scores ranged from 27 to 0. Initially only one patient had a score of zero. The discharge mental status scores ranged from 30 to 0, and the mean mental status score at discharge for the sample was 19. At discharge, three patients with dementia had a score of zero.

### Co-morbidity

The co-morbidity index assigns weights for each conditions that a patient has. The total equals their score. The higher the co-morbidity index, the higher their risk of death. Patients with no delirium (N=8) had a mean co-morbidity index of 1.5. Patients with delirium (N=12) had a mean index of 2.92. Patients with delirium super-imposed on dementia had a mean co-morbidity index of 2.8 versus 3.3 for patients without dementia that developed delirium.

### Factors Associated with Delirium

Question number three, the question of what factors (e. g. medical diagnoses, medications, restraint use, environment, caregiver interaction) are associated with acute confusion super-imposed on dementia, was answered by quantitative measurement of mental status, function, and depression; daily screening for delirium; chart review; participant observation; and event analysis.

Table 6 indicates persons with delirium super-imposed on dementia, persons without dementia who developed delirium, and those individuals who did not develop delirium.

Table 6

Characteristics of Patients With and Without Delirium and Dementia

Variable (Mean*)	Patients with delirium & dementia N=8	Delirious patients/no dementia N=4	Patients without dementia or delirium N=7
Age, year	86	77	78
Education (in years)	7	10	6
1st MMSE	13	22	25
D/C MMSE	10	27	27
Chronic ill	4	5	4
Number of medications	9	11	8
Co-morbidity	2.8	3.3	1.5
Number Readmitted	5	0	1
LOS†	7	10	5

†Length of hospital stay

\*Mean given unless indicated

When using chi square analysis to compare delirious individuals in this sample with those who did not suffer from delirium, eight variables were significant at  $p = < .05$ . These variables included 1) the presence of depression as measured by the Cornell scale; 2) the presence of dementia as measured by a MMSE of less than 24, and the Modified Blessed scale with a history of gradual onset of greater than six months; 3) presence of new onset of urinary incontinence as measured by observation and interview; 4) a weight loss of  $\geq 10$  pounds in 3 months as measured by report of family member; 5) being restrained during hospitalization; 6) number of scheduled or as needed medications ordered in the hospital, 7) ADL scores , and 8) co-morbidity index.

The variables number of chronic illnesses, age, laboratory values, type of anesthesia, or presence of infection, were not significant between the groups. Fifty percent of the total sample had a report of recent weight loss, and 25% percent were restrained during their hospitalization.

#### Delirium Super-imposed on Dementia

The group of eight dementia patients was analyzed separately and compared with the patients suffering delirium in the absence of dementia. The delirium super-imposed on dementia group were older, with a mean age of 86 versus 77, and were slightly less educated (7 versus 10). These variables were not statistically significant.

Chi-square statistic was used to compare dichotomous descriptors, and t test to test the difference between means for these two groups. Four variables were significant at  $< .05$ , including incontinence, MMSE scores, being re-admitted in less than thirty days, and being restrained during their hospitalization. Patients with delirium super-imposed on dementia were more likely to have new onset incontinence, to have lower MMSE scores, to be restrained, and to be re-admitted in less than thirty days. Sixty-three percent (5/8) of the group with delirium super-imposed on dementia were re-admitted during the study compared to none of the delirious group without dementia.

The group with delirium super-imposed on dementia had shorter length of stays, but lower MMSE scores when discharged. Patients with delirium in the absence of dementia had a mean length of stay of 10 compared to 7 days for persons with delirium super-imposed on dementia, but this was not statistically significant.

#### Mental Status Scores

Patients with delirium super-imposed on dementia had a mean mental status score of 13 and showed the biggest change in their mental status score from enrollment to discharge, with 75% having a drop in their mental status scores from enrollment. Their mean mental status score at discharge was 10, compared with the persons that developed delirium in the absence of dementia, who had a discharge mental status score mean of 27. All of the persons with delirium in the absence of dementia either improved their mental status scores or had no change in the score from enrollment to discharge. The persons with delirium super-imposed on dementia had a net change of minus 24 on their time one to time two mental state scores. This lack of recovery in mental status score for persons with delirium super-imposed on dementia was also supported by the observational and interview data.

#### Qualitative Findings

Research questions one and two were answered primarily by the qualitative findings. These results were strengthened by the quantitative findings. Research question one, (how do nurses, families, and other health care workers recognize and respond to an incident of acute confusion in an elderly person?) was answered by participant observation and interviews with members of the nursing staff, with families and physicians, and by event analysis. Research question number two, (what is the experience of the elderly person who develops acute confusion while in the hospital?) was answered by observation, mental and functional status testing, and informal interview of the hospitalized elder.



### Recognition of Delirium Super-imposed on Dementia

Physicians' and nurses' inability to recognize delirium super-imposed on dementia was a recurrent theme in both the participant observation and interviews of family and staff. Thirteen family members (Table 7), six nurses (table 8), and five physicians were interviewed about the confusion event. Several more nurses and physicians were interviewed, but these were not tape recorded and were less structured. Of the family members who were interviewed, 92% were female, 54% were African American, and 69% were daughters.

Table 7

Family interviews. N= 13

Sex	Cross	Age	Relation	Race	Did MD talk	Family recognition of change	Bless score*	Delirium	Stay at bedside	Visit
F	CE-01	73	sister	Black	no	yes	12	yes	no	yes
F	CE-03	85	cousin	Black	no	yes	13	yes	no	yes
F	CE-04	55	daugt	Black	yes	yes	2	yes	yes	yes
M	CE-07	m†	wife	White	yes	yes	5	yes	yes	yes
F	CE-09	63	daugt	Black	no	yes	14	yes	no	yes
F	CE-11	m	daught	Black	no	yes	9	yes	no	yes
M	CE-12	m	son	White	yes	yes	1	yes	no	yes
F	CE-13	60	daught	White	yes	yes	10	yes	yes	yes
F	CE-14	52	daught	White	no	yes	13	yes	yes	yes
F	CE-15	53	daught	Black	no	yes	12	yes	no	yes
F	CE-18	44	daught	Black	N/A	N/A	20	no	yes	yes
M	CE-19	47	daught	White	yes	yes	2	yes	no	yes
F	CE-21	47	daught	White	no	yes	5	yes	yes	yes

\* A Blessed score of &gt; 5 indicates dementia history †missing data

Table 8

Characteristics of Nurses\* who Participated in Taped Interviews, N=5

Age	Range, Mean,	25-42 36
Sex		All female
Years as RN	Range, Mean,	1-17 11
# of confused elders cared for	Range,	25-100
Years at hospital	Range, Mean,	1-17 11
% reported Geriatric education	Percent	75%
Knowledge of delirium vs. dementia	Percent yes	25%

\*All were registered nurses

Eighty-eight percent (7/8) of the cases of delirium super-imposed on dementia were not recognized by the nursing staff. However, of the families who were interviewed, all recognized an abrupt mental change within hours or days in their parent, spouse, or sibling, and 64% (7/11) said that the physician did not talk with them about the confusion.

Early in the data analysis the theme of recognition emerged and revealed there were differences between the recognition of delirium in patients with dementia and those without dementia. Physicians and nurses did not recognize delirium as readily in persons with dementia.

The following patterns of recognition of delirium also emerged from the data: 1) family members were usually the first to recognize an acute change in mental state and to alert staff members to a change; 2) staff members did not recognize confusion unless it was interfering with a medical therapy or unless family members pointed out the change; 3) nursing and medical staff members had little knowledge of tools to assess a patient's mental state and lacked knowledge of how to differentiate between delirium and dementia; 4) nurses often did not mention changes in a patient's mental state to an oncoming shift; 5) when nurses did assess a patient's mental state, that valuable information was not communicated to the next shift; 6) staff members did not recognize the hypoactive form of delirium; and 7) patients with a diagnosis or history of dementia were not evaluated by the physician for a delirium, and physicians then communicated to members of the nursing staff that the confusion was due to a dementia. These themes will be illustrated from the fieldnotes and observations. A description of the patient will be given before the theme.

Mrs. M. was a 95-year-old African American woman who was admitted to the hospital with right arm pain and right arm coolness. Mrs. M. was a very thin, frail-looking woman with a second grade education. She had come to the emergency room (ER) by ambulance accompanied by a cousin. The medical team were suspecting a clot (per chart notes) but 2 weeks earlier she had slurred speech so they first got a computerized tomography of her head before administering Heparin as an anti-coagulation. Mrs. M. had

had a diagnosis of dementia and had been living in a personal care home. She developed delirium on day three of her hospitalization. Both the personal care home aide and the cousin of Mrs. M. were interviewed and they both said that this was a change from Mrs. M.'s usual mental state.

Personnel whom I interviewed and observed did not recognize her confusion as being acute and they charted her confusion only if it interfered with an intravenous line or catheter. She was discharged to a personal care home after nine days with her mental state still impaired and fluctuating. She was re-admitted to the hospital again less than thirty days after discharge after she fell at home.

The decision to enroll Mrs. M. as a patient suffering a confusion event was made because of her diagnosis of dementia and because of the nurse's admit note. The admission assessment was a checklist with a box that one could check and make comments about. The nurse had checked all five boxes: alert, clear, confused, appropriate, and inappropriate. Her comments for Mrs. M. were, "Patient could not tell me where she was or what year it was." Then, below that she wrote, " can not see very well."

With Mrs. M. , as in many of the patients with delirium super-imposed on dementia, staff members were inconsistent in how they charted her mental states and often simply did not report any information about her mental state from shift to shift. In the observation of Mrs. M. , the staff nurses said that they had not been told about her mental state in the shift report and did not know her baseline, as in this example of a 30 year old female nurse who was asked how Mrs. M.'s mental state was and replied,

"She seems okay but I don't really know her, and I am not usually on this floor." I said I understood and then asked whether the nurse from day shift had told her anything about the patients mental state in report and she said, "No, nothing at all."

On another occasion, a nurse who normally works on the floor was asked what the previous night shift had told her about Mrs. M. and she replied, "Nothing unusual, just that

she had a clot and to keep her arm elevated." When asked what they had told her about her mental state, she replied, "Nothing."

The charting on Mrs. M. either reflected an inconsistency in how she was assessed, or the fluctuation of Mrs. M.'s mental state. The following came from the nursing flowsheet that was used to chart the daily patient assessment. On 10/7/96 day and night shift checked alert, oriented, and appropriate, and evening shift checked confused.

The next day, the day and evening nurses both checked alert, oriented, clear (speech), and appropriate. On the night shifts they checked alert, confused, clear, and checked both appropriate and inappropriate. On 10/9/96 none of the shifts checked confused, and on the following day all three shifts checked confused.

The flow sheet where they can record mental state is limited to assessing orientation and a subjective assessment of 'appropriate.' In an interview with a 42-year-old female nurse who had cared for Mrs. M., she discussed her assessment of patients and stated, "I ask them, Do you know who you are and they may or may not answer that appropriately. I try to get them oriented...I look through the admissions assessment and see if they are giving mostly appropriate answers."

On another occasion a nurse who was observed caring for a confused patient was asked whether she knew the mental state of a ninety-nine-year-old woman for whom she was caring and she replied, "She has been confused. She yells out for her son at night and gets out of bed." I asked the nurse whether she had taken care of Mrs. L. at night, and she said, "No, but the other nurses tell me, and I have heard her call out before." I then said, "Do you know if this is new confusion?" She looked puzzled, so I asked, "Was Mrs. L. confused at home; is this a change for her?" The nurse replied, "Oh, I don't know, this is how she has been here. I don't know how she is at home."

This lack of recognition of delirium was a common theme that was observed with every patient with delirium super-imposed on dementia. This persisted even when family members pointed out that it was a change from their usual mental state or they had a

profound change in level of consciousness during the hospitalization. When giving a report on an 83-year-old African American woman with delirium, the nurse said, "She has a history of some dementia pre-op; she says good morning and groans and does not follow commands for me, but I think she is close to baseline...I think this is how she was in the nursing home." The woman that this nurse was reporting on was discharged to the nursing home with a mental score of 0 out of 30 points, giving only occasional one-word responses. She was re-admitted to the hospital 3 days later with an urinary tract infection and dehydration. In a two-month follow-up in the nursing home she was alert, conversant, able to maintain attention to my questions, and scored 11 out of 30 points on the mental status exam.

Mrs. W. was an 83-year-old black woman who underwent an elective procedure for a total hip replacement. Before surgery she had been living alone in a Senior housing complex. Her mental status score fluctuated by eight points during her hospitalization, and she had hallucinations, inattention, and disordered thoughts. She was discharged to a nursing home. During her delirious episodes the physicians were writing, "...confusion unchanged...disorientation due to her dementia." When the attending physician was asked whether he knew what her mental status was he replied, "She seemed fine when I met with her. Basically her sister did most of the talking so I did not notice anything." Several of the nurses on this floor were interviewed about this case and others. As in the case of Mrs. M they expressed that their assessment was to check for appropriateness. A 38 year old registered nurse who had been on the same unit for 14 years responded to a question of how she assessed mental state by stating, "I go in and just do my routine assessment, I'll just be talking and chit chatting [sic]. If they start to say things inappropriately then I'll start to assess more...I'll go through the normal what year is it? Where are you from?" When asked whether she did a different assessment if she knew someone had Alzheimer' disease she responded, "If they are known to have Alzheimer's then usually I don't even try to ask them questions."

Another 74-year-old man with delirium super-imposed on dementia was fluctuating hourly in his mental status, picking at his covers, pulling at his restraints and yelling out. When the third year resident came into the room the nurse asked him, "Where do you think all this confusion is coming from?" The physician replied, "He is always like this; it is his normal." She then said, "Are you sure this is normal for him?" and he replied, "Yes."

This same man was being wheeled down the hall in his hospital bed after surgery, and the recovery room nurse said to the floor nurse, "He is confused but he is demented." The daughter who was also standing outside the room at this time quickly replied, "He is not usually like this. He gets like this when he gets too many drugs, and he is an alcoholic."

