

AN ABSTRACT OF THE THESIS OF

Oh-Jung. Kwon for the degree of Master of Science in Family Resource Management presented on June 6, 1988.

Title: Physical Aspects of Specialized Units for Alzheimer Patients in Long Term Care Facilities.

Redacted for privacy

Abstract approved: _____

Betty Jo White

This exploratory study described the protected living environments of segregated Alzheimer/Dementia Units (ADUs) and compared them to selected physical aspects of the larger institutions in which they were housed. A nonrandom, purposive sample used in this study included 99 nursing homes with ADUs in 34 states.

Data were collected using a mail questionnaire developed to obtain data about ADUs and the long term care facilities in which they were located. A 78 percent response rate was achieved. The data were analyzed using frequency distributions, descriptive statistics, and the nonparametric McNemar test. Four null hypotheses with sub-parts were tested.

Recommendations reached on the basis of the data analysis and literature reviewed were:

- 1) To provide a living environment that permits freedom of movement with complete safety and security for dementia patients (and their personal possessions), further research should investigate the provision of the following safety and security features in ADUs: a

simple, uncluttered environment with all hazards removed or secured, and outdoor exits that are simultaneously secured (locked or alarmed) and "fire safe";

- 2) Furnishings of ADU patients' rooms need not differ significantly from other nursing home residents' rooms in terms of personal furnishings and possessions and privacy arrangements--both should provide a homelike, personalized living environment;
- 3) To help Alzheimer patients to find their way in an ADU, a personal marker or resident's photo posted near the door of their room is recommended;
- 4) To provide a quiet, calm atmosphere in an ADU, sound-absorbent ceiling and wall surfaces, and modified public address systems are suggested;
- 5) Further research should test the effects of the following variables (for which frequencies were significantly different but relatively low in the ADUs) under controlled conditions: lockable storage features in residents' rooms; environmental cueing devices such as landmarks, color-coding, pictograph symbols, or wall hangings; and noise reduction via removal of television sets or radios; and
- 6) Safe and secure outdoor facilities may be an essential and unique physical feature of the ADU living environment.

PHYSICAL ASPECTS OF SPECIALIZED UNITS
FOR ALZHEIMER PATIENTS
IN LONG TERM CARE FACILITIES

by

OH-JUNG KWON

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Master of Science

Completed June 6, 1988

Commencement June, 1989

APPROVED:

Redacted for privacy

Associate Professor of Family Resource Management in charge
of major

Redacted for privacy

Chairman of department of Family Resource Management

Redacted for privacy

Dean of Graduate School

Date thesis is presented June 6, 1988

ACKNOWLEDGEMENTS

Several people have contributed to the production of this thesis and to the quality of my graduate school experience. Special and sincere appreciation goes to my major advisor, Dr. Betty Jo White, Associate Professor in the Department of Family Resource Management. Throughout my program she provided assistance, encouragement, patience, and empathy.

My thanks to Dr. Geraldine Olson, who helped make graduate school a good experience, whether it be financial or emotional. I would also like to thank the other members of my committee; Pamela K. Evans and Dr. Floyd B. McFarland, for their interest and positive and thoughtful suggestions.

Thanks to Suzie Maresh of the OSU Survey Research Center for her statistical expertise and efforts to complete this study. Many thanks to my Korean friends, the faculty and graduate students for their kindness, encouragement and for making my stay at Oregon State University an enjoyable one.

Finally, I wish to express my love and appreciation to my family who have supported me in all of my endeavors.

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
Problem Statement	1
Purpose of the Study	2
Objectives	2
Study Framework	3
Hypotheses	3
Rationale for the Study	6
Definition of Terms	7
Delimitation	12
II. REVIEW OF LITERATURE	13
Ecological Theories of Behavior and Environment	13
Lawton's Adaptation Theory	13
Kahana's Person-Environment Congruence Theory	16
Living Environments in Long Term Care Facilities	17
Physical Aspects	18
Fire Safety	18
Residents' Rooms	19
Common Areas	20
Lighting and Color	22
Backgrounds	23
Noise Control Methods	24
Environmental Cues	24
Dementia and Alzheimer Disease	25
Symptoms and Their Progress	26
Physical Aspects of Alzheimer/Dementia Units	27
Institutionalization and Segregation of	28
Alzheimer Patients	29
The ADU Therapeutic Milieu	32
Physical Design Features	32
Safety/Security Features	32
Residents' Rooms	34
Bath and Toilet Arrangements	36
Environmental Cueing Devices	37
Reality Orientation Aids	38
Noise Reduction Methods	39
Other Areas	40
Lighting	42
Wall and Floor Surfaces	43
Color	44
ADU Program Components	46
Specialized Staffing	46
Admission Criteria	47
Other Components	49
Summary	50
III. METHODOLOGY	56

Development of the Instrument	56
Sample Selection	57
Data Collection and Analysis	58
IV. FINDINGS AND DISCUSSION	60
Sample Description	60
The Long Term Care Facilities	60
The Alzheimer/Dementia Unit (ADU) Programs	62
Admission and Discharge Criteria	62
ADU Program Components	65
Daily Rates and Payment Methods	66
The ADU Residents	67
Sex and Age	67
Previous Location	69
Functional and Mobility Levels	70
Physical Characteristics of ADU Living Environments	71
Physical Characteristics of ADUs	71
Creation of ADUs	71
ADU Common Areas	74
Selected Physical Features	75
Safety and Security Features	75
Reality Orientation Aids	78
Environmental Cueing Devices	79
Furnishings of Residents' Rooms	79
Toilet and Bath Arrangements	81
Communication and Noise Reduction Methods	82
Backgrounds	84
Lighting	85
Evaluation of ADU Physical Aspects	86
Testing of Hypotheses	89
V. SUMMARY AND IMPLICATIONS	101
Summary of Findings	101
Sample Description	102
Physical Characteristics of ADU Living Environments	104
Testing of Hypotheses	107
Recommendations and Implications	108
Implications for Further Research	113
REFERENCES	116
BIBLIOGRAPHY	120
APPENDICES	123
Appendix A Survey Questionnaire	123
Appendix B Cover Letter	129
Appendix C Postcard Follow-up	130
Appendix D Second Follow-up Letter	131
Appendix E Description of ADU Floor Surfaces	133
Appendix F Description of ADU Wall Surfaces	134

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Study Framework	3
2	Environmental Press - Competence Model	14
3	Activity-Matched Color Themes for Alzheimer Patients	45

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Type and Location of Sample Long Term Care Facilities	61
2	Size of Sample Facilities by Level of Care	62
3	Overall Programs of Alzheimer/Dementia Units	63
4	Percentage of ADU Residents by Payment Method	67
5	The ADU Residents	68
6	Physical Characteristics of ADUs	72
7	Selected Physical Features: Safety/Security Features, Reality Orientation Aids and Environmental Cueing Devices	76
8	Selected Physical Features: Furnishings of Residents' Rooms and Toilet and Bath Arrangements	80
9	Selected Physical Features Related to Communication/Noise Reduction, Backgrounds, and Lighting in the ADU	83
10	Physical Changes or Additions to Create ADU	87
11	Most Successful Physical Aspects of ADUs	88
12	Physical Factors that Respondents would Change or Add	89
13	McNemar Test for Comparison of Frequency of Selected Safety/Security Features	91
14	McNemar Test for Comparison of Frequency of Selected Furnishings of Residents' Rooms	94
15	McNemar Test for Comparison of Frequency of Environmental Cueing Devices	96
16	McNemar Test for Comparison of Frequency of Communication/Noise Reduction Methods	99

PHYSICAL ASPECTS OF SPECIALIZED UNITS FOR ALZHEIMER PATIENTS IN LONG TERM CARE FACILITIES

CHAPTER I: INTRODUCTION

Problem Statement

Changes in the age structure in the U.S. population will be dramatic over this century. While in 1900 only four percent of the population was over the age 65, this proportion rose to slightly more than 11 percent by the mid-Eighties. Approximately 15 percent of the population over the age 65 (about four million persons) has some degree of cognitive impairment (Brody, 1985).

Alzheimer disease (AD) is a significant cause of cognitive impairment in the 20th century. At least two million Americans suffer from the disease (Katzman, 1986). From five to six percent of persons over age 65 have diagnosable forms of dementia, and 20 percent over age 85 have AD. Two-thirds of dementia patients are cared for at home, whereas the other one-third are cared for by institutions (Eastman, 1986). The course of the disease eventually leads many families to seek nursing home placement. Currently five percent of all elderly live in institutional settings, and that population is anticipated to rise from 1.1 to 5.4 million by 2050 (Brody, 1985). About half of all nursing home residents have a dementia, with senile dementia of the Alzheimer's predominating (Terry & Katzman, 1983).

The segregated specialized unit for elderly patients

with significant cognitive impairment or behavioral problems is a new phenomenon in U. S. long term care facilities. Alzheimer and dementia patients pose special problems for caregivers and nursing homes. Wandering, agitation, aggression, suspiciousness, irregular sleep patterns, confusion, disorientation, incontinence, and poor personal hygiene are among the behaviors and symptoms that make it difficult to care for Alzheimer patients who are housed with other nursing home residents. Also, other patients (or their families) often object to the presence of dementia patients among the facility's general population.

Many long term care facilities have renovated wings or designed new additions to provide a separate, protective living environment for some of their Alzheimer patients. Certain physical features such as security systems are an important and unique aspect of managing patients with the symptoms and behaviors associated with the disease. Yet the optimum therapeutic milieu for the Alzheimer/Dementia Unit has not been defined and a description of the state of the art in existing U. S. facilities is unavailable.

Purpose of the Study

The purpose of this exploratory study is to describe living environments of Alzheimer/Dementia Units (ADUs) in long term care facilities. Specifically, the unit's physical aspects are described and compared to those of the remainder of the facility.

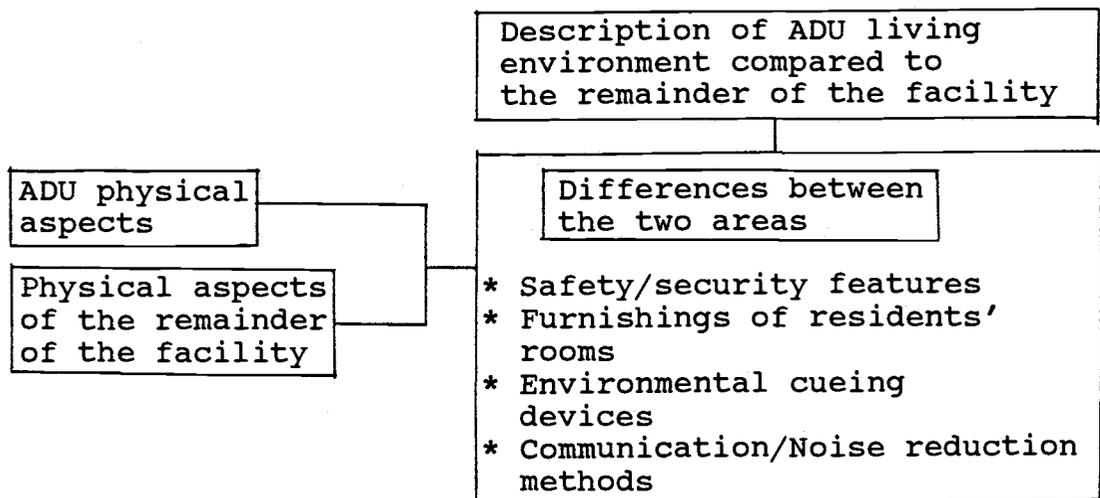
Objectives

The objectives of this study are:

- 1) To describe physical aspects and program elements of ADU living environments, and
- 2) To determine how physical aspects of the ADUs differ from the design and construction of the remainder of the long term care facility.

Figure 1 shows a graphic summary of the variables involved in the study.

Figure 1. Study Framework



Hypotheses

The null hypotheses developed to measure the objectives are:

H₀₁: There is no difference between the sample ADUs and the remainder of their facilities on the proportion of selected

safety/security features reported:

- a) Stairs, stairways, and elevators are secured or alarmed,
- b) Interior "exits" from unit are disguised,
- c) Outdoor exits are openable but equipped with alarm systems,
- d) Secured outdoor exits automatically unlock with fire alarm,
- e) Patients wear sensors to activate security alarms on exits,
- f) Half-doors or dutch doors used on some interior openings,
- g) Wide angle mirrors or video monitors used for surveillance,
- h) Housekeeping chemicals are secured or kept with the aides,
- i) Housekeeping carts are secured while in use,
- j) "Clutter" is minimized--little to grab, eat, or drink,
- k) Glass or easily breakable items kept away from residents,
- l) Residents are allowed to smoke only in specified areas,
- m) Residents are allowed to smoke only under supervision.

Ho2: There is no difference between the sample ADUs and the

remainder of their facilities on the proportion of selected furnishings of residents' rooms reported:

- a) Lockable or latched (chest of) drawers for each resident,
- b) Lockable hanging storage/closet for each resident,
- c) Full- or half-length wall mirrors in room,
- d) Residents may bring in their own bed,
- e) Residents may bring in 1-2 other large pieces (e.g., an easy chair, chest of drawers),
- f) Each resident may have TV, radio, or stereo,
- g) Each room may have TV, radio, or stereo,
- h) Nightlight in each resident's room,
- i) Individual privacy arrangements,
- j) Window treatments secured so difficult to pull down,
- k) Rooms are significantly different with recognizable objects.

Ho3: There is no difference between the sample ADUs and the remainder of the facilities on the proportion of selected environmental cueing devices reported:

- a) Units/floors are color-keyed or "themed" to look different from others,
- b) Residents' rooms are color-coded (walls, furniture, doors),
- c) Color-coded activity areas, e.g., dining, dayroom, etc.,
- d) Use of matching photos or symbols (patient carries

- one, the other is on the door),
- e) Personal marker/residents' photo posted near room door,
 - f) Bathrooms are marked with pictures or colors,
 - g) Supergraphics or patterns on walls or floors,
 - h) Pictograph symbols ("signs without words"),
 - i) Large murals,
 - j) "Landmarks" (picture groups, objects),
 - k) Color or style of staff uniforms,
 - l) Signs.

Ho4: There is no difference between the sample ADUs and the remainder of their facilities on the proportion of selected communication/noise reduction methods reported:

- a) Public address systems modified to cut extraneous noise,
- b) Public address systems are used only in emergency,
- c) Public address systems disconnected or not used,
- d) Staff use walkie-talkie/beeper communication devices,
- e) No television in the dayroom or lounge area,
- f) Residents' rooms monitored by intercom/video system,
- h) Sound-absorbent wall surface material,
- i) Carpeted floors.

Rationale for the Study

The number of Alzheimer patients needing nursing home care can be expected to rise in the coming decades because of

demographic changes (e.g., growing elderly population and older caregivers), the progressive nature of the disease, and social trends (e.g., divorce rate, smaller families) that are likely to result in fewer potential caregivers. In many facilities, Alzheimer patients are separated from other residents and housed in specialized "heavy care" units. The living environment in Alzheimer/Dementia Units (ADUs) must meet the unique needs of both residents and their progressive symptoms. Yet little research has been completed to identify the optimal therapeutic milieu for institutionalized Alzheimer patients.

This study will provide baseline data about physical aspects of ADU design and construction that may be useful to the long term care industry (including staff). The description may also be comforting to patients' family members who may not understand the benefits of the physical differences exhibited by the ADU. Progress toward the ultimate goal of improving the quality of life for Alzheimer/Dementia patients and their caregivers will be furthered if appropriate research questions and methodologies can be identified as a result of these findings and conclusions.

Definition of Terms

The following terms have been defined for use in this study:

Alzheimer disease (AD): The most common form of dementia, an organic brain disease leading to progressive loss of brain

function and eventual death. The cause is unknown and there is no effective standard medical treatment (Committee on Nursing Home Regulation, 1986). Also referred to as Senile Dementia of the Alzheimer Type (SDAT). This study uses the term "Alzheimer disease" (instead of the more familiar "Alzheimer's disease") in accord with recommended usage by the American Academy of Neurology and the American Neurological Association and their respective journals (U.S. Office of Technology Assessment, 1985; hereafter cited as U.S. OTA).

Alzheimer/Dementia Unit (ADU): A specialized and segregated physical location, usually within a long term care facility, that has special activity programming and heavy care for selected Alzheimer and dementia patients who need a protected environment. The term, special care unit (used generically in the long term care industry) is not used here because it has been trademarked by the Hillhaven Corporation (that fact is, however, not well known).

Cognitive impairment: Impairment of mental functions of memory, intelligence, learning ability, calculation, problem solving, judgement, comprehension, recognition, orientation, and attention. Impairment of these functions is a central feature of dementia and primary cause of its associated self-care and behavioral problems (American Association of Homes for the Aging, 1985; hereafter cited as AAHA).

Dementia: Impairment in mental or intellectual function and global cognitive abilities of long duration (months to

years). Symptoms include memory loss, loss of language function, inability to think abstractly, inability to care for oneself, personality change, emotional instability, loss of sense of time and place, and behavior problems. Dementia can be caused by more than 70 disorders, but the leading cause in the U.S. is Alzheimer disease (U.S. Office of Technology Assessment, 1987).

Disorientation: The lack of correct knowledge of person, place, or time, i.e., where a person is, who the people around him or her are, and what time of day, day of the week, or month it is (U.S. OTA, 1987).

Environmental cueing: Using several modes of communication such as certain patterns, colors, textures, symbols and familiar items to provide the individual with more than one stimulus to gain information about his/her surroundings (Koncelik, 1976; Scott, 1977).

Intermediate Care Facility (ICF): A long term care facility offering personal care and help with daily living activities, but less intensive nursing care than a Skilled Nursing Facility (SNF). Called the Health Related Facility (HRF) in some regions of the U. S., the ICF provides room and board for people not fully capable of independent living. The ICF resident differs from the rest home resident in that s/he will have several medical problems and may require treatments or injections (Aranyi & Goldman, 1980).

Long term care facility (LTCF): A general term that serves

as an umbrella over a wide range of institutions offering nursing care and many different levels of service to elderly residents who are unable to care sufficiently for themselves. These include skilled nursing and intermediate care facilities, nursing homes, adult care homes, or similar institutions regulated by the states (Committee on Nursing Home Regulation, 1986).

Medicaid: The federal-state health care financial assistance program for needy and low-income people of all ages. About 42 percent of nursing home residents in the U. S. are supported by Medicaid payments (AAHA, 1986).

Medicare: The federal health insurance program for people 65 or older who are in need of skilled or intensive nursing or rehabilitative care, people who have been disabled for at least two years, people suffering from chronic kidney disease. Certain nursing home costs are reimbursable by Medicare (AAHA, 1986).

Memory: The power or process of reproducing or recalling what has been learned or retained. There are several different forms of memory: immediate (remembering for a few seconds), short-term (remembering for a few months), and long-term (remembering material learned from year to year). Memory loss is a symptom of dementia, particularly short-term memory (U.S. OTA, 1987).

Nursing home: A long term care facility that is licensed by the state to provide custodial and health care at different

levels to elderly people who can no longer live independently because of physical or mental debilitation, emotional trauma, or chronic illness (AAHA, 1986). The terms, nursing home and long term care facility, are used interchangeably in this study.

Physical aspects: The physical design and construction features and facilities that promote maintenance or enhancement of quality of life with safety and respect for the rights of other residents in long term care facilities and Alzheimer/Dementia Units. These features include not only the amount and arrangement of interior and exterior spaces, but also furnishings, equipment, and decor.

Program components: The therapeutic milieu and total program of an ADU consists of the physical facility plus other important elements such as nursing care, activity programming, various therapies, etc.

Reality orientation: A process by which disoriented persons become less confused. Those who come in contact with confused residents participate in the process by reminding the resident of his or her name, where she or he is, the hour, day, or season of the year. Most long term care facilities also have several reality orientation boards (including calendars, photographs, or clocks) scattered throughout the facility (Aranyi & Goldman, 1980).

Skilled Nursing Facility (SNF): A long term care facility that provides 24-hour nursing care, rehabilitation programs,

and other specialized services (under the supervision of a registered nurse) to chronically ill and disabled elderly persons. The SNF resident differs from the ICF or HRF resident in that s/he will require extensive medical and nursing care, may be bedridden, may have indwelling catheters, or may be tube-fed (AAHA, 1986).

Wandering: Behavior in which the resident appears to be walking aimlessly through the area. Careful observation will often reveal that the resident has a goal in mind, but cannot find his or her way there. Wandering is upsetting to the resident, and presents a serious safety problem when he or she wanders away from a long term care facility, frequently with the aim of "going home" (AAHA, 1985).

Delimitation

The focus of this study was limited to the physical aspects of a nationwide, nonrandom sample of specialized Alzheimer/Dementia Units (ADUs) and the long term care facilities in which they were located. Long term care facilities without ADUs were not included in the study.

CHAPTER II: REVIEW OF LITERATURE

The focus of this chapter is the ecological theories of behavior and environment, long term care facility design, dementia and Alzheimer disease, and physical aspects of Alzheimer/Dementia Units.

