Healing through Play
Designing for Emotional Healing in Child-centered Hospital Gardens

Landscape Architecture Senior Project 2012
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Healing through Play

Designing for Emotional Healing in Child-centered Hospital Gardens

Kaitlyn Porter   2012 Senior Project

Presented to the faculty of the Landscape Architecture Program at the University of California, Davis in partial fulfillment of the requirement for the Bachelors of Science in Landscape Architecture

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Abstract

Healing gardens are essential in providing children with an escape from the stresses of the hospital. Existing gardens rarely provide for the entire process of healing. This project aims to provide a research based approach to designing pediatric healing gardens. It presents a set of design guidelines based on Elisabeth Kubler-Ross and David Kessler's five stages of loss and is focused on in-patient rehabilitation for children ages 6-18.

The project was built using three main tenets. First, Elisabeth Kubler-Ross and David Kessler's five stages of loss provide the emotional process and the structure for the design guidelines. Developmental psychology was used to document children's expression of each stage, and environmental psychology theories corresponding with these expressions were adapted and translated into a set of design elements. The use of these design guidelines is demonstrated in design examples in the back of this book. These guidelines are intended to be built upon over time and not used as a definitive list.

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Dedication

For Mom, Dad, and Josh who gave me unending love and support, and encouraged me when I needed it most; and for my late grandparents, Richard and Vivian Holzhausser, wish you could have been here

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Acknowledgements

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⬦ Rady Children's Hospital San Diego, for allowing me to tour their gardens and answering all my questions

⬦ My comittee members, Marq Truscott, Richard Coss, and Claire Napawan for all their advice, patience and support.

⬦ To my friends, in studio and out, who were there for me even when I didn't believe in myself

⬦ To my family, Mom, Dad and Josh, you dont even know how much you helped me through this process. I would not be where I am today without your constant support.

I have learned so much over the past few months, but nothing was more valuable than the resilience I found within myself. Thank you to everyone who challenged me to think in new ways.

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Introduction

Hundreds of thousands of children are hospitalized each year in the United States. The medical profession often overlooks the potential of the physical environment to aid in the process of healing. Hospital environments are not conducive to alleviating a child's fear or facilitating emotional healing. Children in this unfamiliar environment often crave things that feel familiar. Gardens are a way to provide this familiarity. According to Robert Ulrich (1999), a healing garden is defined as "a variety of garden features that have in common a consistent tendency to foster restoration from stress and have other positive influences on patients, visitors, and staff or caregivers" (Ulrich R. S., 1999, p. 30). Gardens provide an escape for children, a place where they can feel they have more control over their situation and can forget the problems they face inside the hospital.

Many studies have shown the benefits of healing gardens in hospitals. Simply a window view of nature can speed up recovery time (Ulrich R. S., 1984). Properly designed healing gardens can greatly facilitate healing.

Healing gardens utilizing the design guidelines presented in this document will help children develop positive coping strategies. Currently many healing gardens focus on only part of the healing process such as the restorative aspects of nature or an outdoor environment conducive only to activity. Landscape architects can create gardens that help children and parents better cope with the healing-adjustment process by creating designs with healing progression in mind. This approach creates healing opportunities for a wide variety of people at many different emotional stages. These guidelines are based on psychological research and provide for patient needs while allowing the designer freedom for personal expression and adaptation.

"The healing garden is both a process and a place. It is a concept at the meeting point of medicine and design."

(Cooper Marcus, 2005, p. 23)

Project Information

This project provides design guidelines and an example design for pediatric healing gardens based on Elisabeth Kubler-Ross and David Kessler's five stages of loss. These guidelines are based on research from developmental and environmental psychology and focus on children ages 6-18.

Within this document the terms "grieving" or "loss" are used to describe a child's psychological reaction to the loss of previous abilities or functions. For instance, if a child has a leg injury and is on crutches, the child will mourn the loss of his ability to walk; thus he is grieving the loss of his capacity to walk. Healing gardens are particularly important for children in rehabilitation settings since many have not yet developed coping strategies for physical loss.

To create a garden that truly helps children heal emotionally, a designer must first understand how children perceive and interact with their environment. This research focuses on the environmental and developmental psychology associated with children's reactions to each of the five stages of loss. The design guidelines outlined in this project developed from this research.

"Designers are familiar with manipulating the elements of place, but sometimes overlook how these impact mood and behavior."
(Cooper Marcus, 2005, p. 23)

Guideline assumptions

This project has been created with in-patient rehabilitation requirements in mind. Through the process of creating this document, I realized that these guidelines have broader implications and can be easily adapted to the needs of a wide variety of patients. The clients these design guidelines cater to are primarily the patient and secondarily the parents, other visitors and the hospital staff.

"Children" in this project refers to patients ages 6-18, unless adolescents are intentionally separated out, in which case "adolescent" refers to those 13-18 years of age while "young children" refers to 6-12 year olds. This project focuses on children at least six years of age because their capacity to develop multiple solutions to situations does not develop until age 5½. Younger children do not experience the same grieving process (Saylor, 1993).

Research

Healing places were originally found in nature. People believed that remarkable natural places had healing properties, for instance a special grove, cave or stream was thought to cure a certain ailment. The earliest hospitals in the western world appeared within monastic communities where a cloistered garden was an integral part of life. Patients were often encouraged to meditate in the garden as part of their healing regimen. Gardens and outdoor spaces remained an integral part of hospital design until the early 20th century. Efficiency became the driving factor in hospital design from the 1950s to 1990. Hospitals replaced natural light and ventilation with light bulbs and air conditioning. Patient rooms became stark, institutional, and stressful for patients, visitors and staff (Cooper Marcus, 2005) (Malkin, 1992). Hospitals focused on healing as many

bodies as possible and ignored the emotional aspects of healing.

In the 90's came an emphasis on incorporating healing gardens into hospitals with the patient-centered care movement. Hospital administrators recognized the negative effects of environments designed purely for efficiency. Competition between hospitals boasting a more comfortable environment fueled research on patient needs and healing gardens (Cooper Marcus, 2005).

Healing gardens and stress

Healing gardens heal both physically and emotionally by reducing stress. Physical symptoms of stress are caused by the release of epinephrine, norepinephrine, and cortisol. When these stress hormones are released into the bloodstream they increase heart rate, blood pressure, respiratory rate, and blood glucose concentrations while decreasing the effectiveness of the immune system (Woods, 2007).

Psychological research has shown that viewing nature decreases stress. In a study by Ulrich (1983), negative feelings in subjects were replaced by positive feelings and negative thoughts were blocked while subjects viewed nature (Ulrich R. S., 1983). Measurable health effects from engagement in nature such as a lowering in blood pressure and heart rate have been noted by various researchers. They agree that nature reduces stress (Ulrich R. S., 1984) (Grahn, 1994) (Kaplan & Kaplan, 1989) (Ul-

rich, et al., 1991) (Ulrich R. S., 1999) (Verderber, 1986).

Ambiguity

It is important to reduce ambiguous elements and maintain a familiar environment in healing gardens. Ambiguous elements can sometimes lead the viewer to negative interpretations. Niedenthal et al. (1994) developed the concept of emotional congruence to explain this phenomenon (Niedenthal, Setterland, & Jon, 1994). Emotional congruence is the idea that when a person is presented with environmental stimuli they are more likely to focus on the parts of the stimuli that match their current emotional state (Ulrich R. S., 1999). Elements that look creative and interesting to a healthy person could be threatening or scary to a person who is stressed. In a hospital where stress is common it is better to design elements to have a familiar and positive feel (Cooper Marcus, 2005). Abstract art should be avoided.

Previous design guidelines

Design guidelines do already exist for healing gardens, but they are often vague so interpretations can be inconsistent. According to Ulrich's Theory of Supportive Garden Design, a healing garden must meet four requirements to mitigate stress.

◇ Create opportunities for movement and exercise

◇ Provide a temporary escape, access to privacy,

opportunities to make choices, and experience a sense of control

◇ Encourage gathering and promote social support among visitors

◇ Provide access to nature and other distractions

(Ulrich R. S., 1999)

Ulrich's design guidelines are well put together, but limited in their application. They are too vague and lack concrete examples. The guidelines presented in this project incorporate Ulrich's guidelines and go a step further to translate psychological theories into physical forms.

The project presented in this document is unique given that while it uses research from other disciplines, the guidelines were created from a landscape architect's point of view. A landscape architecture student developed design guidelines, used them to design an example site, and then refined the guidelines to be more comprehensible. Outside research was synthesized into a theory that inspired physical form and lead to a design. I enjoyed seeing how other professions utilized this information and thought about how it could be adapted to landscape architecture.

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Five Stages of Loss

The five stages of loss posited by Elisabeth Kubler-Ross and David Kessler (2007) are denial, anger, bargaining, depression, and acceptance/hope. They originally described moving through the grieving process after a loved one had died (Kubler-Ross & Kessler, 2007). Recent research shows that humans experience this process in similar ways with different sources of grief (Harvey, 1998). Functional loss has been defined as one of these sources of grief. Functional loss is the loss of previous abilities or functions due to an injury or medical condition. Children's reactions to these life-changing events often differ from that of adults. Movement through the stages is rarly linear. Children can experience them in any order and repeat some stages multiple times. For ease of understanding they are presented as separate, but when designing a garden they should be integrated. The five stages of children's reaction to loss can be characterized in the following ways.

Denial

Stage characterization

When first confronted with a diagnosis or bad news, children often deny that the unwanted fact is true. These children tend to withdraw to more secluded places. They may become apathetic, appear confused or dazed, and lose interest in things they used to like such as friends or toys. Many children refuse to believe the truth until they see evidence with their own eyes (Varma, 1973).