In the interview of this man's family, the family reported this was a big change for him, and his daughter thought it was due to medications and alcohol withdrawal. This man was discharged, still delirious, to a rehabilitation facility and then re-admitted to the hospital 3 weeks later with a wound infection.

### Hypoactive Form of Delirium

Patients with dementia had all of the CAM features, but all but one man (a man with possible alcohol withdrawal) had primarily a hypoactive form of delirium that included features of lethargy and hypoactivity. They also exhibited decreased physical functioning; nighttime confusion; disorientation; decreased attention spans; misinterpretation of environmental stimuli; incoherent, disorganized speech; and a slower recovery from the delirium. Patients without dementia either did not have these features in their delirium or had them in a less severe manner.

Mrs. S. was an 83-year-old African American woman. She was enrolled on a Sunday afternoon after she had fallen at the nursing home and broken her hip. She had moved to a nursing home only one week earlier. When assessed, she was easy to arouse but was intermittently opening and closing her eyes and appeared slightly drowsy. She had her leg in traction with pins to hold her leg in place. She scored a 9/30 on the MMSE. She was not oriented to time at all and frequently responded, "I don't know" when asked the year



or season. When asked the month she said, "I don't know what month it is." Her speech was clear though the volume of her voice was rising and falling and would often trail off.

During the second day of mental status exams, Mrs. S. was very drowsy, closing her eyes and appearing to doze off. She scored a six out of 30 possible points and was 3 points lower than the previous day. When asked orientation questions she replied, "I really do not know. I can't think of it." She said that she was in a nursing home in South Carolina. She also said, "I used to know how to spell, I done forgot....don't know what conversation we were on." When she was asked to take a piece of paper in her right hand, fold it and put it on the table she took the paper and appeared to doze off while holding it and then said, "I forgot what you said to do with it." This was observed the day her delirium developed.

At the time of this assessment she was still waiting to go to surgery for her hip fracture. Mrs. S. had multiple chronic illnesses including Diabetes, Hypertension, and Congestive Heart Failure. She was on six scheduled medications, and five as needed medications including Percocet for pain. Within 48 hours she had received the Percocet twice per the nursing notes. She was also on Insulin for diabetes. Her admitting Glucose was a high 291.

Mrs. S.'s delirium was not recognized by the nurses or physicians until she completely stopped complying with the medical interventions and was too drowsy to take medications or eat. Finally, when she was not taking pills or eating, and not waking up when turned, the nurse called the resident, who came to see her that evening. When the resident came to see her she awakened with painful stimuli. He wrote no new orders and she was discharged from the hospital to the nursing home a day later. The nurse that cared for her that evening described her behavior in an interview, "There was no personality to her. She would be out like almost comatose and they would pinch her and she'd come around when they pinched her. And then she would be alert and talking to everybody. But as soon as she would go to sleep everything would shut down totally." The night nurse

stated, "She had high blood pressure and she would not even wake to take her medications. I was afraid she was going to die. Did she die? They made me so mad I was calling the doctors all night, and do you know what they said? They said they were just waiting for her to die." During these episodes there was no documentation of checking the blood glucose of Mrs. S.

Another example of hypoactivity as the presenting feature of delirium was Mrs. E. an 88-year-old Caucasian woman who developed delirium and was in severe pain and given frequent pain medication. On the second day of her hospitalization her daughter said, "She has been holding her food in her mouth today--and pills" And I said, "Does she do that at home?" and she replied, "No" and then she said, "Someone is here with her all the time because she wakes up and squirms." I looked at Mrs. E. lying in the bed. Her eyes were closed, but her body would jerk forward and her eyes would open. When her eyes opened, her daughter put her face in front of her bed and said, "Do you know who this is?" and Mrs. E. said, "No" and then the daughter said, "Oh, yes she does\_I can tell by her smile and tone of voice." Mrs. E. still had her eyes open and was mumbling mostly incomprehensible utterances. I tried to do a mental status exam, but she could not maintain attention to my questions even with repetition. She also seemed to switch thoughts and said, "I told him it was there." She did identify a pencil and a watch and follow simple instructions but had to be asked several times and was unable to maintain attention. To most of the questions she did not respond at all. Mrs. E. scored a 3 out of 30 possible points on the mini mental status exam (MMSE). She was also picking at the air with her hands, and her body continued to alternate between jerking forward and being very lethargic.

### Role of Family in Recognition and Management of Delirium

The data reported here are from participant observation and a question in the interviews that asked family and staff how they recognized and managed confusion. Family played a role in both recognition and management of patients with delirium. Families were often the

first to recognize confusion and point it out to the staff. In one case where the staff had attributed confused behavior to alcohol and dementia, the physician put the patient on Ativan, a medication for alcohol withdrawal. The physician did not visit the patient when first called by the nurses. Only after the patient's son came in and said his father had never been confused, and did not drink, did the nurse call the physician back and ask him to visit the patient. The nurse that cared for him explained,

"He wasn't my patient but I helped with him and wrote a note in the chart. He was trying to get out of bed earlier in the night about 6 PM but he had gotten Ativan at 4 PM so I was not worried. I thought everything he was doing was appropriate for alcohol withdrawal. I called Dr Kane and he just said put a posey vest on him and keep him from getting out of bed. Later at about 9 PM his son and grandson came in and said he has never acted like this before and he never drinks. We said, 'then wait a minute', and we called Dr Kane back and he ordered the labs and x-ray. But, by the time Dr Kane came back up he was much calmer and he was like, 'what do you mean he is fine.' Of course, he was calmer because his family was there with him."

When the son was interviewed, he confirmed this and added, "When Tyler and I were here, he didn't know where he was and he acted like somebody else was in bed with him. I went and got the nurses until somebody did something. They said well he has been like this since I came on, so I thought he was like this all the time."

Mrs. L. was a 99-year-old woman who had a sudden onset of confusion in September of 1996 who then had two more admissions to the hospital in the next thirty days. The daughter reported that, before August of 1996, Mrs. L. had been bathing, dressing, cooking, walking, and feeding herself, and had been managing her own medications. Her daughter brought her to the emergency room because, "she was getting sleepy all the time. She would pour her water then not take her medications. She has been sleeping more the last month." When asked how she thought the nursing staff were managing her mother's confusion she replied, "I don't think they really understand. She is

having what is like bad dreams and is afraid of the nurses. She told me she saw people in the room." I then asked whether the doctors or nurses had talked with her about the confusion, and she said, "No, not really. He just said she gave them a bad time last night, and the nurse did not say anything."

When the daughter of Mrs. L. asked what could be done to help the confusion she replied, "Well, talk to them tell them where they are. She is so confused this morning she thought they were gonna hurt her. She said they tied her foot to the bed. If I were a nurse I would talk to her. They did not even tell her doctor, Dr. T. I called him to tell him...also I asked them to get her out of bed but they were afraid that she would fall so she was on bedrest. They kept her in bed the whole time and at home we usually get her up and walk her everyday." On the day of her discharge I asked the nurse about getting Mrs. L. out of bed as she had been in bed the entire time and the nurse replied, "I do not know how she gets up and I have a weak back ." I explained that she was going home and we needed to see whether she could get up and measure her for a wheelchair. After several minutes the nurse did find someone to help and Mrs. L. got out of bed easily with minimal assist of myself and the nurse aide

Nurses and physicians interviewed about management of confusion discussed protecting the patient. One nurse observed caring for a man with delirium remarked, "By the way Dr Brown gave me a verbal to put him down if I need to." When asked what this meant she said, "He said do whatever you need to protect his hip and keep him in bed."

Another nurse stated, "I reoriented him to places. You're in the hospital. You're in the bed. Today is whatever day it was...general reorienting type things. We were trying to keep him from hurting himself and I think we went as far as to put restraints on his ankle, a soft restraint so he would not flop his leg around and displace his hip."

### Recurrent Themes From Observation and Interviews

Six main themes emerged from the family interviews including depression, functional decline preceding hospitalization, immobility, pain, nurse and physician communication, and eating problems.

#### Family Report of Acute Decline in Functioning

Several of the patients also had a report from the family of a change in their physical and mental functioning within a few days of their admission to the hospital as in these comments from the daughter of a ninety-nine-year-old patient, "The last few days has been worse. She has been sleeping more and would sit up in bed and say crazy things and be talking and just go off like when I brought her to the ER this time she said to me while we were in the ER, 'Did you put the toast in the oven?' She has also been weaker and needs more help and I can hardly do it anymore. Her son lives there too but he is handicapped so I do it all." This woman exhibited delirium in her first 24 hours in the hospital.

In an interview with the 60 year old daughter of a woman with dementia, she expressed concern before surgery that her mother was in weak state in the past week, and she remarked, "And she really needs to be built up to some extent, and when I say built up ... she is a very small person, but she was 84 lbs. 3-4 weeks ago so she has lost ten pounds in the past 2-3 weeks

#### Depression.

A history of depressed moods was a theme in several of the interviews. This was not supported by the depression scores however, as most of the patients with positive depression scores were patients with delirium in the absence of dementia. The daughter of an 83-year-old woman with dementia who developed delirium in the hospital talked about her mother being depressed after recently relocating to a nursing home; "After my sister died she stayed depressed...I took her to the psychiatrist and they gave her some medication...lately she would talk about going home on the weekends, and that just made her sad. So she started not being so anxious to go home or not glad about things that used

to be fun for her...'bout two weeks ago she just stopped everything." This woman scored a twelve on the Cornell depression scale. Scores on this instrument may range from 0 to 34, and a score of > 5 is positive for minor depression, and a score of 12 or > correlates with probable major depression.

### Pain Management

Pain or discomfort was mentioned in the fieldnotes of five patients with delirium super-imposed on dementia, three of the patients with delirium in the absence of dementia, and one of the patients with no confusion. Two of the patients with pain had severe rheumatoid arthritis, and three had suffered hip fractures. Mrs. E. was an 88 year old woman with moderate dementia and an ischemic leg. Mrs. M. was repeatedly complaining of pain in her leg by grabbing her leg, grimacing when moved, and nodding yes when asked if she was in pain. She was medicated with a narcotic every four to six hours. Mrs. E. had daughters in her room who were requesting pain medication for their mother as soon as the ordered time period allowed. In addition to disorientation and agitation, Mrs. M. was becoming increasingly lethargic and was refusing to eat or get out of bed. She was delirious most of her hospitalization, and Medicine was consulted to assess her behavior and pain.

### Impaired Vision and a Strange Environment

The hospital was a complex, busy environment, typical of a large, referral and teaching hospital. Data were collected about the noise levels, medical devices, and the physical setting on the floors and in the unit when patients were transferred to an intensive care unit. Several times there were interactions observed between increased confused behavior and an unfamiliar, strange environment.

Several of the patients had multiple 'medical' devices on them and around their bed. Four of the patients spent some time in the intensive care unit (ICU) where the noise level was higher than it was on the floor, and there were more devices present. Mrs. E. was an eighty-eight year old woman who was transferred to the ICU after having respiratory

distress. She had many devices connected to her including, 2 intravenous lines, an arterial line, an oxygen mask, EKG leads on her chest, and a pulse monitor on her finger. There was also a lot of constant noise from the monitor above her head that was constantly going off when she would move around and her EKG lead would fall off. The alarm would also go off when her oxygen level decreased. When observed in the unit, she was more agitated and was thrashing around in the bed.

Mrs. M. was a 95-year-old woman with impaired vision who could only see shapes of people and could not read large print at all. She had a diagnosis of dementia and had a new onset of delirium on day three of her hospitalization. Several times she was observed sitting up in bed appearing to strain to see, and on one occasion she was observed sitting up staring at the foot of her bed where her food tray sat untouched. When asked what she was looking at she replied, "The garden." When it was pointed out that it was her food tray, she replied, "Oh, it was so clean in here I thought it looked like the garden."

Mrs. M. also had difficulty even seeing her tray to eat as observed one evening. Her right hand was swollen from the clot and moving awkwardly, and she dropped the fork twice and said, "Aw shoot." She was grabbing around for the fork and couldn't find it. I gave her the spoon and suggested it may be easier to eat with that. She said, "I am trying to feed myself, but I can't." I then said, "Do you go to the table at the personal care home?" She said, "Yes, but they come to the table with me at the personal care home and feed me. I have a man nurse." I then told her what was on the tray and asked her what she liked the most and she replied, "The muffin" I broke it in half and put half in her hand and she was able to eat it with only spilling a few crumbs. I watched her try several times to pick up her orange juice carton that I had put a straw in, and she could not get the straw in her mouth so I asked whether I could help her and I held the carton for her. She ate more than half of the food on her tray that day.

Another patient Mrs. W. was repeatedly asking for her glasses when she was being observed. Her sister reported that she normally wears them but that she had taken them

home for fear of losing them. Mrs. W. was observed one evening to suffer a delirium that was characterized by inattention, disordered speech, and misinterpreting the environment. She had multiple medical devices on her and in her room, including bilateral compression boots that wrapped around her legs, alternately squeezing them and making a loud noise when they compressed. She also had a urinary catheter, a large foam pillow between her legs to keep her hips abducted, two intravenous catheters, and a large dressing on her leg. This evening she was pointing to the bottom of the bed and in garbled speech that was rambling and more difficult to understand than earlier she said, "They're pumping these out and carrying them in the trucks." She then pointed to the window and said, "See the wheat fields, see the wheat fields." She was also pointing at the red needle disposable box which was directly in front of her at the end of the bed where there was a mirror, vanity, and small sink. As she pointed she was saying, "There pumping it in there...they are carrying it in planes... ."

#### Nurse Communication and Interactions with Patient and Family

Despite what appeared to be reasonable staffing levels, patients were often left alone for long periods of time and were talked about and not to by nurses. Staff were in and out of the room quickly, resulting in many different people coming in and out of rooms during the course of a day. Families also expressed feeling disconnected from the nursing and medical staff.

The daughter of a 69 year old woman with severe dementia who was sitting at the bedside with her mother remarked, "I don't know if I wasn't here and she can't tell anyone what she wants, and they don't know her, and they don't know her ways and all, it would be horrid." She also said, "Well several people come in the room...different people come in for different stuff because you got people coming in to take her pressure, you got somebody that comes into bathe her, and you got another person who does this and that...and somebody else may come into help the nurse."



