

# **Enhancing Inclusive Design in Emergency Department Waiting Areas: a mixed methods architectural study of five Toronto hospitals.**

by

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## **Abstract**

This inclusive design MRP study explores the architectural and interior design factors affecting the patient experience in hospital Emergency Department (ED) Waiting Areas in the Great Toronto Area (GTA). The phenomenologically-based qualitative study included site observation and analysis; visual semiotic analyses of waiting room images; and studies of users' experiences using a participatory research method to empower participants and marginalized individuals' contributions. The study offers insight into architectural and interior design affordances for creating more optimal, sensitive, and inclusive ED Waiting Areas. Results include a set of recommendations for improving the patient experience. The study provides evidence that the ED Waiting Room is often overlooked and under-developed. It presents concepts that designers can utilize to create environments that are less stressful and more sensitive to the patient experience. Specific recommendations include flexible and comfortable furniture, privacy enhancement, a children's area, and positive distraction elements.

**Keywords:** User experience, lived experience, inclusive design, hospital waiting room, healthcare design, experiential architecture, emergency waiting area, healthcare environment, Toronto hospitals.

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## Dedication

*This work is dedicated to my parents; without them I wouldn't be who I am today or where I am today. I would also like to express my absolute gratitude to my family here in Canada for helping me every step of the way since I set foot in Toronto: Thank you all very much.*

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# 1 Introduction

Prolonged waiting times in healthcare facilities is a continual and pervasive problem in Canada in general and in the Greater Toronto Area (GTA) specifically. In Ontario, in the year 2003-2004, the provincial Emergency Department wait time average was just over 6 hours, while patients in Central Toronto EDs waited over 11 hrs (ICES, 2005). According to Health Quality Ontario (website: statistics dated May 2018) the average waiting time in an Ontario Emergency Department *Waiting Area* is 1.5 hours.

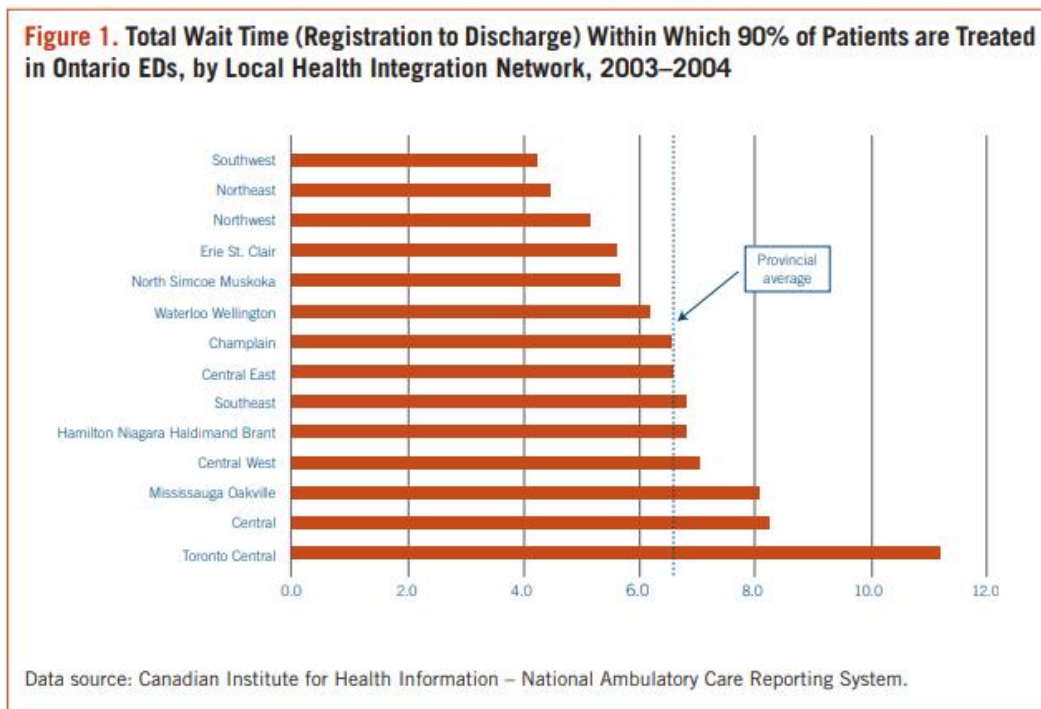


Figure 1 Total Wait Time (Registration to Discharge) in Ontario ED's

Esmail (2008) notes that Canada has one of the most expensive healthcare systems in the world yet has one of the longest waiting times compared to other developed countries. See also Bundy et al (2005) and San Martin and Rose (2006), who emphasize Canada's longer wait times compared to the United States, United Kingdom, and Australia.

Between 2004 and the present day several strategies were implemented by the Ontario provincial government to minimize the patient waiting time in the EDs (Introduction of Ontario Emergency Room Wait Time Strategy). However, a recent survey done in 2016 by the Commonwealth Fund reported that 29% of Canadian patients still have to wait 4 hours in the ED Waiting Area compared to only 4% in other developed countries like Germany, the Netherlands and France.

From my personal experience as an architect and a researcher focused on GTA hospitals' Emergency Department Waiting Area(s) (EDWA), I believe there is room for much improvement in this sector of the healthcare environment. The general public frequently complains about patients' experiences in the Emergency Department. This cannot go unnoticed—it can be found easily and

frequently on TV shows and news, and on a monthly basis in newspaper reports. It can be also found easily as heated discussions in local online platforms such as Facebook or Twitter; almost every Torontonian has a story to share about Emergency Waiting Area experiences.

The objective behind this MRP thesis is to explore the importance of the physical and ambient elements in the ED Waiting Areas in GTA hospitals and to structure an understanding of these elements in order to find ways to improve the EDWA environment for all.

## 2 Literature Review

The Emergency Department Waiting Room as a specific architectural setting is not often singled out for discussion. However, Hospital Waiting Room typology can be understood as generally being relevant for this specific user group and spatial setting. The research review used the following keywords to search for topics relevant to architectural or interior design aspects of Emergency Care Waiting Areas: architecture hospital waiting area; interior design hospitals waiting area; architecture factor emergency department waiting area; social interaction waiting area; accessibility emergency department waiting area; emergency department architecture case studies.

Through the review process, as discussed below, four key categories emerged that can be seen as important to discussion and development of Emergency Waiting Room design. These are: 1) social (relational); 2) physical architectural (material); 3) environmental (ambient); and 4) distraction (attention-related). The literature review below seeks to ground this research project in studies done by



others that address these four thematic areas of interest for designers and for those commissioning designed spaces.

## **2.1 Social Factors**

The social factors within architecture and interior design include elements influencing the interaction between patient, patient companions, and staff members in the ED Waiting Area.

Kassebaum and Baumann (1965) note:

*“Within any given population there may be found a number of distinctive conceptions of illness and sociocultural patterns of help-seeking behavior. It is also reasonable, therefore, to anticipate the existence of a variety of sub-cultural beliefs regarding behavior appropriate to the sick role.”*

As the literature shows, in considering the EDWA as a social (behavioural) space, it is important to consider three particular elements: 1) family and staff; 2) confidentiality and privacy; and 3) furniture layout.

### **2.1.1 Family Members and Staff Members**

The satisfaction of the patient companion (family member or friend) is an essential part of the Waiting Area experience. Eminent healthcare researcher Roger S. Ulrich has conducted many studies contributing to evidence-based strategies for healthcare design. In a 2004 study, Ulrich et al. concluded that there are six critical factors to improving the interaction and communication between ED staff members and patients and their companions in the ED waiting environment: 1) A waiting room near the patient treatment area; 2) The ability to see the patient frequently; 3) Providing the essential utilities (e.g. washroom facilities near the Waiting Area); 4) Providing comfortable furniture in the Waiting Area; 5) Providing easily accessible communication tools and amenities such as telephones and snack machines in or near the Waiting Area; 6) Providing isolated spaces for patient and companion privacy in the Waiting Area.

A recent Australian Emergency Room Design Guideline (2014) listed several key points on how to make healthcare facilities more ‘efficient’ for patients, carers,

and staff members: 1) Friendly, well-informed staff members who can communicate easily and happily with the patients in the Waiting Area; 2) Providing sufficient amount of information about the Emergency Department process (i.e. triage, waiting time) to the patients or their companions; 3) Creating a 'secure' environment in the Waiting Area; 4) Keeping Waiting Areas clean and tidy all the time; 5) Providing easy access to food and drinks.

Anderson, Barbra and Feldman (2007) used a qualitative survey approach to identify key elements for enhancing patient experience in the healthcare setting: 1) Access/communication; 2) Quality of care process; 3) Care continuity; 4) Quality of facilities and healthcare staff. They identified communication, access, interpersonal skills, care coordination, and follow-ups as core healthcare qualities for patient and patient companion satisfaction in the Waiting Area. They noted that an in-depth look at communication and access qualities showed that a well-informed patient was usually a happy and satisfied patient. Other studies emphasized the same concept—that a well-informed patient in the Waiting Area

is usually a more satisfied patient (Nathen Margert, Thomas Clark, Craig Warden et al. 2002).

### **2.1.2 Confidentiality and Privacy**

Breach of privacy in Emergency Departments has been reported in numerous studies—see for example Ulrich et al. (2004)

*Mlinek and Pierce (1997), Olsen and Sabin (2003), Karro et al. (2005). In their observational study of Emergency Departments, Mlinek and Pierce (1997) found a 100% rate of breach in sound privacy. Karro and colleagues (2005) reported a rate of 45% for visual and auditory privacy breaches in EDs.*

*“Mlinek and Pierce (1997) observed a rate of 53% for speech privacy breaches, and Karro et al. (2005) found a self-reported rate of 55% for both speech and visual privacy incidents. For all ED cubicle areas, Karro et al (2005) reported a rate of 62% for speech and visual privacy breaches, and Olsen and Sabin (2003) found that 36% of patients overheard conversations.”*

They note that spaces where the staff members (physicians and nurses) mostly spent their time typically has the highest rate of confidentiality breaches.

Further studies emphasize the significant role of installing high-performance ceiling tiles and other sound-absorbing panels in reducing reverberation time, sound propagation, and noise pressure levels in healthcare facilities (Hagerman et al., 2005; Philbin and Gray, 2002). These elements could be applied in critical areas such as Waiting Areas and Admission/Reception Areas because this is where more confidential information is transferred between patients and staff members (Joseph and Ulrich, 2007).

According to a study done by Ubel, Zell, and Miller (1995), staff members very frequently breach patient confidentiality and privacy by discussing and talking about or with their patients in places where they might be overheard by other staff members or patients. Barlas et al. (2001) studied two types of hospital multi-bed rooms—i.e., they varied in terms of visual and auditory privacy. In one of the rooms curtain partitions were being used while the other had a solid wall partition. As might be expected, the room with curtain partitions reported less

visual and auditory privacy as compared to the one with a solid wall partition. The research study concluded that only 5% of the patients in the curtain-partition room would fully share their medical history because of the lack of privacy in the space. None of the patients in the solid-partition room withheld either their medical history or consent to undergo examinations or tests.

Marc Broadbent, Lorna Moxham, and Trudy Dwyer (2013) conducted 8 weeks of interviews with 45 staff members in an Australian triage room for mental health patients. They note that environmental factors do influence care:

*“Nurses who work in ED triage are cognisant of environmental impacts as they undertake rapid client assessment and manage busy and noisy waiting rooms. The triage environment does influence the ED triage assessment and the management of clients who present seeking mental health care.”*

Nanda (2012) has suggested that positive distraction can be a strategy for creating a social and personally pleasant environment. More discussion of this concept will follow in the section below on ‘distraction elements’.

### 2.1.3 Furniture Layout

There is strong evidence that social interaction in the healthcare environment could be reinforced and strengthened by providing social gathering spaces. Providing comfortable mobile furniture is one means of using design to facilitate the ‘agency’ of spatial occupants in healthcare settings—their capacity to act independently, to be active rather than passive...to ‘exert power’ through their actions (Ulrich et al., 2008; Melin and Gotestam, 1981). Peterson et al. (1977) concluded that a well thought out design of movable furniture around the dining area would increase the level of interaction between patient(s) and companions; it would also improve patient eating habits in the healthcare environment.

Others (e.g. Holahan, 1972) have discussed seating arrangements as related to social interaction. Sommer and Ross (1958) concluded in their findings: *“Much research on day rooms and waiting areas has shown that the widespread practice of arranging seating side-by-side along room walls inhibits social interaction.”*

Yet in Waiting Areas, the opposite conclusion is often reached (see discussion below).

## 2.2 Physical Architectural Factors

There are both physical and ephemeral aspects of spatial environments that impact upon experiences and behaviours. Affordance theory by James J. Gibson could be useful to designers of healthcare environments. Gibson explains the relationship between a living being and its surroundings:

*“The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. The verb to afford is found in the dictionary, but the noun affordance is not. I have made it up. I mean by it something that refers to both the environment of the animal and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment”* (1979/2015, p. 119, emphasis in original).

Ulrich et al. (2004) suggest that the physical attributes affecting the health environment include affordances for privacy, social support, freedom, control, and calmness.



Doreen Balabanoff (2017), in her doctoral research on the birth environment, notes five principles for the development of architectural affordances necessary for better birth spaces: "1) *familiarity*, 2) *privacy*, 3) *spatial organisation*, 4) *emotive embodiment* and 5) *temporality and aliveness*."

In this research project many of the same concepts emerged through the literature review and the observational studies, as relevant to the Emergency Room Waiting Area (EDWA) environment.

### **2.2.1 Colour**

Colour is a physical and ephemeral factor in the architecture-built environment. Renown environmental colour expert Frank H. Mahnke offers a description of color that includes the ambience of lighting in the spatial setting:

*"Color is not a property of objects, spaces or surfaces; it is the sensation caused by certain qualities of light that eye recognizes and the brain interprets. Therefore light and color are inseparable, and, in the design of human habitat, equal attention should be devoted to their psychological, physiological, visual, aesthetics and technical aspects."*

Mahnke (1996) emphasized the importance of corridor colours in hospitals, and the role that colour plays in affecting patient/companion and staff member moods. Mahnke also touched on the concept of using a variety of colours in healthcare spaces. He notes the emotional sterility created by using a non-coloured theme in the healthcare environment. Mahnke warned against the use of wall strips of colours as orientation and identification tools, suggesting it too typically 'institutional'. When choosing colours for corridors that would lead to the intensive care unit, Mahnke encourages use of cool colours like blue and green and notes that the tone of the colour shouldn't be too dark or too light. He proposes using similar relatable colours between walls, flooring, and ceiling (colours that follow the same hue-families or harmonic groups). Important to this MRP/study, Mahnke states that the designer should not think only about the aesthetics, but should engage in an inclusive process of thinking about nurses, patients, and their companions roaming those corridors using wheelchairs, carts, and other medical equipment.

Dalke et al. (2006) observed 20 hospitals in the United Kingdom and found that many patients used coloured orientation tools in the hospitals' Waiting Areas rather than relying on signage boards and plates with medical terms. The researchers also concluded that waiting areas in hospitals with less institutional colours provided a more intimate and less stressful environmental space. Regarding senior or visually impaired patients/companions, the authors advocated use of a familiar color-coding for corridors and zones in the healthcare spaces: "*Colour requires knowledgeable implementation and should be used for simple zoning of no more than four spaces of a building.*" They advised healthcare designers to use only four-colour coding, preferably using blue, yellow, red, and purple; they explained the exclusion of the green colour as confusing for visually impaired individuals: "*...it is widely disputed whether it is a blue or a green.*"

### **2.2.2 Architecture Materials**

Mahnke (1996) warned healthcare designers against the use of any elements or materials that cause visual deception or illusion in the healthcare environment, e.g., mirrors and other reflective surfaces (flooring, ceilings, and

windows). He also emphasized the importance of avoiding using complex patterning on walls, flooring, and furniture. Dalke et al. (2006) also emphasized the idea of avoiding the use of material with glaring and reflecting surfaces in healthcare facilities.

Broadbent, Moxham and Dwyer (2013) concluded patient and staff members were forced to speak louder in triage rooms with vinyl flooring and ceilings. The low absorption rate of the materials affected patient privacy, and subsequently also affected patient management processes in the triage area.

Broadbent et al. note that *“Harris (2000) found that family and friends stayed substantially longer during visits to rehabilitation patients when patient rooms were carpeted rather than covered with vinyl flooring.”*

Leather et al. (2003) examined the changes done during a renovation to a traditional Waiting Area in a neurology clinic. The changes included general layouts, colour schemes, furniture, floorings, curtains, and providing information via journals and electronic interactive displays. All of these changes helped in

affecting positively the mood and satisfaction levels between the Waiting Area's occupants.

