

# Designing for Dementia

*Nadia Tobia & Susan Black*

A major program has begun in Ontario to address the critical need for long term care for the aging and chronically ill.

The Riverdale Hospital, situated in Toronto, is Canada's largest chronic care facility with over 500 inpatient beds. The facility is in the process of redeveloping its prominent urban site to become a leading long term care provider as part of a large master plan called "Village on the Park". The new and redeveloped facility will be integrated into a barrier free campus of gardens and terraces, connected to a large public park to the north of the site, and to a heritage building to the south.

As a precursor to initiating the first phase of the master plan development, The Riverdale Hospital examined one of its more vulnerable populations, the existing Cognitive Support Unit. The Unit is located on the top level (8th floor) of the existing building. It consists of an east and west subsidiary unit. The Hospital was able to reduce the population of this floor prior to the renovations from over 80 patients to 50.

Patients admitted to this Unit have cognitive impairments secondary to dementia from various causes like substance abuse, Huntington and Alzheimer Disease. This mix of patients includes some who can be aggressive. Admitting criteria excludes patients with significant risk of inflicting serious bodily harm to self or others, as well as those who have primary diagnosis of a psychiatric illness or acquired brain injury. Average age of patients at the time of the renovation was 65 years, ranging from 21 to 107 years. Anticipated length of stay is generally 6–12 months.

## Objectives of the Project

To support the Hospital mission *"to enhance patients quality of life and maximize their ability"*.

1. To design and complete the renovations for one of the Cognitive Support Units (maximum 25 beds) which will have a positive impact on the daily life of the residents while providing them with a transitional and protected home area during major redevelopment of the site around them.
2. To compare the impact of this redesigned environment with the neighbouring unit of the same size and program which received minimal renovations.
3. To determine reactions, if any from those living, working or visiting the unit before and after the renovations.
4. To provide a collaborative team approach to the design and implementation of the project including families, multi-disciplinary staff and the architects.



**Nadia Tobia**  
*B.Sc.Arch. M.Arch.Sc*

Nadia Tobia is a Vice President of Susan Black Architects Inc, Toronto, Canada. She has a keen interest in developing human design solutions that meet and go beyond expected health-care requirement. These efforts are enhanced by her architectural experience in the hospitality sector. Prior to establishing her architectural career in Canada, Nadia worked in Baghdad, Iraq with the Japanese Consortium of Consulting Firms as an urban housing planner and with the Architectural Composition Group on various architectural projects. She received her BSc Arch from the University of Baghdad, Iraq and her Master of Architecture from the University College of Dublin, Ireland.

## Project Methodology

### *The Team:*

The project followed the normal course of schematic and design development through to the contract documents for tendering with one simple difference: the focus throughout was placed on a collaborative team approach to all facets of the process. The team included members of senior administration, as well as specialized clinical professionals including a program manager, clinical nurse specialist, case manager, occupational and recreational therapist, social worker, visiting geriatric consultants, physician, and the architects and consultants. Hospital security, engineering and maintenance representatives assisted in all steps of the process through commissioning and on-going review.

### *The Architects:*

To achieve the attention to detail and support required for this project, as well as other work in the hospital, a unique relationship was organized between the hospital and the architects. The architects were almost part of the hospital system and culture. A dedicated on-site presence reinforced the team spirit and approach during all stages of the project and permitted the ultimate in field review and contract administration during construction.

### *Continuous Education and Research:*

The team members worked directly with each other and the architects were available to evaluate and discuss each stage of the project. They visited similar facilities and attended conferences and seminars on the subject. Research included literature review and consultations with clinical and hospital planners. Trial materials for the project were researched, tested and evaluated.

## Design Criteria

The continuous education, research and previous experience of the members of the team led to a set of design criteria that were followed throughout the project:

## Sense of Community

- **Provide a Visual Connection to the Landscape and the Surrounding Park**

Views to nature and the surrounding park were key elements in creating an atmosphere of well being. Elements such as natural light and unrestricted views of the outdoors create a sense of harmony with nature.

- **Create the Feeling of Home**

Familiar spaces and furnishings create a sense of home that will contribute to the patients' comfort and relaxation.