An example of nurse communication with a person with dementia was observed in Mrs. E., an 88-year-old woman with delirium and dementia who was transferred to the intensive care unit. She was having trouble breathing and her wrists were restrained with soft wrist restraints. A nurse and a therapist were observed talking over the top of her bed. Three women were around her putting an Oxygen mask on her that tied tightly behind her head and sealed over her nose and mouth. Mrs. E. was moving her head and seemed to be resisting putting on the mask. One of the members of the nursing staff said angrily, "She's not cooperating...don't pinch me!" Just then the alarm was sounding from the monitor which monitored her heart rhythm, blood pressure, and respiration's and oxygen saturation levels. The nurse said, "There was some V-tach" and one of the women, a respiratory therapist, said, "Is she a DNR" the nurse responded, "No, that is the same thing I asked, but she is a full code." They were talking as if Mrs. E. could not hear them. I then walked closer to the bed and introduced myself to the nurse and therapist. I asked whether the family had been in today and the nurse replied, "Yes, and I asked them to step out because she was more agitated when she was there and all they want is for her hands to be untied when they are in with her but the nurse before me said she needs them. I gave her Morphine and Haldol for her agitation, and she calmed down for about 15 minutes and then she would be wild again." During this time the two members of the respiratory staff continued to work with keeping the mask on tighter and did not once address Mrs. E. or attempt to reassure her. Mrs. E. continued to move her body around the bed, squirming around and pulling against the restraints.

Negative feelings about this nurse were later expressed by the daughter and granddaughter of the same woman with delirium super-imposed on dementia who stated, "She hates being tied up and we don't like it, but I think the evening nurse will let us hold her hand." When asked why she thought the evening nurse would and not the day nurse, the daughter replied, "Well if it is the same one, she is just different just like there are different teachers. She treats her like she would her own grandmother. The other is

focused on these tasks I have to do, the technical things and she is just another patient in the bed." Then the granddaughter said, "Her nurse today does not talk to her. She hasn't talked to her yet when I have been in there...she is just a technician and that is all grandma is to her." The daughter then said, "Well it is just like teaching, some are just good technicians and she is a good technician."

This same family member was interviewed a second time after her mother had died in the hospital and she was returning to talk with the physician. The daughter remarked that she felt a closeness to the other families but not to the medical and nursing staff. "There is a lack of privacy, but I really felt a closeness and connection with all the other families waiting in the hall...." When asked whether she felt a connection with the professional nursing or medical staff or other caregivers in the hospital, she replied immediately and with emphasis, "No, I felt very disconnected to [sic] them...I know it is a teaching hospital and some people may not expect that because they are coming here because it is a state hospital and is all they can get financially, but I had been here before for surgery and I told them what I expected. I wanted to have Dr. W. be her main doctor, but I saw so many different doctors and people. At the two most critical times I did not see Dr. W.--when she went to the ICU and when they put her on the breathing machine...I guess it is my responsibility because I did not ask to see him then--but I couldn't. I was just trying to maintain control of myself at that time. I think the service on the floor was poor...they were not watching her and maybe if they could have taken her straight to the ICU. She needed more nursing care than she had...she was just getting weaker and more sedated...."

On another occasion, an 84 year-old African American woman with delirium was restrained with a vest restraint and with wrist and leg restraints. The nursing notes for this woman indicated that she was checked every fifteen minutes, but she was observed by the investigator on day and evening shift (on separate days) to be left alone and restrained for over an hour.

### Incontinence in the Hospital Environment

New onset of incontinence was observed in several of the patients with delirium superimposed on dementia, and confirmed in interviews with family members. While talking to a thirty-year-old nurse about a patient that was delirious, she rolled her eyes back and said in a frustrated tone of voice, "I don't know why she is asking for the bedpan, she is incontinent and wears a diaper, she doesn't know when she has to go and she also told me she couldn't use her arms but I said oh yes you can and pulled her arms up above her head!" (and she then demonstrates for me by pulling her own arm up into the air). A few minutes later Mrs. L. was sitting up on the side of the bed. The woman standing by the bed said, "I took her off the pan." I introduced myself to her and asked whether she was family and she said, "I am her daughter and her other daughter is here also." I asked if her mother had used the bathroom, and the daughter replied, "Yes and I kept it in the bathroom." I walked in to look and there was a moderate amount of very dark, tea-colored urine in the pan. In a later interview, the daughter revealed that Mrs. L. was usually continent of urine at home, and both the daughter and the patient complained that she was not allowed out of bed during her entire hospitalization.

Mrs. W. was an 83-year-old African American woman who had been living alone in a Senior housing complex near the hospital. She received weekly visits from her sister. She had a tenth-grade education. She was a patient of the Geriatric service at the hospital in which she was followed. She had been seen pre-operatively in the Geriatric clinic at the request of the Orthopedic physicians. The geriatrician had diagnosed dementia of the Alzheimer's type, but despite that, Mrs. W. continued to live alone. Two weeks before her surgery, the Geriatric nurse had done a mental status exam, and Mrs. W. had scored a 19/30. A score of less than 24 indicates some mental impairment. She had been admitted to the hospital for an elective total hip replacement when I saw her.

When the nurse was asked how Mrs. W. was doing she replied, "She has really been confused." I then asked the nurse to describe how Mrs. W. has been acting and she said, "She was fidgety and restless. She pulled out her foley with the balloon intact and kept asking to get on the bedpan. I put her on the bedpan and she would pee a little then pee in the bed. Now she is just incontinent in the bed. She was also trying to climb out of bed to go to the bathroom. " When I went in to observe Mrs. W. she was lying in a wet bed and asking to use the bathroom.

Sensory impairment and incontinence of urine in a strange environment were also seen in Mrs. M. who was observed to be confused and agitated early one evening when she had moved to another room and had to go to the bathroom. Even though the personal care home had said in the interview that Mrs. M. was continent and went to the bathroom without assistance she had a diaper on during her hospitalization and her leg was restrained. This appeared to be a very upsetting experience for her. One night she was observed to be yelling out "Come in here please and get this off of my legs!" Her voice sounded irritated, and that was the first time I had seen her angry. She appeared restless and was pulling at her covers and said, "Fool put this on me when they know my leg hurts and I can't move. Why you all want to keep me like this? Let me up where I can stretch my legs. I can't go to the bathroom. I can't do nothing-- you do me like I am a dog, no more than a dog!" I approached her and could see her diaper was very wet-appearing and seemed tight. I went to look for her nurse and she was with a patient in respiratory distress so I changed the diaper and told Mrs. M. how to call for a nurse if she needed help again. On another occasion her nurse stated, "She asked for the bedpan twice, but then later was wet and was stooling when she would urinate." This same day when I was in the room with her Mrs. M. declined a drink of water stating, "No I would be getting up in the night and there would be noone to help me."

On another occasion Mrs. M. surprised the nurses by being continent of urine;

As I walked into the room, Mrs. M. was lifting her head from her pillow (she was in bed) and seemed to be straining to see me (she had impaired vision) and she said, "Is that my nurse? I have to go to the bathroom, nurse." I walked over to the bed and said, "No this is Donna but I will go get a nurse to help you to the bathroom." I went out to the station and told the clerk who was sitting at the desk with two other staff members whom I had not met. A nurse aide came to help me. Mrs. M. was walked to the bathroom and independently used the toilet, with the nurse aide standing next to her. Later, when interviewing the personal care home aide and the sister of Mrs. M. they both reported that she is normally continent of urine. The day before the discharge of Mrs. M. the nurse note read, "Much better today, knows when she has to use the bathroom and eats well. Walked to the bathroom."

### Cultural Attitudes

Sixty-five percent (13/20) of elders in the study were African Americans and 54% (7/13) of the family members that were interviewed were African American. They were cared for by a largely Caucasian staff. Differences in culture may have contributed to a lack of recognition of confusion by staff members.

Cultural attitudes of not needing to assess the mental status of elders who were minorities, were expressed by nurses and physicians who were interviewed. Mr. G. was a 69-year-old man who was admitted to the hospital on the Urology service. When his primary physician was called on the telephone to gain permission to enroll Mr. G. in the study (as required in the institution) the physician replied, "Why do you want him in the study. He's a backwoods poorly educated, man...I can't tell you what his mental status is. It is different here culturally. I am just telling you so you will know...it is hard to understand the languages and nuances. I have been here 26 years, but I am originally from New York and it is often hard for me to tell if they are confused." The man that he was referring to was a 69 year old African American man who had a fifth grade education. He was enrolled into the study and did not meet criteria for dementia or delirium and he did not

develop delirium during his hospital stay. He was in the hospital for four days and his mean MMSE score was 22 out of 30 possible.

Another African American in the study was Mr. H., a 84-year-old man who was in the hospital with gastro-intestinal bleeding. He was married, lived at home, and had a second grade education level. He agreed to be in the study, but when I began to assess his mental state he said, "I did not finish the third grade because I had to walk six miles to school every day. If the creek was up I couldn't make it, but I can still read and write a little." One day, his attending physician came in the room with a group of residents. They were in the room with Mr. H. and me for about 30 seconds. They said hello and two of the residents pulled up his gown and pressed on his abdomen and then walked out of the room quickly. As they were doing this Mr. H. said, "Look, they are pulling up my dress without even talking to me. They are double teaming me." And after they left Mr. H. said, "They come in like this all the time and this is all the time they spend with me." Later, when asked whether he was in good spirits most of the time he replied, "I have to be. I get along with everybody, even white men." Mr. H. did not have a diagnosis of dementia and did not develop delirium. His mental status score was 25/30.

#### Hospitalized Patients with Delirium in the Absence of Dementia

Patients with delirium in the absence of dementia were usually recognized as delirious by nursing and medical staff within a day or two of presenting with delirium. As presented in the quantitative results of mental status scores these patients were also more likely to be discharged with an improvement in their mental status score, compared to persons with dementia.

Mr. T. was a man without a diagnosis of dementia who presented with delirium on day two of his hospitalization. His delirium was characterized by inattention, acute disorientation, and restlessness. His delirium was recognized by a member of the nursing staff when he was trying to get out of bed with a fractured leg. He spent 20 days in the hospital. His mental status scores were as low as 14 out of 30 points when he developed

delirium. His mental state improved and he was discharged with a mental status score of 30/30. He appeared to have recovered from his delirium.

#### Patient Experience in the Hospital Environment

Patients who were being observed often expressed an awareness of feeling confused or mentally foggy. On several occasions, patients were observed to be struggling during a confusion episode, as in the following example of Mrs. M. who began to answer questions about orientation and said, "I don't know--I feel turned around since I have been in here." As I continued to ask questions she said, "This place sure turns me around. I feel confused."

Mrs. L. was a 99-year-old with a history of mild dementia who was admitted to the hospital with heart failure. She was in a two bed room by herself. Her bed was closest to the door and faced a wall, a sink, and mirror. Next to the sink was a disposable red needle box. Next to her right side was the other bed which is the bed that was next to a large two paned window. There were no personal items in the room and no clocks or calendars or signs to identify for Mrs. L. where she was. The room was quite cluttered and dirty. Mrs. L. could not reach anything on her bedside table and both side rails were raised. She was on bedrest during her entire hospitalization. Her vision was impaired, and she could not use the call light when asked to demonstrate its use. Mrs. L. was frequently calling out for a nurse with a loud voice.

#### Staff Members Knowledge of Delirium and Dementia

Nurses and physicians who were observed and interviewed lacked a knowledge of differentiating delirium from dementia. Seventy-five percent of the nurses who were interviewed stated they did not know the difference between delirium and dementia even though 75% also said they had formal education or went to a conference about confusion in the elderly (table 8). When asked whether she knew the difference between delirium and dementia a nurse responded, "I don't know. I mean to tell you the truth I don't know the exact difference between the two right now, I would have to go back and look that up."

A chief resident physician who was interviewed expressed a need for more geriatric experiences, stating. "We are supposed to go to a geriatric clinic. I think it is twice, and we work with them for an afternoon. That is a very good experience because I rarely see geriatric patients--I mean patients who are coherent and healthy in their sixties, seventies, and eighties...I see patients at the nursing home, but all my patients they are either real sick or they are out of it, or they can't even carry on a conversation with you, or they are confused."

Another physician chief resident was consulted to see a patient with delirium without dementia. She saw him in his room, asked him a few orientation questions (that he had just been asked by the nurse), and listened to his lung sounds. After her assessment she talked with me about her assessment and stated, "He is fine. He seems perfectly okay to me today. My attending thinks he is sundowning, but I don't know why we were called." Within one hour of the physician assessment this man was assessed with the mental state exam and scored 18 out of 30 points. He was observed to be displaying inattention, disorganized thoughts, poor short term recall, and disorientation. None of this was noted by the consulting physician. This man was discharged to a rehabilitation facility with a score of 24 on the MMSE.

#### Outcomes: Mortality and Morbidity

##### Re-admission

Five of the eight patients with delirium super-imposed on dementia were re-admitted to the hospital during the study within 30 days. I am presenting three of the five cases, since they are the cases where patients were re-admitted to the hospital within a few days or weeks.

One 83 year-old woman was discharged from the hospital still meeting all four criteria for delirium and was re-admitted to the hospital three days later with an urinary tract infection, dehydration, and a change in mental status. A member of the nursing home staff was later interviewed and the nurse stated that she had identified the change in mental status



and then called the primary care physician. When re-admitted to the hospital, this woman had an elevated BUN/Creatinine of 60/2.5 and her WBC was 15,000. Her previous admission BUN had been 25. Two months later she was interviewed in the nursing home and her mental state had improved markedly. Her mental status score had increased by 11 points. She was conversant, following directions, and participating in activities at the nursing home.

Despite having a delirium characterized by inattention, hypoalertness, lethargy, and hallucinations Mrs. J. was discharged from the hospital to her home still delirious. She was re-admitted seven days later with dehydration, hypothermia, and Dilantin toxicity. During her first hospitalization, her length of stay was four days. On her second admission, she was hospitalized for seven days.

