

Using Landscapes as Wellness Factor for Patient Therapy

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Introduction

We are all aware that human identity and personal fulfilment depends to a large extent on our relationship with nature. It has been demonstrated scientifically and we know anecdotally, there is an influence of the natural world on our emotional, cognitive, aesthetic and even spiritual development. We know from the ancient gardens of Mesopotamia and the intricate gardens of early China the great lengths to which people went to maintain this connection with nature. It is not a modern phenomenon. In more recent times

there is recognition that psychological well-being is generated through stress reduction and we believe that access to nature helps with stress reduction (Ulrich 1983, 1993). The promotion of physical health has been the justification for two hundred years of public parks and gardens like those seen in Paris and London. Can we postulate that more than at first is obvious with this deep and intimate relationship humans seem to have with living things around us?

Biophilia

Edward Wilson, a Harvard entomologist in 1984 coined the term "Biophilia" meaning literally "love of living things" (Wilson 1984). He used it to hypothesis about human responses to nature. He noted both Biophilic (positive/approach) and Biophobic (negative/avoidance) might be inherent through a genetic predisposition. His idea was that humans evolved as creatures deeply enmeshed with the intricacies of nature and we still have this affinity ingrained in our genotype. Those humans who developed sensitivity to their environment survived. The rewards and dangers associated with the natural environment favoured those who readily learned and remembered adaptive responses.

Considerable research by bio-scientists in the past 30 years suggests that humans gain enormous psychological, physiological and certain health responses by engaging with living things (Kellert 1993). There are numerous studies which show that humans respond immediately (unconsciously) in positive and negative ways to the natural environment that can't be linked to learned responses. These responses are consistent across different cultures and peoples hav-

ing different life experiences. They are reflected in a metaphorical symbolism of animals within all cultures across the globe (Lawrence 1993). These factors might explain such things as an immediate fear of dangerous insects or animals and the liking for places that are safe.

Roger Ulrich (1993) points out that if this hypothesis holds true then certain risk reducing probabilities will immediately be associated with specific depth and spatial configurations that create a liking for landscapes felt to be safe and useful (water, food opportunities, etc). Recognition of safe spaces are reflected in numerous studies showing a peoples' attraction for "savannah" type settings in which groupings of trees are placed around open lawns (Ulrich 1983, Heerwagen & Orians 1993). These settings are consistently preferred among quite different groups being studied. These preferences are hypothesised to a genetic reminiscence of places with lower probability of encountering something dangerous hidden in long grass or an enclosed forests. Also the trees and surrounds provide cover to hide and shelter. Additionally this supports people's preferences for longer views across rolling hills where visual distance is achieved.

In the past twenty years design has been affected by a large research literature which describes studies that have developed affinity and emotion-laden rating scales that can be used to identify landscape preferences (Kellert, Ulrich 1993). These preferences can now be designed into health facility landscapes to achieve an immediate unconscious liking by their users, either public or staff. This will reduce emotional stress and anxiety, and provide peaceful places to sit and walk, away from the healthcare work place.

International Examples

Internationally there are recent examples of landscapes being integrated into hospital and health settings to reduce the stress created by

visiting such facilities and to distract and comfort people waiting for care. Research shows the increased appreciation by older people of landscape settings especially where there is the need for repeat attendances.

One example is the Trillium Health Care Centre, an ambulatory facility at Queensway in Toronto, Canada, designed by Perkins Eastman and Black that provides a dramatic green pathway through the existing buildings and links the new building (Black 2004). It reflects wellness and is known to be an anxiety reducing space inspired by the healthcare program itself.

Another example is the Healing Gardens at the San Diego Children's Hospital where the care by parent program is supported by access to gardens that enable interaction by the children or just quiet sitting, often these spaces are for watching others play and interact.

Again the Bronson Methodist Hospital in Kalamazoo, Michigan, has deliberately achieved positive distraction through stress reducing indoor gardens. They use natural light to all private rooms that have access to nature and enjoy external landscape views.

All of these examples follow the key elements suggested by the literature: connection to nature, control of access to nature and the use of landscapes to provide social support.

An Australian Solution

Now for the first time in Australia a hospital has developed specially designed "Healing Gardens" (Forbes 2005). The Biophilia principles have been designed into the landscapes around the Queen Elizabeth Hospital at Woodville, west of Adelaide in South Australia. The first stage of the redevelopment designed by Woodhead International architects used the opportunity created by the shape of the building to develop special gardens that would extend the treatment regimes and influence the healing of



Figure 1 *The Queen Elisabeth Hospital site plan*

the patients whose accommodation is adjacent to them. It also applies to outpatients' who visit the hospital for routine treatment.