According to Conway Saylor (1993), there are two ways children cope with denial: proactive encounter coping and reactive encounter coping. Proactive encounter coping occurs when children are curious about what is going to happen to them and role play with medical equipment. By experiencing aspects of what will happen, they are able to better predict the process of healing and accept that certain circumstances must exist so that they can get better. Reactive encounter coping is when children do not know what to expect and have no experience to help them build an image of the future. This leads to them catastrophizing the situation, withdrawing, or transitioning to the anger phase (Saylor, 1993).

Fig. 1, Section showing the integration of withdrawing (denial) and accomplishment (acceptance/hope) elements (Porter, 2012)

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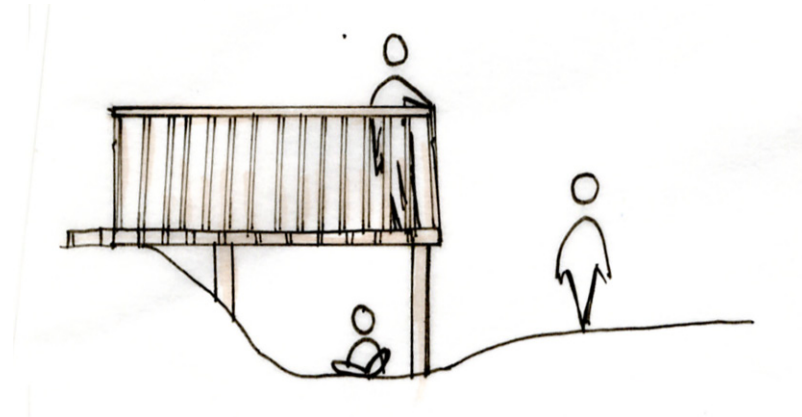
Psychological aspects

Observation

In order for children to move through this stage and increase their involvement, they need to be taught new ways to interact with the world (Kaland & Salvatore, 2002). In the self-directed environment of a healing garden, one of the best ways children can learn new methods of interacting is by watching others.

Seeing images or examples of others going through similar experiences helps children build a sense of what to expect and can help them relax. This can be achieved by having images of children going through similar experiences as the targeted patient

Fig. 2, Section of an environment that promotes feelings of security and observation behavior (Porter, 2012)
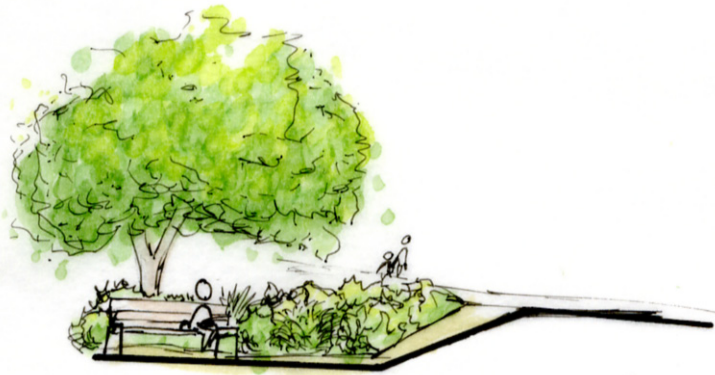
group. For instance, in a rehabilitation healing garden, this can be achieved through a mural of children on crutches and in wheelchairs playing or enjoying nature. Statues and mosaics are also effective (Humphrey & Humphrey, 1985).

Prospect-refuge

Children need a place to escape from reality as they adjust to their loss. The environmental psychology theory of prospect-refuge provides a space children can feel safe while allowing them to maintain a sense of control over their circumstances. Prospect is defined as an unimpeded opportunity to see and refuge is defined as the opportunity to hide. By combining the two, the child

Fig. 3, Section of a form acting as a prospect-refuge (Porter, 2012)

gains the opportunity to hide while still watching and emotionally participating with the environment around them.

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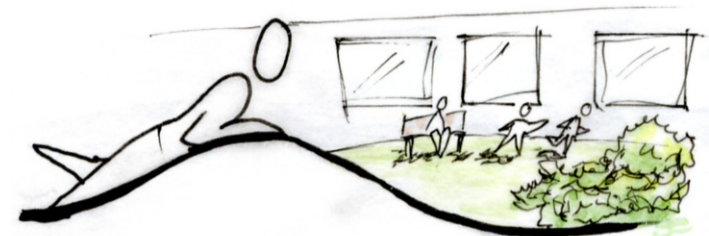
Environmental psychologists have found that convex shapes suggest prospect while concave shapes suggest refuge (Appleton, 1975). To create this effect, a designer can combine these shapes in creative ways, keeping in mind the view of each prospect and placing refuges so each view is interesting to the child. An example of a prospect refuge is a cave with a view of a play area.
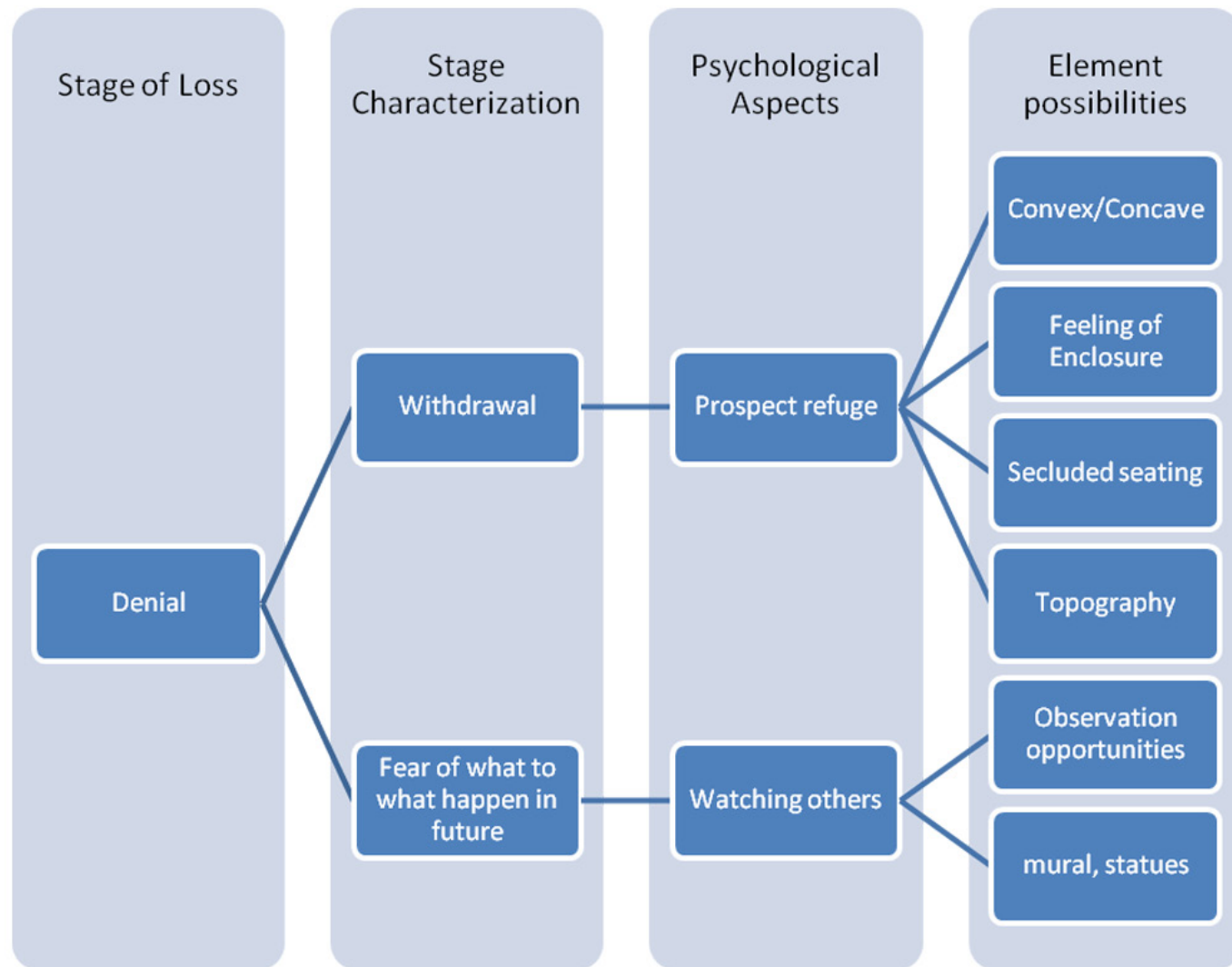
Denial Guidelines

Fig. 4, Design Guidelines for Denial (Porter, 2012)

Anger

Stage characterization

Children often experience anger when something interferes with their movement. When a child is injured, this interference can be caused by the injury itself or the treatments involved with healing such as a cast, crutches, or IV. (Humphrey & Humphrey, 1985) As children age, their reactions to their emotions evolve becoming more mature.

Psychological studies have shown that young children between 10 and 13 years of age most often have a physical, violent response to anger. Responses include hitting other people or objects, fighting, striking out, biting, throwing things, slamming doors, and stomping their feet (Gesell, Ilg, & Ames, 1956). Young children tend to become emotionally overwhelmed and blow up or boil over. Emotional/verbal violence is also common for this age group. They will yell, scream, call names, swear, make mean or sarcastic comments, talk back, and snap back at others. This is also the age group where pouting, sulking, crying, and planning revenge (though rarely going through with it) are the most common. Leaving the room is rare, but occurs more often in 11 and 12 year olds (Gesell, Ilg, & Ames, 1956). Another hallmark of young children is that emotions tend to be intense, but short lived and can sometimes shift rapidly from one extreme to the other (Humphrey & Humphrey, 1985).