Swan, Richardson, and Hutton (2003) examined two types of healthcare spaces and found that patients in well designed, well-furnished hotel-like healthcare facilities rated their attending physicians and other health services more favourably than patients in standard rooms (typical hospital beds, inexpensive regular family sitting chairs, and no artwork). Patients in the former facilities expressed positive intentions both about their willingness to visit the same hospital again and to recommend the hospital to other patients.

Dalke et al. (2006) concluded that a domestic-style Waiting Area with calm and comfortable furniture settings "homey" was appreciated by hospital patients and companions.

### **2.2.3 Furniture Layout and Circulation**

Furniture layout in the Waiting Spaces plays a vital role in enhancing the waiting-time experience in the ED Waiting Area.

Circulation is considered a vital factor in the patient waiting room experience. Fluid circulation between spaces in healthcare facilities improves work flow and increases staff members' work efficiency. These factors increase patient satisfaction in healthcare environments (Pierce, Rogers, Sharp, and Musulin 1990).

Both, Holahan (1972), Sommer and Ross (1958) concluded that designing the Waiting Area with seating side by side along the walls enhances the social interaction between patients and their companions in the Waiting Area environment. The Australian Emergency Room Design Guideline (2014) listed several points on how to make healthcare facilities more inclusive for patients, carers, and staff members: 1) Providing a Waiting Area with sufficient comfortable circulation and adequately sized seating that could be arranged in clusters or groups (i.e., formats that include separation partitions for privacy reasons); 2) Providing recliners and comfortable spaces for senior patients; 3) In the Waiting Area 20% of the furniture should accommodate overweight patients; 4) A sufficient number of toilets should be located near the Waiting Area; 5)

Every Waiting Area should provide a childcare area for children who accompany patients'/companions.

#### **2.2.4 Landscape and Green Areas**

It has been suggested that having access to an exterior landscape space would increase the social bond between patients and staff members. Garden spaces are considered an advisable destination space to take a break from the indoor, artificial clinical environment (Cooper-Marcus and Barnes, 1995; Ulrich, 1999).

Cooper-Marcus and Barnes (1995) examined four hospitals' gardens in California and found them to be used by healthcare nurses as a haven from stress and pressure. Whitehouse et al. (2001) also found that gardens used by patients and their companions facilitated a positive mood and reduction in stress and anxiety levels.

Parsons and Hartig (2000) and Ulrich (1999) both concluded that there is strong evidence that any encounter with a natural setting, even for a short period of

time (e.g., from 3 to 5 minutes), can provide a vital recovery agent from stress and anxiety in the healthcare environment. Ulrich (1991) concluded that by looking at any natural scene the physiological condition of the viewer (patient) would be affected through the production of bodily stress recovery agents, which would affect the blood pressure and heart activity of the viewer. Conversely, by viewing a construction-built scene such as skyline towers, parking lots, or any other construction barrier or obstacle, the recovery processes of the viewer would start decreasing, thereby negatively affecting stress and anxiety levels.

Beukeboom, Langeveld, and Tanja-Dijkstra (2012) studied 457 patients exposed to two different Waiting Areas in Dutch hospitals with three different landscape settings (natural, non-natural (i.e., artificial), and non-existing landscape elements). They found that both natural and artificial landscape elements reduced patient stress levels. They concluded that increasing the attractiveness of the atmosphere in the Waiting Area through landscape design could result in improved patient well-being.



The 2014 Australian ER Design Guideline cited earlier also asserts the concept of enhancing the patient experience in healthcare facilities by providing artificial or natural landscape elements in the Waiting Area.

### **2.2.5 Signage and Wayfinding**

Another important aspect of the EDWA experience is the signage, including wayfinding elements.

The Australian ER Design Guideline (2014) lists several points on how to make healthcare facilities more efficient for patients, carers, and staff members. Among these are *direct and clear* signage plates in the Waiting Area. They note that healthcare facilities should provide plates that include braille language for visually impaired patients. Multilingual signage, where appropriate, is also seen as valuable. Further, use of interactive electronic screen wayfinding and information kiosks are useful approaches.

A five-hospital observational case study in Bombay, India by Gakopoulos (2009) concluded that patients and companions were heading to and waiting in the

wrong hospital wards because they couldn't read the signage and wayfinding maps. The researcher advocated the use of numeric signage/wayfinding maps that are useful for hospitals that are located in multilinguistic population areas.

Lee et al. (2014) exposed a group of patients in three different countries (the United States of America., South Korea, and Turkey) to 14 healthcare symbols representing different areas in the hospital. Taking into consideration patients' ages and genders, the researchers reported that most of the symbols were identified correctly by the participants. From these results the researchers suggested that there is an excellent likelihood of successfully designing and creating universal healthcare symbols that could be used in diverse cultural and multilinguistic areas or countries.

### **2.3 Ambient Environmental Factors**

There are many sensory and 'experiential' factors that have significant impact on spatial experience. Ulrich et al. (2003) and Harris et al. (2002) note that ventilation, acoustics, and lighting are key factors for patient well-being. Yet these factors may be under-considered in ED Waiting Space design because they

are intangible or invisible. This section focuses on these aspects—temperature, lighting, ventilation, and acoustics—and how these elements may affect the patient and companion waiting-time experience.

### **2.3.1 Ventilation and Temperature**

Evidence shows that higher rates of ACH (air change per hour) in healthcare facilities lower the potential of infection in the healthcare spaces. The ideal rate of ACH occurs between 12 ACH and 15 ACH. In a comparative study of SARS infections in one healthcare facility, researchers found that wards with the highest ventilation rate had a significantly lower infection rate among healthcare staff members (Jiang et al., 2003). Menzies et al. (2000) examined 17 Canadian hospitals and concluded that staff members in healthcare facilities had higher infection rates for tuberculosis if the ACH rate level was low.

Harris et al (2002) interviewed over 300 patients following their discharge and concluded that there were specific factors that could play vital roles in improving patient experience in the healthcare space. These included a good quality of natural light, quietness, and a *comfortable* room temperature.

Escombe et al. (2007) studied eight hospitals in Lima, Peru—three old hospitals (pre–1950) and five modern ones (1970–1990). They found that the old hospitals with higher ceilings and bigger size windows provided better natural ventilation than modern hospitals with smaller window sizes and lower ceiling heights.

### **2.3.2 Light**

Both natural and artificial lighting are important elements of spatial design for human well-being (Ulrich, 2008). Balabanoff (2017) described the inseparability of light, colour, and darkness, and notes their experiential qualities:

*“Light (light-colour-darkness) can be sensitively designed to provide multiple architectural affordances that enhance embodied, atmospheric and soulful experience. These are important aids to a positive birth experience.”*

Harris et al. (2002) concluded after 380 telephone-call interviews with discharged patients that one of the important satisfaction-producing elements for patients in healthcare facilities is provision of a space with a window that provides a “sufficient amount of natural light and a nice landscape view.”

Mahnke's (1996) recommendations on lighting in healthcare spaces include: 1) Use artificial light with a similar spectrum composition to that of natural light; 2) Use balanced spectrum lamps to help staff members with the diagnostic process in the triage area ('unbalanced' spectrum lamps are unfavourable for seeing patient skin colour, and decrease companion patient-encouragement); and 3) The Illuminating Engineering Society recommendation of using 'colour-improved' lights with higher CRI (Colour Rendering Index) ratings. Alzubaidi and Soori (2012) gave the exact amount of light required in the ED Waiting Area as 200 lux.

However, as Mahnke relates, colour-light is a complex phenomenon that cannot be decided upon reductively. This is an area requiring more study, particularly as lighting technologies are in a process of rapid change today.

### **2.3.3 Acoustics**

Australian Emergency Room Design Guideline (2014) listed several points on how to make healthcare facilities more efficient for patients, carers, and staff members. Included among these points are the following: 1) Provide a hearing

loop system or infrared system to assist patients or patients' companions with hearing aids that function as a noise isolator in the waiting ambient; 2) Provide non-repetitive calm music in ED Waiting Spaces. Staricoff (2003) concluded that live music can play a vital role in decreasing blood pressure and anxiety levels for patients and companions in the Waiting Area. Routhieaux (1997) emphasized that music can play a vital role in reducing patients' stress and anxiety levels in the Waiting Area, and it follows that this impact could reduce patients' aggression toward staff members in the EDWA. Cabrera (2000) made similar assertions by suggesting one replace noise pollution with calm, subtle music.

In an observational case study that lasted for 24 hours in a major US hospital, Orellana, Busch-Vishniac, and West (2007) concluded that the high sound pressure in the hospital emergency room resulted from the need for frequent communication between staff members, patients, and companions, and that this, in turn, created a tiring healthcare environment.

## **2.4 Distraction elements**

Distraction elements in the EDWA are considered one of the principle elements that affect the patients and companions waiting-time experience in the ED. Mahnke (1996) mentioned distraction elements in the Waiting Area as an important tool that encouraged the patient to be distracted by an outside factor rather than focused on inner pain.

The term positive distraction refers to elements or conditions in a space that attract the attention of patients and engages them so that their awareness shifts away from pain or other stressors. Distractions may include music, pets, TV (news or comedy shows), artworks, and, especially, nature and landscape elements (Ulrich, 1991).

### **2.4.1 Artwork**

Staricoff (2006) examined qualitative and quantitative studies while searching for evidence supporting art interventions in the healthcare ambient. She reported that the Chelsea and Westminster study provided clear evidence

that the integration of the visual and performing arts in the healthcare space had an obvious impact on patients' well-being.

From a survey of 300 randomly selected patients, Carpman and Grant (1993) concluded that patients preferred looking at natural-themed landscape images rather than abstract-themed images.

After exposing two groups of patients in a psychiatric department to two types of artwork, Ulrich et al. (1991) concluded that the first group of patients expressed negative feelings toward artworks that were ambiguous, surreal, or could have different meanings. The second group showed strong positive reactions toward artworks that contained either natural landscape scenery or natural elements.

In a study done in a Swedish hospital, researchers found that heart-surgery patients in ICUs who were exposed to artwork which contained trees or water surfaces (e.g. lakes, waterfalls) had lower levels of anxiety and stress and required lesser amounts of pain killers in comparison to a group that had been exposed to abstract-themed artwork (Ulrich et al., 1991).



A randomized investigation found that adult patients undergoing a painful bronchoscopy treatment in a room with ceiling-mounted nature scenes felt less pain than patients in a room with a normal blank ceiling (Diette, Lechtzin, Haponik, Devrotes, and Rubin, 2003).

By observing two Waiting Areas in two different major cities in the United States Nanda (2012) concluded that by utilizing nature-themed artwork (positive distraction) in waiting areas patients and companions were too busy focusing on the artwork and discussing the meaning behind it to stare at each other, thereby creating a social and privacy buffer within the observed EDWA.

According to the Australian Emergency Room Design Guideline (2014) providing artworks and images in the Waiting Area can help reduce stress and anxiety levels of patients and companions. The Guideline also suggested using local artists and children's artwork, and emphasized the dynamic role of children's artwork. Further, it was noted that murals and ceiling paintings in the Waiting Area also played a distraction role.

### 2.4.2 Media

Multiple studies suggest that if natural landscape elements cannot be provided in the waiting environment, a valuable alternative could be the use of visual display screens (TV or Sun-glass displays) with nature-themed programs or TV shows (e.g. nature documentaries).

*“A well-controlled study of blood donors in a waiting room found that blood pressure and pulse were lower on days when a wall mounted television displayed a nature videotape, compared to days with continuous daytime television programs (Ulrich, Simons, and Miles, 2003).”*

Harris et al. (2002) concluded that specific elements could enhance overall patient satisfaction with their experience in healthcare facilities. These included wall colours, artwork, and easy access to media distraction elements (e.g. television, landscape).

According to the Australian Emergency Room Design Guideline (2014) calming colours and positive distractions (e.g. television, fish tanks, magazines,

movies/DVDs, and interactive screens) help reduce perceived waiting time in the ED Waiting Area.

Staricoff, (2003) notes that live music can play a vital role in decreasing blood pressure and anxiety in the Waiting Area. Music can also reduce patient stress and aggression against staff members in the waiting are. Cabrera (2000) suggested utilising music in the Waiting Area to help counter hospital noise pollution.

### **2.4.3 Natural Elements**

Wilson (1984) proposed a “biophilia” hypothesis which asserted that human beings have a strong bond with the natural world. As noted earlier natural elements enhance the well-being of patients in the EDWA. Nature simulations with both visual and auditory elements can also play a vital role as distraction agents. Malenbaum et al. (2008) has emphasized the role of noise and stressors in exacerbating pain.

Ulrich (1984) examined two groups of patients recovering from cholecystectomies (gallbladder removal surgery) in two different types of rooms.

Patients in the first group were placed in a room that had a natural view; the second group of patients were placed in rooms with a view of a brick wall (i.e., construction view). Patients with the natural-landscape window view recovered faster, took less pain medication, and had fewer negative-toned comments compared to the group with the construction window-view.

Diette et al. (2003) exposed patients (undergoing bronchoscopies) to natural scenes and sounds to reduce pain during randomized clinical trials. They concluded that those exposed to nature showed better levels of pain recovery.

Hoffman, Patterson, and Carrougner (2000) conducted a research study on burn patients undergoing physical therapy using VR technology showing landscape sceneries and noted significant decreases in pain intensity, pain unpleasantness, and time spent thinking about pain.

## 2.5 Literature Review Summary

This literature review focused on four themes or potential areas for design affecting patient experience: social, physical, ambient, and distraction.

- 1) Social Factors focused on the interaction between patients, companions, and staff members in the Waiting Area.
- 2) Physical factors focused on the architectural and interior design elements in the Waiting Area.
- 3) Ambient Environmental Factors discussed ventilation, lights, and acoustics in the Waiting Area.
- 4) Distraction Elements focused on elements that seemed to reduce pain and sense of waiting time (e.g. artwork, journals, TV, and nature elements).

The main concepts emerging from the literature review, relevant to my own *inclusive design* research focus, were:

- 1) The value of information provided by: a) Well-informed staff members who could provide patients with adequate information about their medical

status and waiting time (Ulrich et al., 2004); b) Wayfinding plans and signage plates that are clear and easy to translate, understand, and follow (Gakopoulos, 2009).

2) The importance of providing a private space where the confidentiality and privacy of the patients/companions would be kept and preserved. This could be improved, for example, by installing highly acoustic-absorbing material surfaces (Hagerman et al., 2005; Philbin and Gray, 2002).

3) The role that furniture layout and comfortable furniture could play in enhancing social relationships and well-being in the Waiting Area (Ulrich et al., 2008; Swan, Richardson, and Hutton 2003).

4) Use of calm colours (Mahnke, 1996) and adequate natural and artificial light (big windows and balanced spectrum lamps) (Mahnke, 1996).

5) A window looking out onto an exterior landscape view (Cooper, Marcus, and Barnes, 1995; Ulrich, 1999).

6) Provision of a well-ventilated space with high ACH rate (air change per hour) (Jiang et al., 2003).

7) Sound control, e.g. noise absorbing surfaces and hearing loop or infrared system to assist patients and patient companions with hearing aids (Australian Emergency Room Design Guideline 2014).

8) Provision of distraction elements as a vital recovery and pain-reducing agent (Ulrich et al., 1991). Positive distraction elements in the Waiting Area include artwork, live media (optimally natural-themed programs and shows), plants, flowers, and artificial and natural water elements (e.g., fountains and artificial waterfalls).

### **3 Research Methodology**

To achieve a phenomenological qualitative research study, three research methods were implemented in this MRP: **site observation**, **semiotic research**, and **online user survey**. Each method plays a vital role in understanding the ED Waiting Area environment. Site observation assists in structuring a conceptual understanding of the current situation in the EDWA. Semiotic research offers an important comparison of case studies where negative and positive elements

are observed and studied, and the online user survey is the main participatory method of collecting data—specifically by gathering end-users’ (patients’ and companions’) experiences of existing ED Waiting Areas in the GTA hospitals.

The literature review played a vital role in establishing my understanding of architectural and interior design elements within the ED Waiting Area. These elements varied from **finishing materials** (colour, texture, reflectivity of walls, flooring, ceiling); **furniture layout**; artificial and natural **lighting**; **way-finding maps/signage**; **distraction elements** (printed matter, media screens, artwork); **landscape elements** (plants, water elements, courtyards); **privacy elements** (wall partitions, privacy curtains/screens); and **childrens’ play areas (or other childcare environment approaches)**.

### **3.1 Site Observation**

As noted above, the literature review provided an overview of key aspects of the architectural setting that requires attention for optimal EDWA ambient experience. Site visits to six hospitals in the Greater Toronto Area (GTA)



provided an opportunity to include my own lived experience as part of the research process.