Ecological Theories of Behavior and Environment

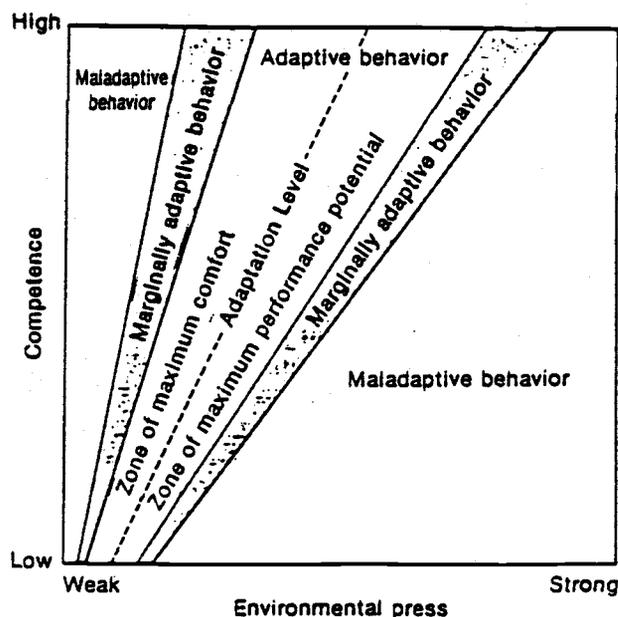
Lewin (1951) conceptualized person/ environment relations by formulating the ecological equation, $B=f(P.E)$; that is, "behavior is a function of both the person and the environment" (Lawton, 1986). This theoretical construct helps specify the common features of many types of interactions between persons and their environments. Environmental psychology and ecological theory are based primarily on Lewin's equation and are relevant to housing problems of the elderly because in general, older people are particularly sensitive to environmental variation (Lawton, 1982). The two ecological models of person-environment relationships that provide the theoretical background for this study are applicable to the task of improving the living environments of the elderly, particularly in nursing homes. They are Lawton's Adaptation Theory and Kahana's Person-Environment Congruence Theory.

Lawton's Adaptation Theory

Lawton and Nahemow (1973) elaborated a model of adaptation and aging to show the relationship between man and the

environment. This model has two major components: competence and environmental press. "Competence" represents the person element (P) of Lewin's equation; "environmental press" is the environmental element (E); and adaptive behavior is the behavioral outcome (B). Competence can be defined as the individual's functional capacities in terms of health, perception, cognition, and motor skills. Environmental press is the type of stress, challenge or demands placed on an individual, therefore activating behavior. The physical, architectural, psychological and social barriers in residential surroundings are included in the environmental press (U.S. OTA, 1985). Figure 2 graphically summarizes Lawton's model.

Figure 2. Environmental Press - Competence Model



Source: Lawton and Nahemow, 1973, pp 45.

The relationship between the individual's level of competence and the amount of environmental press creates a broad spectrum of adaptive behavior. Lawton's environmental docility hypothesis states that the less competent the individual, the greater the impact of environmental press on that individual. Conversely, the more competent the individual, the less the impact of environmental press. The adaptation level represents a state of balance between the environment and the individual. Maladaptation occurs when individual competence is low and environmental press is high, or when individual competence is high and environmental press is low. But it is difficult to determine when the individual moves from the marginal to the maladaptive behavior situation (i.e., when environmental press is strong enough to induce functional dependence in an older person) (U.S. OTA, 1985). If the environment becomes too complex for the individual, behavioral outcomes may include failure to achieve, struggle, and stress (Lawton, 1986).

Lawton attempted to classify living environments on the basis of the demands they place on older persons. These include high competence-high challenge, low competence-high support, high competence-high support, and low competence-high challenge (Lawton, 1975). Alzheimer patients living in long term care facilities represent the low competence and high environmental press situation as a result of a non-homelike environment. Segregated specialized units for those

patients (Alzheimer/Dementia Units in this study) may lower the press. Physical aspects or features of ADUs, in particular, may be important elements in reducing maladaptive and negative behaviors in dementia patients. Behavioral outcomes such as stress, extreme emotionality, agitation, disorientation, and other symptoms in Alzheimer patients may be caused by the disease but may also result from maladaptation to high environmental press.

Kahana's Person-Environment Congruence Theory

Kahana's congruence model characterizes the optimal environment as one that offers maximal congruence between individual needs and environmental press. Kahana uses Lawton's definition of environmental press. Congruence is "goodness of fit" between characteristics of the person and the properties of his or her environment (Kahana, 1982). Congruence represents the desired state of affairs and leads to a sense of well-being, the primary outcome. Adaptive strategies may serve to reduce any mismatch either by changing individual needs or by changing the environment. Either too great a mismatch or complete congruence produces a negative outcome.

Kahana's model can be applied to older people's needs for special settings such as in nursing homes. Alzheimer patients have unique needs because of their cognitive impairment and symptoms, and may experience high environmental press within the institutional setting. The im-

portance of the physical aspects of ADUs, based on Kahana's model, is that positive behavioral outcomes can be a response to a changed and more appropriate living environment.

Living Environments in Long Term Care Facilities

The demand for nursing homes to care for the ill elderly began increasing in the 1950s, but significant growth did not occur until the enactment of Medicare and Medicaid laws in 1965 (Aranyi & Goldman, 1980; Breger & Pomeranz, 1985). The need for new nursing homes continues to increase because of dramatic increases in longevity, shifts in family composition and living arrangements, lack of caregivers in the family, and advances in medical and public health. The typical nursing home resident is white, female, widowed, 79 years old, and has lived in the facility for 2.6 years (Kart, 1985).

Nearly 30 percent of today's long term care facilities were not originally designed and constructed for their present use. Difficulties include operational inefficiencies, inaccessibility to the handicapped, lack of life and fire safety, and lack of amenities and design features that increase the quality of residents' life. The basic design and layout of nursing homes is often based on the medical model. Therefore, it is not surprising that long term care facility living environments are often not very homelike or residential.

Researchers have begun to describe the optimum "thera-

peutic milieu" for nursing home residents, however, and flexibility to adapt to change has become a major specification in facility design (Noakes & Taylor, 1986). The physical environment can play an important role in improving effective functional flow and establishing a homelike atmosphere in long term care facilities. Hiatt (1982) suggests that physical environment, as a tool of prevention, rehabilitation, and compensation for impairment of older people, can be used to maximize health, well-being, sensory acuity, and independent functioning.

Physical Aspects

To place the detailed discussion about ADUs in context, the following discussion briefly introduces physical aspects of long term care facility design in general. The specific elements are fire safety, residents' rooms, common areas, lighting and colors, backgrounds, noise control methods, and environmental cues.

Fire Safety

Fire safety is vital in any public building, but especially so when the residents have mobility restrictions, sensory impairments, or suffer from disorientation. Long term care facilities are subject to strict federal and/or state fire safety codes (in addition to local building code requirements) and are required to be inspected and cleared for fire safety at least once a year. Facilities that

participate in either Medicare or Medicaid must meet the National Fire Protection Association's Life Safety Code (Aranyi & Goldman, 1980; Zimmerman, 1983). Fire codes require that exit doors be clearly marked, unobstructed and unlocked from the inside. Stairways are enclosed and the doors to stairways must be kept closed. An emergency evacuation plan must be posted throughout the facility, and practiced often by the staff and residents (AAHA, 1986).

The basic goal of fire protection in a long term care facility is to limit combustible materials and limit the spread of fire via compartmentation. Various fire safety equipment and features such as fire alarm systems, smoke detectors, fire extinguishers, sprinkler systems, panic hardware on doors, and smoke partitions or barriers are likely to be required to achieve these goals and to promote a safe/secure feeling among the residents and staff (Aranyi & Goldman, 1980; Speyer, 1987). Furnishings such as upholstery, mattresses, draperies, and carpeting should be of fire retardant materials. Heating systems, kitchens, and laundries must be contained in rooms with one-hour fire walls, and equipped with automatic sprinklers.

Residents' Rooms

Nursing home residents' rooms become the major area for private behavior, expressions of identity, and personal control (Noakes & Taylor, 1984; Brown, 1987). Nursing home residents often spend 90 percent of the day in their rooms.

Single resident rooms are optimal, but there should be no more than four beds, situated to permit easy access.

Each resident room should open onto a corridor, have a window, and be large enough to maneuver a wheelchair easily. Each bed should also have a drapery for privacy, a call button, and fresh drinking water within reach. Each resident in the room should have at least one comfortable chair, a reading light, a mirror, closets and drawers for belongings. To maintain a sense of identity and well-being, each resident may have personalized space to display pictures, mementos, books, and other belongings. A window view and space for sitting can help create a homelike atmosphere (Aranyi & Goldman, 1980; Brown, 1987; Noakes & Taylor, 1984).

Ideally, each resident's room has a private toilet and lavatory. But toilet and lavatory may be shared by up to four residents. Toilet rooms should be convenient to the residents' rooms, designed for easy use by wheelchair patients, and have space to facilitate personal assistance, transfers and grooming, and include call buttons, grab bars, and nonslip surfaces. Storage, quite lacking in most institutional bathrooms, should be sufficient to accommodate the grooming needs of the user (Aranyi & Goldman, 1980; Koncelik, 1976).

Common Areas

Dining rooms can give an attractive and inviting atmosphere and should contain comfortable chairs, tables and

space for wheelchair users to move around conveniently. The dining area should be sufficiently separated from the food preparation area. In many cases, nursing home residents eat in their own rooms because the dining facilities cannot meet their special needs.

An activity room is designed for residents to enjoy reading, craft work, or social activity such as card games. Depending on the size of the nursing home, there may be a separate activity room, or the dining room may double as one between meals.

The lobby or lounge area is usually the focal point for active participation in and passive observation of residents' social activities. Koncelik (1976) concluded that lounges often do not meet their intended purpose, i.e., the promotion of socialization and the provision of a place of retreat or relaxation. Lounges may be inaccessible and impeded within by furniture unsuitable for use by most of the residents. A welcome atmosphere with comfortable chairs and couches, plants or flowers, colorful wall decorations, or a bulletin board with menus or notices of activities is advisable.

Hallways should be wide enough to allow two wheelchairs to pass with ease. Handrails must be installed on the walls. Too-long hallways are not recommended because they become architectural barriers (Brown, 1987; Koncelik, 1976). Placement of chairs or benches in hallways, and near or within elevators will help residents conserve their energy,

thus decreasing the potential for accidents.

Lighting and Color

Rutledge (1987) notes that lighting is one of the tools used to help people find their way through the environment. Good artificial and natural lighting is essential in a nursing home to help create a positive and aesthetically pleasant environment not only for residents but also staff and visitors. It also decreases the chances of accidents and increases mobility within the facility (Aranyi & Goldman, 1980; Brown, 1987). Lighting design must accommodate the reduced sensory perception of old people. They may be sensitive to glare, unable to see details in dim light, less comfortable under fluorescent lights, and slow to adapt to varying intensities of light. Most studies show a preference for warm lighting as it relates to human skin tones (Rutledge, 1987). Overhead fluorescent fixtures are most commonly used in corridors for economy. Illumination levels for incandescent lighting are usually limited because of the heat produced and the energy consumed. Using indirect lighting and adequate contrast with colors is an effective way to create a homelike atmosphere while providing adequate and consistent light levels (Aranyi & Goldman, 1980; Hiatt, 1982; Rutledge, 1987).

By providing contrasts in color, texture, and pattern in facility design, the psychological and physiological well-being of residents can be enhanced. Colors and patterns,

however, must be carefully selected to avoid optical confusion or dizziness. To aid independence and promote safety, different colors can be used on door handles to differentiate them from the door, on light switches to differentiate from the wall, or on walls to identify the handrails (Stichler & Peters, 1987). Colors can also individualize residents' rooms, giving them a sense of territory. Color-coding in corridors and individual rooms can also help the residents find their way more easily (Aranyi & Goldman, 1980; Mousseau, 1987).

Backgrounds

Backgrounds such as walls, floors, and ceilings are important aspects of the physical environment in stimulating vision and sense of touch. Considerations in selecting materials for these backgrounds should include their hygienic qualities, colors, light reflection, sound-absorbent qualities, textures, insulation value, durability, and initial and maintenance cost (Aranyi & Goldman, 1980; Koncelik, 1976).

In order to avoid glare, glossy surfaces should not be used on walls and floors. Vinyl wall covering is an excellent material on walls in areas that require frequent cleaning. Sound-absorbent material such as carpeting must be considered for floor surface treatments. But facilities that house incontinent residents should avoid the use of carpets because of the constant maintenance problem. Also, ceilings may be more textured than walls and floors, because they do

not come into direct physical contact with the residents. These ceilings are used mainly for sound distribution or absorption (Aranyi & Goldman, 1980; Mousseau, 1987).

Noise Control Methods

Acoustical environments can be a barrier to the social behavior of the residents in long term care facilities. Researchers have reported that uncontrollable background noises are detrimental to older persons' abilities to understand sounds (Birren, 1964). The solutions to background noises and voice amplification involve eliminating noisy sources; using more sound absorbent, textured (fire resistant) materials; isolating mechanical and electrical equipment that produce noise and vibrations; and appropriate site planning far from noisy streets (Aranyi & Goldman, 1980; Hiatt, 1982).

Environmental Cues

Environmental cues have also become important design factors in long term care facilities. Lack of proper identifying cues such as (super)graphics, signs, lights, familiar large items, plants, and wall hangings can often lead to confusion for many residents. Use of simple patterns and clearly marked cues in corridors and floors can make the residents feel more comfortable to find their ways (Koncelik, 1976).

Dementia and Alzheimer Disease

To understand the person-environment interface between the Alzheimer patients and the living environment, information on the disease is necessary. The major topics discussed in this section include dementia and Alzheimer disease, and symptoms and their progress.

Dementia is an organic brain syndrome that results in the progressive loss of mental functions. These losses often begin with memory, learning, intelligence, comprehension, attention and judgement, and a complex of symptoms that can be caused by many different underlying diseases. Dementia is different from mental retardation (having below average mental abilities) in that it involves a loss of previous abilities (U.S. OTA 1987). Alzheimer disease is a surprisingly common disorder that affects the cells of the brain and accounts for from 50 to 60 percent of dementia cases.

In Alzheimer disease, the nerve cells are destroyed throughout the cerebral cortex (the outer layer of the brain) leading to an accumulation of abnormal fibers. The disease was first described in 1906 by Alois Alzheimer, a German neurologist. Its cause is currently unknown and no cure has been identified, although various treatments are currently being tried (Deedy, 1984). Alzheimer disease is now recognized as the most common cause of cognitive impairment in older Americans. Called "the disease of this (20th) century," it is ranked as the fourth leading cause of death for

American adults. It usually appears when people are in their 40's or 50's and thereafter, but in rare cases in their 20's (Aronson, 1982).

Symptoms and Their Progress

Alzheimer disease symptoms and their progress vary from one person to another. Some individuals become very passive and quiet while others become angry and agitated and, in some cases, physically or verbally abusive. Still others proceed through a variety of behavior patterns in sequence over time (Morscheck, 1984). Various researchers divide the stages of Alzheimer disease differently. Hayter's classification (1974), which describes three stages, is summarized here (Dietsche & Pollman, 1982).

The first stage is approximately two to four years in duration and is characterized by memory loss and time disorientation that may result in changes of personality, mood, behavior, and judgement. This stage is so subtle that neither the patient nor the family is likely to be aware that the symptoms indicate a disease (Morscheck, 1984).

The second stage may extend over a long period of time with progressive mental and physical disorientation. In this stage, many patients undergo marked changes in personality and exhibit behaviors such as wandering, extreme memory loss, language difficulties, sleep disturbances, agitation, incontinence, aggression, and suspiciousness. In the most severe cases, the patients are totally incapable of caring

for themselves. In the past, these patients were often housed in mental institutions. With the advent of the deinstitutionalization movement of the Sixties and Seventies, however, that is no longer an option for most patients.

The third stage is the terminal stage for Alzheimer patients (although it may last for months). The focus of care shifts from behavioral management to full-time nursing care in this stage, in which the patient may require hospitalization (Schultz 1987). The final stage is characterized by apathy, progressive weakness, coma, and death.

Many patients in the late first or early second stages of Alzheimer disease are admitted to long term care facilities because they have extreme difficulties living at home. The disease has become severe enough to cause both social and safety problems. While mildly and moderately impaired Alzheimer patients may be able to remain among the general nursing home population, some may benefit from living in a separate, segregated unit of the facility. The living environment of these units is developed to maximize orientation, functioning, safety, and security with regard to the residents' symptoms and incapacabilities.

Physical Aspects of Alzheimer/Dementia Units

To accommodate the specific symptoms and behaviors described above, the segregated Alzheimer/Dementia Unit (ADU) has been developed within many long term care facilities. The major topics discussed in this section include

institutionalization and segregation of Alzheimer patients, the therapeutic milieu, physical design features, and special ADU program components.

Institutionalization and Segregation of Alzheimer Patients

Three major factors are consistently involved in the decision to institutionalize an Alzheimer patient: bowel and bladder incontinence; uncontrolled, persistent wandering; and aggressive, assaultive behavior (Schultz, 1987). Behavioral changes such as wandering, irregular sleep patterns, agitation, denial, paranoid thought, apathy, irritability, depression, and an inability to communicate and to complete routine daily tasks such as dressing, toileting, and getting to activities, create a greater dependency than found among other chronically ill nursing home patients and increase workloads for staff/caregivers (Pynoos & Stacey, 1986). Presently, however, many long term care facilities are inadequately prepared to deal with these factors.

For the most part, Alzheimer patients are housed in mixed settings, together with other nursing home patients. Pynoos and Stacey (1986) concluded that mixed nursing home settings are characterized by inadequate and inappropriate staffing patterns and regimentation which, in turn, causes loss of autonomy and control, impoverished environments, and isolation of patients. Lawton (1981) also suggests that the typical nursing home environment is inadequate both spatially

and behaviorally for Alzheimer patients. Therefore, these patients may benefit from segregated nursing home settings in which staffing, programs, and the environment are specifically arranged to meet the residents' special needs.

ADU placement will not be appropriate for all Alzheimer patients. The level of severity of the disease must be established at the outset in order to prevent premature admission to an ADU (Peppard, 1985). ADUs try to match the environment to individual competencies so that the demands of the ADU are not beyond patients' capabilities. At the same time, these units provide enough environmental stimulation to allow patients to exercise their competence (Pynoos & Stacey, 1986).

The ADU Therapeutic Milieu

Although no cure now exists for Alzheimer disease, many experts agree that the quality of life of Alzheimer patients could be improved by creating an environment appropriate to their needs (Schultz, 1987). But only a few empirical studies have been done on ADUs: e.g., an observational assessment of the effectiveness of specialized Alzheimer nursing home units (Bell & Smith, 1987) and the design of a unit for confused elderly people at the Philadelphia Geriatric Center (Liebowitz et al., 1979). Other research has involved case studies (Peppard, 1985 & 1986a-b) and library research-based development of "design patterns" for nursing homes with Alzheimer patients (Roll, 1986). These studies

suggest that environment is the single most significant factor affecting the behavior and functional level of the Alzheimer patients. In creating a therapeutic milieu that gives stability, security, and consistency to Alzheimer patients, the following need to be considered: staff and their relationships with patients, family environment, medical care, and the physical environment. Within that holistic approach, this study focuses on the physical aspects.

Undoubtedly, the physical environment plays a major role in the dementia patient's emotional well-being, as it can either encourage depressed feelings or improve morale in general (Schultz, 1987). Therefore, the living environment of the ADU should be uniquely designed to: 1) help staff with their workload, 2) accommodate patients' immediate and changing needs, and 3) maximize residents' orientation, functioning and safety. Its overall atmosphere should be stress-reducing, consistent, and purposely active (Peppard, 1985).

Institutional life is foreign and difficult for everyone, but placing an Alzheimer patient in an unfamiliar institutional environment can exacerbate existing memory problems and lead to greater agitation, confusion, and potential catastrophic reaction (Pynoos & Stacey, 1986). Patients are most comfortable in an environment similar to home rather than institutional in appearance. The creation

of a homelike atmosphere and a warm, accepting, uncritical, relaxed environment can minimize the need for physical restraints and reduce or eliminate insomnia. Furthermore, patients may be kept calm with little or no psychotropic drug treatment (Boosalis, 1985; Peppard, 1985).

The planning and design of ADUs requires a thorough understanding of the behaviors manifested by dementia patients. The following behaviors have great impacts on the living environment: wandering, sundowning, rummaging, and incontinence (Schultz 1987).

Wandering is the most common problem among Alzheimer patients. Although its cause is not certain, it may be based on previous lifestyles of people who were "always on the go" or who left when unable to handle stressful situations.

Sundowning is agitated behavior exhibited by many Alzheimer patients in the late afternoon or at the dinner hour. As the disease progresses, sundowning becomes increasingly prevalent. The lack of stimulation and environmental cues such as light during evening hours sometimes causes patients to become demanding, restless, upset, confused, and dis-oriented.

Rummaging is thought to occur when patients lose their ability to distinguish between people and things. Because Alzheimer patients forget and are confused, they often feel compelled to search aimlessly for something that is missing. They may rummage through others' possessions as well as their

own.

Incontinence is involuntary loss of urine and/or feces (Aranyi & Goldman, 1980). Approximately 70 percent of all nursing home admissions occur because a person has become incontinent (Schultz, 1987).

Physical Design Features

The following sections describe the physical features of ADUs. The specific elements include safety/security features, residents' rooms, bath and toilet arrangements, environmental cueing devices, reality orientation aids, noise reduction methods, other areas, and backgrounds.

Safety/Security Features

Patient safety/security is an issue that deserves special attention when designing an ADU. To create a safe physical environment, it is necessary to minimize environmental stress and potential injury but maximize residents' freedom and independence within the living environment, and decrease disorientation and agitation. Strict fire and safety adaptation should be made (Schultz, 1987). Physical features closely related to wandering or other cognitive impairments that may result in injury are necessary to provide a safe ADU environment and to protect persons with those behavioral problems. Features or arrangements for optimum safety also make it possible to reduce chemical and physical restraints (Bell & Smith, 1987; Goodman, 1986).