Mr. M. was a man with dementia and a hip fracture who developed delirium during his hospitalization. He was discharged from the hospital to a rehabilitation facility after six days and was re-admitted less than 30 days later with a wound infection. He was restrained during both hospitalizations. He developed stage III skin breakdown on his heels and remained dependent in his ambulation.

#### Discharge to a Nursing Home

Mrs. W. was a woman with dementia and arthritis who had an elective hip arthroplasty. Both the sister and attending physician stated the surgery was done to decrease her pain and to improve her function. Previous to the elective surgery she had been living independently in Senior housing. In the family interview the sister stated that she thought Mrs. W. would socialize more outside her apartment if she had less pain in her hip. Mrs. W. had a severe delirium super-imposed on dementia during her hospitalization and was unable to follow instructions from the physical therapist; therefore she was unable to ambulate after surgery. She was discharged to a nursing home with a decline in both her physical and mental functioning.

#### Weight Loss

Eight of the twelve (67%) of the patients with delirium had a history of recent weight loss. In addition to the descriptive data regarding percentages of patients or family reporting a recent weight loss, patients with delirium were also observed to be eating poorly in the hospital and losing weight during the hospitalization. The family of Mrs. E. reported that she had lost over ten pounds in the past two to three weeks before coming in the hospital.

Mrs. S was hospitalized for eight days then re-admitted and hospitalized seven more days. She was delirious during both hospitalizations and was observed to be often too lethargic to eat or refusing to eat. She was weighed in the nursing home the week she fell and broke her hip and then ten days after her return from the hospital. She lost 17 pounds over a four week period. Two days after her delirium developed she was observed to be in the room alone, lethargic appearing with her eyes closed and her dinner tray in front of her. Food was all over her hospital gown and there was food visible in her mouth. Her daughter was outside the room and remarked "She didn't eat breakfast either she just holds the food in her mouth."

Another patient with delirium super-imposed on dementia and weight loss was an 84 year old woman whose daughter reported that she had not been eating or drinking for two to three days before coming into the hospital. Her Albumin on admission was 2.0.

### Death

One of the patients died during the study while in the hospital. An 88 year old woman with dementia who was admitted for an elective below the knee amputation developed a delirium. During her delirium she was on bedrest, restrained, and eating poorly. On the fifth day of hospitalization, she was transferred to the ICU with respiratory distress. She died in the hospital four days later.

## Chapter V

### Discussion of Findings

The four major findings of this study are:

1) delirium super-imposed on dementia is poorly understood and unrecognized by health care professionals. Delirium often went unrecognized by nurses and physicians. Physicians and nurses caring for patients suffering from delirium super-imposed on dementia often lacked knowledge of the patient's ordinary mental state and they attributed the confusion to the dementia; not to a delirium, 2) functional status, a > 10 pound weight loss in the past 6 months, and mental state 2-4 weeks before hospitalization may be pre-hospital risk factors in the development of delirium in elders, 3) compared to elderly patients with delirium, persons with delirium super-imposed on dementia were discharged from the hospital not fully recovered from the delirium and were re-admitted to the hospital in less than thirty days, 4) factors in the hospital environment (physical environment, culture, communication) seem to interact with baseline patient vulnerability as a factor in the development and management of delirium in patients with dementia.

These findings have several implications for clinical practice and future research. Perhaps the most important results of this study, are the quantitative findings that persons with delirium super-imposed on dementia were discharged from the hospital when not fully recovered from the delirium, and were re-admitted in less than thirty days. In contrast, persons with delirium in the absence of dementia were more likely to be discharged home or to a rehabilitative facility with an improvement in their mental state. These quantitative data, combined with the interviews and observation of patients and staff members, demonstrates that delirium super-imposed on dementia is often not recognized at all or is recognized late in the syndrome. These patients are often discharged with a decline in their mental status from admission. The consequences for the individuals in this study were

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frequent re-admission to the hospital, death, placement in a nursing home, and a permanent decline in function.

### Recognition

The lack of recognition of delirium in elders is not new to the science of delirium research. In a 1989 study by Inouye and others 65% of physicians and 43% of nurses failed to recognize delirium in hospitalized elderly patients. This study contributes to this growing body of evidence by describing the apparent differences in recognition of delirium in those with and without dementia. This study suggests that lack of recognition is even a greater problem in patients with delirium super-imposed on dementia, and the consequences of the failure to recognize this problem are costly and deadly. Elders were often labeled as chronically confused, so any additional confusion was seen by staff members as normal. This under-recognition may have been an important factor in the poor outcomes of these hospitalized dementia patients.

Why did members of the nursing staff under-recognize delirium in persons with dementia? This study does not fully answer that question, but it does provide results showing nurses and physicians who are interviewed and observed are assessing mental state only minimally by asking questions about orientation and 'appropriateness'; or they are failing to assess mental state. Additionally there was poor communication nurse to nurse, among physicians and nurses, and with families regarding the mental state of elders.

These findings are supported by recent studies. A case study in critical care utilizing chart audits, observation, and interviews of nurses found two main problems in under-recognition of delirium in critical care 1) lack of knowledge on the part of nurse on ways to detect delirium; and 2) ineffective communication between staff in reporting symptoms of onset (Eden & Foreman, 1996). Inouye (1990) found orientation to be one of the least sensitive feature for assessment of delirium. In a study of 432 medical-surgical patients, confusion was most often mentioned in the medical record by nurses, but was not

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identified as an acute change with a reversible cause (Pompei, Foreman, Cassel, Alessi, & Cox, 1995).

As evidenced in interviews and observation of patients and staff members, nurses and physicians spend little time with each individual patient--time that is necessary to assess mental status. In addition, staff are either labeling any confusion normal for patients with dementia, or simply failing to assess mental state in patients for whom they are caring

Lack of recognition of delirium may also be increased because patients with delirium super-imposed on dementia are exhibiting the 'quiet' or hypoactive form of delirium more often than other patients. The analysis of the qualitative data found patients with delirium super-imposed on dementia to have some features of delirium that differed from patients without dementia that developed delirium. If delirious patients are not 'acting out' and pulling out medical devices, nurses may not see the lethargy as a problem and then fail to recognize delirium.

This is further complicated by the observation and interview data that indicate nurses and physicians lacked the knowledge of how to assess confusion. As described in the interviews with staff members, nurses and physicians lack basic training and education in the area of confusion. Only 25% of the nurses interviewed stated they knew how to tell the difference between delirium and dementia, and as one nurse stated, "If they are known to have Alzheimer's then usually I don't even try to ask them questions."

#### Factors Associated With Delirium

Many of the risk factors for delirium found in the quantitative analysis were not surprising. Mini-mental state scores, dementia, and the burden of co-morbidity have been found in previous studies. A 1994 study by Pompei, Foreman, Rudberg, Inouye, Braund, and Cassel used a cross-sectional study design. Subjects with delirium had longer hospital stays and an increased risk for death in the hospital. An impaired mental state, the burden of co-morbidity, depression, and alcoholism were found to be independent predictors of delirium.





### Management of Patients with Delirium Super-imposed on Dementia

This question was answered primarily by observation and by staff and family interviews. There were five major issues that emerged from the qualitative data on management of these patients: 1) physicians and members of the nursing staff were less likely to seek a reversible cause of confusion for patients with a diagnosis of dementia even when family identified the change; 2) patients with dementia were discharged sooner to another facility; 3) staff were more likely to label these patients as demented and not communicate with them directly or assess the reasons for their increased confusion; 4) these patients were more likely to be restrained and experience skin breakdown and incontinence; and 5) these patients were more likely to be re-admitted to the hospital in less than thirty days compared to both delirious patients without dementia and patients without delirium.

Persons with delirium super-imposed on dementia had several similar patterns in their event analysis from observation, and family and staff interviews. These patterns included; 1) Failure of staff to recognize delirium and to communicate mental status assessment from shift to shift, 2) patient sensory impairment and misinterpretation of the environment, 3) labeling the person with dementia, 4) normalization of the problem by staff, 5) environmental factors such as the elder having multiple medical devices and lying in a wet bed interacting with baseline factors, and 6) the nurse-patient interaction. Delirium in these patients was managed by restraints to protect the medical devices such as surgical drains, catheters, and intravenous lines. Management by protection of medical devices as the number one goal, does not treat the delirium, and it may worsen the problem.

### Consequences of Not Recognizing Delirium

The consequences of not recognizing delirium in this population were severe and long lasting; placement in a nursing home, physical and mental decline, re-admission to the hospital, and death. As our population grows older it is increasingly important to examine the consequences of hospitalization for the elderly.

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Previous studies have shown that mortality and morbidity are higher for persons with delirium compared to matched controls. Within two years after an episode of delirium, 15%-30% of patients had died (Inouye, 1993; Thenhaus, 1990). In a study by Conn (1991), the mortality rate of elderly persons with delirium was double that of controls during a thirty-day period. This study adds to this previous data by comparing persons with and without dementia, and by providing in-depth descriptions of patients poor outcomes.

In this study, patients with dementia appear to have been overlooked or misdiagnosed leading to poorer outcomes compared to persons with delirium in the absence of dementia. They were also discharged from the hospital sooner. This raises the question of whether patients with dementia are more at risk of early discharge from the hospital. Unless they have strong advocates they may be the most likely target for the rationing of care and management of inpatient hospital costs. All of the patients in this study had similar types of insurance, but the fact that patients with delirium in the absence of dementia had longer lengths of stays is perplexing.

This study measured numbers of chronic disease, functional status, medications, laboratory values, and co-morbidity. The delirium in the absence of dementia group had better outcomes than the patients with dementia even though they were on more medications, had a higher co-morbidity index, and were more functionally impaired. Delirium itself may be a marker of physical decline, but the fact that delirious patients with and without dementia had such different outcomes suggests the importance of factors besides severity of illness. The better outcomes may be because persons without dementia were recognized as being delirious before patients with dementia. This also suggests that environment may be more important than physical factors for persons with dementia that develop delirium.

The lack of recognition of delirium may also lead to poorer outcomes because underlying medical problems are then not recognized as they were in the persons without

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dementia. Mrs. S. had many possible medical causes for being delirious including hyper or hypoglycemia, dehydration, medication toxicity, and infection. By not acknowledging her delirium these problems were not investigated, and Mrs. S. lost 17 pounds while hospitalized and was re-admitted to the hospital.

### Recovery

While investigating delirium super-imposed on dementia, the question of what constitutes recovery of delirium in persons with dementia was uncovered again and again in my mental memos made while observing patients in the study. Patients with delirium super-imposed on dementia had a mean mental status score of 13 and showed the biggest change in their mental status score from enrollment to discharge, with 75% having a drop in their mental status scores from enrollment. For the most part they did not regain this drop. Their mean mental status score at discharge was 10, compared with persons that developed delirium in the absence of dementia, who had a discharge mental status score mean of 27.

All of the persons with delirium in the absence of dementia either improved their mental status scores or had no change in the score from enrollment to discharge. The persons with dementia had a net change of minus 24 on their time two mental state scores. This slower recovery in mental status scores for persons with delirium super-imposed on dementia was also supported by the observational and interview data. The recovery may be the key difference between delirium and dementia, as other features of delirium overlap with other types of dementia (MacDonald & Treloar, 1996). One must ask however, if full recovery from delirium super-imposed on dementia is possible, or should be expected? Since a key feature of delirium requires that it be of an acute onset, we would expect that it an individual with delirium would show evidence of some, if not total recovery.

The patients in this study showed evidence of recovery, but not as great of a recovery as persons with delirium without dementia. Mrs. S. was not found to be recovered until follow up in the nursing home over two months later. Mental status scores may be an

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inadequate way to determine recovery in persons with dementia since previous studies have shown that scores on the mini-mental state exam may vary widely in hospitalized older medical patients (Treloar & MacDonald, 1996). In this study however, patients were also observed in-depth and mental state scores were compared with observed functional improvement. This study uncovered the question in an in-depth manner by comparing recovery in patients with and without dementia and found recovery was slower in persons with delirium super-imposed on dementia; even though it did occur. Since delirium often occurs in the presence of dementia, the type of recovery expected is important to define in future studies so delirium can be further differentiated from dementia and normal aging.

#### Hospital Environment and Patient Vulnerability: An Interactive Model of Stress

It appears from the results of this study and others, that delirium is of multi-factorial etiology--a combination of baseline factors and factors in the hospital environment that make an individual vulnerable to the development of delirium. This person-environment model for delirium includes admission variables like sensory impairment, dementia, depression, and weight loss, and factors that occur once the person is in the hospital such as pain, incontinence, physical restraint, iatrogenesis, and sensory deprivation.

This is supported by a recent study by Inouye and Charpentier (1996). They prospectively developed and validated a predictive model for delirium based on precipitating factors during hospitalization, then examined the interrelationship of these predictors with baseline vulnerability. Delirium developed in 18% of the development cohort and five independent predictors for delirium were identified: use of physical restraints, malnutrition, more than three medications added during hospitalization, use of a bladder catheter, and any iatrogenic event. For the baseline factors in their model, they used four variables that were validated in a previous study: vision impairment, severe illness, cognitive impairment, and a serum urea nitrogen:creatinine ratio of  $>18$  (proxy for dehydration). They found that patients increased their risk of developing delirium as baseline factors and predictive (hospital) factors interacted.

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The results of this study are supported by the Progressively lowered stress threshold (PLST) theory. The PLST model proposes that individuals with dementia need their environmental demands to be decreased or otherwise modified due to declining cognitive and functional abilities.

As discussed earlier, in the PLST model both environmental stressors (noise, activity) and internal stressors (pain, infection) are demands that may make the person with dementia anxious and agitated. The Iowa researchers categorized losses associated with cognitive decline into four groups: (1) cognitive or intellectual losses, (2) affective or personality changes, (3) planning losses that lead to a decline in ability to perform functional activities, and (4) "loss" of the stress threshold, which results in dysfunctional behavior or agitation. As mentioned earlier, in the Iowa model, persons with dementia display three main types of behavior: baseline, anxious, and dysfunctional. In the PLST model normal or baseline behavior is a calm state where the person is able to communicate needs and respond to communication from others (socially accessible), and is aware of and oriented to the environment (cognitively accessible). Anxious behavior occurs when the person with dementia experiences stress. At this point however, the caregiver is still able to maintain contact with the patient. When too much stress is present the patient becomes increasingly anxious until the stress threshold is exceeded, resulting in agitated behaviors and client inaccessibility (Hall & Buckwalter, 1987; Hall, 1994, p. 130). This theory, the results of this study, and Inouye's statistical risk stratification model may explain why persons with dementia are at greater risk of delirium and experience poorer outcomes when admitted to the hospital.

