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# Comprehensive Cancer Care: an outpatient treatment facility

Braden Abrams Reid  
*Clemson University*

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**COMPREHENSIVE CANCER CARE:**  
AN OUTPATIENT TREATMENT FACILITY

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A Thesis  
Presented to  
the Graduate School of  
Clemson University

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Architecture

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by  
Braden Abrams Reid  
May 2014

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Accepted by:  
David Allison, Committee Chair  
Daniel Harding  
John Jacques  
Dr. Cynthia Pury

**COMPREHENSIVE CANCER CARE:**  
an Outpatient Treatment Centre

Master of Architecture + Health Thesis Proposal

by Braden Abrams Reid

## **0 | ABSTRACT**

A cancer diagnosis can result in a loss of decision-making and control for patients. The majority of clinical treatments fail to adequately address corollary symptoms and needs that arise both from treatment and from the disease itself. Thus, the architectural problem identified in this thesis inquiry is how can an outpatient cancer centre treat the whole patient comprehensively, while at the same time instilling control and re-empowering the patient? This thesis project proposes a patient-centered environment designed to support the myriad and nuanced needs of the cancer patient, as well as a site-specific proposal for a comprehensive outpatient cancer treatment centre located in Spartanburg County, South Carolina. This cancer centre is designed with the notion of patient-empowerment as a design driver, and incorporates non-traditional complementary treatments in addition to those clinical treatments typically offered in the conventional North American cancer centre.

By way of supporting this topical area of inquiry, the following topics comprise



the scope of inquiry undertaken in this project: Clinical Cancer Treatment Architecture: the three main facility types in which cancer treatment occurs – freestanding, aggregated, and monolithic. Complementary/Alternative Treatment Architecture: both cancer-focused and general alternative treatment centres were also investigated, in order to determine what complementary therapies might be appropriate to incorporate with a clinical cancer treatment center. Additionally, these facilities were helpful in giving cues as to what physical design drivers could help guide the subsequent thesis design proposal.

The review of many personal cancer patient blogs and video diaries (all openly available online) was important in framing the experience of the patient. What therapies were commonly feared, personal aversions that developed as a result of treatment, and similar notions written or spoken about all helped to give a sense of what it might be like to be in a patient's situation, and what design decisions might have been helpful in nurturing a more positive experience.

Design principles were developed out of the topical inquiry and architectural

investigation, with the focus of patient empowerment at hand. Similarly, site selection, programmatic development, and the final design proposal were each conducted through the lens of the patient experience, and how best to instill control before, during, and after treatment is delivered (that is to say, before the patient arrives, the experience of receiving care, and what is taken away once they leave the treatment centre).

The resulting design proposal developed from this investigation is a 45,000 square foot outpatient cancer treatment centre located in Spartanburg County, South Carolina. The facility comprises a full hematology and infusion therapy suite, a radiation therapy suite, an alternative medicine suite, a physical therapy program, mind-body therapies, and a diet and nutrition area. Patients originating in the Cities of Greenville, Spartanburg, and Greer, and all surrounding areas will utilize this centre.

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To my family, for foolishly allowing me to do a second master's degree, and for supporting me in ways I could never have hoped. I promise to put all this education to good use. Thank you mom and dad. I love you and I miss you every second of every day.

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## 1 | INTRODUCTION

Cancer is ubiquitous. It impacts virtually everyone's life in one form or another, and nearly every American has had an encounter with cancer (be it personally, or with a family member who has had cancer, or a friend with a positive diagnosis). The impact cancer has on mortality in the United States is significant: it ranks as the second leading cause of death among Americans ([www.cancer.org](http://www.cancer.org), accessed 30 March, 2015). Further, cancer is a prolific disease: in 2014, 1.66 million new cases were diagnosed in the US, and an average of 1,600 people per day died from cancer (*ibid*). However, with these staggering figures comes some hope: survival rates from 1977-1979 were 49%, with 1 out of every 2 cancer patients dying from their disease; since the mid-2000's this figure has improved dramatically to 68% (*ibid*).

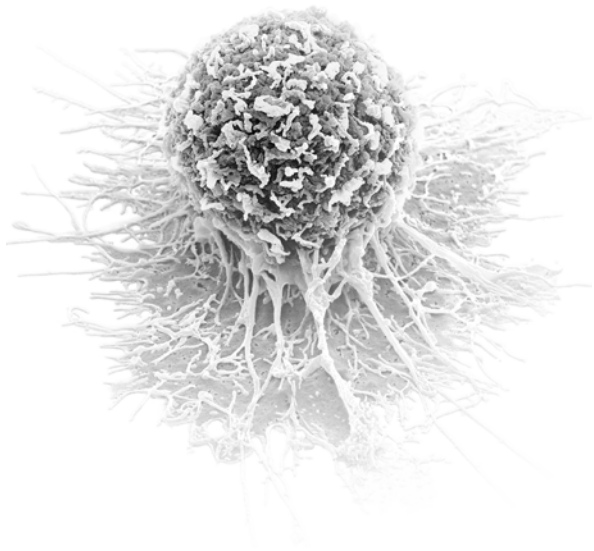


Figure 1: electron microscopy image of an invasive cancer cell (Micronaut)

With this prevalence at a nationwide scale, cancer also effects people's lives in ways that extend beyond the basic principle of an illness hosted by a body. The physical ramifications of having cancer and enduring cancer treatment

are significant. In relation to people with no history of this disease, 58 percent of people with cancer in their past or present report having other functional disabilities; 42 percent of these people report having additional chronic medical conditions; and of those individuals below 65 years of age (in an eligible, active working age-bracket), 17 percent were unable to work as a result of a health condition (Hewitt et al., 2003). The lasting effects of cancer treatment (discussed in greater detail in chapter 2) can be manifest as cognitive impairment, fatigue, and pain (Adler & Page, 2008).

While the physiological nature of having cancer is unquestionably exacting of one's body, the nature of cancer diagnosis and treatment implicates every other facet of life as well; it is not simply relegated to the physical realm. In 2008, the Institute of Medicine of the National Academies commissioned "Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs" (CCWP), a document which elaborates in rigorous detail the extent to which cancer can wreak havoc on a patient's life beyond those physiological ramifications. Recognizing that there was a significant gap between the methods of care being delivered, and

the unmet psychosocial needs of the individual, “Cancer Care for the Whole Patient” outlines in great detail the corollary areas in which treatment must also be provided. At its most broad level, CCWP suggests that the delivery of cancer care in America be rethought, such that it would incorporate additional therapies and support to treat the holistic needs of patients.

However, with the compounding effects of having cancer, and the marks it leaves in all dimensions of life, there is an added dimension of complexity: patients experience a vulnerability and helplessness, expressed by Chang as a “social and psychological morbidity” (Chang et al, 2004). This condition is understood as ‘disempowerment’, or a person’s decreased capacity to affect the social and operational aspects of their lives (Whitmore, 1988). The frightening physical change of having a serious illness, coupled with an uncertain treatment plan, and a profusion of experts all dictating what must and will change in one’s life – these variables can divest a person of their independence, virtually overnight. From the point of diagnosis onward, patients are now forced to incorporate a multitude of changes into their lives over an indefinite period of time, and

these changes may not incorporate well into the life patients knew prior to their diagnosis (Aujoulat, d'Hoore, and Deccache, 2007). The challenge of how to re-establish control and empower patients throughout their cancer journey is a focus central to this thesis investigation.

In the past decade, cancer care providers have placed a greater emphasis on the psychosocial needs of patients. Facilities like the Memorial Sloan-Kettering Brooklyn Infusion Centre were conceived around the concept of patient control and choice. Since 2008, and the release of 'Cancer Care for the Whole Patient', most treatment centres have begun to offer additional, historically non-traditional services to patients. The range of these therapies, called "complementary" or "alternative" throughout this thesis project, has been kept small in scope. In comparison with the demonstrated benefits of sundry alternative therapies practiced in the US today (detailed more in the chapter 2), most cancer treatment facilities will offer a limited breadth of complementary services. Of the case studies and facilities visited during this thesis research, most centres offered their alternative therapies in rooms that were tucked away



in non-clinical areas of the cancer centre (the most prominent complementary service observed was a healing garden with a meditation/contemplation space, found in two of the sites visited).

From this overview of the complex physical and psychosocial experience of the patient, coupled with the insubstantial list of services offered by cancer care centres that address these needs, a research question becomes apparent: can a comprehensive cancer treatment centre that combines clinical and complementary treatments, in equal prominence, be developed? Further, can this comprehensive treatment centre have an overarching focus that empowers the cancer patient through every step of their journey?

In order to answer this query, an in-depth investigation of the cancer patient experience must be developed. It is virtually impossible to establish a map of the universal patient journey, because every body is unique and the response of cancer to treatment can be unpredictable. However, cancer patients do have shared experiences, even if their tumors have a completely different

origin. Each of the numerous personal blogs reviewed in this thesis research made reference to helping another person get through their own illness. The comment sections of most blog entries were replete with supportive words, often from strangers who had been through the same journey and wanted to share their own experience.

*“The life-threatening nature of the disease, the extensive treatment modalities with uncertain outcomes, and the intrusiveness of the disease may challenge one’s control perceptions, even in patients with a good prognosis. In general, there is little that patients can do to influence the medical course of the disease” (Rancho et al, 2010).*

A second requisite investigation is that of the treatment options which exist today within the contemporary context of ‘Cancer Care for the Whole Patient.’ Cancer treatment in the United States has evolved remarkably over the past 15 years. Technology has become more precise, less invasive, and yields better outcomes. Through architectural design, this thesis seeks opportunities embedded within cancer treatment processes that can enable patients to have greater control over their experience.

## Definitions

*Disempowerment*: a person's decreased capacity to affect the social and operational aspects of their lives (Whitmore, 1988)

*Psychosocial*: conditions of life which exist in psychological (eg. emotional, mental, spiritual) or social realms (eg. work, relationships, family); the non-physical dimensions of daily life (Adler & Page, 2008)

*Holistic medicine*: healing practices outside the formalized scope of scientific western biomedicine, understood to include alternative, complementary, and traditional medical practices (eg. homeopathy, naturopathy, spiritual healing, traditional healing, touch therapy, imagery and visualization therapy, and art therapy) (Williams, 1998).

*Locus of Control*: a patient's perception that the causes of specific events will be attributed to either personal (internal control) or situational (external control)

elements, the nature of which can either mediate or exacerbate stress (Watson, Greer, Pruyn, and van den Borne, 1990)

*Courage*: a willing, intentional act involving substantial difficulty or risk, primarily motivated to bring about a noble good or morally worthy purpose (Rate, 2010).

*Hapticity*: “the various sensibilities of the body to its position in the physical environment and to its own condition” (O’Neill, 2001).

*Perceived control*: “refers to beliefs that important aspects of one’s life are under one’s control” (Ranchor, et al, 2009).

*Primary Clinical Treatment*: the suite of therapies, including radiation therapy and chemotherapy, used in established western medicine to treat cancer.

*Complementary therapy*: “the group of diverse medical and health care systems, practices and products that are not presently considered part of conventional

medicine” (Verhoef, Trojan, Armitage, Carlson, & Hilsden, 2009).

*Phenomenology*: “exploring how human beings make sense of experience and the meaning they give to these experiences” (Al-Busaidi, 2008).

**THESIS CLAIM**

Cancer has an effect of **disempowering** patients; treatment must address this **comprehensively**, and not only physically.

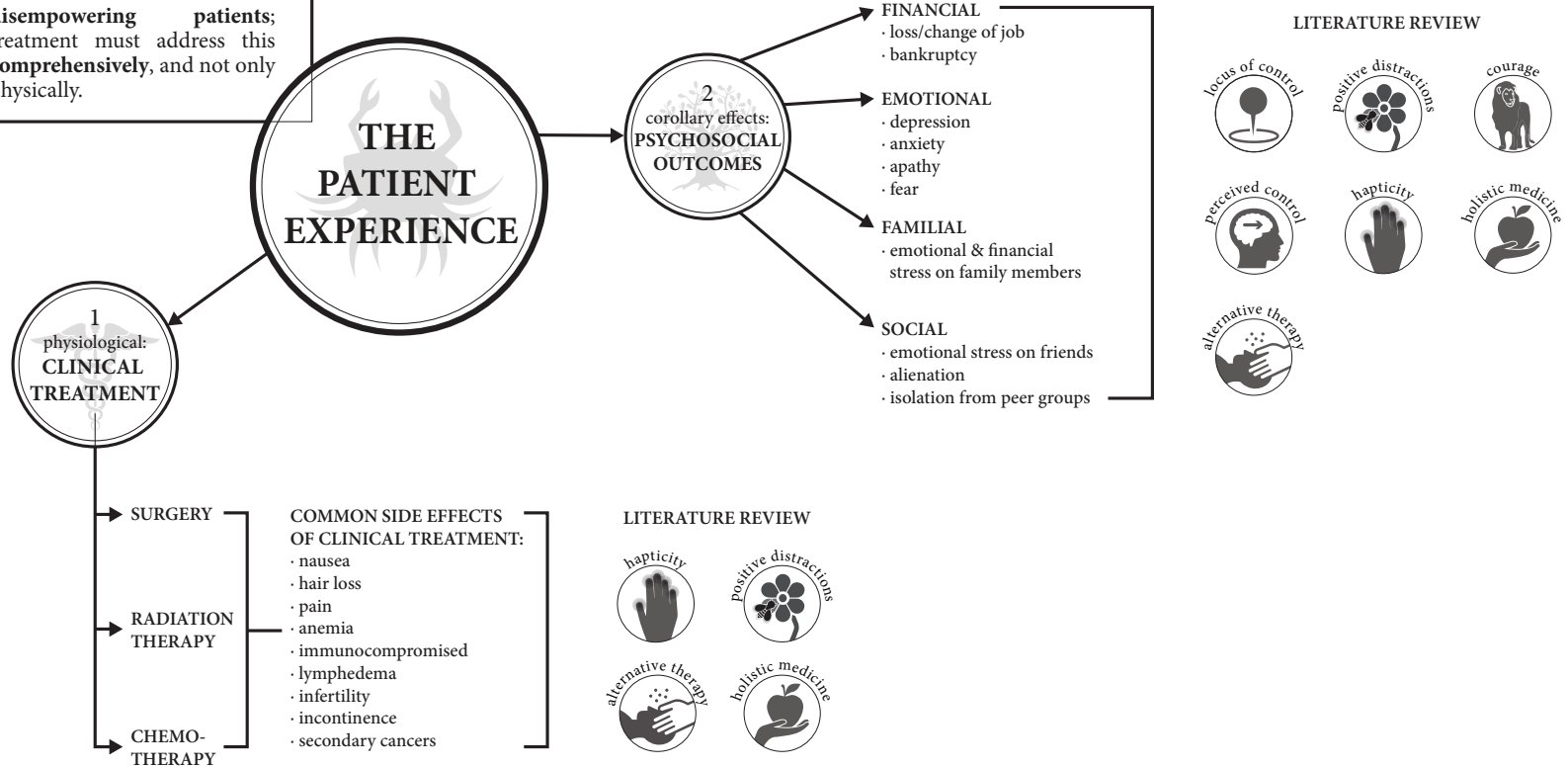


Figure 2: an overview of the patient experience in both physical and psychosocial capacities (Braden Reid)

## 2 | THE CANCER PATIENT EXPERIENCE



Figure 3: Andy + Non-Hodgkin's Lymphoma  
27 years old, from Millbury, MA

after stem cell transplant, going through follow-up bloodwork and IVs for immune system regrowth (3 times/week for ~2 hours, then twice/week, then once/week, then every two weeks etc, for a duration of approximately 1 year)

“Your mind is your worst enemy.”

(Braden Reid)

Approaches to cancer treatment can be either curative or palliative in nature. For those illnesses for which a cure of the cancer seems possible, treatment aims become curative (Adler & Page, 2008). The curative clinical approach is focused on eradicating disease from the patient's body. For cancers which bear a terminal trajectory, and for which no cure will be possible, the treatment takes on a palliative focus. Palliative cancer care is meant to maximize the patient's quality of life as they end its final stages (Campbell, 2011). It is common for some cancers to appear curable early in care, and then shift from curative to palliative after the tumor does not respond favorably to initial treatment (ibid). For patients, the possibility for treatment not to work adds another layer of uncertainty and fear to an already frightening experience.

This dichotomy between curative and palliative treatment brings about another discussion: what does it mean to heal a person, and what does it mean to cure them? In “Healing and the Mind,” Bill Moyers suggests that ‘curing’ takes on

a purely physical nature, specifically the treatment of a biological disorder. In contrast to this, 'healing' has a focus which encompasses the person as a whole: their emotional, mental, and spiritual needs are addressed, in addition to those needs which originate in the body. For a cancer patient with a tumor that appears treatable, this concept is especially relevant. They are attended to by a care team whose directive is to offer a cure, but this cure focuses solely on remediating the cancer itself; it does not address the healing needs of the patient. The clinical process of cancer treatment will in actuality yield significant side effects. For a patient who is already grappling with the idea that they have cancer, they must also now carry the burden of the physical and psychosocial 'cost' of treatment. In the realm of cancer care, there needs to be an equal emphasis placed on both healing and curing.

The concept that an individual's needs are made up of more than just physical treatment introduces a core focus of this investigation: what other, non-physical effects do cancer and cancer treatment have on the patient?



## Psychosocial Side Effects to Cancer Diagnosis and Treatment



Figure 4: Sandhy + Stage IV Metastatic Breast Cancer  
48 years old, from Baltimore, MD

date of diagnosis: December 2006  
weeks spent in chemotherapy to date: 16 (non-  
consecutive, 4 different cycles of chemo @ 4 weeks  
apart)

“Find a bit of beauty in the world today. Share it. If you  
can’t find it, create it. Some days this may be hard to  
do. Persevere.”

(Braden Reid)

A diagnosis and the subsequent treatment of cancer have effects that are manifest in both physical and psychosocial form. Until 2008, the psychosocial effects of cancer diagnosis and treatment had not been given the same attention as that of clinical treatment (Adler and Page, 2008). The corollary experience of having cancer can have implications that impact nearly every dimension of one’s life. These implications may emerge from the diagnosis itself, prior to any treatment, and take the form of psychological distress (Artherholt and Fann, 2011). They may also come as a direct result of the clinical therapies used to treat cancer. Many of these corollary implications become intertwined, where one negative effect may lead to others, further complicating strategies for treatment and care.

Though the term “side-effect” is often used with negative connotations, it can also be understood to have productive outcomes. Many cancer patients experience a re-oriented outlook on life after diagnosis (Manne et al, 2004),

and potentially more so if they reach a status of remission (this phenomenon was noted in many patient blogs and video diaries). The various psychosocial effects of cancer diagnosis and treatment are as follows:

*Spiritual:* it has been shown that spirituality is an important tool in aiding a patient to achieve reconciliation over their diagnosis (Brady, Peterman, Fitchett, Mo, & Cella, 1999). Within the context of psychosocial survivorship and coping, spiritual health has also been recognized as an important dimension for defining quality of life (Holmes, Coyle, and Thomson, 1999). For some patients, their connection with a higher power or with some inward part of themselves can be strengthened through their diagnosis. It is common for patients to express a re-ordering of the priorities in their life upon learning they have cancer; “I don’t sweat the small stuff anymore,” is a very common sentiment amongst patients (see Carl Denning, Emily McArthur, Melinda, Derek K. Miller, Lisa Bonchek Adams personal blogs).

The other side to what may be newfound spirituality for some, or strengthened



Figure 5: Stan + Colon Cancer  
64 years old, from Carlsbad, new Mexico

diagnosed December 2012, first underwent nanoknife,  
followed by 6 months of chemotherapy.

“We don’t get a break from ourselves.”

(Braden Reid)

spirituality for others, is a challenging of the spiritual beliefs one held before receiving their diagnosis. For some patients, they may find themselves asking the question, “why did this happen to me?” (Puchalski, 2001). This doubt of one’s self and of their foundational beliefs can work against the goals of treatment. In order to maximize quality of life, and the potential for positive treatment outcomes, the spiritual needs of the patient must be considered.

This can be achieved through a iconic and thought-provoking formal design (such as that found in a Maggie’s Centre, discussed in Chapter 5). Another way in which patient’s can have spiritual guidance is through the selective programming offered in a treatment centre, such as mindfulness practice, counseling, and through activities like yoga.

**Emotional:** there are extensive emotional side effects to a cancer diagnosis. Depression, anxiety, and fear are some of the common types of emotional distress experienced by cancer patients. Emotional turmoil can interfere with treatment, going so far as to inhibit patient adherence to their plan of care

(Artherholt and Fann, 2011). Depression is one of the most common emotional stressors for cancer patients. With an estimate that 20-25% of patients will experience depression at some point over the course of their illness, this makes cancer patients three times more vulnerable to develop depression than the rest of the population (Carr, 2002). Even more alarmingly, depression amongst cancer patients may result in higher mortality (ibid).

Anxiety is another common emotional stressor in cancer care. Some repercussions to having anxiety as patients can be high levels of fatigue, as well as impaired physical and social functioning (Stark and House, 2000). Many patients feel high levels of anxiety after their treatment has concluded, worrying about the possibility for their disease to come back (ibid). For patients undergoing chemotherapy, they frequently feel anxious about each of their infusions. For the first treatment, this anxiousness is usually attached to the stigma of chemo in popular culture (self-reported in numerous patient blogs). During all subsequent treatments, patients often associate the negative effects of chemo with all other areas of life, which can help to build up anxiety levels in



Figure 6: Carl Denning before treatment (Personal Blog)



Figure 7: Carl Denning 4 months into treatment (Personal Blog)

advance of the next round (Stark and House, 2000).

Having an emotional preoccupation with their physical health can become either an inhibitor to treatment or a contributor to healing. In 1990, Waston, Greer, Pruyn, and van den Borne developed the Cancer Locus of Control Scale, which identifies two very different paths a patient's experience can take, depending on their emotional response to their disease. For patients with high internal locus of control regarding the *cause* of their illness, they exhibited an "anxious preoccupation" about their disease (Waston, Greer, Pruyn, and van den Borne 1990). This meant that they felt helpless about why they had become sick, and was counterproductive to their path of care. For patients who had higher internal locus of control about the *course* of their cancer, they showed much more optimistic outcomes related to self-esteem, had lower anxiety, and less emotional turmoil (ibid). These patients felt more in control of their physical and emotional state.

The physical realm in which cancer treatment is delivered should help to calm

and centre patients as they undergo various therapies. By providing spaces and programs for contemplation or emotional reconciliation, in addition to, and at times within clinical treatment programs and spaces, the overall treatment setting can bring patients back into emotional balance, and equip them with the tools to preserve this balance throughout their healing process.

*Social:* many cancer patients find difficulty in maintaining the social ties they had experienced prior to diagnosis. While some support networks remain intact, becoming integral parts of a patient's treatment and recovery, some individuals find difficulty in knowing how to react to a friend's diagnosis and subsequent treatment. In one patient's blog, she describes the revelation of who her true friends are,

“Mostly the friends I thought were brilliant and I could depend on for anything – well, they have [nearly] all been amazing. Then you get the friends who you think you can count on 100% - ho, ho – forget that peeps! It doesn't work quite like that at all; when you

really need friends, some of them really startle you. Some of them are not really friends at all.”

*Sandhy*

(<http://sandhysown.blogspot.com/2008/09/oh-blah-de-blah-blimey-i-cant-half.html>, accessed 4 March, 2015)

As treatment progresses, and the patient experiences some of the physical side effects from their therapies (hair loss, lymphedema, weight loss or weight gain), friends find difficulty in reconciling the physical appearance of the person whom they knew before having cancer. The physical transformation of these side effects can be dramatic. This change in physical appearance can lead to social isolation for patients, which in turn may result in increased morbidity about their disease, and higher rates of mortality (Adler and Page, 2008).

In another patient’s video blog, the young woman (diagnosed at age 19 as a freshman in college), describes her difficulty in connecting with her peers as she begins treatment and the subsequent changes in her appearance develop.



Figure 8: Karen + Pancreatic Cancer  
30 years old, from Seattle, Washington

diagnosed February 2012, two weeks after giving birth to her son. undergoing 4 weeks of radiation therapy 5 times per week to shrink tumors, followed by 9 cycles of chemotherapy to be administered every two weeks.

“Sometimes I lie awake at night and ‘speak’ to my cancer. I tell it to get the hell out of my body – there’s no place for it in me.”

(Braden Reid)

In a later post, to cope with her feelings of loneliness and to fill her time with activities, she joins in an art class at her treatment centre. In her description of the other people in the class, she laughs somewhat embarrassedly, and says,

“it’s me and three... older people, and it’s really interesting, and it’s pretty funny.... but... i get a laugh out of it.”

*Lauren Wagner*

(<https://www.youtube.com/watch?v=li2ZJ-YMQnc>, accessed 3

March, 2015)

For patients to have a proactive opportunity to direct their own social path is very important, even if they feel apprehensive about it at first. Being social creatures, patients and survivors alike may seek kinship in sharing their experience. Not only is preserving close friendships from before diagnosis important, so too is establishing new connections with people who may empathize with another patient’s experience.



The design of the comprehensive cancer treatment centre can help to ease the burden of these dramatic physical effects by first establishing itself as a safe and comfortable place in which patients will not feel self-conscious. Spaces need to be provided that support opportunities for informal socialization and camaraderie with other patients going through a similar experience. The comprehensive cancer treatment centre can also offer programs that counteract some of the physical appearance side effects of treatment, such as physical therapy and diet and nutrition spaces.

***Familial:*** having a family member diagnosed with cancer can result in dramatic changes within a household. If the patient was a primary income-earner for the family, they may be unable to work while undergoing treatment, or the extent to which they are able to continue to earn might be reduced. In her personal blog, ovarian cancer patient Sandhy shares her concerns about her continued ability to earn a living, and contribute to the household income, a constant source of stress,

“For the rest of 2010 [once I got a grip], we struggled to make ends meet – literally. We canceled our pensions. We extended our mortgage. Well, the FH did all that, as I was useless. I got to work doing gardening, cleaning, painting and decorating – with the odd bit of graphic work thrown in. Anything at all. Just work – find it, do it, get paid.”