Wandering is the most common behavioral problem related to patients' safety/security. Usually, an ADU is located away from high activity areas in a separate wing where residents have the freedom and security to wander. Kromm and Kromm (1985) suggest that an ADU may be closed off and operated during the day as a self-contained unit with its own staff and nursing station. At night, the ADU may be opened and supervised by the home's general nursing staff.

An alarm system is one of the most useful features in an ADU to help staff monitor patients' whereabouts (Kromm & Kromm, 1985). All outdoor exits are equipped with an alarm system and exterior doors are secured to allow "controlled" wandering (Berger, 1985; Kromm & Kromm, 1985). Gwyther (1986) suggests installing an alarm system at the nursing station. The alarm, a coil embedded in rubber or a sensor worn around one ankle or in the shoe of the wandering patient, signals the nursing station whenever the patient approaches an exit. This type of system is recommended over a door alarm that produces a shrill, unexpected noise that can frighten the patient.

Stairways and elevators also need to be monitored by a secured or alarmed system; and easy-to-grip, properly anchored handrails should be installed (Gwyther, 1986; Berger, 1985; Schultz, 1987). These areas, as well as selected doors may be "disguised" so that patients do not try to use them. For example, doors leading to potentially

dangerous steps are painted to match the walls. Half-doors or dutch-doors may be used in some interiors to discourage entry or exit but allow surveillance. Wide angle mirrors and video or intercom systems are sometimes used in corridors or at nursing stations for surveillance and patient monitoring (Liebowitz et al., 1979).

In a resident's room, most objects can be permitted but potentially dangerous things such as clutter, food, razors, and easily breakable items should be removed. Curtains or draperies, recommended to maintain a homelike appearance, should be secured with a special cord made of flexible, stretchable rope to keep patients from pulling the window treatments down or off the wall (Berger, 1985; Schultz, 1987). In a kitchen, a special switch and timer may be attached to the range to ensure that it can be turned on only when staff are in the area to supervise (Liebowitz et al., 1979).

Residents' Rooms

The design of residents' rooms in ADUs should make them feel "at home" and accommodate their disabilities. Each room should provide for privacy, identity, and personal control (Noakes & Taylor, 1984). Lack of privacy is one of the most difficult aspects of ADU design. A private room with toilet for each resident is usually suggested to give privacy, reduce the confusion that a semi-private room may create, and help residents to remain continent (Liebowitz et al., 1979;

Pynoos & Stacey, 1986). But Goodman (1986) states that Alzheimer patients prefer to share their rooms with others for social bonding.

To aid in self-identification, ADU rooms are clearly numbered and labeled with residents' names (Kromm & Kromm, 1985). Peppard (1986a) also suggests that a personal identification "label" may be chosen by each resident on the ADU. Of distinctive design and color (e.g., a triangle, leaf, or half-moon), the label is consistently placed on all items relating to the resident.

Furnishing residents' rooms with their personal possessions, such as their own bed, bedding, chest of drawers, chairs, a television, radio, or stereo, is encouraged to create a sense of individuality and belonging (Liebowitz et al., 1979; Schultz, 1987). Meaningful objects, such as photos, mementos, awards, and trophies also give the room a personalized atmosphere. These should be fire-resistant and nonhazardous (Hiatt, 1980). Adequate in-room storage space for clothes and other possessions helps motivation to dress and choose clothing. Locks on storage units will minimize rummaging in others' belongings. A full or half-length wall mirror is provided to keep the resident "in touch with who she or he is" (Liebowitz et al., 1979).

In order to reduce over-stimulation and over-excitement, warm and light natural colors with bright color accents are recommended for patients' rooms. Washable vinyl wall

coverings of a neutral shade provide a background for fabric wall hangings and pictures (Liebowitz et al., 1979; Schultz, 1987).

Bath and Toilet Arrangements

To Alzheimer patients, a bath can be a frightening experience. Furthermore, a shower or whirlpool bath can be especially so and should be avoided. Deinstitutionalizing the bathing rooms in ADUs can diminish agitation and fear of bathing. Staff should maintain a calm and relaxed atmosphere while the patient is bathing or using a toilet (AAHA, 1985).

Toilet rooms must be large enough to accommodate the resident and two staff members (Schultz, 1987). Schultz notes that some experts recommend one toilet between two rooms but others believe this arrangement can create confusion if a resident enters a bathroom, gets "turned around," and exits into the other room. Bathroom fixtures should be a different color than the walls and floors to aid patients in identifying them (Schultz, 1987).

Colorful towels and shower curtains, plus curtains instead of stalls with doors are used in ADU toilet areas to avoid patients' getting "trapped." Improved bathroom design is important because many Alzheimer patients are unable to control their bowel/bladder. ADU programs may include hydration programs that include monitoring of intake, plus scheduled bathroom visits. Incontinent residents may also wear incontinence aids (Liebowitz et al., 1979; Schultz,

1987).

Environmental Cueing Devices

Environmental cueing uses several modes of communication to provide the individual with more than one stimulus to gain information about the environment (Koncelik, 1976). Environmental cueing devices can help patients to find their way to or be guided away from specific areas in an ADU. According to Hiatt (1980), cues are signals (for example, name plates, color coding, and numbers) that may be viewed close up to tell patients that they are going the right way. She defines a landmark as a conspicuous object, identifiable from some distance. It should be selected because of its clearly identifiable cultural, geographic, or religious meaning and its ready recognizability and distinctiveness in relation to the surroundings.

Because color is a latent cue for orientation, ADU units or floors may be color-keyed or "themed" to look different from others. Hallways may be painted a different accent color in order to increase orientation. Door jambs of ADU rooms are color-coded to help residents distinguish their rooms from others (Liebowitz et al., 1979). Residents may distinguish better among different pieces of furniture if each has its own bright color such as blue, red, and green (Goodman, 1986).

Other environmental cues may be provided by signage or sensory variations. Because rooms are typically very

similar, familiar objects such as personal markers or residents' photos could be placed outside the resident's room door to assist him or her in orientation. Or each room may have the name of occupant and a three-dimensional room number installed at eye level. Simple supergraphics on walls or floors, pictograph symbols ("signs without words"), and large wall hangings or murals are often used as cues in corridors, residents' rooms, bathrooms, or main entrance doors (Berger, 1985; Hiatt, 1980; Liebowitz et al., 1979; Schultz, 1987). Finally, textile changes may be utilized to assist in way-finding by differentiating architecture visually and/or tactilely. For example, the elevator lobby can have a different tactile surface (such as brick) than the painted corridor walls (Roll, 1986).

Reality Orientation Aids

Reality orientation aids are used as a psychotherapeutic technique for assisting confused, disoriented elderly persons. The importance of the reality orientation variable for Alzheimer patients stems from the nature of the disease itself (progressive loss of mental faculties). The purpose of these aids is to orient the individual in time and space while compensating for the progressive losses in sensory acuity associated with aging and the disease (Roll, 1986).

One simple way to combat confusion and disorientation in an Alzheimer patient is to establish a reality orientation center in their room. This center is the core of an or-

ganized system of clues and environmental aids that will enable the person to function with more independence (Folsom, 1968). Whether located in resident's room or in common areas of the ADU, reality orientation centers usually include such things as a large clock, and easily-read appointment or activity calendar, and a chalk board or bulletin board on which the resident can record the day's schedule, a place for frequently used items such as keys, glasses or hearing aids, and simple cues to remind the memory (Liebowitz, et al., 1979; Hiatt, 1980; Roll, 1986). An orientation board that shows the name of facility, the date, the weather and the next holiday can be centrally located in the resident's room or in ADU common areas. It should be easily accessible both visually and physically (Roll, 1986).

Sometimes reality orientation aids are not used with Alzheimer patients because they can cause anxiety, frustration, and subsequent undesirable behaviors. Much of the information offered in reality orientation is irrelevant and overwhelming (Goodman, 1986).

Noise Reduction Methods

Alzheimer patients who are hearing impaired are more likely to become agitated or experience catastrophic reactions in the presense of noise. The progressive loss of hearing that results from the aging process (presbycusis) can cause special problems for Alzheimer patients who cannot comprehend their loss. Therefore, an ADU should provide a

quiet, calm atmosphere.

Several methods of noise reduction are recommended for ADUs: 1) control noise by increasing the distance between the noise source and the individual; 2) utilize acoustical/sound-absorbent materials for floors, walls, ceilings, window coverings, and furnishings; and 3) stop noise at its source by utilizing sound-absorbing materials such as felt, rubber, nylon or encasing the noise-producing object in sound-absorbing material. Also, television or radio/audio systems may be eliminated or be monitored with volume control for clarity and comprehension of sound since hearing impaired patients may have difficulty hearing low- and high-frequency sound. Music may also be provided as a stimulus within social areas and private areas (AAHA, 1985; Peppard, 1985; Roll, 1986; Schultz, 1987).

Other Areas

Other areas of concern in designing ADUs are hallways, dining areas, living/activity/lounge areas. In ADUs, the hallway creates close physical proximity of residents and staff, even in the absence of social interaction. Patients may receive enjoyment by passively watching the activity in the corridor. Widening the hallway in an ADU can give the benefits of the institutional hallway while avoiding its undesirable aspects such as congestion, a heightened institutional look, and safety hazards. Long corridors are recognized as contributing to patients' disorientation. There-

fore, they should be no more than 50-75 feet in length or more than 8 feet wide to place patients' chairs and decorative furniture (Goodman, 1986; Liebowitz et al., 1979). Buzzers installed in floor pads in the corridors signal patients' approach to the elevators and warn the staff that they are exiting (Goodman, 1986). It is recommended that each hallway be painted a different accent color in order to increase orientation (Kromm & Kromm, 1985; Liebowitz, 1979).

Kromm and Kromm (1985) recommended that an ADU have its own dining area to provide a stable and safe atmosphere to avoid the frustrations caused by loss of short-term memory. Furthermore, a "therapeutic kitchen" is kept locked, but can be used by residents under staff supervision. Through cooking, patients will recall their past lives and keep their short-term memories. Residents are encouraged to socialize at mealtime and be as independent as possible. Alzheimer patients usually prefer to take meals in a dining room rather than eat alone in their rooms. Appropriate seating arrangements, such as a U-shaped or kidney-shaped table (for providing assistance), appropriate dishware patterns, design and color, and the overall dining room environment are keys to successful mealtimes for Alzheimer patients (Goodman, 1986; Liebowitz et al., 1979; Peppard, 1985).

Schultz (1987) concluded that the way to facilitate mental well-being for Alzheimer patients is to provide one or more areas such as activity rooms or lounges where small

groups can congregate. Several sources recommend that ADUs have their own large living or activity areas located centrally in the unit to encourage socializing and unplanned encounters with others. Usually, these areas have a piano, television set, video equipment, and easily movable furniture for small activity groupings. Sometimes, the living/activity space also can be used for passive recreation, such as listening to music and watching movies. Lounge areas are usually smaller spaces than living/activity areas. Small lounges to be used by families while visiting may be located near the entrance (Berger, 1985; Kromm & Kromm, 1985; Liebowitz et al., 1979).

Lighting

Lighting is a major factor in designing an ADU. Appropriate light location and level are closely related to improving the Alzheimer patient's mental and physical abilities. Lack of light can cause fear of darkness, agitation, sleep disturbances, and wandering behavior. Dim or dark corridor lighting and glare from floors, table tops, and furnishings, plus a lack of homelike lighting are problems in ADUs. The use of nonglare surfaces is very important because of the hallucinations that Alzheimer patients may experience (Berger, 1985; Peppard, 1985; Schultz, 1987).

Lack of daylight in corridors and central activity areas is a critical problem in ADUs. Adjustable fluorescent

ceiling lighting can provide at "daylight levels" (Liebowitz et al., 1979). Ceiling fluorescent lighting is usually too uniform but the addition of wall-mounted incandescent fixtures and table lamps can provide warmth, shadows, and textured light. These fixtures also create a homelike atmosphere. High-glare floors or furnishings should be eliminated and shiny table tops covered.

Wall and Floor Surfaces

Peppard (1985) suggests that the use of highly textured, "pastel-contrasted," sound-absorbent materials as ADU wall or floor surface treatments. Wallpapers have been used extensively to give warmth and contribute to a homelike atmosphere. Washable vinyl wall covering of a neutral shade is often used as a background for fabric wall hangings or pictures. "Wild," busy patterns on wall coverings are eliminated in order to avoid residents' confusion and agitation (Liebowitz et al., 1979; Peppard, 1985; Schultz, 1987). Schultz (1987) reported that while some clinicians oppose bright, patterned, striped, plaid or otherwise intricately-designed wallpaper, all types of patterned wallpapers have been used in Europe without problem. Carpeting as a floor or wall treatment is installed to add warmth and to reduce sound and glare. Patients who do not communicate and are incontinent are assigned to areas with hard surface floors instead of carpeting.

Color

Throughout the normal aging process, several changes take place in the older eye: the lens begins to thicken and becomes yellow, and the muscles that control pupil dilation weaken. While both of these changes have a major impact on environmental perception, they are exacerbated further when the individual suffers from a dementia (Peppard, 1986b). Color is one of the suggested strategies for improving the living environment in an ADU. But its effect on patient behavior is frequently debated among experts (Schultz, 1987).

Schultz concluded that color can be an effective way to monitor patient behavior and response to sensory perception. Because Alzheimer patients often respond on a sensory rather than an intellectual level, color therapy is an effective means to control and direct behavior. Therefore, it may be implemented to aid patients in their day-to-day living in an ADU. In general, neutral colors are used for calming, and brighter colors are used to initiate responses that appeal to old memories or basic behavioral patterns (Goodman, 1986; Rhodes & Houser, 1986).

Bright colors are advised in common areas because they enable patients to differentiate one area from another, making them less likely to enter the wrong one. Conversely, a light neutral tone or a moderate color scheme is recommended for patient rooms in order to calm and base the residents and to reduce stimulation (Berger, 1985; Goodman,

1986; Liebowitz et al, 1979; Schultz, 1987). Based on case study research, Rhodes and Houser concluded that different areas in an ADU should have their own matched color theme appropriate to the use of the area. Figure 3 summarizes their color recommendations for each area:

 Figure 3: ACTIVITY-MATCHED COLOR THEMES
 FOR ALZHEIMER PATIENTS

AREA	COLOR	EFFECT
Activities	Violet	Stimulates thought, interest, inquiry; may stimulate fine motor movement; related to cognition
Sitting Room Lounge	Blue	Evokes calm, peacefulness, little physical stimulation; may stimulate certain sensory organs (i.e. eyes, nose, and ears)
Conversation	Green	Sense of healing, calming; may stimulate speech, communication and verbal skills
Dining Room	Yellow & Orange	Uplifting, stimulates physical alertness, warming
Patient Rooms	Taupe & Beige	Little or no stimulative effects; peaceful and nonthreatening

 Source: Rhodes & Houser, 1986, pp 31.

Light and dark color contrast can be used to help patients differentiate between a door and its frame (Schultz, 1987). But sharp color contrast in flooring should be avoided. Goodman (1986) stated, "if there is a point on the floor where two different colors meet, dementia patients feel that there should be an accompanying change of level, and they become fearful of crossing it." In sum, although many

experts recognize color as an important means of improving ADU patients' quality of life, conclusive evidence of its specific role has not been found.

ADU Program Components

This section describes various program components that ADUs may offer to complete the therapeutic milieu. These potential components include specialized staffing, admission criteria, and other elements.

Specialized Staffing

In the treatment of Alzheimer disease, a desperate need exists for the personal-care assistant, particularly in the early and middle stages of the disease (Schultz, 1987). Appropriate staff approaches in an ADU can reduce the frequency and intensity of behavior problems in Alzheimer patients. The intensive staffing pattern of an ADU includes: 1) carefully selected, highly trained, experienced staff members; 2) continuity in staffing (no high staff turnover and no large proportions of part-time employees); and 3) higher resident to staff ratios (a usual recommendation is a ratio of five residents to one staff person). This pattern will ensure that patients receive the individualized care and attention they need to minimize their disorientation, discomfort, agitation, and disruptive behavior (Berger, 1985; Bell & Smith, 1986; Peppard, 1985; Pynoos & Stacey, 1986).

Each ADU patient may be assigned his or her own aide,

practical nurse, or registered nurse, who will present the same familiar face from day to day (Berger, 1985; Pynoos & Stacey, 1986). To provide familiar, noninstitutionalized surroundings for the patients, ADU staff often do not wear uniforms (Bell & Smith, 1986; Peppard, 1985). Because these skilled staff members are well trained and very sensitive to moods and responses of individual residents, they are able to reduce combativeness, incontinence, and night wandering (Peppard, 1985). The staff also capitalizes on long-term memory and tries to avoid the frustrations that patients experience due to loss of short-term memory (Goodman, 1986). Because the staff work in an intense atmosphere, however, they can easily "burn out" (Bell & Smith, 1986; Berger, 1985).

Resident-living assistants in ADUs must be certified nursing assistants who have gained specialized training with Alzheimer patients. If possible, ADUs also have continuing training and education programs for all staff. In addition, a well-organized volunteer program for patients' families can reduce the need for nursing staff, making the ADU more cost-effective (Bell & Smith, 1986; Schultz, 1987).

Admission Criteria

Not all Alzheimer/Dementia patients will live in the ADU. In order to avoid inappropriate placement, ADU admission criteria may include a complete neurological assessment, with a diagnosis of Alzheimer disease or a

related irreversible dementia. Family information is gathered on an assessment tool that includes the patient's social and psychological history, as well as recent personal history. For example, "What side of the bed does the resident normally get out on?" "Does the resident have an alarm clock next to his bed? If yes, what kind?" (Peppard, 1985).

Examples of other admission criteria include those used by one facility (Yankee Health Care, 1987):

- 1) Resident is ambulatory.
- 2) Resident is able to feed him/herself.
- 3) Resident gives evidence of having severe memory loss.
- 4) Resident does not require more than the minimum amount of medical care than the limited number of staff can give.
- 5) Resident can manage some self care (dressing, bathing and brushing teeth) with the help of staff.
- 6) Resident can follow instructions related to very simple tasks such as pouring a glass of milk or putting cookies on a plate.
- 7) Resident will be given a six-week trial period on the unit before admission is considered permanent.

When patients reach the later stages of the disease and can no longer benefit from the ADU program, they may be transferred or discharged to another level of care, to their homes, or to a hospital or hospice. ADUs may specify "discharge criteria" to determine the point at which the ADU is no

longer beneficial.

Other Components

In order to enhance the independence and functional level of Alzheimer patients and to improve the quality of care, ADUs may have several special therapeutic programs and may make special efforts to involve the families and community in the functioning of the units. These program components can increase appropriate management of the patients' common problems such as wandering, incontinence, anger, insomnia, restlessness and catastrophic reactions (Bell & Smith, 1986; Peppard, 1985; Rhodes & Houser, 1986). They include the following:

Hydration programs keep incontinent residents on a hydration or bowel/bladder monitoring schedule (Peppard, 1985).

Daily activities programs have a dramatic, positive effect on wandering and night-time wakefulness (Peppard, 1985; Rhodes & Houser, 1986).

Family education programs are beneficial for both staff and family, incorporating the family in the care of their relative (Berger, 1985; Peppard, 1985).

Therapy programs Occupational or recreational therapy is helpful to keep residents active and busy. Music can also play an important role in the life of the Alzheimer patient, even when speech is lost. A music therapist may be retained to spend 30 hours per week with the residents of the unit (Goodman, 1986; Schultz, 1987).

Summary

Ecological theories that are primarily based on person-environment relations are closely related to housing problems of the elderly. Two ecological models, Lawton's adaptation theory and Kahana's person-environment congruence theory, are applicable to the task of improving the living environments of elderly nursing home residents and Alzheimer patients in particular. Lawton's adaptation theory shows the relationship between the individual's level of competence and the amount of environmental press. It states that the less competent the person, the greater the impact of environmental press on that person. Alzheimer patients living in long term care facilities may represent the low competence and high environmental press situation as a result of a non-homelike environment. Kahana's congruence model characterizes the optimal environment as one that offers maximal congruence between individual needs and environmental press. The importance of the physical aspects of ADUs, based on these two models, is that positive behavioral outcomes can be a response to a changed and more appropriate living environment.

The design of long term care facility living environments is often based on medical models, and therefore is not homelike or residential. Facilities may also have difficulties such as operational inefficiencies, inaccessibility to the handicapped, lack of life and fire safety, and lack of

amenities and design features that increase the quality of residents' life. But researchers have begun to describe the optimum "therapeutic milieu" for nursing home residents. The physical environment can play an important role in improving effective functional flow and establishing a homelike atmosphere in nursing homes.

Fire safety is vital in long term care facility design, especially when the residents have mobility restrictions, sensory impairments, or suffer from disorientation. Residents' rooms should also be designed to provide for privacy, identity, and personal control. Common areas such as dining rooms, activity rooms, lobby or lounge areas, and hallways should be attractive and designed so residents feel safe, comfortable, and attractive, and enjoy their social activities. Good nursing home lighting is essential to help create a positive and aesthetically pleasant environment for residents, staff, and visitors; to decrease the chances of accidents; and to increase mobility within the facility.

By providing contrasts in color, texture, and pattern, the psychological and physiological well-being of residents can be enhanced. Backgrounds such as walls, floors, and ceilings are important to stimulate vision and sense of touch. Acoustical environments can present social barriers to hearing-impaired residents, especially when background noises decrease older persons' abilities to understand sounds. Environmental cues are also important design

factors; use of simple patterns and clearly marked cues can make residents find their way and feel more comfortable.