Adolescents from 13 to 18 years of age have learned how to control their anger in more socially appropriate ways. There is much less physical violence. Verbal response is the most common and is expressed through yelling, swearing, calling names, arguing, talking back, snapping back, and making mean or sarcastic comments. Also common is leaving the area or going to another room to get out of the situation that is making them angry. The younger ages in this range often sulk and want to be alone when they are angry. As adolescents get older, they try not to show their anger. They "sit and take it", glare, make faces and sometimes plan revenge. Sometimes adolescents will deflect their anger by taking it out on someone else, usually someone close

Fig. 5, Stepping stones help children improve balance, agility and speed. A child can release anger by focusing on a task. (Porter, 2012)

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Psychological aspects

to them. As adolescents move through this age group it becomes more common to talk situations over with friends or the person they are angry at (Gesell, Ilg, & Ames, 1956).

Climate

Environmental psychology has proven that temperature can affect our social behaviors. In general people are less likely to help others when the temperature is too hot or cold. However, heat is specifically related to aggression. People tend to be more aggressive as temperature rises.

Fig. 6, (Below) A sand pit with spheres of various weights provides isotonic exercise for some and isometric exercise for others (Porter, 2012)
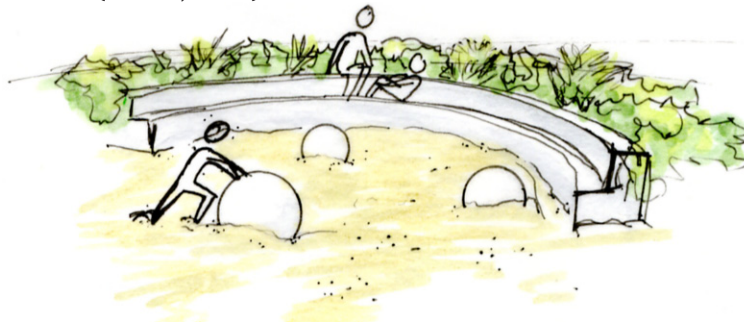
Prolonged exposure to noise above 60 decibels can also lead to increased aggression (McAndrew, 1993). Quiet, shady places help children

moderate their anger.

Color

Color can effects on children's moods. Red tends to bring up moods of excitement and defiance. Pink promotes feelings of relaxation and reduces aggression. Blue and green also help to reduce aggression to a lesser extent (McAndrew, 1993).

"One of the most important characteristics of life is movement."
(Humphrey & Humphrey, 1985, p. 100)

Physical Exercise

When a child is angry they get tense. Muscle tension builds and is maintained until released. If held for too long the child will become tired, and muscles will shorten and thicken. This tension should be released by exercise (Humphrey & Humphrey, 1985).

There are three main types of exercise:

Fig. 7, (Right) An undulating narrow surface improves balance and can serve as a platform for imaginary play. Wheelchairs can pass through the low portions and join the fun. (Porter, 2012)

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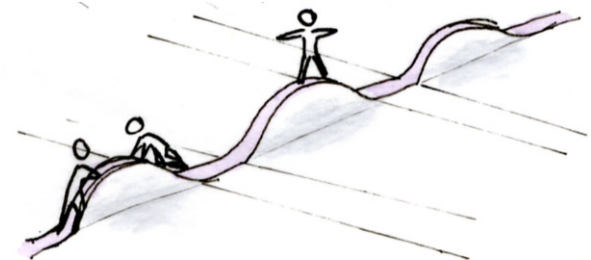
Proprioceptive-facilitative, isotonic, and isometric.

Proprioceptive-facilitative exercise relates to repetitive patterns of movement. This type of exercise includes features such as the ability to release muscular force in a short time span, agility while changing body position or direction, speed in which successive movements can be performed, flexibility of joints, balance while moving and stationary, and coordination of the entire body to accomplish a task. Examples or these include, respectively: standing long jump, dodging run, sprinting, touching the floor with straight knees, and throwing or catching objects (Humphrey & Humphrey, 1985).

Isotonic exercise is the amount of resistance one can overcome in one application of force. These exercises improve strength and range of motion. Some examples of Isotonic exercises are lifting weights, running, and biking (Humphrey & Humphrey, 1985).

Isometric exercises involve contracting muscles against resistance. A maximum amount of force is applied against a fixed resistance. Examples include pushing or pulling an immovable object (Humphrey & Humphrey, 1985). Each of these exercises helps children release tension and express anger in more constructive ways.
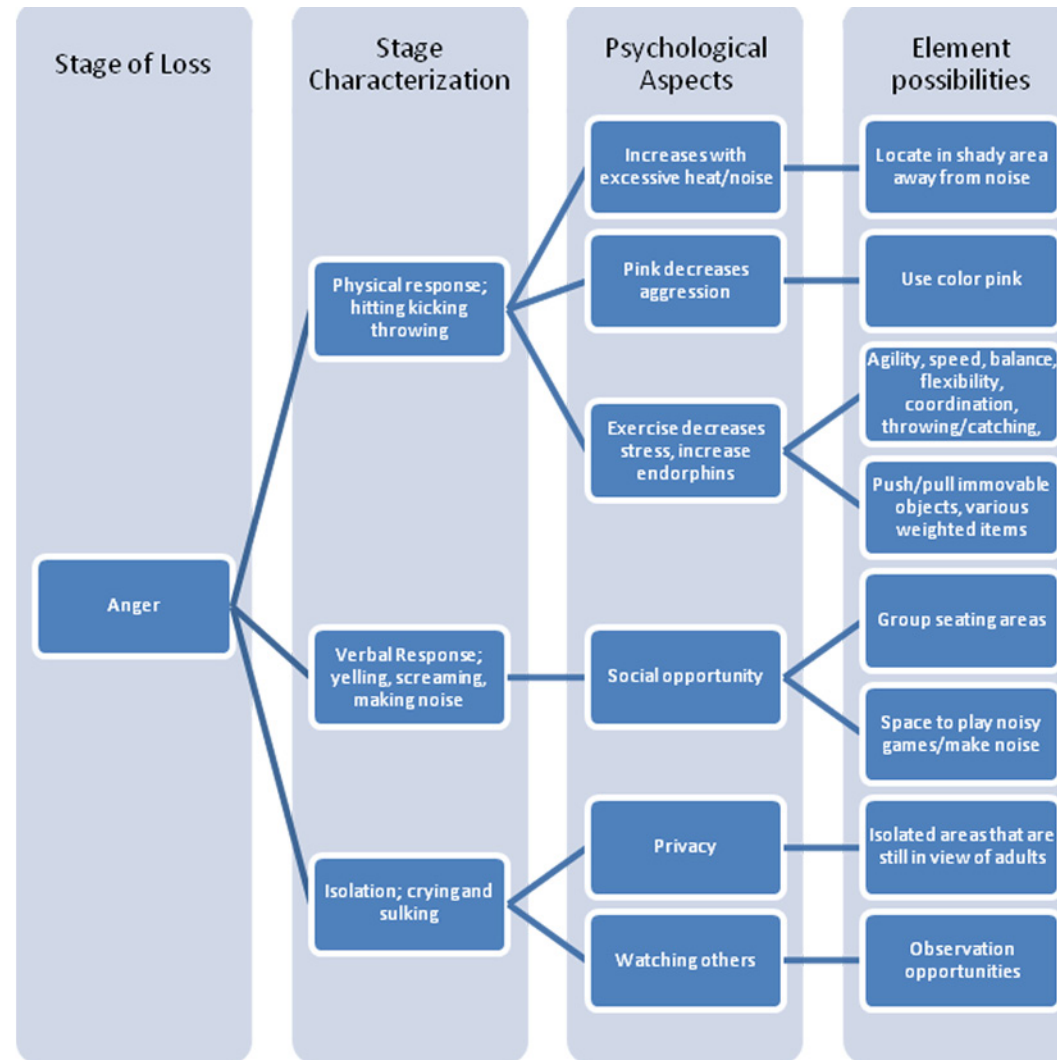
Anger Guidelines

Fig. 8, Design Guidelines for Anger (Porter, 2012)

Bargaining

Stage characterization

Children often use bargaining with the hope that it will remove the reality of the event that has happened. This stage is when children begin to talk. It may be only to themselves, or to trusted people in their lives such as parents or an imaginary friend. Bargaining is expressed differently by young children and adolescents and is more prevalent in adolescents. There have been studies showing how bargaining behavior differs in children ages seven to eighteen (Harbaugh, Krause, & Linday, 2003).

Young children in the bargaining phase will have thoughts such as "Maybe if I just become a better kid, everything will be like it was before" or "God, please make this go away and I promise to do whatever you want" (Children's National Medical Center, 2010). Some children are uncomfortable or do not know how to talk about their feelings. These children express bargaining nonverbally by using physical means to express their thoughts such as drawing, painting, or pretending (Moore & Goltsman, 1992).

When adolescents are in this stage, bargaining takes one of two forms, comparing or devaluing. Comparing is when adolescents evaluate their situation in relation to another circumstance that is either better

or worse, "I can't walk well but at least I don't need a wheelchair". Adolescents may also devalue things that they used to enjoy for instance, "Who cares if I can't use my arm, I never liked writing anyway." (Kaland & Salvatore, 2002). Moving through the bargaining stage is a way for children and adolescents to adjust to their situations.

Fig. 9, (Left) Children will look for familiar places to socialize when they share their fears. A hill satisfies all the criteria for bargaining. (Porter, 2012)

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Psychological aspects

Light

Light is an important aspect in bargaining due to its welcoming effect. Dark places can be more intimidating to a child who is expressing their fears, making children less likely to share feelings. Well lit spaces increase activity levels and can appear more welcoming (McAndrew, 1993).

Color

Color and space are related. Lighter colors make enclosed areas look bigger and darker colors make areas look smaller (McAndrew, 1993). In areas associated with bargaining, lighter colors should be used to create more hopeful solitary spaces.

