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Programming and Design for Dementia: Development of a 50 Person Residential Environment

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PROGRAMMING AND DESIGN FOR DEMENTIA

DEVELOPMENT OF A 50 PERSON RESIDENTIAL ENVIRONMENT

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Abstract

The goals of this applied research project were three–fold: 1) to extend understanding of optimal micro-environmental design for people with dementia; 2) to present a systematic process for the planning, programming, and design of environments for people with dementia; and 3) to illustrate this process by the planning, programming, and design of a model 50 person residential facility. This project was sponsored by Helen Daniel Bader, Milwaukee.

Pp. 107 and 59 illustrations.

Related Publications:

Environments for people with dementia: Annotated bibliography. (1987). Rand, J., Steiner, V., Toyne, R., Cohen, U., & Weisman, G. Washington, D.C.: Health Facilities Research Program, AIA/ACSA Council on Architectural Research.

Environments for people with dementia: Case studies. (1988). Cohen, U., Weisman, G., Ray, K., Rand, J., & Toyne, R. Washington, D.C.: Health Facilities Research Program, AIA/ACSA Council on Architectural Research.

Environments for people with dementia: Design guide. (1988). Cohen, U., Weisman, G., Ray, K., Steiner, V., Rand, J., & Toyne, R. Washington, D.C.: Health Facilities Research Program, AIA/ACSA Council on Architectural Research.

Environments for people with dementia: Regulatory analysis. (1990). Cohen, U., Weisman, G., Day, K., & Ray, K. Washington, D.C.: Health Facilities Research Program, AIA/ACSA Council on Architectural Research.

Environments for people with dementia: Illustrative designs (1990). Cohen, U., Weisman, G., Day, K., Robison, W., Dicker, J., & Meyer, G. (1990). Milwaukee, WI: Cohen and Weisman.

Holding on to home: Designing environments for people with dementia. (1991). Cohen, U. & Weisman, G. Baltimore, MD: Johns Hopkins University Press.

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PREFACE AND ACKNOWLEDGEMENTS

This publication is a direct consequence of the vision and generosity of Helen Daniel Bader. Through her work with people with dementia, Helen Bader came to appreciate the therapeutic role of the designed environment in their care, and to develop strong ideas about the form such settings ought to take. Along with her son David, an alumnus of the School of Architecture and Urban Planning, she enlisted the services of the School to transform her ideas into architectural reality. The resulting applied research project and this publication have two intertwined objectives: 1) to develop both a program and a design for the free–standing 50 person residential environment envisioned by Helen Bader; and 2) to focus, in the programming and design of this facility, on ways in which the micro–environment can support the functional abilities of people with dementia.

These two goals are reflected in the six parts that comprise this publication. Parts 1 and 2 provide a foundation. Previous work linking dementia and design is reviewed and, based upon a conceptual model, a set of therapeutic goals for environments for people with dementia is advanced. Parts 3 and 4 introduce the principles that underlie the design for a model facility for 50 residents presented in Part 5. The publication concludes in Part 6 with a consideration of issues of environmental evaluation.

This publication and the applied research project from which it evolved reflect the contributions of many people. We were pleased to continue our collaborative relationship with George Meyer, AIA, who took the lead in translating planning and design principles into the design presented in Part 5. Kristen Day played an invaluable role in all phases of the project, gathering, organizing, and analyzing information, as well as preparing material for publication. Gaurie Attanayake, Teet Stumbur, and Somkiet C. Thurmong produced and rendered illustrations and diagrams.

Based upon their own research activities, Margaret Calkins of Heather Hill Inc, in Chardon, Ohio, and Jon Pynoos, of the Andrus Gerontology Center, at the University of Southern California, both contributed much useful information on appropriate design of the micro-environment. As in our past efforts, the Wisconsin Alzheimer's Association freely provided their time and assistance. Finally, the Department of Architecture, the Center for Architecture and Urban Planning Research, and the Graduate School of the University of Wisconsin-Milwaukee provided financial, logistical, and moral support.

Though Helen Bader succumbed to illness before the completion of this project, it is hoped that the process that she initiated will lead to more therapeutic environments for people with dementia. Such settings would be fitting tribute to her concern and commitment.

Introduction

INTRODUCTION AND PROJECT GOALS

Programming and Design for Dementia is the continuation of a significant area of study within the School of Architecture and Urban Planning at the University of Wisconsin–Milwaukee. Four faculty members and a substantial number of Master's and doctoral students have, for the past three years, been actively involved in the investigation of environments for people with dementia.

Previous projects have resulted in six publications exploring diverse aspects of this broad topic, including review of the research literature (Rand, Steiner, Toyne, Cohen, & Weisman, 1987), identification of relevant codes and standards (Cohen, Weisman, Day, & Ray, 1990), analysis of a sample of case study sites (Cohen, Weisman, Ray, Rand, & Toyne, 1988), and the generation of both a set of guidelines for planning and design (Cohen & Weisman, 1991) and a number of illustrative designs (Cohen, Weisman, Day, Robison, Dicker, & Meyer, 1990).

This seventh publication on dementia and design is shaped by three related goals:

[1] To extend our understanding of optimal micro–environmental design for people with dementia.

[2] To present a systematic process for the planning, programming, and design of environments for people with dementia.

[3] To illustrate this process by the planning,

programming, and design of a model 50 person residential facility.

Optimal micro–environmental design. While some data are now available to guide basic architectural planning and programming decisions, much less information is available regarding the design of smaller scale aspects of the environment, including appropriate colors and surfaces, lighting levels and sources, furnishings, equipment and technical devices for security and/or assistance.

More generally, there is a great deal of controversy in this existing literature. Some authors suggest that environments for people with dementia should be highly stimulating, employing bold and saturated colors and contrasts to effectively gain the attention of people with dementia and to compensate for deficiences in vision associated with aging. Others maintain that colors and patterns ought to be subdued and subtle to provide a relaxing environment less likely to provoke agitated behavior.

Part 2 of this publication endeavors to extend our understanding of disease-related deficits— functional/behavioral, cognitive, social, and emotional—and their relationship to environmental design strategies and solutions.

Systematic planning, programming and design process. A previous publication (Cohen & Weisman, 1991) presented an overview of a process, as well as a set of generalizable prin-

ciples, for use in the planning, programming, and design of a broad range of environments for people with dementia.

Programming and Design for Dementia extends and illustrates this model. Specific principles to guide the planning and design of an innovative facility for 50 residents are presented in Parts 3 and 4.

Model residential facility. The final goal of this publication focuses on the planning, programming, and design of this residential facility for 50 people. It represents a new and as yet underdeveloped point along the continuum of care—from residence in the community to institutional settings. The rationale for the planning and design of this facility are presented in Parts 3 and 4, and the resultant building is presented in Part 5.

As a note of caution, it must be recognized from the outset that very little of the research into Alzheimer's disease explores linkages to the physical environment. Research activities are directed toward either medical and biological issues, such as possible causes of the disease, or social/organizational concerns such as caregiver burden. Of the limited research that directly explores the role of the environment as a therapeutic tool, much is experiential or anecdotal in nature. Therefore, most of the recommendations advanced in this volume are, of necessity, extrapolations from existing research and experience. In the strong tradition of action research, they are presented as hypotheses deserving and indeed requiring further investigation.

LINKING ALZHEIMER'S DISEASE AND ENVIRONMENTAL DESIGN

Alzheimer's disease and environmental design seem, at the outset, to be two very disparate topics; the relationship they bear to one another may initially be quite unclear. This introduction can provide only a brief explanation of such an important subject. Understanding the relationship between architecture and Alzheimer's disease depends upon an understanding of three fundamental premises. First, it is essential to recognize that the role of the architectural environment need and should not be limited to the mere provision of physical shelter. Thoughtfully designed architectural environments represent potentially valuable, albeit typically underutilized, therapeutic resources in the care of people with dementia. Indeed it has been argued (Coons, 1985, p.13) that many of the behaviors attributed to Alzheimer's disease are, in part, a consequence of counter-therapeutic settings. Both theoretical and empirical support for the therapeutic potential of the physical setting will be briefly reviewed.

Secondly, it must be recognized that the physical settings occupied by people with dementia do not exist in isolation; rather, they are integral parts of a larger, complex system and must operate in concert with the social and organizational dimensions of this larger system. Thus, a conceptual model will be presented that reflects the interaction of architectural, social, behavioral, and organizational variables.

Finally, there is great value in recognizing the residential qualities of environments for people

with dementia. Many such facilities, while well-intentioned, do not, as a consequence of their medical or institutional characteristics, serve the best interests of people with dementia. To the extent possible, all therapeutic settings should retain the positive attributes of home.

Therapeutic Potential of the Physical Setting

The role of the architectural environment in therapeutic interventions for people with dementia has traditionally been quite limited. Interventions are defined and implemented in social and organizational terms, physical factors being limited to concerns of hygiene and/or aesthetics. However, the study of the reciprocal relationships between people and their total environment over the past several decades demonstrates that the architectural environment is more than a background variable; it may exert significant influence on the behavior of both individuals and groups.

There are both empirical and theoretical reasons for efforts to utilize the therapeutic potential of the physical setting in the provision of care for people with dementia. Several studies assessing the impact of changes in the physical setting on people with dementia carried out by Lawton and associates are reviewed in Lawton (1981). A small scale remodeling effort undertaken in a long term care facility resulted in the creation of six single bedrooms plus adjacent

semi-public spaces. Residents both took advantage of this new-found opportunity for privacy and increased the number of occasions on which they were observed outside of their bedrooms (Lawton, Liebowitz, & Charon, 1970). In two pilot studies of the effect of environmental modifications on a psychiatric geriatric population (Fraser, 1978), rearrangement of furnishings and introduction of materials for recreation and reading resulted in some social gains and a decrease in pathological behavior. In a pioneering demonstration and research project, Lawton, Fulcomer, and Kleban (1984) compared the behavior of severely impaired, elderly residents of a nursing home before and after transfer to new facility designed in response to their environmental needs. Results indicate that, despite expected decline in measures of basic competence, there was not a corresponding decline in more pliable behavioral variables.

> *Even more remarkably, in five instances improvement occurred, and in only one instance was there a significant decline. This pattern of findings ... confirms the presence of a clear prosthetic effect, to the point where the direction of a decline was reversed in some instances to become improvement (p. 751).*

More recently, a longitudinal study of a special care unit conducted by Benson, Cameron, Humbach, Servino, and Gambert (1987) indicated improvements in mental and emotional status and in basic functions of daily living 12 months after admission to the unit.

A major research/demonstration project undertaken by the Institute of Gerontology at the University of Michigan created Wesley Hall, a special living unit for eleven people with severe memory loss (Coons, 1985). Along with intensive training of staff, a number of modifications were made in the physical setting; these included introduction of softer and more domes-

tic finishes and lighting, provision of private rooms, a den, living room, dining room, and kitchen as part of the Wesley Hall unit. Staff observations indicated positive resident response to therapeutic interventions designed to reduce problem behaviors such as night wandering, incontinence, and combativeness.

Theoretical support may be seen as coming from several sources. The environmental docility hypothesis promulgated by Lawton and Nahemow (Lawton, 1970; Lawton & Nahemow, 1973) posits that "limitations in health, cognitive skills, ego strength, status, social role performance, or degree of cultural evolution will tend to heighten the docility of the person in the face of environmental constraints and influences" (Lawton, 1970, p.40). Thus, people with dementia, who often experience impairments of the kinds described by Lawton, may be particularly vulnerable to environmental impacts. Conversely, even modest modifications in the environment, which serve to reduce what Lawton and Nahemow characterized as the "press" or demand characteristics of the environment, may yield significant improvements in both adaptive behavior and affect. At least some clinically based dementia research (c.f., Hall & Buckwalter, 1986) emphasizes the importance of conscious regulation of the demand characteristics of the environment, particularly in terms of sensory and social stimulation.

In summary, there is both empirical and theoretical support for the role of the physical setting in caring for people with dementia. Data suggest that modification of traditional room and unit layouts, along with complimentary modifications in the organizational environment, can slow or in some cases even reverse the declines expected over time in the behavior of people with dementia. Such findings appear to be consistent with Lawton's "environmental docility hypothesis," which suggests that even modest changes in the environments of people of re-

duced competence may have significant positive consequences. This publication has pursued this relationship one step further, presenting programming "hypotheses" that suggest how problems that result from specific deficits (behavioral/functional, cognitive, social, and emotional) associated with Alzheimer's disease might be resolved by a range of policy, planning, and design solutions. Particular emphasis is placed on microscale furnishings, surfaces, and equipment that may help to compensate for these deficits.

THE FACILITY DEVELOPMENT PROCESS

PREPARATION	PLANNING
Things to know and do before starting	Defining the facility in organizational terms
The unique environmental needs of people with dementia and their caregivers	Position of the facility along the continuum of care
The relationship between organizational goals, individual needs, and the physical environment	Organizational goals for the facility as a whole
The continuum of environments currently available to people with dementia	Number of clients/residents to be served
	Staffing needs and patterns
	Criteria for site selection

This book concerns itself with the planning and design of environments for people with dementia, as exemplified in the development of a 50 person residential facility. The design or renovation of facilities for people with dementia—beginning with initial planning and culminating in construction and occupancy—is a complex process. To insure that every facility realizes its therapeutic potential, it is essential to carefully define those psychological, social, and organizational problems that the resultant building is meant to solve. Fortunately, decisions to be made in this process occur in an orderly and somewhat predictable pattern. This sequence of decision–making activities can be characterized as the facility development process. For organizational and conceptual purposes, the information in this book is organized according to the steps in this process, with decisions applying to the development of this 50 person residential facility discussed as examples in each chapter.

It is useful to conceptualize the facility development process as a five stage model, involving: (1) preparation; (2) planning; (3) programming; (4) design, construction, and occupancy; and (5) evaluation. This process parallels that proposed by the American Institute of Architects (1971), but is less heavily weighted toward the "production" aspects of new facilities (i.e., preparation of architectural drawings, bidding, and construction). The reader is referred to the authors' earlier publication *Holding on to Home* (Cohen & Weisman, 1991) for a more thorough examination of the initial phases of problem formulation and design guidance, as well as of the final phase of systematic evaluation.

1. Preparation

It is essential to understand the needs of people with dementia and the ways in which the environment may serve these needs.

This first phase of the facility development process provides the foundation for the phases that follow. Anyone who anticipates involvement in the planning and design of a facility for people with dementia should begin with a clear understanding of the particular

PROGRAMMING	DESIGN, CONSTRUCTION AND OCCUPANCY	EVALUATION
Defining facility requirements in architectural terms	Translation of plan and program into architectural form	Addressing "performance" of the operating facility
Desired experiential qualities of the environment	Preliminary schematic design	Adequacy of sensory and spatial conditions
Required activity areas and their sizes and adjacencies	Detailed design development	Emergence of desired patterns of behavior and environmental experience
Required sensory conditions (acoustics, lighting, temperature)	Contract documents	
	Construction bids and negotiation	Realization of individual and organizational goals
	Construction and occupancy	

Figure 1. The facility development process.

environmental needs of this user group, as well as of those who serve as caregivers. This book provides a summary of much of this information (*People with Dementia*), along with a detailed matrix to allow the reader to begin to link deficits that result from the disease with specific environmental solutions (*Deficits of Alzheimer's Disease and Their Relation to Environmental Design Solutions*). Finally, it is essential to appreciate the place of the physical setting within the complex system linking goals, human behavior, and buildings (*Conceptual Framework for Environments for People with Dementia*), and the therapeutic potential of environments for people with dementia (*Therapeutic Goals*).

2. Planning

Typically, it is in the planning stage that basic decisions regarding the functioning of the facility are made. One must be aware of the range of environments currently available to people with dementia, as well as the "gaps" in this continuum of choices that define the need for new and innovative facility types

(*Continuum of Care*). Other necessary decisions include formulation of basic organizational goals, structure, and policies, as well as decisions regarding in–house services to be provided and community services to be utilized, staffing, and number and population of people to be accommodated (*Organizational Goals and Local Resources* and *Small Groups of Residents* begin to address some of these issues). Procedural matters, such as formation of building committees or advisory groups, are also considered at this point.

3. Programming

A program defines the set of requirements that the architectural design is to satisfy.

The goal of the programming phase is the definition of the requirements that the facility to be designed is meant to satisfy. Such requirements may be defined in terms of: (a) patterns of behavior to be accommodated in the facility; (b) desired experiential attributes of the environment, such as accessibility or familiarity; and (c) required sensory properties

(e.g., light levels) and spatial properties (e.g., square footage) of individual spaces within the building. Programmatic information on specific spaces within the facility, including consideration of attributes of the environment, relationships between spaces, and requirements for individual activity areas (*General Attributes of the Environment, Building Organization,* and *Activity Areas*) is presented in Part 4. In addition, examples are provided of specific products and materials that meet many of the programmatic requirements outlined here. A more detailed discussion of these programmatic requirements is published in *Holding on to Home* (Cohen & Weisman, 1991).

4. Design

The design phase results in a complete architectural design for a new or renovated facility, typically represented in a combination of drawings and verbal descriptions. Building upon the programmatic requirements outlined in Part 4, a specific design "prototype" for innovative facilities serving people with dementia—in this case, a 50 person, free–standing residential facility—has been developed (*Design*). The nature of this facility is defined in programmatic terms, including goals, organizational structure and staffing, and population to be served. Drawings of the facility are accompanied by verbal descriptions or "annotations" that describe the designs in greater detail and indicate how key planning and design principles are implemented.

5. Evaluation

Environments for people with dementia may be evaluated in terms of technical, behavioral, and therapeutic concerns.

To complete a cycle of the facility delivery process, the occupied building should be evaluated to assess how well it satisfies the goals specified in the preparation, planning, and programming phases. Such evaluation can include technical issues (are lighting levels in the dining room high enough?), patterns of behavior (is the lounge being used for family visiting?), and experiential and therapeutic concerns (does the activity area provide sufficient stimuli to encourage conversation?).

In addition, during the evaluation stage, one can "test" many of the hypotheses implied by proposals in the programming section. For example, based upon the programming for resident rooms, questions can be developed to assess 1) which methods were employed to create a soothing and sleep–conducive environment, as well as 2) whether these modifications have an actual effect on the reduction of nocturnal wandering. A set of such questions is included as an example of the type of questions that may be used in the evaluation of either existing or proposed environments for people with dementia (*Evaluation*); additional questions should be tailored for the assessment of specific characteristics of the reader's own setting.

Preparation

CONCEPTUAL FRAMEWORK FOR
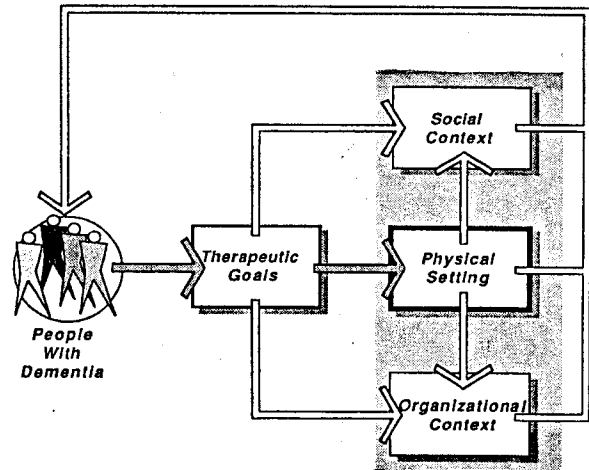# ENVIRONMENTS FOR PEOPLE WITH DEMENTIA

Figure 1. A conceptual framework for the organization of the person-environment system.