- **Create the Feeling of Hospitality**

A non institutional, pleasant and welcoming environment encourages families to visit more often and creates less stressful surroundings.

## Cognitive Environment

- **Provide a Safe and Comfortable Environment**

A safe and comfortable environment reduces pressure on staff, allowing efforts to be concentrated on the health care aspect.

- **Address Specific Cognitive and Behavioural Needs**

Catering for the cognitive needs through design gives the opportunity to provide privacy, dignity and independence for patients.

- **Reduce Patients' Agitation**

A well designed facility can lessen frustration and confusion and create a quieter, more relaxing environment.

## Life Enhancing

- **Use of the Environment as a Therapeutic Resource**

Patients should have the opportunity for visual stimulation and passive socialization. The environment can become a therapeutic resource to enhance the well-being of patients.

- **Provide Adequate and Efficient Space for Patients' Activity**

Patients can benefit by the provision of adequate, efficient and flexible space to accommodate their activities of daily living.

- **Apply Barrier Free Design**

All new designs must comply with barrier-free requirements, thus insuring greater independence for all patients including those with walkers and wheelchairs.

## Design Solutions

The proposed renovations occurred only on the existing floor plate that was built in the mid sixties. Construction took place while the unit was in full use by patients, staff and visitors. Understanding that the existing unit was to be renovated within a strict budget as a transitional environment, and that direct relationships to wandering gardens or implementation of personal space standards could not be part of the scope, the team set out to provide the most beneficial upgrades possible. The final design included: 1) physically separating the two units; 2) enclosing the elevator lobby; 3) renovating one unit into an open space concept for the dining, living and ADL spaces, while the other unit retained its traditional layout. In neither unit would any major renovations be carried out in the patient bedrooms or service areas.

### *Front Door:*

Four elevator doors constantly opened and closed in the central lobby on the floor. The Hospital had employed round the clock surveillance staff to retrieve residents who entered the elevator cabs and set off the alarms with their transponders. Elopement occurred regularly and agitation levels were difficult to diffuse. To counter this the elevator lobby was enclosed with maple panels discreetly detailed with a row of round wooden projections. One of these relief circles is a door pull and another contains the hidden card scanner. Staff and visitors enter and exit smoothly

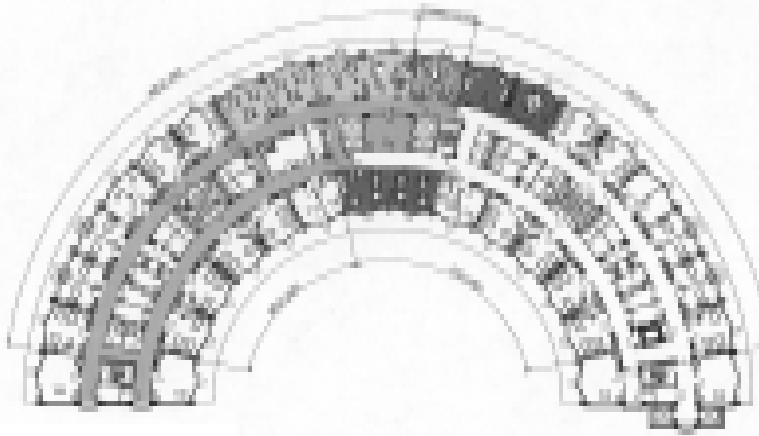
with a covert swipe releasing the actual 'door panel'. A communication system was installed inside the new elevator lobby enclosure. Signage made it clear which doors visitors should use. Patients reacted calmly towards these panels, some patients touch or seem to knock on the projections, almost playfully, from one end to the other.