External stresses in this study were the physical environment consisting of multiple medical devices, the noise and stimulation of the intensive care unit, iatrogenic urinary incontinence, nurse communication and interaction with the person with confusion, immobility and restraints applied to the hospitalized person with dementia, and cultural attitudes. Internal stresses were impaired vision, depression, medications, pain, and

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infection. When the stress threshold is exceeded Hall and Buckwalter do not call this phenomena delirium in the person with dementia, but this study adds to their previous work by making a comparison between delirium and what they theorize occurs, and by describing the recognition, management, and factors associated with the phenomena of delirium super-imposed on dementia.

It is clear from the results of this study that in order for interventions for preventing and managing delirium to be effective, they must be aimed at the individual and the environment. When patients with dementia are pulled out of their familiar structure and normal routine they are made more functionally dependent (becoming incontinent, eating poorly) and placed in a strange environment. Mrs. L., Mrs. M. , and Mrs. W. were not using the bathroom as they had in their usual environment. Incontinence in these patients was accepted as normal by members of the nursing staff, despite the fact that they had used a toilet at home and were asking the nurses to get up to the bathroom.

If these patients are not asked if they want to use the toilet and a diaper is placed on them, this environmental insult combined with their baseline vulnerability may push them past their stress threshold and acutely increase their confusion. All of them were observed to be acutely agitated and restless when incontinent. These environmental issues appear to be a significant factor in persons with delirium super-imposed on dementia and they must be addressed while treating physiological causes of delirium.

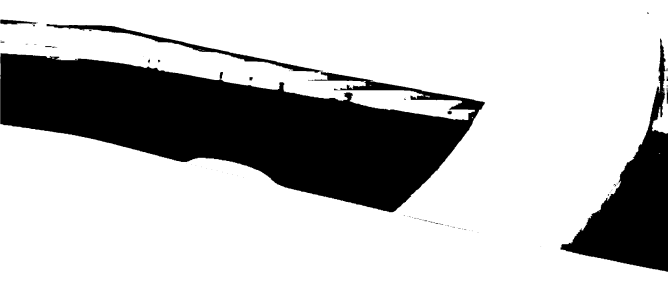
#### Incontinence

Incontinence, urine elimination problems, or presence of a bladder catheter have been found to be associated with confusion in previous studies, but the interaction of incontinence with environmental factors has not been discovered. The association of a bladder catheter and confusion may be related to the immobilization, increased risk of urinary infection, or the presence of an unfamiliar device (Williams et al., 1985; Inouye et al., 1996). Even though immobility was not measured as a variable, several of the incontinent patients were on bedrest their entire hospitalization. Other studies have found



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that impaired cognitive status correlated positively with urinary incontinence. However, these studies did not differentiate delirium from dementia (Jirovec & Wells, 1990; Seidel, Millis, Lichtenberg, & Dijkers, 1994).

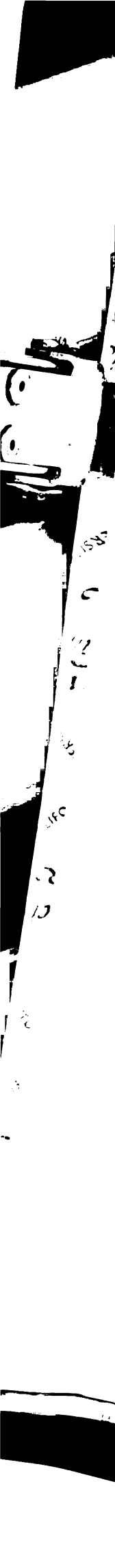
Weight loss, depression, and culture may have also played a role in the recognition and outcome for patients with delirium. Weight loss appears was both a baseline vulnerability factor of delirium super-imposed on dementia, and an outcome of hospitalization for patients with delirium super-imposed

Depression has been found to be a risk factor for delirium in several previous prospective studies including a 1994 study by Pompei, Foreman, Rudberg, Inouye, Braund, and Cassel used a cross-sectional study design with a non-probability convenience sample to determine the rate of delirium in two hospitals, to contrast the clinical outcomes of patients with and patients without delirium, and to identify clinical predictors of delirium. Subjects with delirium had longer hospital stays and an increased risk for death in the hospital. An impaired mental state, the burden of co-morbidity, depression, and alcoholism were found to be independent predictors of delirium.

Tinetti (1993) investigated factors that lead to decline in older persons, and individuals with dementia that develop delirium are at risk of serious permanent decline. If delirium is recognized in these individuals this may delay permanent disability. Recognizing delirium in persons with dementia may be even more crucial than the general population because of the poorer outcomes for persons with dementia.

#### Culture and Ethnicity

The role that culture may have played in this study is unclear, but it appears to have been a factor in this environment, and it may be unique to this setting. The 69 year old African American man who had a fifth grade education was referred to by an experienced attending physician as "backwoods and poorly educated" The physician said that it was, "...often hard to tell if they are confused." The man he was referring to was enrolled into the study and did not meet criteria for dementia or delirium and he did not develop delirium



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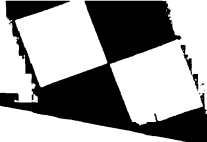
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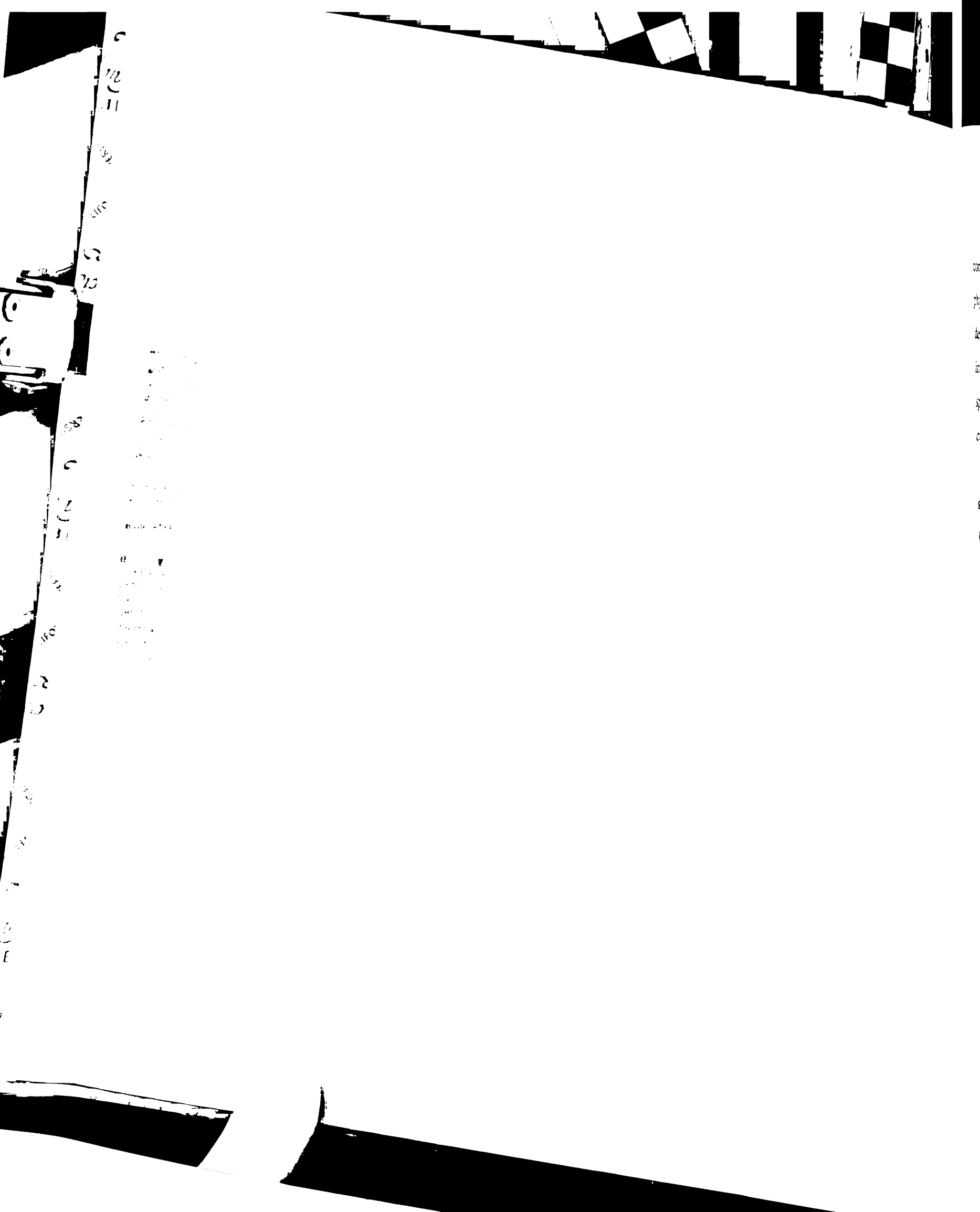
during his hospital stay. He was in the hospital for four days and his mean MMSE score was 22 out of 30 possible. These attitudes and beliefs may prevent members of the staff from adequately assessing mental state.

Another African American in the study was Mr. H., a 84-year-old man who was in the hospital with gastro-intestinal bleeding. He was married, lived at home, and had a second grade education level. He expressed that the physicians spent little time with him, and referred to them as 'white men.' Even though they had little formal education the African Americans in this study showed changes on the mental state exam, and scored within the suggested educational norms (Fillenbaum, Heyman, Williams, Prosnitz, & Burchett, 1990; Tombaugh & McIntyre, 1992).

Specific problems may exist in communication with ethnic elders in the context of formal care. Mr. H. suggested that there was a power difference between himself and the white doctors in his room that may have impaired the communication. Ethnic, cultural, and economic backgrounds may affect the interactions between patients and physicians. One study found that African Americans were less likely than whites to be referred to Specialists or receive advanced surgical procedures (Clark, Potter, & McKinlay, 1990; Beisecker & Beisecker, 1996). In this study the majority of patients with delirium super-imposed on dementia were African American. There is evidence that dementia may be more prevalent in persons of African American ethnicity therefore overcoming cultural barriers to assessing and recognizing mental status changes is vital.

#### Communication: Implications for Nursing

Nurses are in a key position to collaborate with other disciplines to manage and prevent delirium in hospitalized elders. A major theme in this study was nurse communication and interaction, another was staff recognition of delirium. Both of these have the potential to be affected by changes in nursing care and by the continued changes in health care delivery.





Several types of communications were observed in this study; nurse to nurse communication; physician-nurse communication; nurse-patient communication; and patient-physician communication. Eighty-eight percent of the cases of delirium super-imposed on dementia were not recognized by the nursing staff. However, of the families who were interviewed, all recognized an abrupt mental change within hours or days in their parent, spouse, or sibling, and 64% (7/11) said that the physician did not talk with them about the confusion.

Communication with families and other providers is vital for persons with dementia since they may have problems communicating their present needs and past history. Families in this study often had very important information to provide about the care of their spouse or parent. As cost cutting and managed care sees nursing move to the use of unlicensed assistive personnel and a task oriented approach; a lack of communication may become more of a factor in the recognition and management of delirium. Communication with patients and families may be further divided among different personnel.

Many times the communication with persons with dementia is nonverbal communication as in the case of the daughter talking about her 69 year old mother with dementia, "I don't know if I wasn't here and she can't tell anyone what she wants, and they don't know her, and they don't know her ways and all, it would be horrid...several people come in the room...different people come in for different stuff because you got people coming in to take her pressure, you got somebody that comes into bathe her, and you got another person who does this and that...and somebody else may come into help the nurse." This type of communication requires more time to execute successfully, and families are often vital in the communication with cognitively impaired patients. Nurses in this study were observed to spend little time with patients and families in general, and practically no time assessing the mental state of patients.

Nurses and physicians repeatedly failed to communicate their assessment of the patients mental state. The reasons for the lack of communication are not completely clear.

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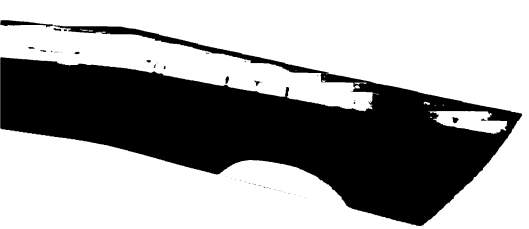
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It appeared like mental state was a low priority in the assessment and shift to shift report. In addition, if the nurses have lower expectations for the mental state (beliefs--confusion is normalized) they may not see the necessity of communicating this information to the other nurses.

Much of the research in the area of patient nurse communication is with intact patients or patients in an intensive care unit. A phenomenological study of eight patients who were interviewed after coming off a ventilator described the communication between nurse and patient as impaired and frustrating to the patient (Hafsteindottir, 1996). This theme is also supported by a case study review by Eden and Foreman (1996) that indicated under-recognition of delirium was related to ineffective communication between members of the staff. The role of communication in the care of persons with dementia and delirium deserves further investigation.

#### Environmental Model for Delirium

Environmental factors influencing the recognition and management of delirium including culture, communication, and the physical setting may be viewed in the context of the Kayser-Jones model of multiple factors in the environment that influence the elder having restraints applied (Kayser-Jones, 1992).

This model may be applied to the elder with confusion to explain the interaction of environment and patient vulnerability. The cultural environment of the hospital in this study included attitudes and beliefs; and knowledge about aging and normal cognitive function. Health care personnel expected the elderly with dementia to be confused, so they ignored a worsening of confusion and did not recognize a reversible phenomenon such as delirium. In this study nurse, physician, patient, and family communication was part of the Personal and Supra-personal environment, and this poor communication affected the recognition of delirium.

