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# Evaluating the effect of therapeutic gardens

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## Abstract

*Sometimes the visitors to therapeutic gardens do not necessarily experience the garden the way the designers intended. A postoccupancy evaluation (POE) can reveal discrepancies between the designer's intentions and use of the environment by the actual visitors. A POE is a user-oriented assessment that elicits the opinions of the visitors to a building, facility, or environment. This paper describes a POE of therapeutic gardens at a multilevel care facility for the aged. The population included patients at various stages of Alzheimer's disease progression.*

*Key words: postoccupancy evaluation, therapeutic gardens*

## Introduction

Facilities for patients with Alzheimer's disease have been designed and built with the therapeutic effects of gardens and gardening in mind.<sup>1-3</sup> The number of such facilities has been growing steadily. According to Kavanagh,<sup>4</sup> the number of horticultural therapy gardens has increased in hospitals, hospices, clinics, and other healthcare settings.

However, relatively few studies have evaluated the effects of gardens and gardening in an actual setting. One such study by Cooper Marcus and Barnes<sup>5</sup> described four case studies of healthcare facility gardens in California. The research included a visual analysis of the physical site, systematic nonintrusive behavioral observation, and interviews with garden visitors. The interview data revealed that after spending time in the gardens, over 75 percent of visitors reported feeling more relaxed and calmer, and 25 percent felt refreshed and rejuvenated.

Cooper, Marcus, and Barnes also compared two mood shifts (a pleasing drop in energy level, and spiritual

uplift) in garden visitor groups, which included staff, patients, and visitors. They found that visitors were most likely to experience a pleasing drop in their energy level (i.e., visitors were more relaxed, or their stress level went down), and patients were more likely to report a spiritual uplift. The authors also pointed out the need for more empirical research to evaluate gardens in healthcare facilities to develop appropriate design recommendations.

One technique for evaluating environments is the postoccupancy evaluation (POE), a set of methods for examining the effectiveness of occupied environments for human users.<sup>6</sup> As the name implies, the evaluation is conducted after participants have actually used the facility for a certain length of time. This evaluation often enables researchers to identify a number of problems that were not identified at the design stage. In addition, a POE is user-oriented; the objective is to evaluate the environment in terms of user functionality rather than the aesthetic features of the building only.<sup>7</sup> This paper describes a POE of therapeutic gardens in a multilevel care facility. It also documents the changes implemented to address the problems identified in the POE, as well as general recommendations for designing therapeutic courtyard gardens.

## Methods

### Setting

The study was conducted at a multilevel care facility for older adults and Alzheimer's disease patients in British Columbia, Canada. The facility opened in 1995 and has eight courtyard gardens. The gardens were designed with five major goals: 1) to provide a safe outdoor environment, 2) to provide a place for reflection, 3) to provide a place for relaxation, 4) to provide a place for socialization, and 5) to provide a place for people to maintain the hobby of gardening.

The gardens also include various safety and motivational features, such as wheelchair accessible level pathways with colored concrete paving to reduce glare,

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handrails around the garden perimeter, raised garden beds, use of nontoxic plants, and protection from the sun and wind.

### *Purpose of the POE*

This POE was conducted to investigate how the gardens were actually used by various groups (volunteers, staff, families of the residents, and residents) and to assess the garden visitors' opinions of how well the garden met the designer's goals for safety and visitor motivation.

### *Participants and procedures*

Four user groups participated in this study: 1) cognitively able residents, 2) one member of each resident's family (including residents who were unable to be interviewed), 3) staff members, and 4) volunteers. On average, male residents were in their mid-70s, and female residents were in their early 80s. Of the 225 residents, 57 percent were male. Residents were approached for interviews if the staff considered them to be cognitively able to answer the interview questions; 67 residents participated. To make it easier for residents to read and complete the questionnaires, they were individually interviewed. In addition, all 298 staff, 160 volunteers, and 225 members of residents' families (one per resident) were given questionnaires that closely paralleled the interview. Although most of the questions were structured, participants were also encouraged to offer their opinions.

### *Results and discussion*

Eighty of 298 staff members (average age 41.1, 27.9 percent male), 36 of 160 volunteers (average age 52.3, 19.4 percent male), and 57 of 225 family members (average age 60.3, 23.1 percent male) returned the questionnaires. The overall average return rate was 25.5 percent. Among 67 residents who were approached for an interview, 17 agreed to participate in the interview (participation rate 25.4 percent) (average age 77.3, 41.2 percent male).

This facility had a policy that prevented staff members from using the gardens on their own during their breaks. However, they could escort a resident into the gardens as part of their work. Thus, staff members were not asked to complete the portion of the questionnaire concerning their own use and rating of the gardens. After this study, management decided to review the no-use policy.

The following list summarizes the results of the 190 interviews and questionnaires.

1. Of the total number of respondents, 83 percent reported that they had visited at least one of the eight gardens, and 96.5 percent of the respondents said they liked the gardens.

2. Over 80 percent of the users said that most of the design goals were well met, except for the fifth goal (provide a place to maintain the hobby of gardening). This response reflects the fact that gardens were already fully planted with no empty space for residents to do their gardening.

3. The evaluation of specific garden features varied widely. For example, 70 percent of respondents indicated that wheelchair accessibility and the garden beds met their safety needs; 65 percent of respondents said the handrails and water features met their safety needs. On the other hand, only 16 percent indicated that trees provided enough shade, mainly because the trees were still immature.