The environments inhabited by people with dementia and those who care for them constitute a complex system comprised of organizational, social, and architectural factors that interact in multiple ways. For purposes of analysis, programming, and design, environments for people with dementia can be conceptualized in terms of a five-part framework (Figure 1).

First and foremost are people with dementia, defined in terms of their physical, functional, and emotional needs, as determined by the characteristics or deficits that result from their disease. In keeping with overall project goals, the following section on People with Dementia presents a detailed exploration of behavioral/functional, cognitive, social, and emotional deficits associated with the disease. General strategies for design are also presented here, and further elaborated in Parts 3 and 4.

In response to the nature and needs of people with dementia, a variety of therapeutic goals such as "preservation of dignity" or "encouragement of independence" are commonly raised in the literature. Such goals, while clearly abstract in themselves, do provide guidance and

direction for subsequent decisions regarding organizational and social planning, as well as architectural design. Secondary goals, which may differ slightly in recognition of personal and setting variability, are subsumed under these global goals.

The final three components of this framework are the organizational, social, and physical environments within which people with dementia live. The organizational context is conceptualized in terms of the policies and program of a special care unit. The social context is represented by family and friends who serve as informal caregivers. Staff and other residents also form part of this group. The physical setting is defined in terms of its materials and finishes, furnishings and equipment, sensory and spatial properties.

The design of responsive settings for people with AD must recognize social, organizational, and physical considerations. Unless there is congruence among these three subsystems and their interactional effects, therapeutic goals cannot be realized.

THERAPEUTIC GOALS

- Ensure safety and security
- Support functional ability through meaningful activity
- Heighten awareness and orientation
- Provide appropriate environmental stimulation and challenge
- Develop a positive social milieu
- Maximize autonomy and control
- Adapt to changing needs
- Establish links to the healthy and familiar
- Protect the need for privacy

Figure 2. Therapeutic goals to guide the development of responsive environments for people with dementia.

Review of the literature on dementia and design (Rand et al., 1987) reveals a variety of therapeutic goals intended to provide direction in the creation of appropriate and supportive environments. While one clearly cannot make specific planning or design decision on the basis of these global statements, such goals serve to highlight desired relationships between people with dementia and the environments they occupy, and provide direction for policy, programming, and design decisions. The following set of goals has been distilled from the authors' review of the literature, and has proved useful in both the analysis and the design of environments for people with dementia.

These goals are, of course, an abstraction. In some instances, goals may overlap or even conflict with one another. Nevertheless, an understanding of such goals can sensitize the reader to many higher level imperatives to which all environments for people with dementia should respond. Furthermore, it is often through efforts to accommodate therapeutic goals that are inherently and necessarily in conflict that the richest and most creative strategies for problem solving emerge (Alexander, 1969).

1. Ensure Safety and Security.

Ensuring that users sustain no harm is the first imperative of any therapeutic environment. As emphasized by Calkins (1988), people with dementia are potentially vulnerable as a consequence not only of cognitive impairment, but also due to physical disabilities related to the process of aging, as well as to the dementing illness. Thus, it is essential to ensure the physical safety and psychological security of people with dementia. In addition to issues of life safety (e.g., fire retardant construction, adequate emergency exits), the physical environment may impact the safety and security of people with dementia in less obvious ways. The absence of adequate grab bars, an unsecured gas stove, or, at a larger scale, floor plan configurations that thwart staff supervision of residents, may all compromise security.

2. Support Functional Ability through Meaningful Activity.

Both Mace (1987) and Peppard (1986) emphasize the importance of maintaining those abilities not totally impaired by dementia. Support

of the highest level of functional ability can have important and positive implications for the sense of competence and self-esteem of people with dementia, especially when facilitated by the incorporation of activities from the past, such as household work, that is relevant and meaningful to residents.

This goal can be further realized through the provision of prosthetic devices that compensate for limited ability (e.g., handrails in corridors to facilitate walking) and spaces and equipment that support familiar activities of daily living (e.g., modest cooking or housekeeping).

3. Heighten Awareness and Orientation.

Program, policy, and design should all assist people with dementia in "knowing where they are" in spatial, temporal, and social terms. Disorientation brought on by confusing, illegible, and unpredictable environments can be decreased. The design of clear paths to desired destinations, differentiation or elimination of repetitive forms, and the incorporation of physical landmarks are among possible interventions.

4. Provide Appropriate Environmental Stimulation and Challenge.

People with dementia may be unable to process high levels of stimulation without experiencing overload and distress; conversely, many institutional settings represent a degree of sensory and social deprivation that is clearly not therapeutic. The physical environment can provide "unobtrusive" stimulation—such as views to the outdoors, color schemes, things to touch—that does not overwhelm residents.

5. Develop a Positive Social Milieu.

Environments that provide opportunities for social interaction and maintain a degree of challenge for residents may slow atrophy of skills, reduce deprivation, and enhance quality of life (Lawton et al., 1984). The physical environment can provide opportunities for involvement, ranging from places for passive viewing of activities to an arena for participatory activities (e.g., a domestic kitchenette).

6. Maximize Autonomy and Control.

People with dementia should, to the greatest extent possible, have the ability to make decisions and to take responsibility for their own lives and environments. "Personalization" of one's own space can foster a degree of individuality. Control over social and environmental stimuli can be supported by providing places for retreat and reflection, thereby allowing residents to moderate their desired level of sensory input.

7. Adapt to Changing Needs.

It is essential to respond to both changing needs of individual residents over the course of the disease, and to differences in the needs and abilities among the resident population. It is also necessary to respond to evolving therapeutic approaches. Facilities must determine the population (in terms of size, services needed, and stages of dementia) they are best equipped to serve. A flexible design can provide a better fit between varying levels of resident competence and the degree of environmental press to which they are exposed.

8. Establish Links to the Healthy and Familiar.

People with dementia are confronted with an ongoing series of changes in themselves and

their world. It is important, to the extent possible, to maintain their ties to that with which they are familiar and comfortable. Patterning the facility after familiar environments—the home and the past—can provide a "soft transition" to the institution (Mace & Rabins, 1981). Inclusion of things from the past and encouragement of homelike environments suggest many design applications.

9. Protect the Need for Privacy.

As a consequence of the need for surveillance and assistance with activities of daily living, relocation to an institutional setting often results in an accompanying loss of privacy for people with dementia. Although it is often both expensive and difficult to provide physical privacy, environments for people with dementia should allow residents to choose between solitude and participation in activities by providing a range spaces from public to private. Clearly defined boundaries between public and private areas minimize ambiguity between that which is shared and that which belongs to an individual. Demarcation of territorial boundaries in the bedrooms of institutionalized elderly is related to increased self-satisfaction and improved mental status among both organically impaired and unimpaired residents (Nelson & Paluck, 1980).

PEOPLE WITH DEMENTIA

Although many readers will be familiar with Alzheimer's disease and its characteristics, some may find the following brief review a useful introduction to this topic. This section includes a description of the nature and history of the disease, current research topics, typical symptoms, and their impact.

INTRODUCTION TO ALZHEIMER'S DISEASE

- *Dementia is a disease, and not a result of normal aging*
- *Alzheimer's disease usually develops in the mid-60s, but can occur earlier*
- *More than 2.4 million U.S. citizens suffer from severe Alzheimer's disease*
- *60-70% of all patients in nursing homes have Alzheimer's disease*

The most devastating illness associated with aging is Alzheimer's disease (AD). This progressive irreversible neurological disorder is seen in its most severe form in 5% of the population over 65 years of age, and in 20% of the population over 80. Alzheimer's is the most common of the dementing diseases of the elderly, accounting for 50-60% of all such cases. In developed nations, it ranks fourth as a cause of death (after cardiovascular disease, cancer, and cerebrovascular disease).

The severe disabilities resulting from AD, which usually renders its victims helpless, are a major reason for institutionalization, and have created a major public health problem. The magnitude of this problem is projected to increase as the number of elderly people in the population increases.

In the United States, the number of individuals with severe AD will more than double in the next 30 years (Heston & White, 1983; Reisberg, 1983; Lindeman, 1984; Office of Technology Assessment, 1987).

SIGNS AND SYMPTOMS

- *Decline in functional, cognitive, emotional, and social abilities*
- *Reduced mastery and control over the environment*
- *Prognosis: people with Alzheimer's disease usually die seven to ten years after the onset of dementia, although this period may last up to 15 to 20 years*

The first sign of AD is forgetfulness, especially of recent events. Other cognitive functions are gradually compromised: judgement and the ability to orient one's self in space and to time are lost; new learning cannot take place; and expressive speech becomes difficult. Disabling personality changes and mood swings occur. This cognitive, emotional, and behavioral deterioration is not linear, and may differ greatly among individuals (however, see Figure 3 for an outline of a typical progression).

AD is relentless, irreversible, and devastating, as personal competence is eroded, and the afflicted person slips into a state of complete dependence. In the final stages of the disease, which is eventually terminal, neuromuscular changes interfere with mobility and physical abilities (Heston & White, 1983; Reisberg, 1983; Gilleard, 1984; Lindeman, 1984; Shamoian, 1984; Office of Technology Assessment, 1987). These changes are summarized in Figure 3.

ETIOLOGY

- *Diagnosis is difficult*
- *Cause is unknown*
- *AD develops regardless of gender, race, or social status*

The etiology (or cause) of Alzheimer's disease is unknown. Early signs and symptoms may be mistaken for normal aging, and, as the disease progresses, are difficult to distinguish from those of other dementias. Therefore, the goal of diagnosis is to rule out both other forms of irreversible dementias and reversible dementias, which may respond to treatment. For this reason, a battery of tests, usually including a medical history, physical examination, psychological and laboratory tests, and various kinds of brain scans, may be administered (Heston & White, 1983; Gubrium, 1986; Office of Technology Assessment, 1987). Drugs are sometimes used to ameliorate symptoms such as agitation and paranoia, but, currently, there is no effective treatment that can arrest the underlying pathology of AD.

IMPACT ON CAREGIVERS

Most people with dementia are cared for at home, at least in the earlier stages of the disease (Office of Technology Assessment, 1987). The unrelenting demands placed upon the caregiver, usually the spouse or close family member, create what Mace and Rabins (1981) have characterized as the "36 hour day". Without respite, the caregiver often becomes the second victim of the disease.

Problems in caregiving are exacerbated with the progression of AD, and include: difficulties with activities of daily living (ADL) such as feeding oneself, getting dressed, etc.; getting lost or constant wandering; rummaging behavior; disorientation in time and space; agitation or occasional violent or catastrophic behavior; and withdrawl. The consequence of these problems is that eventually the person suffering from Alzheimer's disease cannot be left alone, and the caregiver ultimately becomes bound to the home almost completely. Complete care is required at all times (Kelly, 1984; Office of Technology Assessment, 1987).

Supportive therapies that help both the person with dementia and the family to adjust to the progressive decline, by improving coping and daily living skills, constitute the main assistance that can be offered. Activities and environmental modifications that help to minimize dysfunction and maximize remaining capabilities should also be implemented.

DEFICITS OF ALZHEIMER'S DISEASE AND THEIR RELATION TO ENVIRONMENTAL DESIGN SOLUTIONS

The major performance deficits of Alzheimer's disease can be divided into four categories: behavioral/functional, cognitive, emotional, and social. Behavioral/functional deficits include those changes associated with dementia that result in detrimental task performance (e.g., reduced ability to deal with demanding employment situations) and significant physical changes (e.g., incontinence). Cognitive deficits result in difficulty in mental functioning (e.g., remembering names, abstract thinking). Emotional deficits include changes in affective response (e.g., personality changes and catastrophic reactions). Social defecits include changes in behavior towards others (e.g., decreased performance in social situations and alienation.)

In Figure 3, these four types of performance deficits are plotted against the stages of the disease (as described in Reisberg, 1983) in which they are likely to occur. Stage 1 is the period in which symptoms are first likely to be noticed; there may be anxiety and some decrease in task performance and social aptitude, but there is not typically a diagnosis of Alzheimer's disease at this stage. Stage 2 witnesses increased deficits, including major changes in the ability to perform tasks, concentrate, remember recent events, and conduct reasonable or abstract thought. There is also a significant decrease in the display of emotion, and in the ability to function in social situations. Stage 3 is the final stage, in which the most severe consequences of dementia are likely to surface, including wandering, incontinence, severe loss of memory and orientation, severe and significant changes in personality, and an inability to tolerate most social situations.

The second column of Figure 3 links the problems associated with behavioral/functional, cognitive, social, and emotional deficits to general environmental strategies for resolution or amelioration of these problems. For example, people in the second stage of dementia may find themselves getting lost easily (cognitive deficit). Strategies for resolving difficulties associated with this deficit may include: 1) increasing the ease of locating someone who is lost; 2) increasing the safety of the environment in traditionally "unsafe" areas, thereby circumventing any accidents that might occur if a wandering person entered these areas; 3) employing multi-sensory clues to encourage wayfinding, such as color coding and successful signage, and associating distinctive smells and sounds with specific areas; and 4) developing easy, memorable and consistent routes with recognizable landmarks for use by people with dementia.

BEHAVIORAL/FUNCTIONAL DOMAIN	
Deficits	**General Strategies for Resolution**
Stage 1 Early a) No observable deficits in home or work situation Late b) Coworkers, spouse, close friends begin to note poor performance (e.g., getting lost, losing things)	
Stage 2 Early a) Difficulty with complex tasks in situations that require decision–making or that are highly stressful (e.g., handling finances, driving in traffic) Late b) Unable to perform complex tasks (e.g., grocery shopping, traveling)	**a, b): Reduce distractions and simplify tasks as much as possible.** Some tasks and equipment are fundamentally confusing to all (e.g., single–handle faucets), but most people are capable of adapting to these. Because people with dementia cannot make these adaptations, it is necessary to explore means of making complex tasks, activities, and equipment less complex. • Define subtasks • Limit choices to a restricted, well–defined set of possibilities • Use visual and verbal instructions • Conduct only a single activity at a time • Define sequences of tasks, and break complex tasks into simple steps • Eliminate those tasks that cannot be broken down and are too complex to be completed by the person with dementia.
c) Nocturnal restlessness	**c): Modify physical settings or activities.** Environmental strategies: • Create a soothing and restful night time environment, as well as a day time environment that is not over– or understimulating • Separate sleeping environment from other spaces Activity strategies: • Introduce appropriate night time activities for restless individuals • Schedule day time activities to encourage sleep at night
d) Reduced coordinational and motor skills (e.g., as manifested in household falls, inability to use some utensils, tools, or equipment)	**d): Provide support and mitigate hazards.** • Employ prothestic devices such as grab bars, stair rails, or furnishings stable enough to provide support • Mitigate hazards by avoiding potentially dangerous surfaces and equipment

Figure 3. Defecits of Alzheimer's disease and their relation to environmental design solutions.

BEHAVIORAL/FUNCTIONAL DOMAIN (continued)	
Deficits	**General Strategies for Resolution**
Stage 3 Early a) Cannot initiate or complete purposeful tasks (e.g., doing crafts, cooking, choosing clothing independently, making phone calls)	a): **Clarify and simplify purposeful tasks.** • Amplify important environmental messages • Dampen unnecessary environmental messages • Use consistent sequential ordering of steps in tasks and of necessary equipment/utensils
b) Nocturnal confusion, wandering	b): **Minimize the causes of and/or accomodate wandering.** • Enhance the ease with which environmental messages can be understood • Accommodate wandering as an acceptable activity
c) Reduced mobility, shuffling gait	c): **Create more negotiable environments.** • Aviod surfaces that are difficult to traverse (e.g., highly polished materials or exceedingly thick carpeting) • Eliminate barriers to mobility, including great distances and changes in levels • Employ protheses and other means of support
Late d) Incontinence	d): **Facilitate toileting by making toilets easier to locate and use** **Make clean and sanitary environments easier to maintain** **Make assistance with toileting less problematic**
e) Dependent for all care	

COGNITIVE DOMAIN	
Deficits	**General Strategies for Resolution**
Stage 1 Early a) Difficulty remembering names of people, familiar place, objects Late b) Obvious word–finding deficit	a, b) **Aid in remembering names and other words.** • Employ cues such as labels to aid remembering and recognition • Make names of people, places, objects and their functions more obvious
c) Loses objects of value	c) **Make objects harder to lose.** • Assign or develop specific locations for objects • Make objects easier to spot/locate **Make objects of value harder to lose.** • Make objects of value inaccessible • Substitute items of lesser value for those likely to be lost.
Stage 2 Early a) Poor concentration	a) **Manipulate the environment to increase ease of concentration.** • Amplify important environmental messages • Dampen unnecessary environmental messages • Use consistent sequential ordering of steps in tasks • Limit the number and length of activities that require intense concentration
b) Impaired reason, judgement	
c) Gets lost	c) **Reduce the problems associated with wayfinding in environment.** • Increase ease of locating a person who is lost • Increase the safety of traditionally "unsafe" areas and environments • Employ multi–sensory cues to encourage wayfinding • Develop easy and consistent routes
Late d) Difficulty recalling recent events, personal history	d) **Use personalization of the environment to aid in recall of recent events and personal history.** • Incorporate familiar artifacts from residents' personal pasts (e.g., photos of family or of local landmarks) • Utilize "every day" items
e) Financial incompetence f) Impaired abstract thought	

COGNITIVE DOMAIN (continued)	
Deficits	**General Strategies for Resolution**
Stage 3 Early a) Severe memory loss, cannot recall major aspects of life, names of close family members	a) **Use environment to support short and long term memory.** • Reduce dependence on memory for daily functioning • Introduce "memory–jogging" activities and artifacts • Incorporate "reality" orientation devices and activities • Reduce the number of critical, memory–dependent tasks
Late b) Largely unaware of time, space, events	b) **Use environment to increase awareness of time, space, and events.** • Make function of places readily apparent • Incorporate "reality" orientation devices and activities
c) Loss of speech	c) **Increase ability to communicate without speech.** • Keep key artifacts of daily living in visible and accessible locations
d) Loss of intentionality	d) **Increase ability to remember name, identity.** • Provide verbal labels and/or pictograms for important spaces and objects

SOCIAL DOMAIN	
Deficits	**General Strategies for Resolution**

Stage 1
Early
  a) No observable deficits
 	
Late
  b) Decreased performance in demanding social situations
 	
  c) Communication difficulties
	
	b) **Manipulate environment to regulate and support social interaction.**
	   • Provide a range of opportunities for social interaction—more to less demanding—and for solitude
	   • Provide sociopetal spaces to support interaction when it is desired
	
	c) **Use environmental cues to facilitate communication.**
	   • Provide nondistracting, appropriately stimulating environments to support communication (e.g., carpeting and other surfaces to reduce extraneous noise)
	   • Encourage sustained relationships with a limited numbers of caregivers, who will communicate more easily with residents whom they know well
	   • Limit the amount of unnecessary communication by providing autonomy and a supportive environment for people with dementia, limiting the number of services, etc. they must request directly

Stage 2
Early
  a) Inappropriate, embarressing social situations
 	
Late
  b) Socially inept
 	
  c) Social alienation
	
	b) **Provide sufficient opportunities for nondemanding social interaction and solitary activities.**
	   • Provide spaces for a range of interactions, both more and less demanding
	   • Structure social spaces and activities to allow for choice
	   • Moderate the number and variety of people with whom the person with dementia must interact at a given time. Encourage regular contact with familiar people
	   • Provide an appropriate degree of stimulation and a supportive environment
	
	c) **Employ sociopetal environments and policies and practices that encourage social interaction.**
	   • Provide a variety of spaces for a range of interactions
	   • Ensure opportunities for passive and active participation
	   • Use "family"/household organization of units
	   • Support meaningful and familiar roles for people with dementia
	   • Encourage and support visiting by families and friends