Socialization

Children in the bargaining stage need spaces to express their fears, yearnings and hopes. This can be done through verbal or physical communication. Verbal communication involves talking about their concerns aloud either to another or themselves. In the bargaining stage, children are typically not ready for large group socialization and prefer smaller spaces to talk to one or two people. Physical communication is needed when a child does not want to, or cannot express themselves verbally. These children need alternate

Fig. 11, (below) Children need a range of formal and informal seating Fig 12, (lower right). Children need non-verbal communication options Fig 13, (right). They will seek out material to express themselves with. Often these are natural materials. (Porter, 2012)

Fig. 10, (Left) Making wishes is a way for many children to communicate non-verbally. Children write down their wishes and put them in the box hoping that their wish will come true. (Porter, 2012)
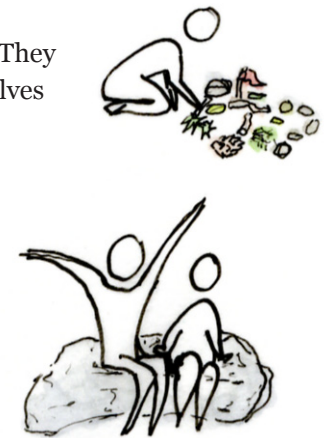
movable pieces within gardens help children express themselves non-verbally (Moore & Goltsman, 1992). Elements that ask children to deposit wishes, such as a statue or mailbox, are another way to provide nonverbal bargaining opportunities. Staff can later collect these wishes to learn what the children long for and how to better care for them.

Bargaining Guidelines
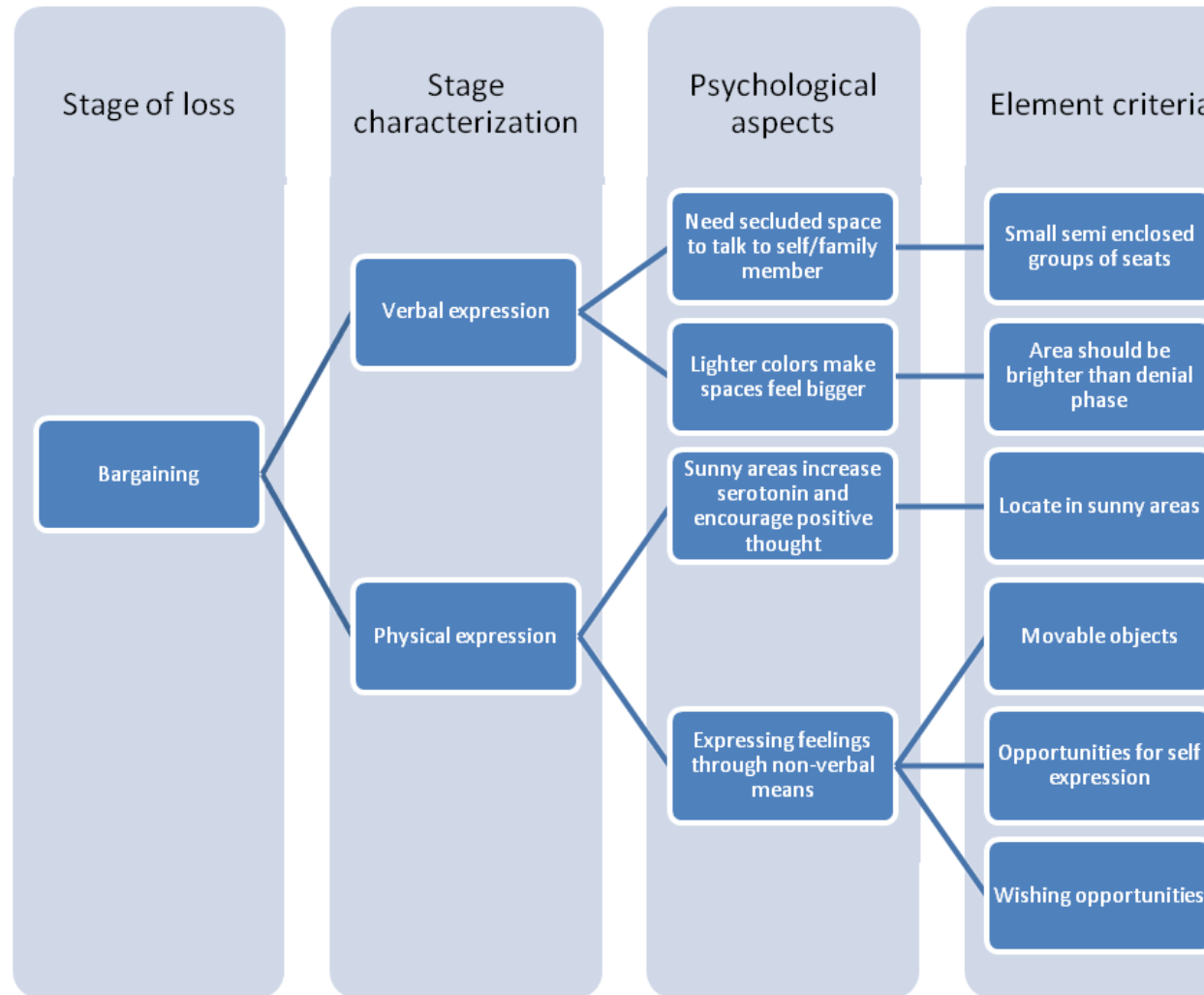
Fig. 14, Design Guidelines for Bargaining (Porter, 2012)

Depression

Stage characterization

Depression in children and adolescents involves changes in four areas; emotion, motivation, motor functioning, and cognition. Changes in emotion could be feeling sad, crying, looking tearful, or becoming irritable. A change in motivation may be signaled by a decline in school work, and a general lack of interest. Motor functioning is apparent by their loss of appetite, weight loss, slower movements, fatigue, oversleeping or inability to sleep. Changes in cognitive ability are signaled by a child's anticipation of failure, feelings of worthlessness, guilt, decreased concentration, and indecisiveness (Wenar, 1994).

Psychological aspects

Climate

Studies have shown that light can have an antidepressant effect. Natural sunlight and bright artificial light are the most effective in producing this effect (McAndrew, 1993). Sunny areas are the best place for elements that address depression.

Color

Colors can play a crucial role in reducing depression. The color blue generates feelings of security, comfort, tenderness, serenity and is generally soothing. Yellow is the opposite of depression and used correctly, may help people move forward. Orange should rarely, if ever, be used in areas associated with this stage since people often associate it with being distressed or upset (McAndrew, 1993).

Fig. 15, Children use found items such as sticks and plants as manipulative play material (Porter, 2012)

Physical Exercise

Physical exercise is proven to provide both physical and psychological benefits. Physical benefits include cardiovascular health, and increased immune system function.

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Psychologically exercise has been shown to decrease patient anxiety and depression (Salitsky, 2012). It is suggested that exercising regularly is as effective as psychotherapy (Ulrich R. S., 1999).

Opportunities for physical exercise begin with designing areas that facilitate accessibility and independence (Cooper Marcus, 2005). Visual goals can be incorporated in the design to create "Achievement points". These points can be high points, focal points, or other interesting places where children must overcome a challenge to reach the goal. Challenges can range from walking across the garden to climbing a structure. These achievement points must be enticing enough to attract the child and keep them interested as they wrestle with the challenge.

Experience of Nature

Access to nature is the life of the garden. Research demonstrates that nature has many restorative effects. Psychological research has shown that while people are viewing nature, negative feelings are replaced by positive feelings and negative thoughts are blocked. This is especially true if the view has a focal point along with moderate depth, and complexity (Ulrich R. S., 1983) (Ulrich, et al., 1991). The

> "The fact that nature simultaneously offers rest and stimulates reflection is part of what makes it a restorative environment." (Ottosson, 2007, p. 15)

types of areas that are most effective at reducing stress are open light-filled spaces with a view of water, and trees spaced at a moderate distance. This space should have a barrier behind the viewer. This barrier acts as a psychological shield, protecting them from any perceived threat or

Fig. 16, Ramps and platforms can increases childrens interaction with nature (Porter, 2012)

Fig. 17, Examples of reflective surfaces that mimic water and increase the sense of movement in a space (Porter, 2012)
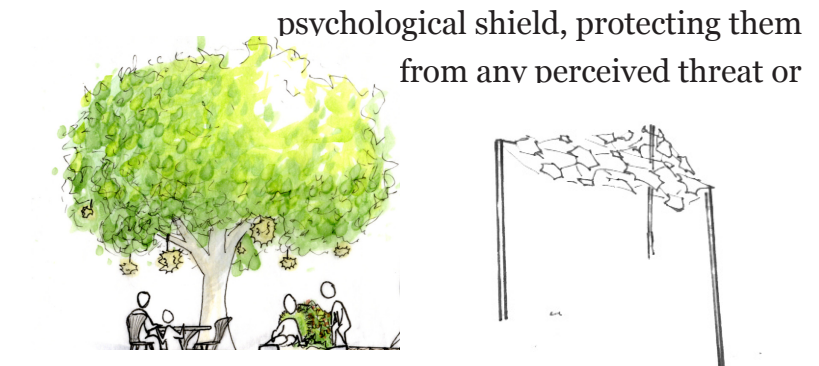
surprise (Ottosson, 2007). Incorporate variation into natural settings to enhance perception of changes. Humans become habituated to their environment and in order for them to notice something; it has to be novel or different from others (Grinde & Grindal Patil, 2009). Seasonality can help develop this concept as well as variation in color, scent, texture, shape, habit and arrangement.