My hospital visits were conducted in a 2-week period, between the 5<sup>th</sup> and 19<sup>th</sup> of September 2017. Six hospital ED Waiting Areas were visited: 1) Humber River Hospital; 2) Markham Stouffville Hospital; 3) Toronto General Hospital; 4) North York General Hospital; 5) Mount Sinai Hospital; 6) St. Michael's Hospital. Each ED Waiting Area was visited twice. The time of each Waiting Area visit lasted for 20 to 30 minutes. Immediately after leaving each facility I drew basic plans (from my on-site experience). Further, I considered each plan as a conceptual diagram showing/contrasting the relationships and choreography laid out in the various plans. A summary of my learning from this observational process is included at end of this section.

An important objective of the site visits was to experience the current situation in the EDWA in Toronto and establish a comparative understanding of the real-world local Toronto ED settings, informed by exemplars and concepts found through the literature review.

### **3.1.1 Humber River Hospital**

Humber River Hospital is considered a new hospital in Toronto, enrolled into service in 2015. It is located in North York. I visited this ED Waiting Area twice – allowing 20 minutes per visit; the time for both visits was in the afternoon. The following chart and plan/diagram drawing is typical of the outcomes at each of the six hospital sites visited. See Appendix 7.1.4 for data from all six sites visited.

**Table 1: Humber River Hospital**

<b>Item</b>	<b>Status</b>	<b>Observation of the researcher</b>
<b>Approximate size</b>	5 x 10 = 50 m <sup>2</sup>	
<b>Patient capacity</b>	approximately 30 patients	<i>crowded</i>
<b>Floor finishing</b>	vinyl flooring	<i>plain gray colour, depressing</i>
<b>Wall finishing</b>	normal paint	<i>off-white and hue purple colour, depressing</i>
<b>Ceiling finishing</b>	false ceiling	
<b>Furniture</b>	new	<i>gray-greenish colour</i>
<b>Artificial light</b>		<i>200 - 300 lux, comfortable</i>
<b>Natural light</b>	<i>well lit</i>	<i>light seemed appropriate at that time: it wasn't annoying or dim</i>
<b>Patient calling system.</b>	numerical system	<i>patient takes a number from designated machine, and waits for his/her turn: presented on a digital screen that shows patients the numbers that the doctor is ready to examine</i>
<b>Nurses' monitoring-status over the waiting area</b>	have full view over the Waiting Area	
<b>Wayfinding plans</b>	doesn't exist	
<b>Signage</b>	clear & easy to read	<i>a lot of doors without any signage</i>
<b>Distraction elements</b>	TV, digital clock	<i>News: channel, CP24</i>
<b>Artwork elements</b>	doesn't exist	
<b>Water element</b>	doesn't exist	
<b>Landscape elements</b>	doesn't exist	
<b>Childcare center</b>	doesn't exist	
<b>Noise level</b>	29 - 32 dB.	<i>could be described as quiet area</i>
<b>Privacy element</b>	doesn't exist	<i>Waiting Area is an open space without any barrier or privacy component</i>

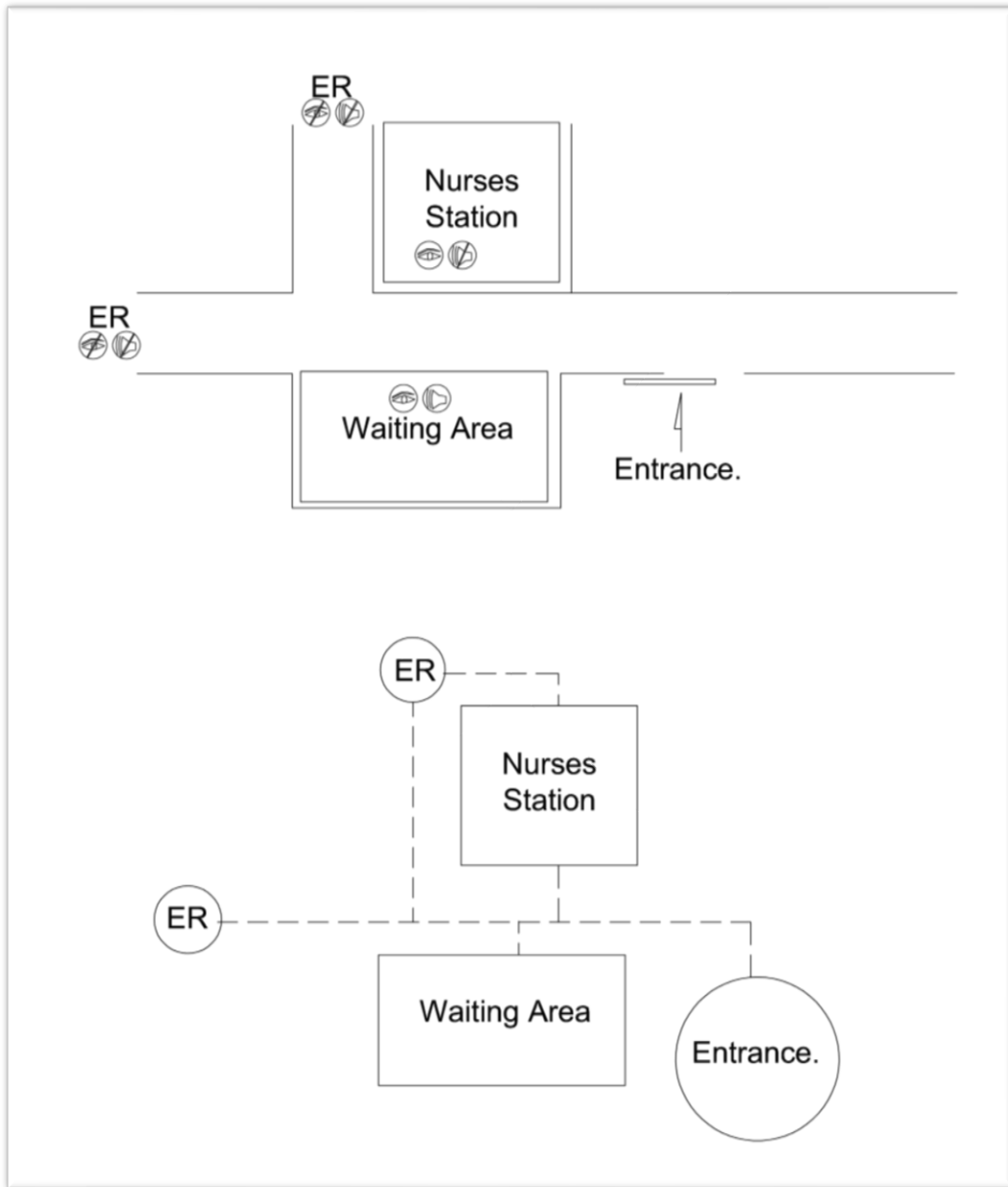
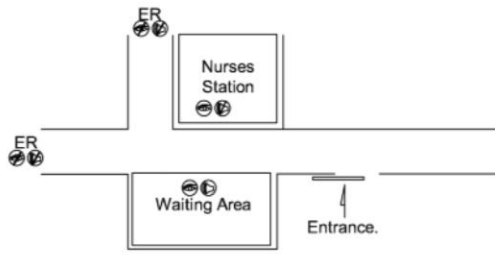
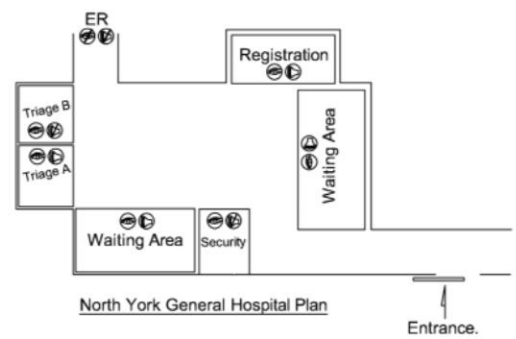


Figure 2: Humber River Hospital Diagram and Plan



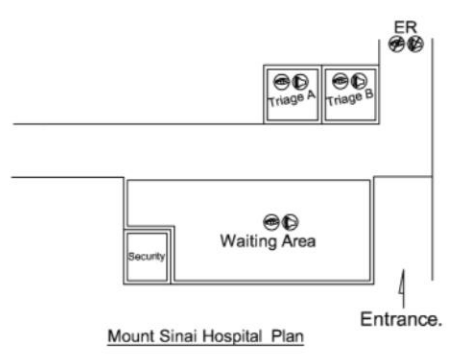
Humber River Hospital Plan



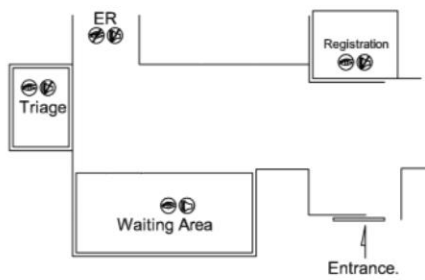
North York General Hospital Plan



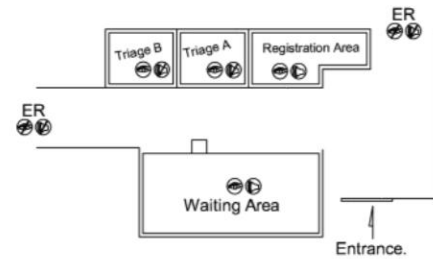
Toronto General Hospital Plan



Mount Sinai Hospital Plan



St. Michael's Hospital Plan



Markham Stouffville Hospital Plan

Figure 3: Plans of All the Visited EDWA Hospitals

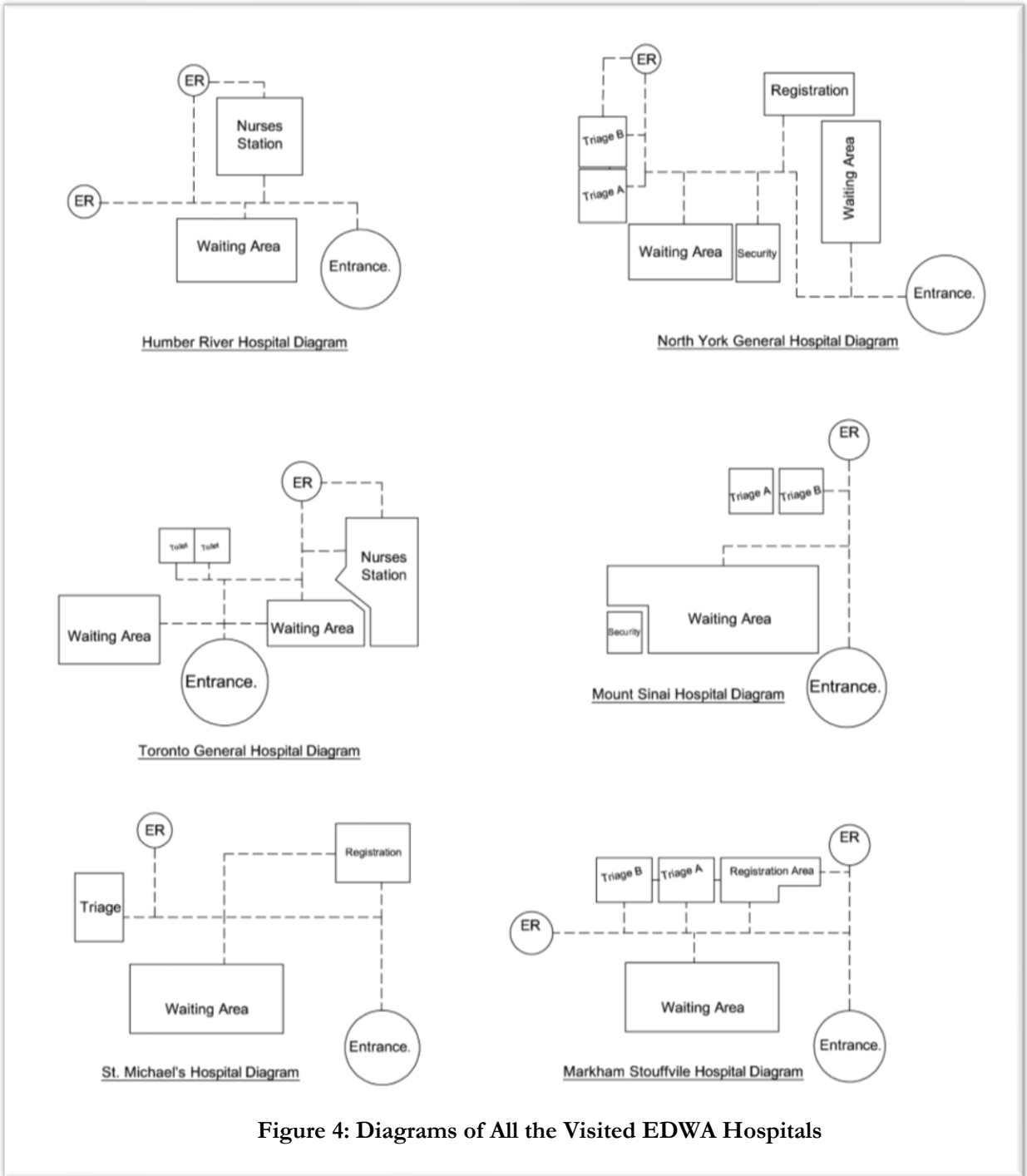


Figure 4: Diagrams of All the Visited EDWA Hospitals

### **3.1.1 Site Observation Summary**

A checklist of the most influential architecture and interior design factors and elements in the EDWA was prepared as an outcome of the literature review, and was under a continuous revision process throughout the visits to the six EDWA's visited.

Phenomenological observations from the six site visits were as follows:

1) None of the simple vital elements noted throughout the literature review were provided (e.g. nature-themed artwork and TV programs; colourful exciting environment; privacy partitions, etc.), with the exception of partial implementation in one or two of the visited locations. For example, see my notes in observational charts (Appendix 7.1.4) concerning landscape elements; only one EDWA, at Mt. Sinai, had natural-themed Distraction Elements (water elements).

2) Concerning artwork, Markham Stouffville (Appendix 7.1.1) was the only one to provide artworks in the space, and it was an abstract work, rather than a

nature-based work (see Carpman and Grant, 1993 and Ulrich, 1991 who advocate nature-themed artworks to more optimally alleviate stress).

3) A common observation gathered from the six visited sites concerned the television (wall-mounted, running a 24-hr channel, CP 24 local news). It should be noted that most of the time, during my observational period, the news showed graphic content of car accidents on highways and CCTV footage of crime and violence. Since Ulrich et al. have noted that nature-themed TV programs and shows are important in such distraction elements (Ulrich, Simons, & Miles, 2003), one can consider the GTA locations as providing a less-than-ideal, stressful, and therefore 'unhealthy', ambient environment.

4) Except for Humber River Hospital, none of the observed sites employed patient call systems (as advocated by Emergency Department Design Guidelines (2014) and Anderson et al. (2007).

5) Further, none of the Waiting Areas have privacy elements, with the exception of St. Michael's, where two Waiting Areas were separated by a wall partition (Appendix 7.15). One of these was further divided by using another low-height



wall/partition. Concerning wayfinding and graphic signage, all sites except North York General hospital and Humber River hospital contained old and fading and unclear plates. All had very poor wayfinding, with the exception of North York General which provided four different coloured strips on the floor for patients to follow to their designated area.

6) All of the visited EDWAs shared almost the same finishing-material/ colour (vinyl/grey or white) and the same number of seats (30–40).

7) Except Mount Sinai and St. Michael's, all the Waiting Areas seemed to have a reasonable amount of natural and artificial lighting.

In Summary I wish to emphasize the following:

1) All of the visited Waiting Areas shared the same size, number of seats, and furniture layout plan. They also (with the exception of one or two hospitals) lacked some vital elements, e.g. distraction and privacy elements or wayfinding plans/signage. This could be seen both in a recently designed hospital (Stouffville) and in older hospitals like Mount Sinai hospital or St. Michael's,

implying that there is some kind of a model that healthcare designers have been following since the 1950s that has not changed or developed until now.

2) None of the visited Waiting Areas complied with the ideal or more effective “patient-friendly” architectural and interior design elements found in the literature review (see review above).

### **3.2 Semiotic Research**

Within every Waiting Area image that can be found on the internet or in any architecture magazine or medical journal there is a promotional aspect or message (commercial/advertisement or educational). The semiotic research method objective explores these messages in order to discover the communication/meanings behind the image.

Krippendorf (1980) describes semiotic research as a content analysis: *"a research technique for making replicable and valid references from data to their contexts."* Wynn

(1997) noted the ‘conversational’ aspect of this approach as: *“it is assumed that the meanings are shaped in the context of the exchange.”*

The goal behind using this method was to reveal architectural ways of seeing/knowing that provide evidence of factors affecting patients’ and companions’ experiences in the EDWA. Six images out of thirty were chosen to disclose key important elements: privacy; colour; contrast; distraction elements; furniture layout; and artificial and natural light in EDWAs.

This project uses a semiotic social analysis methodology, described by Kress and Van Leeuwe (1996) as ‘looking for the visual signs’ within an image—signs that have a particular meaning for the spatial user.

