# DESIGN4 HEALTH

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# 699. Co-designing the waiting room of the future: Considering a combination of the spatial, service, and technology layer through the lens of patients' emotions

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*ABSTRACT Here, we report on the findings and outcomes of the Waiting Room of the Future Project which was conducted in collaboration with a local community health care provider (Access Health and Community). The aim of the provider is to lead innovative health provision in the region and as part of this to have a waiting room where their patients feel welcomed and cared-for. Previous research has shown that the experiences that patients have while waiting for their appointment has a direct impact on overall patient satisfaction levels. However, studies concerning waiting rooms in healthcare settings often provide little emphasis on emotional responses of stakeholders. Hence, the research presented here focuses on patients' emotions as starting point for designing the patient experience in the waiting room. We demonstrate our emotion-led design approach and associated co-design methods. A photo documentation kit and a focus group, were used to ascertain future goals and aspired emotions from staff surrounding service delivery. Surveys distributed in the ACCESS H&C waiting room were used to discern how patients would like to feel when engaging with technology and services on-site, but also the acceptance of technologies in regards to scheduling, information provision and health self-management. We illustrate our findings concerning stakeholder experiences using goal models and rich picture mappings and how they were translated into spatial and application design. In considering the spatial, service, and technology layers in one study simultaneously we can compile a holistic waiting room concept that stretches beyond the physical space and caters to user needs across each layer. Lastly, we offer a variety of co-creative methods providing people a strong voice embedded in a design approach that allows key stakeholder to communicate their emotions. The waiting room concept is currently realised by our industry partner on their site.*

Keywords: spatial health care design, co-design, waiting room, emotional goals, health technology design

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## Introduction

In this research we collaborated with a local health care provider in Melbourne, Victoria called Access, Health and Community (ACCESS H&C). ACCESS H&C has centres that are located across three municipalities. The centre focused on in this research hosts a wide range of health service specialists ranging from general practitioners, dietitians, physiotherapists, dentists, counsellors and chiropractors (see Figure 1). The objective of this research is to create solutions that will enable ACCESS H&C to deliver innovative health provisions in the region. Our main strategy to achieve this is to create an environment that aligns with their patients' emotional needs. Emphasizing emotions as the leading driver in this study, the investigators asked: How do patients want to feel in the health care waiting room of the future? To answer this question, a multidisciplinary team consisting of a Human-Computer Interaction (HCI) specialist, a digital media designer, a service designer and an interior architect collaborated and worked closely with the service provider. The HCI designer managed the project; the digital designer developed digital prototypes; the service designer developed co-design materials and the interior architect translated the findings into spatial designs supported by a Master's student team.

## The Waiting Room as a Space

A survey of 1360 people conducted by The Australia Institute (Dennis & Fear, 2010) found that 44.1% had avoided going to the doctor because they were "too busy", while 31.3% didn't go because it was "too hard to get an appointment". These results affirm that lengthy wait and lead times are not just a mild inconvenience, but a barrier to healthcare. Unsurprisingly, the 'wait' also has a significant impact on patient satisfaction, dropping as perceived waiting time increases (Yeddula 2012). Additionally, this perceived wait time is detrimentally affected when the patient is found to be waiting for unknown reasons, with anxiety, in discomfort, or in an unproductive state and for an unspecified time (Karaca 2011). The pressure of mounting queues also permeates through to physicians, who need to deal with conditions from a broad range of patients within a limited timeframe. Sherwin et al. (2013) highlight that these limited consultation timeframes can lead to patients feeling rushed, and with unanswered questions or incomplete information. Staff too can experience low morale (Knight 2005) derived from the difficulties in managing patient wait times, queues, and complaints in the face of dwindling patient satisfaction. Healthcare services can be unpredictable. Often, emergency scenarios are given priority which can push out waiting times. Interestingly, research into patient satisfaction finds that it is not just the time spent waiting, but the perceived wait time of the patients that causes frustration (Carroll 2012). Perceived waiting time is key to improving the patient experience and satisfaction.

### *Emotions*

Research has focused on the waiting room environment in relation to perceived quality of care (Arneill 2002), staff efficiency (Ulrich et al. 2008) and the influence of design to create functional environments that communicate brand attributes (Cooke 1983). This research approaches the

practice of designing waiting rooms by understanding how a user would prefer to feel when experiencing a waiting room. If not addressed, the negative emotional responses endured whilst waiting for an appointment can cause anxiety, stress and influence the patient's overall satisfaction with the visit. However, it is not only during a visit that patients may feel emotionally distressed. Kuusela et al. (2013) explain that older adults, in particular, often leave their appointment feeling anxious because they find it hard to remember the doctor's instructions and absorb health information. This presents an opportunity for studies that focus on the role of emotions within the space of the waiting room and opportunities for implementing technologies and innovative services.