Depression Guidelines
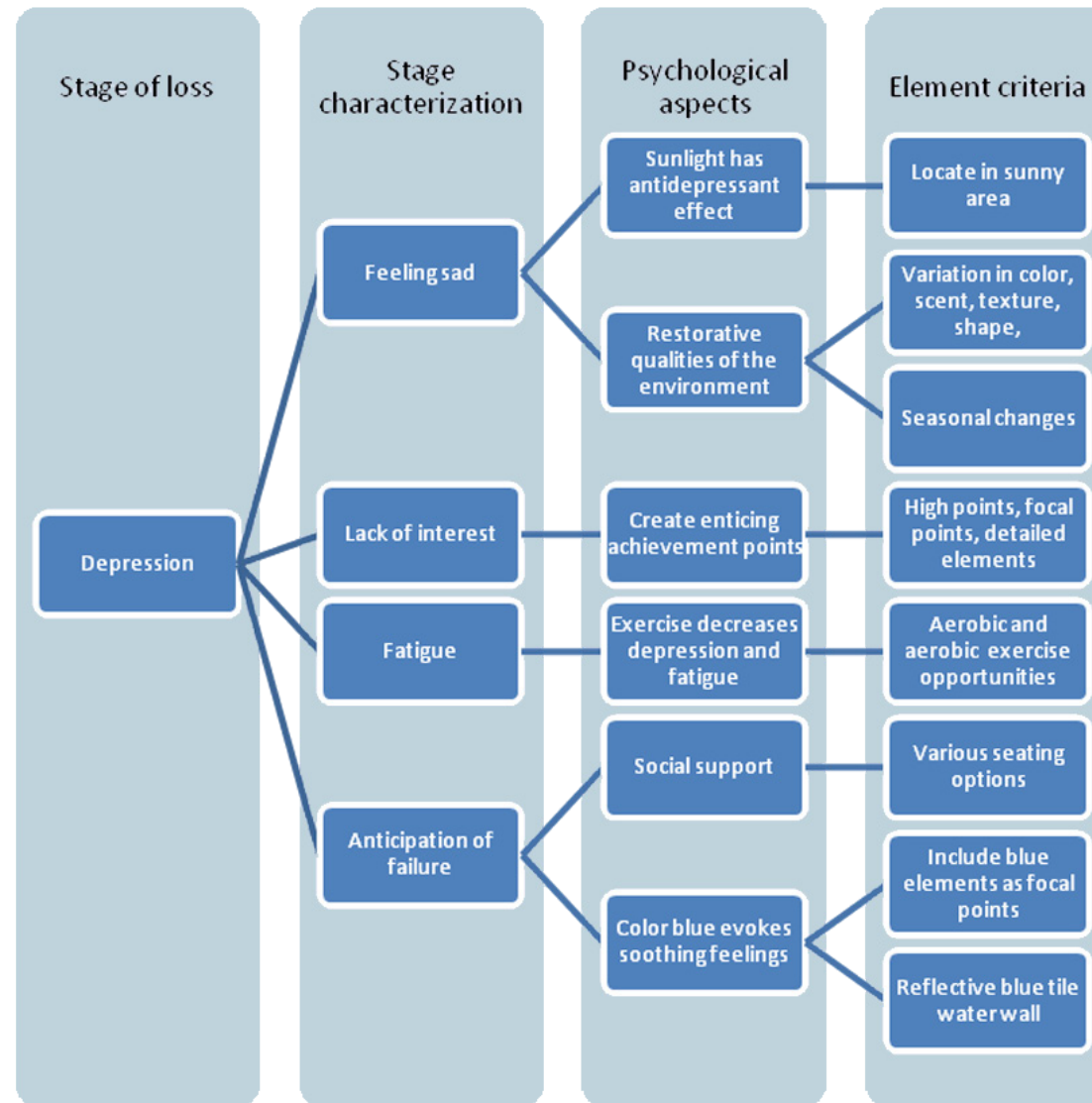
Fig. 18, Design Guidelines for Depression (Porter, 2012)

Acceptance/hope

Stage characterization

The acceptance/hope phase is about children adapting to their new situation and if possible, overcoming the challenges it presents. Children adapt through self expression and exploration (Kaland & Salvatore, 2002). Children often cannot express themselves in the same way as adults. Children use a variety of non verbal strategies to express themselves and each child is unique in their expression. A child needs to have options and be able to make choices that influence their environment in order to express themselves fully.

A child will often recreate traumatic experiences in play to work through emotions they cannot verbally express. Play provides an outlet for children to release suppressed emotions. Often their reenactment has a happier ending than the original event (Saylor, 1993). The practice of play therapy shows how beneficial play is in a child's healing process. Play helps children work through emotions that they don't want to talk about or don't have the capacity to talk about (Moore R. C., 1999). In order to do this, children need an environment that provides options, encourages questions and rewards curiosity.

Fig. 19, Example of combining a visible accomplishment point (acceptance/hope) with a climbable structure and a refuge (denial) (Porter, 2012)
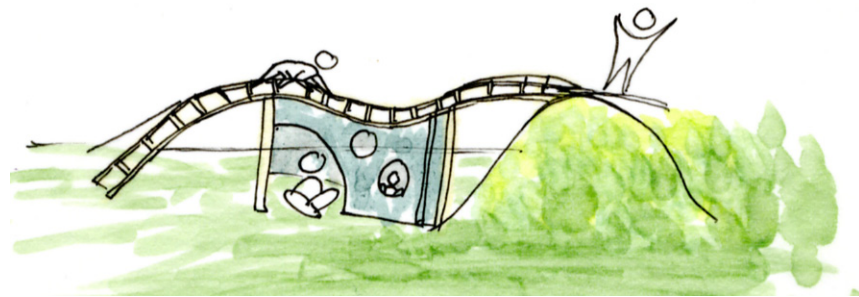
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Psychological aspects

Color

The best color for areas associated with this stage is yellow. Yellow evokes the cheerful mood that this symbolic of this stage and could help prepare children to transition into it (McAndrew, 1993).

Social Seating Opportunities

Research shows that patients with more social support are usually less stressed and healthier than those who are more isolated. Patients with higher levels of social support often have improved recovery and survival rates (Cooper Marcus, 2005). Seating needs to vary in sun and shade, exposure to wind and physical structure. Some chairs should have armrests and backs, others should allow patients to lie down, seats need to be various heights to accommodate smaller children. There should also be a mix of formal seating such as
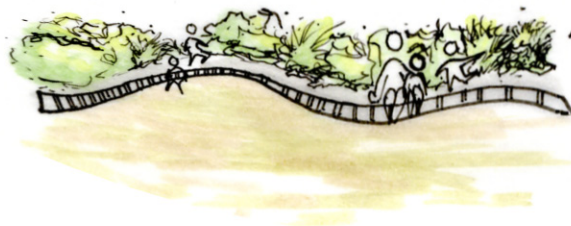
Fig. 20, Planter edges can be used for social seating, interaction with nature, and imaginative play (Porter, 2012)

benches and chairs and informal seating like rocks, logs, and sculptures.

Play

Play is an integral part of a child's life. It's a child's main form of interaction with their environment (Moore R. C., 1999). Children find enjoyment in play and use it to learn and relate to the world around them. Children sometimes have trouble verbalizing complex emotions. They may not know what their feelings are, or what they mean, much less how to explain these

"Play is a child's way of establishing authentic relationships with the social and physical world" (Moore R. C., 1999, p. 323)

Fig. 21, Tricycle tracks increase motor function, provide a sense of accomplishment, and help children learn problem solving skills (Porter, 2012)

things to others. Children often express such feelings by playing. This helps them work out problems, and gives them opportunities to express their feelings in ways they are familiar with. Play provides the platform to express internal conflict, fears, and desires non-verbally and in their own time (Moore R. C., 1999). A sense of mystery often encourages play. Children have a natural need to explore when they feel secure in a space. Nature provides this security within the familiar garden setting. Children need to be able to get up close to the plants and experience the smells, textures, and colors for themselves. These experiences help distract children from the harsh realities inside.

Quality play areas require opportunities for motor skill development, decision making, problem solving, imaginative, and cooperative play.

Motor Skill Development

Children require opportunities to use and improve both fine and gross motor movements (Moore & Goltsman, 1992). It is necessary to provide various options for large movements as well as smaller more

> "...practically all of our achievements are based on our ability to move" (Humphrey & Humphrey, 1985, p. 101)

precise motions, each with multiple levels of difficulty so children can practice and test the limits of their abilities. These elements should have visible accomplishment points where the child can look back and celebrate their progression (Moore & Goltsman, 1992). No matter what a child's ability level is, they should be able to feel as if they accomplished something and can move on to a new goal.

Decision Making

Children need to be able to feel a sense of control over their environment (Moore & Goltsman, 1992) (Ulrich R. S., 1999). They need to have opportunities to make decisions. This is especially important in hospital settings where the child's schedule is dictated to them and they have little control over what is happening to them. Within the healing garden children should have control over of at least some part of the environment. There should be materials to build with, moveable objects, or other easily controlled elements. Movement through the garden should never be cut off by a dead end.

Children need decision points where they have a choice of which path, activity, or direction to go in (Moore & Goltsman, 1992). Multiple options help to maintain interest and to avoid excessive repetition. Avoid strictly linear spatial experiences.

Problem Solving

Children are natural problem solvers and they use play to make sense of the world. In order to problem solve, children need to be able to actively manipulate their environment by building, dismantling, and transforming their surroundings (Moore & Goltsman, 1992). This can be accomplished by giving children opportunities to change their perspectives and experience the difference between high and low or stillness and motion etc. They learn about the different properties, uses and relationships of various objects and how to adapt them to accomplish a goal. This learning builds children's confidence and helps them cope with their current physical limitations.

Imaginative Play

To express themselves children need an environment that promotes imaginative play. Imaginative play, or pretending, is a vital part of the healing garden because it allows children to create their own stories using characters other than themselves to understand and work through their feelings. The environment is the main resource for this type of play. Physical elements should relate to each other in interesting ways to pique curiosity. Gardens should be designed to suggest multiple uses for elements while not being too literal or abstract. An environment that is too literal will limit a child's imagination, but a design that is too abstract will not fully stimulate it (Moore & Goltsman, 1992). Imaginative play also provides opportunities for cooperatively playing with others which increases the feeling of social support.