SOCIAL DOMAIN (continued)	
Deficits	**General Strategies for Resolution**

Stage 3
Early
  a) Only simple, structured familiar social situations can be tolerated
	a) **Provide a healthy, familiar, "normal" environment.**
	  • Offer varying degress of stimulation and a range of opportunities for interaction
	  • Provide spaces and time for solitude
	  • Maintain a structured schedule of activities, to take place in predictable locations
	  • Provide opportunities for normal interaction in familiar roles and activities and with familiar others

b) Reality orientation needed	b) **Manipulate environmental variables to enhance orientation to reality.**
	  • Provide a "normal," familiar residential environment, atmosphere, and activities
	  • Increase visual and physical access to the outdoors (to maintain orientation to time, season, and location)
	  • Encourage visiting as a source of information about "reality"

Late c) No social interaction possible	

EMOTIONAL DOMAIN	
Deficits	**General Strategies for Resolution**

Stage 1
Early
  a) Anxiety and appropriate
     concern about symptoms
 	
Late
  b) Moderate anxiety about
     symptoms
 	
  c) Irritable
	
	c) **Provide soothing and nonfrustrating environmental options.**
	  • Offer access to soothing, calming, private spaces as relief from overstimulation, which may cause irritibility
	  • Moderate environment to decrease irritibility due to environmental frustrations (e.g., trouble with activities of daily living, difficulty remembering functions of household objects)

Stage 2
Early
  a) Anxiety about symptoms
 	
Late
  b) Denial of symptoms
 	
  c) Flat affect
 	
  d) Withdrawl from challenging
     situations
	
	c) **Support activities and opportunities for the display of affect.**
	  • Encourage sustenance of affective response by encouraging opportunities for exercising emotions (e.g., caring for pets, reminiscence, social interaction in sociopetal spaces, physical contact)
	
	d) **Encourage people with dementia to continue to perform at or near their maximum level of capability.**
	  • Support autonomy in decision making and in activities of daily living whenever possible
	  • Limit environmental frustrations
	  • Provide meaningful and achievable choices and challenges
	  • Provide a range of opportunities, more to less challenging, to meet individual needs over time
	  • Encourage people with dementia to undertake challenges and reward their efforts

EMOTIONAL DOMAIN (continued)	
Deficits	**General Strategies for Resolution**

Stage 3
Early
  a) Denial and shame
  b) Catastrophic incidents: irritability, agitation, and violent episodes
	b) **Prevent, moderate, and isolate catastrophic incidents.**
	    • Moderate the level of environmental stimulation, especially during times that catastrophic incidents are likely to occur (e.g., late afternoon)
	    • Provide access to a soothing, private space for use during catastrophic incidents to lessen their duration, intensity, and likelihood of spreading to other residents

Late c) Personality changes: paranoia, hallucinations, delusions	c) **Ensure a healthy and familiar ("normal") environment to discourage hallucinations and delusions.** **Encourage retention of normal and healthy roles for people with dementia (e.g., friend, supporter, participant in leisure activities, group member.)**

d) Obsessional behavior	d) **Discourage and moderate harmful obsessional behavior.**
	    • Recognize that not all "obsessional" behaivor is harmful (e.g, wandering as a form of activity)
	    • Provide distractions for obsessional behaviors (e.g., create a rummage box for residents who go through others' closets)

Programming and Design for Dementia

Planning Principles

CONTINUUM OF CARE

Limited Environmental Options

Unfortunately, the environmental options currently available to people with dementia and their caregivers remain far too limited. Most localities have only "home" or "institutional" options, with the result that many people with dementia find themselves in long-term care facilities prematurely. Alternatives such as day care centers or group homes are not available in many communities, and still do not meet all the needs of people with dementia or their caregivers. Because of the very limited range of available environmental options, family caregivers are often forced to choose between the overwhelming burden of caring for the person with dementia alone at home, or accepting institutionalization before this may be necessary. The problems resulting from this limited range of environmental options are represented in Figure 1.

Creating New Options

Environments for people with dementia are defined by both the physical setting and by the range of services that they offer. Different combinations of several building forms (single family home, congregate housing, group homes, nursing homes) together with a provision of various services (prepared meals, housekeeping, day care, assistance with personal care) can provide new options for people at different stages of Alzheimer's disease (Figure 2).

This proposed residential facility for people with dementia represents one such new option along the continuum of care. Accommodating 48 residents, it is clearly larger than most group homes. At the same time, as a consequence of division into two potentially autonomous clusters of 24 residents each, and further subdivision into 8 resident clusters, it is smaller than typical nursing units. Organization of the facility in terms of two 24 resident clusters likewise permits variations in level of service, such that some clusters might serve individuals in earlier stages of the disease, and others could serve a somewhat more impaired population.

Level of Service

Caregiver Burden

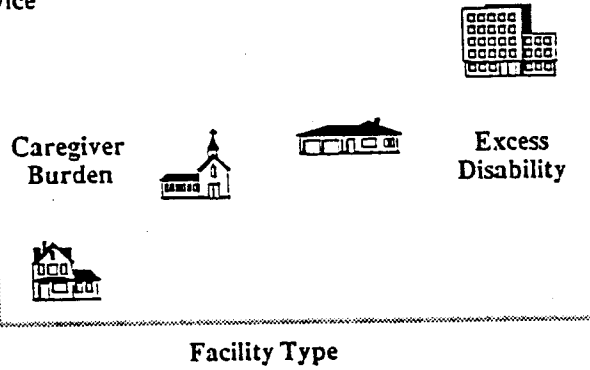Excess Disability

Facility Type

Figure 1. Two major problems are illustrated by this matrix: caregiver burden as a function of limited support services, and excess disability as a function of an environmental misfit. (Excess disability refers to the fact that many restrictive and institutional environments tend to assume total dependency on the part of people with dementia and do not, for the most part, allow for the exercise of remaining competencies) (Kahn, 1975).


Figure 2. A renovated pair of city duplexes turned into a small group home represents a new option along the continuum of care.

ORGANIZATIONAL GOALS AND LOCAL RESOURCES

It is essential to recognize that environments for people with dementia are not independent entities; rather, these exist in a larger environmental context that can provide important opportunities. Among the most important local resources are those family members and friends who may serve as informal caregivers and thus make significant contributions to the social environment of a facility for people with dementia. Decisions regarding the location of a specific facility can either strengthen or weaken such ties. Other important local resources include specialized medical facilities, parks, theaters, museums, shopping centers, and senior recreation centers. Consideration of accessible resources in the selection of a facility site can alleviate the need for the costly provision of some activities, settings, and services within the facility.
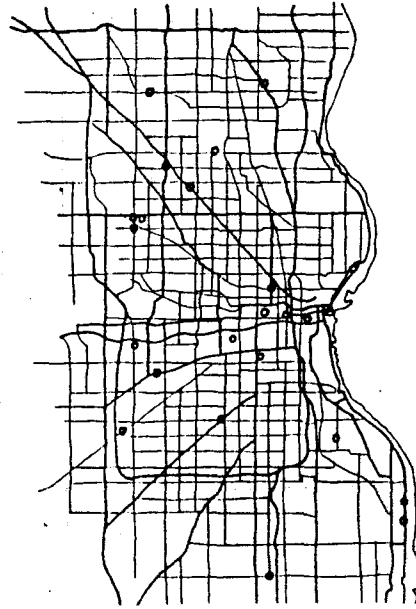
Day care and related facilities distributed across a metropolitan region may be viewed as a system of services.

SMALL GROUPS OF RESIDENTS

The transition from the small scale residential environment to a larger scale group living situation can be stressful for anyone; it is often especially so for people with dementia. New residents may be easily overwhelmed by a complex and unfamiliar environment (Peppard, 1986), and may experience confusion, frustration, and feelings of helplessness. They are often removed from their everyday social support network of family and friends, and deprived of the familiarity of their home and neighborhood.

Some of these problems may be ameliorated by the creation of smaller groups of residents, on the scale of "family", rather than the "institution." Group size in institutional settings is often defined solely in terms of the number of residents under the supervision of a staff member (e.g., the number of residents in a nursing unit in a traditional long-term care facility). However, it is possible to break such functional groups down into smaller social groups, often referred to as "households," "families", or "clusters."

To emphasize this concept of social groups, activity areas are contiguous to a cluster of resident rooms. Such areas become the centers of "household" activities, with these households functioning as self-contained units accommodating common functions, such as dining. Higher staff–to–resident ratios need not necessarily result from such cluster arrangements; indeed, some authors and administrators suggest that the creation of small groups of residents intensifies and enhances resident-staff relationships and contributes to a staff perception of tasks as more manageable.

A variety of architectural strategies are employed to spatially reinforce the organization of residents into small groups. Shared spaces are created for each such grouping, including a household "dining room," "living room", and "kitchen".

See also:
• Activity Areas
• Public to Private Realms
• Shared Spaces
• Domestic Kitchens
• Intimate Dining
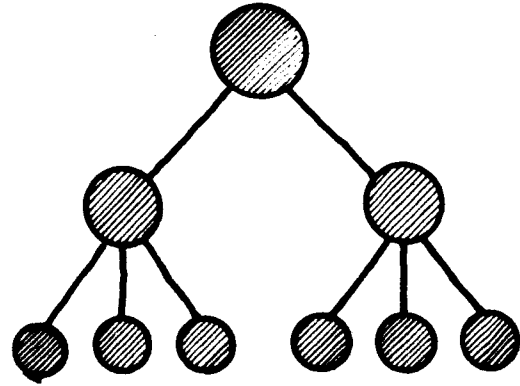
The facility consists of two 24 resident units, each of which is further divided into 8 resident clusters.

RESIDENT ROOMS
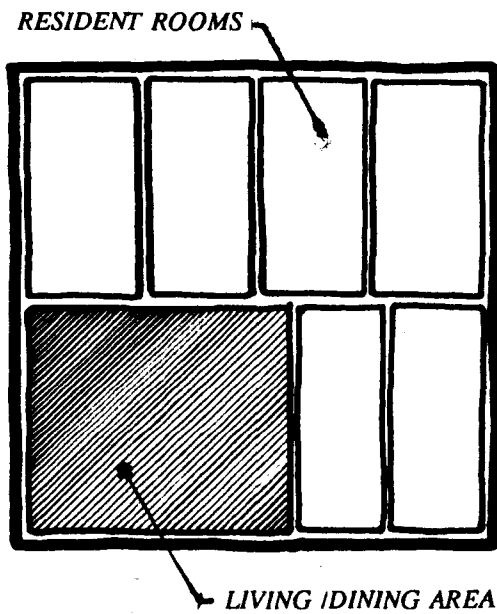
LIVING /DINING AREA

Each residential cluster has the potential of functioning independently, with its own living and/or dining area.

Programming
Principles

GENERAL ATTRIBUTES OF THE ENVIRONMENT   4.1

One's experience of and behavior in a particular environment are often more strongly influenced by general qualities or attributes of the setting than by specific architectural features. In the planning and design of various environments for people with dementia, four such attributes appear to be particularly salient: image, negotiability, familiarity, and stimulation. These attributes are a function not only of the physical environment, but also of the interactions of physical, organizational, and social subsystems. Thus, creation of a "homelike" environment requires appropriate furnishings and finishes, patterns of ongoing behavior typical of those found in residential settings, and policies and programs supportive of such residential activities.
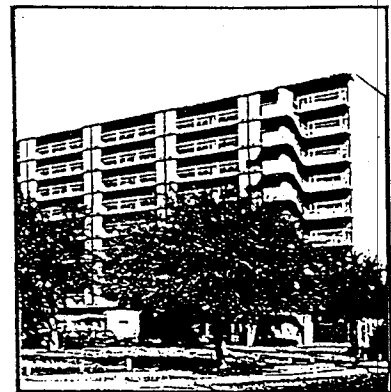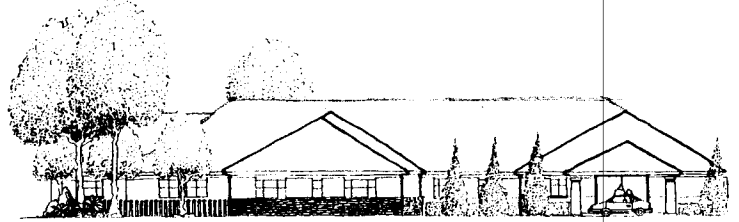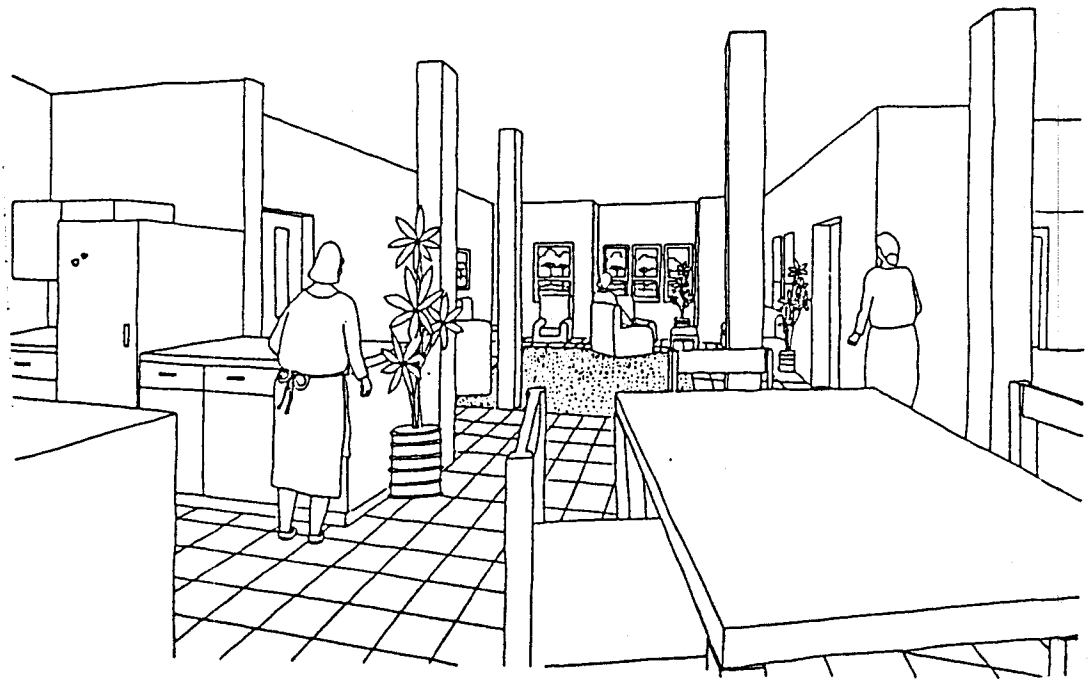
NONINSTITUTIONAL CHARACTER

People with dementia are confronted with an ongoing series of changes in themselves and their world. It is therefore important, to the extent possible, to maintain their ties to that with which they are familiar and comfortable. Facilities should be patterned after the outside community and its residential imagery—rather than after the medical model of the hospital and nursing home—to assist people with dementia in retaining these ties to the healthy and familiar.

A one story building organized in components of "house" size components with residential imagery can reduce the institutional character of a facility for 50 residents.

Breaking down the monolithic character typical of many hospitals and nursing homes is the first step in creating environments in keeping with this domestic scale. Externally, this is achieved by creating small interconnected units, as opposed to a single large structure. Internally, this is achieved by breaking down the organizational and physical structure of the environment. Institutional materials (e.g., ceramic tile and stainless steel), typically selected for their qualities of indestructibility, can be replaced with equally durable "domestic" materials (e.g., selected types of carpeting). Variety in the visual appearance of the facility will also contribute to this goal.

Concerns regarding sanitation need not dictate traditional "insitutional" furnishings and surfaces. For example, residential–looking living room and activity area furnishings can be ordered complete with silicone–sealed construction, strategically–placed drainage outlets built into the seat decking, moisture barriers between the upholstery covers and stuffing, and moisture–proof fabric upholstery.

The open plan of this domestic kitchen allows unobtrusive observation of many parts of the unit by caregivers, yet eliminates the need for a conventional, institutional nurses' station.

ELIMINATING ENVIRONMENTAL BARRIERS

In recent years, considerable attention has been directed to the creation of "barrier-free environments" (ANSI, 1980). Truly accessible and "negotiable" settings for people with dementia must also respond to additional demands. Dementing illnesses often exacerbate common age-related problems in the performance of seemingly simple tasks, such as knitting, fastening buttons, or closing snaps. It may be equally difficult to operate a variety of "control devices" in the microenvironment, such as appliance dials, door handles, and telephones. Such difficulties reflect a variety of factors (Mace & Rabins, 1981), including apraxia (whereby messages from the brain may not be transmitted to hands and fingers), tremors, muscle weakness, and vision problems.

In addition to requirements for barrier-free design (ANSI, 1980), a variety of strategies may be employed to mitigate hazards and overcome barriers to negotiability in environments for people with dementia. For example, Pastalan (1979) proposes the concept of redundant cueing, whereby the same information is presented via several sensory modalities. Such a recommendation is realized in the design of a dining room that includes pictures of food, smells of cooking from the adjacent kitchen, and auditory access to the sounds of meals being served, all of which direct residents from the corridor into the dining area. In another example of redundant cueing, light switches can be made conspicuous in both color and form.

Objects in the microenvironment can often be designed with enhanced anthropometric fit to compensate for the decreased abilities (e.g., hand-eye coordination or visual acuity) of people with dementia. Examples include lever-action handles instead of door knobs, and pressure-plate light controls instead of the common switch. Koncelik (1976) proposes self-correcting design of objects in the microenvironment (e.g., door locks with recessed tumblers to "guide" the key, thereby directing and correcting the movements of people with dementia.)
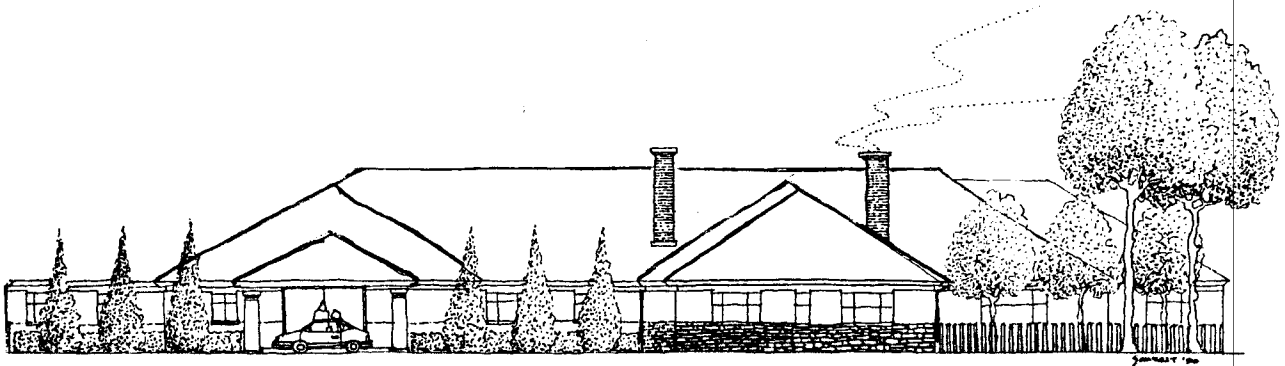
This simple, one-story structure provides several compensations for decreased capabilities. For example, the absence of stairs and level changes will reduce physical demands; familiar residential layout will be consistent with past experiences and will reduce cognitive complexity.
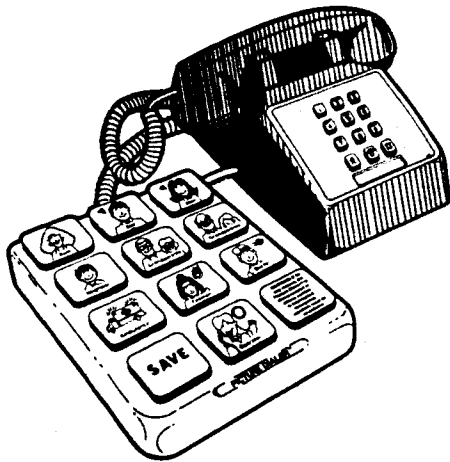
This telephone attachment can be programmed to automatically dial up to ten frequently-called or emergency numbers. It is unique in that its large, easy-to-press keys each hold a picture or photograph, allowing the person with dementia to continue using the telephone without having to remember a sequence of numbers (The Picture Dialer, from The Perfectly Safe Childcare Catalog).
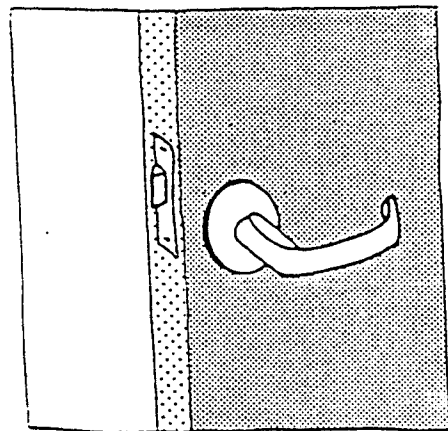

Lever action door handles compensate for decreased capabilities among the general population of elderly people, and especially among people with dementia.

