

# **Communicating a Healing Environment**

From a clinical to a graphical stroke ward experience.

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*01/05/2021*

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# **Abstract**

The physical environment of a hospital caters to the technological advancements in medicine, focused on curing illness rather than supporting the wellbeing of people. This project explored how graphic design might be used in a healthcare environment to improve the experience of healthcare professionals, patients, and their families on a stroke ward. After a stroke, many people experience mental and physical impairments. This affects their ability to move and communicate as well as impacts how people respond to their surrounding environment. Being placed in the environment of a stroke ward can heighten the anxieties already faced after experiencing a stroke.

In this research, healthcare professionals working in North Shore Hospital's acute stroke ward were involved in the design process. Through methods used in action research and human-centered design, staff were able to share information around the inpatient experience and the challenges they face when aiding the recovery of patients in a stroke ward environment.

Observations and expert interviews with staff revealed areas on the stroke ward that may be activated through graphic design to create a positive healthcare experience. Although the participation of healthcare professionals supported the development of designed solutions throughout this research it also revealed the challenges many designers face when working in healthcare. The time restrictions of staff meant they were unable to fully participate in all stages of the design process. This may have affected the outcome of my project when considering the needs of stroke patients and their families.

Through installing designed prototypes in the stroke ward, it was revealed that not only can graphic design influence the experience in this space but the behaviour of staff. This highlighted the importance graphic design has in a healthcare environment when not only creating a positive experience but facilitating connections in this space.

The final output of this project incorporated ideas of holistic healing when supporting those recovering from a stroke, bringing nature into the stroke ward environment through designed installations. These designed installations revealed the ability graphic design has when transforming a clinical space into an environment that has the ability to aid the recovery of stroke patients.

# **Introduction**

Stroke is the second leading cause of death and the main cause of adult disability in New Zealand (Stroke Foundation,2020). In the past year, eleven thousand New Zealanders have been affected by stroke. A stroke is caused by the interruption of blood flow to the brain. This results in the death of brain cells and can affect a person's ability to move and communicate (Stroke Foundation, 2020).

After experiencing a stroke, especially when severe, many people are admitted into an acute hospital ward. Here they undergo treatment and testing for their stroke. A hospital experience can often be far from pleasant. White corridors, artificial light, and the constant noise coming from multiple machines make it a stressful environment in which to recover (Veitch, 1995). Inpatient care patients spend most of their time in bed, in a shared space with other stroke survivors. Every day the inpatient experience involves encounters with the physical environment (Jones, 2013, p136).

There has been little research into how the environment of a hospital impacts the experience of healthcare professionals, stroke patients, and their families. However, the environment of a hospital isn't the only aspect that affects the experience of patients. The nature of becoming 'a patient' has a psychological impact. When comparing patient's behavior in their homes versus the hospital, Holmquist (2001, p1502) found that patients took more initiative and regularly expressed goals when at home.

Being in the unfamiliar environment of a stroke ward adds to the anxiety many already face (Bright, 2019). By taking the perspective of patients, Roger Ulrich determined that faster recovery and shorter stays in hospitals can be supported by scenes of the natural environment as well as artwork (Jones, 2013, p136) rather than the sterile environments hospitals are currently.

Staff on North Shore Hospital's Acute stroke ward felt that there was an opportunity to create a better experience for patients and their families when staying on the ward. A senior staff member approached Good Health Design, a trans-disciplinary design and research studio based at AUT's Auckland City Campus (Good Health Design, 2021).

Before undertaking an internship with Good Health Design in the winter of 2019, I had little understanding of the impact design could have on healthcare. During my time at Good Health Design, I and another colleague branded the 'Design for Health Symposium 2019'. Whilst learning the differences between healthcare and design, my eyes were opened up to a community of people pushing for change in a heavily medicalised system. I was fortunate enough to be given another opportunity by Good Health Design at the end of 2019, where I was given the opportunity to design a prototype model of a sensory mobile intervention for older adults living with dementia.

For this project, I worked alongside clients and healthcare professionals, getting a more personalised understanding of what dementia is and how it affects those suffering from it. It was during this project that I started to think about my master's project and what I would do. I was introduced to an opportunity in the stroke ward of North Shore Hospital. This opportunity involved improving the experience of healthcare professionals, stroke patients, and their families staying on the ward. This project was of interest to me as although I had a lack of knowledge about what stroke was, having spent some time in the hospital environment throughout my life I knew it was far from pleasant.

This research was conducted with staff working in North Shore Hospital's Acute Stroke ward. Using a human-centered approach, the research aimed to find out if graphic design can improve the experiences of healthcare professionals, stroke patients, and their families in a hospital environment. The following exegesis is separated into four sections.

The first being a contextual review that derives research from the inpatient experience in a stroke ward, healing environments, human-centered design, and the role graphic design plays in healthcare. This is followed by the methodology section, which discusses action research and human-centered design and the methods that have been used to carry out the creative process of the research. How these methods were utilised throughout the project is showcased in the documentation of the research chapter. The exegesis concludes with a discussion that presents the findings of the research and how graphic design can positively impact the experience of those on a stroke ward.

# **Contextual Review**

## **Inpatient Experience in a Stroke Ward**

Stroke is caused by an interruption of blood flow to the brain, damaging brain cells, and can cause both physical and communicative impairments (Stroke Foundation, 2020). Most people who experience a stroke are admitted into an acute stroke ward. Depending on the severity of the stroke people are either sent home after initial tests or kept in hospital to continue treatment and rehabilitation (Stroke Foundation, 2020). Being in hospital can be daunting for many, especially when they are unable to process and understand the information being given to them due to impairments caused by a stroke.

In addition to the anxieties stroke patients face in the hospital environment, the mentality behind being a 'patient' is also known to be demoralizing when recovering (Holmqvist, 2001, p1501). Lotje Sodderland (2014) describes her experience in a stroke ward, expressing that as a patient you are reduced to being an idle body with everyone else.

Once you become a patient, you also become a medical entity (Sodderland, 2014). David Herkt (2009) reflecting on his own experience, describes how his daily routine was determined by the hospital environment, and although many disregard the architecture of the hospital space he emphasises the importance the physical environment had on his recovery as all you have in that space is environmental cues. The environmental cues of natural light and nature can provide stroke patients with stimulation (Ulrich, 1991). If there is a lack of stimulation, patients become occupied with their thoughts and can lead to anxiety and depression (Ulrich, 1991, p102).

Brain damage caused by a stroke can affect how a person behaves and responds to their environment. Unfortunately, for stroke patients, the hospital environment is often discouraging and creates more fear (Daemen, 2014, p119). In the past decade, studies have shown that there is a need for a physical setting that supports wellness and healing to aid staff and patients cope with the stress of hospitalisation (Daemen, 2014, p115).

## Healing Environments vs Hospital Environments

Despite there being developments in medicine, the influence that the environment can have on a person's health is often overlooked by the healthcare system (Fornara, 2012). The advancements in medicine over the past decades have meant that hospitals have been built to cure the physical body rather than promote wellness and healing (Fornara, 2012, p297).

As these developments in medicine started to take place in the Western world, hospitals started to forget what it is like to be human (Oppermann, 1997). Treating the physical body of a person and disregarding their spiritual and social being. This also caused patients to disassociate themselves from the healthcare environment and hospitals were no longer considered places for people to heal (Oppermann, 1997).

Before hospitals became spaces for technological advancements in medicine, they were known as places of healing (Daemen, 2014). Daemen (2014, p114) defines a healing environment as "a physical setting and supportive culture that nurtures the physical, intellectual and spiritual wellbeing of patients, families, and staff and helps them to cope with the stress of illness and hospitalization". Hospitals promoted a healing experience through a holistic approach, surrounding patients with nature, music, and art (Daemen, 2014, p114).

A well-known example of the value of healing environments comes from English nurse, Florence Nightingale. After observing the impact holistic environments had on the overall recovery of patients, Nightingale pushed for hospitals to focus on the needs of people and adapt as a service provider to improve the overall health experience (Fornara, 2012, p297).

Although Nightingale's findings led to the creation of environments that were effective when carrying out healthcare functions (Daemen, 2014), the increasing amount of modernised technology used in medicine has resulted in growing neglect of how a patient experiences their environment (Fornara, 2012, p298).

Hospitals can often conjure “thoughts of long sterile hallways, stainless steel utensils, banks of life monitoring equipment, and the smell of rubbing alcohol and disinfectant” (Veitch, 1995, p291-292). This can often generate negative thoughts and feelings when presented in a medicalised space.

Hospitals are places where people receive treatment for illness and seek advice from healthcare professionals. Recent studies show that there is a developing interest in how the built environment can provide a holistic experience for patients and staff in medical environments (Huisman, 2012). People are becoming more aware of how the healthcare environment impacts their overall health experience. Andrade (2016, p319) explains how the effect that the physical environment of a hospital has on patients should not be ignored. It is an aspect of the healthcare experience that can be easily improved and is vital to a patient’s well-being.

## Communicating to Healthcare Audiences through Graphic Design

Half of the people who experience a stroke are left with communication impairments, affecting their ability to talk, write and comprehend speech (Bright, 2018, p982). There is a lack of rapport by healthcare professionals due to the absence of communication between themselves and patients (Bright, 2018, p982). This adds to the anxiety already faced when placing stroke patients in the unfamiliar environment of a hospital.

The hospital environment is known to have a negative impact on patients, especially those with communication impairments (Clancey, 2020). This is because elements of the hospital including noise, light, and visually busy environments acted as a communication barrier between patients and healthcare professionals (O'Halloran, 2012, p42-43).

These barriers can make it hard for patients to communicate with healthcare professionals, often making them feel isolated after continuously being ignored and excluded (Bright, 2018).

Although healthcare professionals may have admirable technical skills it does not necessarily mean they are great communicators (Paulovich, 2015). Professionals' engagement with patients is often lost in translation when forgetting that patients are people too (Paulovich, 2015, p11).

The insights Felicity Bright revealed about the dilemmas clinicians face when engaging with patients experiencing communication disabilities, along with information about how stroke affects New Zealanders each year, gives me an understanding of the importance of communication in a healthcare environment (Bright, 2018).

Graphic design is often used and described by practitioners as a means of communication (Barnard, 2005). Paulovich (2015) showcases how graphic design can facilitate communication in a healthcare setting. Through collaborating with healthcare professionals she created a graphic resource for paediatric patients with communication difficulties.

People use the principles of graphic design when being able to communicate to a wide range of audiences (Frascara, 1997). But this is often overlooked by the healthcare system as graphic design principles are not a strategy accepted or used by the healthcare system (Dowse, 2004). This is often due to the challenges that surface when designing for a diverse range of patients (Norman, 2015). The minimal knowledge healthcare professionals have of graphic design, hinders the success of graphic design implementation in the healthcare system (Norman, 2015, p91).

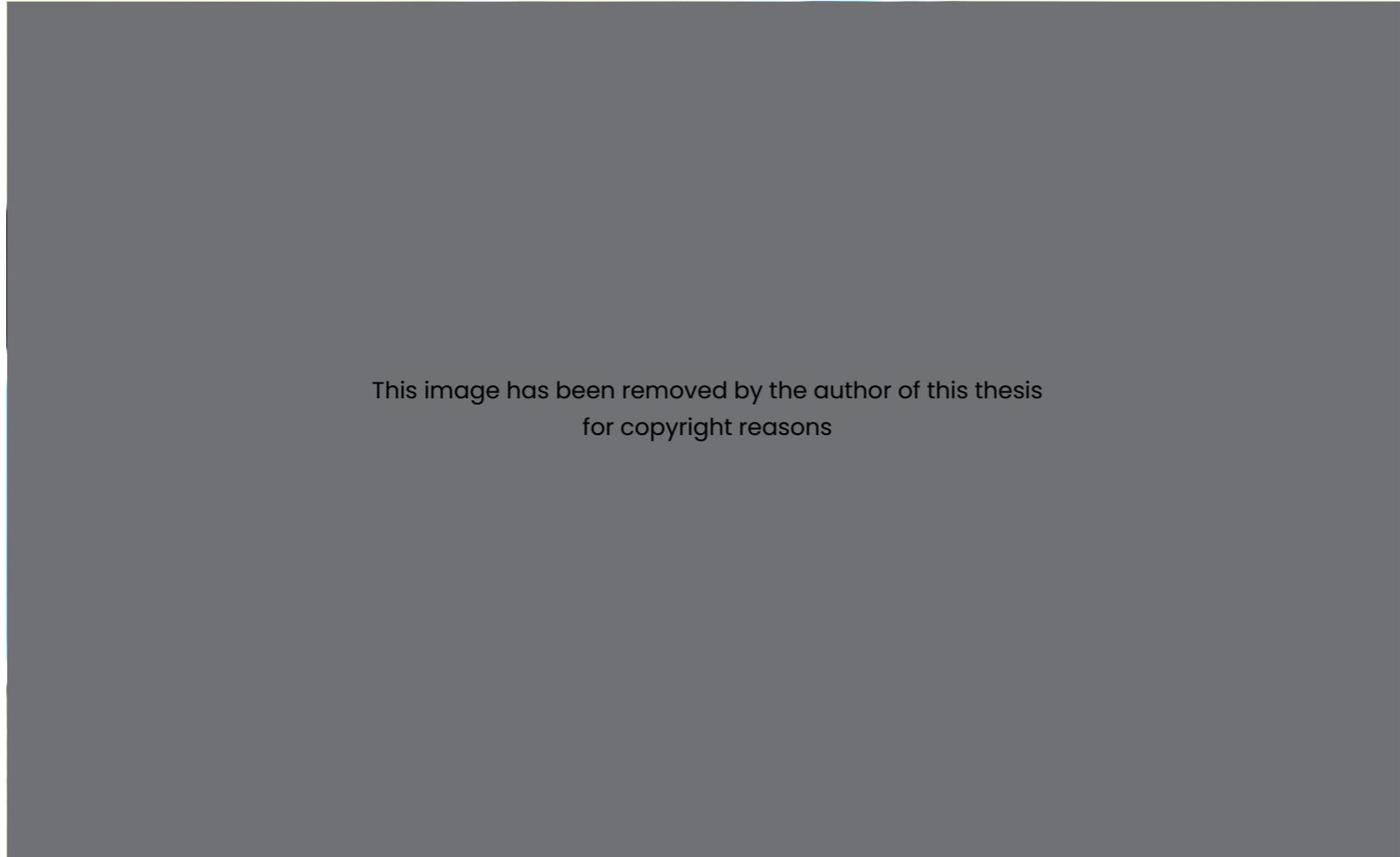


Figure 1. Belinda Paulovich (2015). *The Rehab Journey*. A flashcard resource to facilitate communication between clinicians and paediatric patients.

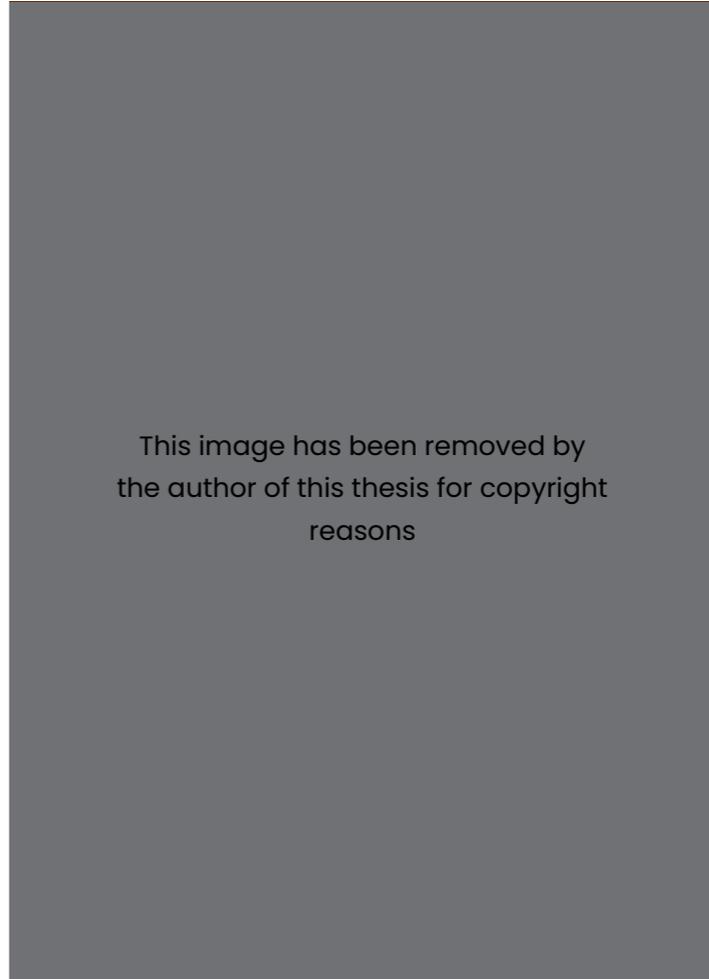


Figure 2. Belinda Paulovich (2015). *The Rehab Journey*. A flashcard communicating a rehabilitation activity.

## Experiential Graphic Design

Experiential Graphic Design is described as environments that can communicate messages and meaning through the arrangement of typography, colour, imagery, technology, and content (Dixon, 2014). This multi-disciplinary field is also known as Environmental Graphic Design (EGD) and aims to connect people to place through experience, using visual elements of way-finding as well as communicating identity and information (SEGD, 2014).

Communicating through the built environment has been used by people for hundreds of years (Dixon, 2014). There is a growing use of experiential graphic design in public areas, as the integration of art and graphic design is known to reduce stress and provide a positive distraction for those who are recovering in clinical spaces (SEGD, 2014).

When reflecting on how graphic design can create a positive experience for those working and staying in a stroke ward, the use of public installation may be a suitable place to start from. Public installations are often used to enhance the uniqueness of a specific place while expressing facets of the shared human condition (SEGD, 2014).

Public Installations are usually responses that are specific to the site including the physical landscape, topic, or cultural context. These installations aim to connect people through a wide range of materials and media (SEGD, 2014). Experiential graphic design and more specifically public installations could create a more personalised environment in an acute stroke ward, moving away from the current sterile and clinical feel (Bray, 2019).



Figure 3. Ralph Appelbaum & Associates (2012). *Experiential Graphic Design at a children's hospital in Columbus, Ohio.*

## Human-Centered Design in Healthcare

Designers have the potential to create healthcare spaces that support wellness if they are designed to foster a sense of control, give access to social support and positive distractions, avoiding negative distractions that can be harmful to patients (Ulrich, 1991). Healing environments are important to consider when exploring the potential graphic design has when transforming the environment of a stroke ward into a space that positively impacts healthcare professionals, patients, and their families within this space.

Human-centered design (HCD) is a methodology that offers designers the opportunity to improve the experiences of patients, families, and staff when working in the 'healthcare space'(Groenvelde, 2018).