*Sandhy*

(<http://sandhysown.blogspot.com/2011/02/really-good-news.html>, accessed 6 March, 2015)

In cases where the patient lives in a two-person household, and the housework and chores were usually shared, the onus of all these tasks plus looking after a very sick person, can be taxing. As Carl Denning, a patient with pancreatic cancer explains,

“I am not sure if i knew how much responsibility it would take to look after me. Everything from hospital visits, caring when sick for

*“There’s a lot of things about being diagnosed with cancer that make you feel like you have no control: you can’t carry on with your ‘normal’ life, you can’t control the side effects of the treatment drugs, you can’t erase the physical surgical scars, and you can’t stop your body failing you. But, once your treatment is over and you start trying to put the experience behind you (as much as you ever can do with something like having cancer), there are things you can do to take back control.”*

Emily McArthur, personal cancer blog,

(<http://emilymcarthur.blogspot.com/2012/10/a-positive-cancer-scar.html>  
accessed 14 March, 2015)

days, cooking and cleaning, taking to the hospital in the middle of the night when something as gone wrong, then re-organizing all work plans due to no sleep.

It is not easy for Rob, or any other partner, family or friend looking after a cancer patient, and especially when they don’t get many pats on the back for it.“

*Carl Denning*

(<http://carldenning.blogspot.com/2014/02/happy-valentines.html>,

accessed 3 March, 2015)

Cancer treatment can therefore be taxing on family members as well. With patients often becoming unable to look after their own physical state, let alone continue contributing to the household, the burden of two people’s lives becomes placed on the shoulders of one person. By offering counseling programs to patients and family member alike, a comprehensive cancer centre can help all parties involved to disseminate their experiences. Some patient-

focused programs (such as diet and nutrition, and physical therapy) may also help to restore some independence to the patient, and subsequently relieve some of the pressure experienced by family members. Additionally, by designing a comfortable and nurturing place that may feel like a home away from home, family members can find reprieve in utilizing the treatment centre as a getaway from their private homes (which can develop negative connotations).

## The Physical Side Effects of Cancer Treatment

Of the myriad treatments used in clinical settings today, the three most common are: radiation therapy, chemotherapy, and surgery. Not all cancer patients will undergo all three treatments, however some cancers do require surgical removal of a tumor first, followed by either chemotherapy or radiation therapy, or some combination thereof (and there are instances in which a patient may receive all three). It is also common with certain cancer types for patients to undergo radiation therapy and chemotherapy simultaneously (eg. colorectal cancer). While each individual patient may react differently to their specific treatment, some of the most common side effects are as follows (<http://www.cancer.net/navigating-cancer-care/how-cancer-treated/radiation-therapy/side-effects-radiation-therapy>, accessed 8 April, 2015):

<i>Fatigue</i>	<i>Immuno-compromised</i>	<i>Anemia</i>
<i>Infertility</i>	<i>Early menopause</i>	<i>Weight loss/gain</i>
<i>Nausea</i>	<i>Taste/smell aversion</i>	<i>Edema</i>
<i>Pain</i>	<i>Secondary cancers</i>	<i>Hair loss</i>
<i>Neuropathy</i>	<i>Difficulty Breathing</i>	<i>Incontinence</i>

Many of these side effects are treated in the clinical setting with medications, either before or after treatment is administered. However for patients who are already undergoing a barrage of intense (and at times invasive) treatments, they become leery of being given more drugs, for which additional side effects can now be anticipated; many patients then seek a more therapeutic remedy (Verhoef et al, 2005). This makes the appeal of complementary therapies strong for patients. Having an alternative treatment which may reduce nausea, help with swelling, develop coping mechanisms for stress and anxiety, these options can bring gentler, more natural antidotes for the side effects of treatment. And finally, one very important reason patients sought complementary therapies, is so they could “take control of their illness” (ibid).

The comprehensive cancer treatment centre can be designed to minimize and counteract these side effects. By developing strategic functional adjacencies, the centre can prevent aggravation of side effects. It can also offer therapies that bring relief from these side effects, and can be accessed immediately, being housed in one facility (preventing the need for multiple appointments).

## Complementary Therapies



Figure 9: Alternative therapy treatment room at the Kaufman Cancer Centre, for acupuncture/massage/reiki (HKS)

While there are prescription drugs that are used to counteract these side effects, other, non-traditional treatments have also been put into practice. Some common therapies, synonymously known as 'alternative therapies', are as follows:

*Acupuncture*

*Reiki*

*Chinese medicine*

*Ayurvedic medicine*

*Acupressure*

*Massage therapy*

*Music therapy*

*Homeopathic medicine*

*Yoga*

*Naturopathy*

While all of these therapies have been shown to have benefits for cancer patients, some of the more prominent ones are discussed in the following section.

***Acupuncture:*** this treatment has been in practice for over 2200 years, and has its roots in Chinese medicine. Acupuncture uses very thin needles, placed in strategic parts of the skin at a shallow subcutaneous level, and in different

configurations to alleviate a variety of ailments, from headaches to allergies to depression. In the context of cancer treatment side effects, acupuncture can be used to treat fatigue from radiation therapy, one of the most common ailments experienced by patients (Mao et al, 2009). Of the complementary therapies in use for cancer treatment today, acupuncture represents over 18 percent, and is therefore the most common alternative therapy (Colleen et al, 2009).

*Massage Therapy:* a very useful alternative therapy for treating a number of different side effects, massage therapy is a very common treatment around the world. For cancer patients, its benefits are many. Breast cancer patients have experienced improved immune and endocrine system functions by receiving massage therapy (Hernandez-Reif et al, 2004); it can also relieve pain and improve mood in patients with advanced cancer (Kutner et al, 2008). Among a large sample of patients who represented myriad different cancer types, decreases in pain, nausea, anxiety, fatigue, and depression were reported (Myers, Walton, and Small, 2008). Additionally, these patients reported an improvement in sleep, insomnia being a common side effect among chemotherapy patients (ibid).



*Music Therapy:* a versatile therapy that can be delivered in either a group or individual setting, music therapy can take on many different forms. At its most basic, it involves simply playing music for patients to listen to. More elaborate forms can become songwriting for patients, or musical performance involving patients. Music therapy may be offered to patients while they sit in a chemotherapy chair and receive an infusion, or it can occur in a dedicated or common central space within a facility.

This treatment has been demonstrated to improve quality of life, help patients to vocalize and express their experience and emotions, reduce stress levels, and ease physical pain or discomfort from treatment or from the cancer itself (Richardson, Babiak-Vazquez, and Frenkel, 2008).

*Yoga:* another ancient form of meditation and alternative treatment, yoga has been practiced for many thousands of years and finds its origin in India. This therapy can be practiced one on one, or in small or large groups. The universally known benefits of yoga are in its restorative properties, physical, mental, and

emotional. The same benefits have been demonstrated for cancer patients. In a study of breast cancer patients who were undergoing radiation therapy, it was found that a regular yoga practice helped to reduce anxiety about treatment while they were undergoing it, as well as the intrusive thoughts that can develop once treatment has concluded and the possibility of a recurrence exists (Chandwani et al, 2010). Additionally, maintaining a level of physical activity during and after treatment was very beneficial to patients in keeping stress and pain levels to a minimum (ibid). In another study involving a restorative yoga practice, participants reported reduced levels of fatigue, health-related quality of life improvements, and positive shared group experiences, two months after their yoga therapy had concluded (Danhauer et al, 2008).

Nearly all of the complementary therapies have the dual benefit of counteracting physical and psychosocial side effects, and establishing a sense of control for patients. Given their high degree of utility, demonstrated benefit in cancer treatment, and relative ease of installation (Chapter 6), alternative therapies can and should find a prominent home in cancer treatment centres.

### 3 | PRIMARY CLINICAL + COMPLEMENTARY TREATMENT FACILITIES

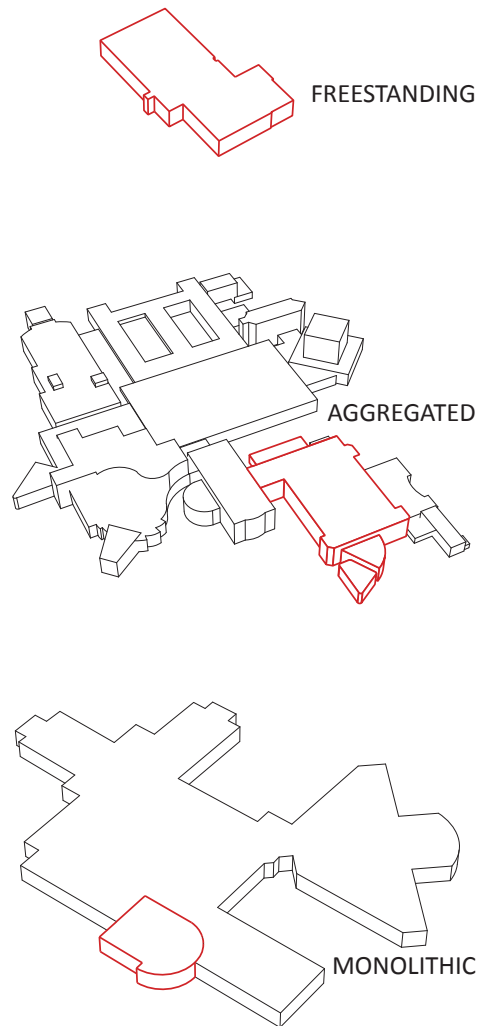


Figure 10: Cancer centre types (Braden Reid)

The architectural portion of this thesis investigation takes place across two different physical and programmatic typologies: the outpatient cancer treatment centre and settings for complementary therapies (which can be anything in scale from a freestanding brick and mortar facility, to a class held in a multipurpose room within a much larger building).

While there are a variety of different architectural options for cancer treatment, primary clinical outpatient care can take one of three main forms: a freestanding clinic, an aggregated clinic attached to a main hospital, or a centre situated within a monolithic hospital structure.

*A freestanding clinic:* in this model, all of the main cancer treatment program components will be housed in a stand-alone building, completely detached from a hospital proper. Depending on the scope of services and the context that this facility serves, the freestanding clinic may still utilize certain services

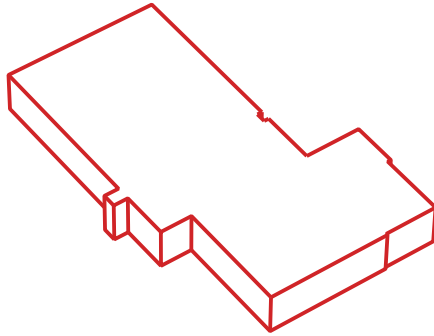


Figure 11: Freestanding cancer clinic form (Braden Reid)



Figure 12: rendering of the front elevation at Bon Secours St. Francis Millennium Cancer Centre (St. Francis Health)

housed in the main hospital. For example, some imaging equipment, such as PET-CT and MRI machines, would likely not be programmed in the freestanding clinic. Instead, clinicians will send patients to the main hospital for a particular scan on a case-by-case basis, amidst whatever treatment they are receiving at the outpatient clinic.

Located in Greenville, South Carolina, the Bon Secours St. Francis Health System Millennium Cancer Center (MCC) is an example of a freestanding brick and mortar clinic. Design by McMillan Pazdan Smith and opened in 2014, the MCC is two stories and 65,000 square feet. Programmatically, this facility includes radiation therapy, chemotherapy infusion (with bone marrow transplant), and medical oncology.

*An aggregated clinic attached to a main hospital:* this form of cancer care is typically added onto an ever-expanding hospital building as the scope of services and community context evolve and demand a more detailed level of care. Physically, the aggregated clinic may either house its own internal

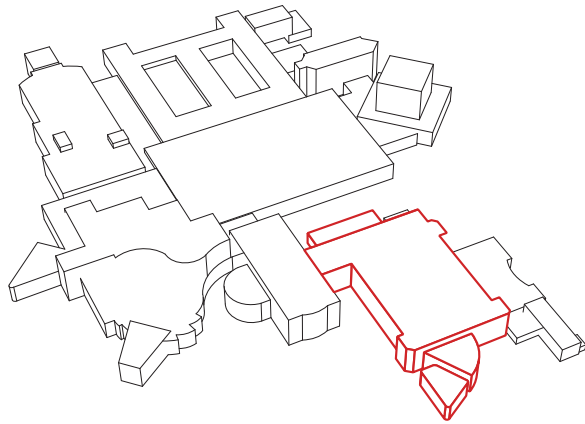


Figure 13: Aggregated cancer centre form (Braden Reid)



Figure 14: entry pavilion for the Ann Barshinger Cancer Centre, with main hospital in background (Architizer)

program components, or may share them with the larger hospital, (depending on adjacencies, patient throughput in the larger hospital, and the physical limitations of the cancer centre addition). These cancer centers are often created and designed to give a distinct service line identity to cancer care within an existing larger institution, and they often have a separate entrance to promote this identity along with ease of access.

The Ann Barshinger Cancer Centre in Lancaster, Pennsylvania is an example of an aggregated facility, added on to the main hospital once demand and funding were in place. This 100,000 square foot facility was opened in 2013. It houses radiation therapy, medical oncology, and chemotherapy infusion suites internally. The point at which it connects to the main hospital allows for shared use of the breast health services and some other imaging services that were not programmed into the cancer centre.

*A service line of department situated within a monolithic hospital structure:*  
built and planned at the outset of the new hospital development, in contrast

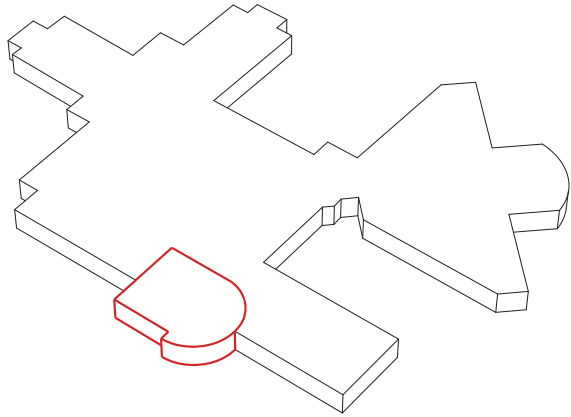


Figure 15: Monolithic cancer centre form (Braden Reid)



Figure 16: rendering of the Cancer Centre wing at the Grande Prairie Regional Hospital (Dialog)

to the aggregated cancer centre form, this type of facility differs in that it will have been incorporated into the program from the conceptual development phase of the hospital. As such, it may have a more idealized set of programmatic adjacencies, while still sharing certain major equipment with the larger hospital, again depending on scope and patient throughput.

The new Cancer Centre at the Grande Prairie Regional Hospital in Grande Prairie, Alberta is an example of a facility programmed into a new hospital, constructed all at the same time. This Cancer Centre will house radiation therapy and chemotherapy infusion, and sits within a larger facility of 690,000 square feet. Patients will utilize some in-department imaging services, as well as the nuclear therapy PET-CT equipment located in the main hospital imaging department on the ground floor.

As the trend in cancer care continues to move into freestanding, community-based outpatient settings (American Society of Clinical Oncology, 2014), this project will focus on the development of a freestanding outpatient cancer clinic.

While there are certainly many instances in which a new cancer centre can be implemented as either an aggregated facility or within a monolithic hospital, using a freestanding form as a test case in this investigation will allow for a truly holistic design exploration. By being fully detached from a primary hospital, a freestanding ambulatory cancer centre is also held to different standards of construction. As Nesmith elaborates, “because of the differences in the strictness of building codes in acute care hospitals, ambulatory care facilities are seen as an opening for more progressive and sensitive design” (Nesmith, 1995).

Additionally, developing this design on a greenfield site will allow for the most exhaustive exploration of a more holistic and integrated approach to site-building design, and allow a more comprehensive demonstration of all design guidelines (Chapter 5), particularly those which address a setting in which topography and existing vegetation is important for design.

From the perspective of patient empowerment, a freestanding facility is afforded

the benefit of selecting its neighbours and how much or how little to interact with them. The full patient experience can be curated in a setting like this, and all opportunities for patient control can be implemented (for instance, the patients will not have to navigate a campus with other hospital departments, allowing for a more assertive and decisive experience of arrival and transition into the facility).



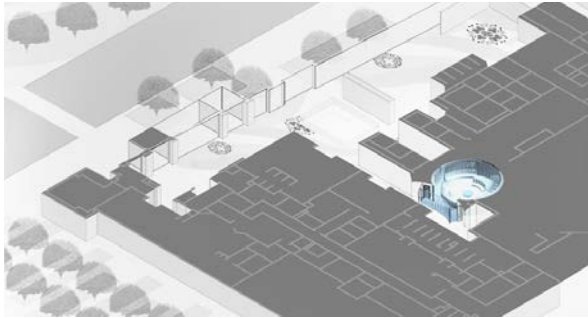


Figure 17: the 'Quiet Room' situated within the floor plan at Duke University Cancer Centre (Duda|Paine)

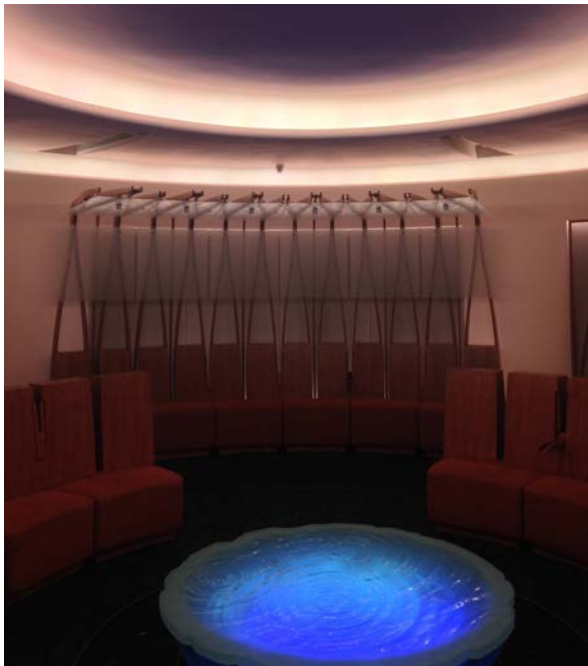


Figure 18: interior detailing of the 'Quiet Room' at Duke University Cancer Centre (Braden Reid)

## The Complementary Treatment Centre

A relatively new addition to the cancer care landscape, complementary treatment centres were investigated in four different forms: small scale treatment in the form of a room or small cluster of rooms within a larger facility; medium scale facilities in the form of a small free-standing centre, approximately 4000 square feet in size; a large scale free-standing facility of approximately 24,000 square feet; and a complementary care facility not specific to cancer. Collectively, complementary therapies in their various physical forms can provide useful and less-invasive treatments to counteract the physical and psychosocial effects of cancer.

*Small scale complementary cancer care:* at the most basic level, complimentary care services may occur as a single room within a larger facility. At the Duke University Cancer Centre, a one-off room was uniquely designed as a spot for introspection, contemplation, and meditation. Patients, visitors, and staff can make their way to this 'quiet room' and take a bit of down time in the midst of



Figure 19: the complementary therapy suite located within the ground floor plan at the Kaufman Cancer Centre (HKS)

a bustling hospital setting. While elaborately detailed, the program of the room itself is very simple: it contains ample seating, fixed in a circular configuration; the room was equipped with programmable lighting settings with different themes that can be set by any user; and there is a light sculpture as a focal point in the middle of the room to reflect upon.

With a slightly more substantive scope, complementary services may be a dedicated suite, programmed and designed as a component of the cancer treatment program. This is seen in the University of Maryland Medical System Kaufman Cancer Centre (KCC), in Bel Air, Maryland. At this facility, they have implemented a program call “Cancer LifeNET” which provides financial, psychological, and familial support for patients. At the KCC, they have also designed and dedicated two rooms for integrative therapies (massage, reiki, acupuncture, and healing touch), and they have a multipurpose room in which yoga and tai chi classes are held (this space also doubles as a conference room, and the setting in which clinicians and the whole care team get together as a tumor board to discuss cases in question that day).



Figure 20: variation on formal design in Maggie's Centres (top-bottom) - Aberdeen (Snøhetta), Fife (Zaha Hadid), Dundee (Frank Gehry)

*Medium scale complementary cancer care:* complementary therapies may also be delivered via a freestanding building, completely independent of the clinical cancer treatment centre. Throughout the United Kingdom, an organization called Maggie's has built 17 unique treatment centres, each of which must fall within a footprint of approximately 4000 square feet. Every Maggie's Centre shares the same program, however the physical form they take is entirely developed by the architect who designed the project. As a result, every Maggie's bears a striking and unique identity (Figure 20), but share common criteria that are embedded in the functional program. It is the combination of unique identity and a shared framework that contributes to the success of every one of these buildings. Alongside a qualitative description of each space required in a new Centre, the Maggie's architectural brief describes the role of the architecture as "a place to turn to which is surprising and thought provoking– and even inspiring – will give [patients] the setting and the benchmark of qualities they will need in themselves" (Maggie's Centres, 2014).

Maggie's Centres are an excellent precedent because they are innovative in their

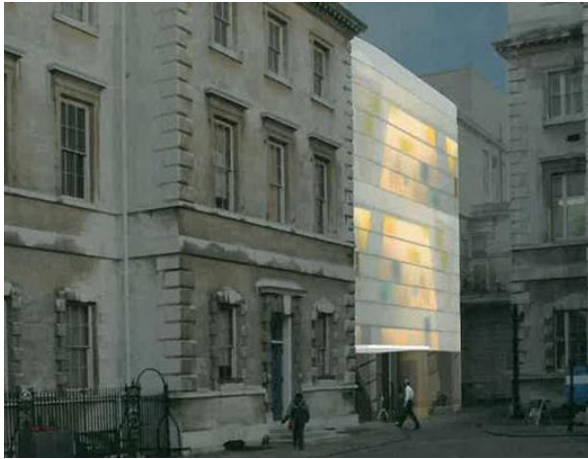


Figure 21: innovative facade design proposed for the new Maggie's at St. Bart's Hospital, by Steven Holl (ArchDaily)



Figure 22: birdseye view of the Centre for Cancer and Health in Copenhagen, in contrast to its red brick surroundings (NORD Architects)

approach to care, but they also place high design at the top of the list for every new facility (Figure 21). The services offered in Maggie's Centres are all free of charge, which means that the facilities must fundraise, rely on donations, and volunteers in order to operate and construct each Centre. This is a testament to the importance of design and the success of these centres: Maggie's is able to engage world-renowned architects for every new centre they build, without the resources associated with most private architectural commissions. In his proposal for the new Maggie's at St. Bart's Hospital in London, Steven Holl has conceptualized the new facility as "a vessel of transcendence," using the facade as a transformative threshold for people when they enter the facility ([www.stevenholl.com](http://www.stevenholl.com)). As an organization, Maggie's recognizes the role that confident and striking design can play in influencing the occupants of a building. This mentality has not typically been associated with healthcare facilities to any great extent, being structures that rely overwhelmingly on functionalism over form (and for good reason). While the healthcare program of a Maggie's Centre is not comparable to a full-scale hospital with a much higher degree of complexity and services, they have nevertheless identified an opportunity to



Figure 23: central dining space and lounge at the CCCH (NORD Architects)

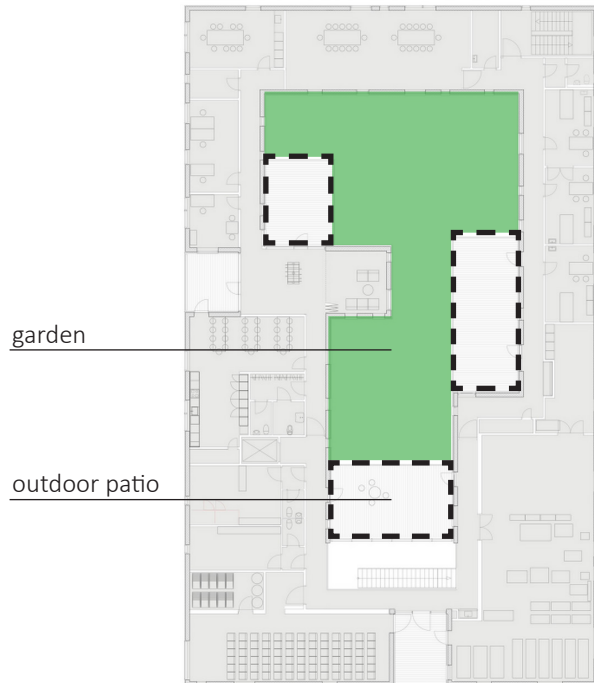


Figure 24: plan for the first floor, with central garden and outdoor patio spaces (NORD Architects)

connect with the very particular patient population they serve, by way of iconic yet experientially rich design.

*Large scale complementary cancer care:* at a larger physical scale of 24,000 square feet, the Copenhagen Centre for Cancer and Health (CCCH) in Denmark illustrates another facility that is dedicated to offering complementary therapies.

The CCCH is a 500 metre walk or drive from the Rigshospitalet, where residents receive their primary treatment. The physical design of the Centre was conceived as a contrast to the red brick architecture of its surrounding environment, breaking down the scale of the megablock buildings in this neighbourhood, and therefore putting “the individual (as) the center of attention” (<http://www.kraeftcenter-kbh.dk/en/a-new-house-for-the-centre>, accessed 18 March, 2015). Another example of empowerment through physical design, the CCCH strikes a sense of closeness among its patients, while at the same time reinforcing their solidarity as agents of their own health and wellness (ibid). One of the main outdoor features of this facility is a patio space where its occupants can sit and think. This allows for contemplation about what is occurring in their lives at the





Figure 25: multiple smaller structures of the CCCH, tied together with a singular sculptural roof (NORD Architects; edit Braden Reid)

moment. It sits within a sheltered space, that can also be monitored by staff discretely, and so provides a safe setting for people to process their experience and regain control over the situation (Figure 24).

In terms of formal design, the CCCH is conceived as a series of smaller buildings that allow for more intimate and parsed out space, but the whole structure is tied together with a sculptural roof (Figure 25). This enabled the designers to maintain a human scale between the building and the users, while at the same time enclosing a significant program (approximately 6 times larger than a Maggie's Centre).