Dementia is an organic brain syndrome that results in the progressive loss of mental functions such as memory, learning, intelligence, comprehension, attention, and judgement. Its cause is currently unknown and no cure has been identified. Senile dementia of the Alzheimer's type is recognized as the most common cause of cognitive impairment in older Americans. The symptoms and progress of Alzheimer disease vary from one person to another. The first stage of the disease is characterized by memory loss and time disorientation. The second stage is characterized by wandering, extreme memory loss, language difficulties, sleep disturbances, agitation, incontinence, aggression, and suspiciousness. In the final stage, patients exhibit apathy, progressive weakness, coma, and death. Many patients in the late first or early second stages of the disease are admitted to long term care facilities because they have extreme difficulties living at home.

The major factors usually involved in the decision to institutionalize an Alzheimer patient are bowel and bladder incontinence; uncontrolled, persistent wandering; and aggressive or assaultive behavior. But many long term care facilities are inadequately prepared to deal with these factors. Mixed nursing home settings (where Alzheimer patients are housed with the facility's general population)

are often characterized by inadequate and inappropriate staffing patterns and regimentation which, in turn, cause loss of autonomy and control, impoverished environments, and isolation of patients. Alzheimer patients may benefit from segregated nursing home units in which staffing, programs, and the physical environment are arranged to meet the residents' special needs.

Few empirical studies have been done on ADUs but a variety of sometimes inconsistent recommendations are available relative to their design and construction. In creating a therapeutic milieu that gives stability, security, and consistency to Alzheimer patients, the following need to be considered: Staff and their relationships with patients, family environment, medical care, and the physical environment. Within that holistic approach, this study focuses on the latter. Undoubtedly, the physical environment plays a major role in the dementia patient's emotional well-being, as it can either encourage depressed feelings or improve morale in general. The planning and design of ADUs requires a thorough understanding of the behaviors (wandering, sundowning, rummaging, and incontinence) manifested by dementia patients.

The ADU physical features selected for this study include safety/security features, residents' rooms, bath and toilet arrangements, environmental cueing devices, reality orientation aids, noise reduction methods, other areas such

as hallways dining areas, living/activity/lounge areas, and backgrounds. Physical features or arrangements for optimum safety can make it possible to maximize residents' freedom and independence, minimize potential injury, and reduce chemical and physical restraints. Wandering is the most common behavioral problem related to residents' safety/security. The design of residents' rooms in ADUs should make them feel "at home" and accommodate their disabilities. Deinstitutionalizing the bathing rooms in ADUs can diminish agitation and fear of bathing. Improved bathroom design is important because many Alzheimer patients are unable to control their bowels/bladders.

Environmental cueing devices such as signals, color-coding, landmarks, simple supergraphics, and pictograph symbols can help dementia patients find their way to or be guided away from specific areas in an ADU. The purpose of reality orientation aids is to orient Alzheimer patients in time and space while compensating for the progressive losses in sensory acuity associated with aging and the disease. Sometimes, however, these aids are not used with Alzheimer patients because they can cause anxiety, frustration, and subsequent undesirable behaviors.

Noise levels must be closely monitored in ADUs because Alzheimer patients may also experience progressive loss of hearing. Noise can upset these patients or cause catastrophic reactions. Hallways create close physical proximity of

residents and staff, even in the absence of social interaction. Having a large living or activity areas located centrally in ADU can encourage socializing and unplanned encounters with others.

Dim or dark lighting, glare, and a lack of homelike lighting are potential problems in ADUs. Highly textured, pastel-contrasted, sound-absorbent materials are used as wall or floor surface treatments in ADUs. Color therapy is an effective means to control and direct Alzheimer patients' behavior because they often respond on a sensory rather than an intellectual level. But conclusive evidence of the specific role of color has not emerged.

In addition to physical aspects, various program components, including specialized staffing, admission criteria, and other elements, complete the therapeutic milieu in ADUs. Appropriate staffing can reduce the frequency and intensity of behavior problems in Alzheimer patients. ADU admission criteria may include a complete neurological assessment, with a diagnosis of Alzheimer disease or a related irreversible dementia. Hydration, daily activities, family education, and therapy programs can provide appropriate management of patients' common problems such as wandering, incontinence, anger, insomnia, restlessness and catastrophic reactions.

CHAPTER III: METHODOLOGY

The primary purpose of this study was to investigate the living environments and other program elements of ADUs in long term care facilities. Specifically, the ADUs' physical aspects were described and compared to those in the remainder of the facility. Data used in this study were collected from a nationwide selected sample of long term care facilities with segregated specialized units for Alzheimer and other dementia patients.

Development of the Instrument

Measuring the occupants' responses to the ADU is problematic because their cognitive impairment makes it difficult or impossible to express satisfaction or dissatisfaction. Observation methods were also infeasible, therefore, nondirect research methods were chosen for this exploratory study. The principal investigator (Dr. Betty Jo White) developed a mail survey to obtain data about ADUs and the long term care facilities in which they were located. The data analyzed in this study were selected from that database.

In addition to published information on Alzheimer disease and long term care facilities, the literature review included two instruments used in New York and Minnesota to survey Alzheimer special units (Christenson, 1985; Hebrew Home for the Aged, 1986). The researchers also visited

specialized dementia units in seven long term care facilities in Corvallis, Eugene, Salem, and Portland, Oregon. Constructed according to the Total Design Method (Dillman, 1978), the instrument was pilot-tested with a nonrandom sample of seven nursing home administrators and consultants. (The facilities in the final sample were not included in the pilot test.) After pilot testing, the instrument was revised according to suggestions received.

The ten-page questionnaire (Appendix A) was composed of five sections: 1) overall program description (e.g., admission and discharge criteria, staffing ratio, program components); 2) physical aspects (room occupancy, location and layout, security and safety features, reality orientation aids, communication and noise reduction methods, toilet and bath arrangements, space per patient); 3) demographic information on the special unit residents (e.g., sex, age, functional and mobility levels); 4) description of the total facility (type, location, size, level of care); and 5) perceptions about successful physical aspects and suggested changes. Most survey items presented closed responses but some open-ended questions were included.

Sample Selection

Because ADUs are a new phenomenon, no one knows how many exist. Therefore, this study used a nonrandom, purposive nationwide sample of long term care facilities. To identify the population of facilities known to have ADUs, the research-

chers made the following contacts: American Association of Homes for the Aging, American and Oregon Health Care Associations, American Hospital Association Section on Aging and Long Term Care, North American Association of Jewish Homes and Housing For the Aged, Alzheimer Disease and Related Disorders Association, and the U.S. Office of Technology Assessment (Alzheimer study staff). Selected major health care providers (Hillhaven Corporation, ARA Living Centers, Manor Care Corporation, and Beverly Enterprises) were also consulted.

The above sources provided names and addresses of long term care facilities that were assumed to have specialized Alzheimer units. The resultant list contained 145 nursing homes in 37 states. The questionnaires were mailed to all long term care facilities on the list, with instructions to return the blank survey marked, "Ineligible" if they did not have an ADU. A total of 113 surveys were returned (78% response rate), 14 of which were ineligible. The final sample consisted of 99 facilities with ADUs, located in 34 states.

Data Collection and Analysis

The surveys were mailed during summer 1987. The cover letter (Appendix B) included a social utility statement stressing the importance of the respondent's participation and enclosed \$1.00 to help improve the potential return. One week after the first mailing, a preprinted postcard (Appendix C) was mailed to all respondents. This postcard thanked

those who had already returned the questionnaire and provided a friendly reminder for those who had not. The second follow-up consisted of a letter (Appendix D) and second copy of questionnaire sent about one month later. Cost factors prevented administration of a third follow-up.

For the analysis, the data were coded on op-scan sheets and converted to a floppy disk. Statistical analyses were performed using the Statistical Package for the Social Sciences for Personal Computer (Norusis, 1986). Statistical techniques used in this study included; frequency distributions, descriptive statistics, and nonparametric McNemar test.

Frequency distributions were utilized to describe physical aspects of ADU living environments and their overall programs. Measures of central tendency were utilized to describe the residents of ADUs. Nonparametric McNemar tests were used to analyze the data for differences between the sample ADUs and the remainder of the facilities on the proportion of certain physical features reported. A confidence level of $p < .05$ was chosen by the researcher as the criterion for rejection of the null hypotheses.

CHAPTER IV: FINDINGS AND DISCUSSION

This study analyzed selected data provided by a questionnaire mailed to a nationwide sample of long term care facilities that have Alzheimer/Dementia Units. The results and discussion are presented in three sections: sample description, physical characteristics of ADU living environments, and testing of hypotheses.

Sample Description

The sample consisted of 99 long term care facilities with ADUs in 34 states. This section describes the facilities, their ADU programs, and the ADU residents.

The Long Term Care Facilities

Table 1 shows frequency data relative to facility type and location. More than one-half of the long term care facilities (59.6%) were proprietary and owned by corporations that own five or more facilities. The second most frequent type of facility ownership was private, nonprofit (33.3%).

In the sample, 33.3 percent of the facilities were located in the central city of a metropolitan area (population over 50,000). The remaining nursing homes were almost evenly distributed among suburban (23.2%), small city (22.2%), and rural or small town (20.2%) locations.

TABLE 1. TYPE AND LOCATION OF SAMPLE LONG TERM CARE FACILITIES

Variable	N	%
<u>Type of long term care facility</u>		
Proprietary, corporation owns 5+ facilities	59	59.6
Private, nonprofit	33	33.3
Proprietary, individual or corporation owns 1-4 homes	6	6.1
Associated with a hospital	0	0.0
Government-owned and operated	0	0.0
No response	<u>1</u>	<u>1.0</u>
	99	100.0
<u>Location</u>		
Central city of a metropolitan area	33	33.3
Suburb of a large city	23	23.2
Small city (20,000-50,000 population)	22	22.2
Rural or small town area	20	20.2
No response	<u>1</u>	<u>1.0</u>
	99	100.0

The mean total number of beds in the sample facilities was 169.9 within a wide range from 22 to 784 beds (see Table 2). The mean number of ADU beds was 31.6, compared to the mean numbers of Intermediate Care or Health-Related Facility beds at 70.2, and Skilled Nursing Facility beds at 94.3. The mean number of other beds (for Medicare, respite care, residential care, hospice, home for the aged, assisted self-care, or personal care) was 17.2.

TABLE 2. SIZE OF SAMPLE FACILITIES BY LEVEL OF CARE

Variable	Mean	Median	SD	Min.	Max
Total number of beds	169.88	134.50	106.39	22	784
Number of ADU beds	31.64	26.00	22.62	2	162
Number of ICF or HRF beds	70.18	58.00	79.70	0	510
Number of SNF beds	94.28	78.00	92.73	0	510
Number of other beds	17.16	0.0	32.31	1	173

The ADU Programs

The following section discusses the sample facilities' ADU overall programs, including admission and discharge criteria, program components, daily rates, and payment methods.

Admission and Discharge Criteria

Table 3 reveals that more than 50 percent of the ADUs reported using six of 12 admission criteria listed in the questionnaire. The vast majority (94.9%) used functional assessments done in the nursing home or patient's home as one admission criteria, followed by in-house transfers made on staff recommendation (86.9%), permission of patient's family required (82.8%), source of payment confirmed (78.8%), and mental status assessment required (74.7%). Mentally retarded or developmentally disabled persons were excluded from 65.7 percent of the sample ADUs, and 52.5 percent did not admit patients exhibiting specific behaviors.

The specific behaviors listed by respondents as

TABLE 3. OVERALL PROGRAMS OF ALZHEIMER/DEMENTIA UNITS

Variable	N	%
<u>Admission Criteria</u>		
Functional assessment done in nursing or patient's home	94	94.9
In-house transfers made on staff recommendation	86	86.9
Permission of patient's family required	82	82.8
Source of payment must be confirmed	78	78.8
Mental status assessment required	74	74.7
Mentally retarded/developmentally disabled persons excluded	65	65.7
Patients exhibiting specific behaviors not admitted	52	52.5
Patients must be ambulatory at time of admission	46	46.5
Patients required to meet DSM III or ICD-9 criteria	37	37.4
Minimum age requirement	18	18.2
Patients must be bedridden at time of admission	0	0.0
Other admission criteria	27	27.3
<u>Discharge Criteria</u>		
Nonresponsive patients discharged/transferred	69	69.7
Residents exhibiting certain behaviors discharged	62	62.6
Residents who become nonambulatory are discharged	33	33.3
Residents live in ADU until death	18	18.2
Residents discharged when private funds exhausted	14	14.1
Other discharge criteria	35	35.4
<u>Program Components</u>		
Special staff training, support, education	99	100.0
Family education, involvement, support	98	99.0
Music therapy	93	93.9
Hydration program or bowel/bladder retraining	92	92.9
Occupational or recreational therapy	92	92.9
Special dietary services	89	89.9
Separate daily activities program	88	88.9
Community education program	80	80.8
Physical and/or speech therapy	78	78.8
Volunteer program to supplement staff	68	69.4
Daily, respite, or in-home care	52	52.5
Other major components	27	27.3

TABLE 3. CONTINUED a)

Variable	N	%
<u>ADU nurse and aide staffing ratio</u>		
Higher than skilled care	78	78.8
Same as skilled care	15	15.2
Lower than skilled care	5	5.1
No response	<u>1</u>	<u>1.0</u>
	99	100.0
<u>ADU daily charge/rate</u>		
Same as skilled nursing rate	23	23.2
Same as intermediate or health-related care rate	13	13.1
Same as skilled nursing and intermediate care rate	4	4.0
Not the same	55	55.6
No response	<u>4</u>	<u>4.0</u>
	99	100.0

^a Total may not add to 100 percent because of rounding.

unacceptable for ADU admission were combative, aggressive, violent, physically dangerous to self/others, and psychotic behaviors and extremely noisy activities. Over one-fourth (27.3%) of the ADUs identified "other" admission criteria. Most frequent among these were diagnosis of Alzheimer Disease or a related disorder or physician testing, plus not permitting persons who require tube feeding, intravenous infusions, or catheters. Wandering was also cited as a behavior that triggered admission.

The most frequently reported admission criteria were similar to those that literature indicated are generally used by ADUs. Although the majority (86.9%) of the facilities' admission criteria allowed for in-house transfers, only one-fifth entered the ADU from elsewhere in the facility (see

Table 5). The high percentage of sample ADUs confirming the source of payment may relate to the fact that almost one-half of the ADU residents' costs (51.5%) were paid privately.

Literature reveals that when patients reach the later stages of Alzheimer disease and can no longer benefit from the ADU program, they may be transferred or discharged to another level of care, to their homes, or to a hospital or a hospice. The two discharge criteria most frequently reported by this sample were that nonresponsive patients (69.7%) and those exhibiting certain behaviors (62.6%) were transferred or discharged. The nonpermissible behaviors most frequently listed in the open-ended question were combative, aggressive, violent, harmful, or disruptive behaviors. "Other" discharge criteria were reported by 35.4 percent of the facilities. The most frequent among these were stated as: deteriorated, bedridden, acute or skilled nursing care needed, no longer able to benefit/respond, tube feeder, unable to feed self, or patient improved.

ADU Program Components

All 11 potential ADU program components listed in the survey were reported by more than one-half of the facilities responding. Ninety percent or more included special staff training, support, and education (100%); family education, involvement, and support (99%); music therapy (93.9%); hydration program or bowel/bladder retraining or monitoring (92.9%); occupational or recreational therapy (92.9%); and

special dietary services (90%). "Other" program components listed most frequently by the respondents included geropsychiatric/neurological services, pet and art therapy, social services, and outings.

Comparing the staffing ratio for nurses and aides in the ADU with the required level for skilled nursing in their state, 78.8 percent of ADUs reported higher ratios, while 15.2 percent showed the same ratio as for skilled care. These data agree with literature, which notes that ADU staffing ratios tend to be higher than those of the remainder of the facility (Pynoos & Stacey, 1986). ADUs are often labelled "heavy care". Only 5.1 percent of the ADU staff ratios were lower than those of skilled care.

Daily Rates and Payment Methods

Table 4 shows that for more than one-half (55.6%) of the ADUs, daily charge/rates were not the same as the skilled nursing rate or the intermediate care rate for the remainder of the facility. Forty-five ADUs in the sample explained how their daily charge/rates were different, with the daily charge/rates being higher in 35 units. Of the ADUs that stated specific dollar amounts, mean per day cost was \$6 higher than that for the remainder of the facilities. Only five ADUs indicated that their daily charges were higher than the skilled nursing rate. The most frequent reasons given for the differences in daily rates were higher ADU staffing ratios, followed by higher nutritional needs, or special

activity programs in ADUs.

The two payment methods utilized by the highest percentages of ADU residents in the sample were private pay (51.5%) and Medicaid (37.7%). The Medicaid segment is somewhat lower than the proportion (42%) reported by the American Association of Homes for the Aging (1986) for all nursing home residents supported by Medicaid. Only 3.8 and 2.7 percent of ADU residents' costs were paid by Medicare and the Veterans Administration, respectively. "Other" payment methods or sources included state, county, or subsidies from churches.

TABLE 4. PERCENTAGE OF ADU RESIDENTS BY PAYMENT METHOD

Variable	Mean	Median	SD	Min.	Max.
Private pay	51.52	50.00	31.93	0	100
Medicaid	37.66	40.00	29.63	0	99
Medicare	3.83	0.0	12.80	0	50
Veterans Administration	2.33	0.0	4.54	0	20
Other payment method	5.18	0.0	14.63	0	70

The ADU Residents

This section describes the sex, age, previous location, and functional and mobility levels of the ADU residents. The data are found in Table 5.

Sex and Age

The mean number of female residents (18.7) in the sample ADUs was more than double the mean number of male residents (8.4). The percentage of male patients was, however, higher

TABLE 5. THE ADU RESIDENTS

Variable	Mean	Median	SD	Min.	Max.
<u>Number of ADU residents</u>					
<u>by sex</u>					
Female	18.73	15.00	13.13	2	91
Male	8.42	6.50	8.35	0	71
<u>Number of ADU residents</u>					
<u>by age</u>					
Under age 60	1.04	1.00	1.44	0	6
Age 60-65	3.30	2.00	4.73	0	22
Age 66-70	3.68	2.00	4.31	0	19
Age 71-75	6.73	4.00	8.01	0	38
Age 76-80	7.53	5.00	7.95	0	40
Age 81-85	8.17	5.00	7.87	1	31
Age 86 or older	7.66	5.00	7.12	0	26
<u>Percentage of ADU resi-</u>					
<u>dents entering from</u>					
Own home	22.10	15.00	23.08	0	90
Elsewhere in this nursing home	20.03	10.00	23.78	0	98
Hospital	17.35	10.00	20.47	0	90
Home of relative	15.81	9.00	18.77	0	90
Other nursing home	9.04	5.00	8.98	0	40
Foster, board/personal care home	5.59	2.50	7.17	0	30
Another location	3.61	0.0	7.30	0	25
<u>Percentage of ADU resident</u>					
<u>by functional level</u>					
Able to feed themselves	54.66	62.50	31.79	0	100
Urinary incontinence	54.23	60.00	30.69	0	100
Fecal incontinence	40.56	30.00	31.43	0	99
Can manage some self care with help	38.90	30.00	30.78	0	100
Able to eat with assistance	33.07	25.00	29.33	0	100
Fully continent	25.25	15.00	23.97	0	99
Able to perform self care	18.37	5.00	25.88	0	100
Nonresponsive, unable to communicate verbally	6.38	1.00	10.27	0	50
Have nasal-gastric tubes	.44	0.0	2.01	0	15

TABLE 5. CONTINUED

Variable	Mean	Median	SD	Min.	Max.
<u>Percentage of ADU residents by mobility level</u>					
Usually ambulatory without assistance	57.57	64.00	31.726	2	100
Ambulatory with personal assistance	18.19	10.50	20.35	0	100
Wheelchair-bound most of the time	17.77	10.00	21.54	0	85
Bedridden most of the time	1.44	0.0	3.57	0	20

than that typically reported for nursing homes (29%) (Aranyi & Goldman, 1980; Kart, 1985). Within seven age ranges, the highest mean number of ADU residents was in the 81-85 year range (8.2), followed by age 86 or older (7.7) and age 76-80 (7.5). This finding agrees with data that show more than four out of five (81.5%) nursing home residents are 75 or over (Kart, 1985). The lowest mean number of ADU residents was under age 60 (1.0), probably a factor of age restrictions included in facility or ADU admission criteria.

Previous Location

Respondents indicated the percentage of special care residents who entered the ADU from various settings. The highest mean (22.1%) was for ADU residents entering from their own home, followed by "elsewhere in this nursing home" (20.0%), and "from the hospital" (17.3%). Least frequent previous locations were foster and board care homes (5.6%)

and other locations (3.6%). The latter included a retirement center, state hospital, residential care center, and an adult day care center.

Functional and Mobility Levels

The highest mean percentages for various functional levels of ADU residents were for "able to feed themselves" (54.7%), "urinary incontinence" (54.2%), and "fecal incontinence" (40.6%). On average, over one-third were able to manage some self care, e.g., dressing, grooming, and bathing (38.9%) or able to eat with assistance (33.1%). The lowest mean percentages were for "nonresponsive or unable to communicate" (6.4%) and nasal-gastric tubes (0.4%). As noted earlier, nonresponsive patients are often transferred or discharged and many ADUs will not admit patients who require tubes, intravenous equipment or catheters.

In terms of mobility levels, on average, over one-half (57.6%) of the sample ADU residents were usually ambulatory without assistance. The mean percentages of those who were usually ambulatory with assistance (18.2%) or wheelchair-bound most of the time (17.8%) were similar. The lowest mean percentage was for ADU residents who were bedridden most of the time (1.4%). The small percentage of bedridden patients is not surprising, given the findings relative to admission criteria. (No facilities reported a requirement that patients be bedridden at the time of ADU admission).