### *Technologies*

The display of waiting times on digital signage can help alleviate the perception of inflated wait times and anxiety generated by unknown wait times (Karaca 2011; Nemschoff 2015). Such notifications can be personalized and expanded to smartphones, which may provide patients with the ability to book appointments, locate the room (Labarre 2011) or check-in for an appointment once close to the clinic (Kennedy 2016). Also, SMS has proven to be just as effective at reducing missed appointments via postal or call reminders whilst being the most economical communication form for patient reminders (Free 2013). Gordon et al. (2015) demonstrated that clinics can extend such messaging services to deliver medically relevant information to the patient or caregivers post consultation; reporting that this type of open communication received 'high levels of satisfaction' from users (Gordon et al. 2015).

Chan (2014) and Rolls (2011) illustrate that kiosks both assist with queue management and can provide information specific to individual patient needs. Flat-panel monitors, can also be utilized as responsive health education tools that can be updated unlike printed materials where wait times are long enough to facilitate the message (Larsson 2015). Productive use of patients' time correlates directly to patient satisfaction levels and perceived wait durations (Yeddula 2012; Karaca 2011).

In sum, a wide range of problems in the waiting room can affect staff and patient experiences. In order to address these problems, we entered a co-design process with key stakeholders focussing on emotion-led design.

## Co-designing for positive emotions

A photo-documentation method ('snap- it' – see figure 1) was used to explore service barriers, workflow (in)efficiencies and future directions, while a focus group elicited refined emotions suitable for developing a goal model based on these barriers. Lastly, a 1:20 model of the waiting room was constructed to spatially position key research insights. Through all methods, three themes for potential intervention were explored: spatial, technology and lastly service design.

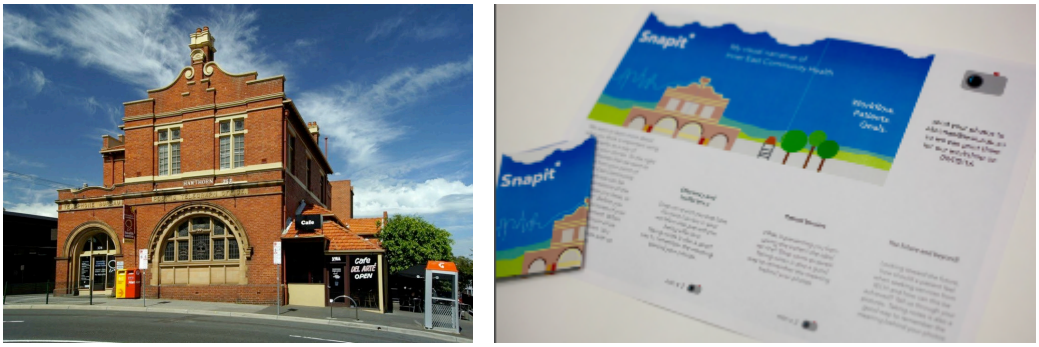


Figure 1: ACCESS H&C building and The SNAPIT* photo-documentation kit instructions

## *Photo-documentation Kit and Focus Group*

Seven of the nine staff returned photographs as a way of capturing stories and building narrative for the focus group. Based on the results of the photo-documentation kit, five ACCESS H&C staff discussed uncovered barriers, efficiencies and inefficiencies and were asked to share their ideas, and feelings with a specific focus on service delivery, technology adoption, spatial design, and future goals for re-design.