### *Living Area:*

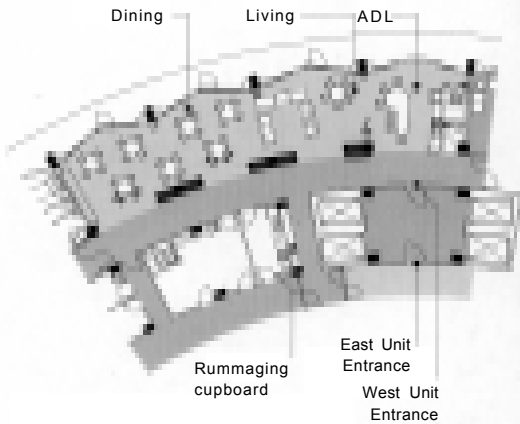
As part of an open space concept, an area was created large enough to accommodate the living, dining and ADL (activity of daily living) requirements of the patients. The open, light-filled space offered views of the Don Valley. The living area, which is the main gathering point for patients, occupied the middle part of the space, thereby locating it further away from the entrance/exit doors to the unit. In contrast, this open space echoes many typical house and apartment plans. The design provided movable wood trimmed screens to divide the areas. This space allowed an interesting loop off the corridor, and a destination along an intended meaningful path. Living room furniture consisted of sofa and lounge chairs grouped around an audiovisual unit made of maple wood. The design of the unit protected the television and provided for a hidden, locked compartment for the VCR. Previously the television had hung from the ceiling, giving the space a very institutional and unfriendly look. Patterns in the selected health care fabrics were avoided. Dining tables were sturdy, square in shape and with colour contrasting edges. The windows are covered in sheers to reduce glare and drapes add a homelike softness.

### *ADL Room:*

The ADL room has the flexibility to be separated from the living/dining area by folding and sliding doors. The design is barrier-free with a wheelchair accessible sink. The kitchen island has one end cantilevered, to be used by patients in wheelchairs or by those who need to sit. All cupboards are locked. The kitchen appliances can be locked behind panels but are available for simple preparations.



8th floor Plan  
Cognitive Support Unit



Dining, Living and ADL areas



Proposed "Village-on-the-Park"

*Kitchen Accessories and Equipment:*

Preference was given to items that were visually distinctive, such as: cutlery with coloured handles and a good grip; equipment that had familiar lines and was easily and visually identifiable; knobs of contrasting colours with a “click” movement; a fridge with a handle in a different colour and kitchen chairs with bold coloured arms. No other accessories were permitted in the dining/living area, except for unbreakable vases and artificial flowers used on dining tables during lunch and then locked away.

*Plants:*

Plants in eye level dividers defined the living/dining space at the same time they served as a cueing and stimulating point along the wandering path. Previous low height planters were misused by some patients as urinals. Real plants were used at the beginning, but after a month patients started uprooting the plants and dragging them along the corridor, it became almost a daily activity. The plants were changed to artificial and cemented in the planters.

*Corridors and Wandering Paths:*

The existing corridors curve with the building's circular shape, making it difficult for staff to supervise the patients along the corridor. Each unit has two parallel corridors with bedrooms on the outside and services in the middle. The two corridors are connected at the ends with cross paths, allowing full wandering loops. At one end of the corridor is the living/dining/ADL area, and at the other a set of large windows. Wandering patients would stop and watch or join in an activity that is going on in the living space. This layout encouraged the positive social behavior. Interactive elements, such as artwork, rummaging cupboards, planters and textured boards were interspersed along the pathways for added interest. Cueing-colours were utilized to aid in location and direction.

*Rummaging Cupboards:*

Rummaging cupboards along the wandering path were created of drawers and cupboards in different colours to help patients distinguish details. It is usually recommended to provide rummaging cupboards for dementia units. In this case, the cupboards were used, but staff could not keep up with stocking items. Patients were storing the items in their bedrooms refusing to give them back. Some items were thrown in the toilets creating plumbing problems.

*Smoking Room and Family Room:*

Two rooms were wedged between the units, available for both groups as required with supervision. There was not enough space, staff or, in the end, functional need for duplication in each unit. The smoking room is furnished with metal garden-like seating for maintenance and to discourage loitering. The small separate family room was designed for private family meetings with residents or staff.