Physical Characteristics of ADU Living Environments

The findings that describe the physical aspects of the sample ADU living environments are presented in three sections. They are entitled physical characteristics, selected physical features, and respondents' evaluation of ADU physical aspects.

Physical Characteristics of ADUs

The following results outline how the ADUs were created and describe their common areas. The frequency data are found on Table 6.

Creation of ADUs

The results of the data analysis showed that 56.6 percent of the sample ADUs were created by remodeling an existing wing or section to meet patients' special needs, while 22.2 percent were converted from an existing wing or section with no special design or structural changes. A few of the ADUs were newly-constructed (9.1%) or were a combination of converted space and a new addition (7.1%). The predominance of "retrofitted" units is consistent with the facts that the ADU is a new phenomenon among long term care facilities and many states regulate the development of additional new facilities or beds via "certificate of need" procedures.

The mean total ADU interior square footage in the sample was 7741.1 square feet, within a wide range from 1420 to

TABLE 6. PHYSICAL CHARACTERISTICS OF ADUS

Variable	N	%
<u>Physically, how was ADU created?</u> ^a		
Remodeled existing wing/section	56	56.6
An existing wing/section converted	22	22.2
Newly-constructed/designed	9	9.1
Combination of converted space plus new addition	7	7.1
No response	<u>5</u>	<u>5.1</u>
	99	100.0
<u>Square feet per patient in ADU</u> ^a		
Same amount of space as other units/levels	48	48.5
ADU patients have more space	37	37.4
ADU patients have less space	7	7.1
No response	<u>7</u>	<u>7.1</u>
	99	100.0
<u>Is the ADU locked?</u>		
Not locked	57	57.6
Locked at all times	38	38.4
Sometimes locked, sometimes not	2	2.0
Locked only during the day	<u>1</u>	<u>1.0</u>
	99	100.0
<u>Location of ADU rooms</u> ^b		
All together on one section or wing	90	90.9
On ground floor	75	75.8
On ground or higher floor	21	21.2
In more than one unit or section	13	13.1
In group home or other self-contained structure	7	7.1
<u>ADU facilities</u> ^b		
Own nursing station or staff work area	81	81.8
Own dining area	70	70.7
Own dayroom or lounge area	65	65.7
Own combined dining/dayroom/lounge area	57	57.6
Small lounge or quiet room for individual privacy or visit with family members	47	47.5
Own kitchen (meal or snack preparation)	41	41.4
Isolation/"noise" room for patients to make noise	10	10.1
Safe gym or indoor exercise area	8	8.1

TABLE 6. CONTINUED

Variable	<u>N</u>	%
<u>Outdoor facilities</u> ^b		
Enclosed patio, courtyard, porch, balcony, or terrace	81	81.8
"Wander garden," path, or loop	72	72.7
Gardening areas/planting beds	60	60.6
Fenced/alarmed perimeter	59	59.6
Sheltered outdoor areas	54	54.5
Other outdoor facilities	23	23.2

^a Total may not add to 100 percent because of rounding.

^b Respondents could select more than one choice.

35,300 square feet. Almost one-half (48.5%) of the sample ADUs indicated that their residents had the same amount of space as other residents in the facility, while 37.4 percent indicated that ADU residents had more space than the other residents. Only 7.1 percent of the sample ADUs indicated that their residents had less space than others in the nursing home.

The majority (90.9%) of the ADU rooms were located together in one section or wing. Furthermore, 75.8 percent of ADU rooms were situated on the ground floor. Thirteen percent of ADU rooms were located in more than one unit, and only 7.1 percent were group homes or other self-contained structures.

Well over one-half of the sample ADUs (57.6%) were not locked, compared to 38.4 percent that were locked at all times. Data from a later question suggest that although the bulk of the units were not locked, most had alarmed exits.

One ADU facility was locked only during the day. Kromm and Kromm (1985) suggest that an ADU may be closed off and operated during the day as a self-contained unit with its own staff and nursing station but opened and supervised by the home's general nursing staff at night.

ADU Common Areas

Liebowitz, Lawton, and Waldman (1979) recommended that ADUs have their own nursing stations to supervise patients effectively. Furthermore, to provide a stable and safe atmosphere and to facilitate patients' mental well-being, ADUs should have their own dining area, dayroom or lounge area (Kromm & Kromm, 1985; Schultz, 1987). Within eight types of ADU common areas listed in the survey, the highest frequency was for "own nursing station or staff work area" (81.8%), followed by "own dining area" (70.7%), "own dayroom or lounge area" (65.7%), and "own combined dining/dayroom/lounge area" (57.6%). Only 10.1 percent of the sample ADUs had isolation or "noise" rooms, and 8.1 percent had a "safe gym" or indoor exercise area.

To minimize wandering behavior of Alzheimer patients, outdoor courtyards should be enclosed and protected and have a walkway that accommodates a circular walking pattern (Goodman, 1986; Peppard, 1986b; Schultz, 1987). All five types of outdoor facilities listed in the questionnaire were reported by more than one-half of the sample ADUs. The highest frequency was that for "enclosed patio, courtyard, or

porch" (81.8%), followed by "wander garden, path or loop" (72.7%), "gardening areas or planting beds" (60.6%), "fenced or alarmed perimeter" (59.6%), and "sheltered outdoor areas" (54.5%). Nearly one-fourth (23.2%) of the ADUs provided other outdoor facilities such as supervised/open areas, outdoor furniture, grills, or gazebo.

Selected Physical Features

The following section describes selected physical features of the sample ADUs. These include safety/security features, reality orientation aids, environmental cueing devices, furnishings of residents' rooms, toilet and bath arrangements, communication and noise reduction methods, backgrounds, and lighting. This discussion is limited to the frequency analyses of the ADUs, although the tables also show corresponding frequencies for the remainder of the facilities. The last section of this chapter will analyze selected differences between the ADUs and facilities as a whole.

Safety/Security Features

More than one-half of the sample ADUs reported eight of 13 safety and security features listed in the survey (see Table 7). Over 90 percent listed three features: "housekeeping chemicals secured" (96.0%), "breakable items kept away from residents" (96.0%), and "clutter minimized" (93.9%). Following those items in frequency order were "housekeeping carts secured" (86.9%), "outdoor exits open

TABLE 7. SELECTED PHYSICAL FEATURES: SAFETY/SECURITY
 FEATURES, REALITY ORIENTATION AIDS AND
 ENVIRONMENTAL CUEING DEVICES

Variable	ADU		Remainder	
	<u>N</u>	%	<u>N</u>	%
<u>Safety/security features</u>				
Housekeeping chemicals secured	95	96.0	90	90.9
Breakable items kept from residents	95	96.0	54	54.5
Clutter minimized	93	93.9	66	66.7
Housekeeping carts secured while in use	86	86.9	75	75.8
Outdoor exits openable/alarmed	83	83.8	68	68.7
Patients smoke only with supervision	82	82.8	54	54.5
Patients smoke only in designated areas	79	79.8	93	93.9
Outdoor exits with automatic fire unlock	52	52.5	39	39.4
Stairs, elevators, secured/alarmed	41	41.4	23	23.2
Wide angle mirrors or video monitors for surveillance	29	29.3	25	25.3
Interior exits disguised	25	25.3	5	5.1
Patient sensors activate alarm	19	19.2	6	6.1
Half doors or dutch doors used for surveillance	19	19.2	13	13.1
Other safety/security features	21	21.2	6	6.1
<u>Reality orientation aids</u>				
Large print calendar	92	92.9	89	89.9
Clock(s) with large face/numbers	89	89.9	86	86.9
(Daily) schedule/activity board	83	83.8	88	88.9
Orientation board	73	73.7	77	77.8
Autobiographical/display of residents' background	32	32.3	18	18.2
Other physical devices	29	29.3	16	16.2

TABLE 7. CONTINUED

Variable	ADU		Remainder	
	<u>N</u>	%	<u>N</u>	%
<u>Environmental cueing devices</u>				
Personal marker/resident's photo near room door	68	68.7	31	31.3
"Landmarks" (picture groups, objects)	41	41.4	27	27.3
Staff uniform color or style	39	39.4	34	34.3
Bathrooms labelled with pictures/colors	37	37.4	9	9.1
Signs	34	34.3	13	13.1
Units/floors color-keyed or "themed"	28	28.3	26	26.3
Pictograph symbols ("signs without words")	27	27.3	13	13.1
Matching photos or symbols in patients' rooms	20	20.2	11	11.1
Large murals	19	19.2	11	11.1
Residents' rooms color-coded (walls, furniture, doors)	19	19.2	13	13.1
Activity areas color-coded (dining, dayroom)	15	15.2	8	8.1
Supergraphics or patterns on walls/floors	12	12.1	8	8.1
Other cues	14	14.1	6	6.1

able/alarmed" (83.8%), "patients smoke only with supervision"(82.8%), "patients smoke only in designated areas" (79.8%), and "outdoor exits with automatic fire unlock" (52.5%).

Only 19.2 percent of the sample ADUs responded that they used patient sensors to activate security alarms on exits, or had half doors or dutch doors on some interior openings (the latter are used to "stop" a patient without completely closing off the prohibited area). Almost one-fourth of the ADUs (21.2%) reported "other" safety and security features, most frequently listing window openings, carpet, and

lighting.

The safety/security features reported most frequently by the sample ADUs are those closely related to minimizing potential injury, maximizing residents' freedom, and accommodating wandering, disorientation, and agitation with safety. Smoking may not be allowed at all in the ADU. The features with relatively low frequencies may result from cost factors or complications that may arise in using sensors with Alzheimer patients (e.g., sensors located in shoes are useless if the patient walks around in stocking feet).

Reality Orientation Aids

Literature states that sometimes reality orientation aids are not used with Alzheimer patients because they can cause anxiety, frustration, and subsequent undesirable behaviors (Goodman, 1986). The results of the frequency analysis, however, show that aids listed in Table 7 were generally more common features in the sample facilities than were environmental cueing devices.

The reality orientation aid reported most frequently in the ADUs was the large print calendar (92.9%), followed by clock(s) with large faces/numbers (89.9%), (daily) schedule or activity boards (83.8%), and orientation boards (73.7%). Although autobiographical/residents' display (32.3%) were used much less frequently than the other reality orientation features listed, they were much more frequent in the ADU than the remainder of the facility. "Other" reality orientation

devices listed by the respondents included photos/pictures, sensory cues, homelike touches, and newspapers.

Environmental Cueing Devices

Among 12 environmental cueing devices presented by the survey, the personal marker or resident's photo near the room door (68.7%) was the most common feature in ADUs. At least one-third of the sample ADUs reported landmarks such as picture groupings or large objects (41.4%), color or style of staff uniforms (39.4%), bathrooms labelled with pictures or colors (37.4%), and signs (34.3%).

Several respondents wrote that to minimize the institutional atmosphere, staff did not wear uniforms. While several sources recommend color-coding ADU rooms (to help residents distinguish their rooms from others) and the use of large wall hangings or murals and simple supergraphics or patterns on walls or floors (Berger, 1985; Hiatt, 1980; Liebowitz et al., 1979; Schultz, 1987), the frequencies for those cues were relatively low. Examples of "other" cues written in by respondents included names on doors, a large rummaging area in the hall, and yellow tape on the floor near doors.

Furnishings of Residents' Rooms

Table 8 reveals that almost all (92.9%) of the sample ADUs allowed residents to bring one or two large pieces of furniture (other than their beds) from home, e.g., an easy

TABLE 8. SELECTED PHYSICAL FEATURES: FURNISHINGS OF RESIDENTS' ROOMS AND TOILET AND BATH ARRANGEMENTS

Variable	ADU		Remainder	
	N	%	N	%
<u>Furnishings of residents' rooms</u>				
Bring 1-2 other large pieces (an easy chair or chest of drawers)	92	92.9	90	90.9
Nightlight in each resident's room	81	81.8	77	77.8
Each resident may have TV, radio, etc.	76	76.8	89	89.9
Individual privacy arrangements	70	70.7	67	67.7
Window treatments secured	56	56.6	46	46.5
Full/half-length wall mirrors	46	46.5	47	47.5
Lockable hanging storage/closet	44	44.4	22	22.2
Rooms significantly different with recognizable objects	36	36.4	31	31.3
Residents may bring own bed	33	33.3	32	32.3
Lockable/latched drawers	31	31.3	20	20.2
Each room may have TV, radio, etc.	29	29.3	38	38.4
Other personalization methods	65	65.7	56	56.6
<u>Toilet and bath arrangements</u>				
Moisture-resistant upholstery on chairs and sofas	93	93.9	77	77.8
Institutional bathing equipment	88	88.9	89	89.9
Mobile residents may use shower	84	84.8	80	80.8
Restrooms located near dayroom/dining	70	70.7	69	69.7
Incontinence aids used	68	68.7	67	67.7
Private toilet and lavatory	61	61.6	57	57.6
Two residents' rooms share toilet/lav	44	44.4	50	50.5
Curtained-toilets (not doors/stalls)	36	36.4	35	35.4
More than two rooms share toilet/lav	7	7.1	6	6.1

frequency (81.8%) among residents' room furnishings listed in the survey. More than three-fourths (76.8%) of the ADUs allowed each resident to have a television set, radio, or stereo. More than one-half of the ADUs reported individual privacy arrangements (70.7%) (usually a curtain surrounding the bed) and secured window treatments (56.6%). Only one-third of the ADUs (33.3%) allowed residents to bring their

chair or chest of drawers. Nightlights were second most own beds.

Although lockable storage in residents' rooms is suggested to prohibit patients' rummaging in others' belongings, lockable hanging storage or closets (44.4%) and lockable or latched drawers (31.3%) were less frequent in the sample ADUs. Nearly two-thirds (65.7%) of the respondents identified "other" methods to personalize or make residents' rooms homelike. Those given most frequently included family or own picture/photos, personal bedding (bed spread, afghan, pillow, or blankets), personal items, or own furniture.

These findings agree with literature, which recommends that ADU residents' rooms be furnished with personal possessions such as their own bed, bedding, chest of drawers, chairs, a television, radio, or stereo, to create a sense of individuality and belonging (Liebowitz et al., 1979; Schultz, 1987). Schultz also identified the problem of Alzheimer patients pulling curtains or draperies off their rods. The high frequencies for the use of nightlights and individual privacy arrangements, and the low frequency on use of own beds probably results from nursing home regulations that require hospital beds. Individual television sets may be standard equipment in long term care facilities.

Toilet and Bath Arrangements

Moisture-resistant or plastic-covered upholstery on chairs and sofas was reported by almost all ADUs (93.9%).

Another response to the same problem was incontinence aids used by residents in more than two-thirds of the ADUs (68.7%). Although bathing rooms in ADUs should be deinstitutionalized to diminish agitation and fear of bathing (AAHA, 1985), 88.9 percent of the sample ADUs had institutional bathing equipment. More than three-fourths of the respondents (84.8%), however, noted that mobile ADU residents were allowed to use conventional shower facilities.

Restrooms were located near the dayroom or dining area in 70.7 percent of the ADUs. A private toilet and lavatory in each resident's room was more common than a toilet and lavatory shared by two resident rooms (44.4%). This finding agrees with literature, which notes that one toilet between two rooms can create confusion for residents who may enter one door and leave by the other (Schultz, 1987). In only 7.1 percent of the ADUs did more than two rooms share toilet and/or lavatory facilities.

Communication and Noise Reduction Methods

As shown in Table 9, the only communication or noise reduction method reported by more than one-half of the sample ADUs was the acoustical or sound-absorbent ceiling (59.6%). Public address (PA) systems were modified to cut extraneous noise in 48.5 percent of the ADUs and much less often were used only in emergencies (20.2%) or had been disconnected or not used (15.2%). Acoustical or sound absorbent wall surfaces (41.4%) were more common than carpeted floors

TABLE 9. SELECTED PHYSICAL FEATURES RELATED TO
COMMUNICATION/NOISE REDUCTION, BACKGROUNDS, AND
LIGHTING IN THE ADU

Variable	ADU		Remainder	
	N	%	N	%
<u>Communication/noise reduction methods</u>				
Acoustical/sound-absorbent ceiling	59	59.6	50	50.5
PA systems modified to cut noise	48	48.5	22	22.2
Sound-absorbent wall surfaces	41	41.4	24	24.2
No television in dayroom/lounge	36	36.4	12	12.1
Carpeted floors	29	29.3	36	36.4
PA systems used only in emergency	20	20.2	14	14.1
Residents' rooms monitored by intercom/video system	19	19.2	21	21.2
PA systems disconnected or not used	15	15.2	3	3.0
Walkie-talkie/beeper devices used	4	4.0	5	5.1
Other communication/noise methods	15	15.2	4	4.0
ADU floor surfaces similar to remainder of the facility?	78	78.8		
ADU wall surfaces similar to remainder of the facility?	74	74.7		
<u>Corridor lighting</u>				
Fluorescent/parallel to floor	65	65.7	63	63.6
Indirect lighting	23	23.2	23	23.2
Wall-mounted lighting	21	21.2	22	22.2
Incandescent ceiling/parallel to floor	19	19.2	18	18.2
Incandescent ceiling/perpendicular	10	10.1	11	11.1
Fluorescent/perpendicular to floor	10	10.1	9	9.1
Other type of corridor lighting	10	10.1	9	9.1
<u>Resident room lighting</u>				
Over-bed fixtures	82	82.8	83	83.8
Ceiling fixtures	56	56.6	52	52.5
Table lamps	33	33.3	36	36.4
Wall-mounted lamps	19	19.2	19	19.2
Floor lamps	8	8.1	10	10.1
Other room lighting	6	6.1	7	7.1

(29.3%). More than one-third (36.4%) of the ADUs had no television in the dayroom or lounge. "Other" communication/noise reduction methods most frequently listed by respondents were fabric pictures/soft artwork, double doors, and staff. The relatively low frequency for carpeted floors may indicate that nursing home administrators perceive that carpeted floors are too difficult to maintain in sanitary condition in the presence of incontinence. The low frequencies for intercom/ video monitoring systems and walkie-talkie devices result from cost factors.

Backgrounds

More than three-fourths of the ADU floor surfaces (78.8%) were the same or similar to those in the remainder of the facility. Respondents described ADU floor surfaces in an open-ended question. Tile was the most common floor surface material, followed by vinyl or linoleum (with non-glare and non-slip finishes) and carpeting (see Appendix E). In general, carpeting is an effective floor treatment to add warmth and reduce sound and glare. But nearly one-half of the sample ADU residents were incontinent (urinary or fecal) and only one-fourth were fully continent. Therefore, the high frequency of hard surface flooring is understandable.

Nearly three-fourths of the sample ADU wall surfaces (74.7%) were the same or similar to those in the remainder of the facility. Wallpaper was the most frequent wall surface treatment in the sample ADU residents' rooms and corridors

(see Appendix F). The most frequent wallpaper designs involved neutral or pastel colors, and stripes, plaid, "speckled," floral, or muted patterns. Many respondents, however, noted the use of wallpaper with no obvious pattern. Painted wall surfaces in neutral or pink/peach/red colors were the second most frequent. Only two ADUs in the sample reported using carpeting as a wall surface treatment. These data agree with literature, which notes that "wild," busy patterned, or intricately-designed wallpaper is avoided in order to minimize residents' confusion and agitation (Liebowitz et al., 1979; Peppard, 1985; Schultz, 1987).

Lighting

Fluorescent lighting installed parallel to the floor (65.7%) was the most frequent type of corridor lighting in the sample ADUs, followed distantly by indirect lighting (23.2%). Only one-fifth of the sample ADUs (21.2%) had wall-mounted lighting in corridors. Many of the types of the corridor lighting listed in the survey were not used by the sample ADUs. "Other" types of corridor lighting most frequently listed by respondents were skylights, lamps on tables, and recessed fixtures.

Over-bed fixtures (82.8%) and ceiling fixtures (56.6%) were the two most frequent types of lighting in sample ADU residents' rooms. Table lamps (33.3%), wall-mounted lamps (19.2%), and floor lamps (8.1%) were not frequently reported by the sample ADUs, although literature recommends their use

to create a homelike atmosphere (Aranyi & Goldman, 1980; Rutledge, 1987). Other types of residents' room lighting most frequently reported by respondents included nightlights and sunlight.

Ceiling fluorescent lighting is usually associated with commercial or institutional use where uniformity and economy are needed. To create a homelike atmosphere in long term care facilities that use fluorescents, however, wall-mounted incandescent lighting can provide warmth, shadows, and textured light. Although lack of appropriate corridor and room lighting may be a critical problem in ADUs, it is difficult to change because of cost factors.

Evaluation of ADU Physical Aspects

Responding to an open-ended question, almost four-fifths of the respondents (78.8%) described the physical changes or additions made to create the ADU (see Table 10). Security systems (44.4%) and outdoor fenced areas or items (32.3%) were the most frequently listed physical changes. Approximately one-fifth of the respondents listed new/changed wall surfaces (22.2%), rooms created or added (20.2%), new or changed floor surfaces (20.2%), new or changed lighting (19.1%), furniture changes (19.1%), and altered or moved nurses' stations (18.2%).