Figure 26: the Duke Integrative Medicine Centre at dusk (Duda|Paine)

*Complementary care not specific to cancer:* precedents of complementary cancer care are few and far between, having become an element of cancer treatment only during the last decade. Many complementary therapies draw on practices that have been extant for a long period of time and are subsequently utilized in many other healing contexts (for example, the use of acupuncture to treat insomnia, or hypnosis as a tool for smoking cessation, Elkins and Rajab,

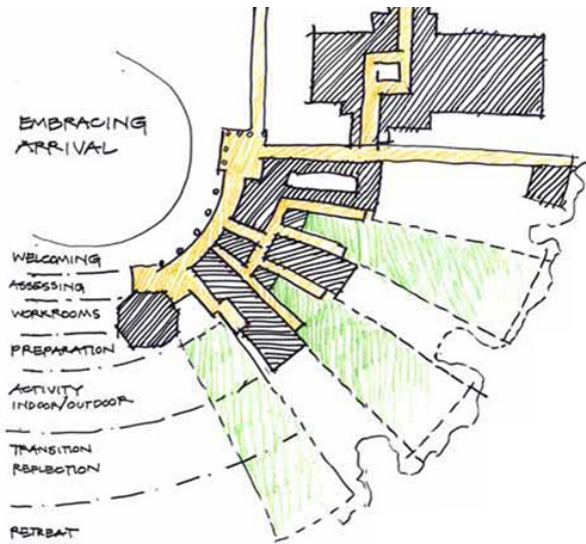


Figure 27: the architect's parti sketch of each wing at DIM projecting into the forest (Duda|Paine)



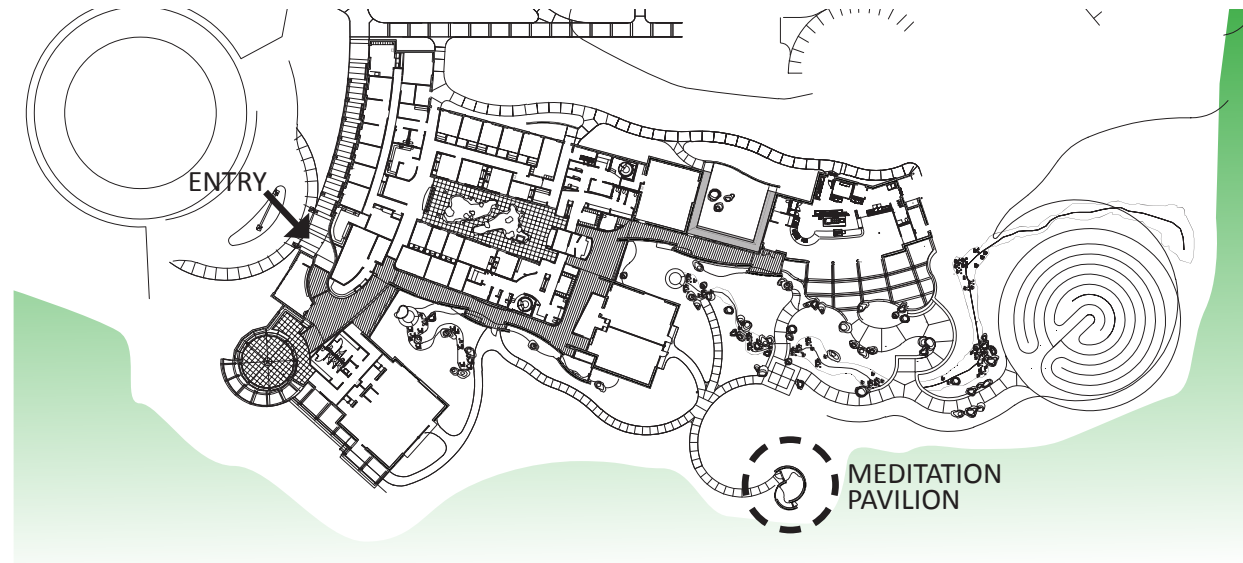
Figure 28: the reading room at DIM, pushed up to the forest edge (Duda|Paine; edit Braden Reid)

2004). Because of this, there is precedent for complementary therapy centres that do not bear a specific cancer focus, but are nevertheless relevant case studies for this investigation.

The Duke Integrative Medicine (DIM) facility in Durham, NC was one of the first dedicated complementary therapy facilities in the US. With a footprint of 27,000 square feet, the DIM contains an extensive selection of alternative therapies. The building itself was sited adjacent to a wooded parcel so that its floorplan could be organized to push users closer to the forest the deeper they get into the facility (Figure 27). Programmatically, this means that patients experience a “layered” effect of entering the building, where public areas of high traffic are found in the first “layer”, and then as patients move further into the facility, they become more enveloped by quiet surroundings that interact as closely as possible with nature (Duda|Paine project description).

The most private, quiet, and fully secluded space in the DIM program is a small meditation pavilion which exists as a separate building at the very edge of the

Figure 29: the meditation pavilion DIM, set apart from the rest of the building, and tucked close to the forest edge (Duda|Paine; edit Braden Reid)



forest (Figure 29). With a major focus on the use of positive distractions, most of the views to nature and program adjacencies are curated to give patients a connection to the outdoors, as well as an element to focus on that will minimize any anxiety about receiving treatment.

The physical setting in which cancer treatment takes place, whether clinical or complementary, is important to the patient experience. The functional qualities of a healthcare facility are unquestionably essential; operations must flow seamlessly, treatment must be administered without hindrance, and staff



and material flows require efficiency to achieve maximum results. However the case studies presented in this chapter show that physical design is also important. It has been demonstrated by Ulrich that the aesthetic qualities of a treatment space can have positive impacts on patients (the healing benefits of views to vegetation and nature). In the same vein, the success of the Maggie's Centres have shown that formal architectural design is also highly valued in the healthcare setting. As an organization, Maggie's boasted a 99% approval rating from the 125,000 patients the treated in 2013 ([www.maggiescentres.org](http://www.maggiescentres.org)). And in a review of 30 trials that focused on the effects of the physical healthcare environment on patient well-being, Dijkstra, Pieterse, and Pruyn found that architectural and interior design were two of the top three most relevant dimensions (Dijkstra, Pieterse, and Pruyn, 2005). Increasingly, an emphasis on architectural form is becoming an important criteria in developing healthcare environments that heal.



Figure 30: the three areas of foci of this thesis investigation (Braden Reid)

#### 4 | THE COMPREHENSIVE CANCER TREATMENT CENTRE

With an in depth investigation of the cancer patient experience (and the physical + psychosocial side effects associated with cancer), the clinical and complementary treatments in practice, and the physical settings in which these treatments are administered, the focus now lies on how to combine these ideas into a design solution. This design solution will take the form of a comprehensive cancer treatment centre.

One of the most important commonalities amongst the three areas of foci (Figure 30) this thesis investigation has taken, lies within the thread of patient empowerment. With the many vulnerabilities presented to a cancer patient (explored in chapter 2), an essential theme in this comprehensive cancer treatment centre becomes how to increase patient involvement and best support their empowerment. Every patient's experience may be different, and indeed, for one patient their individual experience may change from day to day, depending on their reaction to treatment. This volatility can contribute further

to the powerlessness that patients feel. Therefore, the options for individual control and personalized involvement with one's treatment plan become a critical variable in nurturing patient empowerment. As Malkin contends, "(t)he most important thing is to provide control, so that the patient has options and is able to decide what is best" (Malkin, 1991). In order to set up the strategy for achieving this, a series of project goals must be established.

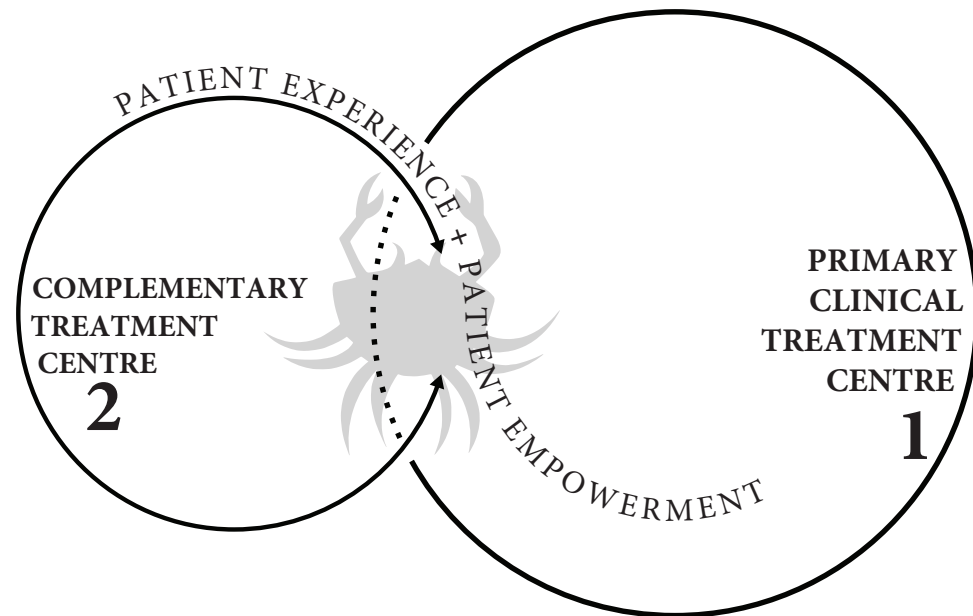
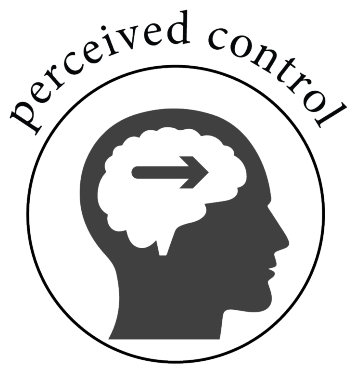


Figure 31: a conceptual diagram for the comprehensive cancer treatment centre (Braden Reid)

## Project Goals

The following goals derive from issues identified throughout this thesis exploration. Some originated out of site visits or case studies, and anecdotal evidence shared by staff members. Others came out of the literature review, and themes with recur throughout cancer treatment studies. Given the patient-experience focus of this project, many of the project goals speak to the personal stories shared by patients in their blogs and video diaries. Together, these goals will help to frame the design guidelines that follow in Chapter 5, and will provide a solid foundation on which to present a design proposal.



*Establish control for patients:* as a recurring theme throughout this investigation, the establishment of perceived control for patients is a central focus. Throughout every part of their treatment, patients should feel as though they are a primary agent in their path to healing. From the point of choosing whether to undergo treatment or not, patients should begin to feel a sense of authorship over their experience at the start of their cancer journey. The degree to which spirituality

may be in question, or the emotional turmoil at not knowing what their outcome may be, these variables can have a corrosive power over patients and are best harnessed by the patient gaining control before it is lost. At every juncture in the design process, the question should be asked, “how can patients be given agency over this element?”



*Nurture a haptic experience:* the various physical and psychosocial side effects that patients can experience have been outlined in detail. Some of those side effects favor one particular sensory stimulant over the others, and can throw that sense out of balance for the patient (chemo patients and taste aversion, for example). Further, the significant amount of time patients spend in the care facility can negatively or positively reinforce these sensations, described by O’Neill as the “time-space routine” (O’Neill, 2001). Rather than viewing this as a phenomenon that must be endured by patients as a part of their cancer experience, the treatment journey can become an opportunity to leave a positive lasting memory on patients, termed by Tuan “topophilia, or love of place” (Tuan, 1974). By focusing design decisions on methods for positively engaging

all senses, mitigating known sensory aggravators, and illuminating new haptic experiences, the design solution can work to nurture the physiological memory left with patients.



*Promote courage in patients:* in the face of extreme physical and psychosocial turmoil, patients can become emotionally defeated by their struggle with cancer. One way in which to counteract this is to promote courage in patients as they undergo treatment and strive to overcome this battle with their disease. Finfgeld defines “courage” as involving the “long-term stamina to push beyond incessant challenges” (Finfgeld, 1999). This aptly describes the struggle of a patient (for whom treatment may appear to work at first and then fail altogether in multiple different capacities, as was described by ovarian cancer patient Emily McArthur in her personal blog).

Courage can be promoted in patients through the physical design of the treatment centre. Similar to how each Maggie’s Centre, small in footprint but expressive and thought-provoking in architectural gesture, confidently presents

itself to the context in which it sits, the design proposal for a comprehensive cancer centre should seize opportunities to be bold in its architectural form.



*Develop a holistic setting to provide care:* the entirety of the comprehensive cancer treatment centre should present a holistic approach to care. Holism is based on a humanistic philosophy, which places human awareness, agency, and consciousness at the center of its focus (Williams, 1998). Review of the patient experience in Chapter 2 expanded upon the human experience embedded in a cancer diagnosis, illustrating in various ways how human awareness and human consciousness can be triggered through physical and psychosocial side effects.

In order to achieve holism as a care facility, the various clinical treatments and complementary therapies contained within the comprehensive cancer centre program must address all the physical and psychosocial needs of patients in an integrated manner, not individually or episodically. Given the humanist approach to holistic design, the development of a holistically therapeutic “landscape” will inevitably emphasize patient empowerment and patient choice as a central

axiom (ibid).

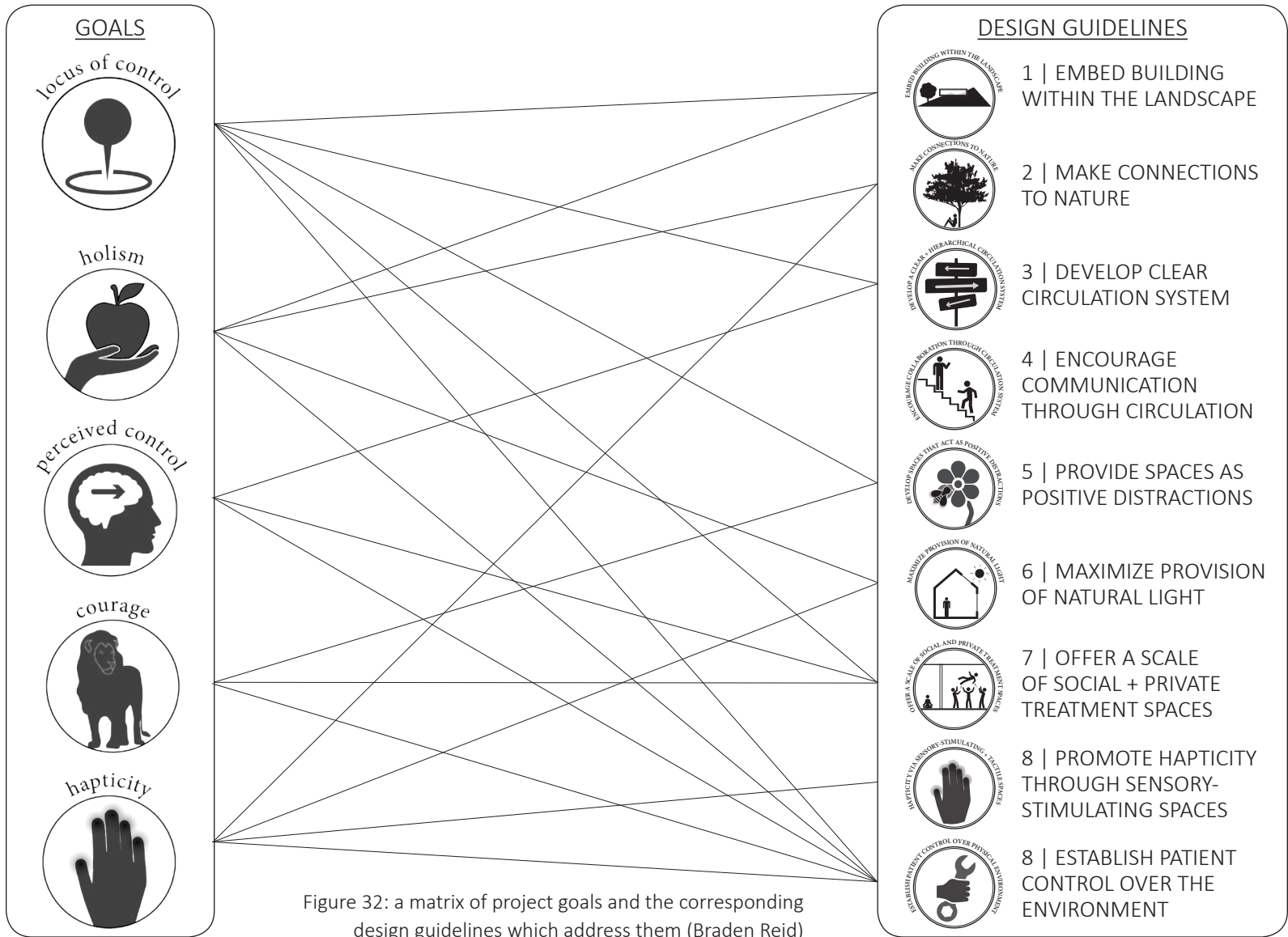
Similarly, the building as a whole will encompass a picture of holistic design. From the scale of siting and passive environmental controls, to the detail of paving materials, every design decision should be an essential component to presenting a complete and thorough building.

Collectively, the goals of this project form a holistic set of foci through which to develop a set of guidelines for designing a comprehensive cancer treatment facility. By achieving these goals, the design guidelines will lead to a facility that addresses the physical and psychosocial needs of the patient.



## 5 | DESIGN PRINCIPLES / GUIDELINES

In order to help guide the design process used in this investigation, the following nine design guidelines were developed and utilized in the production of a design solution: 1) embed the building within the landscape; 2) make connections to nature; 3) develop a clear and hierarchical circulation system; 4) encourage communication and collaboration through the circulation system; 5) develop spaces that act as positive distractions; 6) maximize the provision of natural light; 7) offer a scale of social and private treatment spaces; 8) promote hapticity through sensory-stimulating spaces; 9) establish patient control over the physical environment. Together, these guidelines form a set of directives designed to achieve the goals set out in Chapter 4. They each work to solve the problem of patient empowerment in some way, be it through a high level strategy that addresses empowerment at a phenomenological level, or through a detailed strategy that empowers patients at the sensorial level.



The design guidelines generated in this project are each tasked with performing a multiplicity of functions: to the greatest extent possible, every guideline will address one or more psychosocial issues, and at the same time contribute essentially to a coherent architecture. As such, the guidelines each have in common traits that bear a qualitative and phenomenological benefit. Working in tandem with the psychosocial aspect of this project, the design guidelines focus on countering these non-physical effects of cancer, and fostering patient empowerment. The guidelines also share the directive of being essential for comprising a successful outpatient cancer treatment centre.



important for achieving:

- POSITIVE DISTRACTIONS
- HAPTICITY
- HOLISTIC TREATMENT

how implemented:

- SUBMERGE STRATEGIC PROGRAM COMPONENTS BELOW GRADE (RADIATION VAULTS)
- PLAN SPACES AROUND REQUIREMENTS FOR DAYLIGHT, AND DISTRIBUTE ACCORDINGLY

## Embed building within landscape

This guideline suggests that appropriate portions of the building footprint be built into the topography of the site in which it is located. The exact form this could take will depend upon the topographic profile of the landscape in question. As a result, this would almost certainly result in very different physical outcomes from project to project. Yi Fu Tuan's concept of "topophilia," explains the bond that develops between people and a place (Tuan, 1974). Topophilia suggests that humans will develop a "total, physical engagement with the land" and this will be reinforced the more time we repeatedly spend in a place (O'Neill, 2001).

With the frequency and intensity of clinical cancer treatments, a patient's topophilia will be promoted over the course of their time at the centre. By strategically setting parts of the building footprint into the landscape, this can help positively draw attention to some of the natural features of a site: for example, if there is an area in which slope is more pronounced, and therefore

envelopes more of the building; or the more shallow parts of the site that allow for patients to walk out of the lower level and interact with the landscape; or, if a site bears no significant topography, new contours can be made, and this in itself would yield a compelling topophilic experience for patients.

The significance of setting a portion of the building footprint into the earth is multifaceted. First, the treatment vaults located in the radiation therapy portion of the program have demanding construction requirements. The linear accelerator equipment that delivers radiation doses to patients must typically be contained within concrete walls, floor, and ceiling of the treatment vault, and this is typically achieved by using 5' thick concrete on all sides. As an added safety precaution, the common practice is to avoid abutting spaces with long-term occupancy on all sides of the vault. Locating the vaults below grade mitigates some of the adjacency complications and allow for a more natural concealment of these thick concrete surfaces.

Second, a dramatic design move such as this automatically sets up opportunities

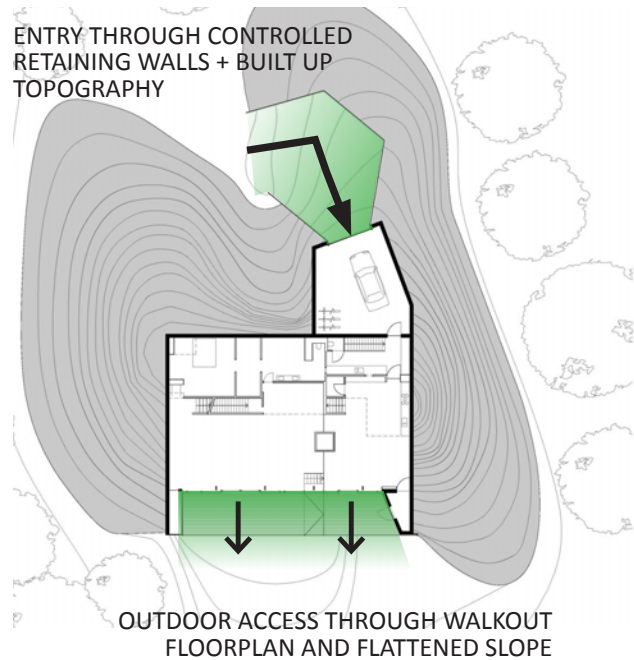


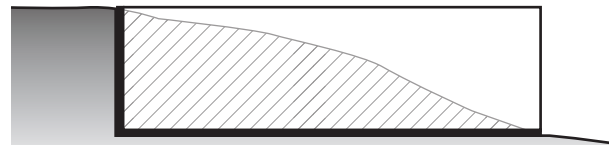
Figure 33: Dutch Mountain House plan by denieuwegeneratie; edit by Braden Reid



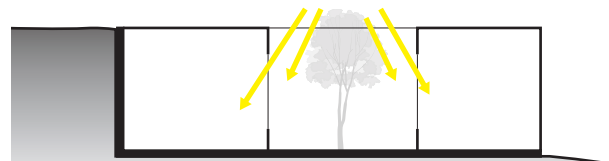
Figure 34: (L) Dutch Mountain House entrance view; (R) walkout plan on opposite elevation (ideasn.com)

for positive distraction, grounded in the user's topophilia for that place. A user who enters a building and then, in moving from the entry floor at grade to another which lies below, experiences a completely different take on the landscape they have just arrived to. This can help shift the patient's focus from any negative emotions they may be experiencing before treatment, to a curiosity and interest in the landscape they have entered for cancer care. The Dutch Mountain house yields a similar experience, inciting curiosity about what manifestation of building form might lie beyond two mysterious doors protruding from a grassy hill (Figure 34).

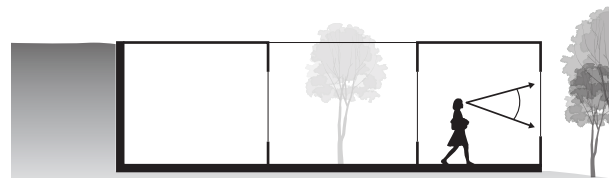
And finally, by submerging a portion of the building below grade, this allows for the use of passive heating and cooling mechanisms, mitigating some of the energy demands a facility of this scale will require. Geothermal heating and cooling takes advantage of a constant ground temperature. In cooler months, air intake is preheated when air is drawn through the ground that is warmer than the outdoor air temperature. In hotter months, the reverse effect happens. Soil below grade is cooler than outdoor air which, allowing for air intake to be pre-



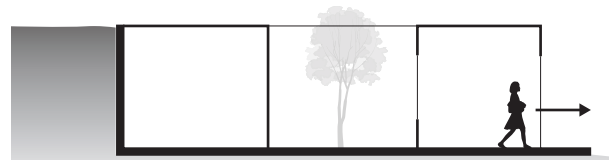
1. USE AVAILABLE SLOPE TO HOST FOUNDATION



2. INTRODUCE COURTYARD FOR NATURAL LIGHT



3. MAINTAIN VISUAL CONNECTION WITH SURROUNDINGS FOR USER ORIENTATION



4. ALLOW OUTDOOR ACCESS FOR EGRESS + AMENITY

Figure 35: methods for setting a building into the topography (Braden Reid)

cooled, and subsequently demanding less energy by the building's HVAC system (<http://www.wpghci.com>).

This guideline can take advantage of any naturally occurring topographic slope on a project site. If no substantial elevation gain or loss exists, it may be possible to develop artificial contour lines to build into, with no loss to the relevance and richness of this guideline (as was done on the site of the Dutch Mountain House).

The basic and fundamental method for setting some of the building program below grade is very straightforward: select an area of the site in which contour lines are closer together and the elevation change is more significant than in other areas, and use that slope to build foundation walls in the ground. Other important design considerations then lie within how to mitigate the 'subterranean' nature of a building set below grade: the introduction of courtyards to the plan which will yield an abundance of natural light; methods for keeping users oriented in their surroundings by providing points of reference



Figure 36: Head Smashed In building set into topography (edit Braden Reid)



Figure 37: daylighting from lightwells on interior of Head Smashed In building (LeBlond; edit Braden Reid)

and views to the surroundings; and allowing easy access to the outdoors on this level so that emergency egress is maintained, and patients do not feel trapped underground (Figure 35).

The Head Smashed In Buffalo Jump Interpretive Centre in Southern Alberta, Canada by The LeBlond Partnership is a clear example where the natural topography of the site was used to great advantage. Conceptually, this project is a narrative on an historical practice of first nations hunters who chased buffalo off the edge of a tall embankment. To make a physical connection between where visitors enter the centre at the bottom of the embankment, and where they can walk along the edge of the cliff at the top, the architects set the three stories of the building into the cliff side almost entirely. This forces visitors to ascend through the topography as they visit exhibits and move through the building. When they emerge from their visit to the Centre, they are at the top of the cliff.

The Spencertown Residence in Upstate New York by Thomas Phifer illustrates a





Figure 38: front elevation of Spencertown House, with retaining wall and view through (edit Braden Reid)



Figure 39: rear elevation of Spencertown House with full glazing and walkout condition (edit Braden Reid)



Figure 40: side elevation of Spencertown House showing placement in topography (edit Braden Reid)

precedent in which a small change in topography was added to the gently sloping site, enabling the architect to resolve their design concept most strongly. On the entry elevation of the building, the user experiences a very controlled profile of the building, seeing only the front door of the house, the edge of the retaining wall running the length of the house, and the roof profile. This allows for the opposite elevation of the building to have a full walkout condition, and windows that run the length of the house. Environmentally, the design maximizes use of geothermal heating and cooling, cross-ventilation, and abundant natural light.



important for achieving:

- PATIENT EMPOWERMENT
- COURAGE

how implemented:

- SIMPLE AND INTUITIVE SYSTEM, APPARENT FROM POINT OF ENTRY
- PUBLIC AND STAFF ROUTES CLEARLY DELINEATED
- CONTIGUOUS THROUGHOUT ENTIRE BUILDING

## Develop a Clear and Hierarchical Circulation System

This design strategy outlines that the system of wayfinding in the building be kept as simple as possible. Its hierarchy should be clear and immediately understood by patients and staff, and should be carried through all levels of the building. Patients should intuitively understand where to go and where not to go. There should be a clear physical demarcation between public and private, major pathways and minor ones. First time visitors should be able to find their way to appropriate destinations and easily recall the journey when returning.