### *Example for staff narrative*

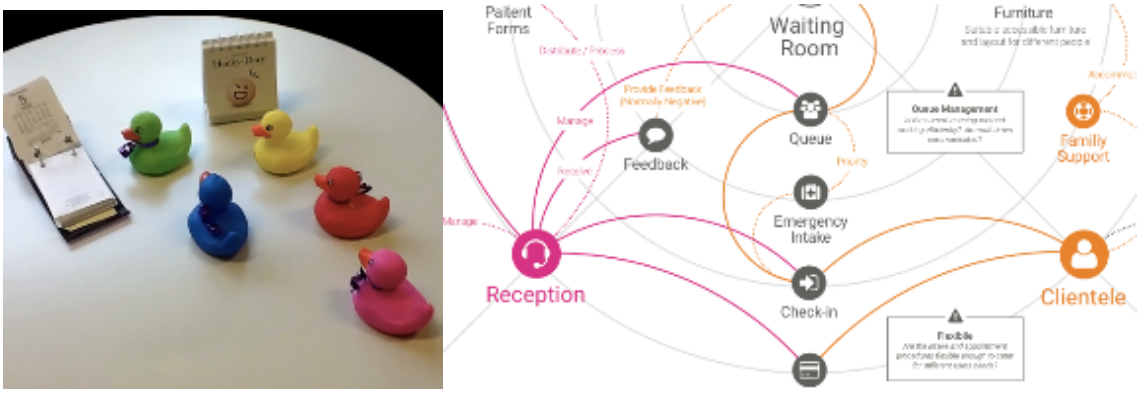


Figure 2: Photo from kit and Rich Picture

Figure 2 demonstrates how photographs from the kit were used as rich stimulants to discuss complex service barriers and their associated emotions. The stories and insights found throughout these activities often shared relationships with multiple stakeholders, and were not isolated. The rich picture (Figure 2 right) demonstrates these complex relationships. Participants preferred a more accessible model that moves away from the largely 'one size-fits-all approach' to a more tailored service in the future. A future goal for ACCESS H&C according to participating staff should be one where 'Patients can Access the services in a number of ways and receive care for their priority need in a timely way' (See figure 2 left opposed to a 'waiting in one line model'). Also, 'patients who need to see multiple care providers receive coordinated, and integrated care' and 'patients are prioritized based on their needs'.

*Digital Barriers*

It became evident that multiple patient information technology systems fail to communicate with each other when staff members are required to manage appointment requests for patients needing to access multiple services. In accordance with Trauma Informed Care, it was suggested by one participant that the lack of a self-check-in kiosk can make patients feel stressed or anxious not having privacy but being forced to speak with the receptionist. The flat screen TV was seen as positive or negative depending on what information was screened and their relevance to the people in the waiting area.

*Service Barriers*

The biggest barrier to services was that clients are put on multiple waiting lists and access services based on the length of the waiting list, rather than the clients' priority need. Staff commented that brochures and information is poorly organized or out-of-date, hence making it difficult for patients to find information relevant to them. The amount of information material was considered over-stimulating. Also, reception staff are put under a great deal of pressure to help patients locate services that are often difficult to find, for instance, one participant commented on regularly being asked to find the call number cards for nursing services. One staff member presented a currently used low-tech communication system between patient, doctor, and reception staff. After each appointment, a clinician indicates on a pre-printed note the fees, funding source and care provider as well as details for booking the next appointment and passes it to reception to process. This interaction facilitates communication between the clinician and reception staff, enhances efficiency and overcomes some of the digital inefficiencies.

*Spatial barriers*

Spatial features such as the width of the corridor from the reception to the medical suites cause access difficulties for people using prams or wheelchairs and for general flow of people (figure 3). Reception staff often needs to direct patients to the bathrooms, out of view from the reception desk. Distraction was also presented as a spatial inefficiency for reception staff who 'have to watch the door slowly close to ensure no one else enters' having to play a secondary role as security staff. The height of the reception desk excludes people in wheelchairs. Also, the spatial location of the reception desk enables other patients who are waiting for an appointment to overhear private patient details of those who are in conversation with reception staff. The door to the reception area opens straight onto a busy road, causing concern for children while parents are checking in at reception or completing forms. It was noted that 'it can feel like parents are not welcome in our service due to the lack of available parent change rooms near the reception area and, that the children's waiting area is not very inviting' (figure 3). Further many patients using wheelchairs 'park' in the children's play area for easy access to treatment rooms, cutting off access for children. There is no private room for a distressed or unwell patient to wait in, away from other patients. It was shown that the only private waiting area, doubles as the Needle and Syringe Room (NSP, figure 3): 'However it is not ideal for an individual experiencing trauma given the potentially confronting

nature of the NSP information and disposal bin'. Finally, patients are required to wait at the doors prior to 8am until reception opens even during bad weather.

Figure 3. Narrow pathways, dual use of needle and syringe room and kids play area

*Goal model with focus on emotions*

In the focus group the narratives were further unpacked considering three distinct goals; Do, Be and Feel Goals (Table 1). For instance, when discussing multiple patient data systems that do not communicate with each other, it was suggested that the healthcare service provider should do 'one health record and shared care plans', that are to be coordinated with individual patient needs and experiences. This would enable Access Health and Community staff to feel productive and useful as well as deliver a feeling of 'My Place' to patients.