Through using the methods of observation, ideation, prototyping, and testing designers can focus on the needs of participants (Norman, 2016). Lenny Naar (Naar, 2015), a design strategist, states that human-centered design is fundamental when working on projects that create a positive experience for patients and have a direct impact on their health outcomes. Groenvelde, (2018, p306) explains that in a healthcare situation, the human-centered design framework allows designers to focus on the needs of people rather than being focused on their illness.

When exploring the potential of graphic design in a stroke ward, it is important to better understand the capability of human-centered design. This will aim to address the difficulties stroke patients face when placed in the sterile environment of a stroke ward. There is a lack of focus on what people need in a healing environment due to the development in modern medicine. When addressing these issues, the human-centered design was reiterated as being an important factor when designing to benefit those within the healthcare system.

Communication designers like Belinda Paulovich and Jeanee-Louise Moys use this framework, allowing their end-user to be the experts of their own experience when facilitating communication in a hospital environment. Graphic design and more specifically, EGD can transform healthcare environments into spaces for healing and provide comfort rather than anxiety. Through contexts reiterated in current research, I am able to gain an understanding of how I can use my practice as a graphic designer to positively impact those in a stroke ward. I acknowledge that those in this environment are in a vulnerable position and that through graphic design I am able to provide some relief to participants when making the environment less stressful.

***Research Question: How can graphic design improve the experiences of healthcare professionals, patients and their families in the stroke ward environment?***

***Aims and Objectives***

***From the reviewed literature I formed the following aims and objectives for this this project.***

To explore how the environment of a stroke ward impacts healthcare professionals, patients and their families.

To create a designed outcome that improves the experience in a healthcare environment.

To design a solution that eases the anxieties and stress commonly experienced in a hospital environment.

# **Methodology**

## Introduction

This research project is practice-led and uses qualitative and quantitative methods to create a designed output that benefits the needs of those in the environment of a stroke ward.

Qualitative research allows the voices of participants to be heard and the designer to carry out research in natural settings (Crouch and Pearce, 2012). Quantitative research builds knowledge based on scientific research and data that is collected. (Crouch and Pearce, 2012, p72)

This research operated under an evidence-based co-design approach within action research and human-centered design methodologies. The following research and design methods allowed further exploration into how graphic design could be utilised in the environment of a stroke ward to improve the experiences of healthcare professionals, patients, and their families in this space.

## Action Research

Action research (AR) is a practical methodology that allows the researcher to be reflective in every step of the design process and share accountability for the project with the end-user (Swann, 2002). Through this process, researchers aim to create change through empowering and collaborating with others (Parkin, 2009, p28).

The collaborative nature of AR allows the researcher to focus on the needs of the user and supports team-building skills when interacting with a diverse range of people from a range of disciplines (Swann, 2002, p56). The collaboration between healthcare professionals and the researcher in this project allowed the researcher to gain new knowledge and insights concerning the needs of the end-user. The main constructs of collaboration and reflection allow the researcher to establish contexts and theories around their research.

Although AR is used as a means of collecting data, it is focused on problem-solving and creating change in the workplace (Parkin, p36). Data is collected through the use of both quantitative and qualitative methods including expert interviews, participant observations, prototyping, etc (Gray, 2004. p26). These methods are applied in a reflective cycle that allows the researcher to collect data, reflect on the needs of participants before taking action.

This reflective cycle involves the act of planning, acting, observing, and finally reflecting on the effects of actions taken during the research and how they affect the aims of the research. (Townsend, 2013, p11). Through reflection, the researcher can continuously revisit the problem and incorporate their findings into practical solutions (Swann, p53). The reflective process means that action research studies can take longer to complete compared to other approaches. This can pose challenges for the researcher and be disruptive when collaborating with participants (Gray, p390).

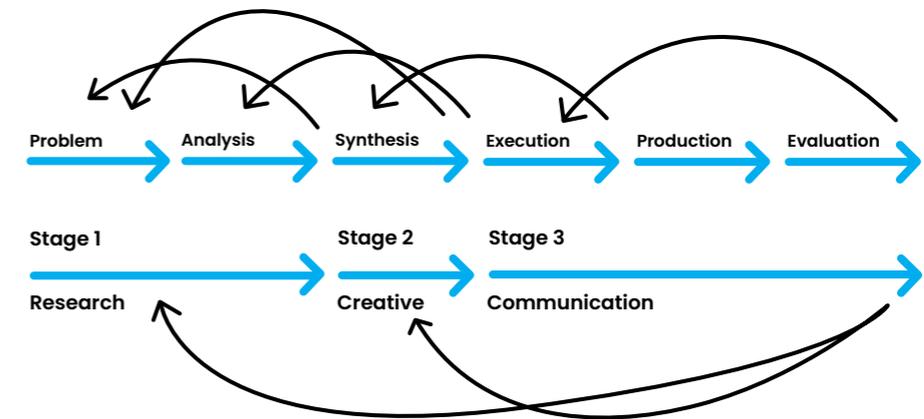


Figure 4. Swann (2002) *Non Linear Design Process*.

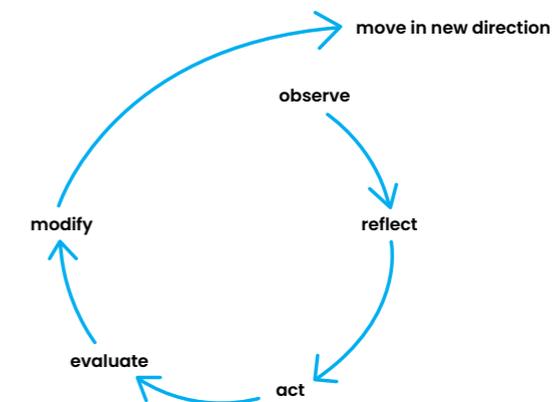


Figure 5. McNiff and Whitehead (2006). *A typical action-reflection cycle*.

## Experience-Based Co-Design Approach

Experienced-based co-design (EBCD) is described as a process of participatory action research that explores how to improve patient experiences, and broadly, healthcare services (Robert, 2013).

This method of research aims to improve how patients feel about a certain healthcare service by capturing their honest feelings and thoughts about their experience (Robert and Cornwell, 2011). Information surrounding patient experience is being collected less frequently due to the lack of clinical information involved. This has led the current development of patient experience to be meaningless when trying to create systematic change in organisation (Robert and Cornwell, 2011).

Six stages of the action research process are used in the EBCD approach. The first stage is establishing the direction of the research and management arrangements, two is interviewing a wide range of healthcare professionals about their experience working in a healthcare

service, three includes the recruitment of patients and carers, four involves the meeting of patients and staff followed by the creation of “co-design working groups” that come together to design and implement service improvements and finally the reconvening of co-design groups to plan the future stages of improvement (Robert, 2013).

These stages are put in place to allow patients to be at the center of the design process and have a say in the services they use, acknowledging the improvements that could benefit their experience with a healthcare service (Raynor, 2020). At the foundation of EBCD is storytelling as the stories of healthcare professionals and patients “contain huge amounts of information, wisdom, and intelligence about experiences that are waiting to be tapped as a rich source of future service development and design” (Bate and Robert, 2007).

Action Research and EBCD are crucial methodological approaches throughout my project when aiming to make a positive impact in the healthcare system and more specifically when creating a positive experience for those who are working and healing in an acute stroke ward. Although I was unable to work with patients, the recruitment of healthcare professionals in this research meant I was still able to design an experience that complements their needs as the main users of the stroke ward environment.



Figure 6. Robert (2013). *Experienced-based co-design: A six stage design process*

## Human-Centered Design

A human-centered design approach is essential when working in a healthcare space and acknowledging the needs of those present within the hospital environment (Naar, 2018). Human-centered design is a “unique approach to problem-solving.” This approach is framed in a way that the researcher learns directly from people to create a final output that is the most “desirable, feasible, and viable for the people you are designing for” (IDEO, 2015).

Ian Hargraves describes human-centered design as an opportunity for designers as although people are at the center of the design process, the opportunity that arises from this drives the implantation of design within a healthcare setting (Hargraves, 2018).

Although many question the relevance of design in healthcare it has the ability to focus on the needs of people (Hargraves, 2018).

In order to create change within the healthcare system human-centered design is an approach that needs to be grounded in the design process when designing for the needs of patients and healthcare professionals (Hargraves, 2018).

Having had not experienced a stroke myself or within my family, I have little tacit knowledge around what it feels like to go through a stroke and undergo rehabilitation in an acute stroke ward. Through human-centered design, I am able to learn from the user. I have acknowledged due to ethical reasons I will be unable to interact with stroke patients and their families in the ward directly, I can gather knowledge from nurses and occupational therapists interacting with patients daily. Design “can be a powerful tool to emphasise not only with patients but also with the care providers with whom patients most frequently interact” (Naar, 2018). Through using HCD in the environment of a stroke ward, I will be able to gain further understanding from both healthcare professionals and patients around their specific needs and difficulties the environment of a stroke ward presents during their recovery and healing journey.

## **Ethical Considerations**

The use of experience-based co-design in this research as well as being positioned within an action research framework meant that participation of healthcare professionals in an acute stroke ward was essential. Participation between the researcher and healthcare professionals informed knowledge around stroke and challenged assumptions around the impact the healthcare environment can have on a healing mind. Participation by healthcare professionals as well as experts in the field of stroke rehabilitation ensured that designed concepts met the needs of the end-user (staff, patients, and their families).

Participation with healthcare professionals and experts involved a series of site observations in North Shore Hospital's acute stroke ward, expert interviews with staff including a charge nurse and occupational therapist. Interviews were also carried out with a physiotherapist and a senior lecturer in rehabilitation who has carried out multiple studies around those who experience a stroke and the challenges they face. Healthcare professionals on the ward were also asked to provide feedback on designed concepts further into the research.

Ethical approval was granted by AUTEK on 17 September 2020 (number 20/258) for this research. See Appendix for ethics-related documents.



# Research Methods

## Contextual Review

A contextual review can be a crucial part of research as it defines an opportunity through critical and analytical activities (Gray and Malins, 2004). There are two aspects to contextual review, the first involves initial surveys that allow the researcher to situate themselves within the research and gain background information in the area of inquiry.

The second phase involves analyzing the research and developing it to form a plausible argument (Gray and Malins, 2004, p36). This method is constantly referred to throughout the research project as through mapping out existing research, the researcher can identify a gap in knowledge that they can contribute towards (Gray and Malins, 2004, p35).

I completed a contextual review at the beginning of this project, through the use of library databases as well as Google Scholar. This allowed me to discover information about the inpatient experience in a stroke ward, healing environments, and the contribution graphic design has had in healthcare. Relevant literature was analyzed to gain an understanding of the inpatient experience in a stroke ward and how graphic design could be used to improve this experience and aid their healing journey. Through mapping out current research, I was able to visualize a 'gap' in knowledge and how graphic design could have Stroke patients were a key focus in the contextual review as they are the end-user and their needs after stroke especially when recovering in a medicalised environment. Developments to the contextual review were made throughout the research process as new knowledge around the stroke ward environment arose.

Through analyzing this information, I gained an understanding of how human-centered design can positively contribute to services within a hospital environment as well as highlight how graphic design can enrich the healing journey of stroke patients.

## Participant Observation

Participant observation allows the researcher to gather data about the internal structure of an organization and how they work visually (Muratovski, 2016). This method of collecting data, allows the researcher to go beyond people's assumptions and view how people naturally interact in the surrounding environment (Gray, 2017). Structures and settings, as well as behavior and interactions, are two realms of participant observation (Muratovski, p64). This allows the sensations of sight, smell, sound, taste, and even perception to be considered during participant observation (Gray, 2017, p238).

I carried out a series of participant observations in North Shore Hospital's Acute Stroke Ward over a six-week period.

These observations were three hours long and were based in the welcome area of the ward. This space is what visitors and patients see before entering the ward and is used by participants to relax and be away from their rooms for a period of time. I aimed to gather data around how participants interacted in a hospital environment and with environmental cues in this space.

These observations revealed the people that interacted in this environment, how they used it and how much time they spent in the welcome area. These observations revealed the daily activities and routines of participants in that space and what sounds and smells add to the experience within this space. The researcher needs to gain an in-depth understanding of people's lives by getting emotionally and physically close to them (Gray, 2017, p242). Places have the ability to impact people's behavior and this was made clear within this hospital environment of a stroke ward (Muratovski, p64). Through these observations, I was able to identify an opportunity for graphic design when influencing the experience of those within a stroke ward.

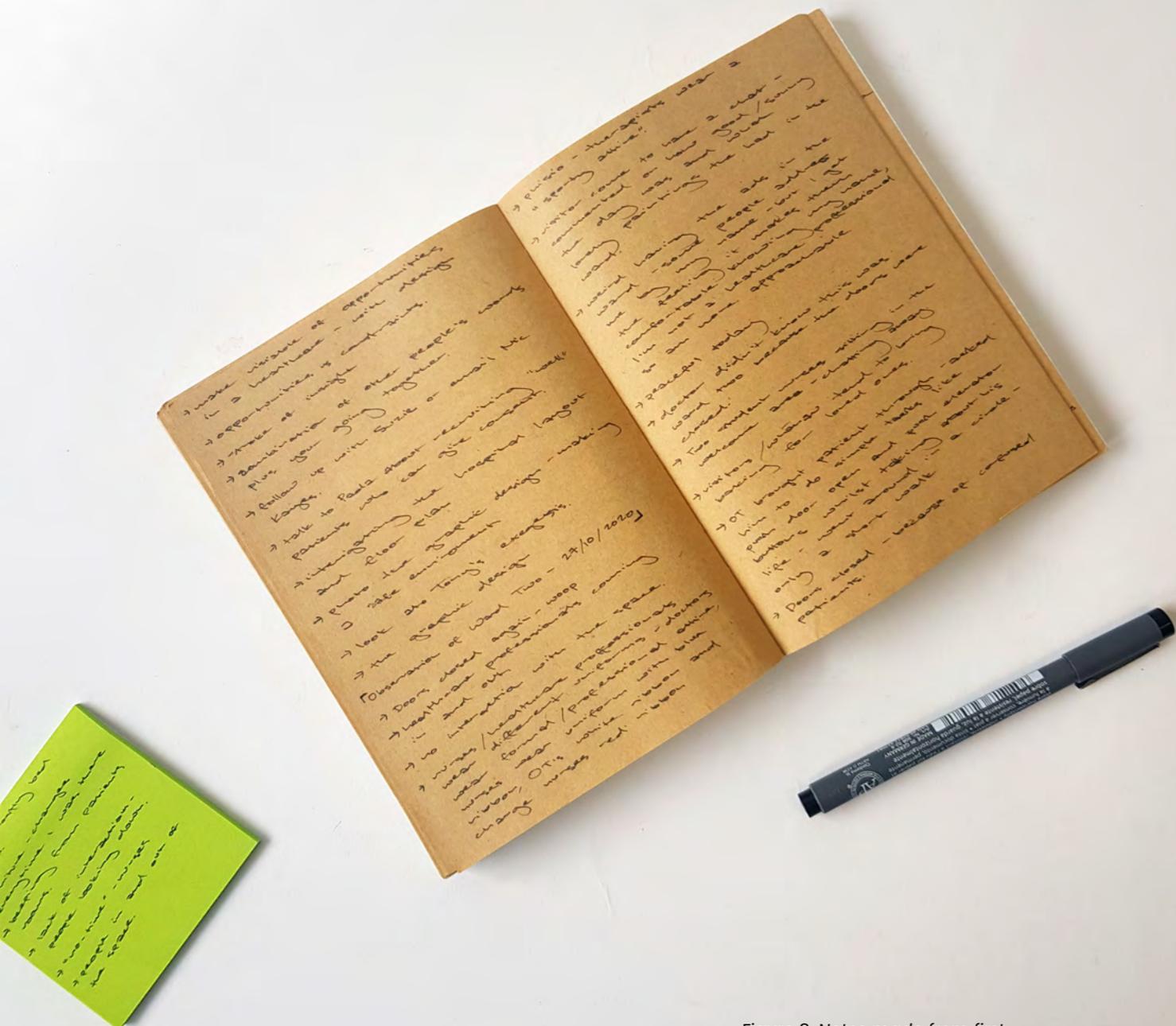


Figure 8. Notes made from first observation at North Shore Hospital.

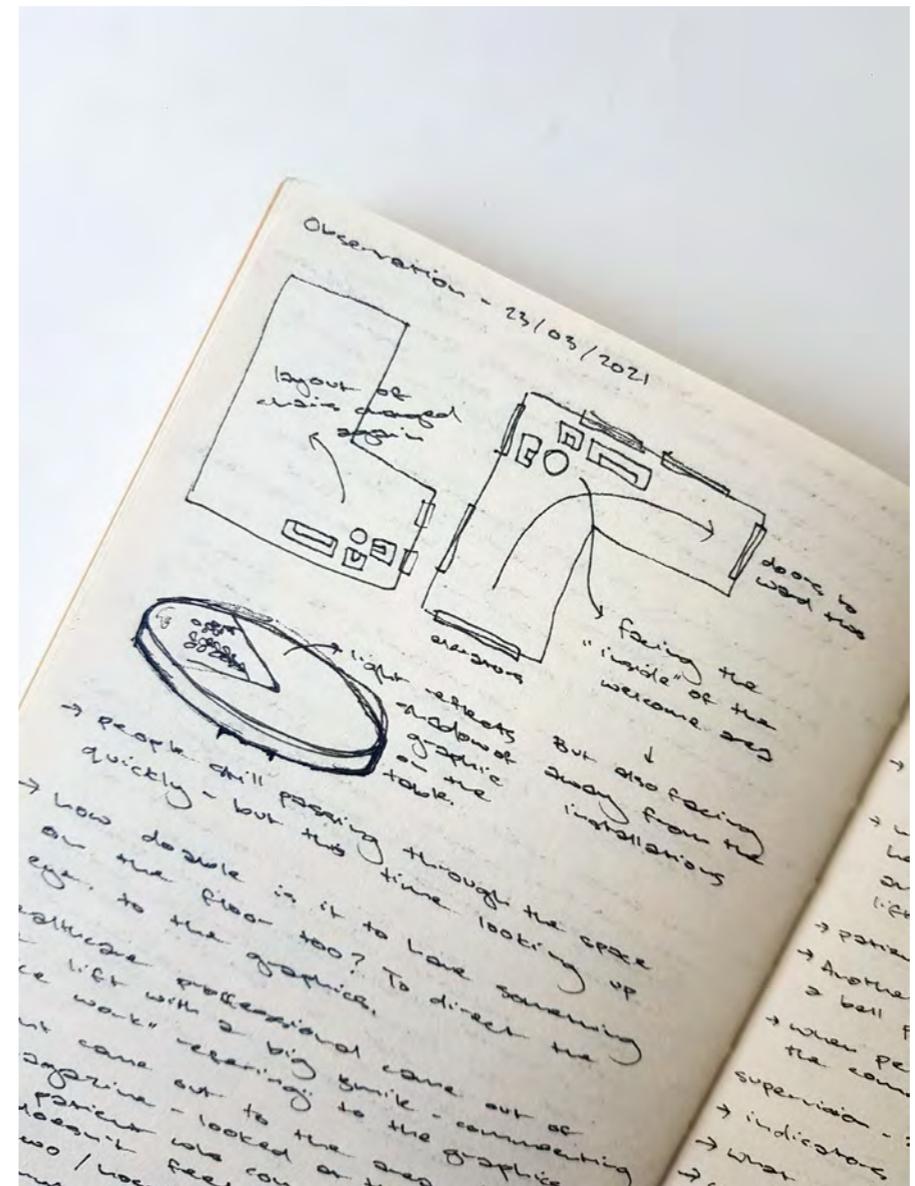


Figure 9. Notes made from observation with prototype installed in North Shore Hospital's Stroke Ward.