As the fundamental way in which patients access the programs and therapies contained within the building, it is essential that they be lead intuitively from one space to another with no possibility for becoming disoriented or lost. Ulrich has demonstrated that a confusing wayfinding system can contribute to a loss of control amongst patients (Ulrich, 1992). Given the stressors already associated with the clinical treatments of cancer care, it becomes ever more important that the design minimize any contribution it might add to the stress

patients experience (Carpman and Grant, 2002). Wayfinding and circulation is one of the most essential organizational elements that can mitigate this stress. The experience of patients and staff of ambulating within the building should be effortless.

The strategy for circulation requires thoughtful consideration at the very early stages of building siting and design. Arrival and patient drop off, point of entry and orientation, pathways to various services, activities, and event spaces all must be given attention when conceptualizing how users will make their way around a building. Given that circulation and wayfinding begins the moment someone enters a site, the clarity of this circulation system should be apparent and organized at the level of site circulation. The clarity and discipline with which the site is organized should be carried through all organizational elements of the building.

The circulation system should be developed with the following considerations:  
are users lead through the site and building with the fewest turns possible?

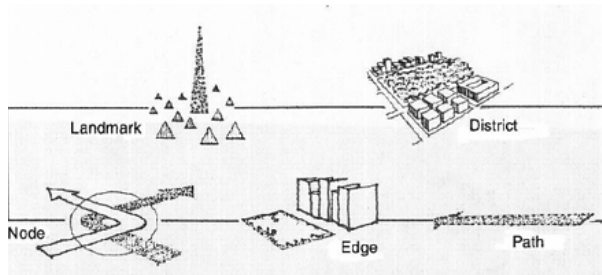


Figure 41: Kevin Lynch's 5 elements that people use to understand their surroundings (Lynch, 1960).

Where do staff and public paths intersect? Diligent organization of major and secondary circulation spines, arranged with the use of consistent wayfinding cues in all levels of the building. Some strategies for answering these questions can be found through Kevin Lynch's tools for wayfinding at the city scale: establish a hierarchy of paths, nodes, landmarks, districts, and edges (Lynch, 1960). In the scope of a smaller healthcare facility, these tools may be implemented in a more limited way: public corridors may be wider than staff corridors to establish the pathway hierarchy; there may be a single node or landmark that takes the form of an atrium; single loaded corridors may be used to maintain a strong edge condition; views to the outside may be preserved so that patients are constantly keyed to their surroundings.



Figure 42: landmark entry pavilion at the Barshinger Cancer Centre (Braden Reid).

An excellent precedent for wayfinding and circulation is utilized in the Ann B. Barshinger Cancer Centre in Lancaster PA, designed by Ballinger. The entrance to the building is articulated by a two-story awning, which breaks the curving form of the façade. This design gesture gives an unmistakable cue to users where they should go once they have parked (or where to drop-off patients

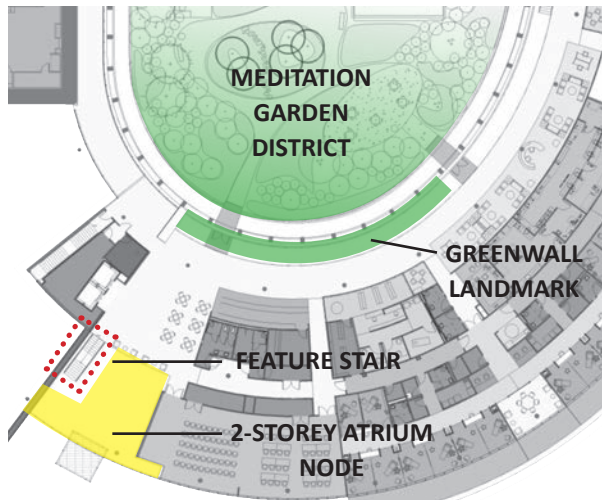


Figure 43: nodes, landmarks, and districts in the Barshinger Cancer Centre (Braden Reid).

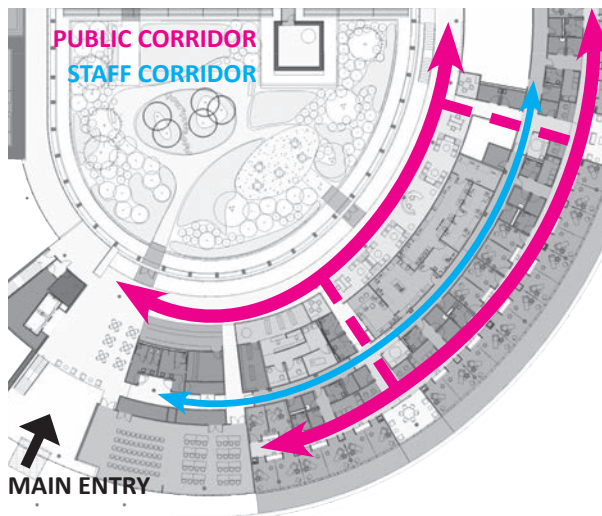


Figure 44: hierarchy of concentric corridors at the Barshinger Cancer Centre (Braden Reid).

prior to parking). When coming into the double-high entry lobby, patients immediately see a feature stair that leads to the upper level (indicating that the building is two stories). At the back wall of this entrance space, a vegetated wall is featured, which offers a landmark demarcating the lobby space. The main corridor rings around a sheltered meditation garden that is visible from all sides of the corridor.

The organizational strategy for building circulation at the Barshinger Cancer Centre is built around a series of concentric rings (Figure 44), each of which offsets from the main corridor. Thus, as users and staff move from the public areas deeper into the building and its departments, they are always utilizing the same curving corridor form, simply connected back to the main corridor via perpendicular cross-corridors.



important for achieving:

- PERCEIVED CONTROL
- COURAGE
- HOLISTIC TREATMENT

how implemented:

- BALANCE CLINICAL TREATMENT SPACES AND ASSOCIATED SIDE EFFECTS WITH VIEWS TO NATURE, SOCIAL COLLABORATION SPACES, NATURAL LIGHT, STRATEGIC USE OF MATERIALS
- PLAN SPACES AROUND REQUIREMENTS FOR DAYLIGHT, AND DISTRIBUTE ACCORDINGLY

Develop Spaces That Act as Positive Distractions (and Make Connections to Nature)

Positive distractions may take the form of a framed view, a natural feature within the building such as a fountain or garden, or the strategic use of a particular material. In general, they should be incorporated into the design as measures that balance the unavoidable but potentially negative properties found in a clinical setting (such as intimidating diagnostic equipment and machines, or infection control requirements such as hard and sterile surfaces and handwashing stations).

The use of positive distractions in healthcare architecture has been demonstrated as a strategy for detracting from the unfamiliar and potentially frightening elements of a clinical setting (Akridge, 2005). Incorporating views to natural features as a form of positive distraction has been shown to reduce patient stress levels (Ulrich, 1999).



These features can be introduced into a building design as early as the site selection process, choosing strategic elements of the surrounding landscape to draw attention to. Accordingly, positive distractions should be given attention throughout the entire design approach, being incorporated from the scale of the site as a whole, down to the detail of material finishes, and covering all aspects of design in between.



Figure 45: treatment waiting area at the DIM is buffered by a bamboo garden and natural light

Some of the most common illustrations of a positive distraction can be seen in the connection of patients with nature, be it in the natural surroundings of the site, or in design features introduced into the building. At the Duke Integrative Medicine centre, all patient waiting spaces are organized around views to either an interior or exterior garden. The shared waiting space outside each of the treatment rooms was planted with a bamboo garden that would give patients a vegetated element to focus on as they wait for a procedure. In another waiting area near the clinical exam rooms, furnishings are located in front of a large picture window, framing views to an outdoor garden and the stormwater retention system. These elements allow for patients to contemplate nature



Figure 46: green wall at the ABCC acts as a distraction for patients awaiting an appointment (Braden Reid).



Figure 47: central meditation garden at ABCC provides a consistent element to focus on throughout the floorplan (Braden Reid).

as a distraction from the unknown, or potential discomfort associated with an upcoming procedure.

At the Ann Barshinger Cancer Centre (ABCC), two natural features integral to the design were previously mentioned: the vegetated wall adjacent to the entrance lobby, and the meditation garden at the heart of the second floor plan. Both of these features provide important measures of positive distraction for the facility. Not only is the living wall a tool in the wayfinding system, it is also used as a positive distraction, sitting across from the waiting space outside the patient diagnostic pod wing where patients wait for assessment and results. Similarly, the meditation garden on the second level is a calming point of reference for all patients and staff heading to and emerging from the departments on that level.

Positive distractions should be replete in the building, and any opportunity to utilize or implement one should be taken. They represent a dignified and implicit method to take patient and staff minds off of the stresses associated with cancer care.





important for achieving:

- POSITIVE DISTRACTIONS
- HOLISTIC TREATMENT

how implemented:

- INTRODUCE COURTYARDS INTO DEEP BUILDING FOOTPRINT
- USE CLERESTORY WINDOWS, PUNCHED OPENINGS, CURTAIN WALL, AND TRANSLUCENT GLAZING WHEREVER POSSIBLE
- ORIENT BUILDING TO MAXIMIZE SUN PENETRATION IN A CONTROLLABLE WAY

## Maximize Provision of Natural Light

Throughout nearly every area of the building where patients and staff linger for any period time, those spaces should be given access to natural light, whether it is the primary illumination source or simply a noticeable attribute of the space. Natural light has been demonstrated to have a profusion of benefits for building occupants. From the perspective of staff, naturally lit spaces can help to improve work performance. In 1997, Begemann showed that individuals prefer to work in lighting conditions that follow the natural cycle of the day, rather than in artificially-lit settings. In addition to keeping staff happier, this may also help to maximize the level of care given to patients.

The benefits of natural light for patients are also compelling. Edwards notes that the provision of daylight in healthcare settings can reduce the mental and physical strain experienced by patients (Edwards, 2002). Similarly, Joseph discusses the myriad benefits to mood and chemical reactions within the body, including support of vitamin D metabolism (Joseph, 2006). Among a host of

other physical benefits, Holick has identified activated vitamin D as an important inhibitor of cancer cell growth (Holick, 2004).

Natural light should be provided in every possible situation where it is readily available. Depending on the space for which daylight is being provided, the use of curtainwall, punched-openings, clerestory windows, skylights, courtyards, and lightwells are all available as design tools.



Figure 48: central meditation garden at ABCC provides access to daylight throughout upper floorplan (Braden Reid).

The courtyard at the Ann Barshinger Cancer Centre is an excellent source of natural light for all the public areas surrounding this central space. Because it is glazed on all four sides, this courtyard allows for the experience of a full daylight cycle, a feature previously discussed as an important element for staff and patient wellbeing.

In the architectural brief for all Maggie's Centres, it is plainly stipulated, "there should be as much light as possible." The resulting design of every Maggie's centre reflects this requirement. Maggie's Aberdeen has five skylights in its



Figure 49: skylights and curtain wall bring natural light into Maggie's Aberdeen (Snøhetta; edit Braden Reid)



Figure 50: floor-to-ceiling curtainwall at Maggie's Gartnavel brings ample natural light (OMA; edit Braden Reid)

roof, bringing extra daylight into the spaces below, in addition to curtainwall as one of three cladding materials (Figure 49). At the Gartnavel and Fife Maggie's (designed by Rem Koolhaas and Zaha Hadid respectively) the architects chose curtainwall as the exterior envelope, and the footprint at Gartnavel is shallow enough to allow for floor to ceiling glass on both sides (Figure 50).



important for achieving:

- POSITIVE DISTRACTIONS
- HOLISTIC TREATMENT

how implemented:

- INTRODUCE COURTYARDS INTO DEEP BUILDING FOOTPRINT
- GIVE VISUAL ACCESS TO COURTYARDS FROM AS MANY PLACES IN THE BUILDING AS POSSIBLE
- FRAME VIEWS TO THE OUTDOORS WITH STRATEGIC WINDOW PLACEMENT
- PROVIDE ACCESS TO OUTDOOR SPACE

## Promote Hapticity Through Sensory-stimulating Spaces

In chapter two of this manuscript, the multitude of physical and psychosocial side-effects to cancer treatment were discussed. With this multi-sensorial experience in mind, it is clear that an environment that draws upon and stimulates all senses is important. The manner in which these stimuli are triggered must be carefully managed, given the sensitivity of cancer patients. Traditionally, 'haptic' refers to the sense of touch or proprioception. In the scope of this investigation, it implies any experience which is translated through tactility (the contact of a material on skin, the warmth of sunlight, the auditory experience of a footstep making contact with a floor finish).

In her thesis on therapeutic architecture, Yvonne Osei suggests that by focusing only on vision we are suppressing all of our other four senses (Osei, 2014). Further to this, her research explores the goal of developing an architecture for the whole body, rather than just the eyes. Osei purports that an architecture which engages all five senses can become a healing one, because it taps into

more of our experiential potential than limiting itself to what can be seen. This bears a direct connection to the full-bodied experience of the cancer patient, wherein the environment through which their treatment is delivered, and the specifics of the treatment itself can have lasting effects of either a positive or negative nature. For instance, a patient who is experiencing light sensitivity as a side effect of treatment may feel their other senses becoming heightened. Smells, sounds, sensations across their skin now become variables that influence their experience over what they can see.



Figure 51: leather-wrapped door handle detail by Aalto  
(<https://jbts.files.wordpress.com>)

The haptic experience of users is most likely to be transmitted through fixtures and finishings, though it will also be implicitly delivered through many of the other design guidelines in this project (namely natural light, positive distractions, patient control, and embedding the building within the landscape). For example, a patient may find themselves basking in the warmth of sunlight from a chair in front of a window in a waiting area. Or, in his detail for an exterior door handle made of steel in a cold northern climate, Alvar Aalto wrapped the handle in leather so that a bare hand would not freeze when grasping it. Relative to the

other, more physically tangible guidelines, the notion of hapticity brings criteria of a more qualitative and ephemeral nature. A healthcare environment that promotes hapticity will give people pause to consider how their other senses are being engaged.

In their design proposal for a hotel in the mountains of Norway ('Mountain Hotel'), the firm Haptic Architects depicts a lounge space in one of their renderings. This image shows ways in which a space can solicit a haptic response. The four



Figure 52: qualities of the Mountain Hotel trigger a variety of haptic experiences (haptic architecture; edit Braden Reid)



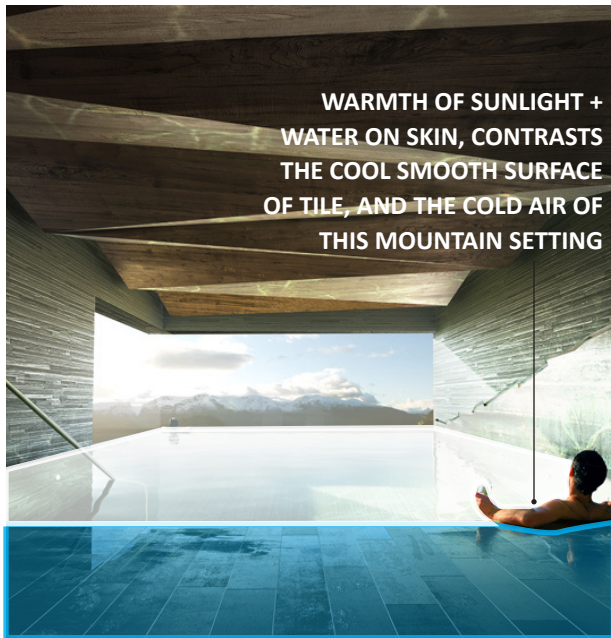


Figure 53: architect's rendering of the pool at Mountain Hotel, suggesting a rich haptic experience (haptic architects; edit Braden Reid)

material palette of the room is simple and emotive: the corner of full-height glazing frames views of the dramatic landscape beyond, a sensation which would trigger an individual's sense of personal scale relative to the landscape. By using this much glazing, the differing degrees of natural light that will enter this space from day to day will also engage a haptic experience: the sensation a person will have while looking out this window on a sunny day while sunlight touches their skin, whereas a rainy day would yield a different haptic experience (i.e., warmth from light versus cool on a winter day). The stone material used on the fireplace has similar qualities. It would capture the heat of a fire while be used on a cold day, and cast warmth that would be noticed through proprioception, as people stand around it and talk. Conversely, when there is no fire burning, the stone would return to its cool natural state, and generate a much different sensorial experience. In another rendering, the architects depict a similar set of haptic experiences which users sit in the outdoor pool, which provides a stark contrast of cool air and tiles, and warmth from sunlight and water.

At Maggie's Aberdeen, the designers used wood, warm fabric and paint colours,



Figure 54: Maggie's Aberdeen intersecting forms conjure two different haptic images (Snøhetta; edit Braden Reid)



Figure 55: radiant in-floor heating at Maggie's Aberdeen allows for patients to comfortably sit on the floor (Snøhetta; edit Braden Reid)

and granite around the fireplace to create a haptic experience similar to that at the Mountain Hotel. The designers also used the strategy materiality and form. The main parti of Maggie's Aberdeen is about two intersecting forms: a right-angled rectilinear box wrapped in a curvilinear and smooth nest-like form. The box is clad in wood, its sharp corners and bands of grain making reference to the raw material it originated as. Most individuals can conjure the sensation of running their hand over a rough piece of bark, or the sensation of standing in a forest. Even if this image is not explicit, the proprioceptive memory remains.

Similarly, the smooth form wrapping this wooden box has a womb-like quality to it. Clad in grey stucco, this nest has the effect of enclosure and security, giving shelter to the precious contents within.

A final, and perhaps more obviously haptic design decision utilized at Maggie's Aberdeen is an in-floor heating system. This has the two-fold effect of minimizing heating and cooling clutter with floor vents, while at the same time encouraging users to sit or lay on the floor with comfort and ease.





important for achieving:

- PATIENT EMPOWERMENT
- PERCEIVED CONTROL

how implemented:

- PRIVATE & SOCIAL TREATMENT SPACES
- PATIENT CONTROL OVER ENVIRONMENT IN PRIVATE INFUSION BAY (LIGHTING, ENTERTAINMENT, FAMILY SUPPORT SPACE)

## Establish Patient Control Over Physical Environment

While there will be measures of patient control embodied throughout a design that adheres to these guidelines, it is important to seize any explicit opportunities to give patients control over their surroundings. Patients can have control over privacy, thermal comfort, daylighting, artificial lighting, views, or ambient color through lighting. Not only will the opportunity to customize a space be invaluable in maintaining optimal physical comfort for patients, it will also bring a host of ancillary benefits, the most important of which is empowerment.

When a patient is unhappy with their surroundings, and yet hapless to change, it may result in a cascade of negative outcomes. This could work against the primary goal of treatment, producing: depression over their inability to rectify a bad situation; anxiety over a suboptimal treatment setting; helplessness at their vulnerability in the situation; physical discomfort from the temperature of the room, the lighting conditions provided, or from acoustic loads which could not be controlled; negative associations with the facility as a whole, having had a bad



Figure 56: different options in which to receive treatment allows for high degree of patient control (ZGF; edit Braden Reid)

experience which activated multiple senses, further reinforcing the detrimental nature of this experience. These negative effects can be catastrophic to the patient's treatment, given the intensity of either a chemotherapy or radiation therapy treatment regimen (which is to say, it will not be a one-off experience).

At the Memorial Sloan-Kettering Brooklyn Infusion Center (BIC), architects ZGF put patient control at the center of their design objectives. In this small treatment centre, patients are afforded a host of options through which they may customize their chemotherapy treatment experience. The treatment area is organized with 11 private infusion pods oriented around an interior garden space. If patients are feeling un-social or particularly ill that day, they can acoustically and visually seal their treatment bay off from the garden space by closing the screened glass door. This door still allows visual connections for staff from the central space, and diffuses the level of social connection between people in the garden and people inside their pods.

Should patients be feeling well enough to sit in the central area to read or



Figure 57: the central garden area at the Brooklyn Infusion Centre in which patients may receive treatment if they feel well enough (ZGF; edit Braden Reid)

socialize, they may choose to move their IV pole out to one of the seats in the garden and interact with whomever they like. This allows for a truly customizable infusion experience. Through review of patient blogs (Carl Denning, Emily McArthur, Sandhy) and in conversation with family members who had undergone chemotherapy (Rick Colarusso, transcript in appendix), it became apparent that socialization and camaraderie were important aspects of their chemotherapy.



Figure 58: a private treatment bay at the Brooklyn Infusion Centre, from the vantage of the infusion chair (ZGF; edit Braden Reid)

Within each treatment pod at the BIC, patient's can customize lighting and ambient sound levels, utilize the computer attached to their chair for social networking or entertainment, and the pod is equipped with ample guest space, made comfortable with built-in beds. Through their blogs, patients reported experiencing unpredictable hot and cold flashes, and sensitivity to light and smell at various different times throughout their treatment (Carl Denning, Lauren Wagner). This reinforces the need for a customizable infusion environment.

## Design Guideline Conclusions

While all of these design guidelines stand on their own as essential tools for creating a comprehensive outpatient cancer centre, they also work together to reinforce the qualities inherent in each one. For example, a patient who can customize their treatment experience by being given control over their physical environment, will not only feel a sense of empowerment at this action but they will also positively effect the hapticity of their treatment (if they are too cold during a chemotherapy infusion, or the light is too bright, they have the power and option to change this aspect of their treatment). Therefore, through giving the patient control over their environment, the design is also providing a haptic experience.

By maximizing the provision of natural light, the design further reinforces the haptic experience. Whether on a warm, sunny day when sunlight will warm a space and all the surfaces within it to the touch, or on a cooler cloudy day, the ambient feel of the environment will also be cooler, changing the proprioceptive

nature of the materials within. These haptic experiences also put the user more in touch with the natural surroundings, with not only visual cues as to what the weather is doing outside, but also sensory cues that are physically engaged by the user.

Another way in which guidelines overlap and support one another can be seen through embedding the building into the landscape. Not only does this yield important passive environmental control benefits, but it also enables a very direct connection to nature. Rather than sitting atop a landscape, the building is submerged within the landscape, affording the option to walk directly out into nature from the lower level.

Together, these guidelines work to establish an architecture that maximizes patient control and empowerment. They offer myriad opportunities to engage patients in their treatment setting, and in the treatment itself.

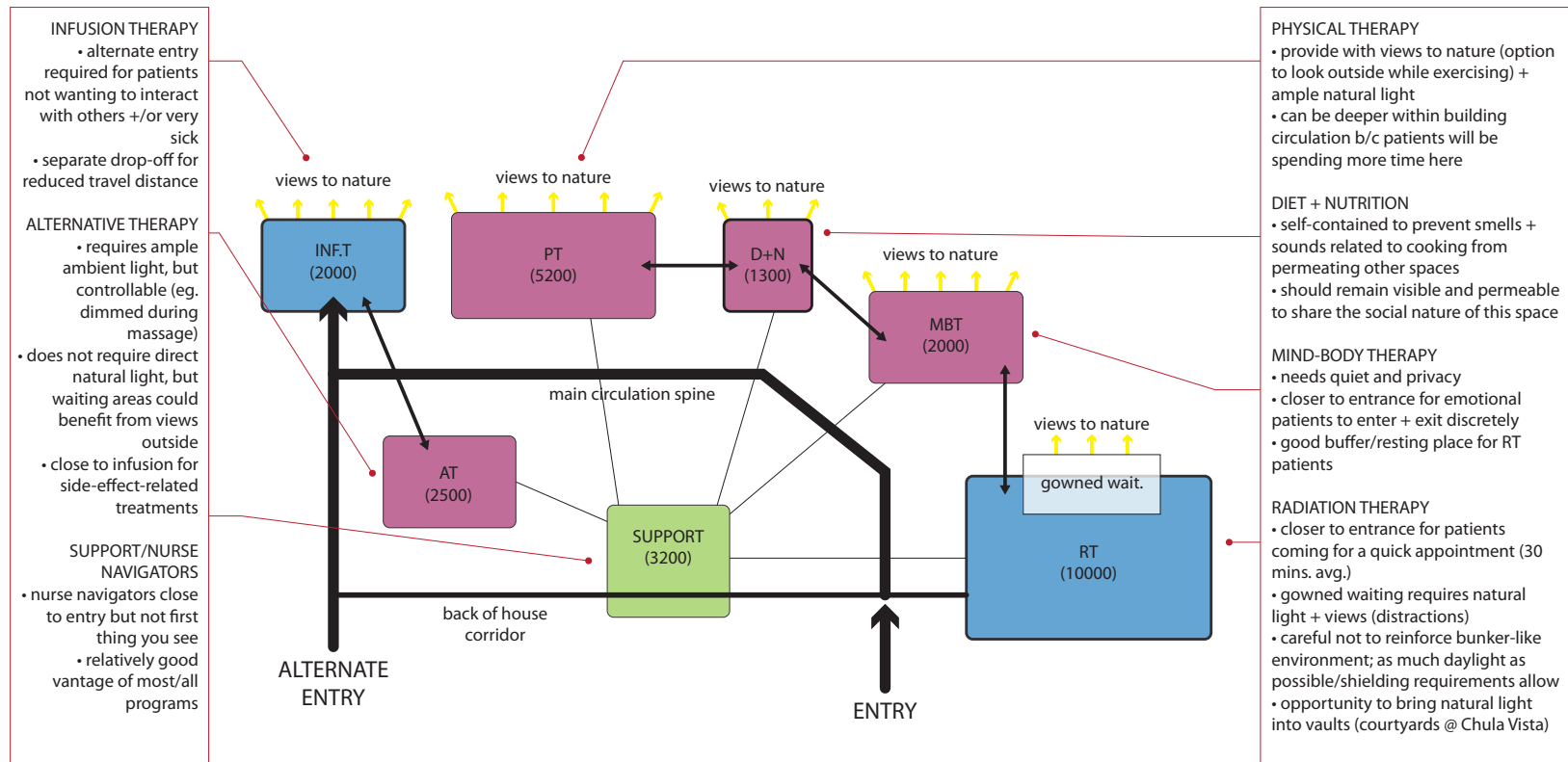
## 6 | PROJECT PROGRAM

The functional program and space list of this thesis investigation were developed in three stages. First, a review of all the case study programs and their respective patient volumes was undertaken to gain an understanding of what ratios could be generally expected in an outpatient cancer treatment center (understanding the essential staff: patient relationship, as well as the volume of patients typically seen in each treatment area). Second, the functional program of the existing cancer center located on the study site was used as a basis for sizing the clinical portion of this facility. By basing the clinical space list on this existing facility, any justification for a facility of this size, located in this region was accounted for (having already had certificate of need approval). It is therefore assumed that the facility would be programmed to support the region in which it is sited. Third, in order to add in complementary therapy components to the program, area takeoffs from several case studies were performed and then extrapolated through a basic understanding of the patient volumes seen by each of the precedents.