THINGS FROM THE PAST

While people with dementia often cannot re-member or be taught to remember recent events (Gwyther, 1986), their long-term memory remains relatively intact until the later stages of the disease. In addition, the emotional components of memory may remain even after other components are lost (Coons, 1985). The utilization of familiar objects—things from the past—can provide opportunities for the exercise and celebration of these remaining capabilities.

The incorporation of objects from the past may assist in the retention of ties to the healthy and familiar through the creation of personalized and homelike environments. Articles and events from the past provide people with dementia with opportunities to reflect upon past experiences and environments (Rapelje, Papp, & Crawford, 1981); such emotions and memories often serve to stimulate social interaction. In particular, the ability of residents to bring some of their own belongings and furniture to the facility can help to create a familiar environment. Objects from the past may be incorporated into residents' rooms, interspersed throughout the public area of the facility, or aggregated in a "museum" area.
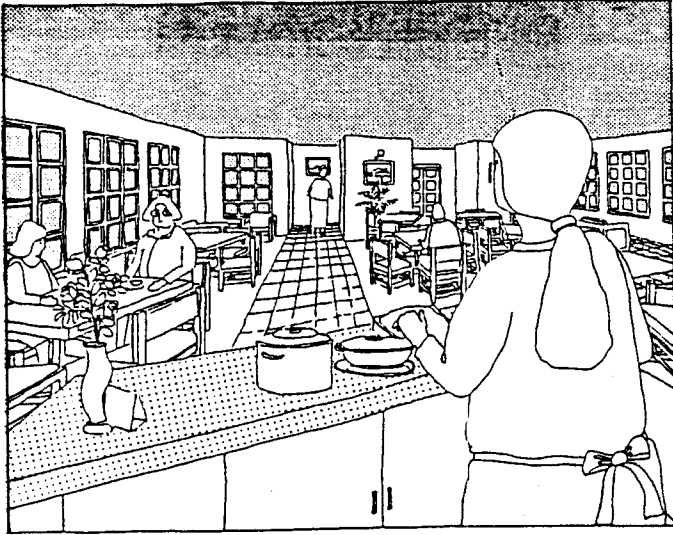
Spaces for familiar and common activities of daily living, such as a domestic kitchen and laundry/clothes drying area, provide a connection to a normalized life style. A simple activity like baking cookies can evoke associations of the past and foster social interaction with other residents, visitors, and caregivers.

Prominant images, from family pictures, both recent and older, to the picture of a favorite cat, can trigger reminiscence. Media is not limited to still photography; movies and video displays also work well.

SENSORY STIMULATION WITHOUT STRESS

Levels of sensory and social stimulation in environments for people with dementia often differ dramatically from those commonly encountered in home environments. In some cases there may be a virtual absence of stimulation characterized, for example, by monochromatic, repetitive spaces with little or no ongoing activity. In other cases, residents may be bombarded by very high levels of stimulation including intercoms, alarms, and—as often occurs in dining rooms—the presence of large numbers of other people. Therefore, attention should be paid to regulating the character and intensity of sensory and social stimulation to provide, in Mace's (1987) terms,"stimulation but not stress." Environments for people with dementia should amplify important messages at the same time they dampen extraneous stimuli.

Messages can be amplified through the provision of adequate contrast between important environmental features (e.g., signs, furnishings, stair treads) and their surrounding background (e.g., walls or floors). Where needed, levels of sensory stimulation and involvement can be increased through the use of textured wall hangings, pieces of carpeting, birds, plants, or an aquarium. Extraneous stimuli can be dampened through the use of carpeting and other sound absorbing materials, as well as through the elimination of distracting background sounds such as intercoms.

Finally, staff behaviors such as touching and hand holding can provide residents with both tactile involvement and positive social stimulation. Conversely, the elimination of overwhelming large group spaces can minimize negative social stimulation.

Environmental features such as signs and furnishings should contrast with their background.

Pets and plants can often provide desired levels of sensory stimulation and involvement.

BACKGROUND   STIMULI
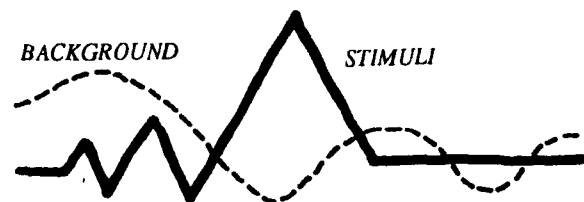
It is essential that important stimuli, whether these be verbal or auditory, not be forced to compete with extraneous noise.

BUILDING ORGANIZATION

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4.2

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In contrast with the preceding principles for planning and design, guidelines in this section are more "physical" in character, focusing on architectural—rather than policy and program—variables. Specifically, the common theme of these four guidelines is the arrangement of spaces relative to one another to provide areas for specialized activities, define levels of privacy, or ensure views and use of the exterior.

The special characteristics of people with dementia necessitate building organizations that are particularly easy to understand and within which it is easy to find one's way. To maintain the homelike character of the environment, familiar spaces (e.g.; outdoor planting areas, private bedrooms, semiprivate spaces for socializing) should be provided. The organization of these spaces can increase the responsiveness of the environment to the specific needs of people with dementia (e.g.; wandering paths should link major social spaces and should reinforce wandering as a meaningful activity; activity spaces should be clustered in a pattern similar to those in familiar single–family homes). In addition, environments must reinforce the sense of dignity, privacy, and autonomy of people with dementia. For this reason, it is important to organize space to provide opportunities for private conversation and reflection, normal socialization, and the exercise of independent choice and decision making.
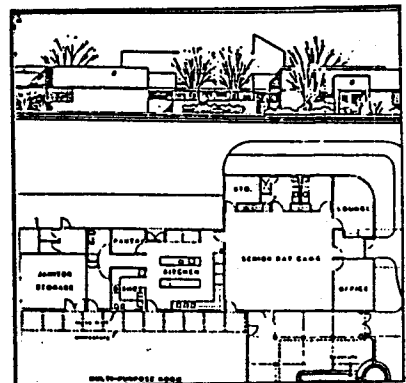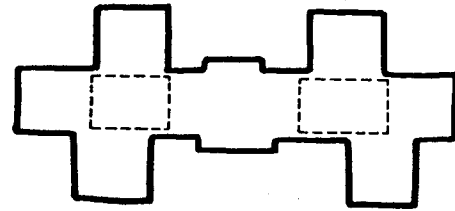
# OPPORTUNITIES FOR MEANINGFUL WANDERING

Wandering is one of the many difficult behaviors attributed to people with dementia. Gilleard (1984) and Coons (1988) identify three types of wandering behavior: (1) wandering as a consequence of disorientation, which may be as much a result of an illegible environment as of an incapacitated resident; (2) habitual activity stemming from previous experience; and (3) restless activity-seeking typically found in environments that provide little to engage residents.

To reduce wandering from disorientation, facility design must ensure that the environment is easily understood and that people do not get lost. Thus, repetitive modules should be avoided and memorable and unique landmarks should be introduced to provide residents with orientational cues.

In acceptance of the notion that wandering may be a habitual activity for some residents, walking paths should provide for more than mere physical exercise. Such paths can allow residents opportunities for passive involvement in activities without requiring them to participate, thus exposing them to social/sensory stimulation. Coons (1988) contends that wandering behavior actually subsides in a rich and supportive environment that provides residents with opportunities for involvement and participation.

Paths for meaningful wandering can serve as the primary means of movement within a building.
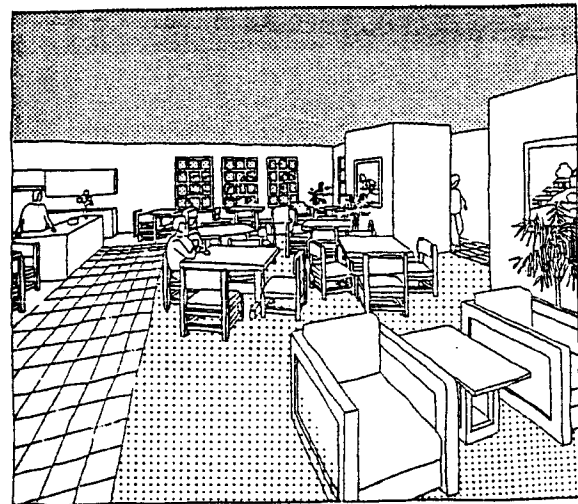

Views to the exterior, as well as adjacent activity alcoves, can potentially engage the attention and interest of wandering individuals.

PUBLIC TO PRIVATE REALMS

Oftentimes, environments for people with dementia do not provide sufficient variation in the levels of privacy available to residents. This is the result of organizational factors (e.g., staff members who do not knock and wait for permission before entering residents' rooms), architectural characteristics (e.g., large, undifferentiated dayrooms as the sole public or semi-public options), and combinations of the two (e.g., a policy that mandates and resultant design that offers only shared resident rooms). Providing opportunities along a gradient from public to private spaces offers residents control over desired level of sensory stimulation, social interaction, and involvement in activities.

Facilities for people with dementia should provide spaces for solitude (such as private rooms, and quiet nooks for one person), as well as for small group interaction (such as sitting areas separating each resident room from the rest of the household, and small outdoor alcoves for private conversations). Many residents also suffer from understimulation and lack of socialization in large, impersonal, and sterile environments. Sociopetal (interaction-encouraging) spaces that are easily accessible to all residents, and that are friendly and inviting in character, are welcome public places in such facilities.
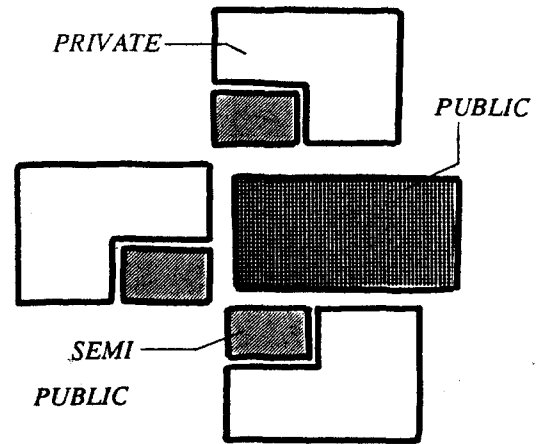

Each of these residential clusters offers a continuum of spaces from public (living rooms) to semi–public (dining/ activity area) to private (residents' rooms).

POSITIVE OUTDOOR SPACES

Outdoor spaces can provide unique and relatively less expensive settings offering residents a degree of autonomy and choice by allowing opportunities for both socialization and retreat within a safe and controlled environment. The outdoor environment is an excellent tool for enhancing a nonmedical, noninstitutional, positive image of the facility among people with dementia, staff, and family. Such spaces also provide an important link with natural elements.

Wheelchair-accessible raised planting beds allow residents to participate in gardening. Water features such as pools, fountains, and waterfalls, located in well-landscaped outdoor spaces, can provide visual, tactile, and auditory stimulation. Outdoor spaces should be kept simple and safe from physical and perceptual obstacles to movement and ambulation, at the same time allowing for easy surveillance. Enclosures can be defined unobtrusively (e.g., with plants or building mass), so not to be obvious or disturbing to residents. In recognition of the physical frailty of elderly dementia patients, a positive microclimate can be created by ensuring protection from excessive sun or harsh winds.

Large, undifferentiated, open spaces may be disorienting for people with dementia. Open spaces should be broken down through the creation of alcoves, which accommodate small group activities and places for solitude and retreat. Such spaces can serve as interest points along an outdoor walking path, and will aid in spatial orientation, at the same time creating an outdoor environment supportive of a rich mix of activities.
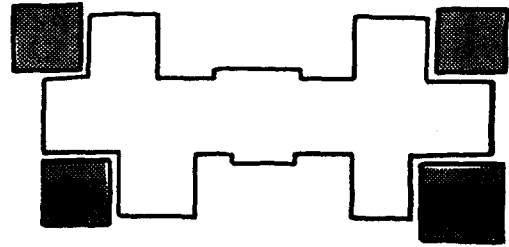

The double cruciform floor plan defines two sides of each of the outdoor courts.
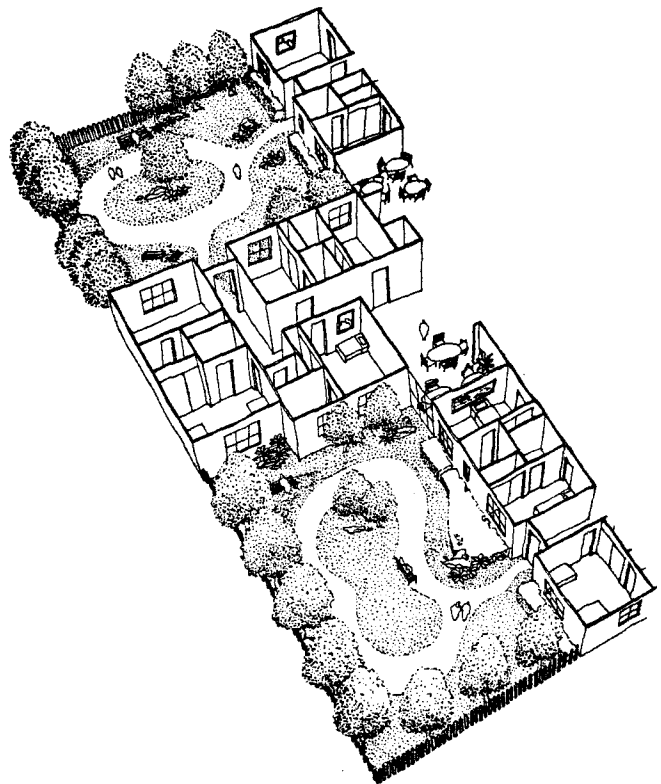
Dense plantings provide unobtrusive enclosure of the remaining two sides of each courtyard. Raised planting beds provide a focus for activity.

This final set of principles focuses on specific spaces for particular activities or events. Recommendations are made for the types of activities that must be accommodated, for the characteristics that these spaces should embody, and for the therapeutic and organizational goals that should be supported through the design of these spaces. For example, one such recommendation is that kitchen facilities be provided for use by residents, family, and caregivers; such kitchens might be used by residents to independently carry on familiar and healthy activities, such as doing dishes, making a cup of coffee, or chatting over the kitchen table. To meet the needs for autonomy and control, maintain links with residents' pasts, and provide opportunities for socialization, kitchen spaces for use by residents should be residential in character and scale, a quality that might be achieved through the use of domestic furnishings and finishes (e.g., curtains in the window, a tablecloth covering a wooden table for four people, and pictures or a calendar on the wall and refrigerator). These domestic kitchen spaces can also be designed to fulfill the organizational need for opportunities for unobtrusive surveillance of residents, easily met through the provision of a kitchen "island" in the space that serves as an informal "observation point" for staff members.
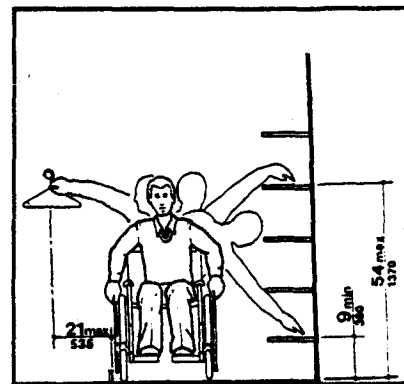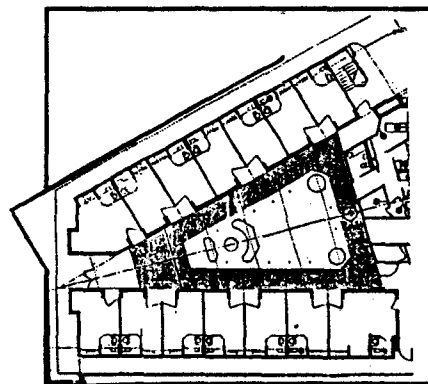
ENTRY AND TRANSITION

The entry represents one's first impression of any facility for people with dementia. For this reason, it should be welcoming and noninstitutional in character. This can be achieved through the maintenance of residential materials and scale in the design of this space. The entrance and transition area should also function to decrease confusion and disorientation for visitors as well as people with dementia. The design of an entrance and "cloak room" that is removed from the sight of residents will limit interruption of ongoing activities by others entering or leaving the building. A "disguised" entry and storage area will also prevent residents from rummaging through their own and others' belongings, and will decrease attempts to wander away from the unit or facility.