## Expert Interview

Experts are able to fill the researcher in on the context of their field quickly, sharing insights into applicable history and innovations (IDEO, 2015). The term 'experts' is often distinguished by the researcher. An expert could be someone who has gained knowledge through working in a particular field or through life experiences (Meuser and Nagel, 2009). Expert interviews are designed to give the researcher insight into a particular field and learn about key insights into a field quickly (IDEO, 2015). The interview is often a conversation between the expert and the researcher (Gray, 2017).

Multiple expert interviews were carried out with healthcare professionals working in North Shore Hospital's Stroke Unit as well as other experts in the field. Due to the busy schedules of staff, only two staff members were interviewed. interpretation of graphic design. Through the use of a semi-structured interview, I was able to direct the interview and question the area of inquiry further (Gray, 2017, 214).

One was a previous charge nurse on the ward and the other an occupational therapist. Through semi-structured interviews, healthcare professionals were able to share insight into the daily challenges they face on the ward as well as the needs of stroke patients. Semi-structured interviews allow the researcher to ask experts to clarify their answers to inquire for more comprehensive responses (Gray, 2017, p214). These questions prompted them to express the challenges they face as healthcare professionals working with stroke patients as well as clarifying areas where graphic design could improve the experiences of patients on the ward.

Further interviews were conducted with a physiotherapist and a senior lecturer in rehabilitation outside of North Shore Hospital, who have both had previous experience and carried out research with people who have experienced a stroke.

These interviews were helpful when identifying challenges and the needs of stroke patients in an acute stroke ward. This was helpful as I was unable to co-design with patients due to ethical reasons.

All interviews were face to face and were audio-recorded with the permission of participants. By audio-recording an interview, the researcher can record essential information as well as focusing on the process of listening and interpreting the answers to re-focus the interview (Gray, 2017, p227). The interview questions varied depending on the background of each expert. These semi-structured questions explored the expertise of the participant, stroke patients, the hospital environment, and their interpretation of graphic design. Through the use of a semi-structured interview, I was able to direct the interview and question the area of inquiry further (Gray, 2017, p214).

## Reflective Practice

Reflective practice aims to connect research and practices by narrowing the gap between action and knowledge (Gray and Malins, 2004, p22). Throughout this research, project reflections were recorded in both physical and digital journals. This allowed me as the researcher to reflect on the information and data I had collected as well as thoughts and ideas that surfaced. I recorded reflections digitally regularly, capturing thoughts and ideas that came out of meetings, observations, and interviews.

Through reflecting on specific findings throughout my research, I was able to process the information and gather a more in-depth understanding of the findings. A physical journal was used for exploring ideas and concepts visually. This is where brainstorming was recorded and thoughts around designed prototypes were explored.

Reflection in action relies on feeling allowing researchers to reflecting on the action while doing it (Gray and Malins, 2004, p23).

By reflecting, practitioners can cope with uncommon and conflicting situations and reflections in their practice (Schon, 1983). This method was helpful when gaining a comprehensive understanding of contexts in my research, especially when it came to the experiences of stroke patients. Through reflecting on literature and observations I was able to gain a clearer understanding of what people face after experiencing a stroke and the long process of recovery. Designed concepts were designed through reflecting on literature, exploring main ideas and themes further. Reflections were also communicating to others my research findings and gaining feedback.

Figure 10. Reflective notes recorded every fortnight in response to current research findings.



## Data Analysis

Data analysis is a systematic process of collecting data to gain a broader understanding of the research. By analyzing the data, the researcher can make meaning of data that has been collected and have an understanding of how the research will move forward (Gray and Malins, 2004, p133).

Data analysis is an ongoing process throughout the research as it allows the researcher to make design decisions depending on the data that has been collected (Tisdell, 2016). If data is not analysed continuously throughout the research can become overwhelming and unfocused (Tisdell, 2016, p197). Thematic analysis is a method within qualitative data analysis that allows the researcher to organize data by sorting information into main themes (Guest, 2012).

This method also requires the researcher's interpretation of the data to identify key information that will impact the development of the research (Guest, 2012, p9).

Data analysis occurred at the key stages of data collection throughout the research, including participant observations, expert interviews, and when receiving stakeholder feedback. Data from the observations was kept simple due to how many observations occurred over a period of time. Thematic analysis was conducted for the expert interviews and stakeholder feedback to highlight key themes and collect general information and feedback regarding the research.

# Design Methods

## Photography

Photography can be used as a visual method for collecting data and documenting evidence of changes that action research has accomplished (Gray, 2017). Through photos, the researcher is able to document a certain place at a certain time, especially when capturing the changes graphic design can create in an acute stroke ward.

Throughout the research, I photographed the welcome area of North Shore Hospital's Acute Stroke Ward. This allowed me to imagine how graphic design could be implemented in this space and how it would flow, creating an appropriate transition from the area into the ward. As well as documenting flow, photography allowed me to capture prototypes of concepts that have been installed in the space. This was particularly important when analyzing which concepts worked well in the space and reflecting on designs during feedback sessions.



Figure 11. Analysis of the 'welcome area' in the Stroke Ward at North Shore Hospital.

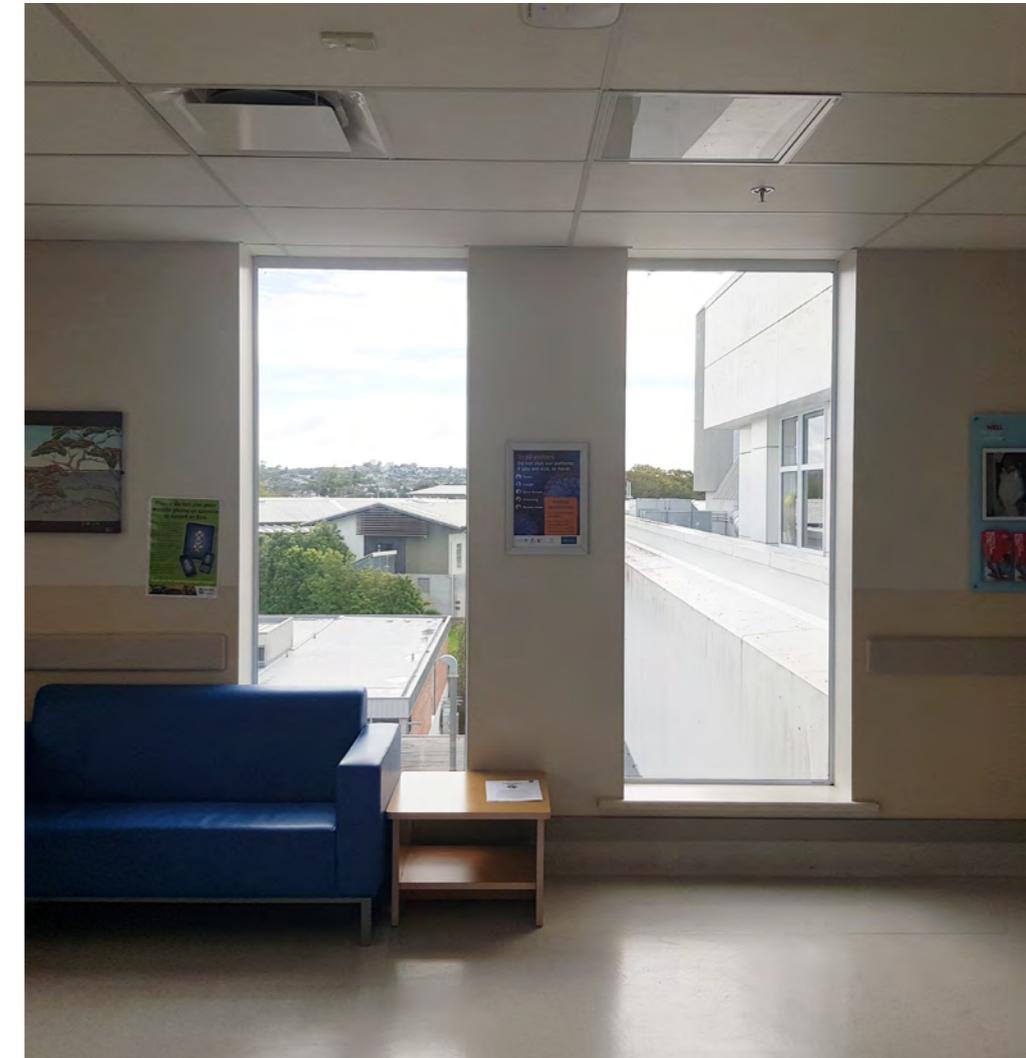


Figure 12. Photograph of windows opposite the elevators in North Shore Hospital's Stroke Ward.

## Sketching

Sketching is a method that is commonly taught to designers as it influences creative thinking through drawing (Hua, 2019). It is a method that can be executed quickly and should reflect the purpose of the design through minimalistic renders (Buxton, 2003).

It is a useful tool when expanding ideas and allows the designer to gain further insight into what the designed outcome may look like (Buxton, 2007). It allows the researcher to identify where key changes need to be made in a design and is used as a process method rather than a finalized artifact (Buxton, 2007, p78).

Sketching was used throughout the project as a way of quickly exploring ideas and responding to data that was collected. I also used sketching as a tool when capturing movements and thoughts during observations in North Shore Hospital's Acute Stroke Ward. Sketches were recorded in a notebook as well as a visual diary as it allowed me to keep observational sketches with notes.

These sketches captured the ward through the eyes of the designer and allowed me to map out how participants moved through the space and interacted with environmental cues. Sketching while observing allows the researcher to slow down and observe key details that may have gone unnoticed if weren't noted down (Weekes, 2005, p37).

By mapping out the area of North Shore Hospital's Stroke ward I was able to explore how graphic design could be used in this space and how it would flow. Through using sketching during my observations and initial design stages I was able to capture details that may have been missed if photograph and explore the emotions and feelings within the space. Sketching out concepts in the space allowed me to identify what designs would and wouldn't work in the space. From these initial sketches, I then identify key concepts that were developed further and tested either digitally or physically within the space.

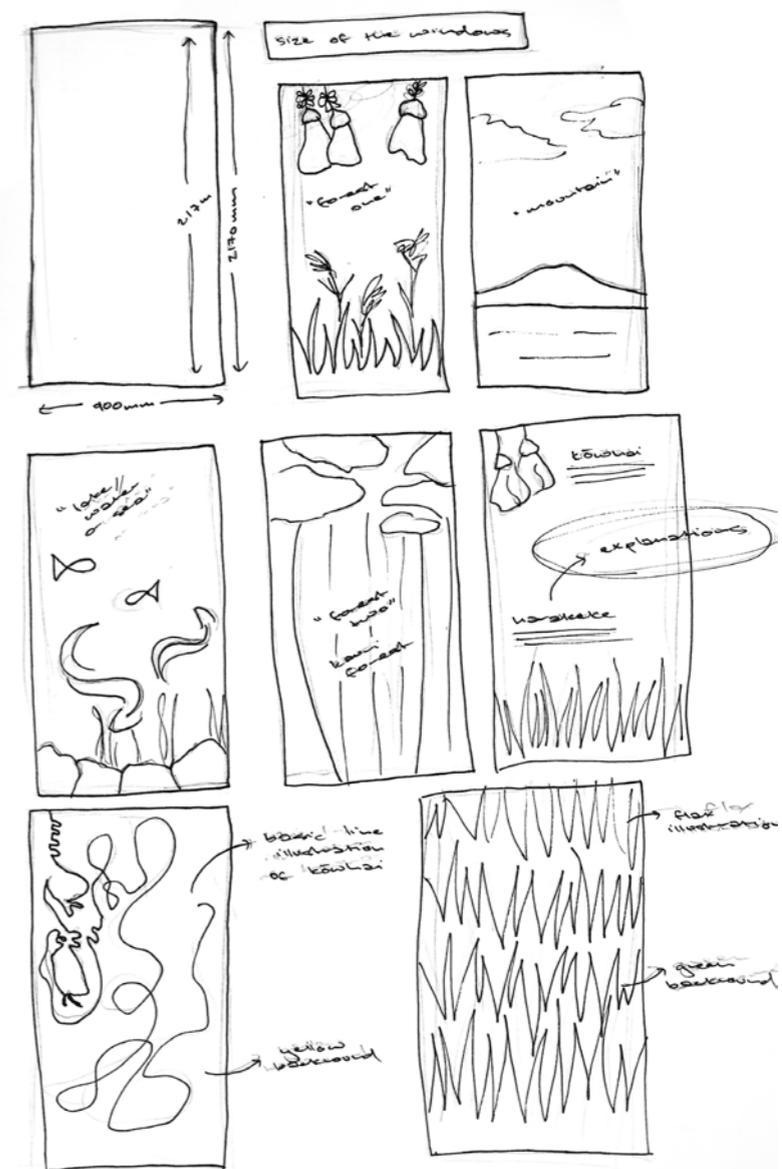


Figure 13. Sketches of potential concepts for windows in the 'welcome area' in stroke ward.

## Brainstorming

A brainstorm is a method that creates ideas and generates creative efficiency by focusing on the number of ideas rather than the quality (Wilson, 2013). By focusing on quantity, ideas that would have usually been criticized or seen as crossing the line are documented and help generate further ideas (Wilson, 2013, p4). Judgment is suspended during the process of a brainstorm to eliminate any barriers (Rawlinson, 1986).

Brainstorming was a method used throughout each design phase as a way to generate ideas and identify points that could be explored further. It was a useful tool when dumping a handful of ideas down after data from observations and expert interviews had been collected.

After data was collected from observations and expert interviews, I would often brainstorm some of the problems that arose. This allowed me to identify some key themes within the data that I was then able to generate ideas from. It also helped when reflecting on ideas that I was unsure about, using the form of a brainstorm to solve a potential designed outcome. Each brainstorm took its own approach and tackled different barriers that arose at each stage of research.

Figure 14. Brainstorm around environmental cues present in the stroke ward environment and how I could build on them.



## Prototyping

Prototyping gives physical form to ideas, allowing the designer to test concepts, and is often utilized for user testing (Kimbell, 2015). Through testing prototypes, the designer is also able to understand their research better and highlight problems in the design that may impact the overall research outcome (McElroy, 2017).

Prototyping was used to give form to early ideas regarding stroke and help communicate the significance of the researchers to healthcare professionals and field experts. This led to conversations around how my practice could have an impact on the environment of a stroke ward. By physically having a concept, I was able to identify gaps in designed concepts as well as observe how people interacted and responded to the physical prototypes.

This method was also used to test out concepts in the welcome area of North Shore Hospital's Stroke Unit. Making them to-scale in the space allowed to see how they fit into the space and added or disrupted the flow. Through installing prototypes in the space, I was also able to observe how participants responded to specific designs and prompted them to communicate other ideas or thoughts around the project. Having to-scale prototypes in the spaces also allowed me to see what was possible to execute in the space and the time it took to install and uninstall.

As well as seeing how designed prototypes transformed a space it was also important for me to communicate to healthcare professionals my project in a visual manner. Main stakeholders can visualize what is possible through prototyping and can create conversations around what may or may not work going forward (McElroy, 2017, p26). Leaving the prototypes in the ward also allowed healthcare professionals to gain a deeper understanding of how graphic design could transform a space but also aid the recovery of stroke patients.

Figure 15. Refined prototype of Chris Knox 'Sympathy for the Cripple' zine.



## Storytelling

Storytelling allows the designer to envision how a concept will be used from start to finish, as well as tell the story of who will use it and how they will use it (IDEO, 2015). When designing in healthcare, it is incredibly important to consider the journey of the patients and listen to their stories to design an outcome that will benefit their needs (Ku and Lupton, 2020, p52).

Unable to work with stroke patients I needed to listen to the stories that healthcare professionals shared as well as find literature from people who had experienced a stroke. Through the data I collected and discovered through the literature, I was able to visualize how graphic design may work in the environment of a stroke ward and the impact it could potentially have on their recovery journeys.

Storytelling was especially important when communicating concepts within my project as it defined how the user would read and acknowledge a particular concept while responding to themes. One example of this would be the house metaphor as I was able to conceptualize the recovery journey of a stroke patient through a metaphor without using specific stories.

This meant that ethically I wasn't crossing any boundaries and secondly was able to create an alternative take on the patient's journey. Through sketching and mind-mapping I was also able to view how this metaphor would be received if displayed on the walls of North Shore Hospital's Stroke Unit. I identified the start and the end of the journey from the elevator, through the welcome area, and into the ward.

## Refinement

Refinement allows the designer to self-critique designed concepts so far, developing and refining them to create the final output.

Refinement happened throughout the prototyping phase of my research and after receiving feedback from main stakeholders. Feedback from healthcare professionals and experts was essential when creating designs that would meet the needs of stroke patients. Each designed concept during my research was refined to a point. The main refinement phase of my research occurred during the installation of designed prototypes at North Shore Hospital. While installing each iteration, many people passing through the space including staff and family members of patients would comment on the designs.

These comments and conversations influenced what the next iteration would be. Final refinements of the designs in this space were made after formal feedback sessions with healthcare professionals working in the Acute Stroke Ward at North Shore Hospital.

The designed iterations in this space were influenced by literature regarding the healing properties of nature and art in healing environments. They were also influenced by the connection most New Zealanders have to the land and flora that is known by Pākehā and Māori to have healing properties.



Figure 16. Refined prototype of nature based installation (Second install at North Shore Hospital).

## Stakeholder Critiques

The views that stakeholders bring to a project are critical when designing a final solution that will meet their needs (Stables, 2017). Due to being unable to work with or talk to stroke patients and their families, it was crucial to receive feedback from staff and experts in the field who had worked with stroke patients and understood their needs.

After prototyping a few designed concepts (Chris Knox zine and the brain metaphor) I held an expert interview/feedback session with a Senior Lecturer in Rehabilitation. This interview allowed me to receive feedback around these concepts and discuss what was working and what wasn't. Through this feedback session, I also learned more about how the hospital environment impacts stroke patients and what is important to them.