Table 1. Do, Be and Feel Goals brainstormed in focus group

| **DO** | **BE** | **FEEL** |
|---|---|---|
| Create one health record | Best practice | My Place |
| Share care plans | Coordinated | Welcoming |
| Work person centred | Client centred | Interactive |
| Enable consumer engagement | Pathway driven | Efficient |
| Welcome patients | Expert Accessible | Holistic |
| Communicate information | Streamlined | Productive, Useful |
| Provide flexibility | Responsive | Cared About |
| | Equitable | |
| | Tailored | |

These categories supported the development on the emotional goal model. Figure 4presents a broad landscape of preferred emotions by the staff ACCESS H&C for their patients.

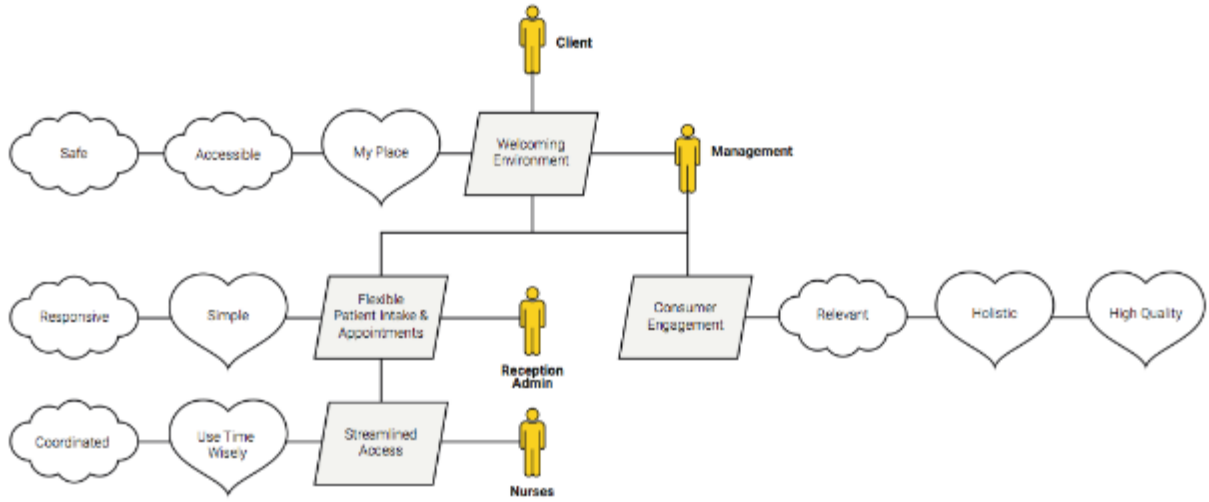


Figure 4: Goal Model - Hearts show desired emotions in the waiting room

## *Patient surveys*

A total of 70 paper and 26 digital surveys were completed by patients about (i) current and preferred emotions and technology use in the waiting room and (ii) giving and receiving information from ACCESS H&C.

Patients wanted to feel welcomed and comfortable. It was communicated that a 'more private waiting area' would enhance client comfort. Self-check-in technology was considered a faceless option, suggesting that many clients appreciate personal interactions with reception staff and within their overall experience in the waiting room. The participants split into two groups of clients who wanted to do nothing or wanted to be productive. With the latter group there was a strong emphasis on the use of technology during wait times, namely using their phones to do work, use apps, or watch television. These would appreciate free Wi-Fi. Strong emphasis was also placed on technology being used to alert patients to changes or delays in their appointments. The majority of participants would like ACCESS H&C to help them take a more active role in their own health journey. However, participants did not feel as strongly when compared to the provision of tailored health information. A digital application was the most desirable format for patient self-management. There is consensus amongst most participants that if they knew the reason for appointments running late they would not mind as much which is consistent with the literature.

## *1:20 Model*

A 1:20 Scale model of the ACCESS H&C waiting room was constructed (Figure 5). After responses were collected from all staff and clients at ACCESS H&C, a clear image emerged defining the spatial problems associated with the waiting room space categorized in emotional, physical and service oriented themes.