Over four-fifths (83.8%) of the respondents described the "most successful physical aspects" of their ADUs (Table 11). Given the frequency of safety/security features

TABLE 10. PHYSICAL CHANGES OR ADDITIONS TO CREATE ADU

Variable ^a	%
Security systems	44.4
Outdoor fenced area/items	32.3
New/changed wall surfaces	22.2
Created or added rooms	20.2
New/changed floor surfaces	20.2
New/changed lighting	19.1
Furniture changes	19.1
Nurses' station altered or moved	18.2
Remodeled rooms or areas	14.1
Added miscellaneous features	10.1
Window treatments	8.1
Reduced storage space/other features	4.0
Signage	3.0

^a Responses to open-ended question tallied by hand; multiple response was possible.

reported earlier, it is not surprising that 34.3 percent concluded that the security system/locked unit was the most successful physical aspect. While over one-half of the sample ADUs provided a wander garden, fenced/alarmed perimeter, or sheltered outdoor areas, almost one-fourth of respondents (24.2%) identified a safe/secure outdoor area and wander garden as their most successful physical aspect. Other "most successful physical aspects" reported frequently included: self-contained/separate unit/freedom of movement (18.2%); well-trained aides/supervision (18.2%); quiet, calm atmosphere (16.1%); separate dining/activity or dayrooms (13.1%); and homelike atmosphere (10.1%). Color, decor, and lighting were infrequently identified as most successful elements.

TABLE 11. MOST SUCCESSFUL PHYSICAL ASPECTS OF ADUS

Variable ^a	%
Security system/locked unit	34.3
Safe/secure outdoor area/wander garden	24.2
Self-contained/separate unit/freedom of movement	18.2
Well-trained aids/supervision	18.2
Quiet, calm atmosphere	16.1
Separate dining/activity or dayrooms	13.1
Homelike atmosphere	10.1
Large/spacious areas	5.1
Color	5.1
Decor	4.0
Lighting	4.0

^a Responses to open-ended question tallied by hand; multiple response was possible.

Almost three-fourths of the respondents (74.7%) identified the physical factors that they would change or add if they were to establish another ADU (see Table 12). Added rooms or spaces (28.3%) were most frequently indicated, followed by larger rooms or spaces (23.2%), private/separate rooms/areas (16.1%), and added or enlarged safe/secure outdoor areas (16.1%). A variety of other suggested changes were identified by ten percent or less of the respondents.

TABLE 12. PHYSICAL FACTORS THAT RESPONDENTS WOULD CHANGE OR ADD

Variable ^a	%
Add rooms or spaces	28.3
Larger rooms or spaces	23.2
Private/separate rooms/areas	16.1
Safe/secure outdoor area (add or enlarge)	16.1
Security systems	10.1
Nursing station (location/shape/size)	9.1
Easy outdoor access (on ground level)	7.1
Noise control/quiet environment	6.1
"Quiet room"	6.1
Environmental cueing aids	5.1
Straight/central corridor for surveillance	5.1
More storage area	4.0
More showers/tubs/toilets	4.0

^a Responses to open-ended question tallied by hand; multiple response was possible.

Testing of Hypotheses

Four null hypotheses were tested in this study. The nonparametric McNemar test for comparing frequencies or proportions between two related samples was used to test the hypotheses. The level of significance was set at $p < .05$, indicating that there is a five percent chance of a difference occurring between the ADUs and the remainder of the facilities on the proportion of certain physical features reported.

H₀₁: There is no difference between the sample ADUs and the remainder of their facilities on the proportion of selected safety/security features reported:

- a) Stairs, stairways, and elevators are secured or alarmed,

- b) Interior "exits" from unit are disguised,
- c) Outdoor exits are openable but equipped with alarm systems,
- d) Secured outdoor exits automatically unlock with fire alarm,
- e) Patients wear sensors to activate security alarms on exits,
- f) Half-doors or dutch doors used on some interior openings,
- g) Wide angle mirrors or video monitors used for surveillance,
- h) Housekeeping chemicals are secured or kept with the aides,
- i) Housekeeping carts are secured while in use,
- j) "Clutter" is minimized--little to grab, eat, or drink,
- k) Glass or easily breakable items kept away from residents,
- l) Residents are allowed to smoke only in specified areas,
- m) Residents are allowed to smoke only under supervision.

Each of 13 safety/security features (H1a through H1m) was tested using the McNemar test. Statistically significant values were found for 10 safety and security features, as shown in Table 13. Therefore, the null hypotheses corres-

TABLE 13. MCNEMAR TEST FOR COMPARISON OF FREQUENCY OF
SELECTED SAFETY/SECURITY FEATURES (N=99)

Variable	ADU N	Remainder N	Statistical significance
Housekeeping chemicals secured	91	89	.5000
Breakable items kept from residents	88	53	.0000***
Clutter minimized	88	65	.0000***
Housekeeping carts secured	82	74	.0078**
Patients smoke only with supervision	80	53	.0000***
Outdoor exits openable /alarmed	78	65	.0106*
Patients smoke only in designated areas	78	91	.0002***
Exits with automatic fire unlock	48	37	.0034**
Stairs, elevators secured/alarmed	37	20	.0001***
Wide angle mirrors or video monitors	29	25	.5034
Interior exits disguised	23	6	.0000***
Patient sensors activate alarm	17	5	.0002***
Half doors or dutch doors	18	13	.2668

* Significance level $p < .05$
 ** Significance level $p < .01$
 *** Significance level $p < .001$

ponding to the following 10 features were rejected: Breakable items kept from residents; clutter minimized; patients smoke only with supervision; patients smoke only in designated areas; stairs, elevators secured/alarmed; interior exits disguised; patient sensors activate alarm; housekeeping carts secured; exits with automatic fire unlock; and outdoor exits openable/alarmed. In other words, a statistically significant difference exists between the sample ADUs and the remainder of their facilities on the proportion of these features reported by respondents. Nine of these were more prevalent in the ADUs. The exception, found more often in the remainder of the facilities, was "patients smoke only in designated areas (without supervision)."

The above results concur with recommendations found in literature, which notes that safety/security features are necessary in ADUs to minimize environmental stress and potential injury but maximize residents' freedom and independence within the living environment. These features also decrease disorientation and agitation, and accommodate Alzheimer patients' wandering behavior.

Ho2: There is no difference between the sample ADUs and the remainder of their facilities on the proportion of selected furnishings reported in residents' rooms:

- a) Lockable or latched (chest of) drawers for each resident,
- b) Lockable hanging storage/closet for each resident,

- c) Full- or half-length wall mirrors in room,
- d) Residents may bring their own bed,
- e) Residents may bring 1-2 other large pieces (e.g., easy chair, chest of drawers),
- f) Each resident may have TV, radio, or stereo,
- g) Each room may have TV, radio, or stereo,
- h) Nightlight in each resident's room,
- i) Individual privacy arrangements,
- j) Window treatments secured so difficult to pull down,
- k) Rooms are significantly different with recognizable objects.

The results of McNemar tests performed for each of these 11 features of residents' rooms are found in Table 14. Only the following three items were significantly different: Lockable hanging storage/closet; each resident may have TV, radio, etc.; and lockable/latched drawers. Therefore, the null hypotheses corresponding to the other eight variables were not rejected.

The results relative to lockable storage/closets and drawers agree with recommendations for minimizing rummaging behavior. In the case of "TV, radio, or stereo for each resident," the frequency for remainder of the facilities was greater than that for the ADUs (although both represented a majority of residents). Literature reveals that Alzheimer patients who are also hearing impaired are more likely to become agitated or experience catastrophic reactions in the

TABLE 14. MCNEMAR TEST FOR COMPARISON OF FREQUENCY OF
SELECTED FURNISHINGS OF RESIDENTS' ROOMS
(N=99)

Variable	ADU	Remainder	Statistical significance
	<u>N</u>	<u>N</u>	
Bring 1-2 other large pieces	87	89	.6250
Nightlight in each resident's room	79	76	.3750
Each resident may have TV, radio, etc.	73	88	.0015**
Individual privacy arrangements	66	66	1.0000
Window treatments secured	51	45	.0703
Full/half-length wall mirrors	44	46	.6875
Lockable hanging storage/closet	43	21	.0001***
Rooms significantly different	32	31	1.0000
Residents may bring own bed	30	32	.7539
Lockable/latched drawers	31	19	.0169*
Each room may have TV, radio, etc.	27	34	.0923

* Significance level $p < .05$
 ** Significance level $p < .01$
 *** Significance level $p < .001$

presence of sound. Although television, radio, or stereo can be source of that noise, a majority of the sample ADUs apparently permit their individual use (but less often than in the remainder of their facilities).

Ho3: There is no difference between the sample ADUs and the remainder of their facilities on the proportion of selected environmental cueing devices reported:

- a) Units/floors are color-keyed or "themed" to look different from others,
- b) Residents' rooms are color-coded (walls, furniture, doors),
- c) Color-coded activity areas, e.g., dining, dayroom, etc.,
- d) Use of matching photos or symbols (patient carries one, the other is on the door),
- e) Personal marker/residents' photo posted near room door,
- f) Bathrooms are marked with pictures or colors,
- g) Supergraphics or patterns on walls or floors,
- h) Pictograph symbols ("signs without words"),
- i) Large murals,
- j) "Landmarks" (picture groups, objects),
- k) Color or style of staff uniforms,
- l) Signs.

The results of the hypothesis testing shown in Table 15 present eight environmental cueing devices for which statis-

TABLE 15. MCNEMAR TEST FOR COMPARISON OF FREQUENCY OF ENVIRONMENTAL CUEING DEVICES (N=99)

Variable	ADU	Remainder	Statistical significance
	<u>N</u>	<u>N</u>	
Personal marker/ residents' photo near door	64	31	.0000***
"Landmarks" (picture groups, objects)	40	27	.0023**
Staff uniform color or style	36	32	.3438
Bathrooms labelled with pictures/colors	33	9	.0000***
Signs	32	13	.0000***
Units/floors color- keyed or "themed"	27	23	.4807
Pictograph symbols	27	12	.0003***
Matching photos or symbols	18	10	.0386*
Large murals	18	11	.0391*
Residents' rooms color-coded	18	13	.1250
Activity areas color-coded	15	8	.0156*
Supergraphics or patterns on walls /floors	10	8	.6875

* Significance level $p < .05$
 ** Significance level $p < .01$
 *** Significance level $p < .001$

tically significant differences were found. The eight variables were: "personal marker/residents' photo near door;" "landmarks (picture groups, objects);" "bathrooms labelled with pictures/colors;" "signs;" "pictograph symbols;" "matching photos or symbols;" "large murals;" and "activity areas color-coded." The null hypotheses related to these items were rejected. In other words, a statistically significant difference exists between the sample ADUs and the remainder of their facilities on these eight environmental cueing devices, all of which were more common in ADUs than in the facilities as a whole.

Literature notes that cues such as resident's photos, name plates, color-coding, numbers, and landmarks are signals that may be viewed close up to tell patients they are going the right way (Hiatt, 1980; Liebowitz et al., 1979). In these results, the proportion of selected environmental cues (photos, landmarks, bathrooms labelled with pictures/colors, signs, pictograph symbols, large murals and activity areas color-coded) was significantly different between the ADUs and the remainder of their facilities. Although Goodman (1986) and Liebowitz, Lawton, and Waldman (1979) suggest that color-coding or keying of ADUs is an effective environmental cue, color-coded in staff uniforms, units/floors, and residents' rooms were not common features in the sample ADUs. Furthermore, no statistically significant difference exists between the ADUs and the facilities as a whole on the incidence of

these color-coded features.

Ho4: There is no difference between the sample ADUs and the remainder of the facilities on the proportion of selected communication/noise reduction methods identified by the respondents:

- a) Public address systems modified to cut extraneous noise,
- b) Public address systems are used only in emergency,
- c) Public address systems disconnected or not used,
- d) Staff use walkie-talkie or beeper communication devices,
- e) No television in the dayroom or lounge area,
- f) Residents' rooms monitored by intercom/video system,
- g) Acoustical/sound-absorbent ceiling material,
- h) Sound-absorbent wall surface material,
- i) Carpeted floors.

The results of the hypothesis testing are shown in Table 16. Statistically significant values were found for six of the communication/noise reduction methods. Therefore, the null hypotheses related to the following six features were rejected: "PA system modified to cut noise;" "sound absorbent wall surfaces;" "no television in dayroom/lounge;" "acoustical/sound-absorbent ceiling;" "PA systems disconnected or not used;" and "PA systems used only in emergency." All of these communication/noise reduction methods were more prevalent in the ADUs. Although literature (AAHA, 1985;

TABLE 16. MCNEMAR TEST FOR COMPARISON OF FREQUENCY OF
COMMUNICATION/NOISE REDUCTION METHODS (N=99)

Variable	ADU	Remainder	Statistical significance
	<u>N</u>	<u>N</u>	
Acoustical/sound- absorbent ceiling	57	49	.0078**
PA systems modified to cut noise	47	22	.0000***
Sound-absorbent wall surfaces	40	23	.0000***
No television in dayroom/lounge	34	12	.0003***
Carpeted floors	27	36	.0636
PA systems used only in emergency	20	14	.0313*
Residents' rooms monitored by inter- com/video system	18	21	.4531
PA systems disconnected or not used	13	3	.0020**
Walkie-talkie/beeper devices used	4	5	1.0000

* Significance level $p < .05$

** Significance level $p < .01$

*** Significance level $p < .001$

Peppard, 1985; Roll, 1986) recommends acoustical/sound-absorbent ceiling and wall surfaces as one noise reduction method in ADUs, little more than one-half of the sample ADUs used acoustical ceilings and less than one-half used acoustical wall surfaces. Over one-third of the dayrooms/lounges in the sample ADUs had eliminated television or radio/audio systems, concurring with recommendations that Alzheimer patients with hearing impairment have difficulties with noise (Roll, 1986; Schultz, 1987).

CHAPTER V: SUMMARY AND IMPLICATIONS

The segregated specialized unit, with its unique physical features, is an important housing-service package for managing the behaviors and symptoms of Alzheimer and dementia patients in long term care facilities. The optimum therapeutic milieu for the Alzheimer/Dementia Unit (ADU), however, has not been defined and a description of the state of the art in existing U. S. facilities is unavailable.

The two primary objectives of this study were to describe ADU living environments and to determine how the physical aspects of ADUs differ from the design and construction of the remainder of the facility. Four research hypotheses were tested to identify differences between the ADUs and the remainder of their facilities on the proportion of selected physical features reported.

A ten-page mail questionnaire was developed to collect the data for this study. The data were collected from a nationwide nonrandom sample of 99 long term care facilities with segregated specialized units for Alzheimer and other dementia patients. Statistical analyses of the data were conducted using frequency distributions, descriptive statistics, and the nonparametric McNemar test.

Summary of Findings

This chapter summarizes the findings, discusses their implications, then makes recommendations for future research.

The findings are summarized as follows: sample description, physical characteristics of ADU living environments, and testing of hypotheses.

Sample Description

Of the 99 sample long term care facilities with ADUs in 34 states, two-thirds (65.7%) were proprietary and 33.3 percent were private, nonprofit institutions. One-third of the facilities were located in central cities of metropolitan areas and the remainder were almost evenly distributed among suburban, small city, and rural or small town areas. The mean total number of beds in the sample facilities was 169.9, with a mean number of 31.6 ADU beds.

More than 50 percent of sample facilities used six of the 12 admission criteria listed in the questionnaire: functional assessment done in the nursing or patient's home; in-house transfers made on staff recommendation; permission of patient's family required; source of payment must be confirmed; mental status assessment required; and mentally retarded/developmentally disabled persons excluded. The two discharge criteria most frequently reported by more than one-half of the sample ADUs were that nonresponsive patients and those exhibiting certain behaviors were transferred or discharged. The nonpermissible behaviors most frequently indicated were combative, aggressive, violent, harmful, or disruptive behaviors.

All 11 ADU program components listed in the survey were

reported by more than one-half of the sample ADUs. Ninety percent or more reported inclusion of the following: special staff training, support, and education; family education, involvement, and support; music therapy; hydration program or bowel/bladder monitoring; occupational or recreational therapy; and special dietary services. More than 90 percent of the sample ADUs showed the same or a higher staffing ratio than that required in their state for skilled nursing care.

In more than one-half of the ADUs, daily charges were not the same as the skilled nursing or intermediate care rates for the remainder of the facility. Four-fifths of the ADUs noting a different rate indicated that their daily charge/rate was higher. The two payment methods utilized by the highest percentages of the sample ADU residents were private pay and Medicaid.

The mean number of female residents in the sample ADUs (18.7) was more than double the mean number of male residents (8.4). Within seven age ranges, the highest percentages of ADU residents were in the 81-85 year range, followed by age 86 or older, and age 76-80. The highest percentage (22.1%) of residents entered the ADU from their own home, followed by "elsewhere in the nursing home," and from the hospital. The highest mean percentage for functional levels of ADU residents were "able to feed themselves," (54.7%) "urinary incontinence," and "fecal incontinence." In terms of mobility levels, over one-half of ADU residents were usually

ambulatory without assistance.

Physical Characteristics of ADU Living Environments

Over one-half (56.6%) of the sample ADUs were created by remodeling an existing wing or section and about one-fifth (22.2%) were converted from an existing wing or section with little or no physical change. Only a few of the ADUs were newly-constructed. The majority of the respondents indicated that ADU residents had the same amount or more space than residents in the remainder of the facility. In most (90.9%) of the ADUs, the rooms were located together in one section or wing. Over one-half (57.6%) of the sample ADUs were not locked, while over one-third (38.4%) were locked at all times.

Within eight types of ADU facilities listed in the survey, the highest frequency was for "own nursing station or staff work area" (81.8%), followed by "own dining area," and "own dayroom or lounge area." All five types of outdoor facilities listed in the survey were reported by more than one-half of the sample ADUs these included "enclosed patio, courtyard, porch, balcony, or terrace;" "wander garden, path, or loop;" "gardening areas or planting beds;" "fenced or alarmed perimeter;" and "sheltered outdoor areas."

In terms of safety/security, eight of 13 features listed in the survey were reported by more than one-half of the sample ADUs. Over 90 percent included the following three features: "housekeeping chemicals secured," "breakable items

kept away from residents," and "clutter minimized." While the bulk of the sample ADUs were not locked, 83.8 percent reported the use of alarm systems on exits.

Most of the reality orientation aids listed in the survey, including large print calendars (92.9%), clocks with large faces/numbers (89.9%), (daily) schedules or activity boards (83.8%), and orientation boards (73.7%) were used by the majority of the sample ADUs. Reality orientation items were more frequently reported than were environmental cueing devices. A personal marker or resident's photo near their room door was the only environmental cueing device indicated by over one-half of the sample ADUs. Frequencies for the use of color-coding, wall hangings or murals, and simple super-graphics or patterns on walls or floors were relatively low.

Almost all of the sample ADUs allowed residents to bring one or two large pieces of furniture (other than their beds) from home (92.9%). Other frequently reported furnishings of residents' rooms were "nightlight in each resident's room," "each resident may have TV, radio, etc.," "individual privacy arrangements," and "window treatments secured." Lockable hanging storage or closets (44.4%) and lockable or latched drawers (31.3%) were relatively less frequent. Well over one-half of the respondents identified "other" personalization methods including family or own pictures, personal bedding or other items, or own furniture to make residents' rooms homelike.

In toilet and bath arrangements, two features related to incontinence showed high frequencies: "Moisture-resistant or plastic-covered upholstery on chairs and sofas" (93.3%) and "incontinence aids used" (68.7%). Institutional bathing equipment (88.9%) was second highest in frequency. A private toilet and lavatory in each resident's room was more common than toilet and lavatory shared by two rooms.

The only communication/noise reduction method reported by more than one-half of the sample was the acoustical or sound absorbent ceiling. Sound absorbent wall surfaces were more common (41.4%) than carpeted floors (29.3%). Almost one-half of the sample ADUs had modified their public address systems to cut extraneous noise. Floor surfaces in over three-fourths of the ADUs were the same or similar to those in the remainder of the facility, and were primarily hard surface flooring coverings such as tile and sheet vinyl. Wall surfaces in nearly three-fourths of the sample ADUs were the same or similar to those in the remainder of the facility. Wallpapers with neutral or pastel colored designs were most frequent, followed by walls painted in neutral or pink colors.

More than three-fourths of the respondents described the changes or additions made to create their ADU, identified their ADU's most successful physical aspect, and suggested changes they would make if establishing another ADU. Security systems (44.4%) and outdoor fenced area/items

(32.3%) were the two changes or additions made most frequently to create the ADUs, followed by new/changed wall surfaces (22.2%). The security system/locked unit was the physical aspect most frequently reported (44.4%) as most successful, followed by safe/secure outdoor area/wander garden (24.2%). Added rooms or spaces, followed by larger rooms or spaces were the physical aspects that the respondents most frequently would change or add if creating another ADU.

Testing of Hypotheses

The nonparametric McNemar test was used to test four null hypotheses in this study. Of the 45 subhypotheses tested, 27 hypotheses were rejected. Among 13 selected safety/security features, statistically significant values were found for the following ten features: Breakable items kept from residents; clutter minimized; patients smoke only with supervision; patients smoke only in designated areas; stairs, elevators secured/alarmed; interior exits disguised; patient sensors activate alarm; housekeeping carts secured; exits with automatic fire unlock; and outdoor exits openable/alarmed. In other words, a statistically significant difference exists between the ADUs and the remainder of the sample facilities on the proportion of those features reported. In all cases except "patients smoke only in designated areas," the ADU frequency was significantly higher.

Within 11 selected features of residents' rooms, the proportion of only the three furnishings were found to be

significantly different: Lockable hanging storage/closet; each resident may have TV, radio, or stereo; and lockable/latched drawers. For lockable/latched storage features and lockable hanging storage/closet, ADU frequencies were significantly higher. For individual TV, radio, or stereo, frequencies for the remainder of the facilities were significantly higher.