*“The concept of modality is equally essential in accounts of visual communication. Visuals can represent people, places and thing as though they are real, as though they actually exist in this way, or as though they do not – as though they are imaginings, fantasies, caricatures, etc.”*

Kress and Van Leeuwen (2006).

For this study I utilized the Kress and Van Leeuwen (2006) approach, with a minor revision to accommodate the study of inclusive design EDWA elements instead of the childbirth space used by Kress and Van Leeuwen.

### **3.2.1 Analytic frame work**

Kress and Van Leeuwen (2006) define the ‘analytic framework’ as including people, places, and contents as elements that construct the image message.

#### *3.2.1.1 Image representation:*

Kress and Van Leeuwen (2006) describe image representation as an observation to identify the relationship between the represented participants in the image. There are two types of processes in image representation: **narrative process** and **conceptual process**. Narrative process is used when the image contains a human figure; conceptual process is used when the picture represents a subject-theme that does not include a human figure.

### *3.2.1.2 Interactive Meaning:*

Kress and Van Leeuwen (2006) describe ‘interactive meaning’ as the way viewers interact within the image – how their ‘attitude’ is constructed by the angle and the position of the shot that the image was taken from. There are two aspects of the viewer interaction: **contact** and **social distance**. Contact interaction occurs when the image viewer is in direct contact with the image participant (participants gazing or staring at the camera). Social Distance interaction occurs when a long-shot image offers no intimate relation or interaction between the image viewer and the persons depicted in the image.

### *3.2.1.3 Composition meaning*

Kress and Van Leeuwen (2006) identify the composition meaning as analysis of the *structural* components of the image and the *relations* between each component within it. There are two concepts used when analyzing the compositional meaning of any image: Information Value and Saliency Value:

Information value includes the main focal elements in the picture, as influenced by the elements’ (objects’) *locations* in the image.

Saliency value: the ability of the object in the image to attract attention using *visual cues* like size and object colour.

#### 3.2.1.4 *Meaning Potentials:*

Kress and Leeuwen (2006) identify ways that visual communication conveys meaning. They note two key types of finding meaning in images:

**Meaning potential:** Describes every element within the image.

**Affordance:** Describes the *function* of each element in the image and how it *interacts with* other elements within the image.

### 3.2.2 Emergency Department at Huntington Hospital

This image represents a new type of ED Waiting Area where subdivision Waiting Areas were created as part of the ‘split flow’ process (expedited triage/assessment process). This new type of EDWA represents a new approach in Emergency Department efforts to take care of the patients as quickly and efficiently as possible.



**Figure 5: Emergency Department at Huntington Hospital**

**Table 2: Emergency Department at Huntington Hospital Image Analysis**

Image Representation	<b>Narrative Process Representation:</b> The Image contain two human figures, turned towards each other.
Interactive Meaning	<b>Social Distance Meaning:</b> There is no staring (gazing) or any kind of real contact and interaction between the image participants and the camera (viewer).
Composition Meaning	<p><b>Informational Value:</b> Dividing partition and the movable furniture are the focal elements in the image.</p> <p><b>Salience:</b> The most attention-attracting value in the image would be <b>the function</b> behind the movable furniture and the dividing partition within the image.</p>
Meaning Potential	<p>There are several noted objects in this image: 1) the design outline of the partition wall (L shape); 2) the two types of chairs in this Waiting Area (fixed and movable); 3) artificial and natural light; 4) white flooring; 5) the red shoes and fashion element drawing attention to the two persons.</p> <p><b>Affordance:</b> 1) the design outline of the partition wall (L shape) which functions as a privacy tool in the Waiting Area; 2) several chairs— two movable chairs for accessibility purposes; 3) the integration between the artificial and natural light in the Waiting Area is another interesting element in this image; 4) a negative element in this image could be the white-colour flooring that could create a negative glaring or reflective surface in this EDWA.</p>



### **3.2.3 Northwell Health's Southside Hospital**

Like the first image, this image represents a new type of ED Waiting Area where subdivided Waiting Areas were created as part of the split flow process (expedited triage/ assessment process) a new ED effort to take care of patients as quickly as possible. The image shows the Radiology Results Waiting Area.



**Figure 6: Northwell Health's Southside Hospital.**

**Table 3: Northwell Health’s Southside Hospital Image Analysis**

Image Representation	<b>Narrative Process Representation:</b> The Image contains four human figures.
Interactive Meaning	<b>Social Distance Meaning:</b> There is no staring (gazing) or any kind of real contact between the image participants and the camera.
Composition Meaning	<p><b>Informational Value:</b> Furniture layout, finishing material, and lighting are the main focal elements in this image.</p> <p><b>Salience:</b> The contrast colours between the finishing material and furniture seating is an attracting feature in this image. The natural-themed wall-mounted artworks are also an interesting element in this image.</p>
Meaning Potential	<p>There are five elements in this image: 1) the furniture layout; 2) the colour of the furniture; 3) the two artworks in the image; 4) the lighting in the image; the people</p> <p><b>Affordance:</b> 1) the furniture layout in this image is serving a subdivided Waiting Area for patients; 2) the colour of the furniture has a strong contrast with the surround ambient; 3) the two natural-themed artworks are providing a positive distraction element in the small Waiting Area; 4) artificial light considered adequate in comparison with the size of the Waiting Area; 5) the people seem relaxed and comfortable.</p>

### 3.2.4 First Doctor Office

Both images represent different Waiting Areas in MCI Medical Centre.

Both images share almost the same interior design feature.



Figure 7: MCI Medical Center.



**Figure 8: MCI Medical Center.**

**Table 4: MCI Medical Centre Image Analysis**

Image Representation	<b>Conceptual Process:</b> The images lack the existence of human figures within them.
Interactive Meaning	<b>Social Distance Meaning:</b> There is no staring (gazing) or any kind of real contact between the image participants (do not exist) and the camera.
Composition Meaning	<p><b>Informational Value:</b> There are no real focal elements within the two images. The dark flooring and furniture colour could be considered as the most attracting element within the two images. The light may also follow the same properties</p> <p><b>Salience:</b> The dark colours. The contrast colors between the furniture/flooring and other ambient materials could be the focal material-properties within the Waiting Area.</p>
Meaning Potential	<p>There are no clear focal elements in this image. Nevertheless, there are several elements that catch the viewer’s attention: 1) the furniture colour; 2) the dark colour of the flooring; 3) the bright lighting in the Waiting Area.</p> <p><b>Affordance:</b> 1) the strong contrast colour of the furniture and flooring may play a vital role in affecting the patients/companions moods in the Waiting Area; 2) the same observation goes to the bright lighting in the EDWA in both images; 3) the artwork in the images may act as a negative distraction element in the targeted two spaces; 4) signage is well presented (LAB); it seems clear and obvious in the Figures no.08. The floor conveys the message of ‘easily cleanable’ but also ‘coldness’ despite its warm colour.</p>

### 3.2.5 Steelcase Waiting Area

This image was approved for this study by Steelcase furniture. it represents an aesthetically beautiful (fictional, proposed) Waiting Area.



Figure 9: Steelcase Furniture Waiting Area.

**Table 5: Steelcase Furniture Waiting Area Image Analysis**

Image Representation	<b>Narrative Process Representation:</b> The Image contain four human figures.
Interactive Meaning	<b>Social Distance Meaning:</b> There is no staring (gazing) or any kind of real contact between the image participants and the camera.
Composition Meaning	<p><b>Informational Value:</b> the bright green and white colour of the furniture and the dark gray/black carpet flooring may be considered the main/focal point of the image.</p> <p><b>Salience:</b> the strong contrast relationship between the furniture colours and the flooring and wall colours may be considered the main focal criteria represented in the image.</p>
Meaning Potential	<p>This image contains several noticeable elements in the EDWA: 1) furniture colour 2); flooring dark colour 3); the big window that allows for adequate natural lighting; 4) the two distraction elements (TV and small landscape elements).</p> <p><b>Affordance:</b> the image represents 1) different zones affording movement, comfort and view to outside; 2) the strong contrast colour of furniture and flooring that may play a positive and a key role in the patients/companions' moods in the Waiting Area; 3) bright natural lighting and view to nature; 3) the distraction elements (TV and plants, outdoor view).</p>

### 3.2.6 St. Joseph's hospital Waiting Area

This image was approved for this study by Global Furniture Group, the hospital Waiting Area considered a local case study located in Hamilton, Ontario.



Figure 10: St. Joseph's Hospital Waiting Area.



**Table 6: St. Joseph's hospital Waiting Area Image Analysis**

Image Representation	<b>Conceptual Process Representation:</b> The Image does not contain any human figures.
Interactive Meaning	<b>Social Distance Meaning:</b> Not applicable.
Composition Meaning	<p><b>Informational Value:</b> Furniture in seating area colour is the focal element in this image.</p> <p><b>Salience:</b> the strong contrast relationship between the furniture colours and other ambient material in the Waiting Area.</p>
Meaning Potential	<p>This image contains several noticeable elements: 1) furniture colour; 2) two distraction elements (TV and landscape pot); 3) three signages; 4) bright artificial lighting; 5) white, off white walls and flooring except the front desk background wall that has an orange colour.</p> <p><b>Affordance:</b> 1) strongly contrasting furniture colour in the waiting space (orange and black) which might have a positive effect on patients/companions' subjective moods; 2) chairs seem wider than usual accommodating different body types; 3) minimal distraction elements (small TV and flower vase); 3) the signage is clear and obvious, especially the reception front-desk signage.</p>

### 3.2.7 Semiotic Research Summary

Analysis of the six chosen images provides a visual semiotic case study of different elements in EDWAs discussed within the literature review.

(Figure 5): This image was taken for promotional purposes (to advertise/showcase this private healthcare institution). The main theme elements in the first image were: 1) the newness and spaciousness of the facility, including visual connection to nature/outdoors; 2) representation of the privacy element in the Waiting Area and the suggested impact on the social interaction between patient and companion (?) in the image; 3) the integration between artificial and natural light in the image that could create an ambience impacting the mood of patients and companions; 4) the neutrality of the predominant finishing material color (white) could be understood as having a negative impact (cold, clinical, stressful/even if it is not intended by the promoters of this image).

*“The absence of color creates emotional sterility and may not be calming (or attractive)”*

Frank H. Mahnke (1996)

(Figure 6): This image was taken for promotional purposes (to advertise/showcase this private healthcare institution). There were no dominating elements in this Waiting Area image; nevertheless, there were three elements of note for meaning potential: 1) the image represents a small-sized sub-Waiting Area (split-flow concept); 2) distraction elements (artwork & magazines) can be clearly seen; 3) the grey colour of the walls and carpet and blue and ochre of the furniture/artworks aim to give a comforting sense of relaxation in the this environment.

(Figures 7 and 8): These images were taken for promotional purposes (to advertise/showcase this private medical centre). The images contain three elements without a clear hierarchy of importance: 1) the dark grey colour of the Waiting Area flooring and walls, which gives a weary feeling and a coldness to the waiting environment (the designer tries to break this feeling with an off-white colour on one of the walls, but the effect was still indecisive); 2) the plastic chairs look completely uncomfortable for lengthy sitting; 3) the artificial lighting in the

Waiting Area could be described as *extremely bright* and glaring, though the space may be less bright than those in other images in this study.

(Figure 9): This image was taken for promotional purposes (advertising/showcasing the *furniture* as a crucial aspect of the Waiting Area). There were several elements that could be found in this image: 1) colours; 2) finishing materials; 3) natural light/view; 4) distraction elements; 5) nature/landscape as part of the Waiting Area spatial setting.

(Figure 10): This image was taken for promotional purposes (advertising/showcasing the furniture in the Waiting Area.) The dominant theme of this image is the use of colour in furniture design for the Waiting Area. Other important elements in the waiting space are: 1) the signage; 2) the TV (distraction element); 3) the flower vase (nature element). There is an obvious contrast theme between the wall colours and the furniture colours that could be described subjectively depending upon individual aesthetic perception, but offers visual contrast that could be useful as an inclusive design strategy aiding visually impaired visitors.

To summarize, there seemed to be a dominant theme between all of the images; that is, lighting and furniture were presented as the most important aspects of the spatial setting. Finishing-material colour was a strong part of the design strategy. Distraction and privacy elements were illustrated in several images, yet most were minimal. Only one of these images seemed to highlight use of these elements as positive aesthetic and therapeutic aspects of the spatial design (Fig. 9).

### **3.3 Online Survey**

A third aspect of the research was an online survey, aimed at bringing an **inclusive design** perspective into the research process and outcomes. The Inclusive Design Research Centre at OCAD University has defined inclusive design as: *“design that considers the full range of human diversity with respect to ability, language, culture, gender, age and other forms of human difference.”* (Inclusive Design Research Centre Website.)

There are three dimensions inherent to inclusive design toolkits: 1) Recognition of diversity and uniqueness; 2) Use of inclusive process and tools; 3) Seeking of broader beneficial impact. Therefore, in the context of Inclusive Design, it is important to involve *participants or users* in any considerations/discussions of Waiting Area design needs. These participants include patients, companions, and staff members). The second dimension of inclusive design toolkits, inclusive process and tools, focuses on the participants' involvement in the research study. Jutta Treviranus, one of the inclusive design leaders in Canada and founder of the IDRC, advises:

*“Use inclusive, open & transparent processes, and co-design with people who have a diversity of perspectives, including people that can't use or have difficulty using the current designs.” Treviranus (2018).*

The Inclusive Design Guide, ((n.d.) Inclusive Design tools and process), describes one of the key principles of inclusive design:

*“Inclusive design teams should be as diverse as possible and include individuals who have a lived experience of the users the designs are intended for. This also respects the edict*

*“nothing about us without us” without relegating people with disabilities to the role of subjects of research or token participants in design exercises.”*

The online survey conducted for this MRP was anonymous, with no identification features required from the participants. The survey was open to the public for one month (January–February 2018). All the questions in the survey were optional except the consent form questions. If the participants, for some reason, did not answer or click the consent form options, the participants would not be able to submit the survey form.

Promotion of the survey focused mainly on word-of-mouth, social networking, and social media invitations, in order to find users interested in the topic through their own lived experience. Another way to promote the survey was by hanging flyers in and around the OCAD U campus, downtown Toronto, and at the bus stops located near the six visited hospital EDWA’s during the site observation phase. The reason behind choosing these locations was to ensure the involvement of: 1) diverse cultural backgrounds (by including areas surrounding the Toronto downtown); and 2) a mix of ages and professions in the participant

groups (by posting inside and surrounding OCAD U campus and the six hospital locations).

### **3.3.1 Process**

The survey was conducted using Google Survey platform. The survey contained three parts. Part One focused on the introduction and the survey guidelines. Part Two contained the consent form for the survey. Part Three contained five questions: the first two questions were about the gender and age of the participant, and the third and fourth questions focused on the time and the date of the ED Waiting Area visit; and the fifth question was the core of the survey, asking the participant to write about their own experience in the ED Waiting Area (500 character limit). Survey response forms were downloaded on a daily basis by the main researcher for privacy and cyber security reasons. Participants had clear instructions not to mention the name of the hospital or the ED Waiting Area staff members' names in their experiences (if that happened, the main researcher would black-out all specific names and locations). The participants were asked to provide their experiences only if they were dated post-2012.



### 3.3.2 Online Survey Results and discussion

The total number of responses received was 43: 37 participants dated their experiences between 2016–2018); one participant dated their experience in 2013; and five dated their experiences between 2014–2015.