Acceptance/Hope Guidelines
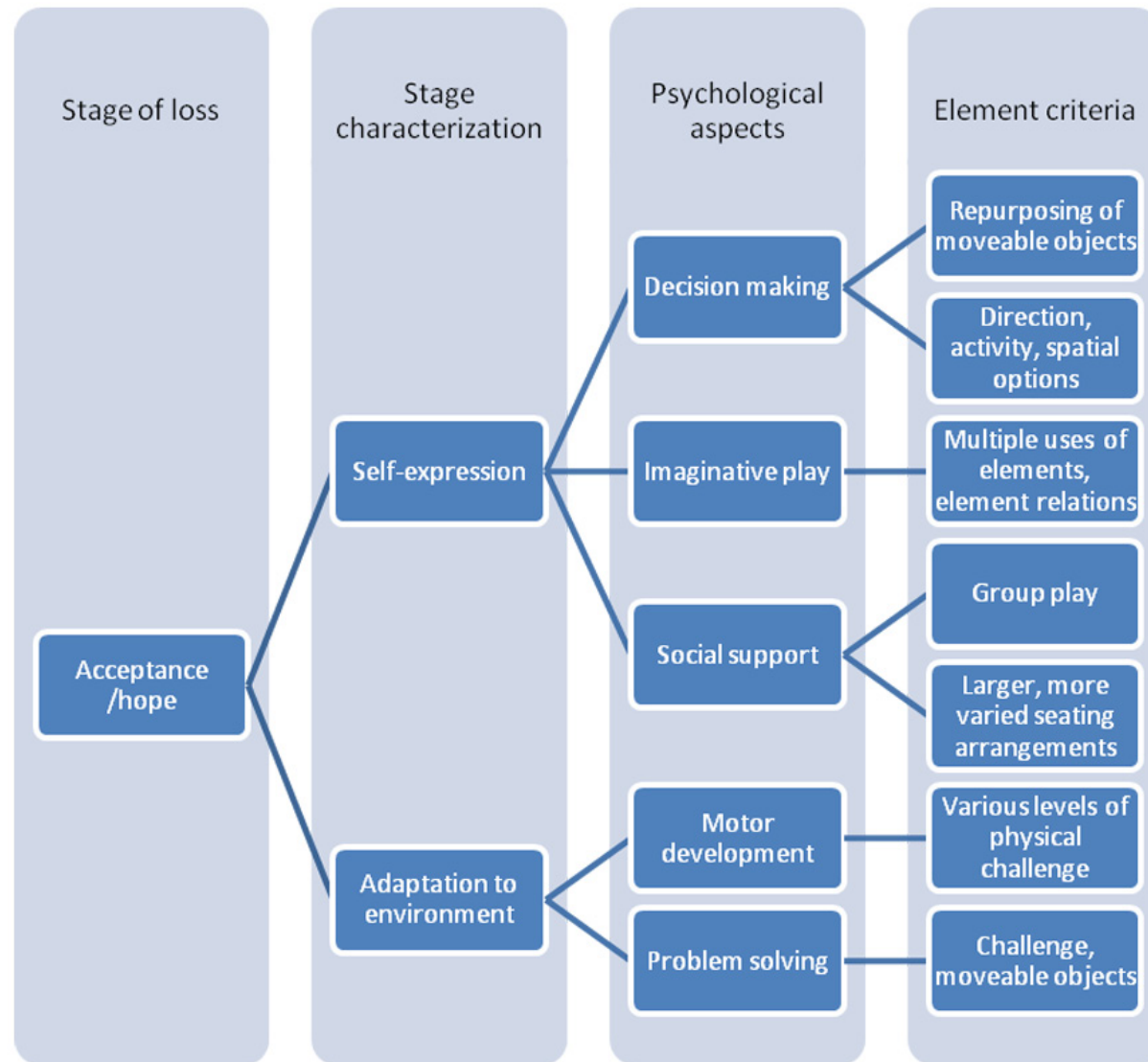
Fig. 22,Design Guidelines for Acceptance/hope (Porter, 2012)

Healing through Play:
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Case Studies

A post occupancy evaluation (POE) was previously conducted on three gardens within Rady Children's Hospital in San Diego (Sherman, Varni, Ulrich, & Malcarne, 2005). These gardens were opened in 1999 and range in size from 6279 sq ft (Garden of Dreams) to 1102 sq ft (Buggy Garden). The gardens are mainly in the cancer center and have patient rooms opening directly into them. This POE looked at users and how they interact with the garden as well as the length of time spent in the gardens.

More adults used the garden than children. About 88% of the visitors were adults and staff while only 9% were children and 3% were adolescents. Most of visitors used the garden as a walk through, spending less than one minute in the gardens (Fig 24).

Children, adults and staff used the gardens differently. Children's activities were

most commonly playing, followed by interacting with garden features, walking around, and interacting with natural features. Adolescents were most often walking around, interacting with natural and garden features, or on the phone. Adults generally sat and talked, walked around or relaxed. Staff seemed to use the gardens mostly as a break area, typically eating lunch, talking and relaxing (Fig 25, Fig 26).

This study provided helpful information but was limited due to the lack of activities within the gardens. Visitors most likely simply walked through them because the gardens do not provide an interesting environment or promote staying behavior. This POE is a very good evaluation and shows important trends, but the findings cannot be applied to all healing gardens.

Fig. 24, Length of stay by garden (Sherman, Varni, Ulrich, & Malcarne, 2005)

Staff, adult visitor, and child/adolescent activities

Staff activities (n = 152)	Percentage	Adult visitor activity (n = 305)	Percentage	Child (n = 72) and adolescent (n = 19) activities	Percentage
Lunch	33.6	Sit and talk	35.5	Play	47.9 (child), 0.0 (teen)
Sit and talk	28.9	Walking around	22.7	Structural interactions	45.2 (child), 20.0 (teen)
Sit and relax	18.4	Sit and relax	20.7	Walking around	38.7
Quick chat	10.5	Patient room	17.8	Natural features	35.5
Structural interactions	9.9	Cell-phone	15.1	Sit and talk	28.0
Work meeting	7.9	Lunch	14.8	Patient room	21.5
Walking around	6.6	Natural features	14.8	Patient interaction	18.3
Patient room	5.9	Structural interactions	13.5	Sit and relax	14.0
Patient interaction	3.3	Sit and wait	12.5	Lunch	14.0
Natural features	2.0	Let children play	12.5		
		Patient interaction	8.9		

Fig. 25, Staff, adult, visitor, and child/adolescent activities (Sherman, Varni, Ulrich, & Malcarne, 2005)

Child vs. adolescent vs. adult activities

Activities	Children[a] (n = 72)	Teens[a] (n = 19)	Adults[a] (n = 305)	d.f.	F	Significance	
All gardens							
Sit and wait	.0000	.0526	.1311	2393	5.215	.006	A>C
Let play	.0000	.0000	.1344	2393	5.999	.003	A>C
Play	.6667	.0000	.0295	2393	75.37	.000	C>A, T
Phone	.0000	.0526	.1639	2393	6.509	.002	A>C
Go around	.4306	.3684	.2361	2393	5.342	.005	C>A
Structures	.6806	.2105	.1672	2393	25.38	.000	C>A, T
Natural elements	.4444	.2632	.1770	2393	8.236	.000	C>A

[a] The numbers in these columns denote mean number of times the activity was engaged in by members of the group.

Fig. 26, Children vs. adolescent vs. adult activities (Sherman, Varni, Ulrich, & Malcarne, 2005)

Fig. 23, RCHSD healing gardens, from left to right: Garden of Dreams, Friendship Garden, Buggy Garden, Leichtag Family Garden. (Porter 2012)

Healing through Play:
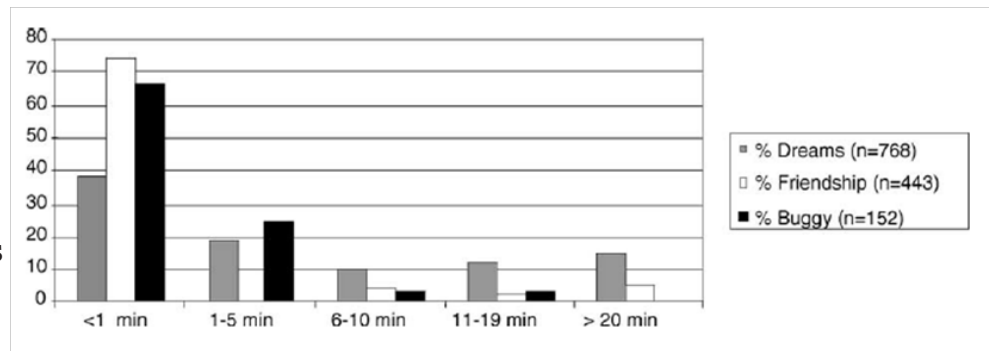Designing for Emotional Healing in Child-centered Hospital Gardens

Healing garden visits

I visited Rady Children's Hospital San Diego and saw the above mentioned gardens as well as the new acute care pavillion healing garden. I listed an inventory of all elements within the five gardens (See Appendix A). None of the water features were functional, conceivably due to their high maintenance requirements.

The older healing gardens were mainly built by volunteers and artists. They were mostly paved with some grassy hills and small trees. There were plenty of formal benches and tables and a few informal seating areas. There were very few playable elements. These were usually a bronze statue, or a place to hide such as an enclosed platform or a playhouse. All of these gardens were very straightforward in their design and had few activities thus promoting walk through behavior.

The new garden in the acute care pavilion is called Carley's Tea Party. This garden was completed in 2010 and is by far the largest garden. It focuses on play and social interaction. This was the only garden that I saw a patient and their family visit. The patient was guided through the garden by his parents. He played with moveable flowers on a wall, hid in a sculpted tree house, and enjoyed the feeling of walking on grass. Meanwhile, his siblings started playing cooperatively by racing on the tricycle track. This garden was very detailed and provided a lot of sensory input. There were many opportunities for play and enough activities to keep children entertained.