The physical environment is often very difficult to measure and move beyond the theoretical model. Observation of Mrs. W. attempted to capture this in the following

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description, 'she had multiple medical devices on her and in her room, including bilateral compression boots that wrapped around her legs, alternately squeezing them and making a loud noise when they compressed. She also had a urinary catheter, a large foam pillow between her legs to keep her hips abducted, two intravenous catheters, and a large dressing on her leg.' Some individuals may require more than this to become confused, but others who start out personally vulnerable are more easily confused when placed in a strange environment. In the case of Mrs. W., she developed delirium while personally vulnerable (prior history of impairment, recent fall) in the context of poor staff member communication, poor nurse-patient communication, and a unfamiliar, complex physical environment (Mrs. W. was lying in a wet bed, covered with 'medical devices' and calling out to use the bathroom). She developed a delirium that was initially not recognized by the nurses and physicians and lead to her functional decline and eventual discharge to a nursing home.

This environmental model of confusion in the elderly allows one to study environment from an individual, family, social, organizational and physical perspective. As in the PLST model, Kayser-Jones model also recognizes the interaction of the physical environment with the hospitalized patient. Kayser-Jones model however, expands the view of environment to include organizational factors such as staffing, and the philosophy of the hospital as a teaching facility and provider of indigent care.

Part of the macro-environment is the financing and changing structure of health care delivery. These changes may affect the management and prevention of confusion in the elderly. Many hospitals now have capitated contracts with the health maintenance organizations, which means the hospital is given a pre-determined amount of money per member to care for that member and if the hospital goes beyond that amount it loses money on that individual. Despite the relatively small penetration of managed care in this region (17%) there was a rapid rise in the past year, and the attitude was still on preparing for managed care. The present macro-environment of outpatient care and cost-savings may

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influence early discharge of patients with dementia and shift the care of these persons to the family and other community providers.

In a managed care environment patients are in the acute care setting only a short period of time. In this study they were discharged home with a delirium. There is not adequate time to evaluate the confusion if the goal is an early discharge to save managed-care dollars. Specialized evaluations of the confusion also require additional time and money. This model stresses the importance of analyzing the environment and recognition of delirium in this context.

### Prevention

Given the proposed interactive model for delirium super-imposed on dementia, how can we prevent delirium in elders at home and in the hospital? The results of prospective studies of prevention of delirium have thus far been unimpressive. A clinical trial is presently in progress at Yale University to prevent delirium by targeting certain risk factors (American Geriatric Society meeting May, 1997). This study is targeting several areas for prevention of delirium including: vision impairment, mobility, cognitive impairment, and dehydration. A recent nursing study decreased the incidence of delirium on an orthopedic unit by focusing on patients with target conditions and avoiding immobilization, and multiple medications (Simon, Jewell, & Brokel, 1997).

Since previous attempts to prevent delirium have not been successful early recognition and management may be the best way to improve the outcomes associated with delirium. A careful assessment of mental state, manipulation of the environment, and treatment of any suspected physiological causes for the delirium, must occur simultaneously. Nurses must coordinate this multi-disciplinary approach. Management of the environment may involve normalizing the environment to the structure and routine that the elder is most familiar with.

Discharging patients home with delirium will also affect nursing care of patients in the home. Patients may be discharged home so that the length of stay is less, but if they are readmitted it is an additional burden to the patient and family, and ultimately increases health

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care costs. Levkoff and others (1986), estimated that reducing the length of hospitalization of patients with delirium by just one day would save Medicare one to two billion dollars annually.

With the current health care changes and shift to managed care we will continue to see shortened length of stays. As a result, an increasing number of patients may be discharged with unrecognized delirium super-imposed on dementia. Geriatric interdisciplinary education should teach a standardized mental status assessment for all hospitalized elders. Signs of delirium super-imposed on dementia need to be investigated in more depth both in the hospital and the community.

#### Mental State: A Geriatric Vital Sign

Nurse and physicians in this study assessed mental state in a casual, subjective manner, or not at all, and only documented the confusion if the patients were displaying obvious signs such as the interference of medical devices. Impaired mental state should be given the same attention as hypertension or diabetes as a silent killer, and should be assessed on a routine basis.

Even though there is increased attention to aging changes and diseases of the aged in the media and in medical education; this awareness does not seem to be reflected in the care of persons with cognitive impairment in this study population. Mental status is often still overlooked as an vital area of assessment, and confusion continues to be labeled as normal for older hospitalized persons. Early recognition could improve outcomes for persons with delirium.

#### Future Studies

There are several directions the results of this study could lead to in the development of this research area. The most important follow-up study to this is a prospective study designed to follow patients longitudinally from the hospital to the community to define the recovery process from delirium and delirium super-imposed on dementia. This is particularly important as patients are discharged earlier from the hospital, often delirious,

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and frequently re-admitted. In addition, it is important to also further investigate interventions to keep patients with dementia from developing delirium while hospitalized. A study could also focus on comparing dementia patients who develop delirium to those who do not develop delirium.

Despite previous research about the under-recognition of delirium, it continues to be a problem. We may not be able to do something about some of the biological risk factors in the near future, but nurses can have an immediate influence on the recognition and management of delirium in these patients.

An experimental study to improve assessment and communication of confusion would have direct implications for clinical care of persons with delirium super-imposed on dementia. As many cognitively impaired persons live in nursing homes, a study could also be done to explore the use of Tele-video to screen for mental status changes in institutionalized patients. This initial study would establish the reliability of assessing mental state over video compared to in-person. The results of this study would then support a study of Tele-video assessment of community elders.

Further questions that need to be answered in delirium research include 1) what constitutes improvement for delirium super-imposed on dementia?; 2) when does the patient with delirium super-imposed on dementia return to baseline?; 3) what are the different stages and severity of delirium?; 4) what is the impact of test-retest unreliability on results of cognitive testing? 5) how long is the hospitalized patient at risk of developing delirium?; 6) when is the patient with dementia at most risk of developing delirium?; and 7) are delirious patients being discharged sooner as a result of changes in the financing of health care? Future areas of research should also include 1) studies on the long-term prognosis; 2) signs of Delirium super-imposed on dementia; and 3) cost effectiveness of interventions to prevent and manage delirium.

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### Conclusions

This study is not generalizable to the general population, but it does describe important information about how patients with dementia are assessed and managed in an hospital environment and describes in-depth, the presentation and outcomes for delirium in a small sample of patients with dementia. This study advances the science of delirium because few previous studies have described the recognition and management of confusion in persons with dementia.

The results of this study build on delirium research as it provides further support for the interaction of environment with admission risk factors. It also raises questions for future studies. The present criteria for diagnosing delirium may not be adequate for patients with dementia. This model of baseline vulnerability and hospital induced environmental stress may be a model for designing intervention studies for the recognition, prevention, and management of delirium. This model may also be applied to other Geriatric syndromes such as falls, incontinence, and weight loss. These problems also require a comprehensive approach for prevention and management. Tinetti and others prospectively examined factors that increased the risk of geriatric syndromes and found that sensory impairment and high anxiety and depression scores increased the risk of incontinence, falling, and functional dependence (Tinetti, Inouye, Gill, & Doucette, 1995).

### Integrating Qualitative and Quantitative Data Sources

This study is primarily qualitative, but it was strengthened by the integration of quantitative measures. The quantitative measures were used to describe the cases of confusion and factors associated with confusion, and to screen for delirium. Quantitative measures were also used to explore factors associated with delirium superimposed on dementia. For example, data on re-admission rates, MMSE scores, and length of stay were integrated with interview and observational data about lack of recognition of delirium super-imposed on dementia. This integration was important to the understanding and interpretation of the study.

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Many of the variables in this study that were associated with confusion such as depression, incontinence, and severity of illness have been found in larger quantitative studies of confusion. This study however using multiple data sources to describe the integration of the qualitative and quantitative data and interaction of these physical variables with the environmental variables which impact the recognition, assessment, management, and outcomes for delirium super-imposed on dementia. Often the quantitative data supported or illuminated the qualitative data, sometimes they did not agree, as in the depression scores, but raised further questions.

A triangulated approach is particularly important for understanding the problem of confusion and advancing the science of delirium. It appears from the results of this study, and others, that delirium is of multi-factorial etiology--a combination of baseline factors and factors in the hospital environment make an individual vulnerable to the development of delirium. This model includes admission variables like dementia, depression, and weight loss, and factors that occur once the person is in the hospital such as pain, incontinence, and sensory deprivation. Many of the themes from the family interviews and observations of these patients were repeating themes seen in multiple sources of data.

#### Limitations

This study would have been strengthened by the use of multiple observers who were blinded to the results of the MMSE and CAM results, and by the use of a independent psychiatrist's rating of delirium. This study did also not separate incident from prevalent cases of delirium. The study used reliable and valid instruments to measure delirium and dementia, but there is not yet a gold standard for measuring delirium super-imposed on dementia, and all of the delirium measures lose some of their reliability and validity when used on persons with dementia (Inouye, 1990; Trzepacz, 1996). This results of this study must also be considered in light of the high number of patients with low education and African American ethnicity. Though the results of longitudinal studies on education and dementia have been mixed, it is generally accepted that educational levels must be

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considered when interpreting MMSE scores for persons with less than an eighth grade education. Ethnicity has also been found to effect MMSE scores (Tombaugh & McIntyre, 1992).

Since the variables restraints and incontinence were not measured before the onset of confusion in all cases, they can not be assumed to be a predictor of confusion and are likely a result of the confusion. These variables would ideally be measured at least 24 hours before the onset of confusion, since hospital stays are often very short this was not done. The quantitative results of the study were limited by a small sample.

### Reliability and Validity

Reliability in qualitative research is a controversial subject. Many qualitative researchers point out that reliability and validity are quantitative terms. Instead of validity they assert that qualitative studies should be judged by credibility, truth value, scientific rigor, applicability, consistency, neutrality, fittingness, and auditability (Beck, 1993; Burns, 1989; Guba & Lincoln, 1981; Sandelowski, 1986).

Auditability is the ability of another investigator to follow the decision or audit trail. This encompasses all the decisions made at every stage of data analysis. Credibility is similar to internal validity and refers to how vivid and faithful the description of the phenomenon is (Beck, 1993).

This study employed several techniques to increase the credibility and auditability of the data. To increase the credibility, whenever possible, thick descriptions and verbatim quotations were used to illustrate the data. In order to be able to provide rich data, notes were taken in the field and when possible transcribed within 4-6 hours. Triangulation of data sources also increases the validity of this data. Field notes were also kept of my interactions, feelings, and experiences in relation to the subjects experiences. This is identified in the memos as my thoughts.

I also kept a documentation notebook prospectively containing information about six key areas: 1) sampling decisions made; 2) instrumentation and data collection procedures

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and difficulties; 3) interviewing techniques and database summary; 4) software used, and how it was used; 5) analytic strategies used; and 6) inclusion of key data displays supporting main conclusions (Miles & Huberman, 1994, p. 439). Peer review was used to identify researcher bias and selective inattention, and two peers in gerontology will be asked to review the findings (Miles & Huberman, 1994).

Auditability was addressed by recording fieldnotes immediately or as soon as possible after the interview, making note of the time. Decisions made in collecting and analyzing the data were partially described, including how data were coded and placed into categories, and then moved to higher levels of abstraction.

Another strategy for increasing the validity of the study is to use respondent validation or member check (the member is the respondent). Respondent validation is where the researcher goes back to the original respondents or actors to see if they recognize the validity of the studied accounts. Validation is a way of establishing whether the researchers and the member's views of the phenomenon agree. One way to do this is to send the participants a part of the report and ask them to indicate how it agreed or disagreed with their view of the phenomenon (Hammersley & Atkinson, 1995).

I will go back to the unit and hospital and formally present the findings to the hospital and the staff nurses. I will also publish the results and make them available to staff.

### Summary

This ethnographic study had as its purpose to explore the recognition and management of acute confusion in hospitalized elderly persons. Through use of both quantitative and qualitative data collection findings important to the quality of care for confused hospitalized elders were discovered and directions for future research identified.

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Appendix A

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Table 1

Reviewed Studies on Acute Confusion

<b>Study</b>	<b>Design</b>	<b>Results</b>	<b>Measurement</b>
<b>Foreman, 1989</b> <b>N=71</b>	Descriptive non-experimental. Daily interview Tested Levine's Conservation model of Nursing	Prevalence of confusion 38% (27 of 71) Most were confused by day 2 of hospitalization	MMSE† VAS for confusion, & Clinical Assess of Confusion (CAM)
<b>Schorr et al., 1992</b> <b>N=291</b>	Prospective cohort analytic study. Daily interview & observation	31.3% incidence of delirium using DSM-III criteria	Delirium symptom interview Incidence of delirium & OR
<b>Wanich et al., 1992</b> <b>N=235</b>	Quasi-experimental tx & control groups	No differences in delirium in tx & control.	MMSE Katz ADL scale
<b>Inouye et al., 1993</b> <b>N=107 &amp; N=174</b>	Two prospective cohort studies in tandem	Delirium developed in 27 of 107 pts (25%) Four risk factors for delirium.	MMSE, & Confusion Assessment Method (CAM)

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<p>O'Brien et al., 1993 N=174</p>	<p>Case control correlational study confusion hip fracture pts</p>	<p>Those with severe confusion were older &amp; likely to have less than a elementary education</p>	<p>Kahn Goldfarb Mental Status Questionnaire (MSQ)</p>
<p>Cole et al., 1994 N=88</p>	<p>Randomized trial with chart abstraction &amp; a nurse intervention</p>	<p>No statistical difference between tx &amp; control groups</p>	<p>Short Portable Mental Status Questionnaire (SPMSQ) &amp; DSM- III-R</p>
<p>Morency et al., 1994 N=325</p>	<p>Descriptive non- experimental nurse observation &amp; interviews</p>	<p>Incidence of delirium 31%,</p>	<p>Delirium Symptom interview (DSI) &amp; DSM-III criteria for delirium</p>
<p>Pompeii et al., 1994 N=432 &amp; N=323</p>	<p>Prospective cohort Descriptive Daily interviews</p>	<p>Subjects with delirium had longer LOS &amp; &gt; mortality</p>	<p>MMSE &amp; DSM- III-R criteria, Yesavage Geriatric Depression, &amp; Alcohol screen</p>