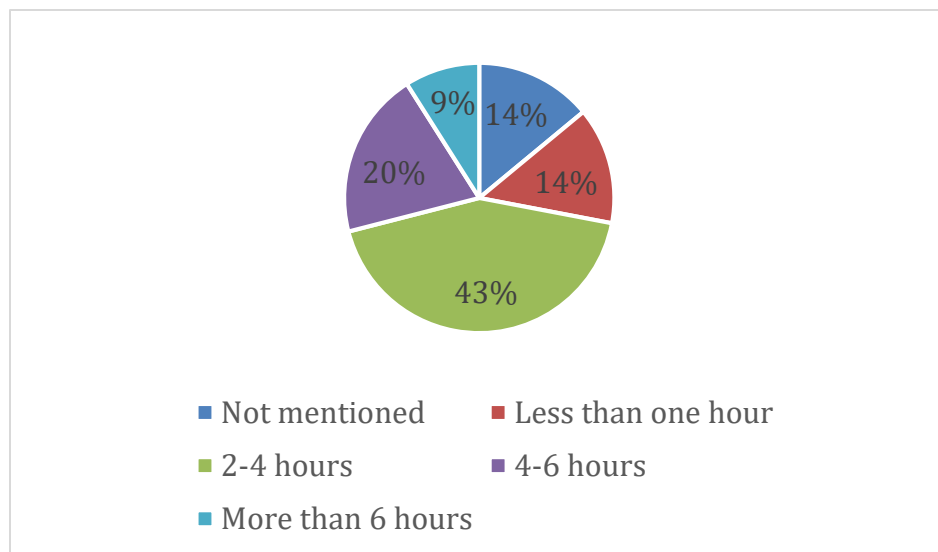


Figure 11: Participant Waiting Time in the GTA EDWAs

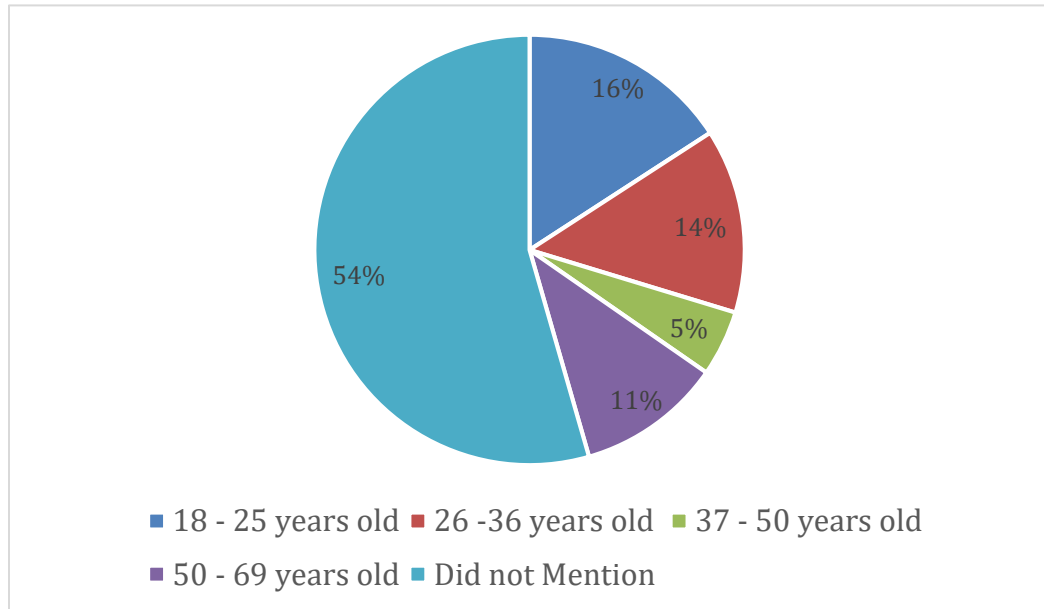
Time spent in the EDWA by the participants

- 14% spent less than one hour
- 43% spent 2–4 hours

- 20% spent 4–6 hours
- 9% spent more than 6 hours
- 14% did not provide their time in the EDWA

Ages of participants in the survey were:

- 54% NO age given
- 16% 18–25 years old
- 14% 26–36 years old
- 5% 37–50 years old
- 11 % 50–69 years old



**Figure 12: Waiting Area Age Participants**

The participants status in the EDWA at the time of the visits were:

- 14% were patients in the ED Waiting Area
- 13% were companions telling their side of the ED waiting time story in the waiting space

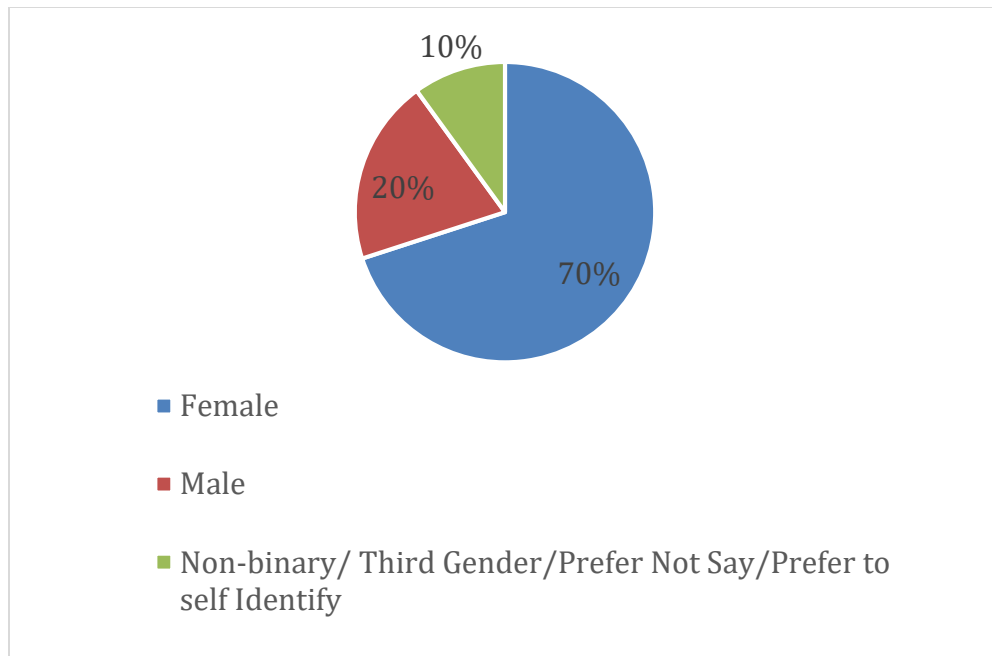
- 9% of the participants provided two experiences: one as a companion and the other as a patient
- 23% of the survey participants were persons just assisting the patient or the companion to help them complete the survey
- 7% of the participants did not provide their status in the Waiting Area at the time of the visit

Concerning the gender of the participants in the survey:

70% female

20% male

10% did not mention their gender



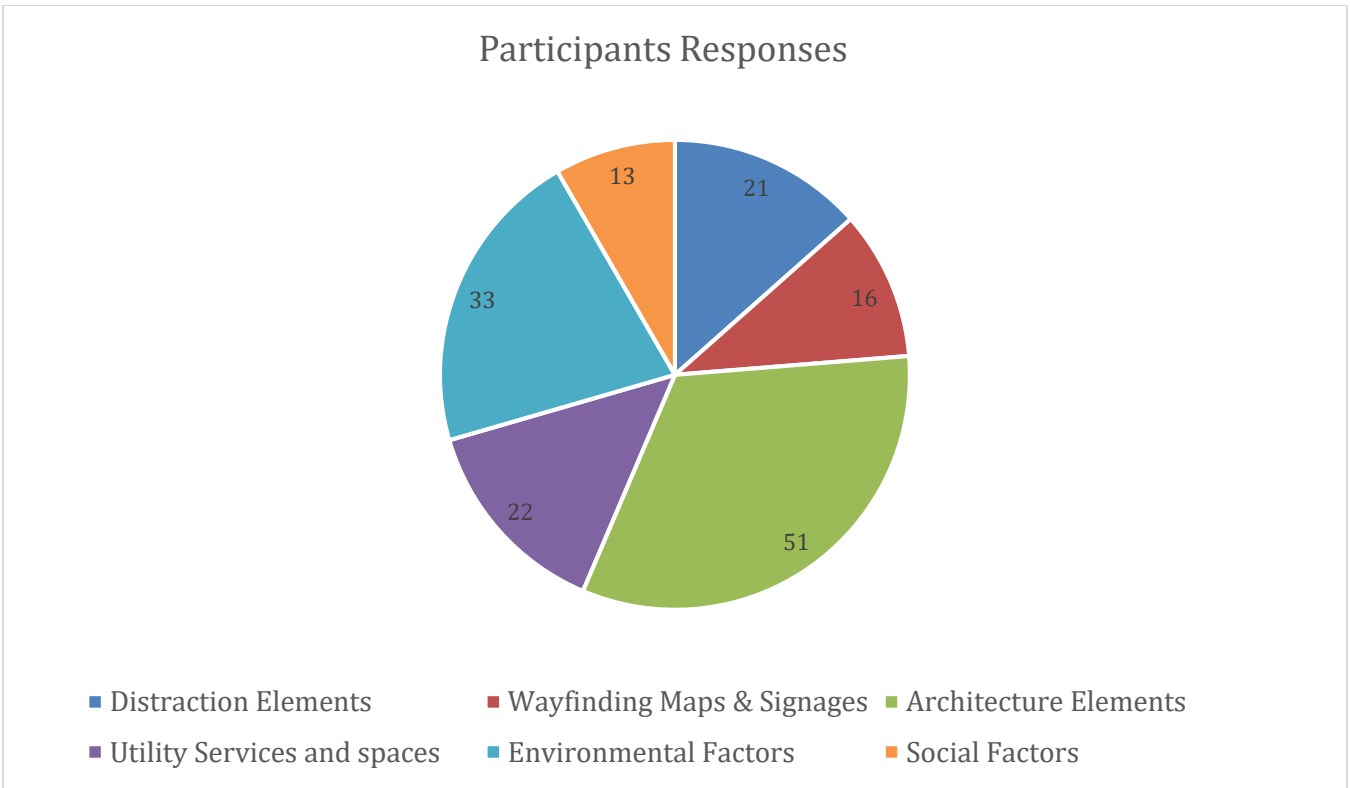
**Figure 13: Waiting Area Participants Gender**

When analyzing the survey participants' responses, 6 factors were established to sort elements affecting the patients and companions' experiences in the EDWA:

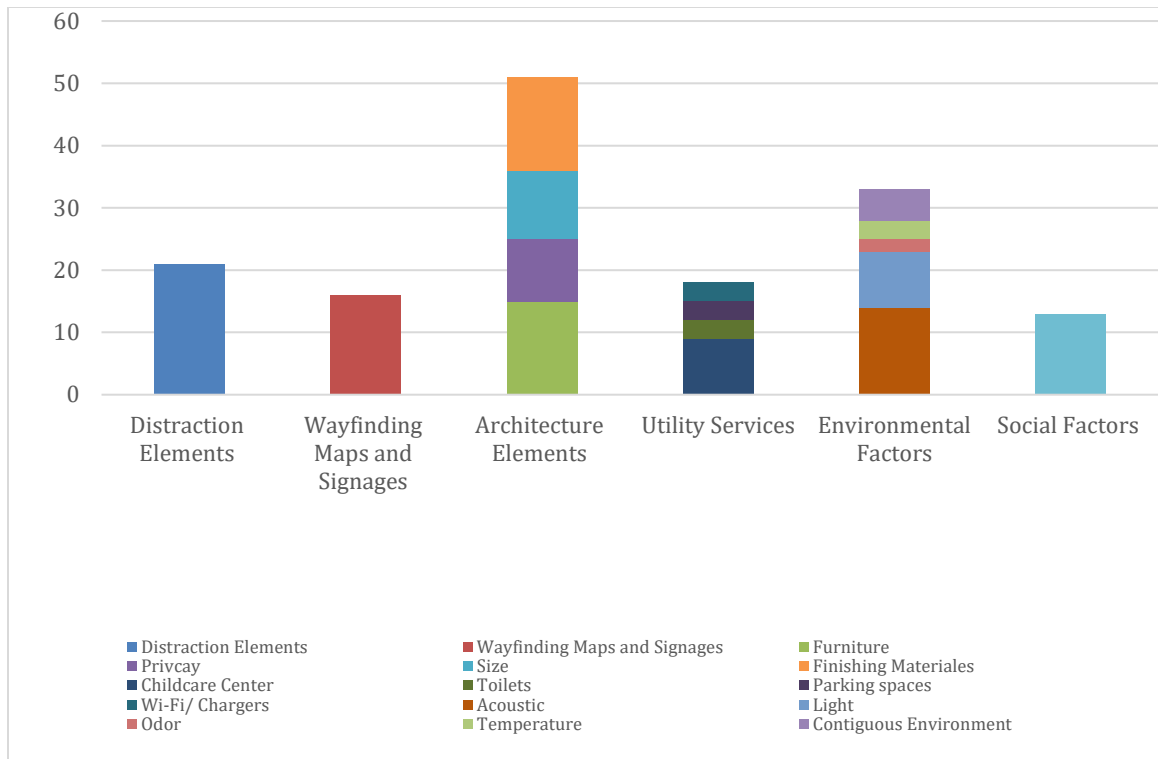
- Architecture elements
- Distraction elements
- Wayfinding maps and signage
- Environmental elements

- Social interaction
- Utility services and spaces

It should be noted that some categories in the chart below include sub-elements that affect the patients' and companions' experiences in the Waiting Area. For example Architectural Elements includes 1) furniture and layout; 2) privacy; 3) size of the area; 4) finishing materials, while Environmental Factors includes 1) acoustic; 2) light; 3) ventilation; 4) odour. Utility Services also include sub-elements of 1) childcare; 2) toilets; 3) wheelchair area; 4) parking area; 5) charger outlets and Wi-Fi services. Social Factors comprises the participants' thoughts and responses regarding the interaction between patients, companions, and staff members in the EDWA built environment.



**Figure 14: Participants Responses in Ontario EDWA**



**Figure 15: Participant Responses (Y axis = number of responses)**

After reviewing participants’ responses I have concluded that architectural elements were the focal point of the participants’ responses. Two of the most mentioned elements within the architecture elements were the furniture and the finishing material. When discussing the furniture element, a repeated comment and/or observation was a description of how comfortable or uncomfortable the chairs in the Waiting Area were.



*“The chairs, really, are my biggest beef. When I go to emergency I'm in too much pain to bare [sic] (from an episodic auto-immune disease) so I want to be lying down, which they've made IMPOSSIBLE.”*

Most of Finishing material responses were mainly focused on the colours inside the Waiting Area ambient.

*“Its sort of mausoleum like to an extent, very dreary classic hospital setting, but well kept. Walls are a very pale grey, floors are also a light grey, ceiling is tiled. Everything is matte and smooth. Nothing exciting.”*

Other elements mentioned in the category of architecture elements were the size of the ED waiting space and how this affected privacy elements.

*“Seating faced each other, very public, which forced my eyes to the floor or ceiling in order to avoid eye contact with those nearby. When feeling vulnerable and in pain, privacy would have been greatly appreciated.”*

*“The space was really small.” “it was cramped.”*

Environmental factors came second on the scale of most mentioned elements by the survey participants. Acoustics and lights were the most mentioned elements in the environmental factors group; participants often used words like “noise” and “bright” throughout their survey responses.

*“The atmosphere and lighting were fairly gloomy in general; beige walls and sparsely placed florescent bulbs.”*

*“The lighting was dull and not very bright.”*

*“Noise was prevalent throughout the ER.”*

*“Noise level was nice and quiet.”*

Other mentioned elements in the environmental factors were related to the temperature, odour, and the contagious atmosphere in the ED waiting environment.

*“It was cold. The signage was confusing. Staff seemed perpetually annoyed. I felt unwelcome, uncomfortable, and completely uninformed.”*

*“It was loud, non-private, smelled anti-septic, and very grey/ blue colour on the walls.”*

*“The waiting area is [sic] too small and all the patients [sic] are so close to each other which it is [sic] unhealthy environment at all since it, it’s [sic] so easy to catch other patients viruses and bacterias [sic].”*

Participants in the online survey showed a real interest in distraction elements and wayfinding maps and signage. As individual elements, both of these elements were the most mentioned elements affecting patients and companions’ journeys in the ED Waiting Area.

*“There was only 1 tv in the entire waiting room playing cp24(weather/ news channel). There was a small fish tank in the kid’s waiting area, that was visible from the adult waiting area, but the fish were boring.”*

*“Got lost a few times, wayfinding was difficult. Poor signage (not enough, and the ones that exist are small and not helpful) and many turns.”*

Childcare areas received their fair share of mentions regarding service spaces associated with the ED Waiting Area. Adequate clean bathrooms and the

availability of Wi-Fi and charger outlets were also mentioned under the same category.

*“The Waiting area does not [sic] include playing area or any amusement for children, so my child felt boring [sic] and was impatient to wait more.”*

*“There were not enough bathrooms near the waiting rooms. Patients being seen in exam rooms in gowns had to walk down halls with people moving to and from separate waiting rooms in order to use the washroom. This was awkward and embarrassing, as people waiting would stare at whoever was going by. There was also always a line up, which was problematic because I needed to use the washroom frequently but was also unable to stand for more than 30 seconds before feeling faint.”*

*“I would like it if they had wifi available since the reception was bad at the emergency room and it was hard to keep my mind away from the reason i [sic] was there or to kill time.”*

*“A good number of electrical outlets to charge electronics. If you're waiting a long time, it's always nice to be able to charge your phone.”*

Several patients' responses were focused on the accessibility/inclusive design part of the utility services in the Waiting Area.

*"There were not adequate space [sic] for people in motorized chairs or wheelchairs, and they were placed in front of permanent seating taking up aisle space."*

*"Sometime people in wheelchairs couldn't sit with their family members because they would block the seating for other patients."*

The online survey participants showed little interest in describing the interaction/relationship between patients and staff members in the Waiting Area. That may be due to the fact that perhaps the online survey questionnaire was mainly focused on the physical attributes of the GTA EDWA.