Figure 5: Goal Model - Hearts show desired emotions in the waiting room

## Outcomes

### *Technology Design*

The application is a tool to encourage patients to become more active in managing their personal health and improve overall communication with ACCESS H&C. The application has been built as fully functioning prototype based on the screen designs (Figure 6) of four design students (Design Honours). A vital feature, this application enables patients to view their appointment calendar, book, cancel and reschedule appointments with ACCESS H&C. As with the data collected during the surveys, patients wanted to use technology to manage their appointments and schedules. Furthermore, one feature allows patients to input their health statistics (weight, blood pressure etc.), enabling better communication with their doctor. The main benefit to tracking personal health information means that patients can review their progress and feel motivated to change/continue their healthy habits. Follow up care is a place to see referrals, access results and most importantly view a written version of doctor's instructions as verbal instruction are easily misunderstood or misinterpreted.

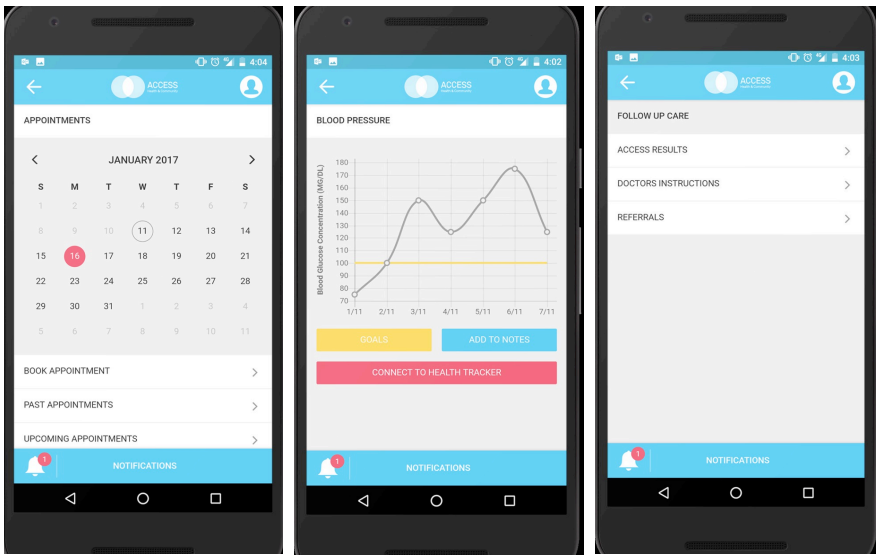


Figure 6: Appointments, Track Your Health and Follow Up Care as main functions of the app

## *Spatial Design*

The spatial design was realised by students from the Bachelor of Interior Architecture (Hons.) program. In a first studio, 16 students developed a concept for the waiting room based on the goal modelling and the published research report. The students aimed to isolate principal problems of flow and circulation, universal access requirements and the need to provide a welcoming atmosphere. Four selected schemes were further developed in a second studio with focus on what was most important for the new waiting room design – namely the position and accessibility of the reception desk (see figure 7).

Figure 7: The entry view – final concept

Students were given a set of empathy provoking exercises through mobility devices and ageing suits in a full scale model of the waiting room that was set up in their classroom space. The students reported that this exercise was fundamental to their understanding of the different user groups of the waiting room as they each role-played being patient, carer and staff. Staff and executive agreed on the strongest scheme but also indicated key features from the others that they wanted included. Three students (Fiona Nowland, Chrissa Drosopoulos and Sarah Tucker) then worked in close collaboration with Flavia Marcello to refine the design to a single project that was approved for execution (see figure 8). It is anticipated that construction will commence in 2019.