Statistically significant differences between the ADUs and the remainder of their facilities were found for eight of 12 environmental cueing devices. These features were: personal marker/residents' photo near room door; bathrooms labelled with pictures/colors; signs; pictograph symbols; "landmarks" (picture groups, objects); matching photos or symbols; large murals; and activity areas color-coded. Significant differences were also found for six of nine selected communication/noise reduction methods, including PA systems modified to cut noise; sound-absorbent wall surfaces; no television in dayroom/lounge; acoustical/sound-absorbent ceiling; PA systems disconnected or not used; and PA systems used only in emergency.

Recommendations and Implications

Based on the data gathered by this study and the literature reviewed, the researcher has identified several recommendations and implications for further research. No conclusions have been reached because of the exploratory and descriptive nature of the study and the fact that relation-

ships were not tested. Also, the findings of this study may not be generalizable to all ADUs or long term care facilities because the data were not collected from a random sample.

Two ecological models, Lawton's adaptation theory and Kahana's person-environment congruence theory, may help to explain the relationship between Alzheimer patients and their living environments. Because Alzheimer patients are low in environmental competence and sensitive to environmental changes, the use of selected physical features may lower the environmental press in an ADU and therefore reduce maladaptive and negative behaviors in its residents. Optimal congruence between Alzheimer patients' needs and environmental press may be accomplished by using appropriate physical features in an ADU. The following recommendations relate to safety/security features, furnishings of residents' rooms, environmental cueing devices, communication/noise reduction methods and outdoor facilities.

Over 90 percent of the sample ADUs reported three features: "Housekeeping chemicals secured," "breakable items kept from residents," and "clutter minimized". Frequencies for the following 10 features were significantly different between the ADUs and the remainder of the facilities:

"Breakable items kept from residents," "clutter minimized," "housekeeping carts secured," "patients smoke only with supervision," "outdoor exits openable/alarmed," "patients smoke only in designated areas," "exits with automatic fire

unlock," "stairs, elevators secured/alarmed," "interior exits disguised," and "patient sensors activate alarm". The last three features, however, were reported by less than one-half of the sample ADUs. Stairs or elevators were uncommon because most of the sample ADU rooms were on ground floor. The relatively low frequency for the use of patient sensors may result from cost factors and patient constraints. Interior exits may not need to be disguised if the ADU is locked or alarmed. Furthermore, the frequency for supervised smoking was significantly higher in the ADU (probably the only way smoking is allowed if at all). Conversely, smoking only in designated areas was significantly higher in the remainder of the facilities. Finally, secured housekeeping chemicals were the most frequent safety and security feature for both ADUs and the remainder of the facilities (and not significantly different), probably as a result of nursing home regulations.

The most frequent and significantly different safety and security features related to breakable items, minimal clutter, secured housekeeping carts, alarmed outdoor exits, smoking restrictions, and exits with automatic fire unlock. Therefore, to provide a living environment that permits freedom of movement with complete safety and security for ADU patients (and their possessions), it is recommended that future research investigate the provision of the following safety and security features in ADUs:

- 1) A simple, uncluttered environment with all hazards removed or secured, and
- 2) Outdoor exits that are simultaneously secure (locked or alarmed) and "fire safe".

More than one-half of the sample ADUs reported the following six residents' room features: "Bring 1-2 other large pieces of furniture," "nightlight in each resident's room," "each resident may have TV, radio, etc.," "individual privacy arrangements," "window treatments secured," and "other personalization methods including family or own photos." Among these frequently cited features, "each resident may have TV, radio, etc." was significantly different but lower in frequency in the ADUs. The other significantly different items ("lockable hanging storage/closet" and "lockable or latched drawers") carried relatively low frequencies. Therefore, it is suggested that furnishings of ADU residents' rooms need not differ significantly from other residents' rooms in terms of personal furnishings or possessions and privacy arrangements--both should provide a homelike, personal living environment.

Although a personal marker or resident's photo near their room door was the only environmental cueing device indicated by over one-half of the sample ADUs, the proportions of seven other features were also significantly different between the sample ADUs and the remainder of their

facilities. In addition to the personal marker/resident's photo, these included landmarks; bathrooms labelled with pictures/colors; signs; pictograph symbols; matching photos or symbols; large murals; and activity areas color-coded. All but one of these were relatively low in frequency, perhaps because ADU sizes were not large enough to require the usual environmental cues recommended for use in long term care facilities. Therefore, relative to environmental cueing devices, the researcher recommends that to help Alzheimer patients to find their way in an ADU, personal markers or resident's photos may be posted near the doors of their rooms.

The three most frequently indicated communication/noise reduction methods were acoustical/sound-absorbent ceiling, PA systems modified to cut noise, and sound-absorbent wall surfaces. The proportions of these three features plus three less frequently reported items ("no television in dayroom/lounge," "PA systems used only in emergency," and "PA systems disconnected or not used") were significantly different between the sample ADUs and the remainder of their facilities. Acoustical ceiling and wall surfaces can reduce overall noise levels in the ADU, while altering PA systems may reduce the incidence of catastrophic reactions caused by confusing, disembodied sounds. Thus, to provide a quiet, calm atmosphere in an ADU, sound-absorbent ceiling and wall surfaces and modified public address systems are suggested.

Although significantly different, the relatively low incidences of certain features in this sample raise questions about their individual contribution (or detriment) to the ADU living environment. Therefore, further research should test the effects of the following variables under controlled conditions: lockable storage in residents' rooms; environmental cueing devices such as landmarks, color-coding, pictograph symbols, or wall hangings; and noise reduction via removal of television sets and radios.

Finally, all outdoor facilities listed in the survey including "enclosed patio, courtyard, porch, balcony, or terrace;" "wander garden, patio, or loop;" "gardening areas or planting beds;" "fenced or alarmed perimeter;" and "sheltered outdoor areas" were prevalent physical aspects in the sample ADUs. Furthermore, the outdoor facilities were not only among the most frequently indicated physical changes or additions made to create the ADU, but they were also frequently identified as the most successful physical aspect. Therefore, it is suggested that safe and secure outdoor facilities may be an essential and unique feature in an ADU.

Implications for Further Research

The above recommendations and results of this study suggest several issues for further research. These data only describe the state of the art in a limited sample (the "way it is") and show how existing ADUs compare to the recommenda-

tions presented by current literature. They do not reveal the way ADUs "ought to be." They can, however, provide the basis for identifying researchable questions and appropriate methodologies.

Lockable storage features that accommodate the rummaging behavior of Alzheimer patients were relatively infrequent in the sample ADUs. Possible reasons why these features are thus far low in frequency include:

- 1) Cost factors to retrofit storage areas with locks,
- 2) ADU or long term care facility administrators do not know that lockable storage may be a useful feature, or
- 3) Administrators do not want to use these features until research provides information that lockable storage can "accommodate" rummaging behavior without creating other problems relative to the patients' abilities to select clothing and dress themselves.

Therefore, further research should investigate possible relationships between lockable storage features in an ADU and their effect on patient's rummaging behavior and independent functioning.

While various environmental cueing devices and communication and noise reduction methods in an ADU are frequently recommended in literature, these features were not common in the sample ADUs. Additional research should be aimed at clarifying the economic and behavioral costs and benefits of including these features in ADUs. Reality orientation aids

were prevalent in the sample ADUs, although literature concludes that these aids may cause negative behavioral problems in Alzheimer patients. Future studies could also use controlled experimental designs to test the usefulness of reality orientation aids in an ADU.

Several other questions emerged as these data were prepared for analysis. For example, while wandering may not be an ADU admission criterion as such, it may be a behavior that triggers admission. Respondents' comments also revealed that window design and treatment may be another important safety and security feature in an ADU. Finally, "Can the same outdoor facilities serve both the ADU and the remainder of the nursing home?"

The above findings, recommendations, and implications constitute only a limited beginning in describing the therapeutic milieu of segregated specialized units for Alzheimer patients. Further studies doubtlessly must make closer and controlled observations of patient/environment interactions and identify the most appropriate research methods for user needs and post-occupancy studies in which the user cannot respond in the traditional sense.

REFERENCES

- American Association of Homes for the Aging (AAHA). (1985). Guide to caring for the mentally impaired elderly. Washington, DC: Author.
- American Association of Homes for the Aging (AAHA). (1986). A guide to quality of care. Washington, DC: Author (pamphlet).
- Aranyi, L. & Goldman, L. L. (1980). Design of long term care facilities. New York: Van Nostrand Reinhold.
- Aronson, M. K. (1982). Alzheimer's disease: An overview. Journal of the Western Gerontological Society, Fall.
- Bell, P. A. & Smith, J. M. An empirical assessment of the effectiveness of specialized Alzheimer's nursing home units. Fort Collins: Colorado State University (mimeo).
- Berger, E. Y. (1985). The institutionalization of patients with Alzheimer's disease. Nursing Homes, 34(6), 22-29.
- Birren, J. (1964). The psychology of aging. Englewood Cliffs, NJ: Prentice Hall, 1964.
- Boosalis, H. (1985). Small secure, homelike environment best for Alzheimer's patients. Aging, 347, 40-41.
- Breger, W. N. & Pomeranz, W. R. (1985). Nursing home development: A guide to planning, financing, and constructing long term care facilities. New York: Van Nostrand Reinhold.
- Brody, J. A. (1985). Prospects for an aging population. Nature, 315 (6019), 463-466.
- Brown, W. J. (1987). Planning construction for resident-oriented long term care settings. Contemporary Long Term Care, Aug., 53-55.
- Committee on Nursing Home Regulation. (1986). Improving the quality of care in nursing homes. Washington, DC: National Academy Press.
- Christenson, M. A. (1985). Special care unit survey (mimeo). New Brighton, MN: Author.
- Deedy, J. (1984). Your aging patients. Chicago: Thomas More Press.
- Dietsche, L. M. & Pollmann, J. N. (1982). Alzheimer's

- disease: Advances in clinical nursing. Journal of Gerontological Nursing, 8(2), 97-100.
- Dillman, P. A. (1978). Mail and telephone surveys: The Total Design Method. New York: John Wiley.
- Eastman, P. (1984). Alzheimer's Disease. Geriatric Consultant, May/June., 11-13.
- Folsom, (1968). Reality orientation for the elderly patient. Journal of Geriatric Psychiatry, 1, 291-307.
- Goodman, G. (1986). Confronting Alzheimer's at Newton-Wellesley nursing home. Nursing Homes, 35(2), 30-34.
- Gwyther, L. P. (1986). Treating behavior as a symptom of illness. Provider, May, 18-21.
- Hebrew Home For The Aged. (1986). The development of a continuum of care for individuals with Alzheimer's disease and other related dementias and their families. New York: Author.
- Hiatt, L. G. (1980). Disorientation is more than a state of mind. Nursing Homes, 29(4), 30-36.
- Hiatt, L. G. (1982). The importance of the physical environment. Nursing Homes, 31(5), 2-10.
- Kahana, E. (1982). A congruence model of person-environment interaction. In Lawton, M. P., Windley, P. G., and Byerts, T. O. Aging and the environment: Theoretical approaches. New York: Springer, 97-120.
- Kart, C. S. (1985). The realities of aging. Newton, MA: Allyn and Bacon, 386-389.
- Katzman, R. (1986). Alzheimer's disease. New England Journal of Medicine, 314, 964-973.
- Koncelik, J. (1976). Designing the open nursing home. Stroudsburg, PA: Dowden, Hutchinson and Ross.
- Kromm, D. & Kromm, Y. H. N. (1985). Nursing unit designed for Alzheimer's disease patients at Newton Presbyterian Manor. Nursing Homes, 34(3), 30-31.
- Lawton, M. P. & Nahemow, L. (1973). Ecology and the aging process. In Eisdorfer, C. & Lawton, M.P. (Eds.), Psychology of adult development and aging. Washington, DC: American Psychological Association, 619-674.

- Lawton, M. P. (1975). Planning and managing housing for the elderly. New York: Wiley-Interscience.
- Lawton, M. P. (1981). Sensory deprivation and the effect of the environment on management of the patient with senile dementia. In Miller, N.E & Cohen, G.D. (Eds). Clinical aspects of Alzheimer's disease and senile dementia. New York: Raven Press, 227-250.
- Lawton, M. P. (1982). Competence, environmental press, and the adaptation of older people. In Lawton, M.P., Windley, P.G. & Byerts, T.O. Aging and the environment: Theoretical approaches. New York: Springer, 33-57.
- Lawton, M. P. (1986). Environment and aging. Albany NY: Center for the Study of Aging (Classics in Aging reprint series).
- Lewin, K. (1951). Field theory in social science. New York: Harper & Row.
- Liebowitz, B., Lawton, M.P., & Waldman, A. (1979). Evaluation: Designing for confused elderly people. American Institute of Architects, 68(2), 59-61.
- Morscheck, P. (1984). Introduction: An overview of Alzheimer's disease and long-term care. Journal of Long Term Health Care, 3(4), 4-10.
- Mousseau, J. K. (1987). Design specialty: A case for color. ASID Report, 13(2), 15-17.
- Noakes, E. H. & Taylor, P. S. (1984). Architecture and long term care: The resident's room. American Health Care Association Journal, May, 87-88.
- Noakes, E. H. & Taylor, P. S. (1986). Architecture and long term care; Tomorrow's facility: Silk purse or sow's ear? American Health Care Association Journal, Sept., 62-65.
- Norusis, M. J.. (1986). SPSS/PC+ for the IBM PC/XT/AT. Chicago, IL: SPSS Inc..
- Peppard, N. R. (1985). Alzheimer special-care nursing home units. Nursing Homes, 34(5), 25-28.
- Peppard, N. R. (1986a). Special nursing home units for residents with primary degenerative dementia: Alzheimer's disease. Journal of Gerontological Social Work, 9(2), 5-13.

- Peppard, N. R. (1986b). Effective design of special care units. Provider, May, 14-17.
- Pynoos, J. & Stacey, C. A. (1986). Specialized facilities for senile dementia patients. In Gilhooly, M. L. M., Zarit, S. H. & Birren, J. (Eds.) The dementias: Policy and management. Englewood Cliffs, NJ: Prentice-Hall, 111-130.
- Rhodes, F. & Houser, G. (1986). Provider initiatives: Caring is the heart of the matter at ARA. Provider, May, 28-31.
- Roll, M. K. (1986). Patterns for institutions: A behavioral approach to designing facilities for Alzheimer's patients. Unpublished master's thesis, University of Wisconsin-Madison.
- Rutledge, J. A. (1987). Lighting as an environmental tool for the elderly. Contemporary Long Term Care, Aug., 42-44.
- Schultz, D. J. (1987). Special design considerations for Alzheimer's facilities. Contemporary Long Term Care, Nov., 48-56.
- Speyer, R. A. (1987). Improving security in LTC facilities. Contemporary Long Term Care, Aug., 65-66.
- Stichler, J. F. & Peter, J. (1987). Color and long term care facilities. Contemporary Long Term Care, May, 41-42.
- Terry, R. & Katzman, R. (1983). Senile dementia of the Alzheimer's type: Defining a disease. In Katzman, R. & Terry, R. (Eds.). The neurology of aging. Philadelphia: F.A. Davis.
- U. S. Office of Technology Assessment (1985). Technology and aging in America (OTA-BA-265). Washington, DC: Government Print Off.
- U. S. Office of Technology Assessment (1987). Losing a million minds: Confronting the tragedy of Alzheimer's disease and other dementias. Washington, DC: Government Print Off.
- Yankee Health Care (1987). Alzheimer's project of Kennebec Valley (mimeo). Gardiner, ME: Author.
- Zimmerman, M. D. (1983). The future of fire safety requirements for Medicare/Medicaid facilities. American Health Care Association Journal, Sep., 21.

BIBLIOGRAPHY

- Armstrong, L. M. (1984). What do residents expect in a nursing home? Nursing Homes, 33(4), 38-39.
- Booth, R. (1985). Designing activities for the Alzheimer's residents. American Health Care Association Journal, 11(4), 41-42.
- Brody, E. M. (1981). The formal support network: Congregate treatment settings for residents with senescent brain dysfunction. In Miller, N.E. & Cohen, G. D. (Eds.). Clinical aspects of Alzheimer's disease and senile dementia. New York: Raven Press, 227-250.
- Charles, R., Truesdell, M. L. & Wood, E. L. (1982). Alzheimer's disease: Pathology, progression, and nursing process. Journal of Gerontological Nursing, 8(2), 69-73.
- Cooper, B. A. (1985). A model for implementing color contrast in the environment of the elderly. American Journal of Occupational Therapy, 39(4), 253-258.
- Edelson, N. S. & Lyons, W. H. (1985). Institutional care of the mentally impaired elderly. New York: Van Nostrand Reinhold.
- Finnelly, A. L. (1985). Making it safe for the patient to wander. American Health Care Association Journal, 11(7), 29-31.
- Grossman, H. D., Weiner, A. S., Salamon, M. J. & Burros, N. (1985-86). The milieu standard for care of dementia in a nursing home. Journal of Gerontological Social Work, 9(2), 73-89.
- Heston, L. L. & White, J. A. (1983). Dementia: A practical guide to Alzheimer's disease and related illness. New York: W. H. Freeman.
- Hiatt, L. G. (1980). Moving outside and making it a meaningful experience. Nursing Homes, 29(3), 34-39.
- Hiatt, L. G. (1980). Is poor light dimming the sight of nursing home patients. Nursing Homes, 29(5), 32-41.
- Hiatt, L. G. (1980). The happy wanderer. Nursing Homes, 29(2), 27-31.
- Hiatt, L. G. (1981). The color and use of color in environments for older people. Nursing Homes, 30(3), 18-21.

- Hiatt, L. G. (1981). Self-administered check-list for planning and priority setting. Nursing Homes, 30(1), 33-39.
- Hiatt, L. G. (1982). The environment as a participant in health care. Journal of Long-Term Care Administration, Spring, 1, 1-17.
- Jason, L. A. & Smetak, S. (1983). Altering the design of a nursing home. In Snyder, M. A., & Gatz, M. (Eds.). Mental health and aging. Beverly Hills: Sage Publications, 215-224.
- Kelley, W. E. (1984). Alzheimer's disease and related disorders. Springfield, IL: Charles C. Thomas.
- Lieberman, M. A. (1969). Institutionalization of the aged: Effects on behavior. Journal of Gerontology, 24(3), 330-340.
- Levine, N. B., Dastoor, D. P. & Gendron, C. E. (1983). Coping with dementia: A pilot study. American Geriatrics Society, 31(1), 12-18.
- Mace, N. L. & Rabin, P. V. (1981). The 36-hour day. Baltimore: Johns Hopkins.
- Moore, G. T. & Tuttle, D. (1985). What is environmental design research? Environmental design research directions: Process and prospects. New York: Praeger.
- Pablo, R. Y. (1977). Intra-institutional relocation: Its impact on long-term care patients. Gerontologist, 17(5), 426-435.
- Parker, S. G. (1983). Getting Back to the "here and now": A look at reality orientation. Nursing Homes, 32(2), 14-16.
- Pease, J. A. (1986). Carpeting. Generations, 11(1), Fall, 41-44.
- Powell, L. S. & Courtice, K. (1983). Alzheimer's disease: A guide for families.
- Reingold, J. (1985). How to cope with Alzheimer's. The New York Times, Sept., 12.
- Schooler, K. K. (1982). Response of the elderly to environment: A stress-theoretical perspective. In Lawton, M. P., Windley, P. G., and Byerts, T. O. Aging and the environment: Theoretical approaches. New York: Springer,

80-95.

- Schur, J. (1984). A nursing home or independent living? Nursing Homes, 33(1).
- Stein, S. S., Linn, M. W., & Stein, E. M. (1985). Patients' anticipation of stress in nursing home care. Gerontologist, 25(1), 88-93.
- Stichler, R. A. (1987). Factors in designing skilled nursing facility patient rooms. Contemporary Long Term Care, Feb., 26-29.
- Thomas, J. & Bobrow, M. L. (1984). Targeting the elderly in facility design. Hospitals, 16, Feb., 83-89.
- Tropper, M. S. & Wagner, J. (1986). An Intranosological classification of Alzheimer's Disease as a multi-stage dementing process--The basis for individualized therapeutic strategies. Alzheimer's disease: Strategies for research and development. New York: Plenum Press, 161-167.

APPENDICES

Appendix A: Survey Questionnaire

SPECIALIZED UNITS FOR ALZHEIMER'S PATIENTS IN LONG TERM CARE FACILITIES



This survey is designed to describe the physical aspects of specialized units for patients with Alzheimer's disease and related disorders. It will also discover how these units differ from traditional nursing home design and construction. The results will help us to identify the challenges faced by long term care facilities in developing and evaluating appropriate living environments for dementia patients.

If you wish to make comments on any questions, or to qualify your answers, please feel free to use the space in the margins. We will read and take these into account.

Thank you for your help.

Please return this questionnaire to:

Dr. Betty Jo White
Department of Family Resource Management
Oregon State University
Corvallis, OR 97331
503-754-4992

For each question, circle one or more choices as needed to briefly DESCRIBE THE OVERALL PROGRAM OF YOUR SPECIALIZED UNIT FOR DEMENTIA PATIENTS.

1. Is your facility now operating a segregated specialized unit for persons with Alzheimer's disease or a related disorder?

- 1 Yes, it was established (month and year): _____
 2 No (If no, please write "Ineligible" on the cover page and return this questionnaire blank)

2. Please indicate whether or not each of the following admission criteria are used for your specialized Alzheimer's/Dementia Unit (Circle one number for each).