*"It was cold. The signage was confusing. Staff seemed perpetually annoyed."*

*"the staff were so nice and helpful but I think more signage and more functional circulation would be more helpful."*

## 4 Discussion

This MRP thesis utilized three research methods: each method paved the way for the next method to create a clear understanding of the physical factors affecting patient and companion waiting-time experience in the GTA EDWA.

The literature review was the foundation for developing understanding of basic factors affecting the patient and companion experience. Site observation was the first research method employed; the purpose behind this method was to understand the current status of the GTA EDWA and establish understanding of real-world, local ED settings as compared with exemplars found through the literature review.

The process of this method (site observation) occurred in two phases of site visits; each phase had its own data entry that was completed using a checklist (formulated through the literature review) of the factors to be used to analyze/categorize the site-observations.

The checklist contained: 1) size of the Waiting Area; 2) seating capacity; 3) finishing materials; 4) natural and artificial light; 5) patient call system; 6) location of the nurses station in the Waiting Area; 7) noise level; 8) the presence of a childcare centre; 9) distraction elements; 10) privacy elements in the Waiting Area.

A main observation I noted was that there seemed to be a certain pattern that was repeated inside all of the six visited GTA EDWAs. For example, most of the visited Waiting Areas were almost the same size and had the same number of chairs (capacity); most of them did not have real/meaningful distraction elements except for some magazines and a small TV broadcasting the famous CP24 news channel. All of the visited Waiting Areas shared the same uncomfortable, rigid furniture for seating.

Other observations recorded in my notes were the lack of an inclusively designed call system and the lack of adequate space or furniture for persons with physical impairments. Also noted during the on-site observations was a general absence of artwork or landscape/nature view. All these observations led me to conclude

that there was a repeated use of a seemingly common design ‘template’ used in creating the visited/observed EDWAs—and that inherent to this common design model was the lack of elements as described above.

The second method was the semiotic research method. The goal of this method was to consider Waiting Area concepts and experiences using visual analysis methods.

The first image (Fig. 5) represented a successful implementation of the privacy element in a small-sized Waiting Area. The same idea was found only in one of the visited EDWAs (St. Michael’s Hospital, Appendix # 7.1.5), but the case study found in the image implemented *a better privacy solution* in terms of dividing the area into smaller sections by using L-shape partition walls rather than just dividing one big area with a straight-line partition wall. The main two themes that could be extracted from the second image were: the *successful attempt to imply natural-themed artwork in the waiting space; and the successful integration of colours and artificial light in the waiting space.* This was not the case in most of the visited ED waiting areas, where there was: 1) *simply no artwork;* 2) *repetitive use of beige and off-*



*white colours which*. Both of these factors created an overall depressing or clinical atmosphere in the observed waiting spaces. The third and fourth images (Figs. 7 and 8) represented just such a problematic choice of colours and uncomfortable seating.

Figure 9 seemed most comprehensive in providing a well-designed and well-furnished Waiting Area that could provide major satisfying factors for patients and companions in reimagined future EDWA's, consistent with Swan, Richardson, and Hutton's (2003) findings that patients in well-designed, well-furnished (hotel-like) healthcare facilities rated their attending physicians and other health services better than patients in standard rooms in the same hospital *and* expressed a willingness to visit the same hospital again and to recommend the hospital to other patients.

Figure 10 as noted earlier, again strongly leaned on the colour of the furniture for 'attractiveness'. Other than the TV and the flower pot (distraction element) in the background, and the width of the chairs, however, there is little to commend as inclusive design.

My subjective observation of the furniture colour in the images selected is that furniture with a middle value tone of blue *seemed more comfortable visually and mentally (more relaxing and pleasant)* than other options.

The third research method was the online survey research method. The goal behind this research method was to involve *patients' and companions'* lived experience as crucial to understanding inclusive design approaches for the GTA EDWA.

In a one-month period 43 responses were collected. Through the analysis, it was found that patients and companions were mostly focused on the architecture elements in the Waiting Area. The comfortableness of the chairs was one of the most frequently mentioned elements; specifically, most of the participants' discussed the need for chairs that could be easily adjusted for lying down or sleeping (corroborating Dalke et al., 2006). Privacy elements and the size of the Waiting Area tied for second most important elements. One of the most used words describing the size of the GTA Waiting Area was "crowded"; many participants stated that there was no privacy in the Waiting Area.

Wheelchairs assumed an interesting spot in the survey results. On this topic, participants' responses were mostly focused on providing an adequate amount of *space and circulation* for wheelchair users and their companions (corroborating the Australian Emergency Department Design Guidelines, 2014).

Regarding distraction elements and wayfinding maps, survey respondents emphasized not having enough of either of these elements in the visited ED Waiting Areas (as noted earlier by Carpman & Grant 1993). Survey responses also emphasized the lack of landscape elements and artwork in the Waiting Areas (agreeing with my on-site personal observations). In terms of wayfinding and signage in particular, several participants used words like “lost” or “maze” when they described their experiences with the wayfinding maps and signage in the ED Waiting Environment (similar to findings reported in Gakopoulos, 2009).

Participants also discussed the lack of childcare centres and breast-feeding areas in the Waiting Area. This concurs with the same claims concluded in the site observation findings (Emergency Department Design Guidelines, 2014).

Participants' observations regarding ambient and/or ephemeral environmental factors affecting their Waiting Area experience varied in terms of light, odour, and temperature, but *most* the participants agreed about the ED Waiting Area being a *noisy* space most of the time (as a negative aspect of the experience).

Finally, there were 13 mentions of EDWA staff members either being unfriendly/annoying *or* friendly. Although this MRP is focused on the physical attributes of the setting, these findings point to social aspects such as the quality of patient-staff interactions that are important as aspects of future research that addresses inclusive design as a spatial design issue (corroborating Golembiewski, 2017).

## 5 Conclusion

The triangulated research approach (observational, semiotic image, and user survey) offered three perspectives that could be compared for similarity and/or diversity of findings. In each, certain aspects of the situation were revealed.

In the first—site observation—phase, a similarity between all of these GTA Waiting Areas became evident. The chart developed from this (personal) observational approach brought forward many elements that could/should be included in any review of EDWA's – especially as considered from the inclusive design perspective. From the data collected, it seemed clear that some vital environmental design elements in the ED Waiting Area have been under-valued or disregarded. These under-utilized design details include 'distraction elements,' including physical and media-based solutions and landscape/nature elements. Furthermore, 'information elements' that provide efficient communications with patients/service users in the Waiting Area (e.g. wayfinding maps and signage) were also under-utilized and poorly designed elements of the experience design.

Another missing item or element was a childcare area, and other important utility spaces like breast-feeding or other quiet/more private areas and sleep-friendly ambient conditions. All of the visited Waiting Areas lacked important inclusive design methods/means of connecting with impaired individuals (individuals with special needs); e.g., braille language signage; tactile wayfinding approaches; use of sensory design elements, including the use of contrasting colours (but no confusing patterning) for visually impaired patients/companions, etc. Choosing non-reflective finishing materials for surfaces could improve experience for the visually impaired.

After the first site observation study there was a strong impression that there was a common (older, uniformed by inclusive design awareness) concept/design model that most of the EDWAs in the GTA were following. It was clear that there is an obvious lack of some vital elements in the EDWAs (e.g. distraction element or relaxation/nature connection element).

The second method—image analysis—corroborated the information gained from the other data gathering methods. Findings from the image analysis

emphasize the vital role of the privacy element in the Waiting Area (Figures 5). The same image (Figure 5) also provides a clear demonstration of movable furniture. Figures 5, 6, and 9 portray a *perfect implementation of artificial and natural light inside the waiting ambient*. Lastly, Figure 9 provided an aesthetic case study of how a Waiting Area should be in terms of lighting, landscape view, furniture, material, and distraction elements.

In the third phase of the research, service-users provided insight into their personal experiences in the ED Waiting Area. The survey data pointed to several key issues for user experience. There was also a loud call, as it were, by participants for the improvement of simple essential elements—e.g., chairs that would be both more comfortable and adjustable for different seating postures; more bathrooms, child-oriented and other dedicated and diverse-use spaces in the Waiting Area. Ideas emerging from the user experience survey included:

- Improving seating options—both for social relations and comfort during long stays—comfort and adjustability of furniture were highlighted.
- Improving accessible washroom facilities: by providing adequate bathrooms in the Waiting Area that also support impaired patients/companions.
- Providing distraction elements: participants reported the presence of a (stressful/noisy) TV as their only distraction element in their experiences in the Waiting Area. While they did not ask for specific elements, it is clear from the literature that providing a natural-themed artwork in the Waiting Area is a vital anxiety-reducing and recovery agent that patients and companions desire.
- Providing clear signage and tactile wayfinding maps (with the option of braille language) is an essential aspect of making the Waiting Area more inclusive of patients/companions, and was articulated by survey participants.



- Improving sound quality in the space was deemed important for reducing stress, anti-socialness and exhaustion—pointing to the purposeful use of better sound-absorbing surfaces as an inclusive design strategy.
- Participants’ use of terms like ‘depressing’, ‘nothing exciting’, ‘noisy’, ‘crowded’ and ‘uncomfortable’ point to many aspects of material, colour and lighting design, spatial layout and communication design as areas for further development.
- Providing childcare space, breast-feeding space, and an adequate space for wheelchair users are important elements toward creating a more inclusive ED Waiting Area.

Through applying my own newly acquired inclusive design understandings and approaches, I sought to challenge existing norms, and to look at aspects of Emergency Department Waiting Rooms from a diversified set of perspectives and methods. Most importantly, this study sought to involve EDWA customers’ lived experience in the research process and outcomes. The outcomes highlight the necessity of changing the current EDWA in Toronto. Simple yet important

changes were indicated/ suggested by survey participants, and these corroborated the findings of other researchers over the past twenty years. Many might be implemented with minimal cost, and yet would provide substantive improvement. These ‘small’ changes (e.g. switching to a nature channel programming of monitors) could be the beginning of an essential ‘inclusive design’ and ‘salutogenic’ upgrading phase for GTA EDWA’s.

Staff, administrators, and designers they work with should bring to the task a willingness to consult with a diversity of service-users who have direct lived experience of spending long hours waiting. There is a growing awareness and consensus in the healthcare design field that these simple elements discussed above could play a vital role in the patient experience, impacting physical and mental health and recovery processes.

Changing the type of chairs in the Waiting Areas is also very important (in much demand by the participants in the survey). In my own experience as an architect involved with Quantity Surveying in the construction field, changing 30–40 chairs in a hospital waiting area is a reasonable expense—especially considering

its potential impact for the human beings, already in a difficult health trauma condition, who would be served by it.

The aim of the research, from the outset, was the gathering together of impressions, ideas, and information that could aid designers in developing not only more ‘attractive’ and ‘pleasant’ waiting spaces, but also more ‘inclusive’ and ‘user-friendly’ places for all those vulnerable and stressed people entering into the Emergency Department seeking help. Considering the emotional as well as physical needs of all of the service-users (including companions, children, family members) emerged as a key factor in this MRP. How people feel is at the heart of the matter, as they navigate a traumatic or stressful healthcare episode.

How might we develop a set of crucial guidelines that can be of service to designers and those who employ them to take on the task of reinventing our ED waiting rooms? What are the evidence-based criteria designers might use to make a case for what seem like ‘aesthetic’ expenses? Clearly, there is a real need to provide more and better washroom facilities, and to develop privacy and comfort (e.g. breast-feeding spaces, resting areas (horizontal/variable body position, quiet

or sound-proof areas). There is a need to provide child-friendly spaces, mobile reclining furniture that supports patient/companion comfort, natural-themed media streams/programs. There is a need to provide for diverse individuals and caregivers' human needs, in order to improve the social and empathetic nature of the EDWA. New guidelines should include provision of nature elements: e.g., natural-themed artwork and landscaped/planted elements/areas (and/or access to therapeutic outdoor garden spaces

The foremost conclusion of the study is that considering the *experiential* aspects of healthcare spaces from diverse user perspectives is important as part of an inclusive design process. Clear but flexible guidelines based on real-world phenomenological experience of all involved is an important missing element for guidance in EDWA design approaches. Inclusive design approaches to thinking about this space are valuable for transformational design. e.g., It is important to Listen to the lived experience narratives of a diverse pool of users *that go beyond 'patients'* to include those who experience the space *with them* whether children, caregivers, or family members. At the same time, persons with various disabilities

should be able to navigate the system as independently as possible and should be served with respect and accommodation.

## **5.1 Limitations**

This MRP study faced several obstacles and limitations mainly because of the time frame and information accessibility.

The main limitation was not being able to interview participants of the online survey after gathering the data. By not being able to do so, certain pieces of the study were felt to be missing, as certain elements mentioned in the online survey required further information about descriptions. This ultimately affect representing participants' diversity and uniqueness more fully, through sharing their more in-depth narrative experience and knowledge.

Another limitation was choosing to use Google Survey (online survey platform) as the survey tool. It was only accessible by Gmail accounts, therefore limited the respondents' diversity, and it has a fixed rigid design mechanism that did not

allow me to design the survey aesthetically (make the survey more attractive to participants in terms of the fonts sizes and colours. However, the Google platform did provide an accessible platform, and this was considered a very important inclusive factor, and was one of the key reasons for choosing it in the first place.

REB was one of the most difficult and stressful experiences I faced in this MRP study. It seemed to be an unnecessarily slow process, and the REB notably did not offer solutions or choices when rejecting a tool or a method. New ideas about online surveys seemed to be cropping up throughout the process, with no consensus from experts about resolving difficult privacy issues. In retrospect it would be better to have allowed identification of subjects, using a smaller sample with more in-depth study of particular narratives.

A limitation of the timeframe given for the study (combined with the inefficient and problematic REB process) was that I did not have time to produce one or more design outcomes illustrating the concepts that emerged through the research. I hope to actualize these concepts in preparing design guidelines and

design proposals that contribute to real-world transformation of Emergency Department spatial design in the near future.

## **5.2 Contributions**

This MRP study provides a foundation that other design researchers may build upon for developing better healthcare design. It contributed a unique, comparative, triangulated study of six Emergency Department Waiting Areas in Toronto. Three interrelated phenomenological research methods were used to consider personal experience in the hospital waiting environment. This study included diverse aspects of the spatial environment (physical, ambient, social and mental attention/distraction elements) in analysis/discussion of the need for transforming of existing and future EDWA environmental design. It is hoped that this study contributes to improved real-world local and global healthcare settings that impact people's experiences through more inclusive and sensitive design, and opens up further areas of interest for healthcare environment design research.

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## **7 Appendix A - Sample Section**

### **7.1 Site Observation**

#### **7.1.1 Markham Stouffville Hospital**

Markham Stouffville Hospital is considered a new hospital in Toronto, enrolled into service in 2014. It's located in Markham. Markham was the only hospital that I visited only once.