The resulting facility and its major components are as follows:

COMPLEMENTARY THERAPIES:	11,760 NSF
CHEMOTHERAPY:	4,546 NSF
RADIATION THERAPY:	9,300 NSF
STAFF + SUPPORT + SHARED:	8,303 NSF
SUB:	33,909 NSF
<i>grossing</i>	1.4
<b>TOTAL:</b>	<b>47,472 GSF</b>

Figure 59: functional relationships associated with each component of the program (Braden Reid)



## Functional Program + Patient Empowerment

The other major task for developing this functional program was to consider ways in which patient empowerment and control could be incorporated into all areas of the building (in both programmatic and physical capacities). In order that this conceptual argument be linked to the program and spaces contained within, two measures were taken: the first was in the determination of the spaces and the activities and events associated with them, as well as the qualitative nature they embodied. The second consideration was in the patient, staff, and family experience contained within each part of the program, the nature of functional adjacencies between all departments, and the relationships therein. These two considerations will be addressed as each major area of the program is discussed in detail.

A comprehensive outpatient cancer treatment center program must account for the needs of three different user groups: patients, caregivers, and family support members. While some of the spaces inside a centre like this may be



relegated to a staff-only designation, most other spaces will be occupied by all three user groups, each of whom brings a unique set of needs. This suggests that most spaces must be assumed to require the highest levels of infection control if they will likely have immuno-compromised patients using them. They must also provide seating for patient's family and support members. In the interest of developing a truly healing environment, all areas should have access to daylight, connections to nature, should nurture a haptic experience, and should have elements that give patients control wherever possible. Similarly, any back-of-house functions (excluding mechanical spaces) should strive for the same therapeutic quality, keeping in mind the needs of the staff as well.

Clinically, there are two main departments found in most any outpatient cancer treatment centre in the US today: radiation therapy and chemotherapy (which would also include a hematology/blood draw component). The scale of each department depends upon the region the centre will be serving. A radiation therapy department is scaled based on the number of linear accelerators it will offer. A chemotherapy unit is scaled based on the number of infusion bays it will

hold. In the upstate South Carolina-context of this thesis, the building is sized to house 2 linear accelerator (abbreviated 'LinAc') machines in radiation therapy (with an approximate net floor area of 12000 square feet), and 8 chemotherapy infusion bays (with an approximate net floor area of 5700 square feet, including hematology). As a component of radiation therapy, many facilities have a CT simulator in the radiation suite which is used in treatment planning. With it's smaller scope, and close proximity to the main hospital of SRHS Pelham, patients would undergo their CT simulations in the imaging department of the main building.

## Radiation Therapy

A patient undergoing radiation therapy can expect their treatment to be delivered once per day, Monday through Friday, for between 3 and 9 weeks, depending on their cancer type. This will yield between 15 and 45 total radiation therapy treatments. With operating hours between 8:00 am and 5:00 pm, the two linear accelerators in this facility will treat approximately 30 patients per day.

By and large, the majority of radiation therapy patients are well enough and able to drive themselves to the cancer centre for treatment. Some patients may bring a family member along for their first appointment as an element of moral support. However given the high frequency of treatment over a longer period of time, and the fact that any side effects associated with radiation therapy do not typically present immediately following treatment, it may be more common for a person to leave work briefly, receive their radiation, and then return to work for the remainder of the day.

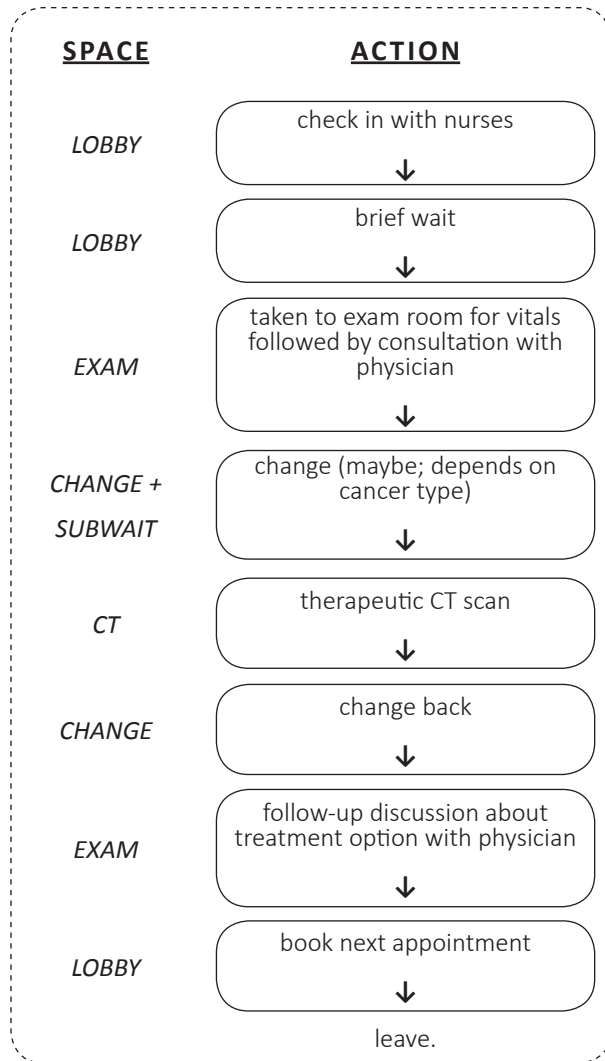


Figure 60: Typical Patient Flow through radiation therapy for first-time visit, 90 mins (Braden Reid)

During their first appointment, patients can expect it to remain at the centre for 90 minutes. During a typical appointment, their flow through the department is shown in (Figure 60). From the end of this appointment until their first treatment, it typically takes 10 days.

Because of the high frequency of patient visits to radiation therapy, the entrance to this department must be relatively close to the main building entry. While some patients may come for their radiation treatment and then utilize a complementary service following their appointment, many patients may come to the centre for their appointment only and leave immediately afterward. These patients should be able to find their way to the department quickly and easily, and not have to embed themselves within the building footprint too deeply.

For all of their actual treatment appointments, patients can expect to be at the facility for a total of approximately 30 minutes (with the exception of the very first appointment, at which time they may need to have a block or cast custom built, depending on the location of their tumor). During these appointments,

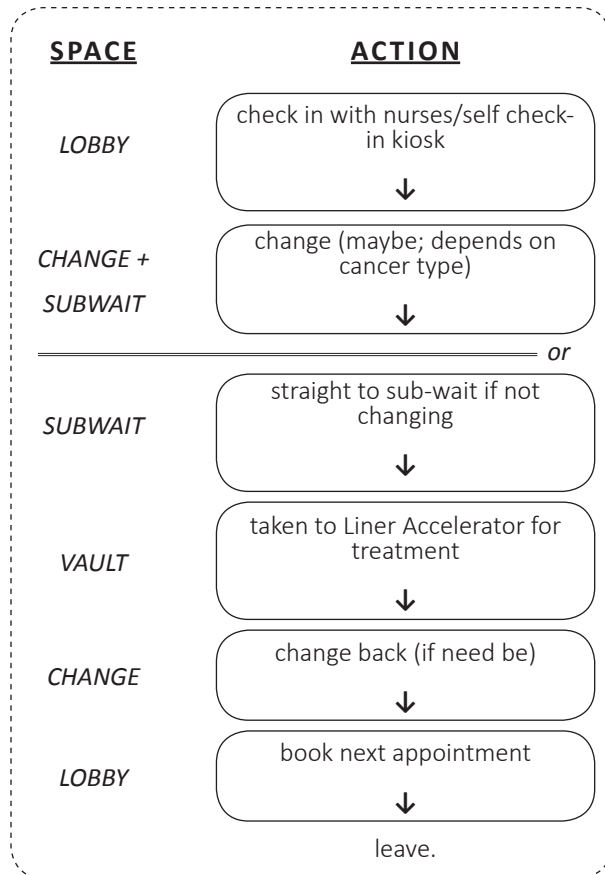


Figure 61: Typical Patient Flow through radiation therapy for treatment visit, 30 mins (Braden Reid)

their flow through the department is shown in (Figure 61).

Periodically during treatment (frequency depends on the cancer type, but approximately once per week on average), patients will undergo another therapeutic CT scan to determine how the radiation is affecting their tumor, and whether the dosimetrists must adjust the level of radiation being administered.

With regard to the psychosocial needs of the patient, the physical conditions in which radiation therapy is delivered have been dramatically improved upon over time. The contemporary vault has many design features that help to break down the intimidation of receiving radiation: sky ceilings, or celestial ceiling finishes that give the patient something to focus on while laying on the couch for treatment; attempts to reduce institutional clutter by concealing it behind screens or built-in cabinetry, and naturalized floor finishes, for example. However, in spite of these treatments, what lies at the heart of this department is a room with 5-foot thick concrete walls, floors, and ceilings, in a darkened space, at the center of which sits a complex machine that moves on all axes; these conditions



Figure 62: an older vault at the Lancaster Cancer Centre, with institutional clutter around LinAc (Braden Reid)



Figure 63: a linear accelerator at the Kaufman Cancer Centre, fitted with a sky ceiling for positive distraction (HKS Architects)

are not conducive for creating a relaxing healing environment. This condition can be exacerbated by the need for blocks or casts that immobilize patients during radiation. In order to minimize unwanted radiation in nearby tissue areas, clinicians must take extra care to target the beam of radiation emitted by the linear accelerator at the exact same place during every treatment. In order to achieve this, patients are often held in place by a custom cast that prevents them from moving (to the extent that a cast may constrict the patient's chest and rib cage to prevent it from moving up and down too much as they breath).

While a creative ceiling treatment may be helpful to minimize some of these negative aspects of treatment, there is still a large gap between gazing at an illuminated sky panel, and being completely immobilized by a body cage for 15 minutes 5 days per week, for multiple weeks. Johnson confirmed that patients whom experience radiation therapy have a reduced ability to cope (Johnson et al, 1988). Further, it has been demonstrated that patients harbor anxiety and stress about their experience for a time after treatment has concluded, many attempting to cope with a 'loss of self' due to physical side effects and self-



Figure 64: celestial ceiling treatment in the CT room, at the Kaufman Cancer Centre (HKS Architects)

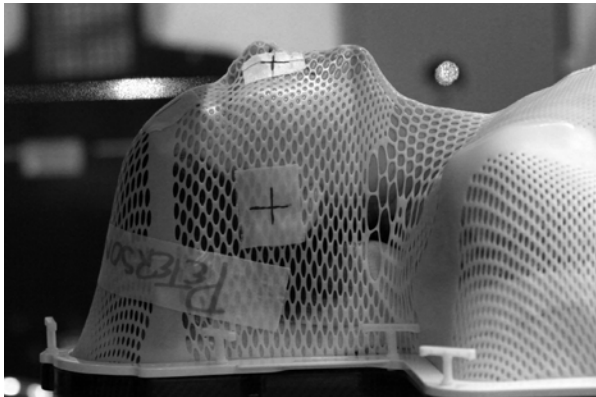


Figure 65: a patient wearing an upper body cast during radiation therapy; cause for anxiety during treatment (<http://stmedia.startribune.com>)

consciousness about how they may be perceived socially (Wells, 1998).

Programmatically, this makes the patient experience before and after treatment in the vault even more important for making a positive psychosocial impact. The department should be equipped with spaces that offer a counterbalance to the bunker-like heft of the radiation vaults. This can be achieved through a variety of different strategies to positively enhance the waiting experience: windows with views to natural scenes can favorably impact patients, (Ulrich, 1991); green plants can reduce stress and help with pain management (Ayas, Eklund, and Ishihara, 2008); and the provision of abundant natural light, which can influence the physical, psychological, emotional, and spiritual experience of a space (Kurtich and Eakin, 1993).

By improving the quality of the waiting area for patients, this will also have direct benefits for staff members, whom spend upwards of 8 hours per day in this department. In a study of staff perceptions of a new hospital design in comparison with their old facility, over half the participants rated the abundance



Figure 66: daylight waiting at Owensboro Hospital, KY (HGA)



Figure 67: self check-in kiosk (Braden Reid)

of natural light in the new facility as the best improvement (Mroczek et al, 2005).

When patients check in, particularly once they are into the routine of treatment, they should be able to use a self-check in kiosk if they wish, and assertively pass through the entry, back into the change rooms if they must gown before getting their radiation, or straight to the seating area if they can receive treatment in plain clothes. At the Kaufman Cancer Centre in Maryland, a self check-in feature is offered and utilized by an estimated 95% of patients (anecdotally told during a facility tour by Donnica Major, R.N and department manager). It fosters a level of self-reliance and confidence that is normally elusive in a clinical setting. This allows patients to easily take time out of their day to attend their appointment, minimizing any unnecessary waiting. Despite the establishment of independence, patients may still interact with staff in a collegial manner, given that routine socialization and a welcoming feeling are important to patients (Ayas, Eklund, and Ishihara, 2008).



## Chemotherapy

The duration and frequency of chemotherapy (synonymously called 'infusion therapy') can vary greatly depending on cancer type, and on the patient's individual response. For cancers such as non-Hodgkin's Lymphoma, patients may receive between 6 and 12 rounds of chemo. Breast cancer patients typically start with a 6 round treatment plan, and for more advanced-stages of breast cancer, patients may undergo multiple cycles of chemo over a number of years. Typically, treatments are spaced in two to three week intervals, and depend on patient response and wellness after each round. The range in duration of an infusion can last between 1.5 and 10 hours, an average appointment length being 3 hours. With its 8 infusion chairs, and operating hours from 8:00 am to 5:00 pm, Monday through Friday, this facility will treat between 12 and 13 chemotherapy patients per day. The nurse to patient staffing ratio is 1:4.

It is common for patients to feel exhausted and nauseous after a chemo treatment, and as such, a family member or friend typically drives them to their

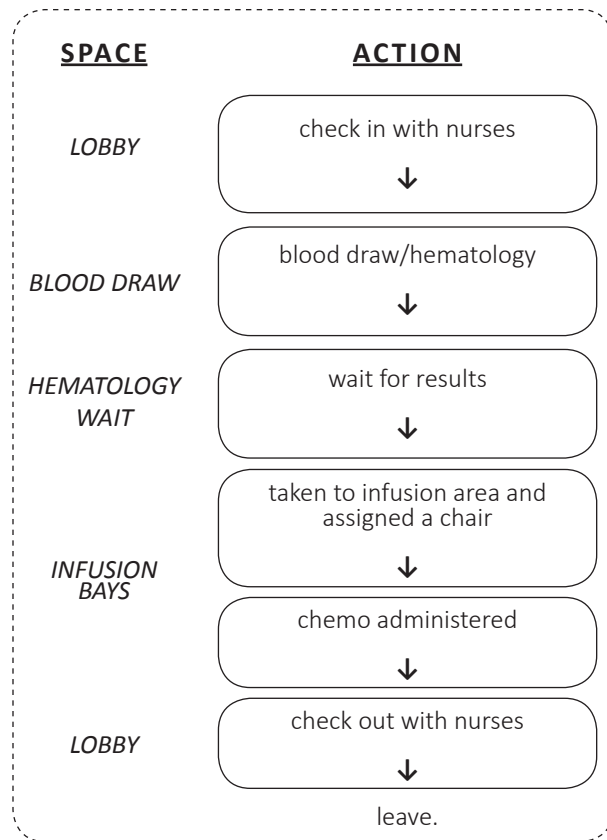


Figure 68: Typical Patient Flow through chemotherapy, 3 hours average (Braden Reid)

appointment. Because of their physical sensitivity, higher fatigue levels, and potential for a compromised immune system, the chemotherapy suite requires its own entrance. This entry should be separate from main facility entry. It also requires a dedicated drop-off spot outside, and the shortest possible travel distance from door to chemotherapy chair, keeping the number of steps patients must walk to and from their infusion at a minimum.

The longer duration of these treatments, coupled with their infrequency (in comparison to radiation therapy), and the physical toll taken on the patient afterwards makes it very common for a family member or friend to keep the patient company during the infusion. Given this, all treatment areas in the infusion department (whether in a group setting or a completely private room) must be sized to account for guest furnishings and their personal comfort.

When patients arrive to their infusion appointment, they will experience the same flow each time, illustrated in (Figure 68).



Figure 69: comfortable, well-lit, and relaxing waiting area at South Lake Union Clinic, Seattle WA (Callison)

All chemotherapy patients will have blood drawn and their cancer markers checked prior to treatment. This allows pharmacists to adjust the chemo mixture each time, in accordance with how the cancer is responding to treatment. Patients therefore need a comfortable space to wait while their blood samples are processed (Figure 69), and a lounge space can be dedicated to this. The results of this blood draw offer a benchmark for patients to keep track of their progress (noted in nearly all of the patient blogs). This can either be a source for optimism or stress, depending on the results. As such, the lounge can provide positive distractions and simple creature comforts for patients. It should offer views to nature, a small nourishment alcove, and comfortable seating.

The functional adjacency of the chemotherapy suite to other components of the cancer centre requires careful attention. Patients undergoing chemotherapy treatment can have sensitivities to light, sound, smell, touch, and taste as a result of their treatment. It is estimated that 2 out of every 3 chemo patients will experience disruptions in their sensory perception (Hong et al, 2008). One common psychosocial side effect of chemotherapy is that of

taste aversion. While the chemotherapy itself may induce nausea, vomiting, or diarrhea (the physiological reaction), patients may psychologically associate foods they ingested or smelled at the same time with becoming physically ill (ibid). This makes adjacencies with other program components which may emit sensory-stimulating sounds and smells, such as the diet and nutrition centre, inappropriate.

Adjacencies which might allow for chemo patients to find positive distractions in people watching can be useful. Patients whose infusion rounds last an entire day may want the opportunity to watch activities happening outside the department. Providing windows and visual connections to non-chemotherapy related activities can be a useful distraction, allowing patients a view to events they might later want to engage in (such as patients coming and going from the alternative therapy treatment that alleviate chemo side effects, or people walking around the manicured landscape outside).

The psychosocial response to chemotherapy can range from no negative

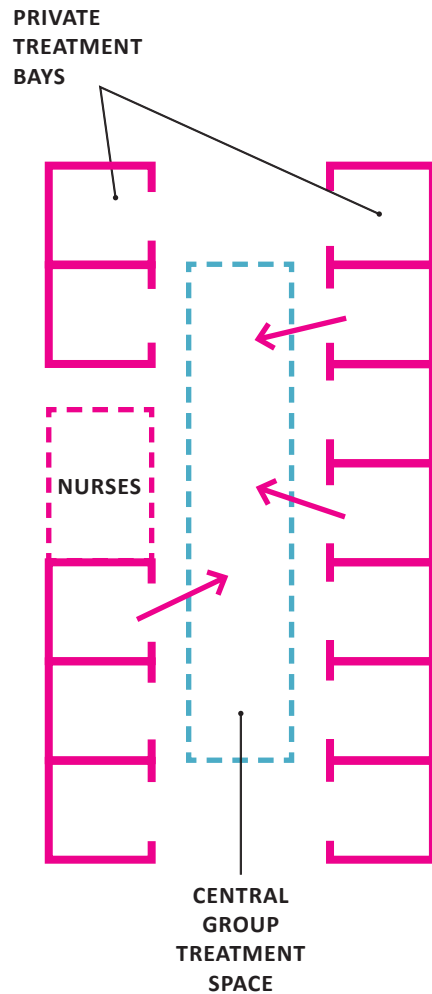


Figure 70: private infusion bays surround a central group infusion space for patients who want to socialize (Braden Reid)

reaction for some, to an all-encompassing treatment aversion on every possible level (meaning that patient may experience side effects both physical and psychosocial). Programmatically, this requires that every measure should be taken to allow for a customizable infusion therapy experience. The program should account for any range of incidents, from the most positive to the most negative.

Patients need be able to isolate themselves physically, acoustically, and socially if they have a bad reaction to their treatment. Conversely, those for whom few or no side effects present should have the opportunity to socialize with others, including staff, other patients, and visitors. A range of treatment spaces is thus required. Private isolation rooms should be provided for those not wanting to interact with other at all, or for patients with extremely compromised immune systems who cannot interact with others. Semi-private rooms should also be provided, offering the option to socialize with a neighbour during one part of the infusion, and the ability to later close off the room if the patient just wishes to nap or rest for the remainder of their treatment. For those patients

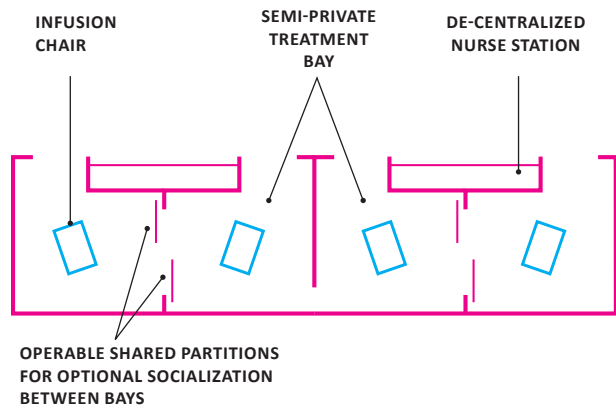


Figure 71: private infusion bays with operable shared wall for semi-private to private treatment experience (Braden Reid)



Figure 72: view to adjacent treatment bay with operable partitions opened (Braden Reid)

who do not experience negative effects from their chemo, or if they simply prefer and enjoy the bonding and camaraderie that develops among infusion patients, there should be a group space where multiple patients can sit and chat as they please. As previously mentioned, all of the treatment options in the chemotherapy suite need to accommodate family support members, offering comfortable sofas and chairs, access to a nourishment alcove, and places to rest and relax.

The detailed fitout of chemo infusion bays must allow for maximized patient control over the environment. These rooms require shading devices for control of natural and ambient light, controls for a variety of artificial lighting conditions, acoustic separation, and entertainment options that can be used by both the patient and their guest, such as a television with a closed audio circuit. While individual temperature control is not possible for each individual bay, a blanket warmer should be provided in the nourishment alcove so that it is accessible for patients and their support members.

## Complementary Therapies

The nature of complementary therapies as an entity in and of themselves facilitates a level of empowerment for patients facility-wide. By simply having the option to utilize a host of services which may counteract the negative effects of treatment, patients are automatically established as agents of their own health. For patients who take a more active role in their treatment, it has been shown that this population is also much more hopeful about their disease (Cassileth et al, 1980). In addition to bolstering hope, patient empowerment is optimized by enhancing the power of the patient as an individual (Gray and Doan, 1990). Therefore, while the components that make up this project's alternative therapy program are each in place to address a variety of side effects (whether physical or psychosocial), it is the nature of choice as a tool to give patients faculty to gain control over their lives.

With regard to patient volumes and room sizes, almost all of the complementary treatment spaces were sized based on a Maggie's Centre, which details how

many people should be accounted for in each area of the program. Some spaces that are offered at Duke Integrative Medicine, but not at a Maggie's, were speculated on based on area takeoffs from the plan (the staff at DIM were reluctant to share their patient volumes, given the proprietary nature of their services). By and large, none of the treatment spaces will have more than 12 patients in it at one time. This facility will offer a comprehensive range of alternative therapies, discussed in greater detail as follows:



Figure 73: alternative therapy treatment room at DIM, with concealed built-in storage (Braden Reid)

*Alternative medicine suite (Chinese, Acupuncture, Acupressure, Massage):* this portion of the program will be comprised of four identical treatment rooms, each sized to accommodate any of the alternative medicine therapies suggested by this project. The basis for this room size was derived from area takeoffs of the Duke Integrative Medicine alternative therapy rooms. Each treatment room is 11' x 13', allowing for a total net area of 143 SF. This allows for enough space to house a treatment table and working space for the therapist around the table, as well as some minimal storage of procedure-related equipment. Environmentally, the treatment spaces require a whole range of lighting



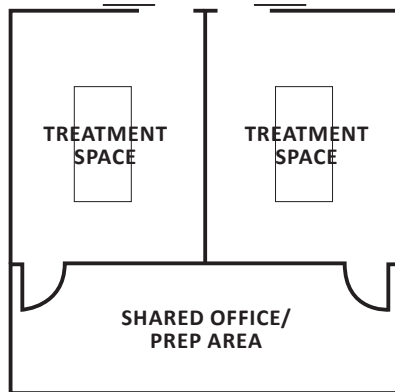
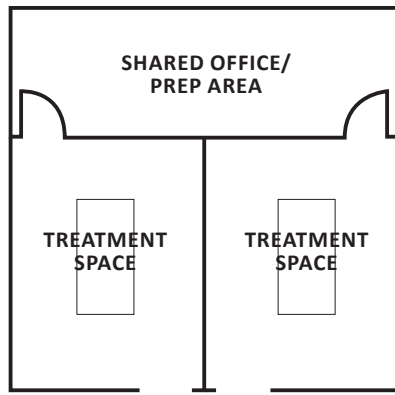


Figure 74: Alternative therapy treatment room configuration, with central garden and shared offices  
(Braden Reid)

options, from naturally-lit to near darkness. They will be equipped with a floor-to-ceiling panel of translucent glazing. This will allow for filtration of natural light, a calming element for patients, but also privacy from adjacent spaces. Window coverings will allow the therapists to block out all light if need be.

Two treatment rooms are paired, and at the back wall of either room, a door will lead to a shared office for the therapists. The therapists may use this office for note-taking, or they may use it for preparing medications or various treatment implements.

Alternative therapy rooms can be offered in pairs, facing onto an indoor meditation garden. Since there may be a component of waiting for patients prior to their therapy, the act of waiting should be considered part of the healing process. Based on a similar concept at Duke Integrative Medicine, this indoor garden should be a quiet space equipped with simple plantings, comfortable furniture, and views to nature. With these various finishings, the overall configuration and feel of the Alternative Therapy Suite should facilitate



Figure 75: example of an indoor meditation garden with simple plantings (ArchDaily)

mindfulness, introspection, and healing.

*Mind-body therapy suite (counseling, yoga, music):* the scope of Mind-Body services in this centre spans a range of activity levels, from individual counseling to group music classes, it encompasses very quiet to deliberately vocal programs. Given this, the distribution of these services in the plan should account for the nature of each therapy, and where it is situated in the building. For instance, louder, more extroverted mind-body therapies are best situated in a central (and therefore highly active) region of the plan. Conversely, programs that innately suggest quietude and introspection need more of a buffer from the louder activities so that their acoustic loads can be controlled.