This information was extremely useful when developing my designs and helped me understand the needs of stroke patients more. Informal feedback was given during the installations at North Shore Hospital. Whilst putting the designs on the windows healthcare professionals, family members and even able patients would comment on the designs. Through observing how these key users reacted and interacted with the designs allowed me to understand how graphic design could impact the experience of those in the space. These observations were confirmed later on through feedback sessions with staff on the Stroke Ward. These feedback sessions looked for more in-depth feedback around the impact specific designs had on their daily activity as well as patients and their families. Staff had the opportunity to raise concerns and ask questions around designed solutions.

Feedback was also given by designers from Good Health Design and fellow students. I also had conversations with a Maori Patient and Whānau Experience lead who was able to direct me on what was appropriate for whānau and designs that could benefit Maori patients when healing in a medicalised environment. Overall, the feedback I received was extremely useful when keeping me on track and putting the needs of the user before mine.

# **Documentation of Research**

# Initial Meeting with the 'Client'

In February 2020, I had my first meeting with staff on the Acute Stroke Ward at North Shore Hospital. A partnership between myself and the staff was formed, setting up the foundation for my project.

At this time, I was quite hesitant about how staff would react and welcome a graphic designer into their space. Fortunately, the staff on the ward were eager to see change and wanted to create a positive experience for future stroke patients. Although there was a lack of understanding of how design could improve the space at the time, the staff were excited for what was to come. Staff commented on the impact that an enriched environment would have on patients and their families and expressed the need for a designed intervention in this space.

A senior staff member invited me back to the ward the following week to get a sense of what occurred on a stroke ward day to day.

This site visit opened my eyes to the diverse range of patients on the ward and the amount of work staff have to attend to daily.

Emotions were running high amongst staff this particular day. They were saddened by the news that a patient had passed away during the night and that a former patient had suffered a second stroke in the space of a year. While confronting at the time, this experience allowed me to develop greater empathy for staff on the ward and for those who had suffered a stroke. Later that day a patient told a member of staff that he was unable to sleep. The sounds of beds being transported down the corridors and heart rate monitors were different from the natural sounds of birds and farm animals he was used to hearing.

This showed me how aspects of the hospital environment can affect those within the space of a stroke ward. This comment has stuck with me throughout my project. It was a reminder of the potential impact the hospital environment can have on someone who is recovering from a stroke.

After this meeting and site visit, I had a more focused direction and was able to start researching and writing my literature review. I needed ethics approval before beginning participant observations and expert interviews. This stalled my research when starting to unpack what happens on a stroke ward.

During this time, New Zealand also entered Alert Level Four. Although this interrupted my research (on the stroke ward) it allowed a chance to be playful and creative around my research topic.

# Chris Knox Zine Exploration

During my internship at Good Health Design, I came across Emily Carr University's Zeitgeist Project (Hannan and Raber, 2019). This project involved communication design students from the university and residents from care homes. Together, they co-designed a series of zines using the stories of those in the care homes. This project helped construct my project. I initially aimed to collect the stories of stroke patients and their families to bring hope to others who would stay in a stroke ward in the future. Unfortunately, due to ethical reasons, I was unable to talk to stroke patients or their families. Any stories I collected were sourced online.

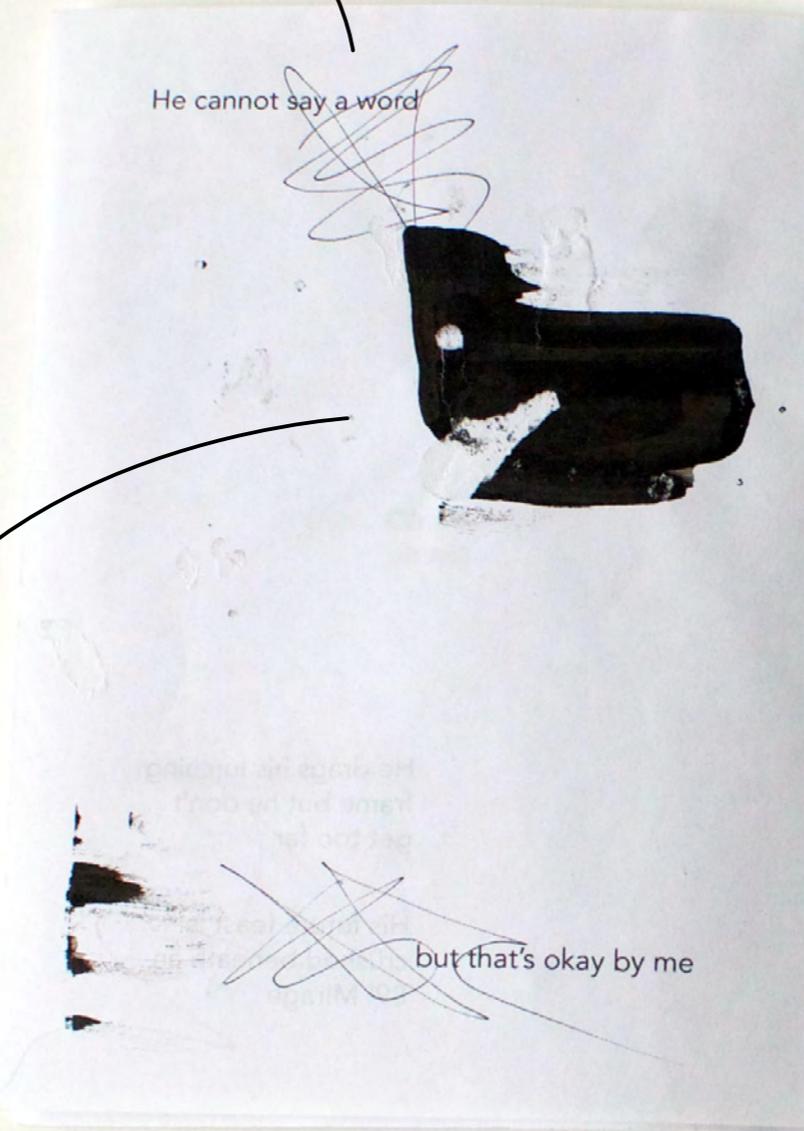
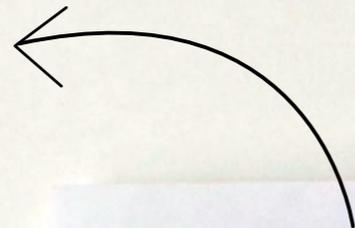
This led me to create a typographic case study with the lyrics and limited vocabulary of Chris Knox. Chris Knox was a New Zealand musician, cartoonist, and filmmaker. After experiencing a stroke in 2009, there was a large outpouring of support for Chris from a diverse community of New Zealanders.

When reading about his recovery in Jess McAllen's article 'Chris Knox: Not giving in lightly' (McAllen, 2015) it was obvious that despite his stroke he was adamant to re-learn the skills he had lost. From reading other literature, I know hope is important to those recovering from a stroke. Knox's story is a story of hope and resilience.

I started with the 'dictionary' of Chris Knox. This was a collection of the only words that he could articulate after his stroke (McAllen, 2015). I chose to assemble this zine physically, rather than constructing it digitally first. This helped me to see how the type would work as a zine and as a poster when folded out. The ink splotches were applied straight onto the zine, sometimes without thought. The splotches resembled blood and bleeding on the brain. I was unsure of how it would look or turn out. But like a stroke, depending on its severity, you never know how it will impact a person's life or how their recovery journey might go.

This experiment led me to explore the lyrics of Knox's songs 'Sympathy for the Cripple' and 'Meat' which were both written before his stroke. I experimented more with the type throughout these zines, playing on the meaning of the words. Along with the type, I started to think about how stroke could be communicated through different imagery and media.

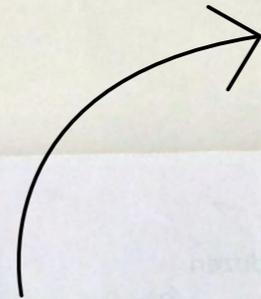
Scribbles were also drawn straight to the page. Unlike the ink, I had more control of placement. The scribbles represent the confusion that comes after experiencing a stroke.



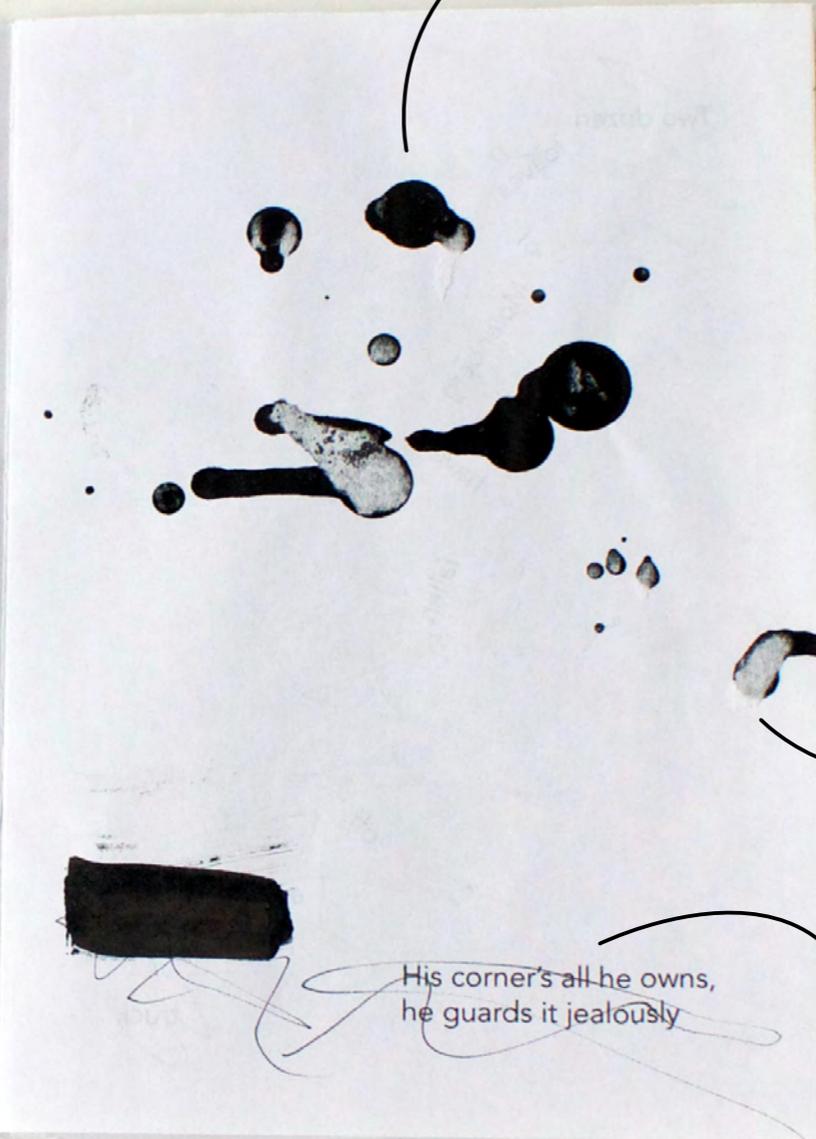
This particular splotch was created by dipping the straight edge of a piece of paper in ink and dragging it along the page.

I created these splotches to connect the flow between the type and the splotches.

Ink was applied straight to the paper. This meant I was unaware of what the splotch would look like or do on the page.



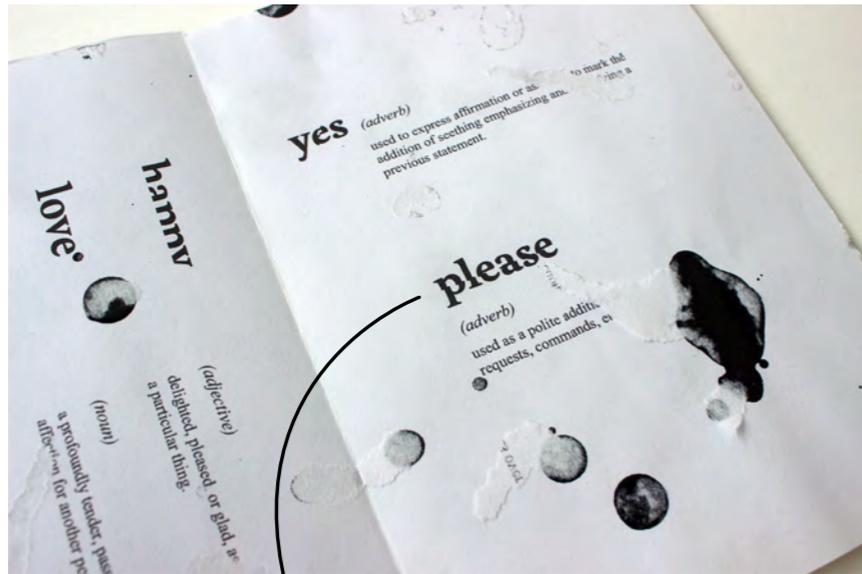
These splotches were applied by dipping a painting brush in ink and dripping it onto the page.



When drying, the ink stuck to the paper and when opened, ripped the paper. Damaging the zine.



Lyrics from Chris Knox's song "Sympathy for the Cripple" which was released in 1995. Eleven years before his stroke in 2006.



This is a spread from the 'Dictionary of Chris Knox'. The layout of the type is made to resemble how words are laid out in a dictionary, but with a twist. Laying the words in different positions reflected the feeling of abnormality after a stroke.

The warped words also represent communication being broken.

The risograph gave the set of Chris Knox zines a lighter feel. The black and white added to the heaviness that comes with experiencing a stroke. The orange and blue was more hopeful and although the confusion was still present through the scribbles and blotches, the colour communicates that the stroke doesn't mean life stops.



Further into the zines, the more expressive the lyrics got the more splotches and scribbles were present.

Stroke is a heavy concept to digest and I wanted to communicate this throughout each zine.

Because the risograph is printed, the splotches and scribbles were placed deliberately. Giving it a less authentic feel.



There are three types of stroke. The first is an ischaemic stroke which is the most common and occurs when a clot blocks an artery in the brain. The second is an embolic stroke which is when a blood clot on an artery wall breaks away and travels to the brain. Lastly, is a hemorrhagic stroke which is when an artery in the brain ruptures causing bleeding on the brain (Stroke Foundation, 2021). This particular stroke is what I tried to capture with the ink splashes on the zines, using ink as a medium for blood.

The scribbles and lines represented the confusion that comes after stroke. Many who experience a stroke are often left confused at how and why they have had a stroke. A normal day can turn into one that will change the lives of stroke survivors forever.

People find it hard to comprehend that they will have to re-learn things they were once able to do. This includes communicating, walking, and even eating and drinking. There are many dimensions to recovery and it can often be an overwhelming and confusing time (Stroke Foundation, 2020) I tried to make this visible through the folding of the zines. This fold is a double-sided, fourteen-page zine with no staples, which once unfolded can be hard to fold back.

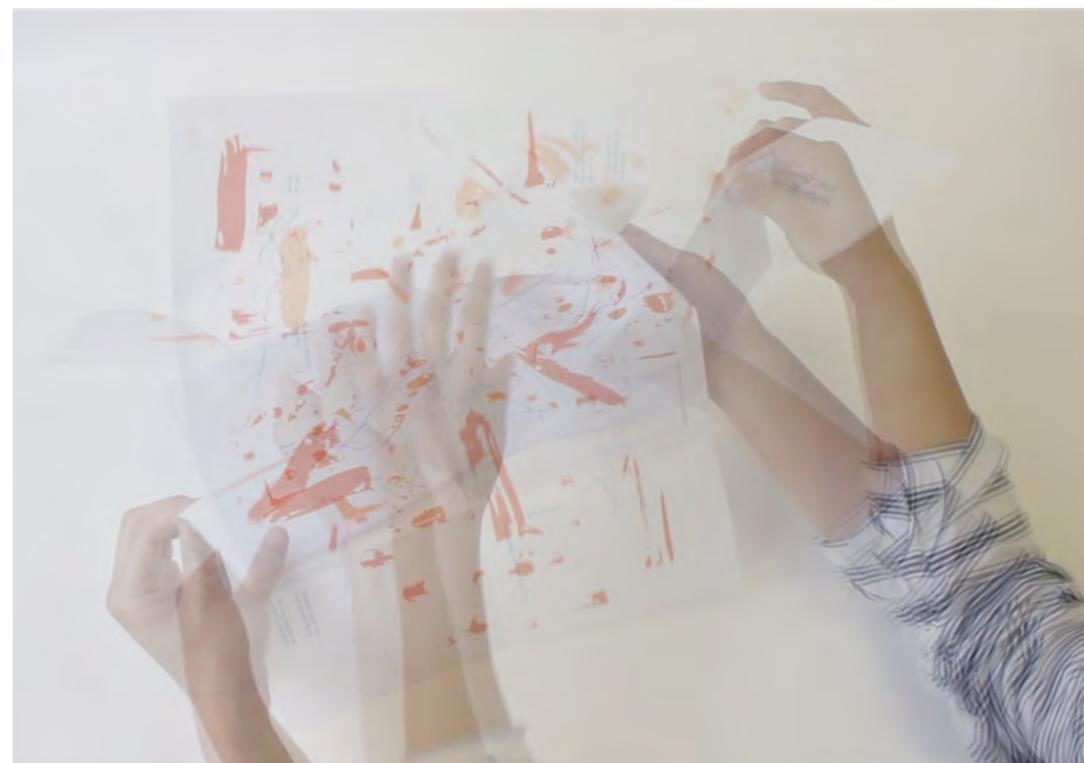
The first experimentations of the zines were in black and white. But I questioned how colour could transform the meaning behind the zines. The monotone of the black and white gave the zine a dreary feeling. This reflected the anxiety and depression that come with experiencing a stroke.

I also used this period to experiment with a risograph version of the zine. The risograph process felt more natural and took more time than a digital print. I spent time lining up each zine to make sure that they came together as I wanted. From time to time a mistake would appear, whether it was a smudge in the ink or something didn't line up perfectly. I felt like this reflected a diverse range of people who experience a stroke and the different recovery journeys they all face.

These explorations were not meant to be read by patients, rather an exploration for me to see how I could communicate stroke visually. It was a way to for me to engage in the creative process and explore how I felt about stroke. Creating empathy through giving form to what I thought I knew about stroke in the form of a series of zines.



Figure 17. *Unfolding of the risograph version of Chris Knox zine.*



# Second Consultation with Staff on Ward Two

I returned to the ward after the first COVID-19 lockdown and had a second consultation with the staff after forming a contextual review. During this meeting, I brought along the Chris Knox zine. I hoped this would give staff more insight into my practice and a better sense for what a creative process could look like. Although they understood the zine, they questioned its use with patients or how it may benefit them. This was reflective of their applied world view and need for resources that were easily understood by themselves and patients. They were drawn to the portability of the design, mentioning that because most of their patients are bedridden, something portable was a feasible option. I took this feedback on board when moving forward in my design process.