- Yes No
 1 2 Patients required to meet DSM III and/or ICD-9 diagnostic criteria
 1 2 Mental status assessment required
 1 2 Functional assessment done in the nursing home or patient's home
 1 2 In-house transfers are made on staff recommendation
 1 2 Patients must be ambulatory at time of admission to unit
 1 2 Patients must be bedridden at time of admission to unit
 1 2 Patients known to exhibit specific disturbing behaviors are not admitted (Please specify _____)
 1 2 Minimum age requirement (If yes, what is minimum age? _____)
 1 2 Source of payment must be confirmed
 1 2 Permission of patient's family is required for placement in unit
 1 2 Mentally retarded/developmentally disabled persons are excluded
 1 2 Other criteria, explain _____

3. Indicate whether or not each of these discharge criteria are used to determine when residents can no longer benefit from the special unit's services and facilities (Circle one number for each).

- Yes No
 1 2 Residents who become nonambulatory are transferred or discharged
 1 2 Residents who become nonresponsive are transferred or discharged
 1 2 Residents whose private funds are exhausted are discharged
 1 2 Residents who exhibit certain behaviors are transferred/discharged (Specify nonpermissible behaviors _____)
 1 2 Once admitted, residents live in the special care unit until death
 1 2 Other discharge criteria, explain _____

4. How does the staffing ratio for nurses and aides in the specialized unit compare with the required level for skilled nursing in your state?

- 1 The specialized unit's staffing ratio is higher
 2 The special unit staffing ratio is the same as for skilled nursing
 3 The special unit's staffing ratio is lower

5. Which of these possible components of Alzheimer's/Dementia Units has your facility included in its program? (Circle one number for each).

- Yes No
 1 2 Community education program
 1 2 Day, respite, or in-home care for dementia patients
 1 2 Family education, involvement, and support
 1 2 Hydration program or bowel/bladder retraining
 1 2 Music therapy
 1 2 Occupational or recreational therapy
 1 2 Physical and/or speech therapy
 1 2 Special dietary services
 1 2 Special staff training, support, continuing education
 1 2 Separate daily activities program with fulltime staff
 1 2 Volunteer program used to supplement care personnel
 1 2 Other major component, list _____

Next, we have some questions about the PHYSICAL ASPECTS OF THE SPECIALIZED UNIT ENVIRONMENT and if they differ from the remainder of the nursing home.

6. How is room occupancy in the Alzheimer's/Dementia Unit broken down? (State in numbers)

- _____ Private rooms (single occupant)
 _____ Double rooms (two beds)
 _____ Rooms with three or more beds

7. The special unit rooms are located (Circle one number for each)

- Yes No
 1 2 All together in one section or wing
 1 2 All together in a group home or other self-contained structure
 1 2 In more than one special unit or section, divided by behaviors or functional levels
 1 2 On the ground floor
 1 2 On the second or a higher floor of the facility

8. What is the layout of the special unit's floorplan?

- 1 Residents' rooms along double-loaded corridors that are _____ feet wide
 2 Residents' rooms clustered around central activity or nursing area
 3 Similar to a single-family home
 4 Other layout, explain or draw in margin, e.g., L- or H-shaped or:

9. Is the Alzheimer's/Dementia Unit locked?

- 1 Yes, it is locked at all times
 2 Yes, but locked only during daytime shifts
 3 No

10. Indicate whether or not each of these physical features is included to provide a safe environment for the Alzheimer's/Dementia Unit (ADU) residents. Are similar features found in the rest of the facility? (Circle one number for each set of columns).

n ADU es No	In Remainder	
	Yes	No
1 2	1 2	Stairs, stairways, and elevators are secured or alarmed
1 2	1 2	Interior "exits" from unit are disguised
1 2	1 2	Outdoor exits are openable but equipped with alarm systems
1 2	1 2	Secured outdoor exits automatically unlock with fire alarm
1 2	1 2	Patients wear sensors to activate security alarms on exits
1 2	1 2	Half-doors or Dutch doors used on some interior openings
1 2	1 2	Wide angle mirrors or video monitors used for surveillance
1 2	1 2	Housekeeping chemicals are secured or kept with the aides
1 2	1 2	Housekeeping carts are secured while in use
1 2	1 2	"Clutter" is minimized--little to grab, eat, or drink
1 2	1 2	Glass or easily breakable items kept away from residents
1 2	1 2	Residents are allowed to smoke only in specified areas
1 2	1 2	Residents are allowed to smoke only under supervision
1 2	1 2	Other indoor safety/security features, specify _____

13. Which of these environmental cueing devices are used to help residents find their way to (or be guided away from) specific areas in the Alzheimer's/Dementia Unit and in the rest of the facility? (Circle one number for each set of columns).

In ADU Yes No	In Remainder	
	Yes	No
1 2	1 2	Units or floors are color-keyed or "themed" to look different from others
1 2	1 2	Residents' rooms are color-coded (walls, furniture, doors)
1 2	1 2	Color-coded activity areas, e.g., dining, day room, etc.
1 2	1 2	Use of matching photos or symbols (patient carries one, the other is on the door)
1 2	1 2	Personal marker or resident's photo posted near room door
1 2	1 2	Bathrooms are marked with pictures or colors
1 2	1 2	Supergraphics or patterns on walls or floors
1 2	1 2	Pictograph symbols ("signs without words")
1 2	1 2	Large murals
1 2	1 2	"Landmarks" such as picture groupings, large objects, or:
1 2	1 2	Color or style of staff uniforms
1 2	1 2	Signs, describe size, colors, etc. _____
1 2	1 2	Other cues, explain _____

11. Indicate whether or not each of these outdoor facilities are provided for exclusive use by the special unit residents (Circle one number for each).

Yes No	
1 2	A secure "wander garden," path, or loop
1 2	Enclosed patio, courtyard, porch, balcony, or terrace
1 2	Outdoor areas sheltered to limit or prevent exposure to sun, rain, or cold
1 2	Gardening areas or planting beds
1 2	Perimeter of the facility/grounds is fenced, walled, or alarmed
1 2	Other outdoor facilities, specify _____

14. Which of these reality orientation aids are used in the special unit and in the rest of the facility? (Circle one number for each set of columns).

In ADU Yes No	In Remainder	
	Yes	No
1 2	1 2	Large print calendar
1 2	1 2	Clock with large face/number
1 2	1 2	Orientation board
1 2	1 2	(Daily) schedule or activity board
1 2	1 2	Autobiographical display of residents' backgrounds
1 2	1 2	Other physical devices used in reality orientation, explain _____

12. Does the Alzheimer's/Dementia Unit include the following rooms or areas for its exclusive use? (Circle one number for each).

Yes No	
1 2	Its own nursing station or work area for staff
1 2	Own kitchen where some or all meals and snacks are prepared
1 2	Own dining area (approximately _____ square feet in size)
1 2	Own day room or lounge area (_____ square feet)
1 2	Own combined dining and day room/lounge area (_____ square feet)
1 2	"Safe gym" or separate indoor exercise area (_____ square feet)
1 2	Small lounge or "quiet room" for individual privacy or visits with family members
1 2	"Isolation room" for patients to make noise

15. Which of the following communication and noise reduction methods are used in the special unit and in the remainder of the facility? (Circle one number for each set of columns).

In ADU Yes No	In Remainder	
	Yes	No
1 2	1 2	Public address systems modified to cut extraneous noise
1 2	1 2	Public address systems are used only in emergency situations
1 2	1 2	Public address systems disconnected or not used
1 2	1 2	Staff use "walkie-talkie" communication devices
1 2	1 2	No television set in the day room or lounge area
1 2	1 2	"Intercom" or video system used to monitor residents' rooms
1 2	1 2	Acoustical/sound absorbent ceiling material
1 2	1 2	Sound-absorbent wall surface materials
1 2	1 2	Carpeted floors
1 2	1 2	Other means, explain _____

16. Indicate whether or not each of these types of lighting are used in most corridors in the specialized unit and the rest of the facility (Circle one number for each set of columns).

In ADU		In Remainder		
Yes	No	Yes	No	
1	2	1	2	Incandescent ceiling lights installed parallel to floor
1	2	1	2	Incandescent ceiling fixtures perpendicular to floor
1	2	1	2	Fluorescent lights installed parallel to the floor
1	2	1	2	Fluorescent fixtures perpendicular to the floor
1	2	1	2	Wall mounted lighting
1	2	1	2	Indirect lighting
1	2	1	2	Other type, explain _____

17. Which of these types of lighting are found in residents' rooms in the special unit and the remainder of the facility? (Circle one number for each set of columns).

In ADU		In Remainder		
Yes	No	Yes	No	
1	2	1	2	Ceiling fixtures
1	2	1	2	Over-bed fixtures
1	2	1	2	Floor lamps
1	2	1	2	Wall mounted lamps
1	2	1	2	Table lamps
1	2	1	2	Other lighting, explain _____

18. Briefly describe the wall surfaces in special unit residents' rooms and corridors (colors, patterns, materials, etc.).

19. Are the wall surfaces in the special unit the same or similar to those in the remainder of the facility?

- 1 Yes
2 No, explain the difference _____

20. Briefly describe the floors in the special unit (colors, patterns, materials, etc.).

21. Are the floors in the special unit the same or similar to those in the rest of the facility?

- 1 Yes
2 No, explain the difference _____

22. Indicate whether or not each of these features are included in the Alzheimer's/Dementia Unit residents' rooms and in the remainder of the patients' rooms (Circle one number for each set of columns)

ADU Rooms		Other Rooms		
Yes	No	Yes	No	
1	2	1	2	Lockable or latched (chest of) drawers for each resident
1	2	1	2	Lockable/latched hanging storage/closet for each resident
1	2	1	2	Full- or half-length wall mirrors in room
1	2	1	2	Residents may bring in their own bed
1	2	1	2	Residents may bring in one or two other large pieces (e.g., easy chair, chest of drawers)
1	2	1	2	Each resident may have a television set, radio, or stereo
1	2	1	2	Each room may have one television set, radio, and stereo
1	2	1	2	Nightlight in each resident's room
1	2	1	2	Individual privacy arrangements, explain _____
1	2	1	2	Window treatments secured so difficult to pull down
1	2	1	2	Rooms significantly different with recognizable objects
1	2	1	2	Other methods to personalize or make rooms homelike, explain _____

23. Indicate whether or not each of these toilet and bath arrangements are found in the special unit and in the rest of the facility (Circle one number for each set of columns).

In ADU		In Remainder		
Yes	No	Yes	No	
1	2	1	2	Each resident's room has a private toilet and lavatory
1	2	1	2	Each two residents' rooms share toilet and lavatory facilities
1	2	1	2	More than two rooms share toilet and lavatory facilities
1	2	1	2	Restrooms are (also) located near day room or dining facilities
1	2	1	2	Bathing equipment is institutional in design
1	2	1	2	Mobile residents may use conventional shower facilities
1	2	1	2	Incontinent residents typically wear incontinence aids
1	2	1	2	Upholstery materials on chairs and sofas are moisture-resistant or plastic-covered
1	2	1	2	Curtains instead of stalls/doors are used in toilet area so residents don't get "trapped"

24. What is the total interior square footage of your special unit?
_____ square feet

25. How does the overall number of square feet per patient in the special unit compare with the remainder of the facility?

- 1 Special unit residents have the same amount of space as other patients
2 Special unit residents have more space than other patients
3 Special unit residents have less space than other patients

26. Physically, how was the Alzheimer's/Dementia Unit created?

- 1 An existing wing or section was converted with no special design or structural changes
- 2 An existing wing/section was remodeled to meet special needs
- 3 Special unit is a combination of converted space plus a new addition
- 4 Special unit was newly-constructed/designed for dementia patients (if all-new, go to Question 30, skipping numbers 27-29)

27. How many patient rooms or other areas and bed spaces were converted to provide separate spaces for dining, lounging, and other activities in the special unit?

- _____ Patient rooms were converted
- _____ Bed spaces were lost
- _____ Other areas converted, e.g., therapy rooms, etc., explain:

28. Briefly list the physical changes or additions made to modify or redesign the existing environment to become a specialized unit (e.g., walls, floors, lighting, furnishings, safety, security, etc.). Star (*) the changes that were made permanently.

29. Indicate whether or not each of these factors made creation of parts of the physical environment of the Alzheimer's/Dementia Unit more difficult, unusually expensive, or impossible. If yes, explain (giving specific examples) in the space following the question.

Yes No

- 1 2 State nursing home licensing requirements
- 1 2 State fire code requirements
- 1 2 Local building code
- 1 2 Local fire code
- 1 2 Medicaid certification requirements
- 1 2 FHA Minimum Property Standards for Convalescent Care
- 1 2 American Hospital Assoc. Joint Commission accreditation criteria
- 1 2 Other standards or regulations, explain _____
- 1 2 Design/construction of the existing physical plant

30. Have you applied for any "program flexibility" under state or federal requirements for licensing or certification?

- 1 No
- 2 Yes, explain _____

31. Which of the following sources of information did you use in developing your specialized unit? (Circle one number for each).

Used Not Used

- 1 2 Other facilities with Alzheimer's/Dementia Units
- 1 2 Architectural or environmental design firm
- 1 2 Private consultant specializing in Alzheimer's disease
- 1 2 Corporate headquarters provided information and assistance
- 1 2 Published materials (books, periodicals, pamphlets)
- 1 2 Consultation with patients' family and/or ADRDA members
- 1 2 Consultation with physicians and nursing staff
- 1 2 Consultation with social work and activity program staff
- 1 2 Consultation with housekeeping and maintenance staff
- 1 2 Consultation with a local advisory board
- 1 2 Research within our facility, incl. observation, experimentation
- 1 2 Other sources, list _____

Next, a few questions about the residents of the Alzheimer's/Dementia Unit:

32. How many special unit residents are:

- _____ female
- _____ male

33. How many Alzheimer's/Dementia Unit residents fall within each age range?

- _____ Under age 60
- _____ Age 60-65
- _____ Age 66-70
- _____ Age 71-75
- _____ Age 76-80
- _____ Age 81-85
- _____ Age 86 or older

34. Approximately what percentage of special care residents entered the unit from each of the following settings?

- _____ The hospital
- _____ Elsewhere in this nursing home
- _____ Another nursing home
- _____ A foster, board and care, or personal care home
- _____ The home of a relative
- _____ Their own home
- _____ Another location, explain _____

35. Approximately what percentage of the Alzheimer's/Dementia Unit residents fall within each of the following functional level categories? (Total of all lines may exceed 100%)

- Able to feed themselves
- Able to eat with assistance
- Have nasal-gastric tubes
- Able to perform self care (dressing, grooming, bathing)
- Can manage some self care with help
- Fully continent
- Urinary incontinence
- Fecal incontinence
- Nonresponsive, unable to communicate verbally

36. Approximately what percentage of the special unit residents are currently at each of these mobility levels?

- Usually ambulatory without assistance
- Ambulatory with personal assistance or a walker
- Wheelchair-bound (but not bedridden) most of the time
- Bedridden most of the time

37. Compared to the daily charge/rate for the remainder of the facility, the per day costs of the special unit (not including medications) are:

- 1 The same as the skilled nursing rate
- 2 The same as the intermediate or health-related rate
- 3 Not the same, explain the differential _____

38. For approximately what percentage of the special care residents are their nursing home costs paid by each of the following methods?

- Private pay
- Medicare
- Medicaid
- Veterans Administration
- Other payment method, explain _____

And for comparison, we need some information on the facility as a whole.

39. In what type of long term care facility is the special unit located?

- 1 Private, nonprofit
- 2 Associated with a hospital
- 3 Proprietary, owned by a corporation that owns 5 or more facilities
- 4 Proprietary, owned by an individual or corporation owning 1-4 homes
- 5 Government-owned and operated

40. The facility is located in a:

- 1 Rural or small town area (population less than 20,000)
- 2 Small city (20,000-50,000 population)
- 3 Suburb of a large city
- 4 Central city of a metropolitan area (population over 50,000)

41. Size of the facility and level(s) of care provided:

- Total number of beds
- Number of Alzheimer's/Dementia Unit beds
- Number of skilled nursing beds (not including special unit)
- Number of intermediate or health-related beds (not including ADU)
- Number of other beds, explain _____

42. This questionnaire was completed by (Circle all that apply)

- 1 Nursing home administrator
- 2 Special unit administrator or coordinator
- 3 Director of nursing
- 4 Activities director
- 5 Social worker
- 6 Other persons, identify by title _____

Our last two open-ended questions can help us obtain your opinions and a bit more detail. (You may continue your answers on the back of the page)

43. What physical aspects of the Alzheimer's/Dementia Unit environment have been the most successful (briefly explain how, for whom, why)?

44. What physical factors would you change or add if you were to set up another special unit for dementia patients? Why?

Appendix B: Cover Letter

College of
Home Economics



Corvallis, Oregon 97331-5109
United States of America

(503) 754-3551

June 19, 1987

Dear Administrator:

You are aware that the nursing home population is changing in major ways, including rising numbers of patients with senile dementia of the Alzheimer's and other types. Some facilities have added segregated specialized units for dementia patients, yet we know little about the similarities and differences between these units.

Your facility is one of a small number of nursing homes that I am surveying to describe special programs for dementia patients. Specifically, my focus is on how the specialized unit's physical environment may differ from the rest of the nursing home. From this information, we can begin to identify major challenges related to developing living environments that are appropriate for these patients and affordable for their families.

The name of your facility was drawn in a nationwide sample of nursing homes identified as having specialized units for Alzheimer's patients. So that the results of this study truly represent the special units in operation today, it is important that each survey be completed and returned. It may be filled out by you or the person with administrative responsibility for the unit. I've enclosed \$1.00 so the respondent can enjoy a cup of refreshment while answering the questions.

Each response will be kept confidential. The questionnaire has an identification number for mailing purposes only--so that when it is returned, I may check your facility off the list. No individual or facility names will ever be placed on the surveys or used in the report of the results.

When the study is completed next fall, I will share the results with the many groups who are concerned about the quality of life for Alzheimer's patients. You may also receive a summary of the findings by writing "copy of results requested" on the back of the return envelope, and printing your name and address below it. Please do **not** put this information on the questionnaire itself.

I will be happy to answer any questions you may have. Please write or call me collect at 503-754-4992. Thank you so much for your help.

Yours truly,

Betty Jo White, Ph.D.
Associate Professor of Housing

Enclosure

Appendix C: Postcard Follow-up

About a week ago, a questionnaire seeking information about specialized units for Alzheimer's patients was mailed to you. The name of your facility was part of a nationwide sample of nursing homes identified as having such units.

If you have already completed and sent the survey to me, please accept my sincere thanks. If not, please do so in the next few days. Because the survey was sent to only a small sample of facilities, it is very important that yours also be included if the results are to accurately reflect the "state of the art" in special units today.

If by some chance, you did not receive the questionnaire, or it was misplaced, please call me collect today at 503-754-4993 and I will mail you another copy immediately.

Sincerely, Redacted for privacy

Betty Jo White, Ph.D., Associate Professor
Department of Family Resource Management,
Oregon State University, Corvallis, OR 97331

College of
Home Economics



Corvallis, Oregon 97331-5109
United States of America

(503) 754-3551

Appendix D: Second Follow-up Letter

August 5, 1987

Dear Administrator:

About a month ago, I sent you a survey concerning the Alzheimer's special unit that your facility may have. As of today, I have not received your completed questionnaire. I certainly understand the time constraints of summer schedules, obtaining information from several sources, and perhaps checking with a Board of Directors or owner. Thus, I can wait somewhat patiently.

I have chosen to study the physical aspects of these special units and how they differ from traditional nursing home design because they provide a relatively new and important service to Alzheimer's victims and their families. Yet little is known about the "state of the art" as it has thus far developed.

I am writing to you again because of the importance that each questionnaire has to the usefulness of this research. The name of your facility was obtained from lists provided by the AAHA, AHCA, the Jewish homes organization, and nursing care corporations. In order for the results to accurately represent and describe the approximately 145 special units we have identified nationwide, it is necessary that every facility in the sample return its questionnaire. This is because past research suggests that those who didn't return surveys may have had quite different responses than those who did reply. If you have a segregated Alzheimer's unit, regardless of the degree of physical changes or differences, your response is important. If you do not have such a facility, please mark the cover page "Ineligible" and return the questionnaire blank.

In the event that your survey has been misplaced, another is enclosed. Your contribution to the success of my study is greatly appreciated. Have a great summer and don't hesitate to call me collect if you have questions: 503-754-4992.

Sincerely yours,

Betty Jo White, Ph. D.
Associate Professor of Housing

Enclosure

Left Blank Intentionally

Appendix E

Description of ADU Floor Surfaces

Variable ^a	<u>N</u>
<u>Materials</u>	
Tile	55
Vinyl covering/linoleum	27
Carpeting	23
Terrazzo	2
<u>Colors</u>	
Neutral/white/beige	41
Pastel	10
Blue/brown	10
Grey	5
Green	4
Red/orange	4
Mauve	3
Yellow/gold	2
<u>Finishes</u>	
Nonglare	7
Non-slip/no-wax	4
Waxed	2
Waterproof	1
<u>Patterns</u>	
Patterned	17
No pattern	8

a Responses to open-ended question tallied by hand; multiple response was possible.

Appendix F

Description of ADU Wall Surfaces

Variable ^a	Residents' rooms <u>N</u>	Corridors <u>N</u>	Both <u>N</u>
<u>Wallpaper</u>			
<u>Colors</u>			
Neutral/white/beige	3	4	13
Pink/peach/red	2	1	6
Pastel	1	0	6
Blue	2	3	4
<u>Patterns</u>			
Plaid	0	1	2
Strips	0	1	2
Floral	1	0	2
Geometric	0	0	1
<u>Painted Surfaces</u>			
<u>Colors</u>			
Neutral/white/beige	6	1	11
Pink/peach/red	3	1	7
Pastel	0	0	6
Blue	3	2	4
<u>Patterns</u>			
Plaid	1	0	1
Stripes	0	2	0
Floral	0	1	0

^a Responses to open-ended question tallied by hand; multiple response was possible.