Fig. 28, "Carley's Tea Party" the newest healing garden in RCHSD Acute Care Pavillion. Includes many interactive activities that promote emotional healing (Porter 2012)

Fig. 27, Marisa the peacock and the inscription on her back. An example of a built wishing container. Provides for the bargaining stage (Porter 2012)

Fig. 29, Allows children to exercise their fine motor skills while giving them the choice of how the flower should look. (Porter 2012)

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Healing through Play:
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Using the Guidelines

As children move through the stages of loss they rarely do so in a linear way. Usually the process is much less predictable. Children can start in depression, and then move to denial as they try to protect themselves by saying nothing is wrong meanwhile, they are secretly bargaining for things to change. They may get angry when things remain the same, but have a good day the next day and move into acceptance/hope only to have their confidence destroyed and slide back to depression. Children can go through any sequence of the stages repeating some of them multiple times. Healing garden designs must address this by integrating the stages with one another. Stage guidelines should be mixed throughout the site as well as within each element. This provides children with more choices and allows them to feel more in control of their location and activity no matter what stage they are in.

Healing through Play:
Designing for Emotional Healing in Child-centered Hospital Gardens

Design Example

This design example is intended to provide a model showing how these guidelines can be implemented in a design. It demonstrates the relationships of each stage to the others as well as how the stages can relate to the site. The design process is presented in order to provide a framework to use the guidelines.

Healing through Play:
Designing for Emotional Healing in Child-centered Hospital Gardens

Context

The Garden of Dreams at Rady Children's Hospital San Diego was chosen to provide an example of how these design guidelines can fit together. This garden currently does not adequately provide for children's emotional needs and could use a retrofit.

      The Garden of Dreams is the larger gardens in the Nelson Pavilion, the old section of the hospital. It is a 6279 sq ft open courtyard within a one story brick building. There are patient rooms along the northern wall with doors that open into the garden. The southern wall belongs to the neonatal intensive care unit (NICU). The east and west walls are hallways and serve as the only public access to the garden.
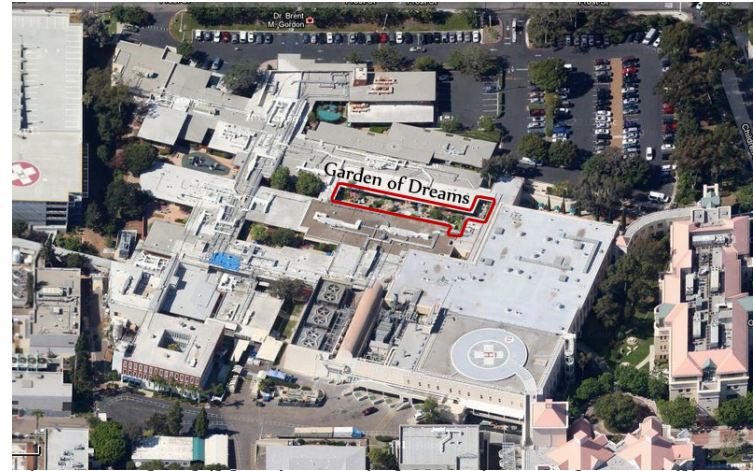

Fig. 30, Rady Children's Hospital San Diego, Nelson Pavilion, highlighting the Garden of Dreams (Porter, 2012)

Process

Concept: Garden of discovery
Goals:

- Provide opportunities for each stage of loss
- Provide an environment that feels like an escape
- Integrate reveals and places that give children a sense of ownership

Site Analysis

In Fig 31, I looked at the natural conditions and what feelings lent themselves to different parts of the site. From there I developed various options for circulation through the site. The curvy paths all help make the experience of walking through the garden more interesting since the curves obscure parts of the garden. This presents people with more distractions and increases the likelihood that visitors will spend more time in the garden. The pink path delineated the space well and made the experience less predictable by doubling back on itself. I also located areas where achievement points or goals would be most visible. In concept development I added variations in topography to increase the sense of discovery and add microclimates that fulfill portions of all stages with intentional transitions between them.

Concept development

Circulation

Natural

Hallway

Patient Rooms

Hallway

NICU

RADY CHILDREN'S HOSPITAL

NORTH

0 10 20 50 100

Fig. 31, Site analysis including a map of natural features, circulation options, and concept development ideas (Porter, 2012)

Site Plan

Throughout this design a visitor moves through a connected series of environments (Fig 32). The west end of the garden is the hill area. The height of the maze hill is exaggerated by the valley of the contemplation corner. While on the path the viewer is in the center of the two, so they feel like they are on the hill. As they progress to the center, the terrain smoothes out and becomes more open. Visitors passing the deck overlook enter into a valley between the free play hill and the stepping stones/nature deck. The terrain smoothes out near the door as it transitions into the hallway.

The final design combines all the stages of loss, intertwined in various ways throughout the design. Many of these have planting areas within view that would contain various textures, smell, forms, and colors. The slope variation on the free play hill offers multiple levels of challenge as children climb different sides of it reach the tree on top. It is an opportunity for vestibular stimulation as children roll down it, and provides a sense of enclosure as people pass by on the nearby paths. Its surface provides space for imaginary play.

The deck overlook provides shelter to watch others, an achievement point at the end of the deck,

social space on the lower level and intimate interaction opportunities with plants (Fig 33). The tree within the deck has shiny reflective glass stars hanging from its branches to catch the sunlight and add movement to the garden as they sway in the breeze. The deck overlooks the deepest depression in the garden. This evokes a feeling of enclosure and serves as a place to stage imaginary games that can utilize the deck as well. This space ramps up into a hill and to the stepping stone climbing areas. Here stepping stones are stacked at various heights. A child can test how high they can climb and watch themselves improve over time.

Further up this hill is a secluded seating area that encourages interaction with nature. The nature deck has an ADA ramp leading up to it and allows children to be on an island surrounded by plants.

The contemplation corner is also a secluded nature environment, but instead of being on a hill, it is in a depression. This creates a feeling of escape to an enclosed area where people can feel secure while watching others pass by on the nearby path.

The wishing bear is a sculpture of a bear on a hill, holding a box where children can deposit wishes.

Wishing Bear

Hill Maze

Hallway

Patient Rooms

Deck Overlook

Hallway

Free Play Hill

Contemplation Corner

Social Nodes

NICU

Observation Mound

Land Bridge

Stepping Stone Climbing Area

Nature Deck

NORTH

RADY CHILDREN'S HOSPITAL

0 10 20   50   100

Fig. 32, Example site plan (Porter, 2012)

This non verbal bargaining tool helps children express themselves while also functioning as an accomplishment point or prop for imaginary play.

The maze hill is a structure that incorporates both ramps and stepping stones. It provides decision points and multiple accomplishment points at various heights.

The ramps leading up to these platforms are sloped at different rates within ADA requirements. The stepping stones weave under and around the platforms meeting up with them at points and providing social spaces under them at others. The hill itself has various slopes and creates nooks for children to play games in.

Stage interrelationship

Deck overlook

Section A-A'

KEY:
- Denial
- Anger
- Bargaining
- Depression
- Acceptance/Hope

Variety of plants stimulate senses

Accomplishment Point

Reflective stars add motion and light

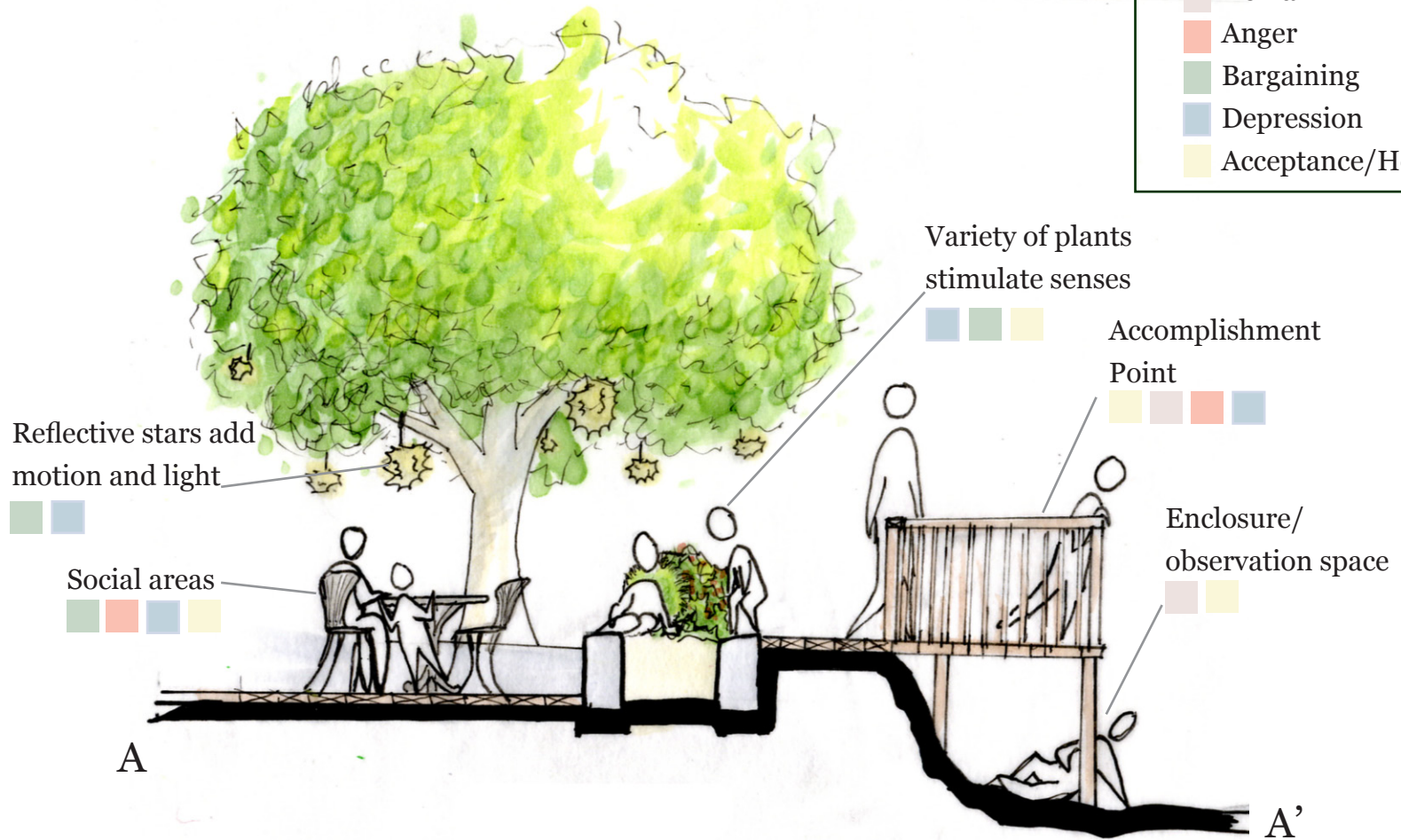Enclosure/ observation space

Social areas

A

A'