An Occupational Therapist shared information about how the hospital environment affects patients and their families.

Many who experience a stroke are often in a state of shock and confused about how the stroke occurred and why it happened. Many patients and their family members enter a stage of grief.

Damage to the brain not only causes communication and physical impairments but it can also affect identity. People grieve for the person they once were or knew. This adds further complexity to the experience patients and family members have on the ward. This staff member also mentioned that many of the resources they had available were catered for older adults and not the younger generation. This is most likely due to the general stereotype that older people are most likely to experience a stroke. It was revealed in an expert interview with a staff member later on, that people often think stroke occurs to those 65 and older. When many people who experience a stroke are often under 65. This can have a bigger emotional impact on patients as it is unexpected and unheard of.

I explored how artwork was used on the ward as there are quite a few paintings and prints on the walls. I was informed me that the artworks had been donated by the community as well as the family members of past patients. Staff used the paintings as prompts during physiotherapy exercises. Many of the paintings were placed on the right side of the ward to encourage patients to scan and re-train their eyesight. As stroke can cause vision impairments in people (Stroke Foundation, 2020).

Staff provided me with the resources that they usually offer patients and their families when they stay on the ward. These resources included books and pamphlets that contained a lot of information. Staff members admitted that they know patients don't retain the information due to communication disabilities caused by a stroke.

Communication disabilities experienced by patients often means they are unable to comprehend information and can leave them feeling alone and isolated in a hospital environment (Bright, 2018). Although this highlighted the need for information that was more easily digestible, it also highlighted that within a hospital context it is probably more helpful to have something that eases anxiety during stressful times.

After discussing and talking through the Chris Knox zine we organised the first few observations that were to take place over the next two months.



Figure 18. Educational material given to patients upon arrival in North Shore Hospital's stroke ward.



Figure 19. Welcome Area on North Shore Hospital's Stroke Ward.

# Site Observations

Following ethics approval, I started to spend time on the stroke ward at North Shore Hospital. I carried out six observations over two months. Each observation was three hours long and took place in the 'welcome area' of the ward. I was constrained to spend time in the 'public' space of the ward due to recommendations made by the AUT ethics committee. There were concerns around the vulnerability of patients. As seen in my ethics form (Appendix #) I was advised to station myself in the 'welcome area' on the ward for the safety of myself and patients. I stationed myself amongst the furniture in this space. This allowed me to have a clear view of the movement in and out of the ward. The main aim of the observations was to understand how people interacted with environmental cues and to map out the flow in the environment of a stroke ward.

I also had a few posters up in the space, informing the public about my research and the reasons behind the observations.

One was placed between the two elevators so that people who were waiting for the elevator would have time to read through the poster. The next poster was placed between the two windows to the left as you exited the elevator.

This was so people entering the space from the elevators would see the poster and were immediately informed about the observations. If people missed those posters, then the last one was placed just before the main doors to the ward. This placement along with the one by the elevator caught the eye of most people in the space. This was important as participants had the right to inform me if they wished to not be recorded during observations.

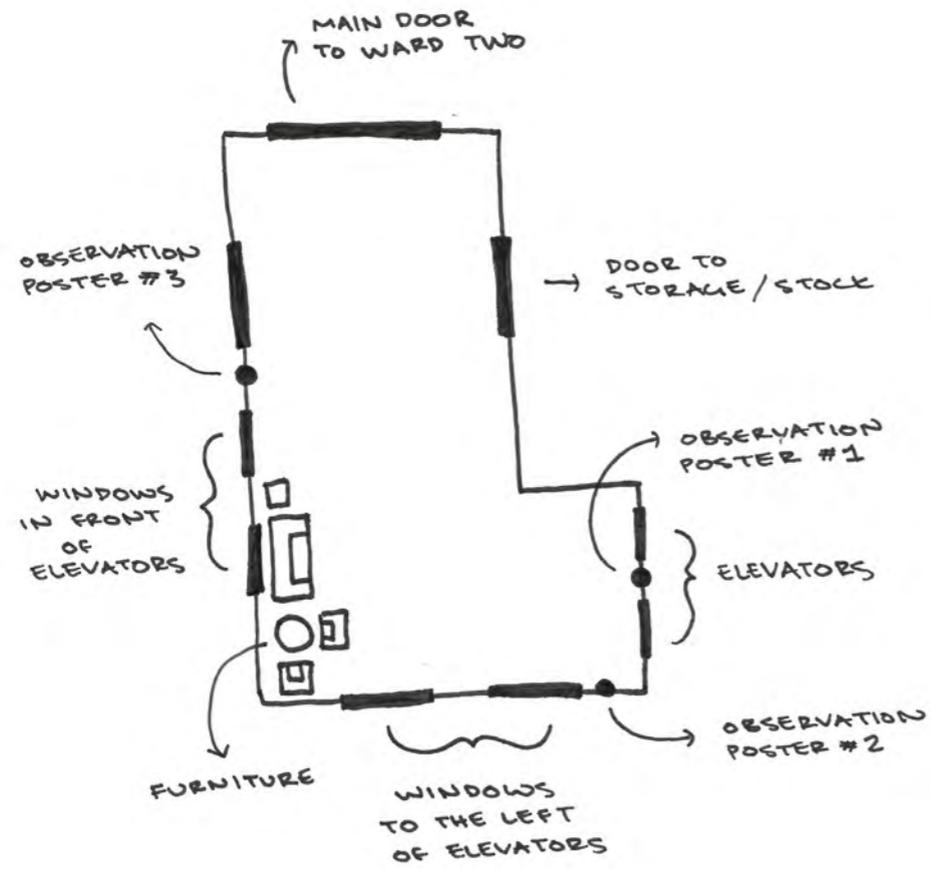


Figure 20. Map of the 'welcome are' on the Stroke Wards and the variety of environmental cues.



Figure 21. The location where I was positioned during periods of observation.

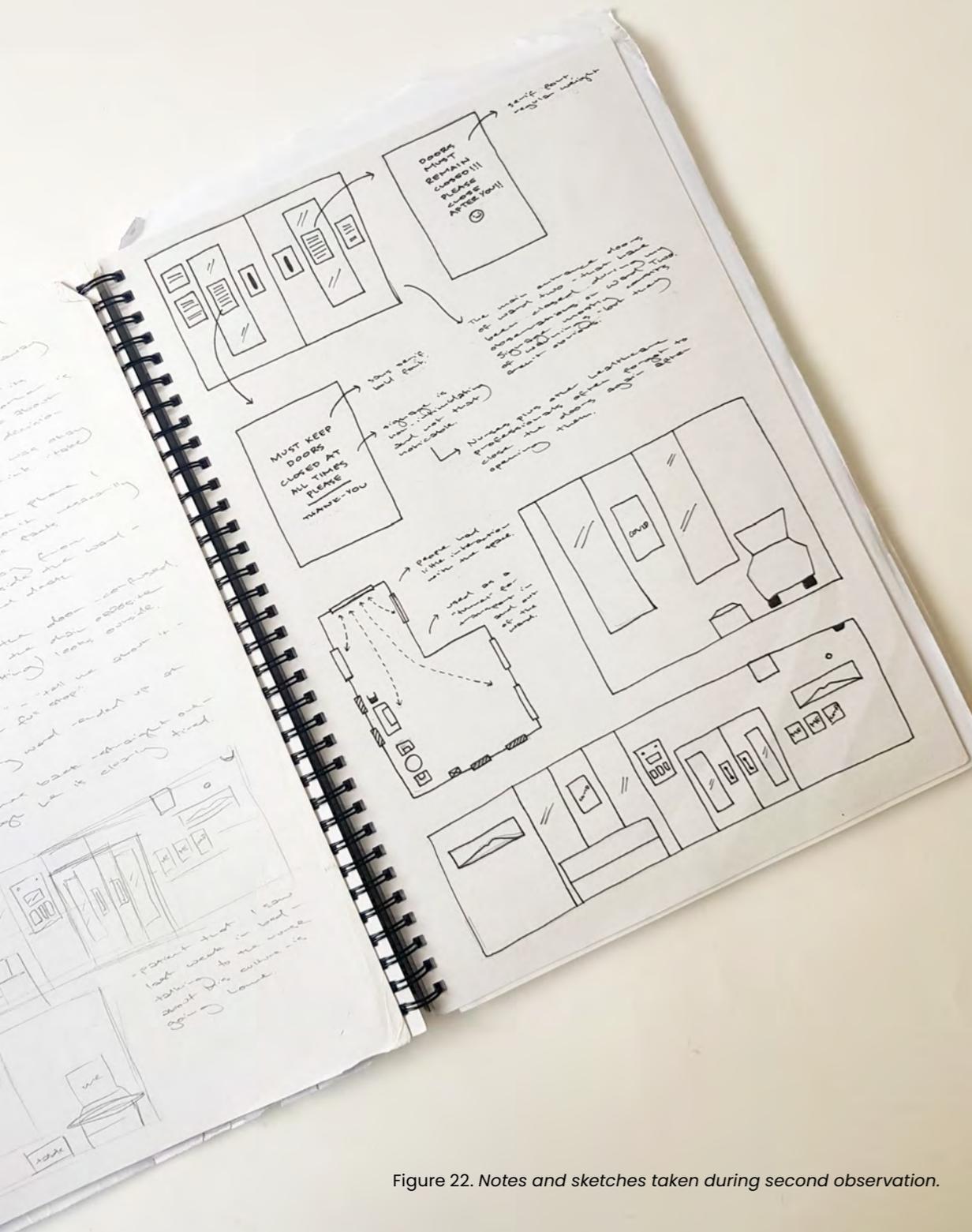


Figure 22. Notes and sketches taken during second observation.

Staff on the ward advised me that the 'welcome area' of the ward would be a good place to design for as it was used by a variety of people, including family of patients. The 'welcome area' was also a space where I could experiment safely within the conditions of my ethics application.

The first few periods of observation gave me insight into the reality of what goes on in a stroke ward. The area where I was stationed was in-between the elevators where people would enter and exit from and the doors to the main ward and reception area.

Due to confused patients that would wander the ward, the main doors to the ward were closed during the first three observations. I witnessed a wanderer once while on the ward. It was quite scary at first but I questioned how I could stop people wandering through designs in the space? When the doors were closed the 'welcome area' became silent and there was a lack of interaction in this space. The sound of the elevators moving became distinct in the space, filling up the silence with constant humming.

There was a set of furniture tucked in the corner of the space, facing the elevators.

Each time I came in to carry out an observation, the layout of the furniture had been moved whilst remaining in the corner. I questioned whether family members who wanted a little more privacy or staff trying to create a more inviting space for visitors were moving the furniture. There were quite a few instances where a family would use this space to make uncomfortable phone calls to loved ones. Not many people interacted with the environment even when passing through, heads were mostly down or looking at phones. I questioned whether the lack of interaction in the space was due to my presence in the space. Whether me being there hindered people from looking up or even sitting on the furniture.

If people were interacting with the environment, they mostly looked out the windows or at my observation posters. Staff would bring patients out to look sit and enjoy the view. The view from the windows was mostly of the roof of the hospital buildings below. From the windows on the left side, you could see a street and the local dairy. The roof below was a popular spot for birds, including a pair of seagulls that had made a nest there. This was a popular observation made by both healthcare professionals and patients.

The windows in this space seemed to bring the most joy to people and provided a sense of calm in the space. The amount of light in the welcome area was a change from the more commonly gloomy hospital rooms in the ward. These windows became an area of interest to me when I was starting to visualise where designed graphics could be placed and where they may have the most impact.

When analysing the data I had gathered over the two month period, I highlighted popular spots where interaction occurred in the welcome area. I also reflected on my experiences through I mind map, visualizing what I felt, heard, saw and thought in the 'welcome area'. These included;

**What I saw...**

Healthcare professionals and patients moving in and out of the ward.

No/little interaction with the space.

**How I felt...**

Out of place - didn't belong

**What I thought...**

The 'welcome area' is a beautiful space that isn't fully utilised

**What I heard...**

Sounds of the elevator constantly going from floor to floor.

Beeping from machines in patients rooms

These observations led me to begin visualising designed concepts in the area and form questions for expert interviews I had with staff on the ward.

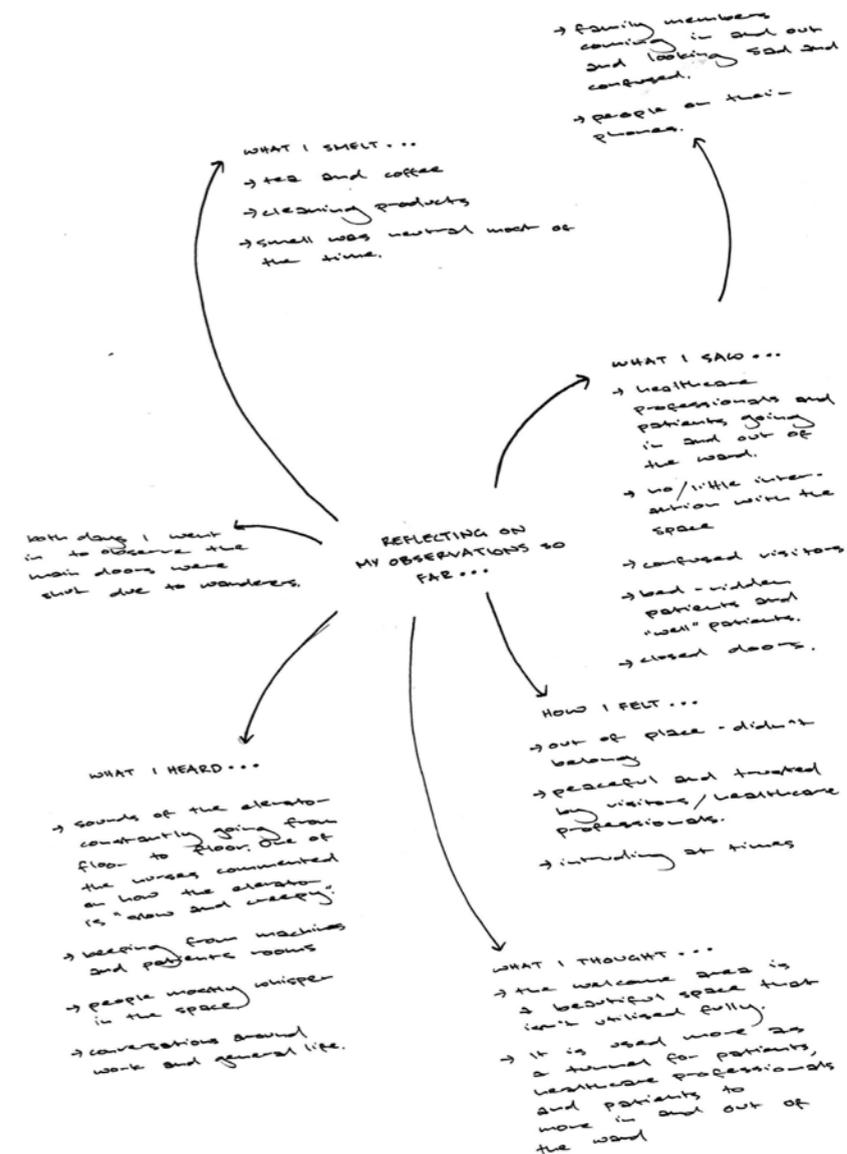


Figure 23. Brainstorm reflection of senses experienced during observation period.

# Expert Interviews with Hospital Staff

During the research, I was constantly in touch with two senior staff members on Ward Two (Acute Stroke Ward). This allowed for easy communication between myself and staff members on the ward. After the first few observations, I approached these two staff members about setting up expert interviews and when would be an appropriate time to do so.

One of the senior staff members suggested that the expert interviews should take place on one of the days where I was carrying out an observation. This would mean it was easier for staff to recognise me and take part in an interview when they had time during the day. The senior staff member sent out an email on my behalf containing an invitation and an information sheet about the interviews. A handful of information sheets were also placed in the staff room. Each participant consented to the interviews being audio recorded as well as notes being taken.

I also got in contact with a senior staff member who previously worked on the stroke ward. This staff member had been involved in the initial setup of the project and agreed to participate in an interview. We set up a time the same morning as the interview with staff on Ward Two. The interview took place in their office on a different ward in the hospital.

The interview was audio-recorded and notes were taken. During this 30-minute interview, I asked questions about how stroke impacts patients and their families and what challenges they face when working on an acute stroke ward.

These questions included;

***What is the main issue you have come across when treating stroke patients or communicating with them?***

***What some unexpected ways a stroke can impact a patient and their families?***

***What are some similar experiences patients and their families have had whilst staying on the ward?***

The first interview indicated what questions worked when receiving valuable answers and were beneficial when informing my research.

After this interview, I headed up to Ward Two to conduct more interviews. I informed a senior staff member that I had arrived and that I would be in the 'welcome area' if staff wanted to start filtering through for the interviews. They informed me that it was a busy day on the ward but staff would try their best to come and talk to me. Three hours had passed and no members of staff had approached me for an interview. Only one staff member participated on the first day of the expert interviews.