Music Therapy: in this suite of services, the music therapy room is by far the most active. This component of the program has the added benefit of being a positive distraction for its neighbouring spaces. Because the music therapy is a highly participatory program, more introverted patients might feel shy to take part. Or they may not feel well enough, but still enjoy watching others partake.

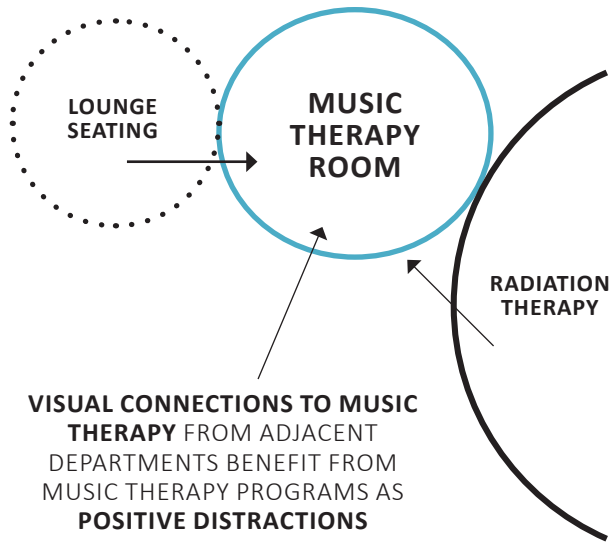


Figure 76: Program adjacencies to the music therapy room (Braden Reid)



Figure 77: music therapy program at Greenville Health System (greenvilleonline.com)

By locating the music therapy room centrally and near radiation therapy, and other public spaces, this space will offer a suitably active bit of program to transition from one space to another.

The physical requirements of music therapy are very simple: its walls must be appropriately constructed to prevent sound from transferring to adjacent rooms, but still incorporate a glass assembly to allow for visual interaction with spaces outside; the interior will be fitted with acoustic paneling to maximize the acoustic quality of this room; it requires some minimal storage in the form of cabinetry to hold instruments and minor equipment, and may be equipped with a piano; it will be furnished with 10 chairs.

Counseling Rooms: a much more quiet component of the mind-body program, the counseling rooms need more buffering from other parts of the program. Ideally, they will exist in their own area of the plan. This area should have ample natural light, distributed through more controlled openings in the envelope. The nature of a counseling room, whether group or individual, is inherently



Figure 78: counseling room at DIM with comfortable seating and soft lighting (Braden Reid)

private. Patients share sensitive and emotional things in counseling, even in a group setting. These spaces should not be observable from the corridor, and should not be located in a high-traffic zone.

The furnishing of these rooms should be very simple: comfortable seating, soft lighting, and views to nature must be provided. There should be two individual counseling rooms, each with three chairs and a small table. The sole group therapy room should have 9 seats. This room should have minimal furnishings so that the usable floor area can be cleared for therapies that require physical movement.

Yoga Studio: the yoga studio - which can also double as a general fitness/activity room - should have the design of a typical studio: dimmable lighting, cork or other antibacterial flooring which also provides some shock absorption, and one or two walls with mirrors. Because there is little to no talking during a yoga class, save for the instructor cueing the participants, the yoga studio should be located deeper in the facility, away from high traffic areas. Yoga classes are quiet



Figure 79: yoga studio with natural flooring and soft lighting (pinterest)



Figure 80: list of foods recommended for cancer patients (pinkribbon.org)

and meditative, and thus require minimized exterior distractions.

*Diet and nutrition centre (kitchen, dining room):* looking after patient nutrition can be useful early in their diagnosis, when patients may need to make significant adjustments to their diet before they start treatment, or after treatment has concluded, and their dietary needs have changed (either due to aversions they have developed, or because they have need for a special diet once they are in recovery). Diet and nutrition therapy can yield important benefits for patients.

A patient who can adeptly prepare food and nourish themselves is likely to feel a strong sense of empowerment, particularly given that food and eating are prominent parts of daily life.

This component of the program should be located in a central space, where the liveliness of activity it produces is shared with other highly active parts of the facility. However because this space will produce smells and sounds from cooking, it needs to be kept completely separate from patients accessing infusion therapy, for whom taste and smell aversions are very common. Diet and

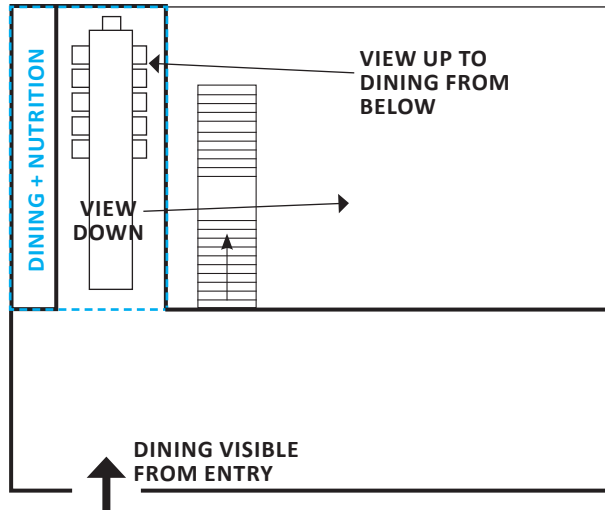


Figure 81: diagram showing the position of diet + nutrition relative to rest of Centre (Braden Reid)



Figure 82: the dining and nutrition space should be open and welcoming (MLS Architects)

nutrition should have ample access to natural light and views, so that the colour and texture of food being prepared is presented in its most favorable light. If sitting down for a light meal, or for tea, patients, families, and staff should have scenic views to the outdoors.

The diet and nutrition centre will offer group cooking classes, where participants will learn valuable kitchen skills. Through cooking, they will also learn important lessons about their body, its needs, and how they can keep it healthy through dietary changes. The cooking area will have ample countertop prep space, and a central island around which participants can gather and socialize while they learn. The kitchen requires a fair amount of storage, but should still maintain a large degree of openness and clear sightlines. If possible, it should not have any secondary rooms so that everything is close at hand, and clutter is kept to a minimum.

In order to allow participants, and bystanders if they wish, space for enjoying food and collegiality, this area of the program should have a large family-style





Figure 83: space for socialization should be provided outdoors (edit Braden Reid)



Figure 84: space for private contemplation should be provided outdoors (edit Braden Reid)

dining table that can accommodate between 10 and 14 people.

*Outdoor garden spaces:* having views and physical access to nature are important experiential elements for patients and for staff. Using an embedded footprint as a point of intimate contact with the landscape, the building should also provide multiple opportunities for access outside, allowing patients the opportunity to leave conditioned indoor space, and go meander through gardens, trees, flowers, and open sky. There should be gardens of varying sizes, some affording patients a bit of privacy if they do not feel like socializing, others allowing for two or three people to walk and discover elements of their surroundings together.

Because of the high degree of fatigue amongst patients, and so there is occasion for pause, outdoor areas should provide many places for sitting. Some patients cannot go far on their own before they must sit down and rest. This should be very easy for them to do while they traverse the landscape.

Some patients may have walking aids, others will be pushed in wheelchairs, and

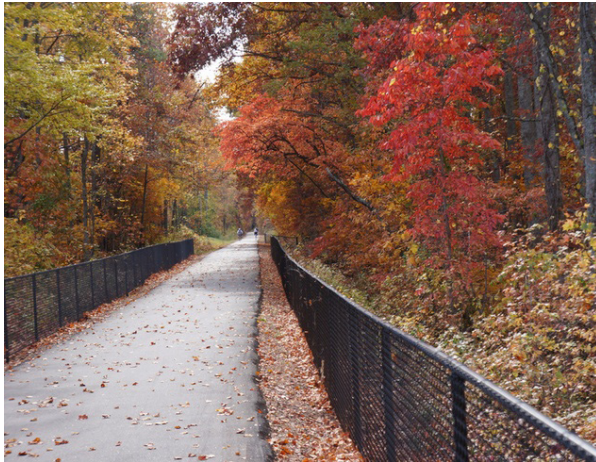


Figure 85: a smooth paving system used on the Swamp Rabbit Trail, Greenville SC (greenvilledailyphoto.com)



Figure 86: a boardwalk provides a safe and aesthetically-pleasing system of paving in Florida (Nature Bridges)

many will walk on their own. To offer a safe space for all users, all surfaces should be well groomed, and free of debris. A recycled rubber paving material (which offers some padding and shock absorption) would be an appropriate surface for all pathways. This surfacing will also be highly porous, allow for stormwater absorption, and prevent pooling water on rainy days. A simple boardwalk system would be a suitable alternative, having similar porosity for water runoff.

Tree plantings should account for shaded sitting areas and pathways during hotter summer months, with a canopy that begins high enough for clear sightlines to the surroundings, but low enough to still offer shade. Employ tree species that lose their leaves during the fall and winter, and subsequently allow for sunlight to reach patients in cooler months.

Overall, outdoor areas should allow for introspection and contemplation, and aid patients in meditation if they wish. They should also offer a simple and fundamental beauty, connecting users with their surroundings in the most essential sense. There is no need for heavily manicured plantings and sculptural





vegetation; the natural beauty of a landscape can be tastefully groomed, and still augment the place it represents.

Figure 87: a small water feature and simple planting allow for evocative yet simple outdoor features (edit Braden Reid)

## Shared Staff Requirements

Throughout the cancer facility, staff should be given the same attention and care as that afforded to patients. Just as the experience of undergoing treatment for cancer is mentally, physically, and emotionally exhausting for patients, so too can this experience be taxing on caregivers and support staff alike. If staff are not given a comfortable work environment, it could interfere with their capacity to provide the highest level of care (Mroczek, 2005). The mortality rates inherent to a cancer patient population add a level of complexity, and often an emotional burden, for those providing treatment. Patients may enter a cancer centre with any range of emotions, from fear, anxiety, depression, sadness, despondence, hope, positivity, optimism and every emotion in between. Not only must the caregivers be adept at recognizing and then appropriately responding to the needs of the patients, they must also maintain a level of professional decorum independent of whatever their own reaction may be to a particular case.



Figure 88: nurse workstation view of courtyard at DIM  
(Braden Reid)

The programmatic implications of these conditions demand that staff members



Figure 89: staff break room equipped with windows and therapeutic finishings (HCD Magazine)



Figure 90: staff break room adjacent to a courtyard, with side collaboration spaces (Hofman Dujardin Architects)

be given a therapeutic and stress reducing working environment, and areas of reprieve that are separate from treatment space. These spaces should have access to ample natural light, vegetation, and also provide a variety of positive distractions. A large staff room should be provided that meets these requirements. It should be furnished with a range of seating options, have dedicated staff bathrooms, a kitchen, and ample dining space.

Staff also require areas for case collaboration: some patients will require radiation therapy and chemotherapy (either sequentially or concurrently), and staff from these two departments typically work in one or the other (they do not flex), making consultation about the nature of certain cases is necessary. The entire care team will formally come together on a weekly basis to have this discussion (referred to as a “tumor board”), and this usually happens in a dedicated conference room in either radiation therapy or chemotherapy. However, there are other side conversations that may happen amongst the care team. For this impromptu consultation, touchdown offices should be provided, ideally adjacent to the staff break room, and central within the floorplan.

## Discussion of Program Development

This comprehensive cancer centre program aims to provide the primary and complementary care services to holistically treat patients. The program that has just been described achieves that, and a wide variety of treatment types and treatment spaces are offered here to cater to any number of complex cancer cases. Another goal, with no less prominence, is that a space program such as this will empower patients throughout the entirety of their treatment process. With this assortment of therapies, each configured in such a way as to maximize patient involvement and choice, patients can tailor the care experience to fit their individual needs (which may change from week to week, day to day, and hour to hour).

If fully realized, this program would foster a sense of propriety amongst its patients. At the conclusion of their treatment they would not feel averse to coming back to the centre to volunteer their time, continue participating in programs, or to simply take a walk around the grounds and enjoy the landscape.

Overview of Program

<b>DEPARTMENTAL OVERVIEW</b>			
<b>RADIATION ONCOLOGY</b>		9300	NSF
<b>CHEMOTHERAPY + HEMATOLOGY</b>		4546	NSF
<b>STAFF + SHARED SPACES</b>		7403	NSF
<b>COMPLEMENTARY THERAPIES</b>		10820	NSF
		<b>32069</b>	<b>Net Bldg SF</b>
		1.4	grossing
		<b>44897</b>	<b>BGSF</b>
<b>PARKING REQUIREMENTS (per Spartanburg County Unified Land Management Ordinance)</b>	1 space per 350 SF/GFA	<b>128</b>	<b>total spaces</b>

<b>RADIATION ONCOLOGY</b>		<b># Rms</b>	<b>SF</b>	<b>SF Total</b>	
Physician Office		1	140	140	
Lobby/Waiting		1	700	700	
Exam Room		4	180	720	
Block & Cast		1	170	170	
Phys/Dosimetry		1	240	240	
Nurse Work		1	360	360	
Linear Accelerator		2	1494	2988	
Linac Equipment		2	120	240	
Linac Molds Storage		1	180	180	
Linac Control		2	108	216	
Dressing Toilets		2	50	100	
Dressing		4	42	168	
Subwait		1	800	800	
CT Simulator		1	504	504	
CT Control		1	72	72	
CT Equipment		1	96	96	
Patient Toilet		1	50	50	
Physician Office 1		1	140	140	
Physician Office 2		1	140	140	
Physicist Office		2	140	280	
Toilet		1	71	71	
Conference		1	400	400	
Planning room		1	365	365	
Vestibule 2		1	160	160	
				<b>9300</b>	<b>NSF</b>
				1.4	grossing
				<b>13020</b>	<b>GSF</b>

<b>STAFF + SHARED SPACES</b>				
Welcome and Reception		1	600	600
Billing Consult		1	125	125
Lounge Seating		3	900	2700
Waiting Toilets		2	215	430
Resource Area		1	108	108
Staff Toilet		2	50	100
Break		1	900	900
Offices		3	200	600
Clean Utility		1	200	200
Soilet Utility		1	200	200
House Keeping		1	80	80
Bulk Storage		3	400	1200
Data		1	70	70
Electrical		1	90	90
				<b>7403 NSF</b>
				1.4 grossing
				<b>10364.2 GSF</b>

<b>CHEMOTHERAPY + HEMATOLOGY</b>				
Vestibule		1	240	240
Physician Office		1	108	108
Exam Room		3	130	390
Lab		1	160	160
Blood Draw		2	65	130
Lab Toilet		1	50	50
Vitals		1	56	56
Lab Subwait		1	115	115
Nurse Work/Charting		1	180	180
Patient Toilet		1	50	50
Long-stay Infusion		2	230	460
Infusion Chairs		6	160	960
Group Infusion Area		1	450	450
Nurse Work/Charting		1	160	160
Nourishment		1	110	110
Clean Supply		1	56	56
Soiled Holding		1	56	56
Conference		1	280	280
Lounge		1	300	300
Med Room w/ freezer		1	85	85
Staff Toilet		1	50	50
Patient Toilet		2	50	100
				<b>4546 NSF</b>
				1.4 grossing
				<b>6364.4 GSF</b>



<b>COMPLEMENTARY THERAPIES</b>	<b># Rms</b>	<b>SF</b>	<b>SF Total</b>	<b>Census</b>
<i>DIET + NUTRITION CENTRE</i>				
Group Kitchen	1	800	800	12-16 ppl
Prep Space	1		0	
Storage	1		0	
Dining Room	1		0	12-16 ppl
Seating	1		0	10 seats
<i>ALTERNATIVE MEDICINE CENTRE</i>				
Treatment Room	4	180	720	
Pharmacy/Prep Space				
Storage				
Office	2	235	470	
Music Therapy Room	1	600	600	10 ppl
Office	1	140	140	
<i>PHYSICAL THERAPY CENTRE</i>				
Gym	1	1100	1100	
Yoga Studio	1	800	800	
Change Rooms	2	1000	2000	
Storage	2	150	300	
Therapist office	2	110	220	
<i>MIND-BODY THERAPIES</i>				
Meditation Room	1	400	400	
Group Counsel Room	1	340	340	12 ppl
Individual Counsel Rooms	2	165	330	
Multi-faith Chapel	1	600	600	
Multimedia Room	1	700	700	
Activity/Art Room	1	350	350	6 ppl
Classrooms	2	350	700	6 ppl/rm
SUBTOTAL			<b>10570</b>	<b>NSF</b>
			1.4	Grossing
<b>TOTAL COMPLEMENTARY</b>			<b>14798</b>	<b>GSF</b>

## 7 | SITE AND SETTING

The study site selected for this thesis project is located at the southeast corner of Spartanburg County. It sits on a parcel owned by the Spartanburg Regional Healthcare System (SRHS) - Pelham Campus. SRHS Pelham is located south off Interstate 85, and slightly east off Highway 14. It sits approximately 2 miles south of the Greenville-Spartanburg Airport. The surrounding context is primarily single-family residential subdivisions (to the southeast and southwest), rural farmland to the northwest, and the hospital campus itself directly north.

Figure 91: regional context map showing the site relative to major municipalities (Braden Reid)

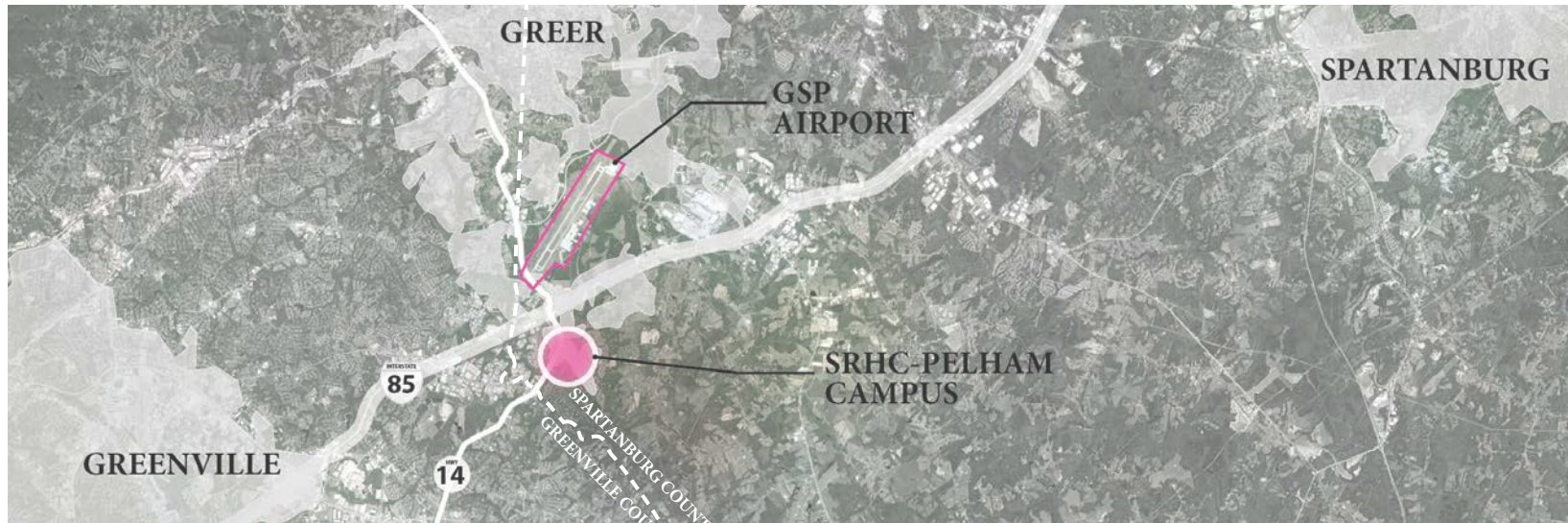




Figure 92: primary site selection criteria used to choose a suitable parcel (Braden Reid)

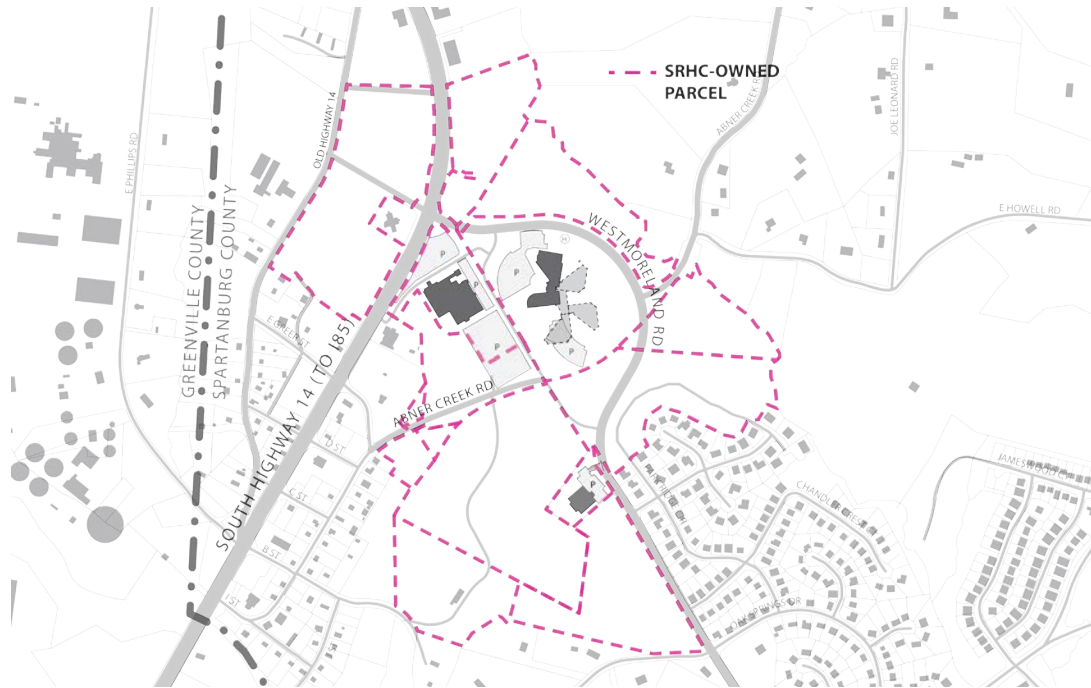


Figure 93: all potential SRHC parcels in context (Braden Reid)

The region served by the Pelham Hospital Campus is comprised of people from the cities of Greenville, Spartanburg, and Greer, and the numerous smaller municipalities nearby.

This region was selected for investigation based on the availability of data from local sources, and from the established need for a freestanding cancer facility in this specific area. Within the SRHC Pelham Campus there were 12 parcels to choose from. To select a single parcel, the design guidelines were arranged in order from most broad in physical scope, to most detailed (Figure 92). This allowed for the organization of site selection criteria, and constraints that would help





Figure 94: tree cover on available parcels (Braden Reid)



Figure 95: topography on available parcels (Braden Reid)

to eliminate potential sites from the 12 available choices (Figure 93). Three of the most high-level criteria (i.e., involving the largest scale site selection decisions like building placement, versus more detailed ones like interior design) were then used to sift through the 12 options: availability of slope to embed a building in, existing tree cover, and site access. Being derived from the design guidelines, this led to two parcels that could host this facility. One option, the final one selected as a study site, was given privilege over the other on the basis of easy access, less dense contour intervals (which would have been problematic for grading the landscape and gardens), and less dense tree cover (which would subsequently



Figure 96: context plan showing access to selected parcel from surrounding road network, and sound access (+ parking), and specific areas loads from GSP International Airport (Braden Reid)

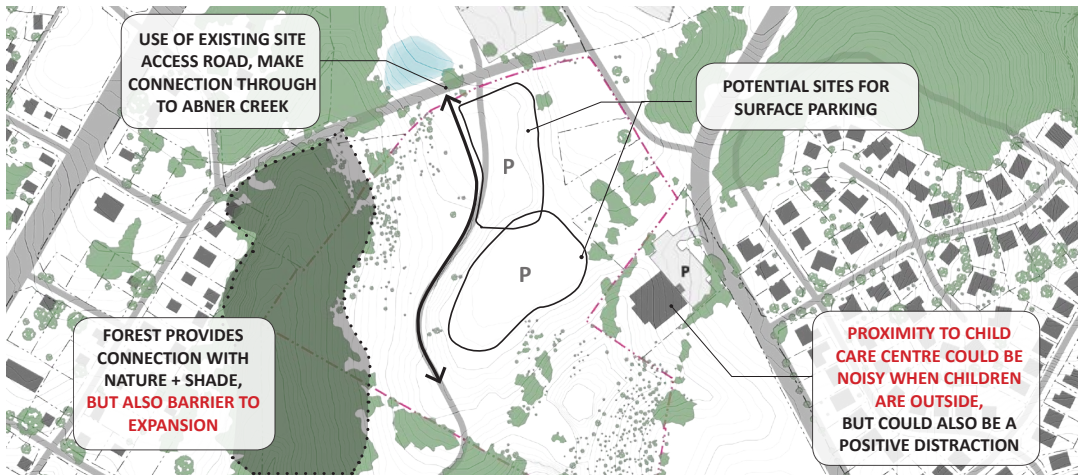


Figure 97 (right): parcel detail map showing site constraints and opportunities (Braden Reid)

have to be removed during construction).

After choosing one parcel, the task became to refine an exact location within that parcel on which to locate the cancer centre. The same design guidelines were again used as constraints, focusing now in greater detail (tree cover, circulation access (+ parking), and specific areas with adequate slope to embed the lower floor of the building into). On the following page, (Figure 98) shows this analysis graphically. Given that the parcel is currently divided by a dirt access road that runs along a low point down the middle, it was more or less divided into two halves. The western half holds a dense amount of tree cover. This would



have been good for providing access to nature within the building, however it would also prevent any future expansion of the building. Finally, this western half of the parcel has more gentle topographic change, making it less suitable for hosting the embedded parts of the cancer centre.