For the same reason, the entry represents an area where surveillance is desirable and necessary. Instead of disturbing alarm systems or humiliating "beeper" devices, surveillance can be sensitively provided by situating an administrative office where an employee can unobtrusively monitor coming and going from the unit, or by introducing technological devices at the entrance that effectively prevent unsupervised exiting (such as doors that only open when the user simultaneously presses two nonadjacent buttons.)
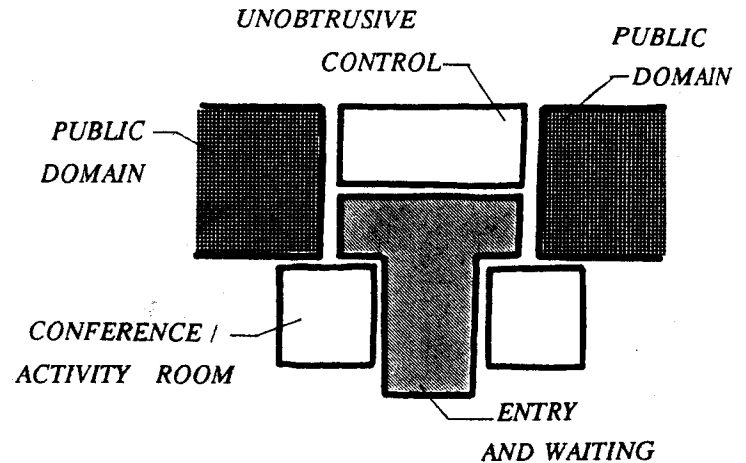
The entrance is shared by the two wings. Unobtrusive control is provided by the office space and the controlled doors leading to the wings.
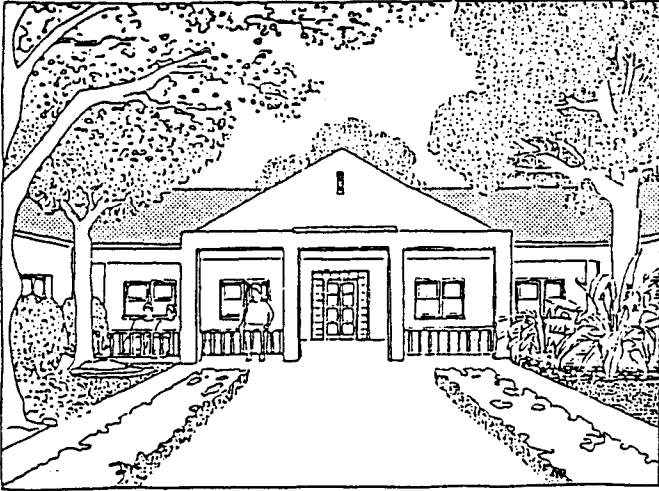
The friendly and homelike exterior signifies a familiar and comforting environment to residents and family caregivers alike.
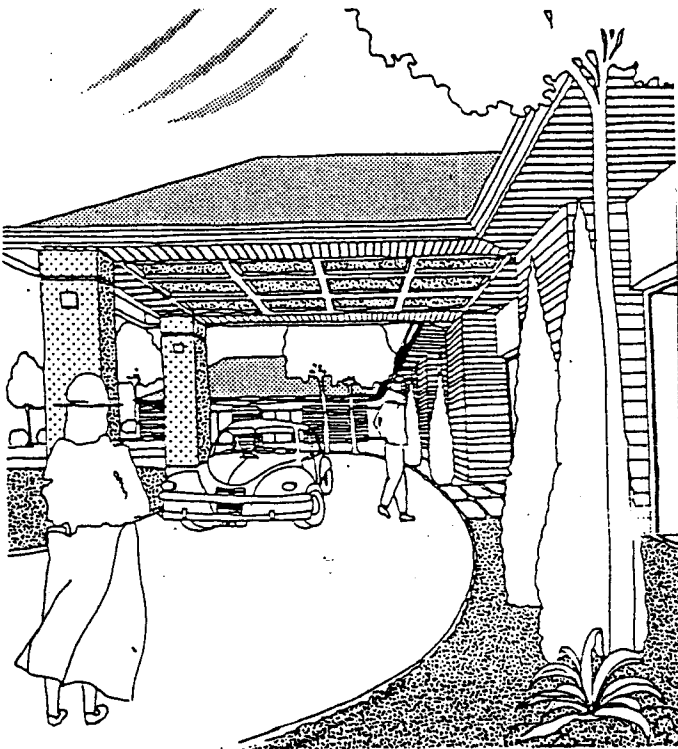

A drop–off point near the entrance, sheltered from the elements, makes coming and going a protected and comfortable experience.

COMMON AREAS FOR EACH FAMILY

In environments for people with dementia, the social structure of "family clusters" should be supported through the physical organization of public spaces. The continuum of spaces ideally ranges from the essentially private resident room to the shared public areas of activity within each family cluster. The goal for the design of these common areas is to increase opportunities for social interaction among residents, as well as to ensure provision of opportunities for individuality, privacy, and autonomy.

One appropriate technique for establishing common areas involves the centralization of various activities at the core of each family cluster. This activity core becomes the public center of the cluster, much as the living room, dining room, and kitchen represent the core of family homes. Activity areas should be established adjacent to, but not interrupted by, circulation paths (Howell, 1980). This encourages participation in highly visible activities, but does not lead to disruption of ongoing events. When possible, it is desirable to carve small subspaces out of larger activity areas to create alcoves for passive participation or retreat, again in recognition of residents' need for privacy.

Common areas should be roughly complementary to those found within homes in terms of both scale and ambience. These domestic qualities will reinforce the residential nature of the space and highlight the ordinary activities of daily living, some of which might be as simple as food preparation in a small kitchenette or family activity around the dining room table.
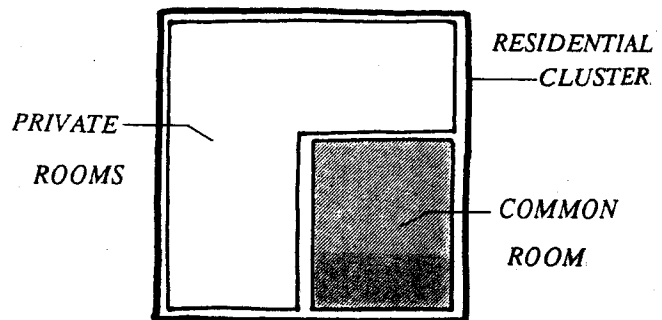

Each residential cluster has a living area for its eight residents. The living room is a semi–public transition between the public area at the core and the private rooms on the periphery.
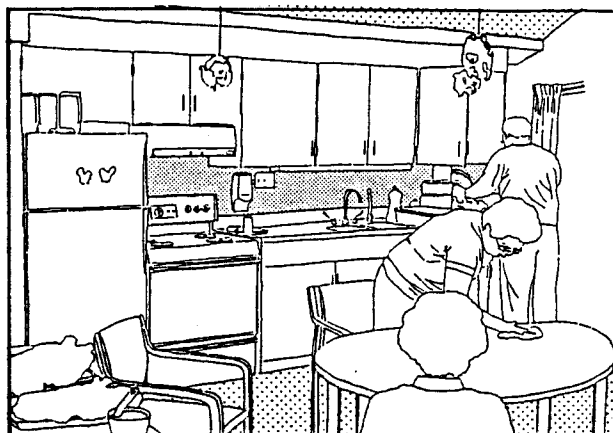
DOMESTIC KITCHENS

Domestic—small-scale, residential—kitchens in the home and in congregate living environments can provide for more than just essential food preparation. Accessible and safe kitchen areas for use by people with dementia make available many meaningful and therapeutic activities and experiences, including such familiar household tasks as washing dishes, setting tables, sweeping, and folding towels. To facilitate this, the kitchen or kitchenette should be designed with plenty of seating and workspace at small "kitchen" tables. Provision of a kitchen in a day care center or long term care facility also enhances its domestic ambience, which can be further reinforced by the substitution of tile, wood, and bright, cheerful carpeting for stainless steel and high gloss monochromatic institutional surfaces.

The provision of a kitchen for use by people with dementia can reinforce the organization of a facility into small family "households". Its design should facilitate the kind of comfortable, informal socialization and reminiscence that often takes place at the family kitchen table. At the same time, the familiar kitchen "island" can function as an excellent point for informal surveillance of the facility by the care provider; this is a practical and noninstitutional alternative to the traditional nurses' station.
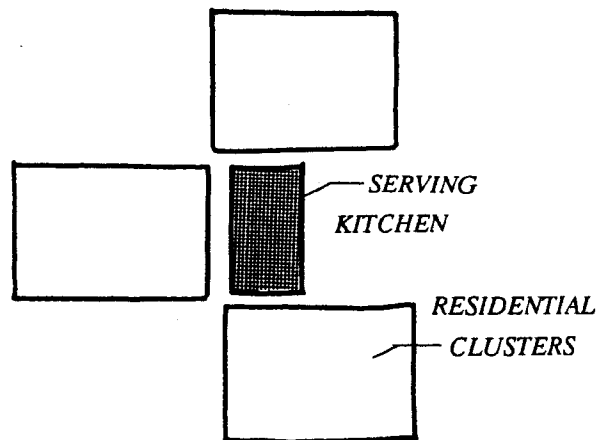
The serving kitchen is centrally located, in proximity to the three separate dining areas. The kitchen also functions as one of the activity areas along the internal wandering path.

The small kitchenette can be used to serve half of the residents in the facility. This kitchenette does not replace the full-service kitchen; however, beverage-making, snack preparation, and the like add to the domestic character and act as catalysts for social activities.
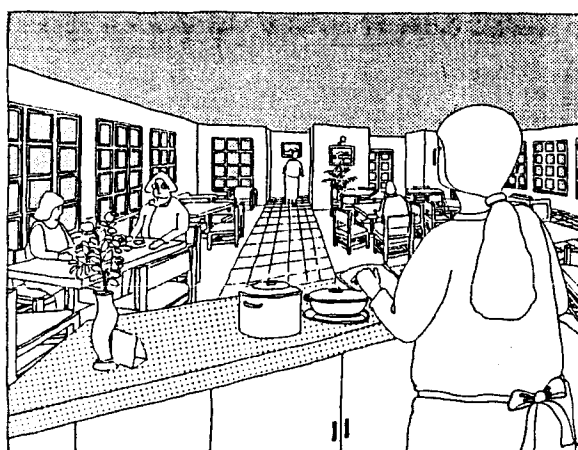

This kitchen counter provides an unobstructed view of the dining area, the entry to the living room, and an outdoor activity area.

INTIMATE DINING AREAS

While there is no evidence to suggest that meals are as highly anticipated by people with dementia as they are by the general population, there is evidence to point out the potential stress that can accompany this activity (Snyder, 1984; Hiatt, 1981; Roach, 1984), often as a consequence of the loss of ability to feed oneself and increased difficulty in the manipulation of utensils. Large, undifferentiated dining areas can engender overstimulation as a consequence of too much noise and too many people, thereby leading to agitation and confusion. Mealtimes, however, still hold the potential of serving as social and nutritional activities. Maintenance of eating patterns developed over an individual's lifetime can provide continuity with the past, and can increase the scope for reminiscence.

Spatial organization that breaks dining spaces into separate subrooms or zones reduces the institutional image associated with a large dining room where great numbers of people are seated at long tables. Intimate dining areas with small tables seating family-sized groups of two to six people can evoke associations of home; these may also be more comfortable for residents, and more manageable for staff. Noninstitutional furniture, together with a residential decor, can help create a domestic ambience, thereby deinstitutionalizing the space and evoking associations of "home."
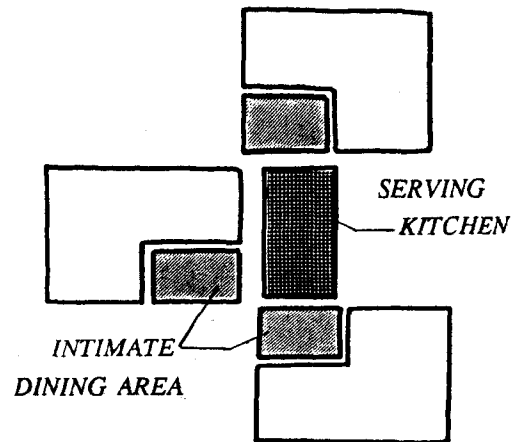
Small dining areas are associated with each residential cluster; each dining area is intimate in scale and includes three tables with seating for eight residents and a few guests. These dining areas overlook an outdoor area as well as an indoor wandering path.

The selection and arrangement of furnishings in this
dining area were designed to create multi–functioning
spaces for intimate dining and household–based activity
areas.
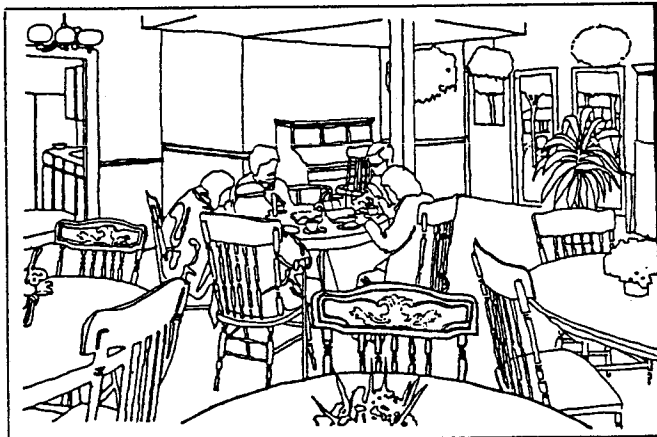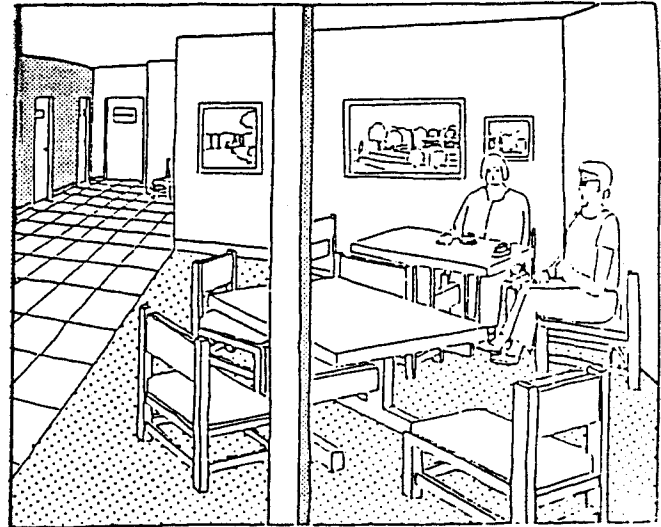
The wooden tables and chairs, plants, lighting, and small
scale of the dining room create a residential and home–like
environment.

ACTIVITY ALCOVES

Facilities for people with dementia often force residents to choose between very public spaces (e.g., large dayrooms) and very private spaces (e.g., their own bedrooms). Either of these extremes can be problematic. The presence of many other people in large, undifferentiated lounge areas may result in sensory and social overstimulation; these spaces likewise fail to provide that measure of privacy desired for interaction with family and friends. Retreat to one's bedroom may lead to confusion of day and night and may still (in semi-private rooms) fail to provide desired levels of privacy.

Thus, the provision of a range of spaces from among which residents are able to choose can support interaction, privacy, and sense of control. Such spaces needn't be large (e.g., a window bay is sufficient), but they should have some demarcation of their boundary (e.g., railing, change of flooring material) from the surrounding area. It is likewise desirable that these areas overlook ongoing activity, either indoors or out, and that they occur along paths of movement, thus providing landmarks for orientation and places where wanderers might stop.

PUBLIC DOMAIN   ACTIVITY ACLOVES
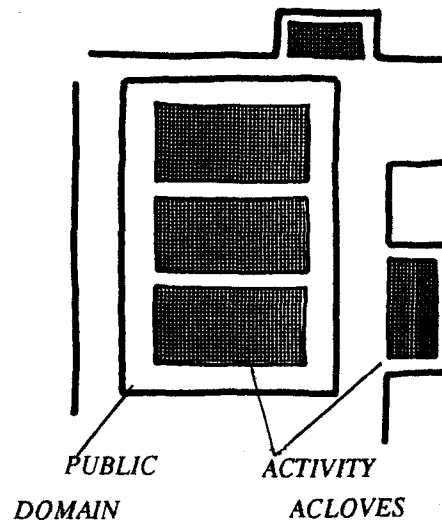
Here a shared activity area both contains and is surrounded by activity alcoves for informal social contact and small group dining.

RESIDENTS' ROOMS

In typical single-family homes, the bedroom is among the most private regions of the dwelling, the place where sleeping, grooming, dressing, and bathing occur; other, less private activities take place in other areas. However, in many facilities for people with dementia, the bedroom loses this quality of privacy. It may be shared with one or more other residents, and activities such as visiting with family and friends may take place here as well. Indeed, in many cases, the only alternative settings for social contact are large, anonymous day rooms or the corridor.

It is possible to respond to this need for resident privacy in a variety of ways. Many care providers now believe that, to the extent possible, all residents should have private rooms. In instances where rooms will be shared, the compatibility of roommates' personalities and temperaments should be considered.

Whether private or shared, resident rooms should create a continuum of zones for semi–private— as well as private—activities. Spaces for socialization and other activities should be located closest to the entrance of the room and the more public corridor beyond. Areas for sleeping and toileting are positioned in the most remote and private area of the room.

People with dementia do not usually require more in the way of demanding medical care than other elderly persons (at least until the later stages of the disease), and so bedroom and other furnishings based upon hospital requirements are neither necessary nor appropriate. Traditional, homelike furnishings will engender residents' associations of their rooms with familiar, residential bedroom activities and functions.

For these reasons, resident rooms should provide opportunities for personalization. This may include the use of furniture and bedcovers from one's home, as well as the provision of space for personal mementos and pictures on the wall.

Nocturnal wandering and restlessness are examples of problems for which environmental design may serve as a partial solution. For example, soft, soothing colors in the bedroom may support the use of this space for quiet activities and retreat from overstimulation, and reinforce its association with sleeping. The removal of "day time" activities (e.g., socialization) from this space may further reinforce this association.

Finally, rummaging in (and subsequent misplacing of) one's own and others' possessions is a problem that is often associated with residents' rooms, and which consumes a great deal of staff time and energy and causes frustration on the part of family caregivers. Strategies to enhance recognition of one's own room and belongings may help to reduce this problem. Pretty, distinctively–colored, washable bedspreads in each room (perhaps again bedcovers from home) and matching valences over the windows or in the doorway may help residents to recognize their own rooms, as will familiar pictures, throw pillows, and other artifacts from home. Residents' rooms should include sufficient space for storing their belongings out of sight, where they do not create a temptation for rummaging. If two residents share a room, it may be wise to assign a different set of furnishings (e.g., two different sets of matching dressers, chairs, beds, and nightstands) to each resident to help each differentiate his or her own belongings.
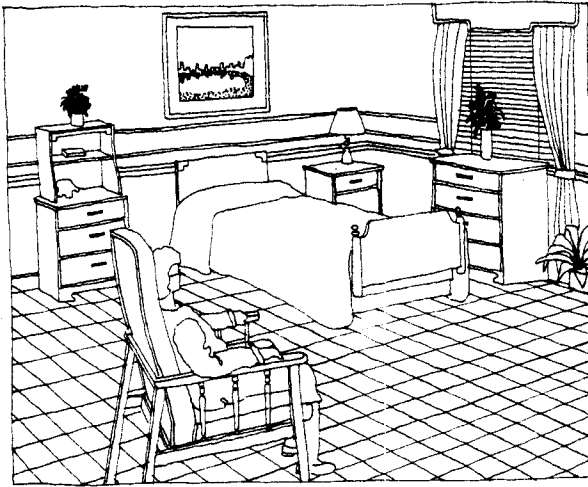
These attractive bedrooms furnishings are quite similar to those the resident may have used most of his or her life. They could easily be combined with a favorite dresser or chair from home to help maintain ties to the past (by Sunrise Medical/Joerns).
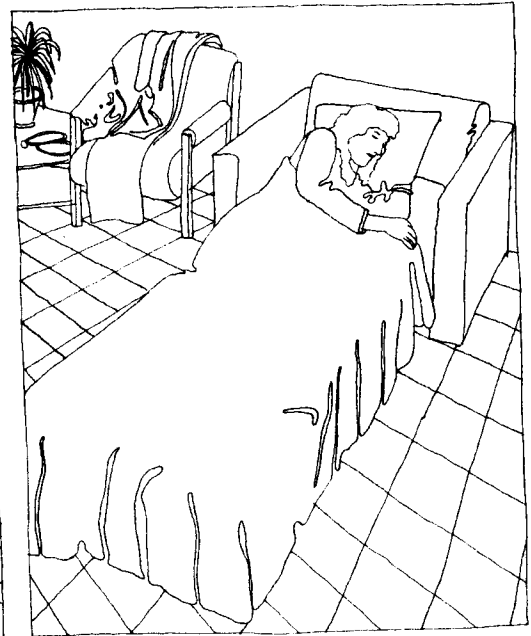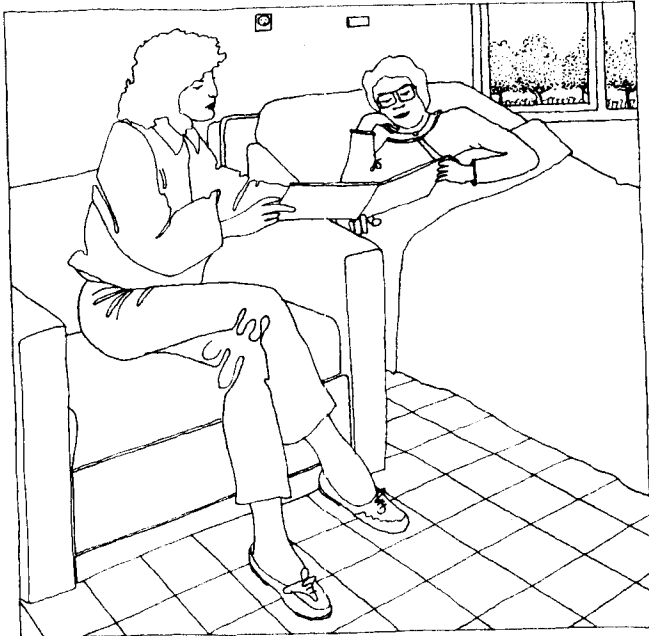
Whenever possible, space for public or social functions should be provided outside of the resident's room. However, a comfortable chair or two in one corner of the room may be appropriate for residents who wish to use their room for private conversations with visitors or for quiet retreat and solitary activities. One practical, multi–functioning choice is a comfortable, easy–to–clean lounge chair that doubles as a fold–out bed for use by spouses visiting overnight (by Lazy Boy Healthcare).