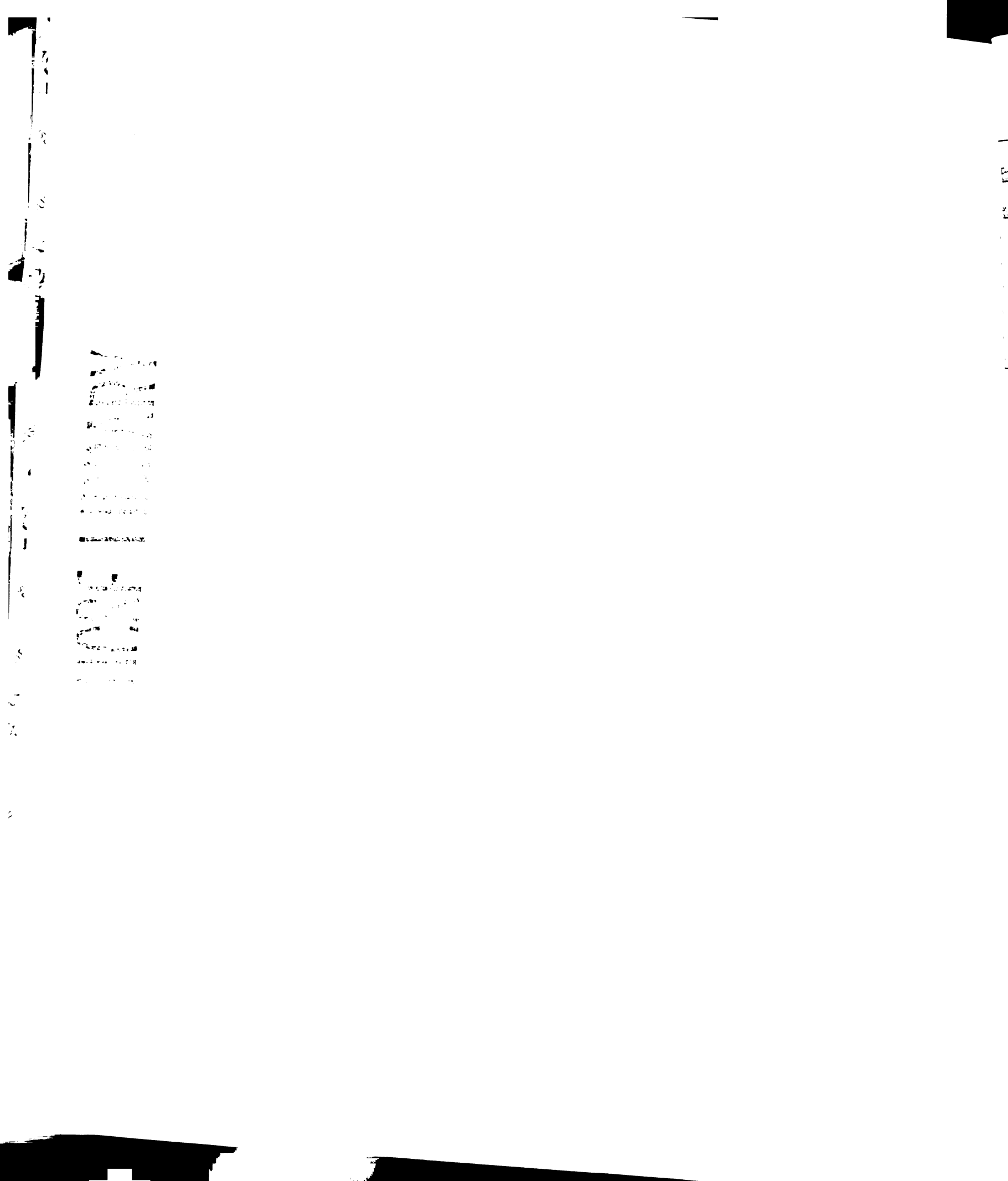
† Mini-mental state exam

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**Table 2**Review of selected Alzheimer's disease studies

Study	Study Design	Results	Measure of outcome	Measure of risk factor
<u>Stern, et al., 1994</u>	Cohort, longitudinal incidence study	Dementia risk increased in subjects with low education RR 2.02 95% CI 1.33-3.06	Neuro-psych tests, DSM-III-R criteria. Hamilton depression scale, & functional status, & Clinical Dementia rating	Education dichotomized into low (<8 years) and high (≥ 8 yrs)
<u>Moritz &amp; Petitti, 1993</u>	Cross Sectional	Reported age at sx onset was later in those with <u>less</u> education. Decreasing education associated > severity of disease at presentation.	NINCDS & ADRDA criteria for AD Blessed-Roth Dementia rating	Education 0-8, 9-11, 12, & >13 Measured as a continuous variable



<b><u>Fratiglioni et al., 1991</u></b>	Cross-Sectional, from ongoing longitudinal study	Less educated had a higher prevalence of false dementias	MMSE cutoff 23/24 DSM-III-R criteria Clinical Dementia rating scale	4-7 years & > 7 years
----------------------------------------	--------------------------------------------------	----------------------------------------------------------	---------------------------------------------------------------------------	-----------------------

**Table 3**Review of AD studies

Study	Study Design	Results	Measure of Outcome	Measure of Risk Factor
<u>O'Connor, et al., 1991</u> N=1,768	Cross-Sectional	Age had significant effect on risk of being diagnosed with dementia, but <u>education did not.</u>	MMSE, DSM-III & CAMDEX	Two education groups school-leaving age < 15 & > 15
<u>Osterweil, et al., 1994</u> N=201	Cross-Sectional Descriptive	Nondemented had a stat. sig. higher level of education than demented subjects	DSM-III-R criteria	0-4 years, 5-8, 9-12, & 13-20
<u>Zhang et al., 1990</u> N=5,055	Cross-Sectional	Low education, increasing age, & female gender significant and independent risk factors for dementia	DSM-III-R & NINCDS ADRD criteria	No formal education, < 6 years & > 6 years



Appendix B

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Appendix B  
Research Timetable and Diagram of Activities

**Weeks**

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|----|------------------------------|
| 1  | Phase One                    |
| 2  | 1) Intensive Participant     |
| 3  | Observation                  |
| 4  | 2) Establish Rapport         |
| 5  |                              |
| 6  |                              |
| 7  | Phase Two                    |
| 8  | 1) Continued Participant     |
| 9  | Observation                  |
| 10 | 2) Conduct in-depth          |
| 11 | interviews, N= 15-20         |
| 12 | 3) Event analysis-gather     |
| 13 | data on confusion events,    |
| 14 | N=20                         |
| 15 | 4) Begin data analysis       |
| 16 |                              |
| 17 |                              |
| 18 | Phase Three                  |
| 19 | 1) Final data collection and |
| 20 | analysis                     |
| 21 | 2) Complete coding of data   |
| 22 | 3) Writing of final paper    |
| 23 | 4) Write papers for          |
| 24 | publication                  |

## Appendix C

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**Confusion Study**  
**Nursing Staff Interview Guide**

**Date** \_                      **Interview length**

**Place of IV**\_\_\_\_\_

**Facility**\_\_A\_\_\_\_\_

**Age**\_\_\_\_\_

**Number of Years in Nursing**\_\_\_\_\_

**SEX:** M\_\_\_\_\_

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**Floor**\_\_\_\_\_

**Ethnicity**

**White**\_\_\_\_\_

**African American**\_\_\_\_\_

**Filipino**\_\_\_\_\_

**Chinese**\_\_\_\_\_

**Japanese**\_\_\_\_\_

**Russian American**\_\_\_\_\_

**Native American**\_\_\_\_\_

**Hispanic**\_\_\_\_\_

**Other** \_\_\_\_\_

**Type of Nurse**

**CNA** \_\_\_\_\_

**LVN** \_\_\_\_\_

**RN** \_\_\_\_\_

**CNS** \_\_\_\_\_

**NP** \_\_\_\_\_

**other** \_\_\_\_\_

**Specialty for CNS/NP** \_\_\_\_\_

**Educational level Diploma** \_\_\_\_\_

**A.D.** \_\_\_\_\_

**BSN**\_\_

**MS**\_\_\_\_\_

**Other**\_\_\_\_\_

**Specialization** \_\_\_\_\_

**How long have you worked at this hospital?**

**<1 year**\_\_\_\_\_

**1-5 years**

**6-10 years**\_\_\_\_\_

**> 10 years**\_\_\_\_\_

**How many elderly patients have you cared for in your nursing career that have been confused?**

**None** \_\_\_\_\_

**20 or <** \_\_\_\_\_

**21-49** \_\_\_\_\_

**50-99**

**100 or >** \_\_\_\_\_

**Interview background**

**Questions about specific patients with confusion**

**1. Do you remember caring for (pts name)? (if no skip to next set of question)**

**Yes**

**No**

**2. Tell me what it was like to care for (pts name)?**

**2a. Why do you think they were doing what they were doing?**

**3. Were you aware that they were confused?**

**4. What did you do for this patient and why?**



**5. Did you talk to the doctor about (pts name) confusion?**

**Yes**

**No**

**6. What did you talk about?**

**7. Did you talk to the family? (if yes probe what about)**

**8. How could you tell that (pts name) was confused? (Probe-what did he/she look like, act, or do or say))**

**9. Tell me why you think (pts name) is or was confused?**

**10. What are the major nursing problems (pts name) confusion presented?**

**11. How did you manage or respond to these problems?**

**12. Describe what some of the obstacles are to managing confused elderly patients?**

**13. How do you feel about using physical restraints for elderly patients who are confused?**

**13b. What about chemical restraints?**

**14. How do you feel about using hired sitters for elderly patients who are confused?**

**15. Do you feel family members can or should assist with the care of a confused elderly patient ?**

**yes\_\_\_\_\_**

**no\_\_\_\_\_**

**16. If yes to the above question, how could family members help with (pts name) confusion?**

**17. Are there differences in the management of a confused older person versus a confused younger person?**

**18. Is there any thing else you would like to tell me about managing elderly patients who are confused?**

**19. Have you had any education or coursework, seminars dealing with confusion in the elderly/ differences /B/ delirium & dementia?**

**Yes (specify)**

**No**

**Family Interview Guide****Code \_\_\_\_\_****1. Age \_\_\_\_\_****2. Ethnicity \_\_\_\_\_****White\_\_\_\_\_****African American\_\_\_\_\_****Filipino\_\_\_\_\_****Chinese\_\_\_\_\_****Japanese\_\_\_\_\_****Russian American\_\_\_\_\_****Native American\_\_\_\_\_****Hispanic\_\_\_\_\_****Other\_\_\_\_\_****3. Relation to patient****Spouse\_\_\_\_\_****Son\_\_\_\_\_****Daughter\_\_\_\_\_****Niece\_\_\_\_\_****Nephew\_\_\_\_\_****Grandson\_\_\_\_\_****Granddaughter\_\_\_\_\_****Sister\_\_\_\_\_****Brother\_\_\_\_\_**

**Sister-I-L\_\_\_\_\_**

**Brother-I-L\_\_\_\_\_**

**Dghter-I-L\_\_\_\_\_**

**Son-I-L\_\_\_\_\_**

**Friend\_\_\_\_\_**

**Legal Guardian\_\_\_\_\_**

**Other\_\_\_\_\_**

**Missing\_\_\_\_\_**

**4. As far as you can remember, has (pts name) ever been confused (probe-mixed up, not thinking straight, talking crazy) before when in the hospital?**

**5. How do you feel about seeing your (pts name/relationship to pt) confused?**

**6. How do you feel about how the hospital staff is managing this confusion?**

**7. Did the physician (DR \_\_\_\_\_) talk with you about the confusion?**

**Yes**

**No**

**7b. Did the nurse talk with you (or anyone else)?**

**8. What did he/she say?**

**9b. Is (pts name) confused at home?**



**9b. How do you manage their confused behavior at home? (if applicable)**

**10. Is there anything you think you could do that would help prevent his/her becoming confused while in the hospital?**

**Modified Blessed Dementia Rating Scale (MDRS) \*\***

**"I'd like to ask you about (pts name) abilities in everyday tasks the past 2 months."**

**1. Have you noticed any problems with ability to perform his/her usual household tasks in the past 2 months?**

JOSE L. MARTIN

JOSE L. MARTIN

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**0 No problem      1 Some Problem      2 Severe problem or inability**  
**7 Refuses to answer      9 Missing**

**2. Have you noticed any problem with his/her ability to cope with small sums of money?**

**0 No problem      1 Some Problem      2 Severe problem or inability**  
**7 Refuses to answer      9 Missing**

**3. Have you noticed any problem with his/her ability to remember a short list of items, such as a shopping list?**

**0 No problem      1 Some Problem      2 Severe problem or inability**  
**7 Refuses to answer      9 Missing**

**4. Have you noticed any problems with his/her ability to find his/her way indoors, either in his/her home or in other familiar locations?**

**0 No problem      1 Some Problem      2 Severe problem or inability**  
**7 Refuses to answer      9 Missing**

**5. Have you noticed any problems with his/her ability to find his/her way around familiar streets, either on foot or when traveling by car?**

**0 No problem      1 Some Problem      2 Severe problem or inability**  
**7 Refuses to answer      9 Missing**

**6. Have you noticed any problems with his/her ability to grasp situations, or to recognize surroundings or people?**

**0 No problem      1 Some Problem      2 Severe problem or inability**  
**7 Refuses to answer      9 Missing**

**7. Have you noticed any problem with his/her ability to recall recent events, such as recent outings or visits?**

**0 No problem      1 Some Problem      2 Severe problem or inability**  
**7 Refuses to answer      9 Missing**

**8. During the past 2 months did you notice in (pts name) any tendency to dwell in the past?**

**0 No problem      1 Some Problem      2 Severe problem or inability**  
**7 Refuses to answer      9 Missing**

**9. Which of the following best describes (pts name) eating habits during the past 2 months?**

- 0 Fed self without assistance    1 Fed self with minor assist  
 2 Fed self with much assist    3 Had to be fed  
 7 Refuses to answer            9 Missing

10. Which of the following best describes (pts name) ability to dress himself/herself during the past 2 months?

- 0 Able to dress self unaided            1 Required minor help  
 2 Required much assist                3 Unable to dress self  
 7 Refuses to answer                9 Missing

11. Which of the following best describes (pts name) toileting ability during the past 2 months?

- 0 Clean, cared for self at toilet    1 Occasionally incontinent or needed reminders  
 2 Frequently incont., needs mush assistance  
 3 Little or no control  
 7 Refuses to answer                9 Missing

Confusion History (CHFX) Before this hospitalization,

1. Did (pts name) ever experience any episodes of being confused or disoriented, like not knowing where he/she was or behaving inappropriately?