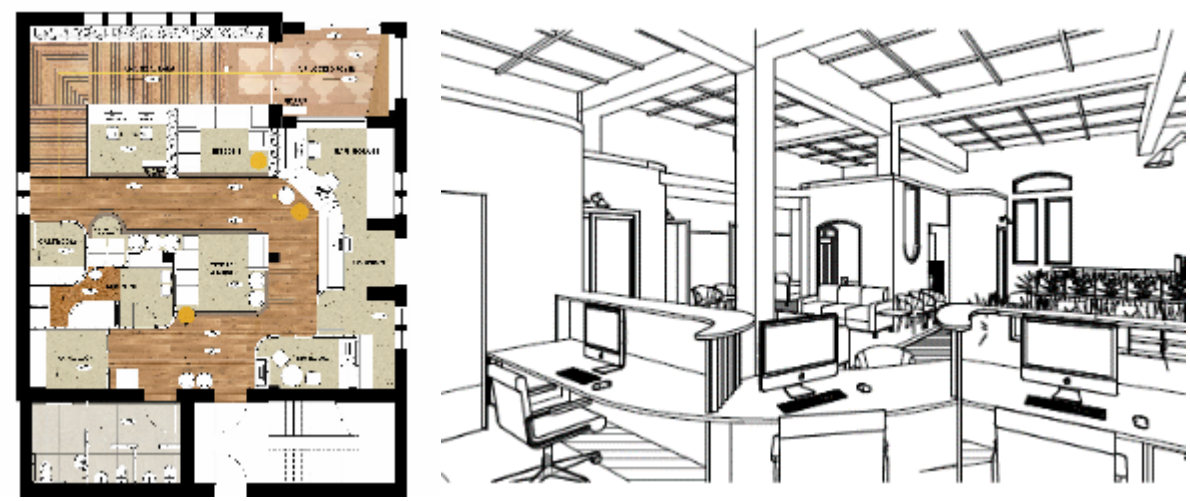

Figure 8: Final design – view from reception desk area (different heights)

## Conclusions

The Waiting Room of the Future project considers the diverse and complex landscape of the standard health care service waiting room. Involving multiple stakeholder groups, the project reaches well beyond the physical space of the waiting room into the lives of patients and medical service processes alike. The research team explored how this interaction and time spent could be facilitated in both supporting technology and spatial considerations that better meets the needs and emotions of patients and helps health care providers to deliver innovative and efficient health services.

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## References


Arneil, B.A., & Deviln, A.S. Perceived Quality of Care:The influence of the waiting room environment. The Journal of Environmental Psychology 4 (2002), 345-360.

Chan, Y. (2014), Medical Utilization of Kiosks in the Delivery of Patient Education: A Systematic Review. Health Promotion Perspectives, 4(1): 1-8.

Cooke, D.F. Design. A successful waiting room. The Journal of Medical Group Management 30, 6 (1983),64-65.

Free C., Phillips G., Watson L., et al. (2013). The Effectiveness of Mobile-Health Technologies to Improve Health Care Service Delivery Processes: A Systematic Review and MetaAnalysis. PLoS Med 10(1): e1001363.

Gordon, C. R., Rezzadeh, K. S., Li, A., Vardanian, A., Zelken, J., et al. (2015). Digital mobile technology facilitates HIPAAsensitive perioperative messaging, improves physician-patient communication, and streamlines patient care. Patient Safety in Surgery, 9, 21.

Karaca, M. A., Erbil, B., & Özmen, M. (2011). Waiting in the Emergency Room: Patient and Attendant Satisfaction and Perception. European Journal of Surgical Sciences, 2(1), 1-4.

Kennedy, B. (2016,). Melbourne technology gives doctor's waiting room hi-tech overhaul. The Herald Sun. Retrieved June 1, 2018, from http://www.heraldsun.com.au/news/victoria/melbournetechnology-gives-doctors-waiting-room-gets-hitech-overhaul/newsstory/266e58155e6486990ed7a45f0b5cae28

Labarre, S. (2011). Six Ways To Improve Doctor's Waiting Rooms. Retrieved May 21, 2018, from http://www.fastcodesign. com/1664797/six-ways-to-improve-doctors-waiting-rooms

Larsson, L. 2015. The Montana Radon Study: Social Marketing via Digital Signage Technology for Reaching Families in the Waiting Room. American Journal of Public Health, 105(4), 779-785.

Nemschoff (2015). Winning Strategies for Waiting Rooms. Retrieved May 23, 2018, from http://www.nemschoff.com/uploads/casestudy-files/Nemschoff_Insight_Winning_Strategies_for_Waiting_ Rooms_2015_01_13.pdf

Rolls K., Smith M., Zhang et al (2012). Preliminary data suggests ICU visitors will use a computer kiosk to Access information in the waiting room. Australian Critical Care, 25(2), 138.

Sherwin, H. N., McKeown, M., Evans, M. F., & Bhattacharyya, O. K. (2013). The waiting room "wait": From annoyance to opportunity. Canadian Family Physician, 59(5), 479–481.

Ulrich, R.S., Zimring, C., Zhu, X., et al., A review of the research literature on evidence-based healthcare design. Health Environments Research and Design Journal. 1,3 (2008), 61-125.

Yeddula, V. (2012). Healthcare Quality: Waiting Room Issues. Industrial and Management Systems Engineering -- Dissertations and Student Research. Retrieved May 23, 2018 from http:// digitalcommons.unl.edu/imsediss/29/