Fig. 33, Section of Deck Overlook and relation to stages of loss (Porter, 2012)

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Healing through Play:
Designing for Emotional Healing in Child-centered Hospital Gardens

Glossary

Cortisol
- ◇ A steroid hormone produced naturally by the adrenal gland, identical to chemically synthesized hydrocortisone.

Epinephrine
- ◇ Also called adrenalin, a secretion of the adrenal glands (along with norepinephrine) that helps the liver release glucose and limits the release of insulin.

Fine motor
- ◇ The use of precise coordinated movements in such activities as writing, buttoning, cutting, tracing, or visual tracking.

Gross motor
- ◇ The ability to use large muscle groups that coordinate body movements involved in activities such as walking, running, jumping, throwing, and maintaining balance.

Isotonic
- ◇ Of or involving muscular contraction in which the muscle remains under relatively constant tension while its length changes.

Isometric
- ◇ Of or involving muscular contraction against resistance in which the length of the muscle remains the same.

Motor
- ◇ Pertaining to motion, the body apparatus involved in movement, or the brain functions that direct purposeful activities.

Norepinephrine
- ◇ A neurotransmitter released by the adrenal gland; part of the fight-or-flight response and also directly increases heart rate, blood pressure, energy release from fat, and muscle readiness.

Proprioceptive
- ◇ Pertaining to the sensations of body movements and awareness of posture, enabling the body to orient itself in space without visual clues.

Healing through Play:
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Appendix A

Garden inventory

Friendship Garden	Buggy Garden
Maze like playhouse	Caterpillar bench
Large Gazebo	Bronze bug sculptures
Table/Benches	Shady
Large Bronze rabbit sculptures	Winding path

Fig. 34, Inventory (above), Buggy Garden image to the left, images of friendship gardens to right including playhouse and rabbit statues (Porter 2012)

Leichtag Family Healing Garden	Garden of Dreams
20' Brontosaurus trellis	Meandering walkway
Constellation wall	Elevated mosaic hummingbird nest
Windmill	Butterfly shades
Moveable canopy benches	Bronze sculpture
Animal Shadow Wall	Mosaic River
Outdoor rooms	Spitting Crane fountain
Animal wall tiles	Table/Benches
Variation in material	Grassy hills
Seahorse fountain	Turtle seat

Fig. 35, Inventory (above), Garden of Dreams (right), Leichtag Family Healing Garden (above right) (Porter 2012)

Healing through Play:
Designing for Emotional Healing in Child-centered Hospital Gardens

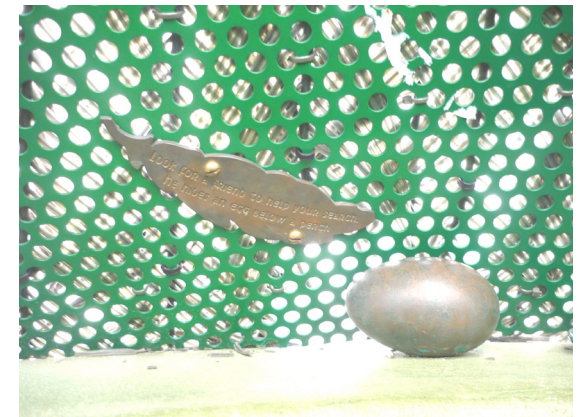| Carley's Magical Garden |
| --- |
| Artificial plants |
| Bronze sculptures |
| Elevated tree house |
| Golden egg hunt |
| Peacock to put wishes in |
| Tricycle track |
| Grassy hill |
| Gazebo with curtains and checkers |
| Basketball hoop |
| Peek-a-boo flowers with sculptures inside |
| Crank sculpture animation |
| Dock and boat w/geese |
| Metal mesh walls w/scenes and lights |
| Table/Benches |

Fig. 36, Inventory (above), General garden layout and egg hunt game to right (Porter 2012)

References

Appleton, J. (1975). The Experience of Landscape. London: John Wiley.

Children's National Medical Center. (2010). Helping Children with the Psychological and Emotional Aftermath of an Earthquake. Retrieved from Children'sNational.org: http: www.childrensnational.org/files/PDF DepartmentsandPrograms/ichoc/Earthquake.pdf

Cooper Marcus, C. (2005, August 29). Healing Gardens in Hospitals.

Dorland's Medical Dictionary for Health Consumers. (2007). by Saunders, an imprint of Elsevier, Inc.

Gale Encyclopedia of Medicine. (2008). The Gale Group, Inc.

Gesell, A., Ilg, F. L., & Ames, L. B. (1956). Youth, the Years from Ten to Sixteen. New York: Harper and Brothers, Publishers.

Grahn, P. (1994). Green Structures – The importance for health of nature areas and parks. European Regional Planing, 56:89-112.

Grinde, B., & Grindal Patil, G. (2009). Biophilia: Does Visual Contact with Nature Impact on Health and Well-Being? International journal of Environmental Research and Public Health, 2332 2343.

Harbaugh, W. T., Krause, K., & Linday, S. G. (2003). Bargaining By Children. Eugene: University of Oregon.

Harvey, J. H. (1998). Perspectives on Loss. Philadelphia: Edwards Brothers.

Humphrey, J. H., & Humphrey, J. N. (1985). Controlling Stress in Children. Springfeild: Charles C Thomas. Jonas: Mosby's Dictionary of Complementary and Alternative Medicine. (2005). Elsevier.

Kaland, M., & Salvatore, K. (2002). The Psychology of Hearing Loss. The ASHA Leader.

Kaplan, R., & Kaplan, S. (1989). Kaplan, R. & Kaplan, S. The Experience of Nature. Cambridge: Cambridge University Press.

Kubler-Ross, E., & Kessler, D. (2007). On Grief and Grieving: Finding the Meaning of Grief Through the Five Stages of Loss. New York: Scribner.

Malkin, J. (1992). Hospital Interior Architecture. New York: Van Nostrand Reinhold.

McAndrew, F. T. (1993). Environmental Psychology. Belmont: Brooks/Cole Publishing Company.

McGuire, L. (2012). Isamu Noguchi's Playground Designs. Retrieved from Landscapeonline.com: http://www.landscapeonline.com/research article/7115

Moore, R. C. (1999). Healing Gardens for Children. In C. Cooper Marcus, & M. Barnes, Healing Gardens: Theraputic Benefits and Design Recommendations (p. Chapter 7). Harboken: John Wiley and Sons.

Moore, R. C., & Goltsman, S. M. (1992). Play for All Guidelines: Planning, Design, and Management of Outdoor Play Settings for All Children. Mig Communications.

Mosby's Medical Dictionary, 8th edition. (2008). Elsevier Health Sciences.

Niedenthal, P. M., Setterland, M. B., & Jon, D. E. (1994). Emotional Organization of Perceptual Memory. In P. M. Niedenthal, & S. Kitayama, The Heart's Eye: Emotional Influences in Perception & Attention (pp. 87-113). San Diego: Academic Press.

Ottosson, J. (2007). The Importance of Nature in Coping. Alnarp: SLU Reproenheten.

Saylor, C. F. (1993). Children and Disasters. New York: Plenum Press.

Sherman, S. A., Varni, J. W., Ulrich, R. S., & Malcarne, V. L. (2005). Post-occupancy evaluation of healing gardens in a pediatric cancer center. Landscape and Urban Planning, 167-183.

Ulrich, R. S. (1983). Aesthetic and affective response to natural environment. In I. Altman, & J. F. Wohlwill, Human behavior and environment: Advances in theory and research. Vol. 6: Behavior and the natural environment (pp. 85-125). New York: Plenum.

Ulrich, R. S. (1984). View through a window may influence recovery from surgery. Science, 224, 420-421.

Ulrich, R. S. (1999). Effects of Gardens and Health Outcomes: Theory and Research. In M. Barnes, & C. Cooper Marcus, Healing Gardens: Therapeutic Benefits and Design Recommendations (p. Chapter 2). Hoboken: John Wiley and Sons.

Ulrich, R. S., Simons, R., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. Journal of Environmental Psychology, 1 I, 201 230.

Varma, V. P. (1973). Stresses in Children. London: University of London Press.

Verderber, S. (1986). Dimensions of person – window transactions in the hospital environment. Environment and behavior, 18(4): 450-466.

Wenar, C. (1994). Developmental Psychopathology; from Infancy Through Adolescence. New York: McGraw-Hill, Inc.

Woods, S. (2007). Spiritual and Complementary Therapies to Promote Healing. In N. C. Molter, AACN Protocols for Practice; Creating Healing Environments Second Edition (pp. 125-127). Sudbury: Jones and Bartlett Publishers.