On the east half of this parcel, the contours sit closer together, resulting in a more dramatic slope on this portion of the site. This would provide enough earth into which the building could be embedded. While the tree cover is somewhat more sparse in this area, there is plenty of open space on for additional tree plantings after the building has been constructed. As well, though the contours lack in

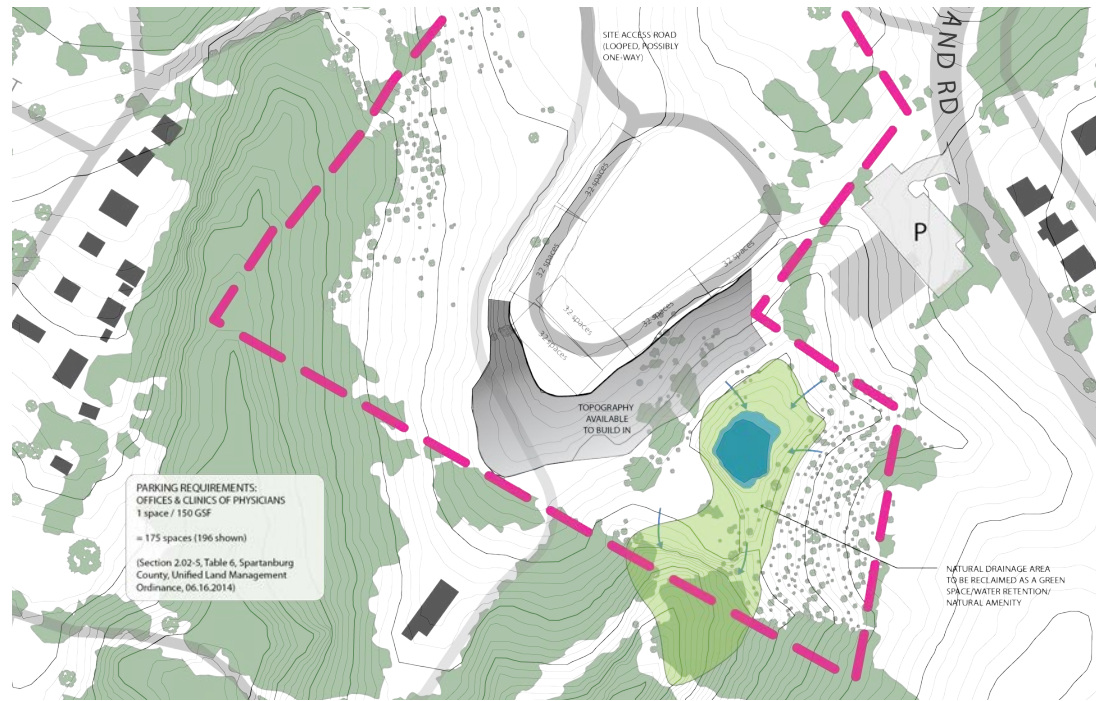


Figure 98: chosen parcel detail map showing parking, slope, and drainage considerations (Braden Reid)

dense tree cover, they offer ample room for future expansion. An additional possibility to connect with nature on this eastern side is found in the natural drainage on site, which settles in a small pond at the foot of the slope. With some grooming and structured planting, this pond holds great potential to be a restored wetland area than can serve as a natural storm water retention area. as well as a natural amenity for the future landscape plan. The only existing neighbour which could affect this parcel is a children's day care facility, located to the immediate east of this parcel, between it and Westmoreland Road. This facility operates similar hours to that of the cancer centre, and it is likely that the children would have outdoor playtime during one or two brief periods each day. While this may be seen as problematic for cancer patients wanting peace and quiet, it is more likely to be a positive distraction for them to watch children laugh and play.

Given the prevalence of cancer worldwide, and particularly nationally, it could be argued that any site would be suited to hosting a comprehensive cancer centre. The specific decisions related to siting the building within a chosen landscape demand greater attention in aligning with the goal of patient empowerment,

as has been discussed in this site selection chapter. However, it is much more pertinent to make sensitive design decisions at the building scale, and simply ensure, at the higher levels of site selection, that the facility in question will be addressing the need for a care facility within its surrounding context.



## 8 | DESIGN PROPOSAL

This design proposal represents a conceptual application of the goals, design guidelines, program, and site selection criteria developed in this thesis investigation. Collectively, the guidelines represent a toolkit for building a comprehensive cancer care facility that will empower patients to become agents of their own, unique healing experience and process. By utilizing this particular care facility, patients of the Spartanburg Regional Healthcare System will be given control over as many aspects of their treatment plan as is possible (both in a clinical and a complementary treatment capacity). This final chapter sets out to demonstrate how this empowered experience of comprehensive cancer care can be achieved architecturally.

Figure 99: view south of the chosen study site (Braden Reid)



### Introduction: The Patient Experience

The patient experience at this facility begins as they navigate their way to the site, whether they are driving themselves to an appointment, or being driven by a member of their support network. From the moment they turn off of the Internal Hospital Road to Abner Creek road (the most likely path of travel for most patients), they will be confronted with a dense tree stand, and a simple, groomed road with one way indication signs. Upon making this turn onto the cancer centre site, the patient will be fully enveloped with a canopy of trees providing enclosure, shade, and a sense

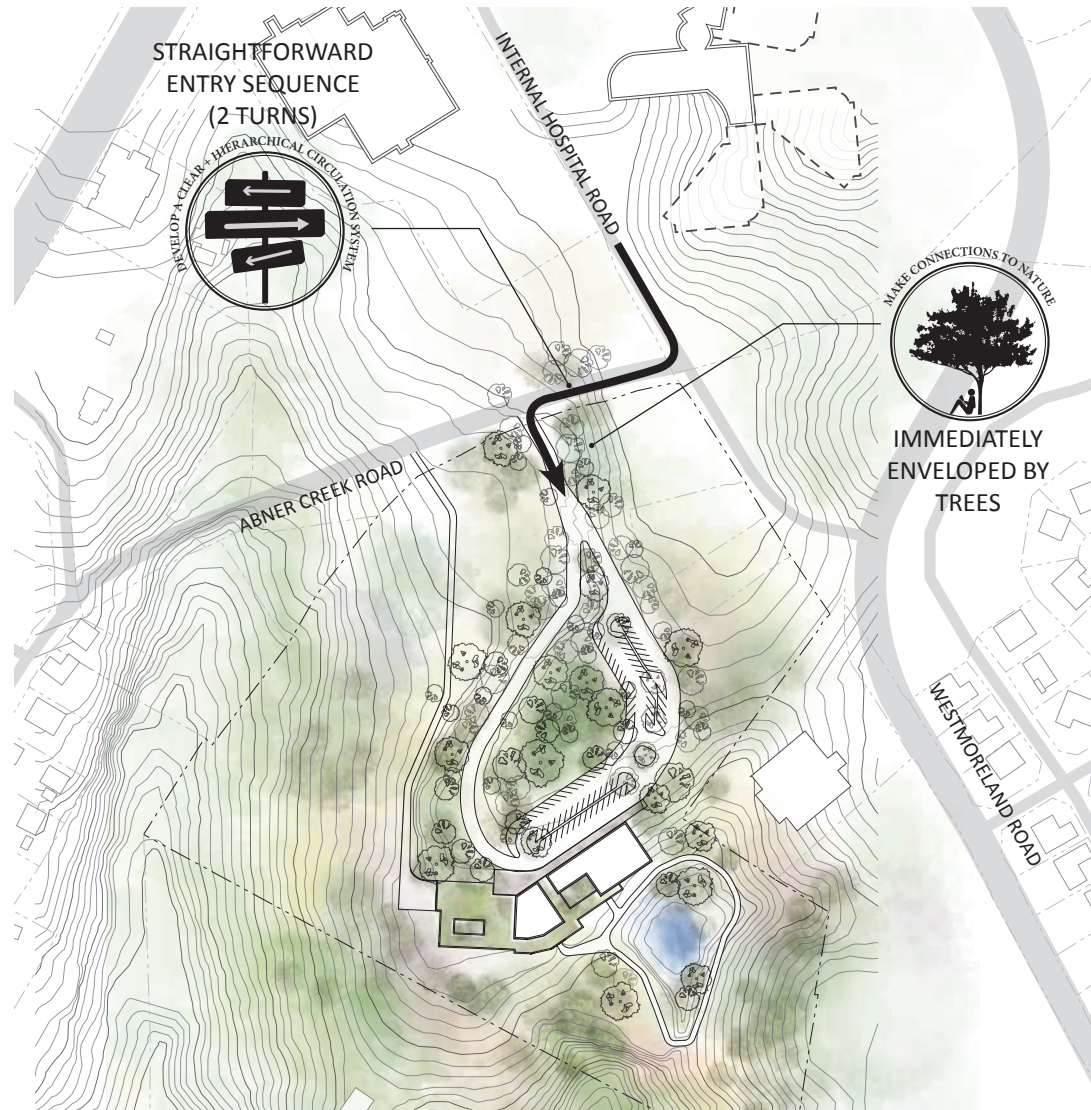


Figure 100: site plan initial access (Braden Reid)

of protection. Their connection to nature will be immediate, their understanding of the circulation system effortless and simple, and their approach to the centre welcoming and deliberate.

Once patients have entered the looped, one-way access road, they will have the experience of being in a forest. This will help to contribute to the host of positive distractions on the site, bringing the patient's focus to the quality of light filtering through the tree canopy rather than to their potential apprehension about a treatment they are soon to receive.

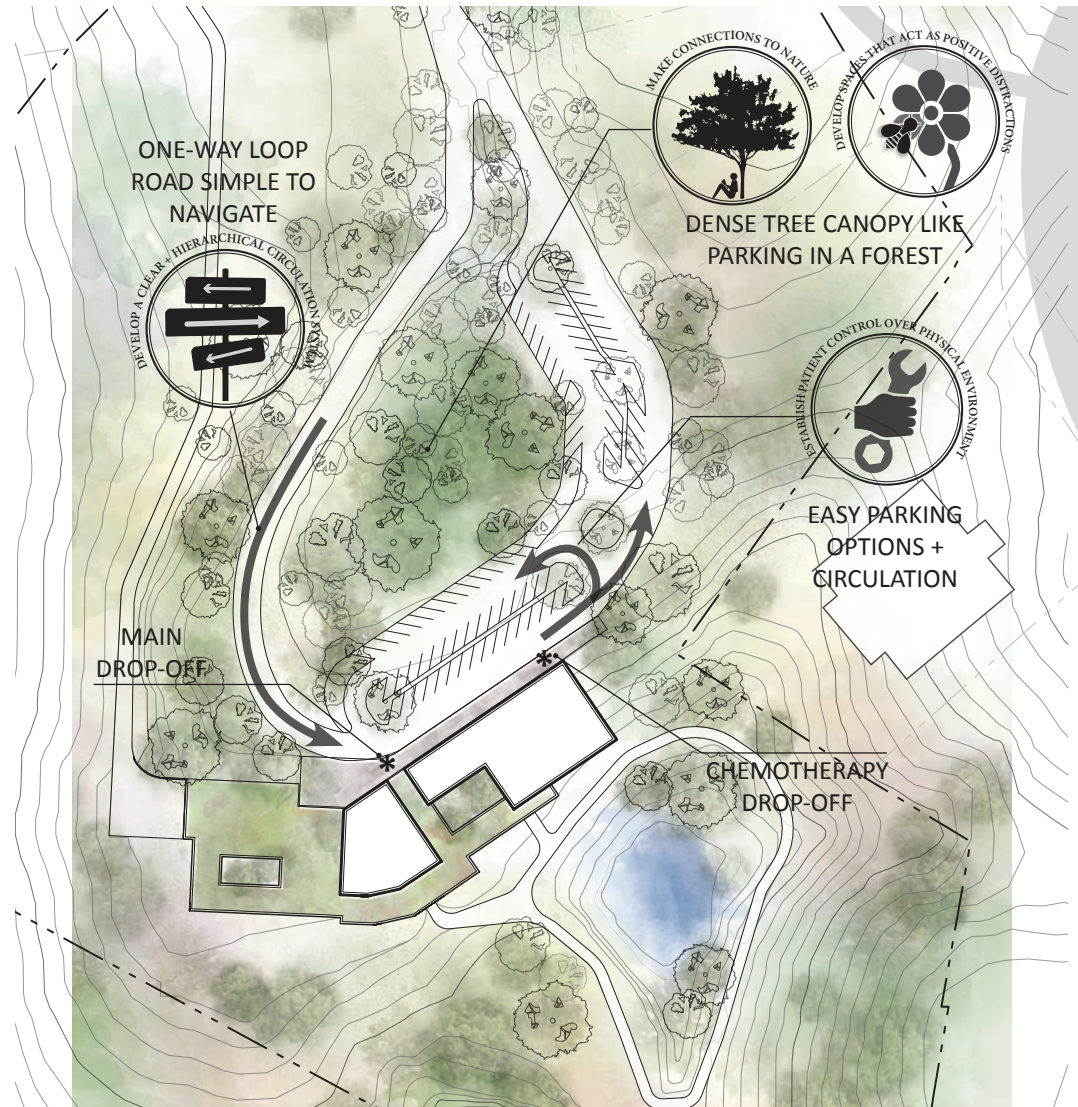


Figure 101: site plan entry and drop-off sequence (Braden Reid)



The patient drop off for either the main entry or the chemotherapy entry are obvious and clear, occurring in sequence along this road, one after the other. The navigation for parking is also structured around one-way loops, maintaining a consistency in the hierarchical circulation system for patients. If driving themselves, patients are in immediate and full control of their place on the site. Angled stalls allow for simple parking. Everything is in clear view.

The first signs of building that greet patients are two simple forms emerging from the gentle hillside. These forms are subtly masked by trees, and the space between them provides a glimpse into the landscape beyond. From this moment, patients become

Figure 102: view looking south, showing the main entry pavilion (Braden Reid)



immediately aware that the building is integrated into the landscape. They can see through the articulated canopy and solid curtainwall of the main building on the right, down to spaces below. Other patients and staff are observable using the central stair and conversing in the upper level of this open space. The organization of the building is not a mystery to the patient; they are in control of their experience, and know where they need to go. At this juncture, patients are empowered to decide which way to enter the building, knowing clearly what their options are.

The building on the left, which houses the alternative therapy + chemo suites, has a lower profile, cueing users as to its status as the secondary building, and not the main point of entry. When they enter the main building, patients are greeted by a volunteer housed at a desk near the elevator. The patient can get an overview of the central circulation space from this vantage, seeing down to the lower level, through to where the diet and nutrition centre is located on their left, and beyond to the green roof and landscape outside. This view will assuage any concerns about the submerged lower level being dark and

cavernous. Instead, patients are welcomed with warmth and daylight.

Once they descend the stair, patients are confronted with a simple choice of directionality: to their right is the glass-front entry to radiation therapy, and a view to the courtyard within; to their left is a view down the corridor to the counseling rooms, also naturally lit and with a view to the opposite courtyard; straight ahead is the lounge area, music therapy room, and gym. With an abundance of natural light, and a simple wayfinding choice to make, this fully-sunken level of the centre is welcoming and friendly.

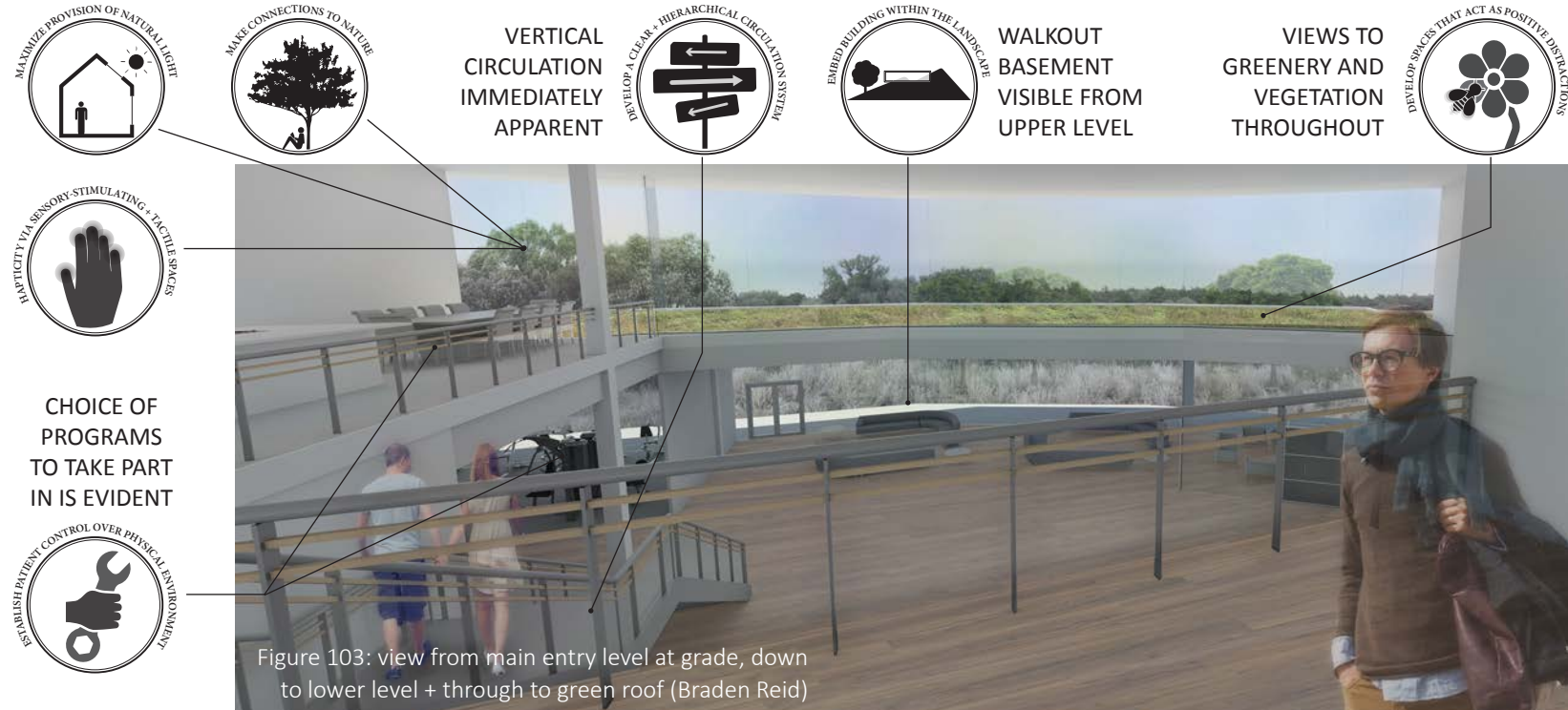


Figure 103: view from main entry level at grade, down to lower level + through to green roof (Braden Reid)



Figure 104: view to the right from the bottom of the stair (Braden Reid)

Patients can feel confident and comfortable wandering through this area without fear of getting lost or going to an area where they are not supposed to be (because a staff corridor is kept separate).

Within the radiation therapy department, the sense of openness and light is carried through. Given its more inward focus, with treatments following an intense degree of precision, this department requires a central element on which to focus, something which will counter the intensity of therapy and concentration practiced here. A large central courtyard is placed in the center of this floorplan, and all patient and staff flows ambulate around this space. The courtyard

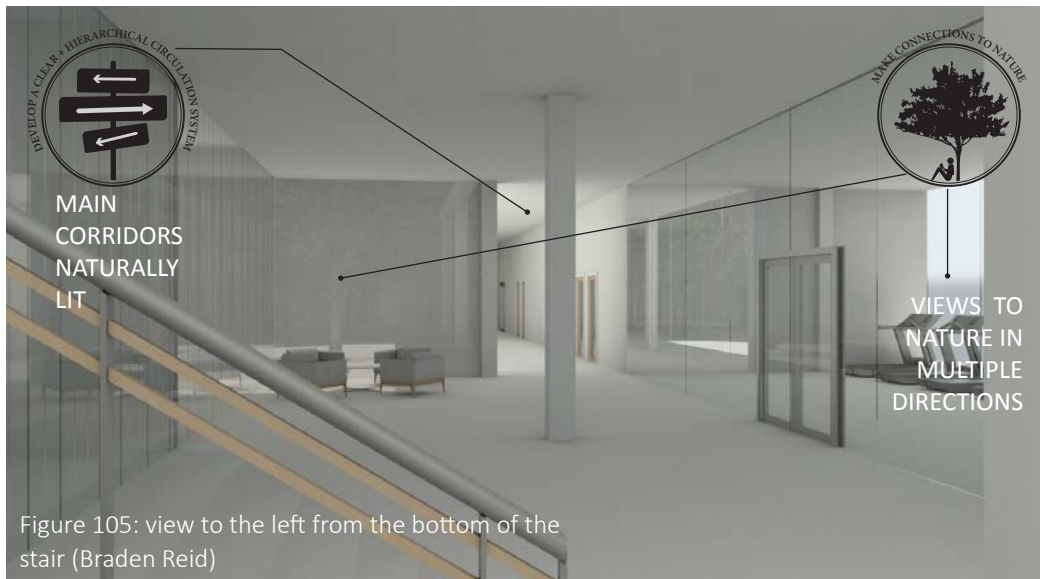


Figure 105: view to the left from the bottom of the stair (Braden Reid)

brings an abundance of light into an inherently dark department (with vaults bearing the nickname ‘bunkers’), and provides patients with a positive distraction that also reinforces the haptic experience of warm sunlight on one’s skin. Patients and staff can communicate openly here, given the welcoming feel of a seating area bathed in light, with views to a treed courtyard, green roof, and the sky beyond.

Figure 106: patient view emerging from radiation vault to courtyard and waiting (Braden Reid)



COURTYARD IS AN AREA OF FOCUS COUNTER TO THE VAULT



TREES IN COURTYARD AND GREEN ROOF ABOVE



SUNLIGHT WARMS WAITING AREA



Patients in the chemotherapy suite have numerous environments in which to receive their treatment. For a patient whose infusions have not been going well, and for whom the treatment takes upwards of 7 hours each time, they may ask to receive their chemo in one of the two private rooms. From this secluded space, they have a view looking west over the courtyard, and sightlines to the main building. They may observe people coming and going throughout the day. They can witness the path of the sun through the curtainwall enclosing this space from the exterior, and register all that happens outside these four walls over the course of the day. In their foreground view is the courtyard, trees, and green roof of the lower level.

TREES IN  
COURTYARD  
AND GREEN  
ROOF BELOW



ACTIVITY OF PEOPLE  
COMING AND GOING  
FROM THE MAIN ENTRY  
(PEOPLE WATCHING)



Figure 107: patient view from private infusion room, looking west to main entry (Braden Reid)

For patients who feel more well, and whose infusion may take less time, there are three primary environments they can be treated in. There are six semi-private bays along the southern wall of this department. Each of these bays is fitted with an operable sliding door that can open up to the adjacent treatment space, should two patients feel the desire to chat with one another while they receive chemo. If their physical condition changes, they can close the shared wall, making their space private. There are also some patients who feel well for the entirety of their chemo, and who are by nature very social. These patients can opt to receive their treatment in the common lounge space, which is naturally lit by the alternative therapy meditation garden visible beyond the curtain wall enclosing the chemotherapy suite.

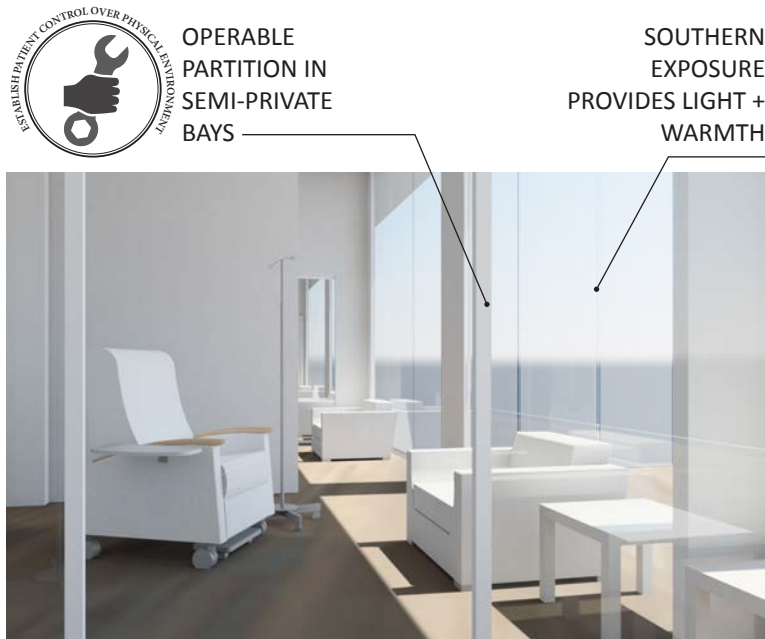


Figure 108: view of semi-private chemo treatment bays, with operable doors opened (Braden Reid)



Figure 109: view of common chemo treatment space, toward alternative therapy meditation garden (Braden Reid)

## Design Proposal Inventory

**Circulation:** in keeping with the design guideline to establish a clear and hierarchical circulation system, such that patients will immediately understand paths of travel through the building without concern of getting lost, the wayfinding in this design proposal is kept very simple. On the ground level, there are two main potential entry points. Upon entering through any of these doors, the choice of navigation is only left or right, and there are clear sightlines throughout. The lower level is arranged the same way: whether descending via the stairs or the elevator, the directional choice is either left or right, and where each of these decisions might lead is made evident through unobstructed views. Patients remain in control of their own navigation system throughout the building. The internal circulation of each department is arranged in a similar way, with landmarks in the form of courtyards, views, or gardens to keep users oriented to their surroundings.

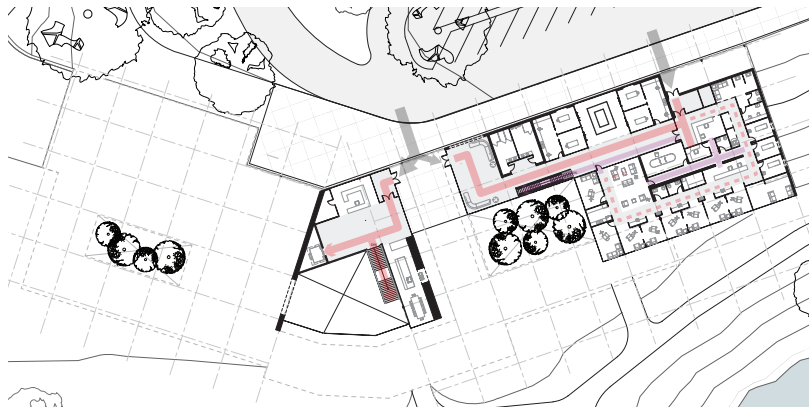


Figure 110: clear + hierarchical circulation system on the ground floor

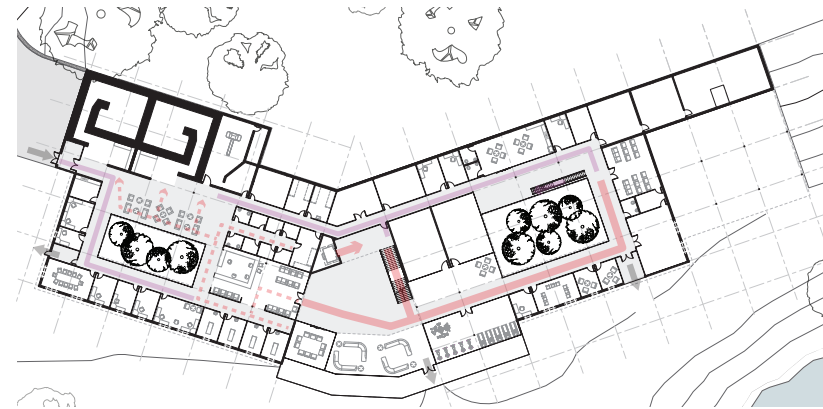


Figure 111: clear + hierarchical circulation system on the lower floor

*Scalar treatment spaces:* to maintain social, emotional, and physical patient comfort throughout the design proposal, a range of different treatment and activity spaces is offered. For patients feeling unwell, and who may like to keep to themselves that day, they can seek some of the more private seating and lounge spaces. If they are receiving chemo, they can adjust that treatment experience accordingly. For others who enjoy the socialization aspect of their time at the cancer centre, they may elect to participate in group therapy classes, be it cooking, singing, yoga, or an educational session. If receiving chemotherapy, they can ask to receive their infusion in the central chemo space, and socialize with other patients. Whatever the mental and emotional state of the patient, there is an option to cater to their needs during treatment. No patients should feel apprehensive about being forced into a social situation, or about the possibility that they may not interact with others.