4. More family members (per capita) reported using the gardens than did residents or volunteers. There are a number of factors contributing to this unexpected finding. For example, family members who visit the facility to see a relative may have more time to themselves compared to volunteers and staff. Also, many residents are not independently mobile and need the help of staff or volunteers to access the gardens. Visiting the garden to connect with nature may provide family members a good opportunity to relieve the stress of having ailing family members.

5. Staff members tended to be more critical when they evaluated garden features. Given that staff members are onsite more than volunteers and family members, and they work every day caring for the residents, they may be the most familiar with the advantages and disadvantages of the various garden features. Thus, their views must be given serious consideration. On the other hand, staff members are not allowed to use the gardens on their own, which may limit the value of their comments and partly explain their more negative evaluations.

6. Most comments tended to be negative. Perhaps those who have negative opinions about the gardens were more likely to return the questionnaire and more likely to offer comments. Therefore, the extent to which we can generalize their opinions to all garden visitors is not clear.

The examination of the comments revealed two main trends. First, some participants did not have a favorable impression of design features that were supposed to help cognitively impaired residents. Instead, they were seen as hazardous to the residents. For example, the handrails that are supposed to help residents get around the gardens were viewed as dangerous (residents might become wedged in the rail gaps, or fall over the handrail). Water features that residents enjoy watching also can be a potential hazard for them, because cognitively impaired residents might climb or fall into the water. In fact, such an incident did occur.

A second trend was that the gardens and some of the features were not used enough by residents. Comments indicate that the facility lacks sufficient staff or volunteers to take residents into the gardens. For example, one respondent pointed out that most residents are not self-mobile, and that they would not be able to use the wheelchair-accessible pathways unless staff or volunteers help them. Another reason residents had difficulty accessing the gardens is that the facility lacked automatic doors and signs directing residents to the gardens. In addition, there was a general lack of awareness and encouragement to use the gardens. Perhaps a well-designed signage system would have increased visits to the gardens.<sup>8</sup>

### *Evaluation follow-up*

The most important reason to conduct a POE is to obtain information that can help management fix problems and improve the visitor's experience. Considering the time, monetary resource, and effort of conducting a POE, this POE reveals very clearly management's strong commitment to improving the quality of life for the residents, staff, and visitors.

Following the POE, a number of changes have been implemented at the facility. For example, automatic doors have been installed at all entrances to the gardens using funds raised from the community. Also, the facility has increased the open space in the gardens and added a new potting bench and raised bed planters, so that residents can enjoy their own gardening. Above all, this POE brought about an unexpected benefit; the interview and questionnaires raised awareness of potential visitors to gardens, which encouraged them to get more involved in the gardens.

### *Designing a better POE*

The following points will address some of the limitations of this POE:

1. The evaluation should ideally be conducted throughout a whole year, if possible. Because

this POE was conducted in winter, there were fewer visitors to the gardens than in other seasons. This fact may have affected the responses to the usage questions.

2. Naturalistic observation should be conducted along with a questionnaire survey/interview. This type of evaluation provides more objective and accurate information on garden use. However, it was difficult to arrange for naturalistic observation for this study because the facility was concerned about residents' privacy (i.e., the facility is "home" for residents, and observers in the gardens might be considered an intrusion in their private space).

3. Because the gardens were designed mainly for the residents, evaluation of the gardens should involve more residents. In our POE, the number of residents who were able to participate was smaller than we hoped (7.7 percent of all residents). However, when most residents are cognitively impaired, collecting their opinions may not be possible. Nonetheless, there are other ways to circumvent this problem. For instance, nursing reports on the frequency of resident aggression or agitation may be used to indicate the effect of using the gardens regularly. Also, the heart rates and blood pressure of residents can be measured before and after garden visits to determine if the garden has had a calming effect. In this study, access to such data was not possible, mainly because of the concern for resident confidentiality.

### *Recommendations*

The data obtained from this POE provides some general guidelines for the design of similar gardens. First of all, it is important to ensure ease of access. It was surprising to find that many residents and others were having difficulty accessing the gardens. To improve access, a good system of signage, maps, and automatic doors to the gardens should be provided. Moreover, educating staff and volunteers about the gardens and how to access them, and encouraging them to take residents to the gardens often, will help increase garden use. Whitehouse et al.<sup>9</sup> also found in their POE of hospital gardens that many potential users did not know about the gardens. They suggest similar remedies to improve access.

In addition to well-planned gardens, providing a simple, open space may benefit residents. The gardens at this facility had a completely paved surface for wheelchair

accessibility and raised gardens built with bricks. However, many respondents wanted a more open and softer environment (e.g., a lawn) that family members and residents could use for a picnic. This particular example clearly shows how important it is to solicit the garden visitor's point of view, which can differ from the garden designer's approach considerably. In addition, leaving some empty space in the garden for high-functioning residents to do their own gardening helps to get them actively involved in the garden. Some of the negative comments indicated that the gardens were too "fancy" and too planned. Those garden visitors might appreciate a simple, flexible space that allows them to use the space in a variety of ways.

Finally, evaluation should be a part of an ongoing design cycle (programming, design, construction, use, evaluation, and the programming of future projects).<sup>7</sup> Ideally, evaluation should be done regularly to ensure constant improvement and a better quality of life for the residents and other visitors to the gardens.

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