DIGNIFIED BATHING

Bathing can be one of the most difficult activities performed by people with dementia and their caregivers. Because of physical deficits (including psychomotor deficits that may affect the sense of balance) and decreased attention to personal grooming, the person with dementia often requires assistance in bathing or at least in getting into and out of the bathtub or shower; however, being lifted into a tub or shower can easily be an unsettling or even terrifying experience. In addition, the resident may resent the indignity of being assisted in bathing; many of the various institutional bathing devices (e.g., "cranes" or hydraulic lifts to hoist the resident into the tub) compound this indignity. These circumstances often combine to create a dislike of or an aversion to bathing in the person with dementia.

Bathing involves many potential threats to safety and security. The caregiver may experience difficulty in lifting and maneuvering the person with dementia, which is especially problematic in the domestic setting, where the caregiver is likely to be an elderly spouse. Fear of falling during bathing or showering may increase the aversion to bathing of people with dementia. Caregivers in facilities for people with dementia are rightly concerned about minimizing the likelihood of falling in the bathing area. An additional safety concern is that unsupervised wandering into bathing areas may result in accidents. Design of bathing areas must respond to these valid concerns.

Whenever possible, people with dementia should be allowed and encouraged to take responsibility for those grooming activities (including bathing, whenever possible) that they can still accomplish with minimal stress or anxiety.

Autonomy ought to be facilitated; for example, a resident may need assistance to use the bathtub, but could possibly take a shower independently, seated on a wooden chair in a shower with no lip and a downward sloping floor. In such a situation, independent showering may be a more attractive alternative to the resident; this opportunity should be provided.

Much of the equipment and many of the furnishings that have been developed to make bathing easier for the caregiver (e.g., hydraulic lifts and raised bathtubs) will probably seem strange to the person with dementia (indeed, to most people). Ideally, "bathing areas should be set up to be as reassuringly familiar and smoothly operational as possible. Bathing equipment that requires [people with dementia] to be suspended in unfamiliar contraptions" will likely be perceived as strange, threatening, and undignified (Hyde, 1989, p. 39). In addition, noisy and crowded [group] bathing areas do not provide a calm setting or promote dignity for residents.

Negotiable and Safe Bathrooms

Accessibility and safety are major issues that must be resolved in the design and furnishing of bathing facilities for people with dementia. People with dementia may have a great fear of falling in the bathroom; however, a variety of measures can be incorporated to reduce the risk of falling, including the use of nonslippery surfaces for floors (rubber backing can keep rugs from slipping); the installation of grab bars above the tub and along the walls; the placement of a nonslip chair in the shower; and the use of a textured, nonslippery surface in bathtubs and shower stalls; and the use of a floor

drain and positive drainage angles to ensure that water will not collect on the floor. Water temperature levels should also be limited to prevent scalding.

Many modifications can also make bathing facilities more accessible to people with dementia and to caregivers, when they are involved. These modifications need not be elaborate or expensive contraptions—they can be as simple as a shower stall designed without a lip or edge and with just a slightly sloping floor to allow water to drain. If the doorway of the shower is large enough to accommodate a wheelchair, a person can be pushed directly in to the shower and showered in the chair.

To ensure a safe bathing area, locks can be removed from doors to prevent people with dementia from inadvertently locking themselves into the bathroom, while still allowing them the privacy of using the bathroom alone (when feasible). In institutions, the bathing area should be designed and located so that it is not visible to solitary wanderers and cannot be entered without a staff member's awareness.

Space for the Caregiver

"What I do to get her out of the tub is, first of all, I wipe up all the water from the floor with plenty of towels so it isn't too slippery; then I get her out of the tub in stages—let me tell you that isn't easy with a wet body that doesn't cooperate—and then I prop my body, sort of wedge it, between the counter and the tub, so that we won't slip and take a tumble, and then I pull her up leaning against me. There isn't room to do it any other way. Mind you, we did have a fall one time, and got pretty bruised too!" (Husband-caregiver, age 75, from Gnaedinger, 1989).

Because bathing and showering frequently require at least some degree of caregiver assistance, areas for bathing should be designed for

maximal efficiency for caregivers. Efficiency can be provided without sacrificing the dignity or privacy of people with dementia. One means of achieving this is through the modification of the floor plan and layout of bathing areas. For example, bathtubs can be situated so that at least two and preferably three sides are accessible to the caregiver, with enough room on the sides of the tub to allow a wheelchair to be maneuvered directly to the edge. Showers should also be large enough to allow room for a caregiver to assist with showering; if the shower can accommodate a wheelchair, less physical exertion is required on the part of the caregiver because residents can be showered right in their chairs, and may now be able to shower themselves without assistance. Removing glass enclosures aroung the tub also makes assisting with bathing easier for the caregiver and recognizing the bathtub less confusing for the person with dementia (Pynoos, Cohen, & Rosner, 1990). A fold–down chair on one wall of the shower accommodates the person who must be seated while showering, without inconveniencing others. These modifications will also make the bathing area easier to clean and maintain.

Domestic and Private Bathing

To alleviate the anxieties of people with dementia, bathing should be maintained as a normal and domestic activity to the greatest extent possible. When it is impossible to use familiar furnishings like residential tubs and showers, bathtubs with a hinged, "walk-in" back or side are preferable to those that require the person to be hoisted over the edge. Because bathing is a private activity by nature, "group" bathing areas should be discouraged, and the privacy of people with dementia should be maintained and encouraged by providing shower curtains, doors, changing areas, etc. For the same reason, people with dementia should be allowed to bathe themselves when possible, with the minimal amount of caregiver assistance necessary. This can be

facilitated by arranging the necessary items for bathing in the proper order.

Place for Grooming

Bathing and showering are activities that may frequently require the presence or assistance of a caregiver; however, the same is not true for grooming activities such as hair brushing, teeth brushing, make-up application, and related activities. Although the bathing area should be located so that it is not accessible to solitary wanderers, the grooming area can serve as an independent activity alcove, and many of the normal bathroom accessories (e.g., toothbrushes, combs) associated with it can be readily available to residents at all times. A special, accessible place designated for this activity may enhance residents' attention to and competence in personal grooming, reinforcing their sense of independence and self-reliance.

While regulatory standards may control the use and storage of some items in this area (e.g., nontoxic liquid soap instead of familiar bar soap is mandated in some states), caregivers should facilitate independence and responsibility for personal grooming activities by making hair brushes, washcloths, etc., visible and accessible whenever possible. Clear marking and independent storage of each person's towel and toothbrush, (e.g., each resident might have his or her own shelf) can lessen the confusion that often leads to "borrowing" of other residents' possessions.

Additional Reading Materials

Goldsmith, S. (1976). *Designing for the Disabled.* London: RIBA Publications Limited.

Koncelik, J. (1976). *Designing the Open Nursing Home.* Stroudsburg, Pennsylvania: Dowden, Hutchinson & Ross, Inc.
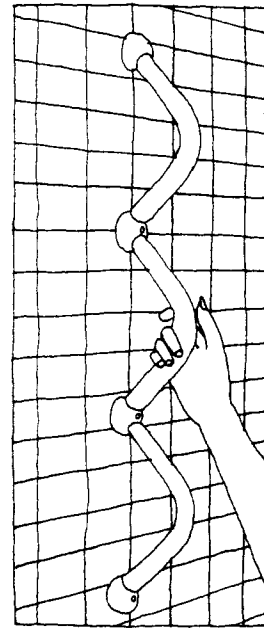
These grab bars can be easily installed beside the tub and shower to prevent falls during bathing (based on Comfortably Yours).
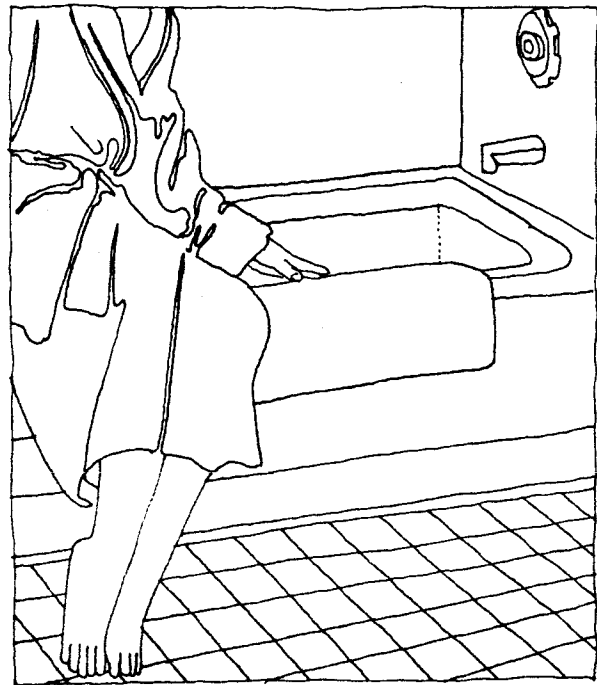
An easily–installed bathtub bumper limits injuries that may occur from bumping into the side of the tub.

A hand–held, wand–type shower provides great flexibility for the caregvier or the person with dementia, and can be especially helpful when using a shower or tub chair during bathing (from Calkins, Namazi, Rosner, Olson, & Brabender, 1990).

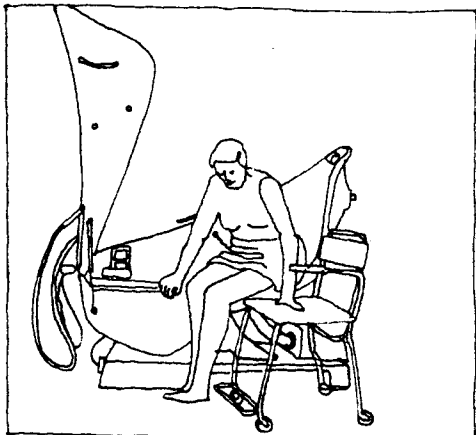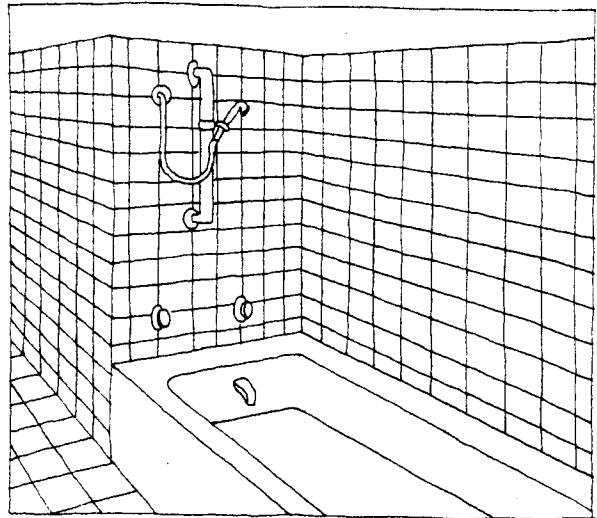*This bathtub (from Kebo Parker Healthcare Systems) can be easily entered and exited through a door that opens on the side, allowing the resident to be seated upon entering. There is no need for residents to be lifted over the edge of the tub, which can be frightening and disorienting.*
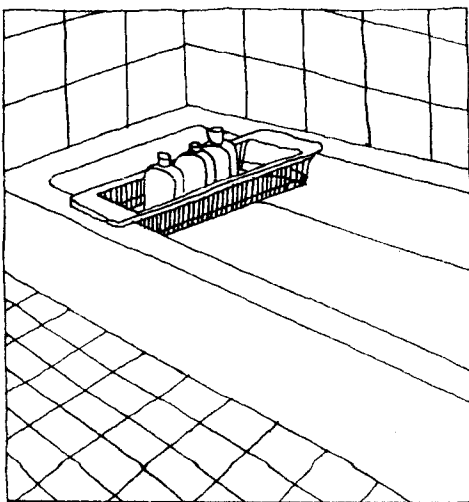
A tub tray that fits over the edge of the bathtub keeps items needed for bathing visible and in the proper order so they can be easily reached by the person with dementia or caregiver (based on Comfortably Yours).

INDEPENDENT TOILETING

Although incontinence is a major problem for many people in the advanced stages of dementia, facilitating toileting can reduce the problem in the intermediate stages. Toileting areas should be easily locatable and identifiable and should be designed to be used independently by the person with dementia whenever possible. These characteristics will increase the ease with which most continent people with dementia can find and use these facilities, making toileting more dignified for all residents and making the assistance of residents a less demanding task for caregivers and staff members.

Normally, toileting is considered a very private activity. However, people with dementia are often unable to locate toilet facilities independently or to remember to use them without being reminded by others. Because of both the embarrassment of accidents and the need for assistance from others, toileting may become a less than private and dignified activity. Even upon locating the toilet area, people with dementia may have difficulty using these facilities independently because of problems of limited access or difficulty in entering and using the facilities without assistance. Incontinence becomes a major problem in the advanced stages of dementia in terms of sanitation, loss of dignity, and associated stigmatization.

At home, the difficulties of hygiene and housekeeping associated with incontinence are often more than the family caregiver can handle. Family caregivers report that incontinence is one of the most burdensome effects associated with Alzheimer's disease (Pynoos & Stacey, 1986), and may often be a critical factor responsible for relocating people with dementia from their homes to some other setting. Incontinence is quite problematic for staff members in any type of facility for people with dementia, necessitating extra time and effort in caregiving and clean-up. In addition, assisting people with dementia in locating, identifying, and using toileting facilities is time-consuming for both professional and family caregivers.

Independent toileting is an activity of daily living that ought to be supported and extended for as long as possible. The self-esteem and dignity of the person with dementia may be closely associated with autonomy and the preservation of privacy and independence in toileting. To assure independent use of toileting facilities, one must increase the visibility of these areas to people with dementia and explore alternative means of enhancing residents' awareness of the need to use such facilities. Facilities for people with dementia should also increase the relative ease of finding toileting areas, as well as employ strategies such as encouragement of regular toileting. Whenever possible, facilities for people with dementia should maintain the familiar appearance and usage of toileting areas, and should avoid alternatives that invade residents' privacy (e.g., group toileting areas) or that obscure the intended use of the areas (e.g., a powder room or lounge area in a public restroom may obscure the function of the toileting area for some residents).

Proximate and Accessible Toilet Areas

Oftentimes, problems associated with incontinence can be resolved by providing several alternative toileting areas for resident use, and situating these proximate to areas where residents congregate. In residential facilities, toilet-

ing areas should be associated with individuals' rooms; this will increase the likelihood that residents will be able to locate the toilet area without assistance and will use toileting facilities with relative frequency. Where it is not possible to situate a toilet and sink in each resident room, toileting facilities should be located in immediately adjacent areas. Because toileting often follows dining, toileting areas should be located proximately but unobtrusively relative to dining facilities. In addition, restrooms placed liberally throughout a facility will reduce the time it takes people with dementia to locate and to reach a toileting area. A large number of small restrooms located throughout the facility may be more appropriate than a few large restrooms in this regard. In the early stages of the disease, directional signage may help the person with dementia to locate the bathroom in the home context, although this strategy is less effective as the disease progresses and the resident loses the ability to comprehend written instructions. In addition, some family caregivers report that rearranging furniture in the home to clear a direct path to the bathroom may decrease incidents of incontinence, although this may have the adverse effect of engendering confusion in an unfamiliar environment (Calkins et al., 1990).

Recognizable Restroom

People with dementia often have trouble in locating and recognizing toileting areas. In addition to reducing the distance that residents must traverse to reach a restroom, modifications can be made to make the restroom itself more recognizable as such. Calkins (1988) suggested the use of a line at eye level to lead residents directly from the dining area to the restroom following meals (thereby alleviating the need for residents to remember complex directions to find this area). Simple additions to the outside and door of the restroom (both the public restroom and those within the resident's

room), when used consistently, will be recognizable cues to direct the residents to the restroom, and to help them to recognize it when they arrive. Such modifications might include consistently painting the door frame and the door of the bathroom a bright, contrasting color, or devising a familiar, three-dimensional marker and a large, identifiable sign to use near the door of all restrooms (again, signage may only be effective during the early stages of the disease, at which time people with dementia are more likely to be living at home) (Calkins et al., 1990).

Autonomous and Private Toileting

Many modifications to toileting areas can increase the independent use of these facilities by people with dementia. For example, a simple grab bar installed alongside the toilet can alleviate the need for caregiver assistance. Making toilet areas more familiar to people with dementia will also increase the liklihood that they can use these facilities independently, and that they will not use the toileting area improperly (e.g., by voiding into wastebaskets). Private bathrooms for use by one person will be *most* familiar to people with dementia; where facilities for more than one person are required, independent and private toileting can still occur by providing doors (without locks) on each toilet stall to provide privacy without increasing the likelihood of people inadvertently locking themselves into the stall. Fixtures in toileting areas should be residential and familiar to residents, as they may be unable to recognize the use of unfamiliar equipment (e.g., sink "levers" that are easier to manipulate than faucet handles but are unrecognizable to residents may not be a wise choice for use in bathrooms for people with dementia).