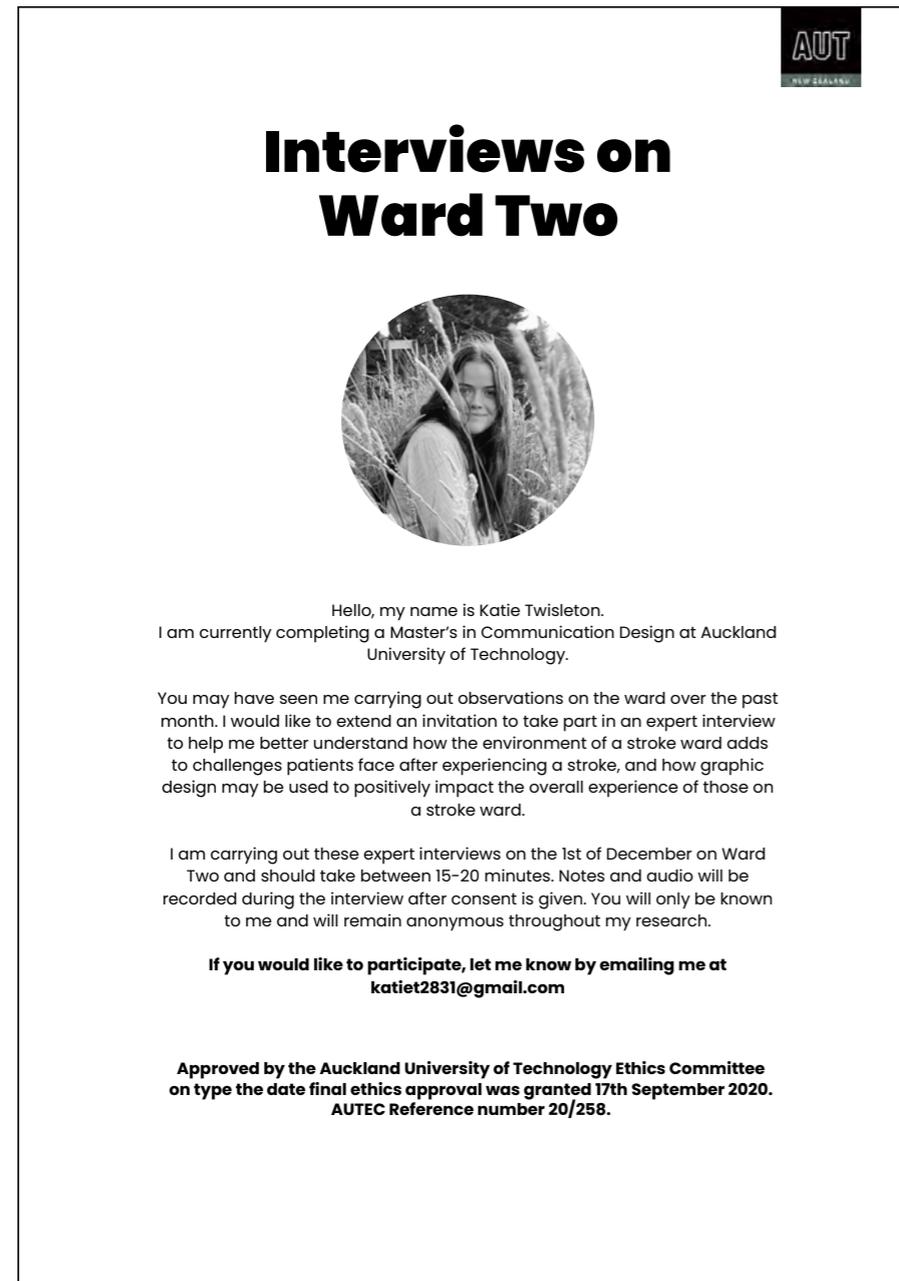


Figure 24. Observation poster advertisement sent to staff

After this, I decided I would make an advertisement about the interviews for staff, which I then sent the senior member to pass on to their colleagues.

I went into the ward the second time ready to conduct more expert interviews. I arrived on the ward and informed a senior staff member and positioned myself once again in the 'welcome area' of the ward. I was there for three hours before the first staff member approached me for an interview.

This staff member was one of the senior members in staff who was a main point of contact. The questions that were asked during this interview were more open-ended and focused on the needs of patients and their families in the ward. Questions that were asked included;

***Do you think the environment of a stroke ward impacts both the patient and their whānau's understanding of stroke and how does this impact their recovery?***

***You were saying before about needing more information on the ward, do you think it's more important to have information and education rather than the calming aspect?***

***What is one thing you think it is important for patients and their families to know after experiencing a stroke?***

After the interview, the staff member explained that the lack of participation of staff was due to their busy schedules. Despite previously expressing interest in participating my research the daily routines of staff and the nature of their roles as healthcare professionals stopped them from following up and contributing to my research.

STROKE PATIENTS

"Every person is different, we can't put people into categories and that's probably a challenge in itself that every patient is different"

"for stroke patients, usually when they come in it's a bit traumatic for the patient and for the family"

"Strokes aren't over 65 they are under 65, and people's lives can change really quickly, and you could search that on the internet and get statistics but that emotional stuff, you can't describe that."

THE JOURNEY

"I think people think that once you've had a stroke you can go to rehab and get fixed and you're going to walk out of here just like that, that doesn't happen and it's so individual and it's an individual journey for each individual patient."

"they're on a journey to recovery and that we are here to help enable that, that's our job and our role is to try and regain people's function and quality of life is a really big driver for us and what's important to them."

HEALTHCARE PROFESSIONALS

"I think it's frustrating for nurses sometimes, the stroke wards are busy and heavy and it's like anything, we have a budget"

"I think we need to do things properly and we've never done things properly."  
(talking about designing for stroke facilities with family in mind).

STROKE WARD ENVIRONMENT

"I think the environment one hundred percent can determine a positive and a quicker outcome"

"a very clinical based environment and apart from those posters on the ward we don't have too much information or education for people to look through so that's probably something we are definitely missing and lacking."

"this could be the entrance to any ward if you look at the front."

"I actually think it would be of more value to have something of interest on the wall to look at and to experience rather than have the advice and education."

"we do give handouts to people, so they do have education, they do have it to hand, so having something that is inspiring and inviting and interesting on the wall is definitely more advantageous."

Figure 25. Key quotes and points from interviews with staff.

The main themes that came out of the two interviews were; Stroke patients and their challenges, the environment of a stroke ward, the journey after experiencing a stroke, and challenges healthcare professionals face. From the literature, I was already aware of some of the challenges both healthcare professionals and stroke patients face. But one of the participants commented on how

**“Strokes aren’t over 65 they are under 65, and people’s lives can change quickly, and you could search that on the internet and get statistics but that emotional stuff, you can’t describe that”**

This emphasised how important it was for me to show empathy throughout my research and understand the emotional toll stroke can take on patients, families and healthcare professionals.

One thing that did surprise me was the participants’ emphasis on the journey of a stroke patient. Emphasising that every patient’s journey is different. Depending on the severity of the stroke many patients can recover quickly while it may take others longer. But even though patients may be recovering, they never fully recover.

Many are often left with communication or physical impairments. Both participants were aware of the impact the hospital can have on the recovery of patients. One participant commented on how there is little education and information available to patients and family members on the ward. But when asked a follow-up question asking if education would be beneficial to have in the ‘welcome area’ they replied saying

**“ Having something inspiring and inviting and interesting on the wall is definitely more advantageous”**

From highlighting the important points from both interviews, I was able to identify the needs of both healthcare professionals and stroke patients in the space of a stroke ward. The interviews also indicated the impact the environment has on the recovery of patients and the potential benefits that graphic design could have in this environment. The most surprising theme to come from both interviews was the emphasis on the journey of stroke patients. Timing is important, and both participants expressed their need for patients and their families to know that healthcare professionals are there to help and aid their journey to recovery. Every individual’s journey is different, but through the support of healthcare professionals and family, they will see the light of day.

# Expert Interview with a Physio- therapist

To get more of an understanding of the impact of the hospital environment, I interviewed a physiotherapist who has experience working with stroke patients in both a hospital environment and a rehabilitation center.

I was introduced to the physiotherapist through my supervisor by email. After hearing about my research the physiotherapist expressed interest in sitting down for an interview to discuss the impact the environment can have on a healing brain. We scheduled a interview and agreed to meet in person but unfortunately the day we were supposed to meet, three new cases of coronavirus had been announced. We decided it would be best to conduct an interview over Zoom.

The zoom interview was recorded on my laptop and later transcribed in full. Questions that were asked during the interview included;

***Do you think the environment of a stroke ward presents issues for patients and their families when recovering from a stroke?***

***How useful are sensory enriched environments for people with stroke?***

Because it was a single interview, I analysed data by highlighting the main points that came out of the interview. The questions asked raised important points around the hospital environment. The participant expressed that

***“there are a lot of issues about the environment (stroke ward) and a hospital”***

and when compared to a rehabilitation environment or even a patient’s home they exclaimed that when at home

***“people have access to their regular things that are meaningful to them and are more involved with their routine’s as well... you have the advantage of people being in familiar environments”***

This then led onto the discussion about the psychology behind being a patient in a hospital, commenting

***“You are in there because you have an illness and it creates a change in people which you don’t see once people get home or they lose that once you get home. I think that also affects how people might choose to interact with their environments in hospital, just the psychological implications of being in hospital”***

The physiotherapist was also the director of a neurorehabilitation practice. They had previously designed the space to be more enriching for their clients. I asked them about some of the design choices they made and how these impacted the experience of their patients.

***Is there anything you stayed away from when designing the space, in terms of colours and things?***

***Is there anything I should stay away from when designing for stroke patients?***

These questions were extremely helpful when starting to imagine how graphic design could positively impact those on a stroke ward.

The physiotherapist further emphasised the impact the hospital environment has on people when asked

***How does the hospital impact the experiences of stroke patients?***

***“Most of our clients have had, they view their hospital experiences pretty negatively on the whole and I think part of that is that they have had a pretty horrendous accident or something like that so it’s in the context of pretty big trauma, but they are kind of glad to be home”***

In their rehabilitation center, they made sure to use bright colours. Giving each room a different colour helped make the clinic feel more inviting and less clinical. They advised me to stay away from childlike colours when designing in a stroke ward as it demoralises patients who have already lost part of their independence.

Through this interview, I better understood how the physical environment of a hospital can have an impact on patients. But importantly, this interview helped me to see how the idea of being in a hospital in the first place can have a psychological impact. Many patients have a negative experience in the hospital, but when at home, show signs of recovering faster. Simple changes like the colour of the walls can change how someone feels in a certain environment and can improve their own experience (Gunawan, 2015).

# Brain Metaphor

Through information gathered through literature, observations, and expert interviews I realised that without a medical background the idea of a stroke was a hard and heavy concept to comprehend. I knew that if it was hard for me to understand what a stroke was, then many patients and their families would find it just as confusing. Having a background in graphic design I knew that I needed a creative way to help me make sense of what a stroke was (and the journey). I started to seek what the stroke journey was through information found on the Stroke Foundation's (2020) website. It was through this that I made the connection between a brain is where memories and feelings are stored, just like a house. This is when I formed the metaphor of a brain was like a house.

At first, I used the colours blue and orange due to conversation around the branding guidelines of North Shore Hospital. But after further discussions with my supervisors, I decided that for my master's project the branding guidelines weren't of concern and didn't address the needs of those in a stroke ward.

I stripped the colours down to black and blue. The journey starts off with a house, the house is like a brain. Like a brain the house holds treasured possessions like photographs of loved ones and achievements that bring back precious memories. A stroke on the other hand is like a flood, the amount of damage caused depends on the severity of the flood.

How people can tell that someone is having a stroke;

- F Face drooping
- A Arm weakness
- S Speech difficulty
- T Take action

What happens to the brain - during a stroke;

→ A blood vessel that carries oxygen & nutrients to the brain is either

blocked by a clot or worse (or ruptures).

→ When that happens, part of the brain cannot get blood (and oxygen) it needs so brain cells die.

\* The contrast between what you physically see vs what is actually going on "behind closed doors" is quite beautiful.



Sketch of the brain that helped visualise the 'journey' of stroke. I also felt that it represented the design process in this project.

JOURNEY OF STROKE IN THE BRAIN...

- \* memories and feelings.
- \* emotions
- \* relationships
- \* sacred "space"
- \* HOME

→ your brain is like a ~~house~~ home and a stroke is like a flood or fire - more like a flood in comparison to blood/bleeding of the brain.

→ rebuilding of trust, hope, memories, sense of self/identity.

→ hospital is like a fire engine with the firefighters being healthcare professionals removing the water but as the owner of the "home" you need to rebuild these memories, trust and identity.

→ critical subject cards - brain as a house/home

The main points about the stroke journey from literature. These points led to the comparison of a house and a brain.



THE HOUSE

- represents the brain as it holds memories, possessions & relationships

THE FLOOD

- the stroke - blood on/in the brain.

FIRE ENGINE / DEPARTMENT

- remove most of the water but can't remove all of it.

RENOVATIONS

- slowly restoring/replacing damage.

Figure 26. Brainstorm/ notes around the journey of stroke that led to the brain metaphor.



Figure 27. First iteration of the brain metaphor - in the colours blue and orange.

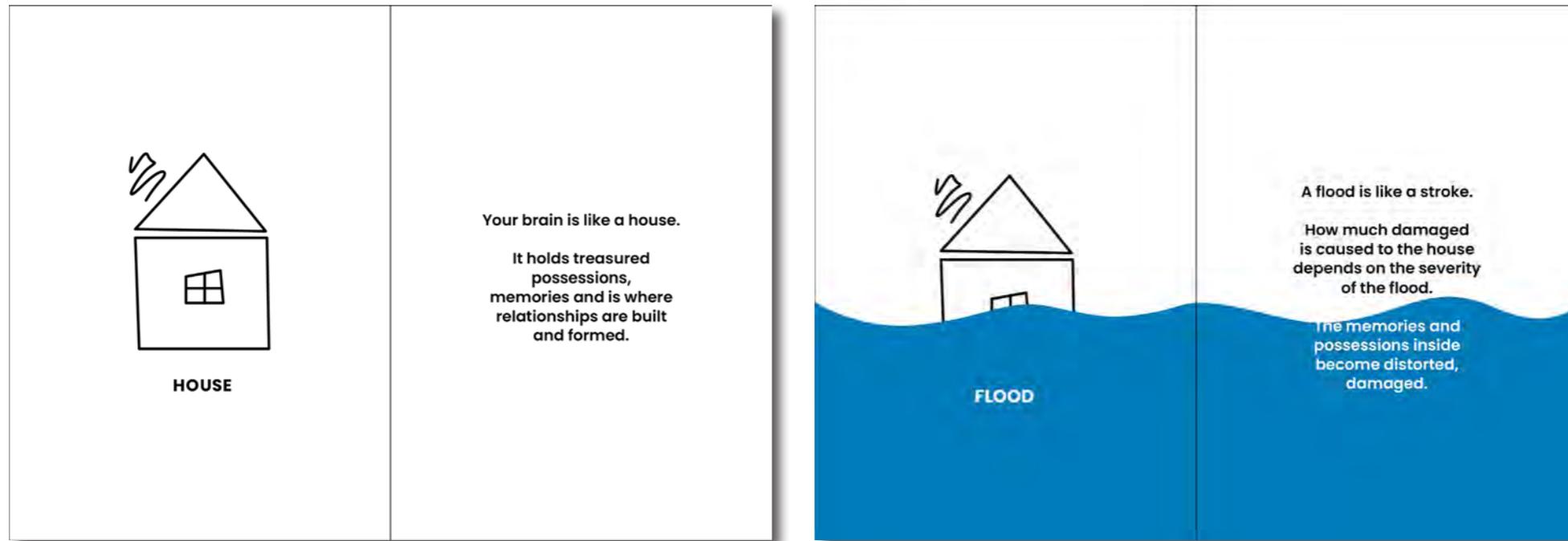
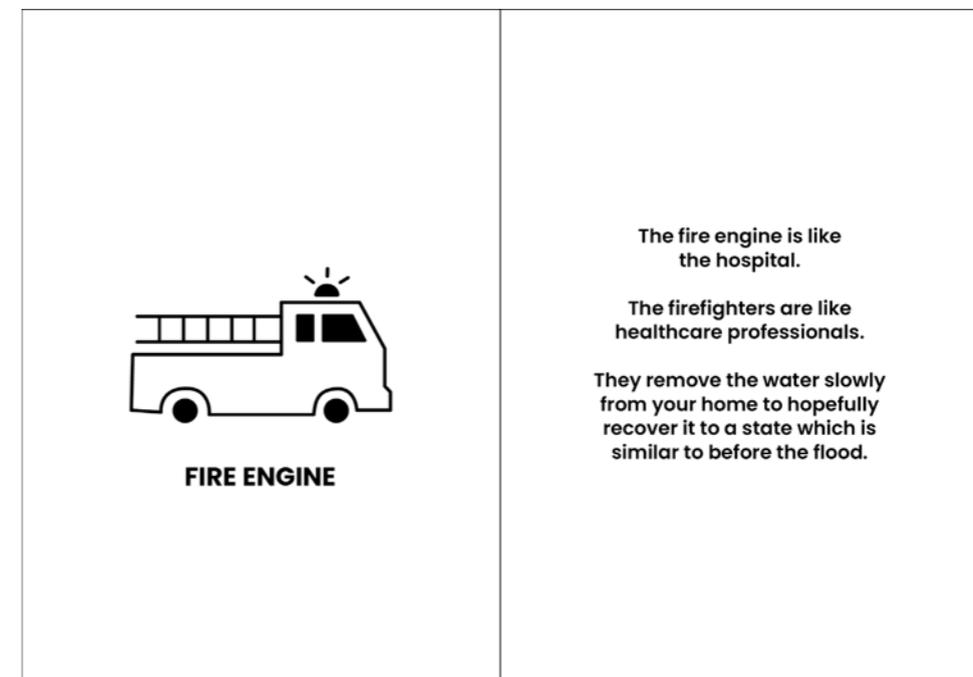


Figure 28. Developed brain metaphor zine.





**DAMAGED HOUSE**

Although most of the water has been removed there still remains some damage.



**TRADESMEN**

The tradesmen are like family members and friends. They are there to help support the rebuild the damage that has been caused by the stroke.

Together, along with the support of healthcare professionals, the brain is slowly repaired just like the house.

Family and friends help plant new seeds in the garden around the house.

Creating a healing environment for the brain to heal.

Depending on the severity of the stroke many people are left unable to communicate or even move. In relation to the house, the flood would damage possessions such as photos and furniture. Leaving the foundations of the house crumbling.

The fire department is then called. Metaphorically, the fire engine is like a hospital and the firefighters are the healthcare professionals. They have the equipment to slowly remove the water from the house. When admitted into an acute stroke ward, the first 24 hours is the most crucial (Stroke Foundation, 2020). Healthcare professionals carry out tests to identify how much damage has been done. Then they set up the next steps to give the patient the best chance at recovery.

Although the firefighters can remove a majority of the water, there is still some water damage. The healthcare professionals have done all they can and ensured that the next steps benefit the recovery journey of the patient.

That is when the tradesmen come in. The tradesmen are like whānau and friends, they are there to support you and rebuild some of the damage that was caused by the stroke.

Family and friends plant seeds in the garden surrounding the house. They start to sprout and eventually with the support of whānau it will grow into a flourishing garden.

The story behind the metaphor was inspired by the literature of Jill Bolte Taylor (2006) and Lotje Sunderland (2014) and the journey that staff described during expert interviews. When a person experiences a stroke, they are often in a dark and traumatic space. There is a lack of understanding around why or how it happened, many go from being healthy and physically able to not be able to communicate or walk. During this time healthcare professionals do their best to repair the damage caused by the stroke.

Essentially, it is the support of family members and friends that make the difference. In one of the interviews, a staff member commented on how during this time patients and families can often enter a stage of grief. Depending on the amount of damage, many people lose their identity and grieve for the person they were or once knew. Even though the impact of a stroke is heavy, there is still hope, and skills that were lost are replaced by new ones.

After completing my observations in the stroke ward at North Shore Hospital I was able to get a better sense of how design could be of benefit to stroke patients and their families. The brain metaphor was a concept that resonated with staff at North Shore Hospital and a journey that had been emphasised throughout my research until this point

When developing the house metaphor, I also questioned how common household items may look or may transform the 'welcome area' of the stroke ward. These items included photo frames, lamps, and even teapots and teacups.