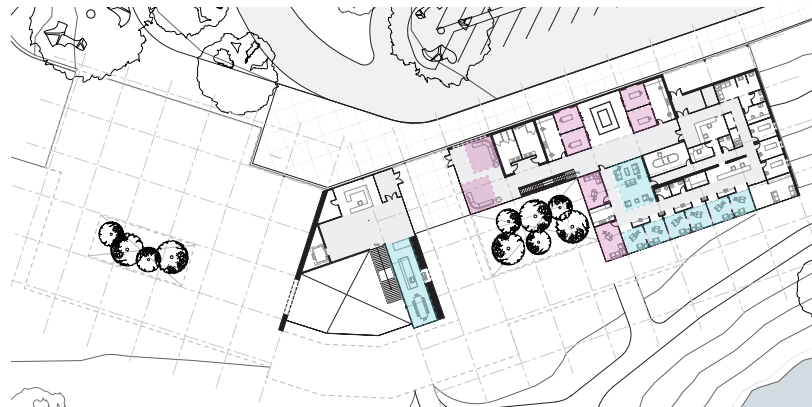


Figure 112: public and private treatment options on the ground floor



Figure 113: public and private treatment options on the lower floor

**Maximized daylight:** as a proven measure of healing, and an essential element to building a therapeutic environment for both patients and staff, options for bringing daylight into the building footprint have been maximized on both levels. This is done either through courtyards curtainwall, or punched openings, depending on the program behind. Spaces which use curtainwall tend to have a more public nature (in the case of the gym, music therapy room, and lounge spaces on the lower level). For those rooms which have a punched opening, the program is most likely more private or intimate in nature, as is the case with the offices in the radiation therapy department, and the counseling rooms on the lower level. While nature light is still important to these uses, it is also important to maintain a degree of privacy and control, such that a feeling of vulnerability and exposure is avoided in these areas.

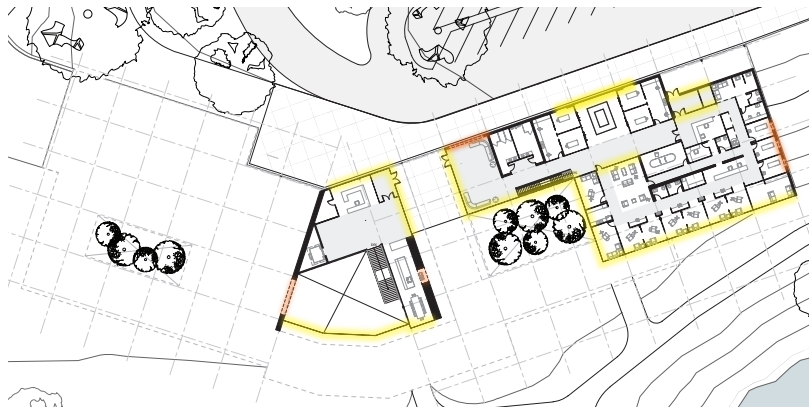


Figure 114: provision of daylight on the ground floor



Figure 115: provision of daylight on the lower floor

*Access to nature*: a tool to provide positive distractions, connections to the landscape, and nurture a haptic experience, providing access to nature will have a multiplicity of positive effects in any design proposal. As a main focus of this design, every opportunity to connect patients with their natural surroundings is capitalized on. From the integration of large courtyards planted with trees, to a green roof on the whole of the lower level, to windows, views, and pathways through the surrounding landscape, patients can remain connected to nature while using many of the facilities at this cancer centre.

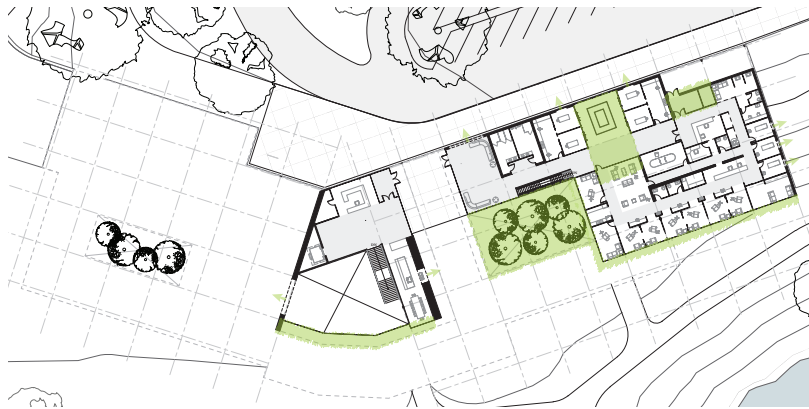


Figure 116: access to nature on the ground floor



Figure 117: access to nature on the lower floor



Technical Details

*Section through central circulation space*

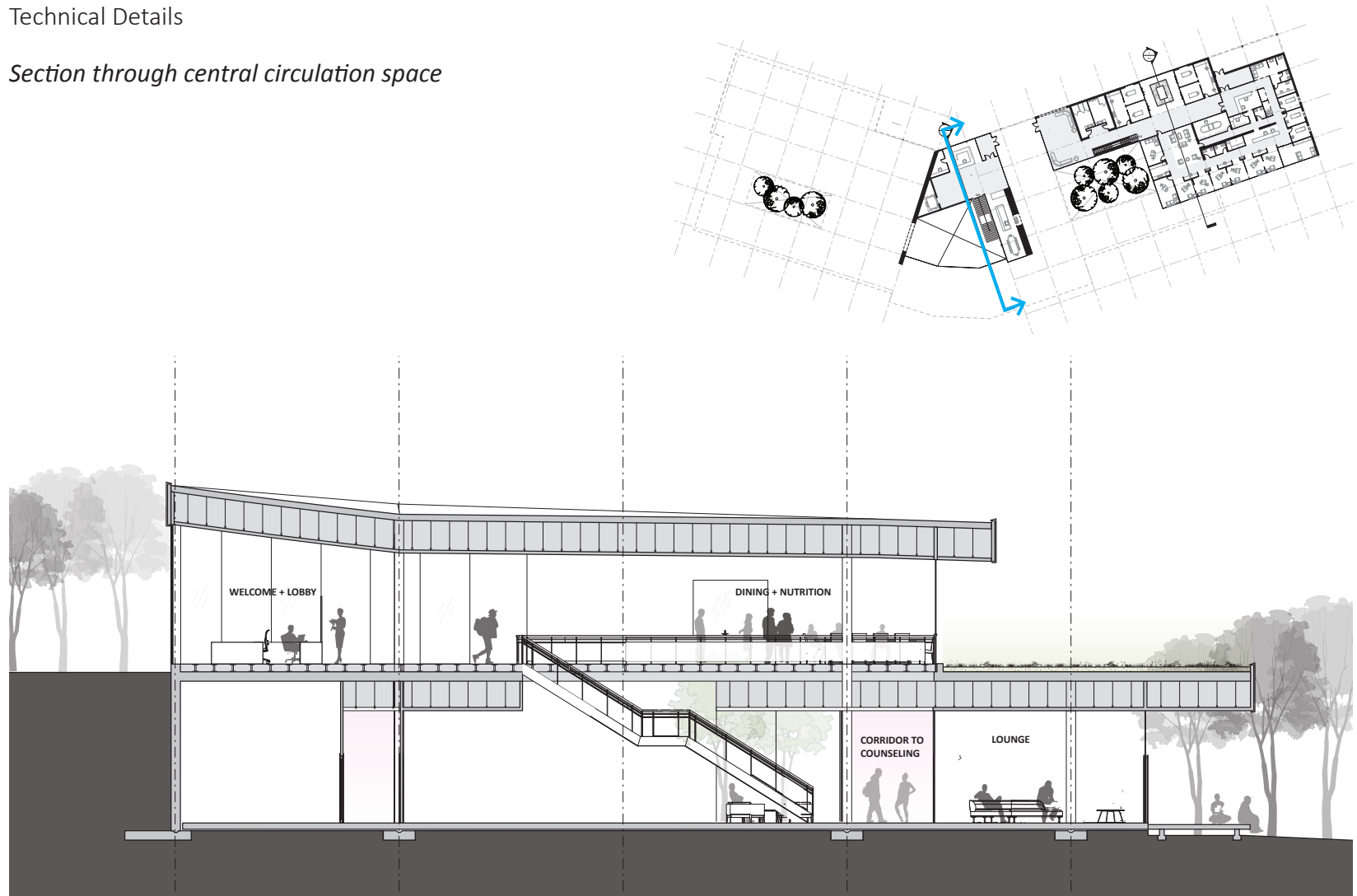


Figure 118: building section through central activity space

Section through infusion (ground) + mind-body therapy (lower) spaces

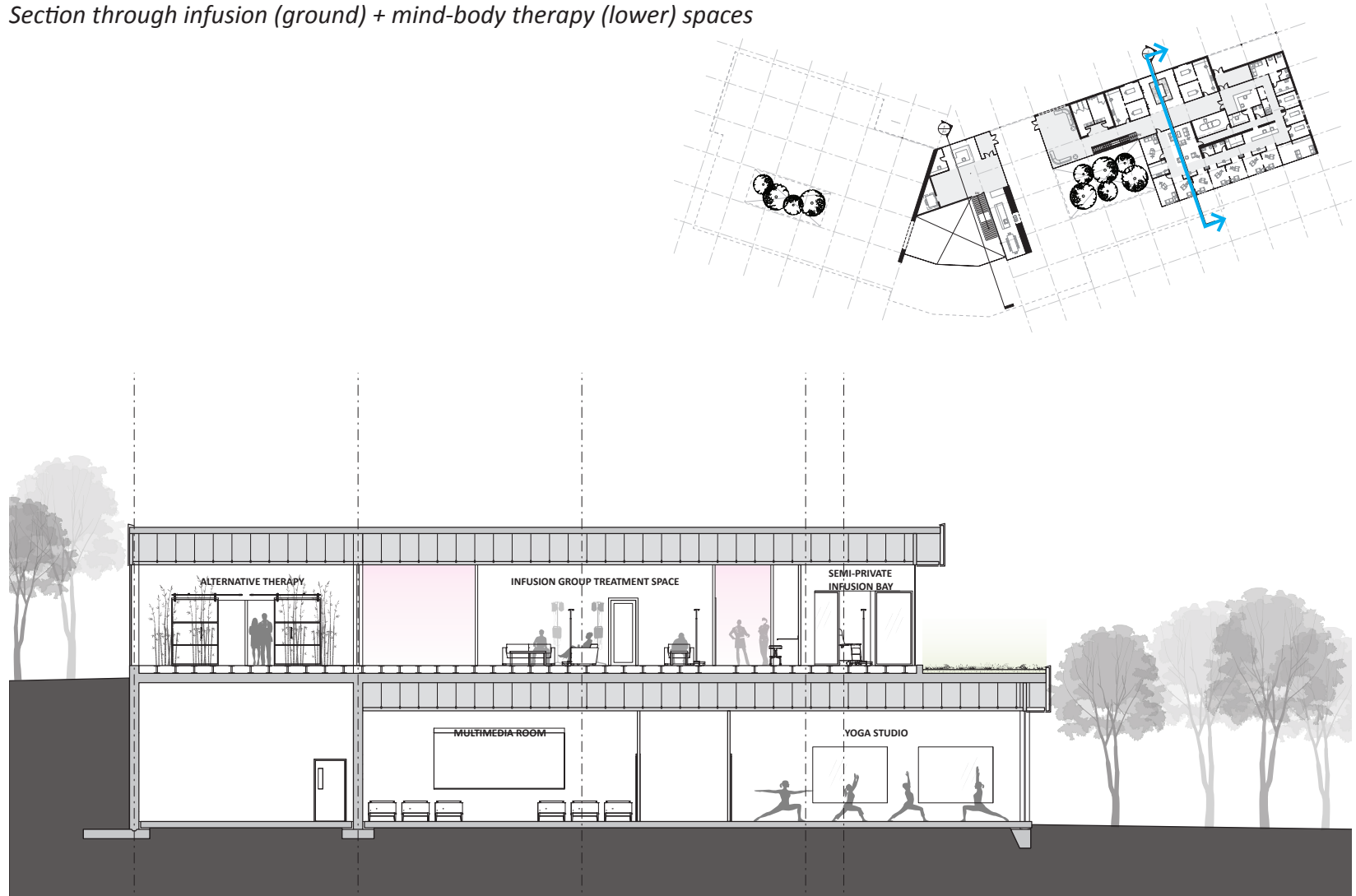


Figure 119: building section through infusion therapy + mind-body therapy



Section through radiation therapy + courtyard

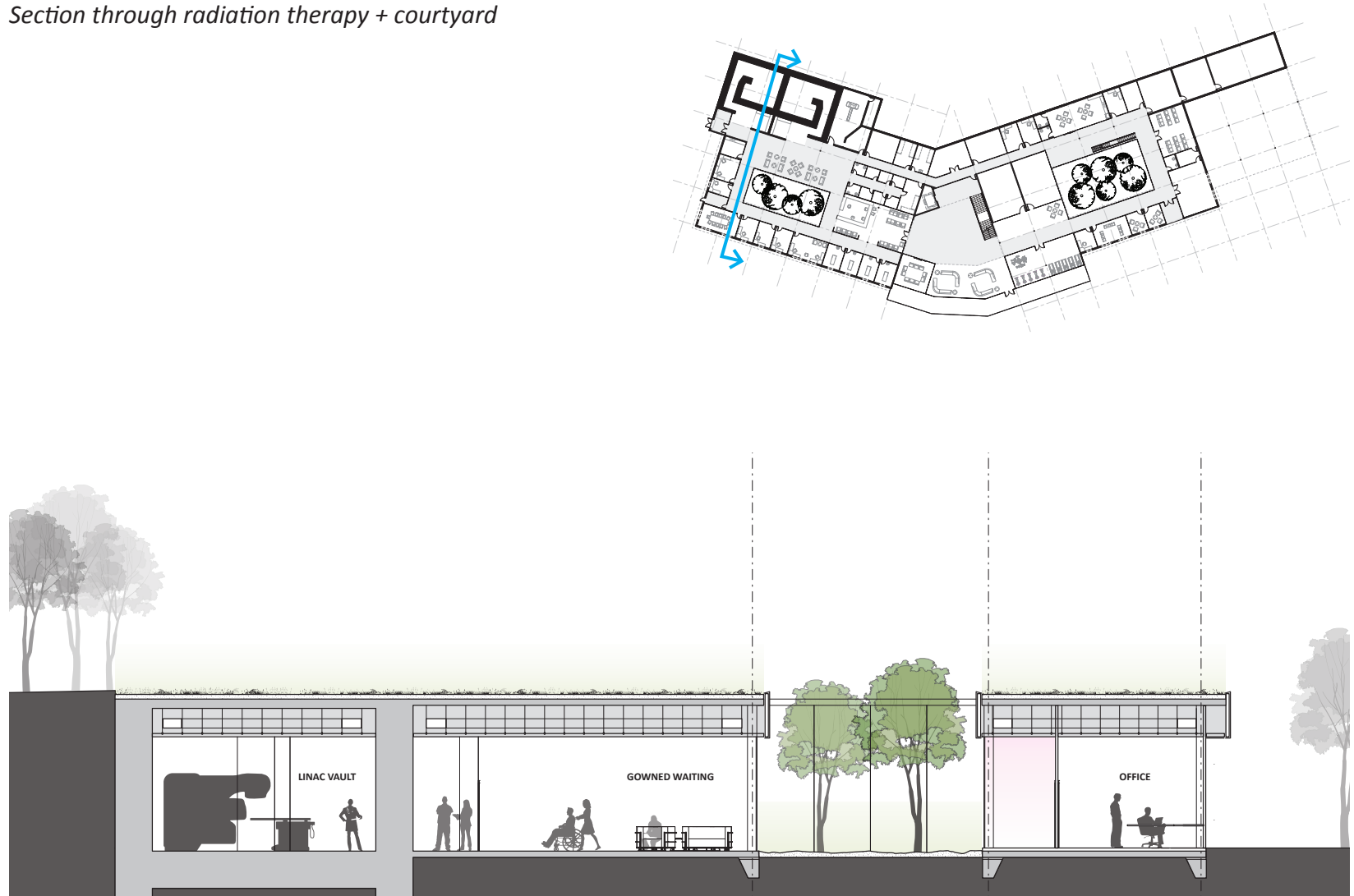


Figure 120: building section through radiation therapy

*Transverse building section*

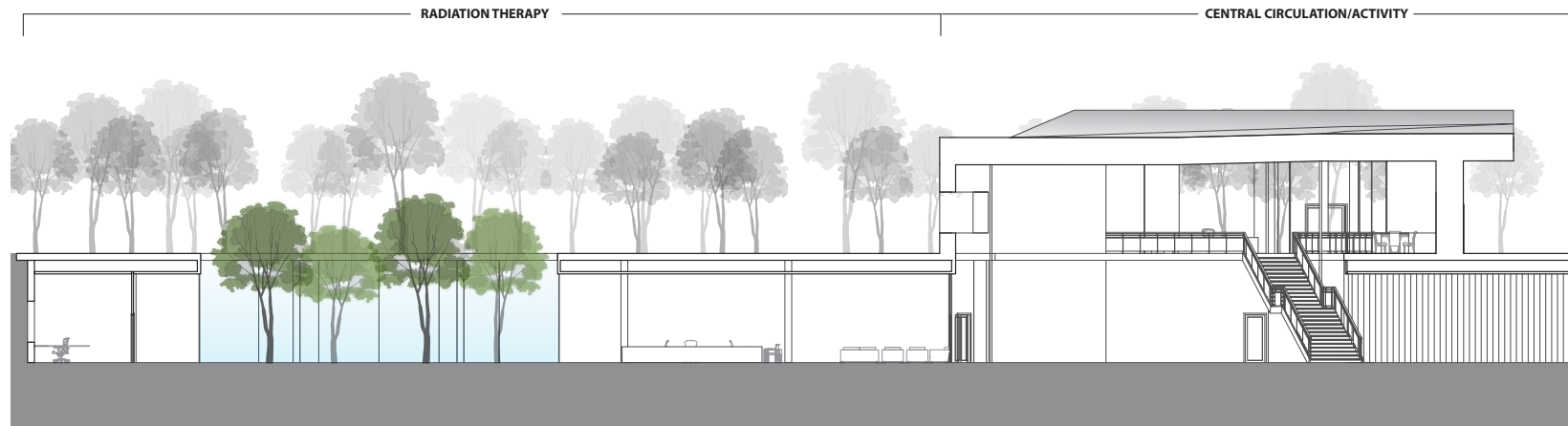


Figure 121: transverse building section (west side)



Figure 122: transverse building section (east side)

## APPENDIX

### PHONE CONVERSATION WITH RICK COLARUSSO, CANCER PATIENT, TRANSCRIPT (1)

2-8-15

treated at UMass Memorial in Worcester, MA

63 years old, non-Hodkins Lymphoma

very tired all the time, had to just sit down in the middle of work, "god i was so tired", hernia operation in his groin, noticed it puffing up, didn't worry too much,  
got to the point where he was changing the tire on his motorcycle, and the next day his ribs were incredibly sore as if he had broken all of his ribs (marrow mostly in ribs and in large bones, so that was a tip off)  
went in and did a blood draw, got a call the next day to stop by friend's office, went there and sat down, "i don't want to say this but there is something really wrong with your blood"  
next day he was admitted, biopsy on groin (lymph node), took quite a few days to diagnose him and they thought it was leukemia, but then they found out  
in the hospital for a few days, then went home, then went into the old clinic for chemo ('chop'),  
every two weeks would go for infusion, took quite a few hours (maybe 4), then would go home (this went on for a few month because he had four infusions)

that old clinic: recliners spread out all over the place, looked kind of old fashioned and crowded (nurses had trouble walking through; people with an iv trouble going to bathroom), but was good because you were right next to other people going through the same thing as you and everyone could relate; 'nothing fancy but had a great upside because you could talk with people; felt like i belonged there'

after 4 chemo, had a bone marrow biopsy (had 8 over the course of all this)  
doctor consulted with them to inform him he had cancer in his spine  
"you try to be up and then you get more bad news"  
consulted at dana farber - didn't like it because they acted like car salesmen, wanted him to come there, felt like he was being lured there, didn't want to go because it was so far away and no one would visit  
decided to remain at UMass, and they consulted with Dana Farber

then had to start a new chemo ('rice') required him to be admitted for 3 days every time, was much more intense, so every few weeks he would be admitted for 3 or 4 days and then would go back home again  
having injections in his spine, but sometimes he would come in out of the blue and get another one if they felt he needed it  
first remove fluid from his spine, and then test it, then put chemo in his spine (had 7 of those) but would be outpatient; would take bone marrow from his hip, like a core sample, this is how they checked his immune system (7 or 8 of those done)

## PHONE CONVERSATION WITH RICK COLARUSSO, CANCER PATIENT, TRANSCRIPT (2)

working, then after another week or two there was an unbelievable drop in the cancer in his blood (like 25%, felt amazing to hear that); 'things were starting to look up'

started talking to him about getting a bone marrow transplant

when people aren't that bad, they can use your own immune system, but he was too bad for that

so they looked for matches in his siblings, sister wasn't a match, brother was a perfect match but was in his 60s and had a heart murmur

i was on the couch alone at home, mary beth was at work, registry called and said they had ended up with two possible matches, but they have to meet the criteria 8 out of 10 markers, so donor has more blood work done, don't have any other matches right now, but will keep looking; he had a strange marker in his blood, so was hard to get a match

had some special radiation treatment, went to his room and they came in with this metal box, that everyone should get but cannot because of insurance, everything was metal, took 15-20 (\$30k!)

2 or 3 weeks later, they called and said they had found a match that was 10 out of 10

after maybe a month, a meeting was set up, he got admitted again, was a strange time for him, leaving his house was very emotional thinking that he might not return

had extremely high doses of chemo to kill his immune system, he would get violent body shakes, shivering so badly after so much chemo

part of his treatment he needed to keep his mouth cold the entire time, 20 minutes to get the chemo (cold would keep from getting bad sores in your mouth), so he would eat 12 double popsicles over this duration

all chemo treatments, none really made him vomit

he despised food throughout this; ' favorite food tasted like tinfoil in your mouth', could only eat ensure and soft boiled eggs, cream of mushroom soup; ' food was the most horrible thing. eating was not a good thing. i despised it. when they came in with my tray it was horrible.'

was getting injections that would make him urinate every minute.

was in a room by himself, only thing he could do was go walk the halls, but had to completely gown up to go out and walk, was only 100' he could walk "if you walk up and down this hall x number of times, it equals a mile" so he did it one day and all the nurses were so happy

the actual transplant was basically just an IV, he lay in bed, they hang the stem cells up, it goes it one of his ports, his favorite nurse was assigned to give him the transplant, and they have to watch over him for "graft versus host" because they want a bit of fighting between the two, but not too much because he could die

they monitor you very closely, day and night

## PHONE CONVERSATION WITH RICK COLARUSSO, CANCER PATIENT, TRANSCRIPT (3)

prepackaged; could not eat anything that had touched other humans; immune system was incredibly vulnerable  
all food had to be thoroughly cooked, no leftovers older than 24 hours  
he was craving foods that were fresh but could only eat processed foods, but food still wasn't a big priority (dried prunes he liked)

went back to the hospital 3 times per week to be checked as an outpatient, but was going to the new clinic (lasted two months)  
put you in a little cubicle in an isolated room, was comfortable but you were alone, was terrible  
make one another feel better by getting your mind off of what was happening  
new clinic was very cold, all the rooms were cold and unfriendly  
when he was going here it was for blood transfusions, various ivs to help his immune system grow  
2 hours per visit  
didn't like the smell of it  
all patients like the old clinic better, would confer on this in the waiting room  
got to be a choice for privacy or socializing!  
\*\*he was starting to feel good but this was a bummer because he was all alone\*\*  
every bay was the same, you didn't know where the hell you were  
went down to 2 times per week (lasted one month), then once per week, then every two weeks he would go once...  
sometimes he would go just for a bone marrow biopsy  
FIRST THING WAS TO WEIGH HIM, THEN TAKE BLOOD (4-5 VIALS), this would happen in a separate room  
his kidneys weren't working too well, so he had to take home iv packs to keep his kidneys working  
constipation was a majorly bad thing for him, was so painful, 'would be plugged up for weeks'  
still goes once per year now  
takes pills now to prevent him from getting shingles

worst thing was mentally - hard to control feelings and think about the future, look through the paper and see obituaries... hard to keep that out of your mind  
need to occupy your mind — he made a few 1000-piece puzzles, and be off and away by himself  
"was therapeutic to concentrate on something else"  
glued and framed the puzzles together and now they hang in his room

### OUTPATIENT CLINIC

old was one crowded but good  
a lot of the times i would step out of the room and walk up and down the hall and wait for the doctor; nothing to do but sit and wait (sometimes for

PHONE CONVERSATION WITH RICK COLARUSSO, CANCER PATIENT, TRANSCRIPT (4)

he would be more than willing to talk to someone at the beginning of a similar journey to help them to cope with it

“your mind is your worst enemy”

mary beth would stay cheerful and positive and he needed that, but then she would go home and cry because she didn't know what was going to happen

“i think you're depressed.”

i picked my head up and said to him, “who the fuck wouldn't be?”

struggle with cancer really took a lot of his energy that never really came background

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