In most instances, those people with dementia who are confined to wheelchairs will require some assistance in toileting. The provision of a

raised toilet seat may make it easier to transfer the resident out of the wheelchair. Toileting areas that are accessible to handicapped persons should also be large enough to accommodate a caregiver, and should include sufficient space for maneuvering an electric wheelchair, which requires more space than a manual chair. Because toileting is often associated with agitation and catastrophic reactions among people with dementia, finishes and surfaces that reduce reflected noise and increase sound absorbency will limit overstimulating noises that can frighten or agitate.
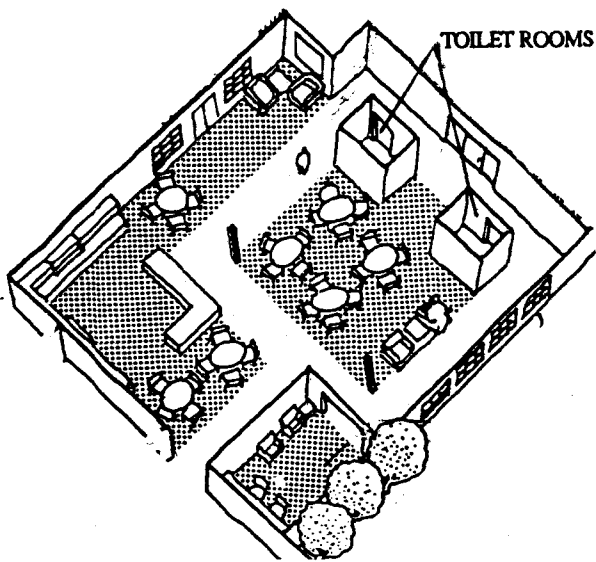

In public spaces, toilet rooms should be located near dining areas to support resident use of these facilities after eating. This prominent location assures that residents will be able to easily locate toilet rooms. The situation of the toilet away from the door within the room affords privacy to the user and provides room for caregiver assistance when necessary.

Ideally, resident rooms should each contain a toilet room with a toilet and sink. This arrangement will be familiar, and hence recognizable, and may increase independent and regular toileting.
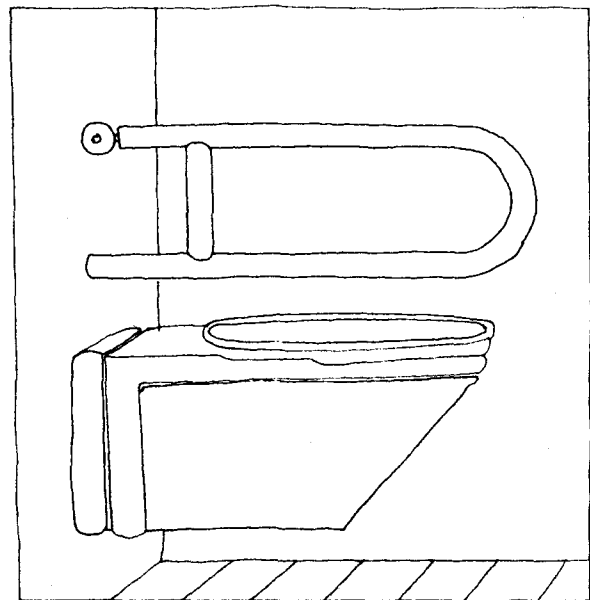
Toilet room modifications to increase safety without sacrificing independence or privacy include removing door locks and dangerous medications from the bathroom, and installing a raised toilet seat and grab bars alongside the toilet (Calkins et al., 1990). Grab bars that are brightly colored and contrast with the walls may be easier to recognize and therefore more effective than noncontrasting models. This grab bar has a spring up and down movement so that it can be moved out of place when not in use, and will lock in up or down position by turning to the left or right (from HEWI Bathroom Accessories).
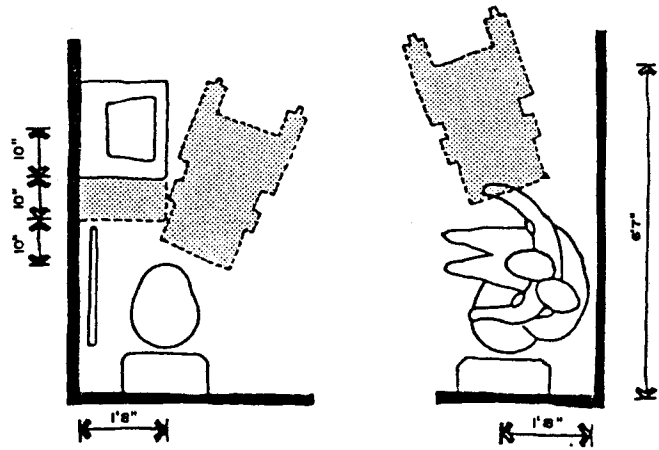
Toilet rooms should include sufficient space to allow for wheelchair manuvering (manual and electric) and care-giver assistance.
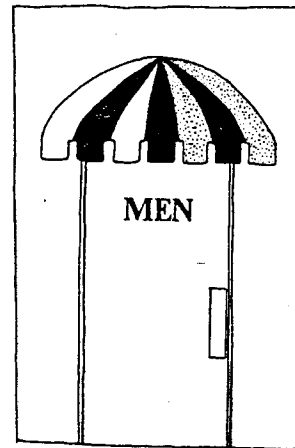
Many simple and inexpensive modifications may increase independent usage of toileting areas by people with dementia. For example: (a), a brightly painted door and recognizable canopy , and (b) , an identifying pictograph sign mark the entrance to this public toilet room, located near the dining area. Residents may easily locate and identify these spaces when they are prominently located and incorporate consistent signs and other cues to signal toilet rooms, such as a painted line along the wall that leads to the toilet room from the dining area.

PLACES FOR VISITING

Visitation from family and friends is an important component in the lives of people with dementia. It is therefore important for facilities to provide spaces for visiting outside of resident rooms, crowded dayrooms, or corridors, none of which readily accommodate this activity. It is reasonable to assume that, at least in the early stages of the disease, residents might benefit from opportunities for relatively private conversations. Environments supportive of visitors' needs may also encourage more frequent visiting, which would be beneficial for people with dementia, family members, and staff. To this end, residents and their visitors should have the opportunity to meet and converse in small and intimate settings.

Persons with dementia may become passive and unresponsive. Under these circumstances, visiting can become a frustrating experience for family members, who may find conversation difficult. Spaces for visiting might remedy this situation by including things from the past to serve as catalysts for conversation with people with dementia, whose long-term memory may be relatively intact. It would also be useful for such spaces to offer "something to do." Places for visiting might be situated accessible to the outdoors, encouraging visitors to take a walk with a resident. These spaces might also provide some simple games or craft materials for activities that residents and visitors could do together.
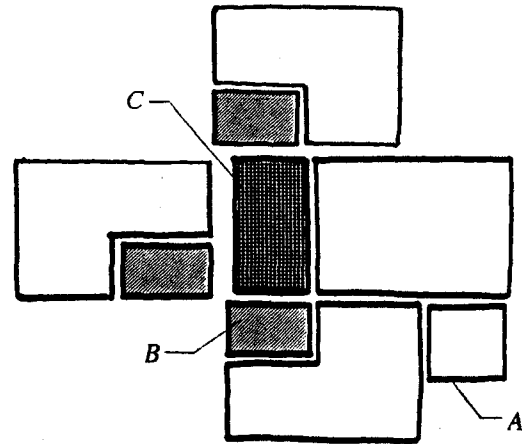
Visiting can be accommodated in a range of public and private spaces: (a) is a private and intimate, quiet den overlooking a landscaped view. (b) is a semi-public dining area, and (c) is an "action"-oriented domestic kitchen, where visitors and residents can engage in familiar activities together.
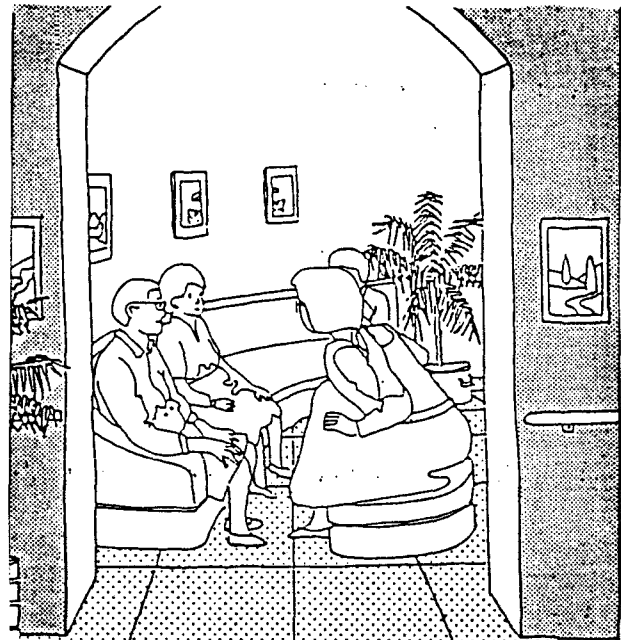

Small, semi-public spaces, such as alcoves, can be equipped for visiting by including magazines, games, crafts, and picture albums of facility activities to offer "something to do" while visiting.

STAFF RETREAT

Care for people with dementia is an extremely demanding and draining job, from which family caregivers and staff members will need an occasional break. In addition, some of the tasks involved in this job require a place where activities such as charting and private conversations with physicians and colleagues can take place without interruption from residents or visitors. Environments for people with dementia should include a space (or spaces) for staff retreat, work task completion, private conversation, socialization, and decompression. These places can also serve as the location for any dangerous equipment or supplies (e.g., hot plate, coffee pot, medication) or personal items (staff members' purses and coats) that should be kept from the person with dementia.

To meet these needs, staff retreat areas should provide comfortable seating, sufficient storage space, and a covenient work area for those who will use it. In addition to a break area and work space, the staff retreat area may serve as a resource, training, and information center for staff members, by including such items as journals, staff mailboxes, and a bulletin board with postings of policy changes and upcoming events. The staff retreat area should be accessible to staff members and yet out of the path of residents. The design of such a place should reinforce the residential image of the environment, and staff members' perception of themselves as valuable people. Caregivers' and staff members' access to a private place for temporary retreat in the home or the facility can increase the quality of life and of caregiving for both groups.
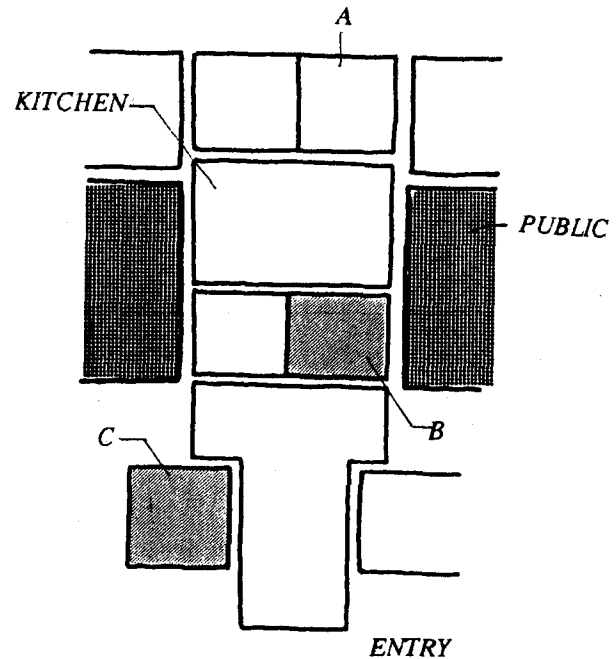
The building organizaton provides a range of spaces to meet staff needs: (a) is a private staff lounge, used primarily for rest and retreat. (b) and (c) are office spaces, from which staff can exercise a degree of control over egress, materials, and activities.
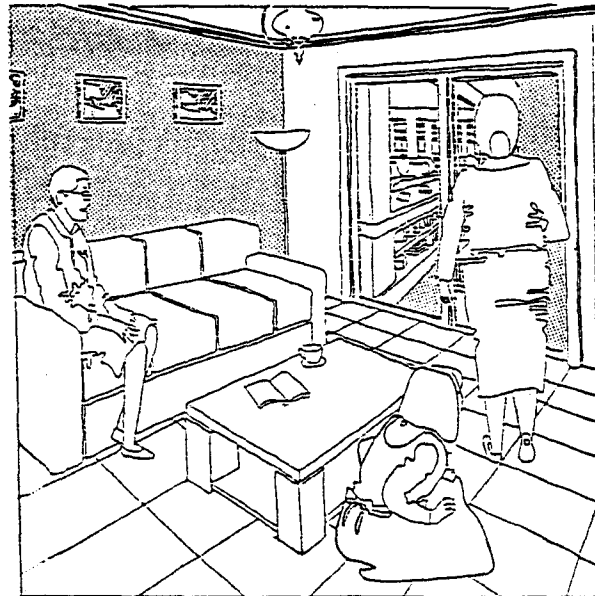
Comfortable seating, provisions for snacks and coffee, and pleasant views to the outdoors can make a short break a real delight.

Design

FACILITY FOR 48 RESIDENTS

This facility for 48 residents is a free–standing building on a suburban site. As a newly constructed structure, it is possible to incorporate many design features that cannot be readily introduced into an existing facility through simple conversion and renovation.

The functional program for this facility (as described below) was developed by Helen Bader of Milwaukee, WI. The program accommodates 48 elderly persons, 24 cognitively impaired, primarily persons with dementia, and 24 elderly people who are frail but cognitively intact.

The program therefore demands a flexible arrangement, which is met by the division of the facility into two units, each serving 24 residents. Within a common framework, each unit emphasizes different qualities and attributes in response to the unique needs of its residents, at the same time allowing for flexibility and change in usage (for example, both units could potentially be occupied by people with dementia. In this case, one unit might accommodate people in the earlier stages of the disease and the other unit might accommodate people in more advanced stages.)

Organizational Structure

- Number of Residents: 48; 24 persons with dementia and 24 frail but cognitively intact elderly people

General Attributes of the Environment

- While the overall building form is large, efforts are made to minimize institutional character; corridors within each wing remain as short as possible, public spaces have direct access to the exterior, and roofs reflect the two separate units.
- The single floor scheme maximizes potential access to the exterior.

Building Organization

- Central core functions (i.e., kitchen, receiving area, storage, staff retreat area) are located at the center of the plan, conveniently serving both clusters.
- U–shaped clusters minimize the length of corridors, provide views to the exterior from public spaces, and define two sides of outdoor spaces located adjacent to the building.

A facility for 48 residents:
Bird's eye view
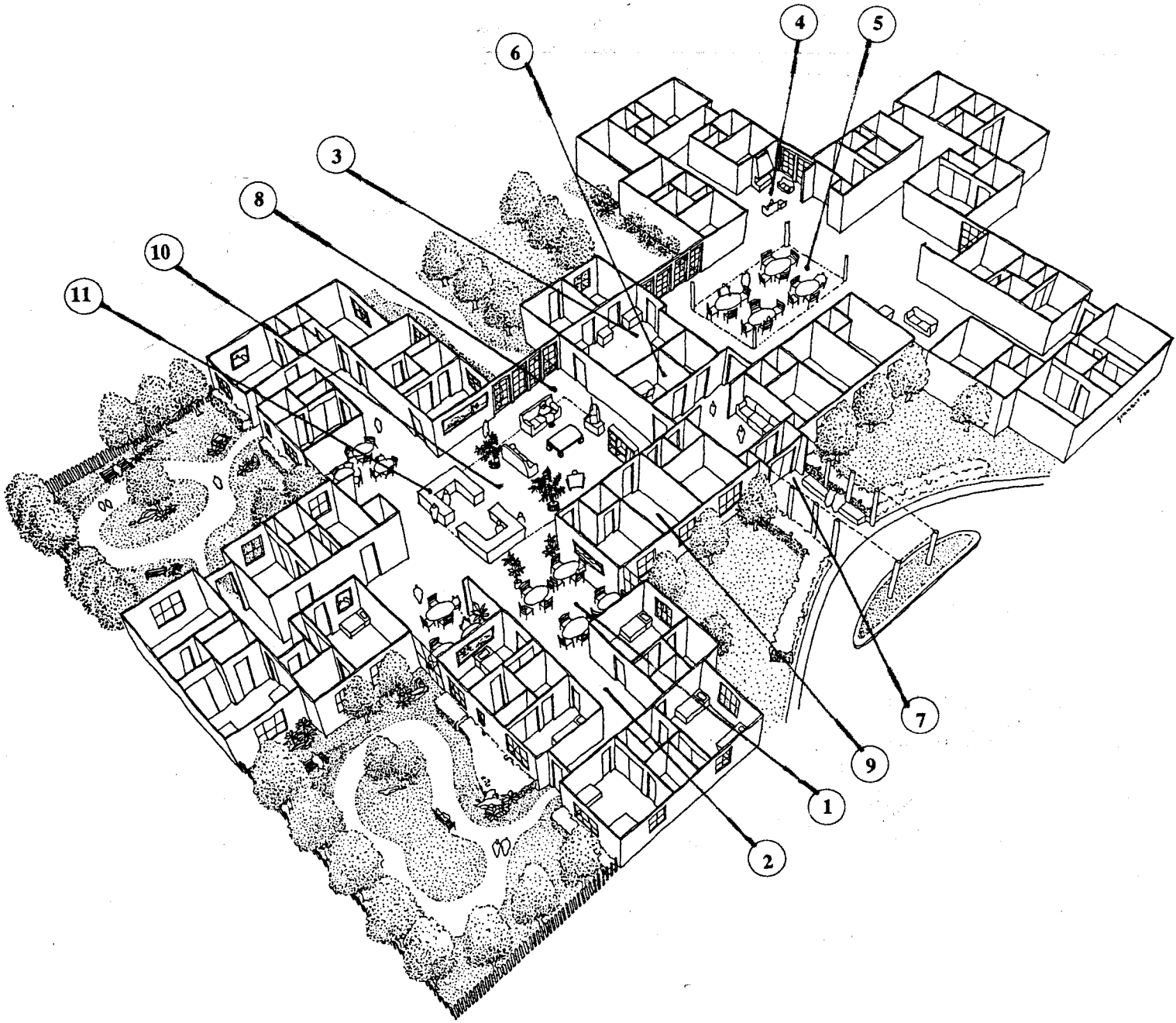
Design Responses:

1. This intimate dining room serves eight residents.

2. Each residential cluster serves eight residents, and includes three double rooms and two single rooms, each with toilet room and closet.

3. The large, central kitchen has external access through a utility room and an adjoining staff retreat area.

4. A communal living area provides a buffer between the public core and more private zone of resident rooms.

5. The common dining area and adjoining activity zone.

6. Unobtrusive control of access is provided by the strategic location of the administrative office.

7. A residential entry links with waiting area of familiar domestic scale and character.

8. This path for meaningful wandering connects a variety of activity areas.

9. A multi–purpose room can be used for such activities as visiting, conferences, etc.

10. The common living room is subdivided into four activity areas of residential scale.

11. The domestic kitchen functions as an activity center, serving kitchen, and location for unobtrusive staff observation.
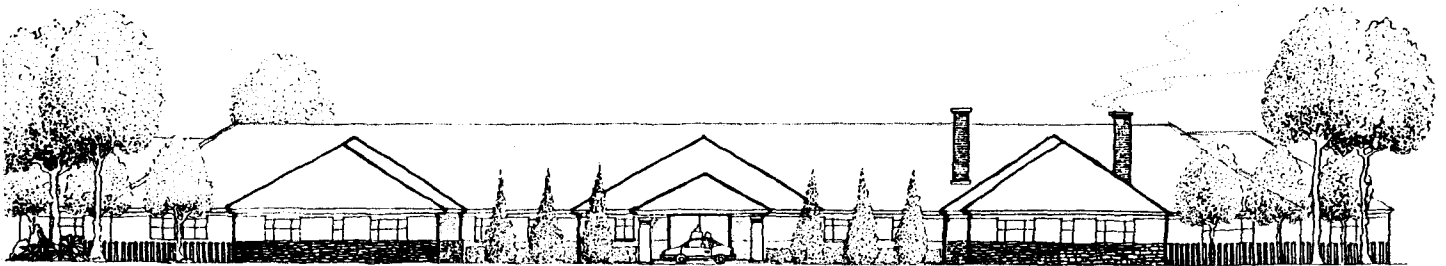
Facility for 50 residents. Elevation

1. Lines of sight from the staff area and serving kitchen allow easy and unobtrusive visual surveillance of each residential cluster.