The hospital was designed with a veranda around the outside of the ward blocks. This invokes a new vernacular expressing the traditional country hospitals built in colonial times in Australia. Veranda's were designed to ensure that the hot daytime sun did not fall on the outside walls and windows, thereby heating up the building. Since the 1970's hospitals in Australia have become air-conditioned and have tended to ignore the benefits of designs used for climate control. Recent introduction of ESD (Environmentally Sustainable Design) principles have reawakened an interest in making context and site important elements of health facility design.

It was also noted that the old style verandas allowed patients to sit outside their rooms and connect with the outside, especially gardens and surrounding flora and fauna usually present in country hospitals. An important element of the new design for the QEH addition was this connection with nature and to have patients move

easily out into the gardens. This is recognised as an important stress reducing element (Stigsdotter 2003). Two levels were built under the veranda so that people on the upper levels could see down into the gardens and in higher locations the floors above could see over to the gardens.

The Biophilia principles employed were:

- Hospital in a garden – a place to promote healing
- Focus on water, shade, sunshine and breezes
- Use of “savannah” settings with lawns surrounded by peripheral bushes and trees
- Use of low maintenance plants, both exotic and native that change with seasons and mix quick growing annuals with slower perennials – as a reflection of life
- Caters for a variety of ages, functional and treatment needs and accommodates different physical and psychological capabilities
- Use of water in a number of ways from running water that is touchable, to possible storm water retention for irrigation.



Figure 2 *Journey garden*

The Gardens Described

The first of the gardens is the Atrium Garden in the centre courtyard used for staff to retreat for lunch and sit quietly. The next is the “backyard” garden off the geriatric ward. It was designed as a walking space and replicates typical South Australian backyards with comfortable seating that provides familiarity for demented residents. It has trees, lemon and other fruit trees, colourful bushes, low maintenance flowers that provide familiar fragrances. Ideas for the future are to add a barbecue, clothes line, post box, and bus stop.

The next garden is a small Fragrant Garden outside the neurology ward with rows of fragrant plants interspersed with stone paths. This provides pleasant fragrances shown by research to be very calming for these patients and also use-

ful for pain distraction. It also provides comfort through impressions and memories evoked by the experiences from the fragrances. It is deliberately located adjacent to the arboreal walkway so that visitors can gain from the fragrances.

The Journey Garden is an outreach garden from the Rehabilitation Ward and the Allied Health Department. It is designed to promote active movement and gate training while walking in the garden. It offers different surfaces, rises, steps and seats for resting. There is a deliberate use of “savannah” settings with seats in the shade to promote feelings of safety and be stress reducing.

The Palliative Care Garden is designed with a wooden “bridge” to push patients out in their beds under the trees. This garden is an extension

of the verandas on the hospital. There are walkways with many locations for families to sit on rocks and benches. The natural bush setting has rock features to promote the connection with nature and a water pond for contemplation.

An Indigenous Garden is designed with assistance from the hospitals aboriginal counsellors. It is located near the hospital entrance so that patients can wait out of public view. It provides places for family groups to sit and uses a mix of native plants and big existing gum trees. The accessible lawn is ideal for sitting under a tree.

The Elemental Garden has paths to separate smoking and non-smoking groups, located off the veranda from the respiratory ward. It is separated from the indigenous garden by berms

and bushes. The garden gets lots of breezes and fresh air and is mostly for observing but used for sitting in. It is a mix of “savannah” lawns and colourful flowering bushes and trees.

The last garden is the Sunken Garden. It is the largest garden that links the old and the new buildings. It provides a public crossing and waiting area for ambulatory programs near by. The centre is sunken to reinforce seclusion and provide a safe enclosure. Its form is symbolic of family groupings and new birth using circular family groupings and new birth using circular paths. It is outside what was the maternity ward which reflects in the ideology of new birth. This garden makes an important use of water, bridges, shaded seating locations having greenery from ground cover and bushes, but open for viewing the water and general people movement.