*Finishes:*

A sensitive and calculated approach to the selection of materials, led to the use of natural materials as much as possible, unless they conflicted with maintenance or cleaning requirements. In the living area existing terrazzo flooring was considered too institutional and was a source of glare. A seamless linoleum floor covering was chosen, with a non-glare finish and in a colour matching the adjacent wandering path so that patients would follow the colour scheme from path into the living area with no confusion. Carpet was rejected, as a previous example proved to be a failure. Rugs and small carpets would cause patients to trip and so were similarly rejected. Wall finishes included existing natural brick, new maple wood panels with a clear, washable finish and walls painted with low-shine latex paint. Simple millwork detailing was also incorporated, all of which helped to promote a home-like atmosphere.

*Colours:*

Consideration was given to the selection of each colour, emphasizing calming and soothing combinations. The colour-selection sessions with the team were interesting, since possible combinations appeared unlimited. In the end a systematic approach was used to select a colour concept that aimed at reducing confusion among patients.

The existing corridors had a brick finish on one side (the bedroom side). To emphasize this existing cueing element, the other side of the corridor was painted a neutral colour. This also made a suitable background for hanging artwork. The neutral wall colour was also used to play down all non-residential door frames.

A contrasting colour identified bedroom door frames. The same colour when used on corridor columns at the open living area reinforced the meaning of entry.

At the end of the corridors / wandering path, a vivid contrasting colour entices residents around the loop. End walls in large spaces were given a different colour to define the space and identify the boundaries.

All horizontal surfaces in the living area were treated with the same colour contrasting with the vertical surfaces. Curtains were of neutral colours to give continuation to the view.

*Signage:*

With few exceptions signage was eliminated from all administration and service rooms (a small number at an upper corner of each door sufficed for identification). Signage for resident bedrooms was made obvious. Several options were discussed with the user group for the patient bedrooms including photograph or memorabilia boards as cueing devices and memory aids. The team preferred a clear individual sign for each patient with lower and upper case lettering. Wash-room signage was large, graphic and coloured to attract the attention of the patients. All patient signage was hung at wheelchair height.

*Artwork:*

Certain areas of the corridors / wandering path were designated as an art gallery. All art was dry-mounted to avoid breakable frames and hard edges. Landscape, floral and fruits as well as multicultural people are common and favorite themes. Resident artwork is being considered as a welcome addition to the ambiance in the unit.

## Results

To evaluate the design solutions and the physical environment, several measures were carried out:

- Documentation of the requests received from the unit to alter or change the interior elements, for the period April 1999 ( completion date ) to January 2000.
- Observations and interviews with each of the key staff members.
- Analysis of the Hospital Incident Reports, before, during and after the renovations.
- Staff Satisfaction Questionnaires were carried out before and after the renovations.

The findings of this project are listed below as they relate to the objectives and to the evaluation measures:

1. The combination of the intense collaboration method and the unique dedicated on-site presence of the architects, allowed the team and especially the hospital members to share their vision and ideas by taking an active role in the search for creative solutions. The design solutions were the results of this process. The wealth of experience gained throughout the project of designing, implementing and monitoring these two units, will assist the team to go forward with final designs for 'purpose-built' programs.
2. As a result of the collaborative on site presence, each design solution was selected from several options. The team made an effort to fully understand the advantages and disadvantages of each option, before a decision was made. Therefore the requests from the unit for changes

after occupancy were minimum and concentrated on further upgrades to the minimally revised unit.

3. The comparison between the open space unit and the neighbouring traditional layout resulted in the following: the open space living area became the core for social activities. Patients use the space more frequently. Patients share breakfast around the kitchen island, more patients use the television, and more residents socialize. The living area, in addition to being an open space, is located along the wandering path which makes it more accessible. Wandering patients stop on their path to watch an activity or to participate. Families constantly request that their loved ones be admitted to the new open plan unit rather than the neighbouring unit. The separate ADL room in the more traditional unit became the space for controlled activities. This led to the decision to upgrade the traditional layout to become similar to the redesigned unit. Plans are underway to redesign this unit with open plan residential spaces.
4. The analysis of the Hospital Incident Reports showed that a decrease in incidents occurred when the number of patients was reduced from an average of 84 patients to 41, while there was no significant change before and after the renovations. (Refer to Appendix A)
5. The general outcome of the Staff Satisfaction Questionnaires showed that a larger percentage evaluated the overall appearance of the unit as good/excellent after the renovations rather than before. (Refer to Appendix A).