**0 No 7 Refuses to answer**

**1 Yes            8 Doesn't know            9 Missing**

**2. Did he/she have difficulty focusing attention, for example, being easily distracted or having trouble keeping track of what you were saying?**

**0 No 7 Refuses to answer**

**1 Yes            8 Doesn't know            9 Missing**

**3. Was his/her speech disorganized, incoherent, rambling, unclear, or illogical?**

**0 No 7 Refuses to answer**

**1 Yes            8 Doesn't know            9 Missing**

**4. Did he/she seem excessively drowsy during the daytime?**

**0 No 7 Refuses to answer**

**1 Yes            8 Doesn't know            9 Missing**

**5. Was he/she disoriented, for example, thinking he/she was somewhere other than where he/she was, or misjudging the time of day?**

**0 No 7 Refuses to answer**

**1 Yes            8 Doesn't know            9 Missing**

**6. Did he/she seem to hear or see things which weren't actually present, or seem to mistake what he/she saw or heard for something else?**

**0 No 7 Refuses to answer**

**1 Yes            8 Doesn't know            9 Missing**

**7. Did he/she behave inappropriately, such as wandering, yelling out, or being combative?**

**0 No 7 Refuses to answer**

**1 Yes            8 Doesn't know            9 Missing**

**8. Please describe the**

**episode(s);**-----  
-----

**9. During the episode(s), were these problems present all the time or did they come and go from day to day?**

**1 Come and go            2 all the time**

**7 Refuses to answer            8 Doesn't know            9 Missing**

**10. When did the last episode occur?**

**\_\_\_\_\_ Months**

**11. Overall have these problems gotten better, worse, or stayed about the same?**

**1 Better    2 Worse    3 About the same    4 Other (specify)**  
**7 Refuses to answer    8 Doesn't know    9 Missing**

**12. Is there anything else you would like to tell me about (pts name) ?**

**\*\* Uhlmann, R.F., Larson, E.B., & Buchner, D.M. (1987). Correlations of Mini-Mental State and Modified Dementia Rating Scale to measures of transitional health status in dementia. Journal of Gerontology, 1, 33-36.**



Appendix D

**Acute Confusion Episode Event Analysis Guide**

**1. Code #** \_\_\_\_\_

**2. Age /DOB** \_\_\_\_\_

**Ethnicity** \_\_\_\_\_

**3. Prior home**

**home/apt** \_\_\_\_\_

**nursing home** \_\_\_\_\_

**board & care** \_\_\_\_\_

**retirement home/assisted living** \_\_\_\_\_

**4. Living arrangement**

**alone** \_\_\_\_\_

**with spouse** \_\_\_\_\_

**with children** \_\_\_\_\_

**other** \_\_\_\_\_

**5. Marital status**

**single** \_\_\_\_\_

**married** \_\_\_\_\_

**divorced/separated** \_\_\_\_\_

**widowed** \_\_\_\_\_

**6. Medical diagnoses (list)**

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**7. Senses**

hearing \_\_\_\_\_ peripheral neuropathies \_\_\_\_\_

vision \_\_\_\_\_ other \_\_\_\_\_

**8. Lab information on admission**

Mean hgb \_\_\_\_\_

Bun/creat. \_\_\_\_\_

Sodium \_\_\_\_\_

Other \_\_\_\_\_

**9. Medications Scheduled (list)**

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**9b. PRN MEDS**

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**10. Lab info (list day obtained)**

Mean hgb \_\_\_\_\_

Bun/creat. \_\_\_\_\_

Sodium \_\_\_\_\_

Other \_\_\_\_\_

**11. Anesthesia type**

**General** \_\_\_\_\_

**Spinal** \_\_\_\_\_

**None** \_\_\_\_\_

**12. Infections after admission (list)**

**13. Discharge destination**

**NH** \_\_\_\_\_

**B & C** \_\_\_\_\_

**home alone** \_\_\_\_\_

**home with spouse** \_\_\_\_\_

**living with family member** \_\_\_\_\_

**Assisted living retire home** \_\_\_\_\_

**14. Restraint use**

**yes** \_\_\_\_\_

**no** \_\_\_\_\_

**# days restrained** \_\_\_\_\_

**type** \_\_\_\_\_

**14b How was the decision to restrain made?**

**Did the family participate in the decision to restrain?**

**15. Use of sitter**

**yes** \_\_\_\_\_

**No** \_\_\_\_\_

**16. Hospital day sitters began** \_\_\_\_\_

**17. Hospital day delirium developed**

Per CAM \_\_\_\_\_

Per chart notes \_\_\_\_\_

18. Folstein score day one \_\_\_\_\_

Folstein score after develop of delirium (list day) \_\_\_\_\_

19. Katz ADL scores (list hospital day)

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20. Total # inpatient days \_\_\_\_\_

21. Environmental factors

Number of room changes \_\_\_\_\_

Presence of IV \_\_\_\_\_ (yes/no)

Urinary Catheter \_\_\_\_\_

interruption of sleep per nurse notes \_\_\_\_\_

Presence of clock \_\_\_\_\_

Calendar (describe) \_\_\_\_\_

Number of days on bedrest \_\_\_\_\_

Number of days OOB or out of bed to chair \_\_\_\_\_

Number of days ambulatory \_\_\_\_\_

Windows in room \_\_\_\_\_

Lighting \_\_\_\_\_

Noise Level \_\_\_\_\_

Number of different RN caregivers \_\_\_\_\_

Number of other nurse extenders \_\_\_\_\_

Personal belongings at bedside (clothing, photos, cards) \_\_\_\_\_

**22. Give a brief summary of the nature of the acute confusion event.**

**23. What were the signs or events that indicated the presence of an acute confusion?**

**24. Person who identified the problem?**

**25. When was the problem reported to the physician?**

**26. Why was the problem reported to the physician?**



Appendix E



## Appendix E

### The Confusion Assessment Method (CAM)

#### Feature 1. Acute onset and fluctuating course

This feature is usually obtained from a family member or nurse and is shown by positive responses to the following questions: Is there evidence of an acute change in mental status from the patients baseline? Did the (abnormal) behavior fluctuate during the day, that is, tend to come and go, or increase or decrease in severity?

#### Feature 2. Inattention

Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?

#### Feature 3. Disorganized thinking

Was the patients thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

#### Feature 4. Altered level of consciousness

This feature is shown by any answer other than "alert" to the following question: Overall how would you rate this patients level of consciousness? (alert [normal], vigilant [hyperalert], lethargic [drowsy, easily aroused], stupor [difficult to arouse], or coma [unarousable]).

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**\*The diagnosis of delirium by CAM requires the presence of features 1 and 2 and either 3 or 4.**

Appendix F

Folstein Mini-Mental State Exam**Maximum****Score    Score****ORIENTATION****5            n            What is the (year) (season) (date) (day) (month)?****5            n            Where are we: (state) (country) (town) (hospital)  
(floor)?****REGISTRATION****3            n            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.****Trials****ATTENTION AND CALCULATION****5            n            Serial 7's. 1 point for each correct. Stop after 5  
answers.****Alternatively spell "world" backwards.**

**RECALL**

- 3**      **n**      **Ask for the 3 objects repeated above. Give 1 point for each correct.**

**LANGUAGE**

- 9**      **n**      **Name a pencil, and watch (2 points)**

**Repeat the following "No ifs, ands or buts." (1 point)**

**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)**

**Total score**

**ASSESS level of consciousness along a continuum**



Appendix G

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## Appendix G

### Cornell Scale for Depression in Dementia

#### Scoring System

a-unable to evaluate    0-absent    1-mild or intermittent    2-severe

#### 1. ANXIETY

a 0 1 2

Do you ever feel anxious or worried?

#### 2. SADNESS

a 0 1 2

Do you ever feel sad or tearful?

#### 3. LACK OF REACTIVITY TO PLEASANT EVENTS

a 0 1 2

Do you attend social activities and enjoy them?

How do you fill your day?

#### 4. IRRITABILITY

a 0 1 2

Do you ever feel short-tempered?



## 5. AGITATION

a 0 1 2

Do you feel restless? Do you wring your hands?

## 6. RETARDATION

a 0 1 2

Slow movement, speech or reactions

## 7. MULTIPLE PHYSICAL COMPLAINTS

a 0 1 2

Do you have any physical complaints?

(score 0 if stomach complaints only)

## 8. LOSS OF INTEREST

a 0 1 2

Less involved in usual activities in the last month

## 9. APPETITE LOSS

a 0 1 2

How is your appetite?

Are you eating about the same qD?

## 10. WEIGHT LOSS

a 0 1 2

How is your weight?

## 11. LACK OF ENERGY

a 0 1 2

Do you tire easily? Do you feel unusually tired?

## 12. DIURNAL VARIATION OF MOOD

a 0 1 2

Do you feel happy or blue some times of the day?

## 13. DIFFICULTY FALLING ASLEEP

a 0 1 2

Do you have any trouble falling asleep?

14. MULTIPLE AWAKENINGS DURING SLEEP

a 0 1 2

Do you wake up during the night?

15. EARLY MORNING WAKENING

a 0 1 2

What time do you wake up in the morning?

16. SUICIDE

a 0 1 2

Do you ever feel like you would not want to live?

17. SELF-DEPRECIATION

a 0 1 2

Have you had a good life?

(feelings of failure or self-blame)

18. PESSIMISM

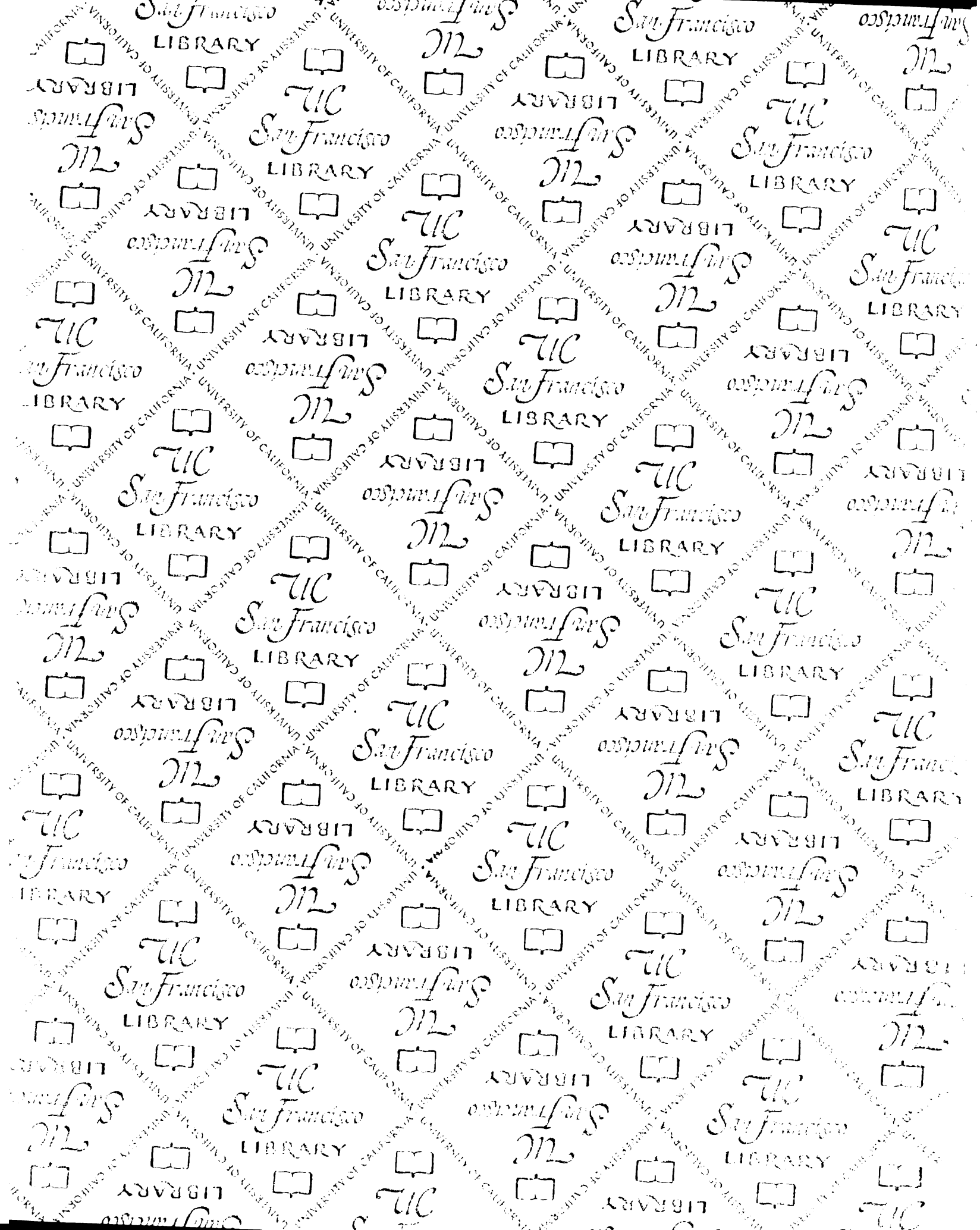
a 0 1 2

Would you say you are an optimist?

19. MOOD CONGRUENT DELUSIONS

a 0 1 2

- a. Can you tell me about your health?
- b. Have there been any changes in your body recently?
- c. Are you having financial problems? If yes, then ask-
- d. Is there some reason why you are having financial problems?



# For reference

Not to be taken from the room.