Figure 3 *Palliative care bridge*



Figure 4 Savannah setting



Figure 5 Ward outlook

The Evaluation

It was agreed that a proper evaluation should be conducted to determine if the gardens achieved their design objectives and to learn from this study what should be done to improve future gardens. An initial evaluation study was conducted by Dr Meegan Gun a radiologist at the hospital, to explore the value of the gardens by questioning various users and a follow-up study was undertaken by the Woodhead International team to test the Biophilia Hypothesis with Dr Gun's support. Detailed interviews were conducted with patients and staff and a second round of questionnaires were completed by the staff on the wards adjoining the gardens. The results showed conclusively that the principles are supported and that the gardens are a great success.

Table 1

Round 1 Respondents No.=82	% of Respondents
Staff n=52	63%
Medical	29%
Allied Health/clerical	29%
Nursing	5%
Patients	28%
Inpatient	10%
Outpatient (62% regular)	18%
Visitors (60% first time)	9%

Table 2

Round 2 Respondents No.=50	% of Respondents
Staff	46%
Nurses n=23	
Patients n=15	30%
Visitors n=12	24%

The initial round of questionnaires was completed by people randomly assigned as they came into the hospital.

The second round was given to staff and patients/visitors who attended the wards adjoining the gardens. Although recognising the potential for selection bias through not using random selection, the second questioning round was used to balance the range of respondents to ensure information on how the gardens were being used for therapeutic purposes. The consistency with the earlier response categories gave confidence that bias was not evident. In-depth interviews were conducted with 15 self-selected people using the gardens. These were used to examine several issues arising from the questionnaire rounds.

Table 3

Biophilia Characteristics - Priorities	Score (1 - 5)
Staff	
Colour & Blossoms	4.4
Water	4.2
Flowers & fragrances	4.1
Hearing birds and leaves	4.0
Having open spaces	3.9
Feel stress reduction	3.9
Having Savannah setting	3.4
Patients and Visitors	
Feel stress reduction	4.8
Having open spaces	4.5
Water	4.3
Hearing birds and leaves	4.1
Having Savannah setting	4.0
Colour & Blossoms	3.9
Flowers & Fragrances	3.8

Respondents consistently gave support for the identified Biophilia elements however the order of preference was different. It was assumed that this simply reflected the different benefits that could be gained by these groups in their use

of the gardens. The staff were looking for relaxation and distraction while patients/visitors were seeking anxiety reduction and privacy. Comments given during in-depth interviews tended to support this view.

Table 4

What 10 features are essential?	Percentage by Respondents
Water	25%
Trees/shade	14%
Sit and relax	13%
Layout garden	11%
Flowers/Fragrances	10%
Plants generally	7%
Open space	7%
Spaciousness	5%
Colour	4%
Lawns	4%

Respondents were consistent about items that they felt were important to their enjoyment of the gardens as well as those elements which they believed were essential to make the gardens useful to them. These items cross referenced well with the Biophilia elements providing stronger support for the hypothesis.

Table 5

THE FUTURE	
More gardens?	% of Respondents
Yes	76%
No (with comments)	24%
More Money for Gardens?	% of Respondents
Yes	72%
Neutral	16%
No (with comments)	12%

This table shows there is a limit that people were prepared to accept regarding more funds and space being put into gardens when funding for clinical support was also necessary. Supportive comments received from the interviews range from a belief that the gardens help to de-institutionalise the hospital, through to clear evidence that people feel the gardens make them feel better. Staff gained from having a place to retreat for lunch, away from the building, and many believed that having the gardens to improve the general ambience of the hospital would help with staff retention.

It is clear that staff on night shift feel they have been disadvantaged by not being able to use the gardens. Positive comments were however received from those who couldn't get out but gained enormous benefits (peaceful feeling, something to look at, etc) through being able to see down into the gardens. The general immobility of many patients was described by staff and visitors as a limiting factor in greater use of the gardens.

Conclusions

Evidence supports the use and effectiveness of the gardens. Data shows 87% of respondents felt the gardens had a positive impact on them and 86% of respondents supported key Biophilia elements in the garden design. We could confidently say the design solution appears to have achieved its objectives.

It can be observed that such designs to be effective need to be underpinned by solid evidence linking cause and effect. We felt that there needs to be a good theoretical underpinning to support the design philosophy and this needs to be properly evaluated at the conclusion.

It is necessary to recognise that design research is not the same as clinical scientific research and we are unlikely to have double blind trials to generate this sort of finding. The use of social science methods are needed if we are understand

the mechanisms involved in the design and to gain support for these experiments. Evaluations can be used in a systematic way to test these hypotheses providing confidence in the generalisability of the outcomes. Regardless, clients and especially government providers must have the courage to try new approaches to achieving better hospital designs.

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