With the understanding of the challenges and restrictions upon this project, the team found that the objectives had been met for this transitional project. The team continues to review, re-search and plan the next steps.

## **Appendix A: Hospital Incident Reports and Staff Satisfaction Questionnaires**

An evaluation process was undertaken by the Clinical Nurse Specialist for the two Cognitive Support Units. This included analysis of the incident reports before, during and after the renovation and a review of the staff satisfaction questionnaires which were distributed both prior to and post construction.

However, there were many organizational changes taking place at the Cognitive Support Program at the time of the renovations. Given all the variables that had the capacity to affect the patients families and staff on the unit it was apparent that any attempt to assess the impact of the design changes on the patients, families and staff would have significant limitations.

### **Hospital Incident Reports**

The data was reviewed for the time periods prior to construction, during construction and after completion of the project. There were limitations with the incident reports, as there tends to be under reporting of incidents.

An incident is any event which is not consistent with either the routine care of a particular patient or routine operation of the Hospital. A patient/visitor/volunteer incident is one in which an individual (other than an employee) experiences an injury or potentially injurious event or loss. All incidents are to be reported to and recorded by a staff member within two hours of the incident.

In March 1998 there were program changes. The total space that had accommodated up to 100 patients was now to be used for a maximum of 50 patients. Due to the possible effect of reduction in patient population on incidents and in order to account for the change in census and the different time periods the data was analyzed to look at the number of incidents per patient per month.

| Period              | Average<br>Census | Reported<br>Incident per<br>Patient per<br>Month |
|---------------------|-------------------|--------------------------------------------------|
| Prior to Renovation |                   |                                                  |
| May 97 – March 98   | 84                | .36                                              |
| April 98 – Nov. 98  | 41                | .25                                              |
| During Renovation   |                   |                                                  |
| Dec 98 – April 99   | 40                | .16                                              |
| Post Renovation     |                   |                                                  |
| May 99 – Dec 99     | 43                | .27                                              |

The report had a category to identify incidents that were related to the open elevator lobby as a factor contributing to the incident. From June 97 to April 99 there were 12 reported incidents of such type. There have been no further incidents related to the elevators since the redesign.

Obviously the census reduction had an immediate impact on the number of incidents. However, the fact that the lowest number of incidents occurred during the actual construction period could lead to false conclusions. We can only assume that under reporting of incidents during that period combined with retention of the 24 hour surveillance at the lobby and the vigilance of the constant flow of consultants, staff and security forces gave the residents increased distraction and positive socialization during this period. The availability of the architects on-site daily permitted constant massaging of schedules and co-ordination of the phasing and safety issues to meet the needs of the residents.

### Staff Satisfaction Questionnaires

Questionnaires were distributed to the staff prior to the start of the renovation and after the completion of the projects. One limitation with the questionnaire is that there have been some changes in staff since the questionnaire was ad-

ministered prior to the start of construction. As the questionnaire was anonymous there is no way of knowing what percentage of the staff answered both questions.

With the pre-renovation questionnaire 42% of the staff responded, while 29% of staff responded to the post-renovation questionnaire. The probable reason for this apparent disinterest in the post-renovation questionnaire is that many staff members were new and staff appeared to be consumed in the reorganization of the patients and the services that were now split into two units. However, the response that was given is indicative, as follows:

#### *Prior to Renovation:*

28% of the staff evaluated the overall appearance of the unit as good.

#### *Post Renovation:*

86% of the staff evaluated the overall appearance of the unit as excellent and good.

#### *Anecdotal comments regarding the unit prior to renovation included:*

*“this floor is too big from one end to the another, one has to search all the rooms”*

*“patients are spread over a large area”*

*“distance of the elevator to the nursing station” were identified as problems.*

#### *Anecdotal comments regarding the redesign:*

*“it is easier for staff and patients because of the shorter corridor”*

*“enclosure of the elevator was good but it is difficult going to the door to open it up to let people in and out”.*