2. Living area has views of the exterior as well as the three adjacent dining areas. Conversely, the visibility of the living area may encourage residents of each cluster to participate in activities.

3. Furnishings and plants can be used to organize the living room into several domestically scaled activity areas.

4. The path surrounding the living area provides a loop arrangement for residents engaged in wandering behavior. The adjacent activity areas provide opportunities for observation and/or involvement.
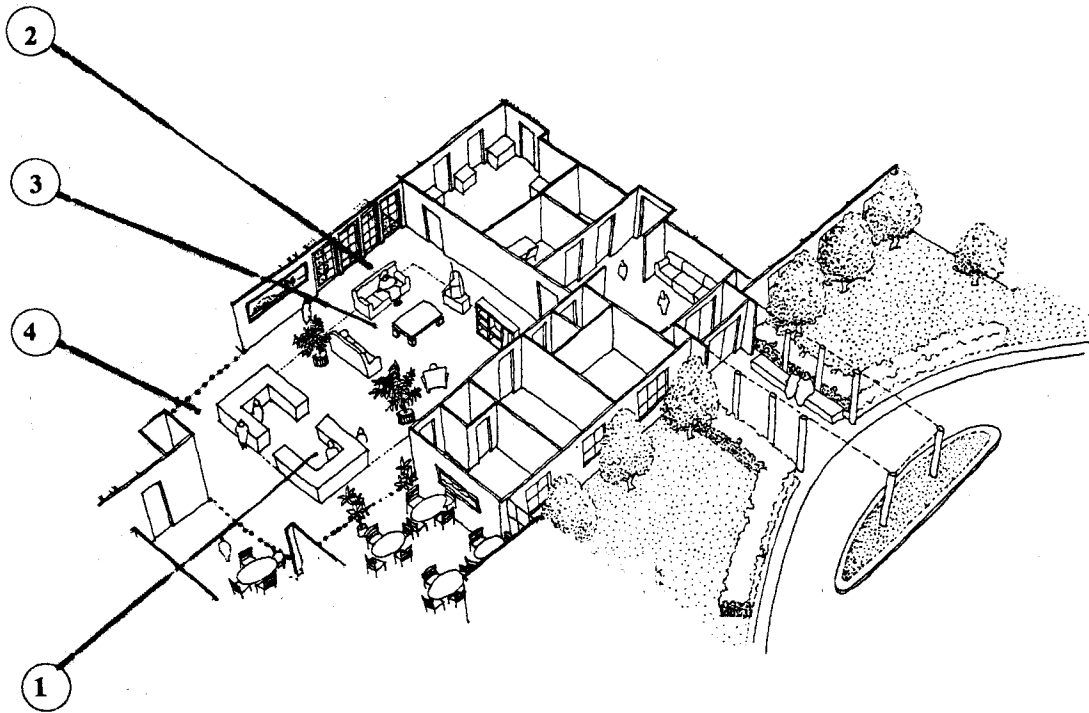
1. The eight residents of this cluster can share meal times, engage in activities or simply spend time together in the dining area. While there is clear visual access to the adjacent living room, subtle territorial markers define this space as "belonging" to these eight residents.

2. Each dining area has visual and/or physical access to an adjacent courtyard space. Such access provides visual stimulation and contributes to spatial and temporal orientation.

3. The provision of both single and double rooms allows residents choice in their accommodations. Elimination of built-in furniture allows for personalization and some choice in location of beds and bureaus.

4. To minimize the "institutional" character of each cluster, and to facilitate spatial orientation and wayfinding, primary corridors are both relatively wide and short.
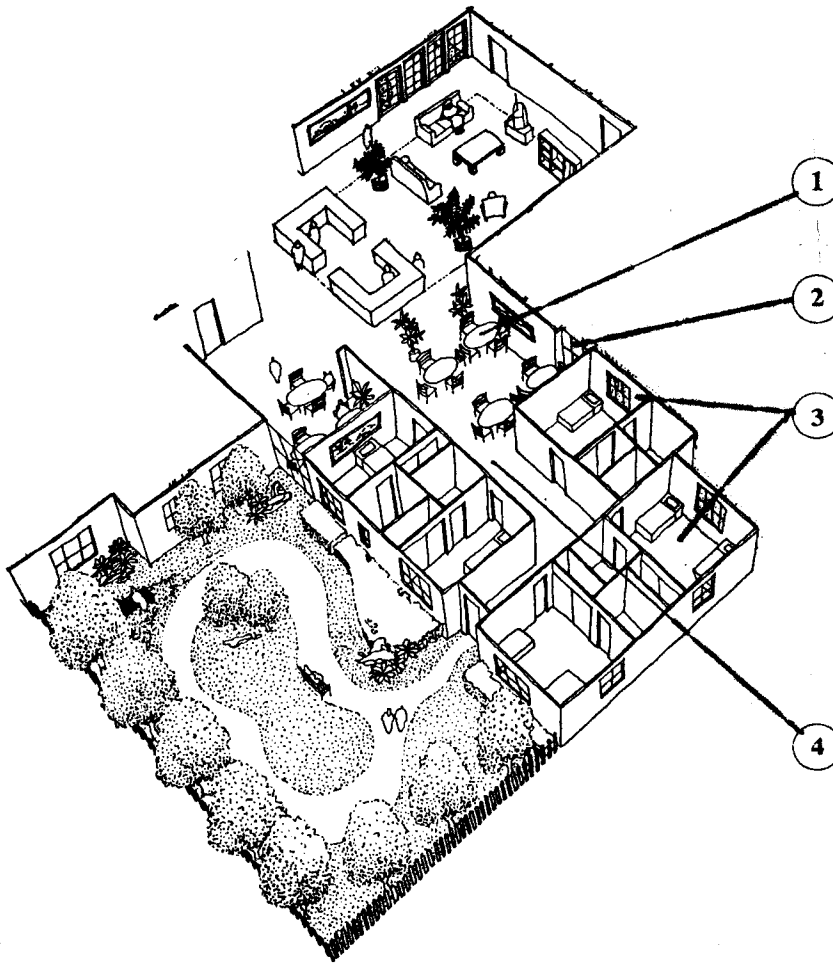
1. The building defines two sides of each protected courtyard; the remaining two sides can be defined by a combination of fencing and plantings, providing effective yet unobtrusive security.

2. A path loops through the courtyard, providing places to stop and rest along its length, and then returning to its point of origin.

3. Seating areas are located in the sheltered microclimate created by the building, providing protection from sun and wind.

4. Raised planting beds provide accessible gardening opportunities for residents of limited agility or mobility. The beds provide each court with a familiar and noninstitutional visual feature.
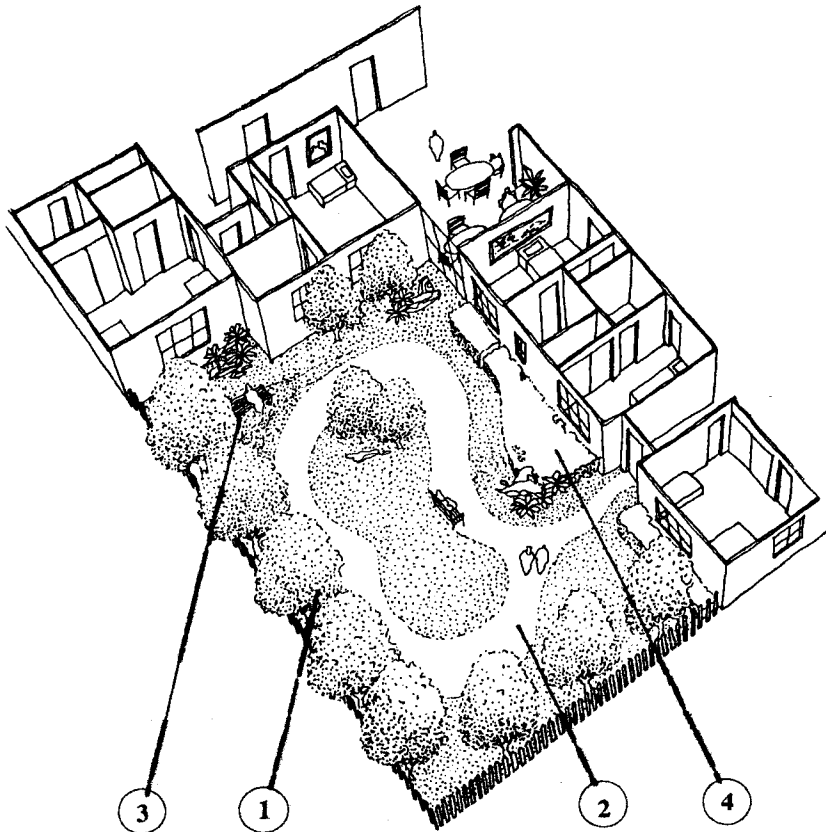
Summary and Evaluation

ENVIRONMENTAL EVALUATION

Building occupancy and use should not be viewed as the termination of the facility development process; rather these represent a beginning, as people move in and patterns of behavior within the facility are established. At this stage, users may begin to recognize problems or incongruencies between desired programs or goals, architectural features and characteristics, and the resultant performance of the facility. This is an appropriate time to initiate a more formal evaluation of the facility to identify problems, derive lessons, and initiate design responses through either renovation or redesign.

In this final chapter, "evaluation" may be utilized in three different ways: (1) for the systematic "post-occupancy evaluation" of a specific facility; (2) as a tool to facilitate "design reviews" by architects and clients during the planning and design of new or renovated facilities; and (3) as a stimulus to the thinking of facility administrators, care providers, and designers regarding the untapped therapeutic potential within their own facilities.

The organization of the following set of evaluation questions corresponds to that of the principles for planning and design presented in Parts 3 and 4. The intent of this section is to enable all those engaged in the planning, design, and operation of facilities for people with dementia to evaluate this and other facilities in terms of general attributes of the environment, issues of building organization, and qualities of activity spaces.

CONTINUUM OF CARE

• Does the facility provide for people at different stages of dementia, with differing levels of capability?
If so, do both organizational policy and the designed environment respond to these differences?
• Is there a range of services for residents of varying functional capabilities?
• Does the facility encourage grouping of residents on the basis of functional level or stage of the disease? How?
• Could the facility offer additional options along the continuum of environments, ranging from day care to long-term care?

ORGANIZATIONAL GOALS AND LOCAL RESOURCES

• What services are potentially available in the community that might be incorporated into the activities of the facility?
To what extent is this currently done? For example, does the local community provide opportunities for resident activities such as visits to beauty salons, restaurants, shows, etc.? Which of these opportunities are currently being utilized?

SMALL GROUPS OF RESIDENTS

• Is the resident population subdivided on the basis of a specific strategy? Which one(s)?
• Do different types of groupings reinforce each other (e.g., do residents grouped into spatial clusters also share daily activities)? How is

this achieved?

- How are spatial and social group development expressed in the facility? What are the architectural design characteristics used to reinforce this grouping?
- If the facility does not currently structure activities and spaces for small groups of residents, how could this strategy be developed?

NONINSTITUTIONAL IMAGE

- Where would you place the facility along the continuum from noninstitutional to institutional character? Which particular characteristics lead to this decision?
- Can you identify any institutional elements within the facility? What are these?
- Are there noninstitutional furnishings and/or finishes that might be appropriate substitutions? How might these be substituted?

ELIMINATING ENVIRONMENTAL BARRIERS

- What features and characteristics of the facility are difficult for the resident population to negotiate? Why?
- Which special features of the facility make it more negotiable by people with dementia? How is this achieved?
- Where is redundant cueing used in the facility? How is this done? Is it successful?
- What environmental changes would make the facility easier for residents to negotiate? Specifically, when might redundant cueing be introduced? Where could contrast be used to make the environment easier to negotiate? What steps must be taken to facilitate these modifications?

THINGS FROM THE PAST

- Does the facility capitalize on reminiscence as a therapeutic resource in the care of people with dementia? How is this achieved (which specific activities, environmental characteristics, and policies encourage reminiscing among residents?)
- Are residents allowed and encouraged to personalize their environment? How?
- How can reminiscing and the use of things from the past be incorporated into the environment? For example, how could familiar activities be incorporated into the facility's daily schedule? What changes must be made in order to introduce artifacts from residents' pasts into the facility? For example, would this require a change in organizational policy, a change in the furnishing of residents' rooms to allow space for personal artifacts from home, etc.?

SENSORY STIMULATION WITHOUT STRESS

- Does the facility offer an appropriate balance between over- and understimulaton for people with dementia? What specific characteristics of the environment lead to this assessment?
- Does the facility also offer varying levels of stimulation for residents? How is this achieved?
- Does the facility attempt to reduce extraneous environmental stimuli (e.g., loudspeakers, door alarms, televisions or radios)? How?
- In what ways might a more appropriate level of sensory stimulation be provided? What modifications could be undertaken to reduce sensory overload and/or alleviate underload? How can variety in environmental stimulation also be ensured?
- In what ways could extraneous stimuli in the environment be reduced in order to amplify various environmental messages (e.g., through the use of sound absorbing material)?

OPPORTUNITIES FOR MEANINGFUL WANDERING

- Does the facility provide a clearly defined and safe place for wandering? Where (or what) is this place? How is it defined?
- Can this path(es) be easily and unobtrusively surveyed by staff members or caregivers? How?
- How much of residents' wandering activity could be due to disorientation or confusion? How could this be evaluated?
- Does the wandering path allow visual access to interesting activities and spaces? How is this achieved?
- Is the wandering path adjacent to activity areas that might spark client curiosity and invite participation? Is this successful? Why or why not?
- If the facility does not currently provide an appropriate area for wandering, how might such a place be created?
- How could the environment be modified to better support *meaningful* wandering behavior, and to decrease incidences of wandering due to disorientation or confusion?

PUBLIC TO PRIVATE REALM

- Is there a center of activity in the facility? What is it? How are the public areas in the facility related to each other?
- Is the space small-scale, and oriented towards small groups of residents? What characteristics of the space(s) lead to this evaluation?
- Are activity spaces normally available and equally accessible to all residents?
- Is there variety in the types of spaces provided? How is this achieved?
- How could social spaces at the scale of small households be developed or enhanced?

POSITIVE OUTDOOR SPACES

- Is an outdoor activity area(s) available at the facility that is safe and accessible for resident use?
- Are interesting and familiar activities incorporated into this space? How?
- Where in the facility are outdoor views provided for residents? Are these views interesting and varied?
- What are the most significant improvements that could be made in order to utilize the outdoor space to its fullest potential?

ENTRY AND TRANSITION

- Is the entry to the facility direct and accessible for both visitors and residents? Is it sheltered from inclement weather, and convenient for drop-off (if this is a critical activity)? How?
- Are the entries into individual households direct and accessible? Are they easily identifiable to residents, visitors, and staff members? How is this achieved?
- Do entries help or hinder residents' and visitors' sense of orientation? How?
- Are entry and transition areas friendly and familiar in nature? Why or why not?
- How can entry areas be improved? Can entering and wayfinding in the facility be made more direct and easier to understand? How can the entry area become more reassuring?
- How can entering and leaving become less of an intrusion into ongoing activities? Which changes would make the exit from the facility less of a temptation to wandering residents?

COMMON AREAS FOR EACH FAMILY

- What are the common social spaces available to people with dementia in the facility?
- Are these spaces domestic and familiar in

scale and ambience? What characteristics of the environment influence this evaluation?

- How are the common spaces in the facility arranged?
- Is there variety in the types of spaces available to residents (e.g., in size, function, and character)? How is this variety provided? Are there provisions for social spaces for the entire facility, as well as for small "family" groups? Which spaces are these?
- How could small-scale social spaces be created? How could existing and new social spaces be more clearly linked to each other?
- How might variety in social spaces be enhanced (e.g., through changes in furnishings and finishes or in function of spaces)?

DOMESTIC KITCHENS

- Does the facility currently have a kitchen area that can be used by people with dementia? Is it safe and accessible? Can it be used independently by residents?
- Is this kitchen domestic in nature? What features or characteristics contribute to this evaluation?
- What types of activities occur in this area? Are these familiar and meaningful activities for residents?
- What changes in furnishings, finishes, or activities might make this kitchen area more familiar, and easier for residents to use and enjoy?
- If there is not presently such a kitchen area in the facility, how could one be created?

INTIMATE DINING AREAS

- How is dining structured in the facility? Do all residents eat at the same time in the same place?
- Are residents allowed choice and autonomy in dining (e.g., time or place of dining, decision about what to eat)? How?
- Is dining a pleasant and meaningful activity for residents? Why or why not?
- How could more intimate dining be provided (e.g., smaller places or smaller groups for dining)? What changes might be made to offer residents greater flexibility in seating, or in what or when to eat?

ACTIVITY ALCOVES

- Other than resident rooms and large common areas, does the facility have clearly defined small social spaces for resident use? What are these?
- Are these spaces adjacent to circulation paths or activity areas to encourage resident observation of ongoing activities? Are they successful in this?
- Do these activity alcove spaces also provide opportunities for quiet reminiscence and retreat? How?
- Do these spaces function as "landmarks", facilitating orientation and wayfinding? How?
- How could such activity alcoves be introduced or improved in the facility?

RESIDENT ROOMS

- Are residents' rooms in the facility treated as essentially private spaces in both function and ambience? How is this achieved?
- How are residents' rooms furnished? Are they domestic and familiar in appearance and ambience? What characteristics contribute to this quality?
- Do residents' rooms also function as the sole small-scale social spaces? If so, how could this function be transferred elsewhere in the facility?
- Can residents' rooms have stronger associa-

tions to domestic appearance and functions? In what ways can the privacy of residents' rooms be enhanced?

DIGNIFIED BATHING

• Does the facility provide bathing and/or showering facilities for use by people with dementia?
• What type of equipment and furnishings do residents presently use for bathing and/or showering? Are bathing facilities domestic in nature and familiar to residents?
• What portion of the people with dementia in the facility presently shower or bath independently, or with minimal staff assistance? Do bathing equipment and policies encourage independent bathing by people with dementia? How (e.g., are they accessible for use without assistance?)
• What types of familiar and accessible bathing furnishings might replace frightening institutional contraptions in the facility?
• What environmental modifications and policy changes might increase the percentage of residents who are able to bathe independently?

INDEDEPENT TOILETING

• Are toileting areas in the facility accessible and independently usable to people with dementia?
• Are they easy to locate and to identify?
• Do toileting areas ensure privacy for residents? How? Are resident rooms associated with private toileting areas for the residents of each room?
• What modifications would make toileting areas easier for residents to use independently?
• Where group toileting areas (restrooms for more than one person) are already in place,

what design changes (e.g., the addition of doors to toilet stalls) would increase privacy for residents?
• How can toileting areas be modified to be easier for residents to locate and identify as such? What changes would make these areas easier for residents to use correctly?

PLACES FOR VISITING

• Where in the facility do residents currently visit with family members or friends ?
• Do these spaces encourage conversation and meaningful interaction with residents? How?
• Are these spaces domestic and familiar in nature to reassure family members and friends, and to encourage them to visit and to participate in the care of the resident? What characteristics create this feeling?
• How could new spaces be developed, or existing spaces enhanced, to allow for greater privacy during visiting? How can visiting areas become more friendly and residential in character?

STAFF RETREAT

• Do staff in the facility currently have a designated place for retreat?
• Is there a place where staff members can complete required work tasks, have a cup of coffee, and hold private conversations, free from distraction from residents or family members? How does this space meet these staff needs?
• If such a space does not exist, how could a staff retreat area be developed or enhanced to address these needs?

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