Figure 29. *Desk Lamp Poster*



Figure 30. *Table Lamp*



Figure 31. *Photo Frame Poster*



Figure 32. *Pot Plant Poster*

I first conceptualized these household items as A3 posters in the space, the negative space forming the silhouette of household items. I chose to use a basic form of these items so that people could identify the items whilst still making their own attachments to them. I visualised the graphics of the teapots and tea, on the table in the 'welcome area'. These graphics displayed an bird's eye view of the teapot and teacups, but I later questioned whether bird's eye view images were the best angle for those who have experienced a stroke. As many people may not be able to identify them as teapots or teacups. I had hoped that having the graphics of the tea set would attract people to sit around the table with their loved ones and have an interactive conversation. This prompted an idea to receive feedback in the future as well. The graphics display the following questions;

**What does your ideal hospital environment look like?**

**How does this environment make you feel?**

**What would you want to change?**

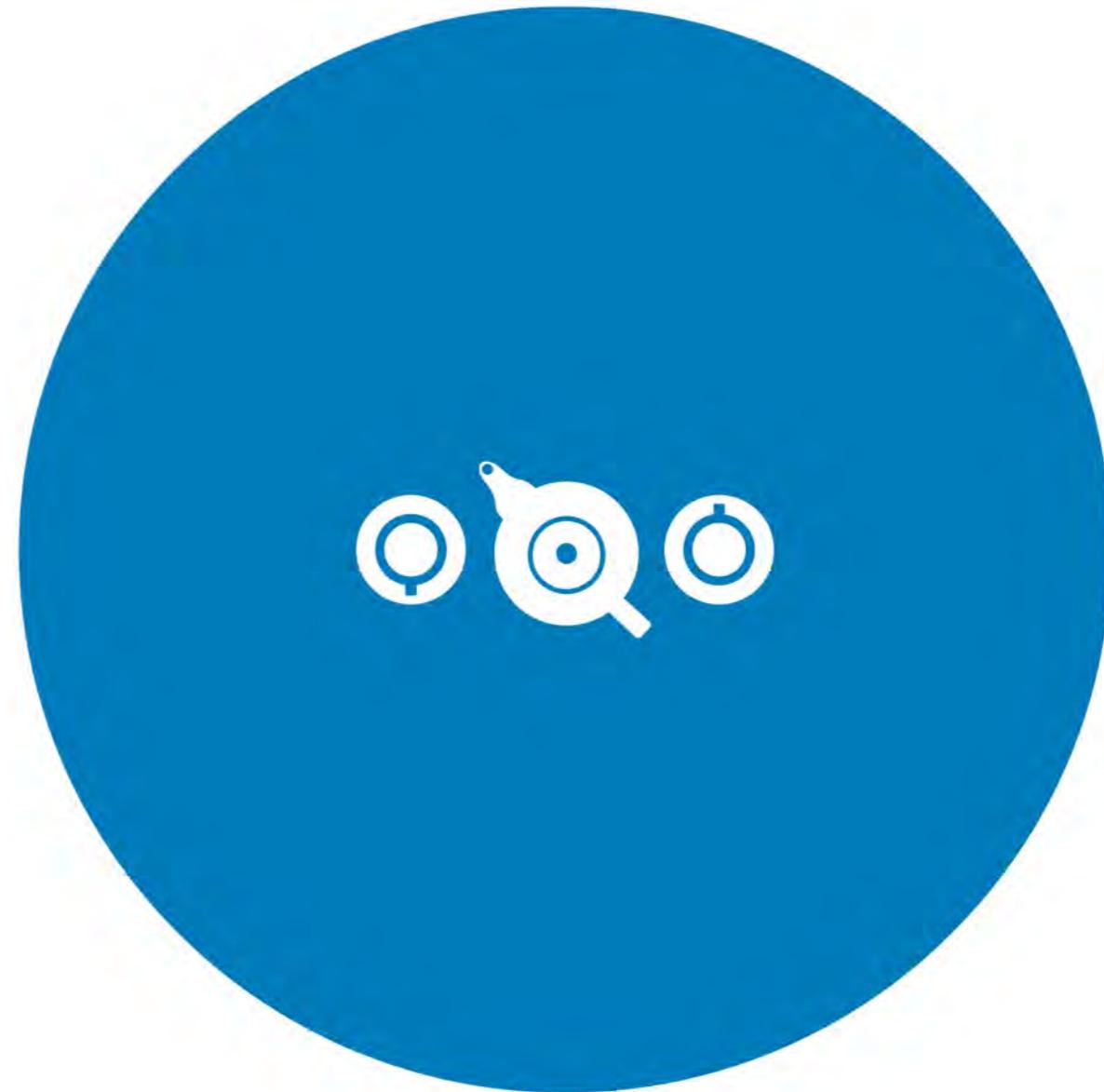
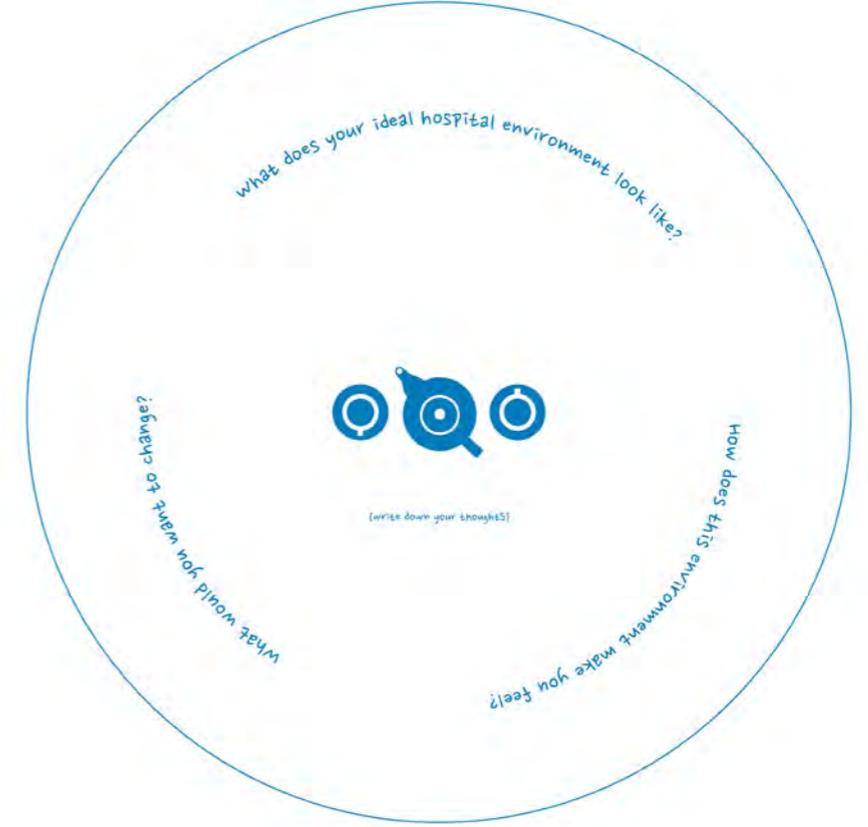
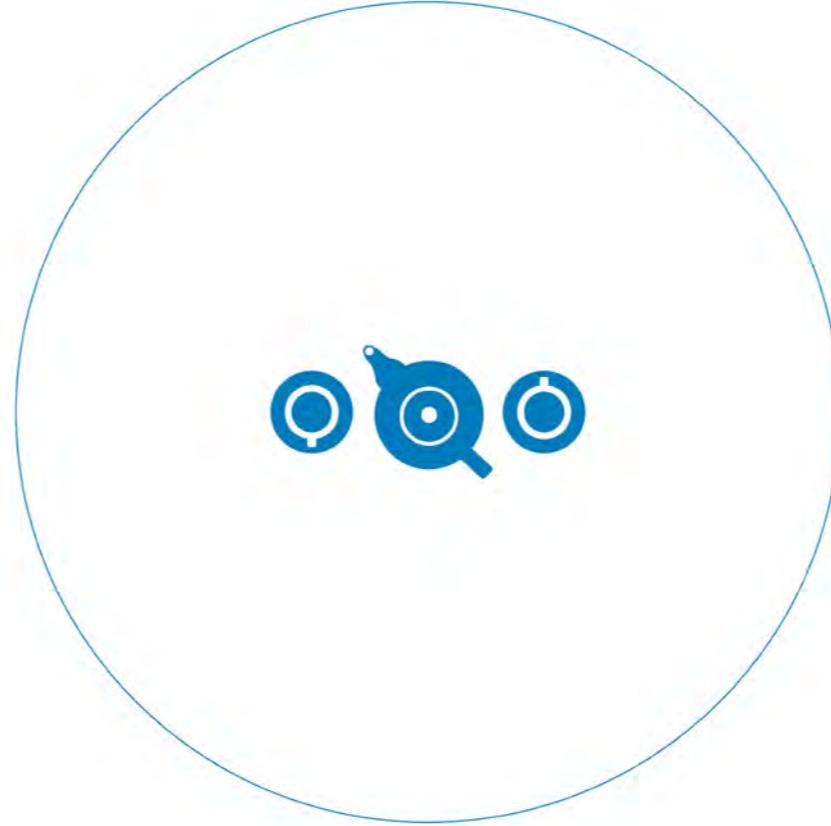
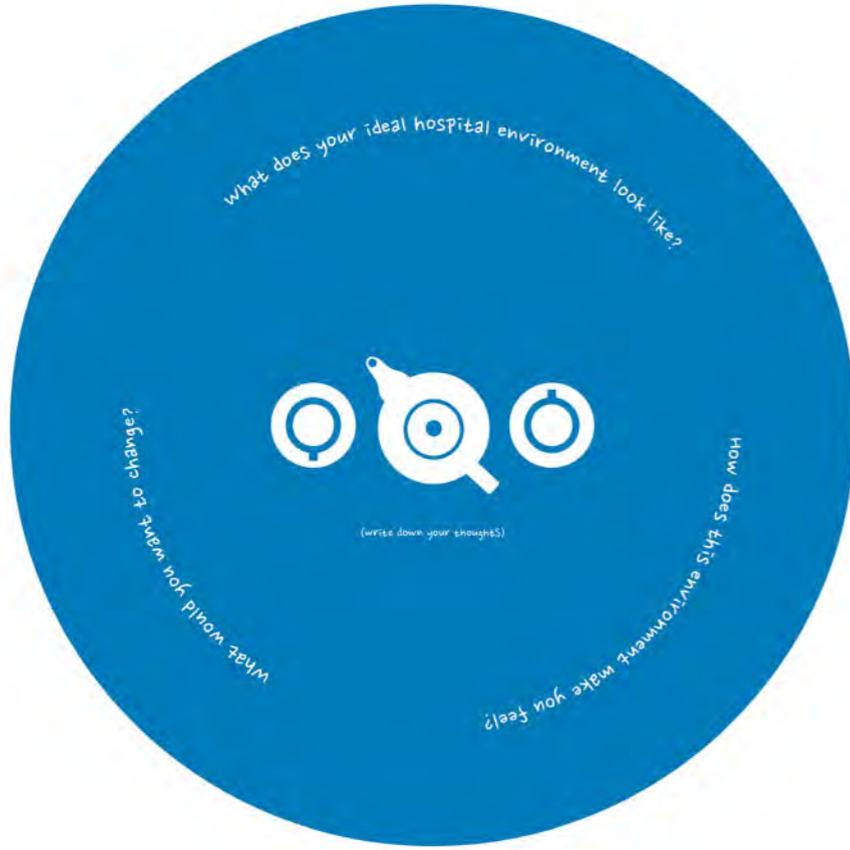


Figure 33. Table spread of teapot and teacup graphics



When reflecting on the house metaphor and how graphics could communicate this journey, I sketched out a storyboard. The storyboard/map shows how patients, visitors, and staff may visually experience the metaphor on a journey through the ward.

The story began at the elevator. The doors of the elevator resemble a door of a house and some water from the flood was seen at the bottom of the door. As you stepped out of the elevator into the 'welcome area' of the stroke ward, a puddle of water welcomed you into this space. Almost like it has spilled out from the elevator. Leaky footprints lead you from the elevator to the ward. Around the welcome area, you were greeted with 2D vinyl illustrations of household items. This is to transform the 'welcome area' into the house in the metaphor journey.

Household items in the 'welcome area' would include plants. There is a lot of evidence around what nature can provide in a healing environment (Daemen, 2014). Holistic healing has been around for centuries but unfortunately due to health and safety and infection control hospitals are unable to physically bring in nature (Fornara, 2012). I used colour in these graphics as it was better when mimicking nature and made the plants stand out against the white walls of the stroke ward.

As you move closer to the main doors of the ward, the water would disappear and the garden would start to flourish. Representing the beginning and the end of patients' journey on the ward. Along with the vinyl graphics in the space, there would be an accompanying zine, telling the story of the brain metaphor and reflecting on the journey to recovery.

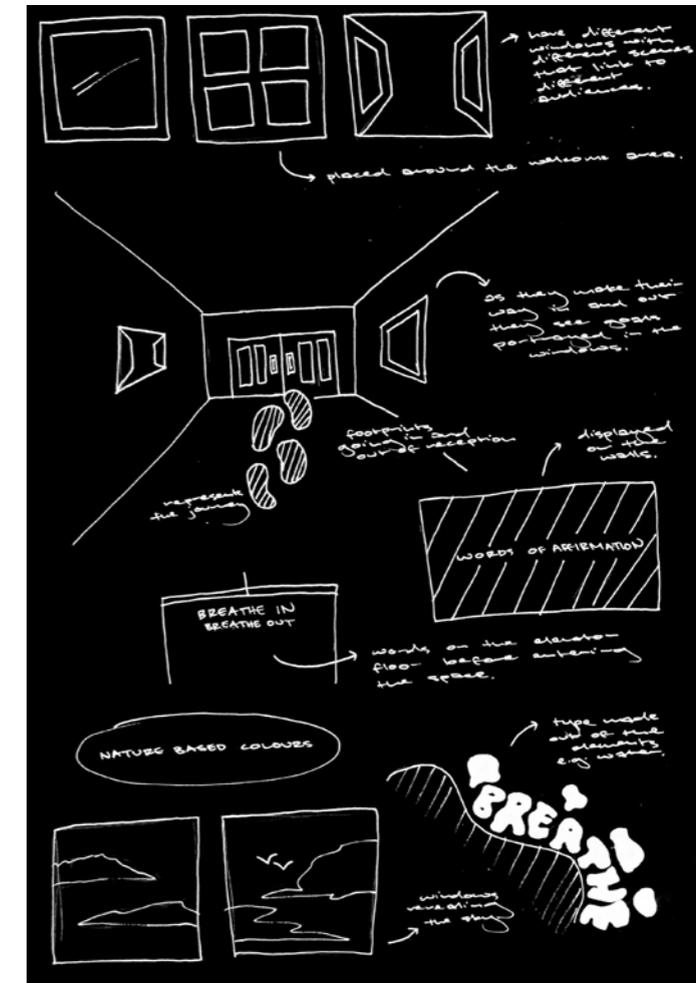


Figure 34. Story of the house metaphor mapped out.