**Table 7: Markham Stouffville Hospital**

<b>Item</b>	<b>Status</b>	<b>Observation of the researcher</b>
<b>Approximate size</b>	60 m <sup>2</sup>	
<b>Patient capacity</b>	41 seats	
<b>Floor finishing</b>	ceramic flooring	gray, brown
<b>Wall finishing</b>	white with wood cladding	
<b>Ceiling finishing</b>	steel finish	
<b>Furniture</b>	dark grey colour, <i>depressing.</i>	
<b>Artificial light</b>	fluorescent light	100–150 lux
<b>Natural light</b>	dim light	100–150 lux; the view is facing the parking lot
<b>Patient calling system</b>	doesn't exist	The nurse calls or shouts for the name of the patient
<b>Nurses monitoring status over the waiting area</b>	Have semi overview over the waiting area	
<b>Wayfinding plans</b>	doesn't exist	Did not notice any of them
<b>Signage</b>	exists	<i>Some of them are hard to read</i>
<b>Distraction elements</b>	TV	Several patients were watching the TV: News
<b>Artwork elements</b>	Two colourful pictures	
<b>Water element</b>	doesn't exist	
<b>Landscape elements</b>	doesn't exist, there are no landscape plants inside the waiting area	Facing the parking lot. Very few trees outside
<b>children caring center</b>	doesn't exist	
<b>Noise level</b>	normal	33 dB.
<b>Privacy Element</b>	doesn't exist	

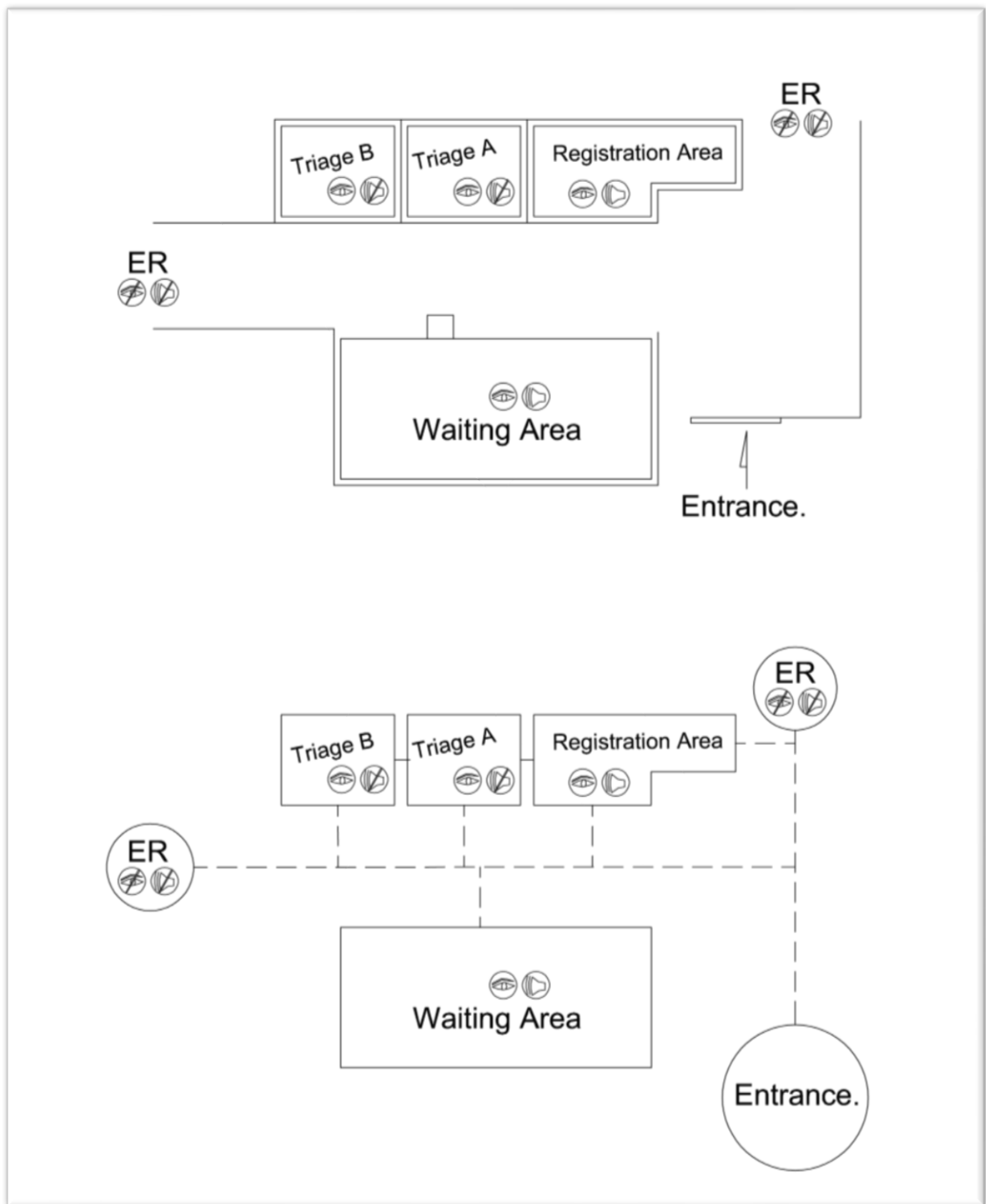


Figure 16: Markham Stouffville Hospital Diagram and Plan

### **7.1.2 Toronto General Hospital**

Toronto General Hospital was built in 2002. It's located in downtown Toronto. I visited the ED waiting area twice for 20 to 30 minutes for each visit. The time of the first visit was 3:00 pm while the second visit was approximately at 5:00 pm.

**Table 8: Toronto General Hospital**

Item	Status	Observation of the researcher
Approximate size	30 m <sup>2</sup>	There are two areas: one for filling out paper and one to wait your turn to get to the ED
Patient capacity	40 patients	There were 10 patients
Floor finishing	vinyl flooring	<i>Shiny, colourful, calm</i>
Wall finishing	normal paint, wood cladding	
Ceiling finishing	gypsum board	<i>cheerful, clean, white colour</i>
Furniture	grey colour, <i>depressing</i>	
Artificial light	dim spot light.	600–700 lux (appropriate)
Natural light	<i>well lit.</i>	Facing a garden and a street
Patient calling system	doesn't exist	The nurse calls or shouts for the name of the patient
Nurses monitoring status over the waiting area	Does not have full view over the waiting area.	There are two waiting areas: The big one has no view over the nurses station
Wayfinding plans	doesn't exist	
Signage	Blue background and white letters.	<i>The main signage was old and fading</i>
Distraction elements	TV, Metro Newspaper	Cartoon Channel: A child with his mother were watching the TV
Artwork elements	doesn't exist	
Water element	doesn't exist	
Landscape elements	doesn't exist	
childcare centre	doesn't exist	
Noise level	49–37 dB.	Reasonable
Privacy Element	doesn't exist	There are two waiting areas but none of them could be considered private

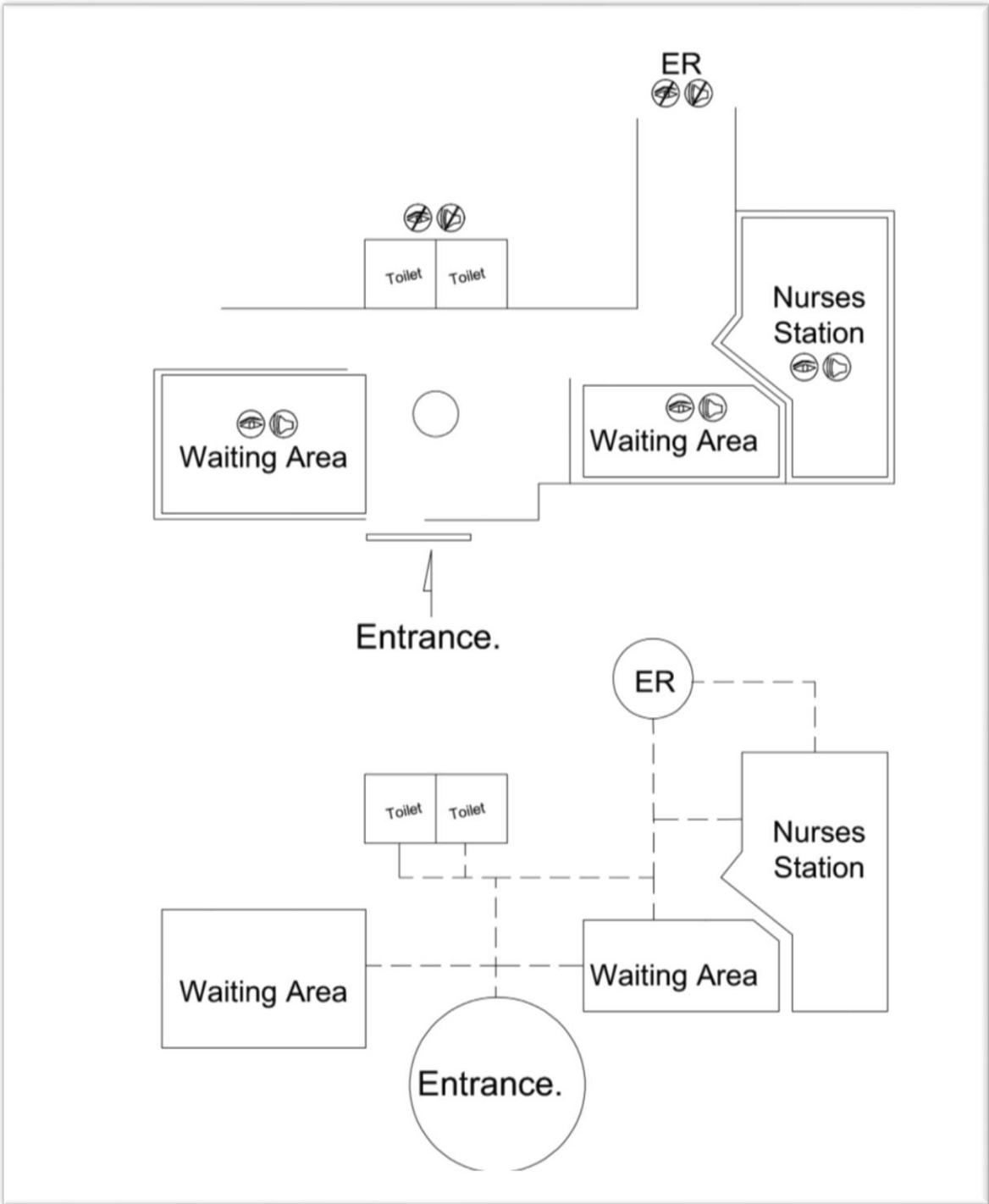


Figure 17: Toronto General Hospital Diagram and Plan



### **7.1.3 North York General Hospital**

North York General Hospital was built in 1968. It's located in the North York region of Toronto. I visited the ED waiting area twice for 20 to 30 minutes for each visit. The time of the first visit was 5:00 pm while the second visit was approximately at 4:00 pm.

**Table 9: North York General Hospital**

<b>Item</b>	<b>Status</b>	<b>Observation of the researcher</b>
<b>Approximate size</b>	40 m <sup>2</sup>	There are two areas, one for filling out paper and one to wait your turn to get to the ER
<b>Patient capacity</b>	approximately 35 patients	The area was half occupied with patients
<b>Floor finishing</b>	vinyl flooring.	Plain gray colour with some ornaments, depressing
<b>Wall finishing</b>	normal paint	Off-white & hue matte blue colours, depressing
<b>Ceiling finishing</b>	false ceiling	off-white. depressing
<b>Furniture</b>	grey colour.	<i>Depressing</i>
<b>Artificial light</b>	<i>well lit.</i>	Fluorescent light
<b>Natural light</b>	<i>well lit.</i>	Facing the parking lot
<b>Patient calling system</b>	doesn't exist	The nurse calls or shouts for the name of the patient
<b>Nurses monitoring status over the waiting area</b>	have full view over the waiting area.	
<b>Wayfinding plans</b>	Exists	Four strips that guide the patient to their designated area by the triage nurse.
<b>Signage</b>	difficult to read	White with red colour background
<b>Distraction elements</b>	TV, there is no clock.	news channel
<b>Artwork elements</b>	doesn't exist	
<b>Water element</b>	doesn't exist	
<b>Landscape elements</b>	doesn't exist	
<b>childcare centre</b>	doesn't exist	
<b>Noise level</b>	acceptable	
<b>Privacy Element</b>	doesn't exist	The waiting area is an open space without any barrier or privacy component

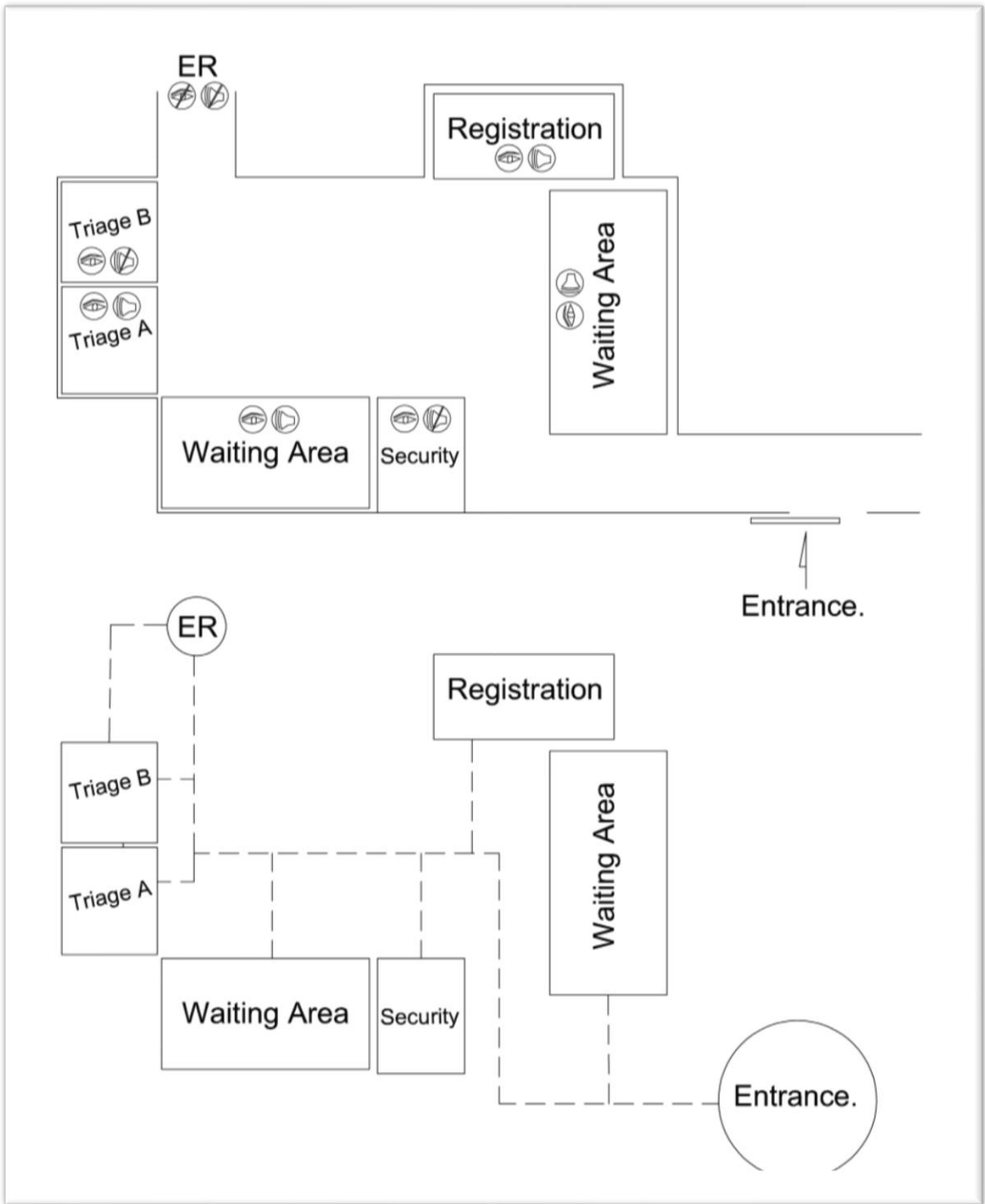


Figure 18: North York General Hospital Diagram and Plan

#### **7.1.4 Mount Sinai Hospital**

Mount Sinai Hospital is considered one of the oldest hospitals in downtown Toronto. It was built in 1953. I visited the ED waiting area twice for 20 to 30 minutes for each visit. The time of both visits was after 5:00 pm.

**Table 10: Mount Sinai Hospital**

<b>Item</b>	<b>Status</b>	<b>Observation of the researcher</b>
<b>Approximate size</b>	40 m <sup>2</sup>	
<b>Patient capacity</b>	34 patients	The area was half occupied with patients.
<b>Floor finishing</b>	wood flooring	
<b>Wall finishing</b>	normal paint	<i>Grey colour, depressing</i>
<b>Ceiling finishing</b>	false ceiling	<i>Off-white. depressing</i>
<b>Furniture</b>	grey colour, depressing	
<b>Artificial light</b>	fluorescent light	100–200 lux, depressing
<b>Natural light</b>	moderate	Facing the parking lot
<b>Patient calling system</b>	doesn't exist	The nurse calls or shouts for the name of the patient
<b>Nurses monitoring status over the waiting area</b>	have full view over the Waiting Area.	
<b>Wayfinding plans</b>	doesn't exist	
<b>Signage</b>	big signages	.
<b>Distraction elements</b>	two water elements	<i>Ugly</i>
<b>Artwork elements</b>	doesn't exist	
<b>Water element</b>	doesn't exist	
<b>Landscape elements</b>	doesn't exist	
<b>childcare centre</b>	doesn't exist	
<b>Noise level</b>	90–45 dB.	<i>Considered to be noisy</i>
<b>Privacy Element</b>	doesn't exist	

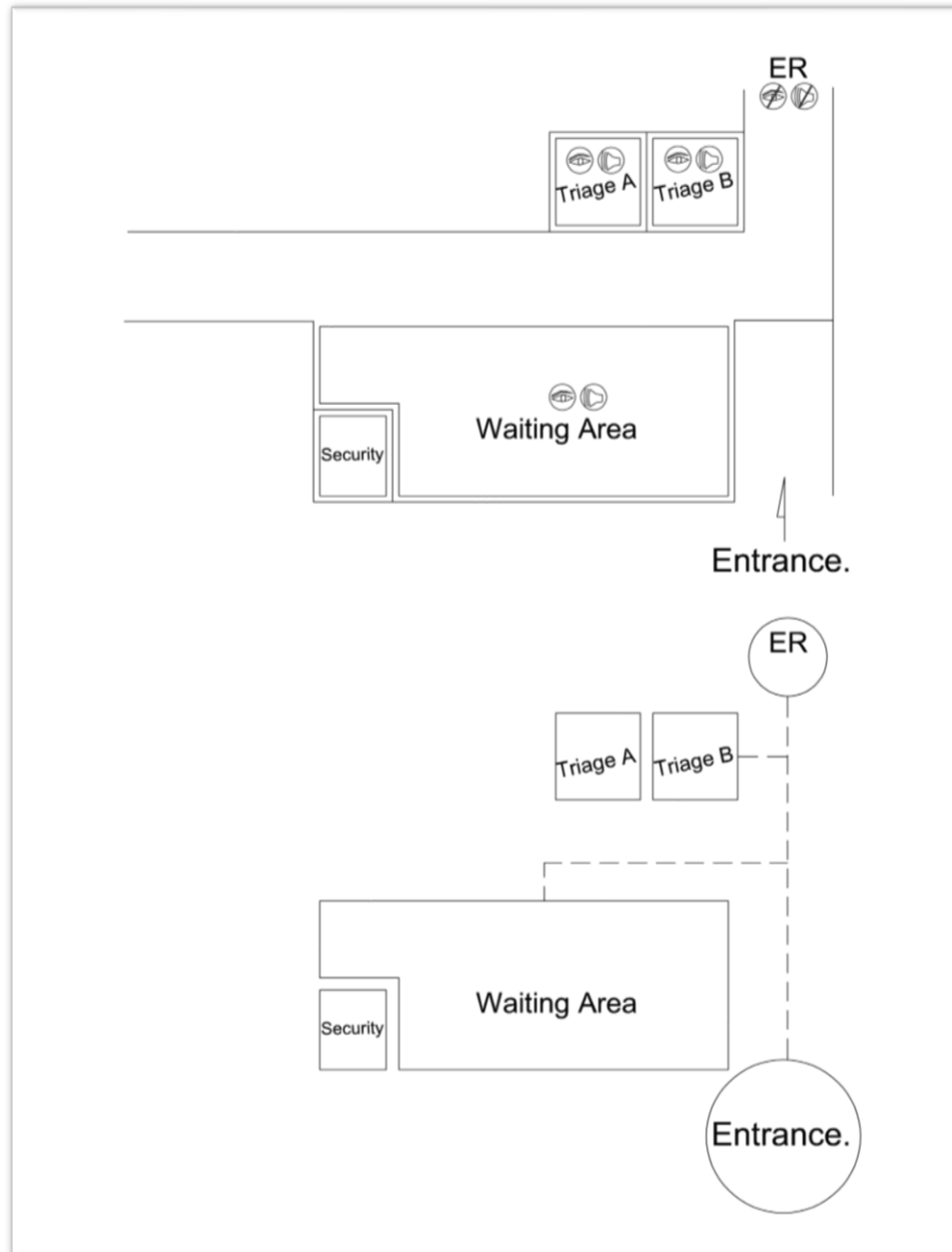


Figure 19: Mount Sinai Hospital Plan and Diagram

### **7.1.5 St. Michael's Hospital**

St. Michael's Hospital is the oldest hospital I visited during my site-observation research method. It's located in downtown Toronto. It was built in 1950. I visited the ED waiting area twice for 20 minutes for each visit. The time of both visits was after 5:00 pm.

**Table 11: St. Michael's Hospital**

Item	Status	Observation of the researcher
Approximate size	35 m <sup>2</sup>	
Patient capacity	approximately 30	
Floor finishing	vinyl flooring	Off-white with texture
Wall finishing	off-white paint	
Ceiling finishing	false ceiling	<i>Old, very old, dirty and depressing</i>
Furniture	dark grey colour, <i>depressing</i>	
Artificial light	fluorescent light	
Natural light	doesn't exist	No windows
Patient calling system	doesn't exist	The nurse calls or shouts for the name of the patient
Nurses monitoring status over the waiting area	zero monitoring over the waiting area	There are two waiting areas
Wayfinding plans	doesn't exist	<i>Did not notice any of them</i>
Signage	old	Did not pay attention to it
Distraction elements	TV	News channel, nobody was watching the TV
Artwork elements	<i>old depressing posters.</i>	
Water element	doesn't exist	
Landscape elements	doesn't exist	
childcare centre	doesn't exist	
Noise level	<i>in the normal range</i>	There are several absorbing acoustic panels
Privacy Element	exists	There are two waiting areas in the hospital; one of them has several connected partitions to separate the waiting area



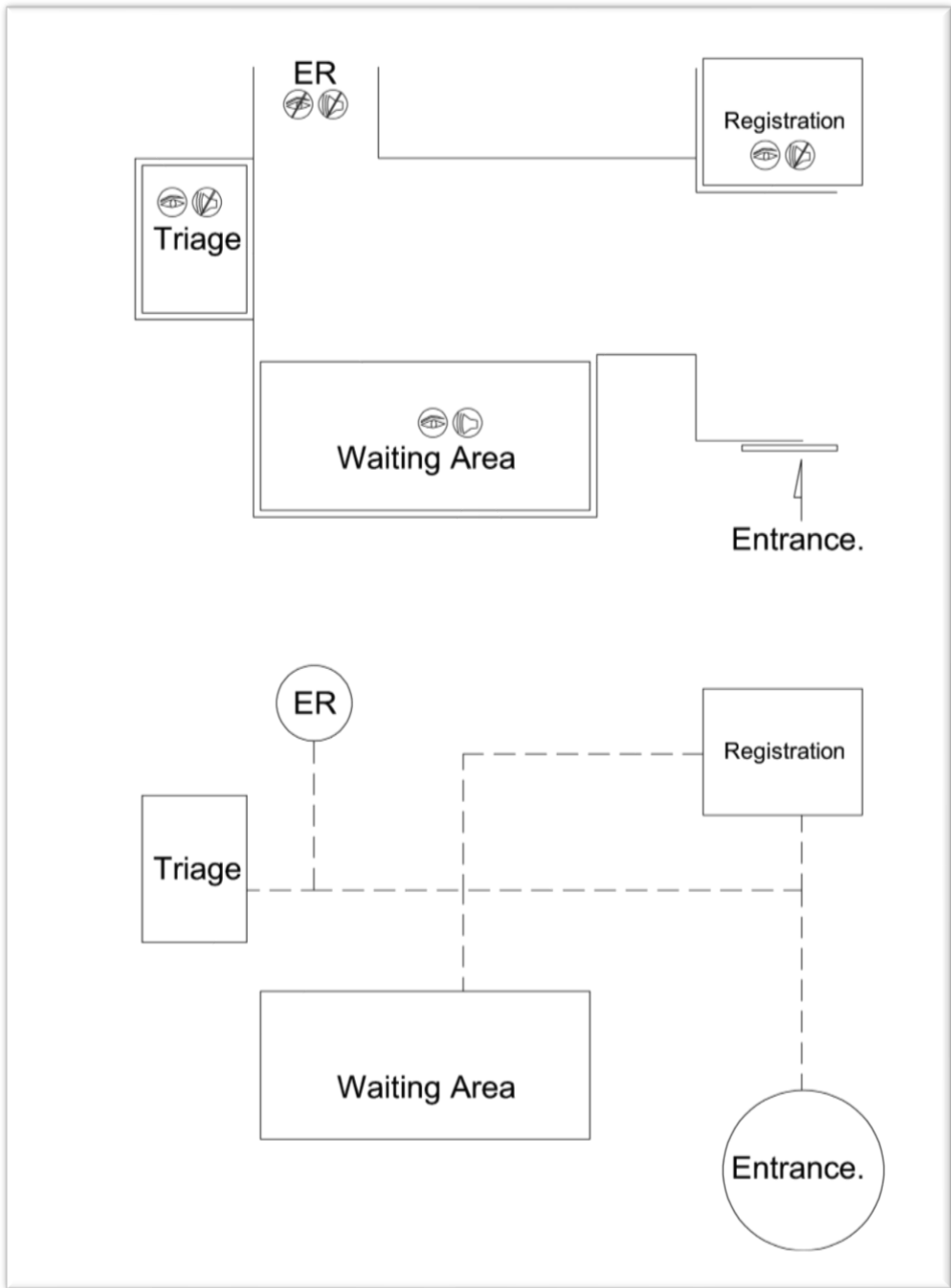



Figure 20: St. Michael's Hospital Plan and Diagram

## 7.2 Visual Semiotic Images Permissions

7/2/2018 OCAD University Mail - Ahmed, Permission to use images in my MRP.

 Ahmed Ghalib <3152038@student.ocadu.ca>

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**Ahmed, Permission to use images in my MRP.**  
2 messages

---

Ahmed Ghalib <3152038@student.ocadu.ca> Wed, Jun 13, 2018 at 12:38 PM  
To: bsarmien@northwell.edu

Hello again.

We just talked on the phone. My name is Ahmed. Inclusive Desing postgraduate student, OCADU university.

Looking for a permission to use two of your images in my MRP (Major Research Project) in a research method called semiotic research method where I take a picture and start analyzing the most influential criteria and elements within the image.

for the picture I'm about to use, I'm focusing on the privacy element within the picture, and the waiting area in the hospital is a very good example of how the privacy should be implemented.

The picture had been taken from Huntington Hospital.

My REB (Research Ethical Board) info:  
File No: 101148  
Approval Date: December 28, 2017  
Expiry Date: December 27, 2018


Regards.


Ahmed

--  
undefined undefined 3152038@student.ocadu.ca OCAD University

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**2 attachments**

 Emergency Department at Huntington Hospital.jpg  
451K

 Northwell Health's Southside Hospital.jpg  
331K

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[https://mail.google.com/mail/u/0/?ui=2&ik=141187d0f3&jsver=H8yF-bO9hWE.en.&cbl=gmail\\_fe\\_180626.14\\_p5&view=pt&search=inbox&th=163faa19...](https://mail.google.com/mail/u/0/?ui=2&ik=141187d0f3&jsver=H8yF-bO9hWE.en.&cbl=gmail_fe_180626.14_p5&view=pt&search=inbox&th=163faa19...) 1/3

Figure 21: Figure 5 & 6 Permission

Search

Ahmed Home Find Friends

MCI The Doctor's Office

8 MAY 02:43

Dear Sir/Mam.

My name is Ahmed F. Ghalib, I'm an Inclusive Design/OCAD postgraduate student, I'm doing an MRP (Major Research Project) about the effect of the physical architecture features in the waiting area in the healthcare facilities in the GTA. I found two pictures of your facilities using google(attached), and I need your permission to use them in my research analysis. My REB (Research Ethical Board) info: File No: 101148 Approval Date: December 28, 2017 Expiry Date: December 27, 2018

Regards.

Ahmed

8 MAY 13:11

Hi Ahmed, Thanks for your interest with our healthcare facility. As long as it doesn't negatively impact our clinic or any of our affiliates (such as Alpha Labs in your second picture), I think you can go ahead. Best of luck with your research! - MCI Team

Type a message...

MCI The Doctor's Office

Options

- Search in Conversation
- Manage Messages
- Notifications

Messenger link

[m.me/MCIDrsOffice](https://m.me/MCIDrsOffice)

Shared Photos

Figure 22: Figures 7 & 8 Permissions

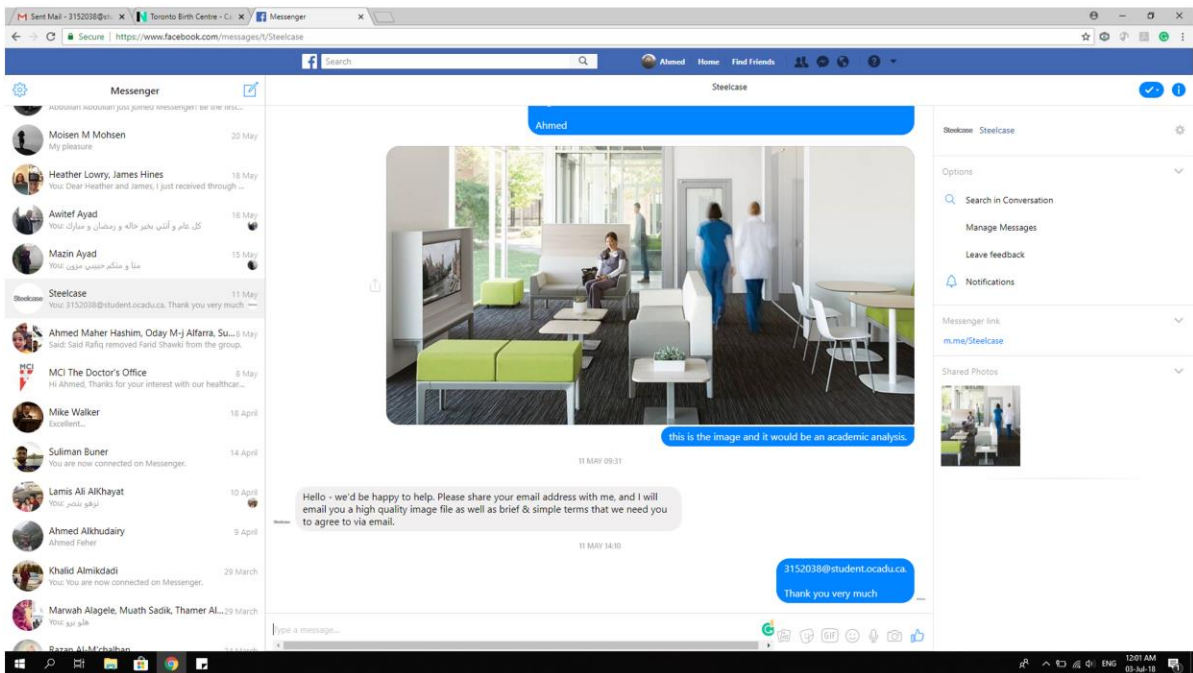


Figure 23: Figure 9 Permission

7/3/2018

OCAD University Mail - Re: GLOBALContract - Contact Form [Ahmed F Ghalib]



Ahmed Ghalib <3152038@student.ocadu.ca>

---

**Re: GLOBALContract - Contact Form [Ahmed F Ghalib]**

1 message

---

cs cs <cs@globalcontract.com>  
To: 3152038@student.ocadu.ca

Fri, May 11, 2018 at 10:58 AM

Thank you for your Email.  
Please go ahead and use our picture.  
Thank you  
Global Contract Web customer service

On Fri, May 11, 2018 at 2:14 AM, <3152038@student.ocadu.ca> wrote:

**GLOBALContract - Contact Form**

Name: Ahmed F Ghalib

Email: [3152038@student.ocadu.ca](mailto:3152038@student.ocadu.ca)

Telephone: 4164200122

Address: [2-6 Elway Crt](#)

City: Toronto

Province: ON

Postal\_Code: M6B 2N8

Country: Canada

Comment: Dear Sir/Mam. My name is Ahmed F. Ghalib, I'm an Inclusive Design/OCAD postgraduate student, I'm doing an MRP (Major Research Project) about the effect of the physical architecture features in the waiting area in the healthcare facilities in the GTA. I found one particular picture of one of your products that I intend to use in the image analysis phase of my project if you would give me the permission to do so the image is for st. joseph's hospital waiting area, the one with black and orange seats. <https://www.globalfurnituregroup.com/ca/healthcare> My REB (Research Ethical Board) info: File No: 101148 Approval Date: December 28, 2017 Expiry Date: December 27, 2018 Regards. Ahmed

**NOTE: Blank fields are not displayed.**

**Figure 24: Figure 10 Permission**

## 7.3 REB Approval Letter

December 28, 2017

Prof. Doreen Balabanoff

Faculty of Design

OCAD University

File No: 101148

Approval Date: December 28, 2017

Expiry Date: December 27, 2018

Dear Prof. Doreen Balabanoff, Mr. Ahmed Ghalib,

The Research Ethics Board has reviewed your application titled 'The Physical & Social Factors That Affect Patient Experience in the Emergency Department Waiting Room'. Your application has been approved. You may begin the proposed research. This REB approval, dated December 28, 2017, is valid for one year less a day: December 27, 2018. Your REB number is: 2017-61.

Throughout the duration of this REB approval, all requests for modifications, renewals and serious adverse event reports are submitted via the Research Portal.

Any changes to the research that deviate from the approved application must be reported to the REB using the amendment form available on the Research Portal. REB approval must be issued before the changes can be implemented.

To continue your proposed research beyond December 27, 2018, you must submit a Renewal Form before December 20, 2018. REB approval must be issued before research is continued.

If your research ends on or before December 27, 2018, please submit a Final Report Form to close out REB approval monitoring efforts.

If you have any questions about the REB review & approval process, please contact the Christine Crisol Pineda, Manager, REB secretariat at (416) 977-6000 x4368 or [cpineda@ocadu.ca](mailto:cpineda@ocadu.ca).

If you encounter any issues when working in the Research Portal, please contact our system administrator via [research@ocadu.ca](mailto:research@ocadu.ca).

Sincerely,

Nancy Snow

Acting Chair, Research Ethics Board