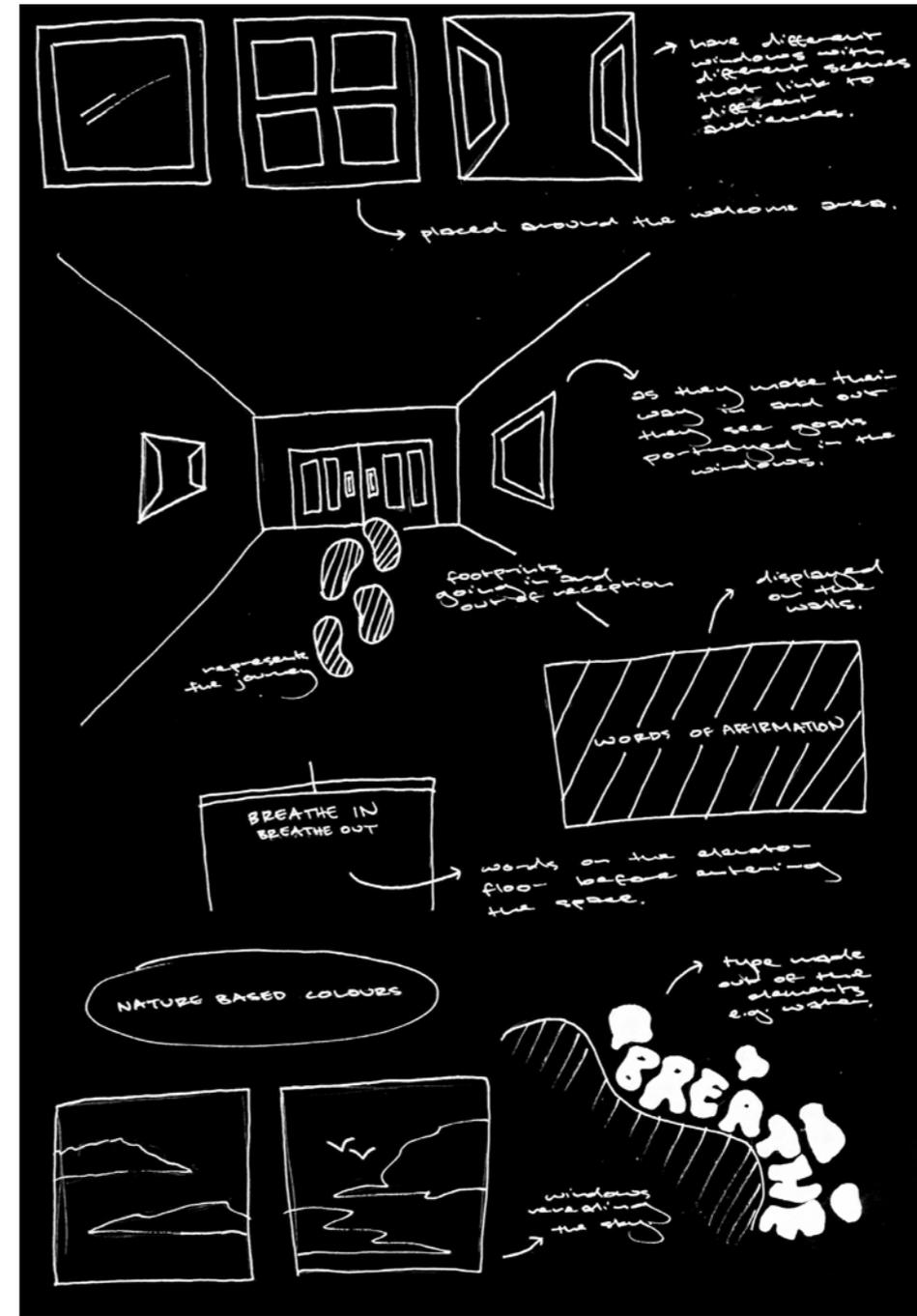
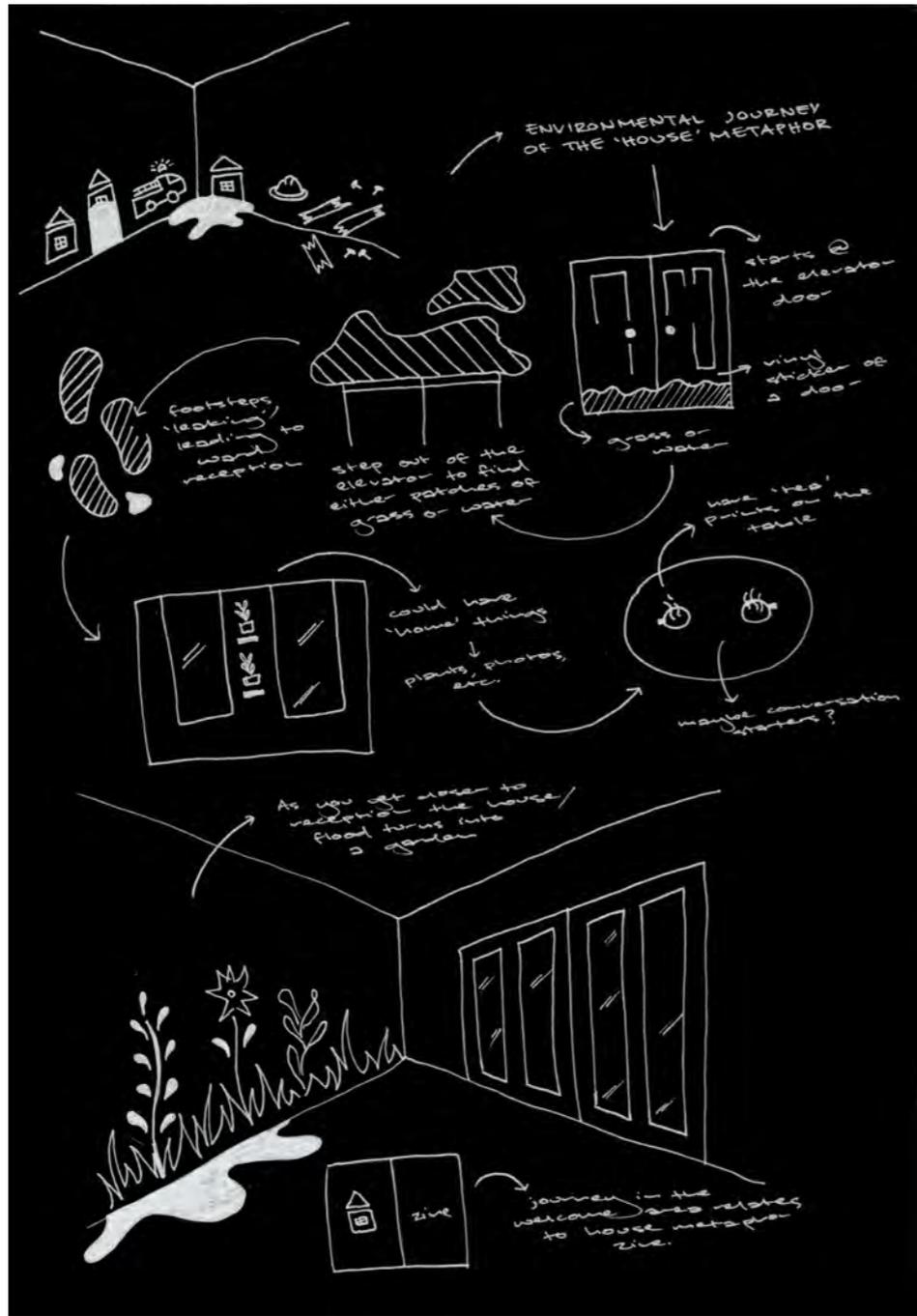


Figure 35. Story of the house metaphor sketched out in the 'welcome area' of the stroke ward at North Shore Hospital.

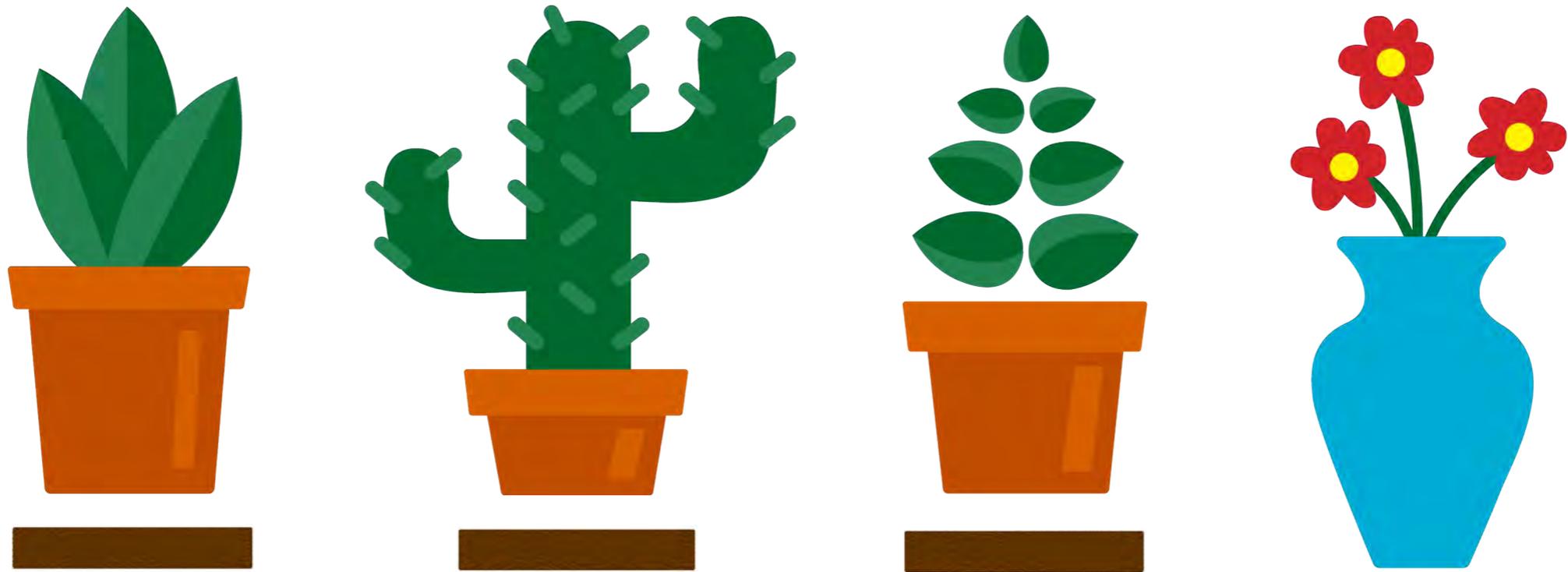


Figure 36. 'Nature' pot plant graphics that would be placed around the ward

The house metaphor had the potential to transform the 'welcome area' space. However, a subsequent discussion with a Māori Patient Experience advisor helped me to see this metaphor from another perspective. When addressing the idea of the house it was important to highlight that not everyone has these household items in their homes and that a house for some is not necessarily a space of healing or comfort.

This conversation emphasized the importance of having a design that addressed the needs of patients from multiple cultures. This is especially important when considering the great diversity of patients on the stroke ward. The average age for onset of stroke for Māori is sixty-one years old, compared to sixty-four for Pacifica and 74 for European New Zealanders (Dyall, 2008). Moving forward I decided to take a step back and view the idea of a house or 'home' from a broader context. Questioning what home meant and looked for people who lived in NZ?

# Meeting with the New Zealand Stroke Foundation

Due to ethical reasons, I was unable to work or talk to stroke patients despite them being the end-users of the research. When I started to develop designed concepts, I knew that the feedback from patients was just as important as getting feedback from healthcare professionals. I reached out to the Stroke Foundation towards the end of 2020.

A senior leader in the Stroke Foundation responded to my email. A meeting was set up for the next week, where we discussed the impact stroke has on people's lives and the concepts I had come up with so far. The senior leader was intrigued by my project as they agreed that the hospital environment was not the best for a healing brain. They mentioned they see a lot of improvement from their members when they are recovering at home.

They asked me if I had seen the new stroke ward at Auckland Hospital. The ward was completed in 2020 and is an integrated stroke and rehabilitation ward. For example, there are walls covered in photos of native flora, reflecting the views of holistic care (Chowhill, 2020). The Stroke Foundation member offered to put me in contact with a staff member on the stroke ward at Auckland Hospital.

This image has been removed by the author of this thesis  
for copyright reasons

Figure 37. Chowhill (2020). *Adult Rehabilitation Integrated Stroke Ward*.

After a few emails back and forth it was decided that I would go and have a look around the new stroke ward at Auckland Hospital. The space still felt clinical despite the floor-to-ceiling photographs of New Zealand fauna. Some of the light casings were even shaped to resemble clouds and birds. This visit showed me what an integrated stroke ward could look like and reflected what potential graphic design can have in a hospital environment.

The senior member of the Stroke Foundation also mentioned that it would be beneficial to link me up with a stroke support group in West Auckland to get feedback on designed prototypes.

The Stroke Foundation has many support groups around New Zealand which support the recovery of people who have experienced a stroke. This would have been a good opportunity to get feedback from recovered stroke patients who are back in the community and able to give consent. Unfortunately, due to two more lockdowns at the beginning of 2020, meant I was no longer able to connect with this support group. This led me to develop concepts further to present to staff on the Stroke Ward at North Shore Hospital.

# Concept Development

Concept development was essential when identifying the strengths in designed and discovering what elements of particular designs could be developed further. One of the main development phases in my research occurred after I identified that the house metaphor wasn't inclusive of all New Zealanders. This allowed me to brainstorm and question how I could communicate the journey in the stroke ward whilst still creating an environment that was welcoming and hopeful.

When brainstorming about what welcome looked and felt like, I reflected on the environment of an airport. Personally, when arriving home and seeing the enlarged photos of New Zealand scenery I feel a sense of relief like "I'm home". This led to thoughts around what is home—is home a physical structure, like a house, or is it the land and having that connection with particular landscapes?

Photographs of New Zealand landscapes, fauna and flora seem to be popular when making people feel welcome. The main entrance of North Shore Hospital also includes large photos from landscapes around Auckland.

Connection to land is especially of importance to Māori. They feel a spiritual connection to the land and are tangata whenua (people of the land). People are one with nature and not superior to the land as it is able to pass on knowledge and understanding to the human world (Te Ara, 2007). For many New Zealanders the idea of home is connected to the outdoors and physical activity in nature (Wiles, 2008). From this research I started conceptualising ideas that referred to the landscape of New Zealand and what it might offer in the environment of a stroke ward.



Figure 38. Nature's Pic Images Blog (2009). *A nice welcome home to NZ.*

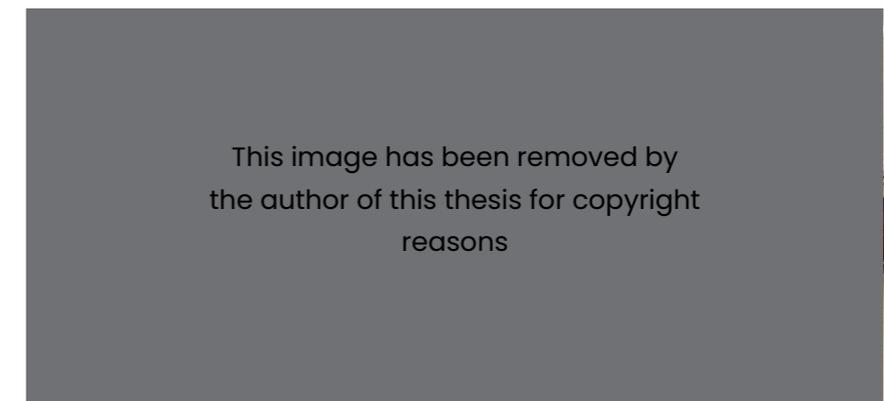


Figure 39. Auckland Airport (2011). *The complete visitors arrival experience.*

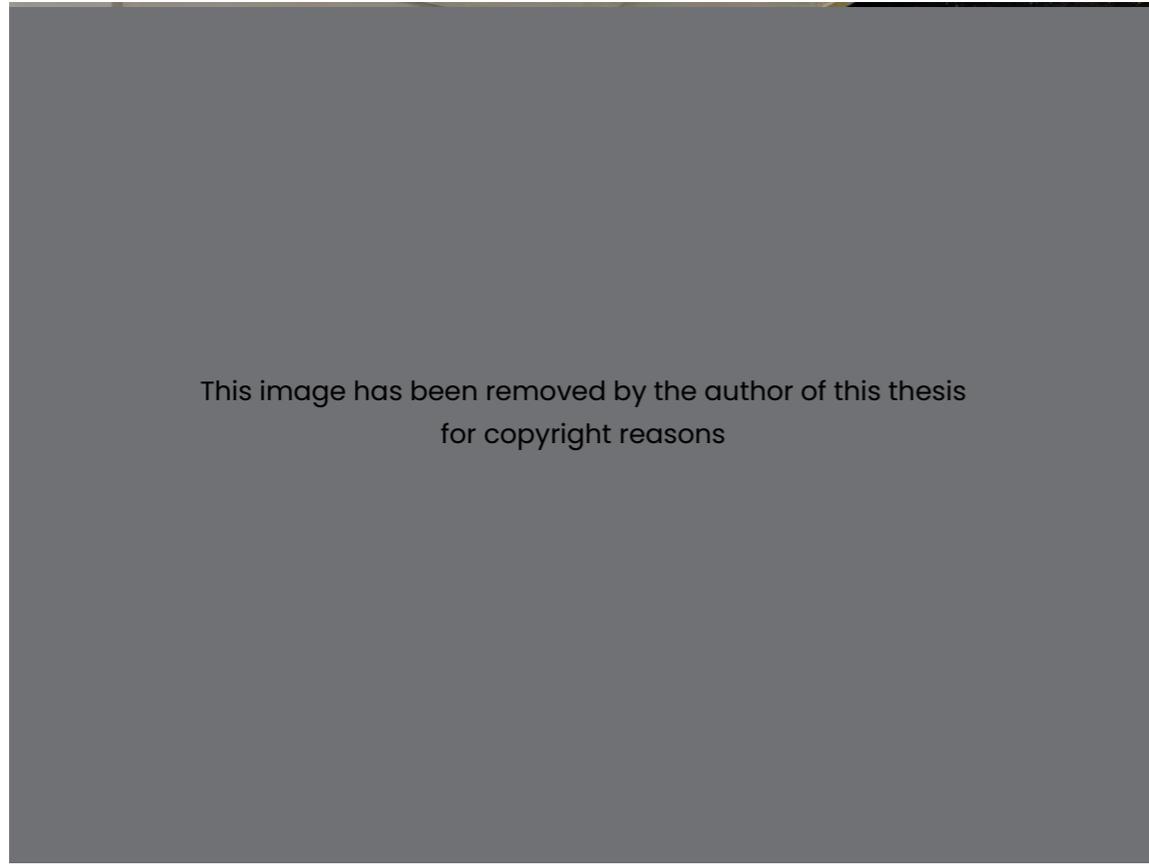


Figure 40. Grafix Wall Art. (2018). *North Shore DHB*.

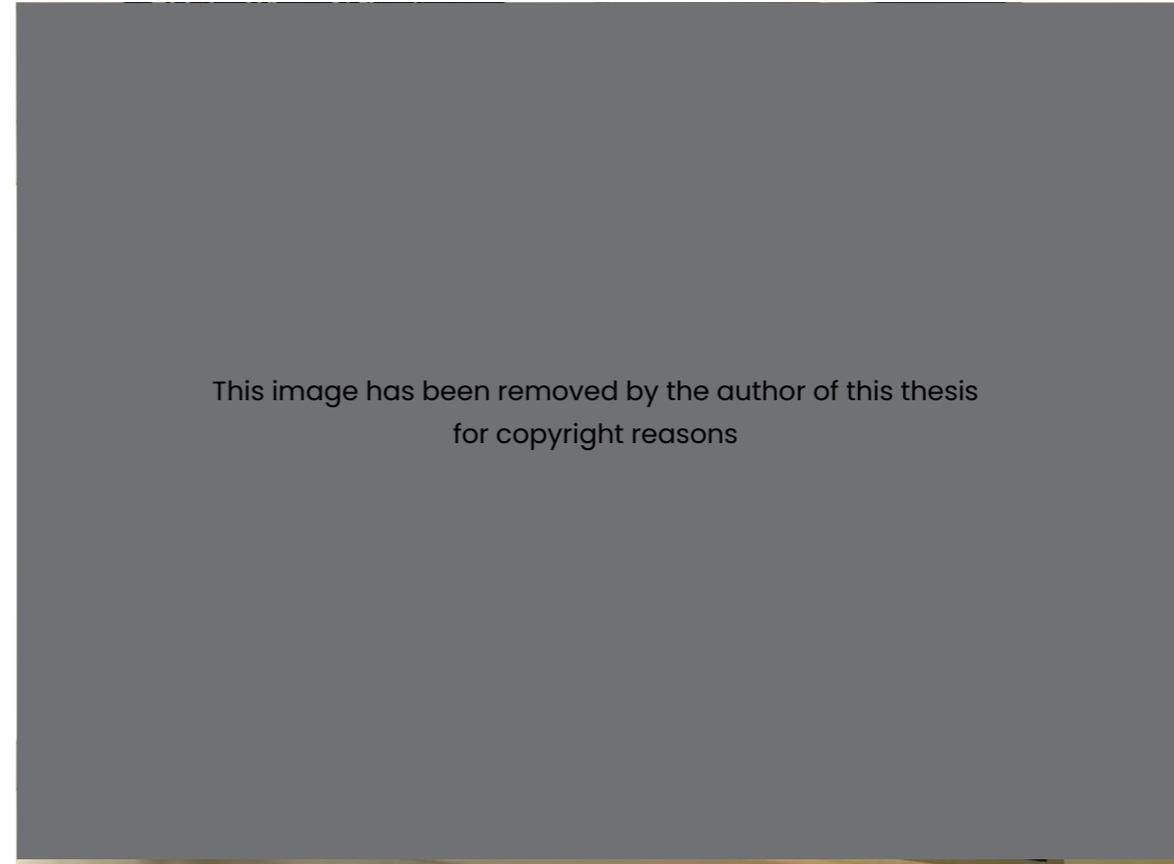


Figure 42. Grafix Wall Art (2018). *North Shore DHB*.

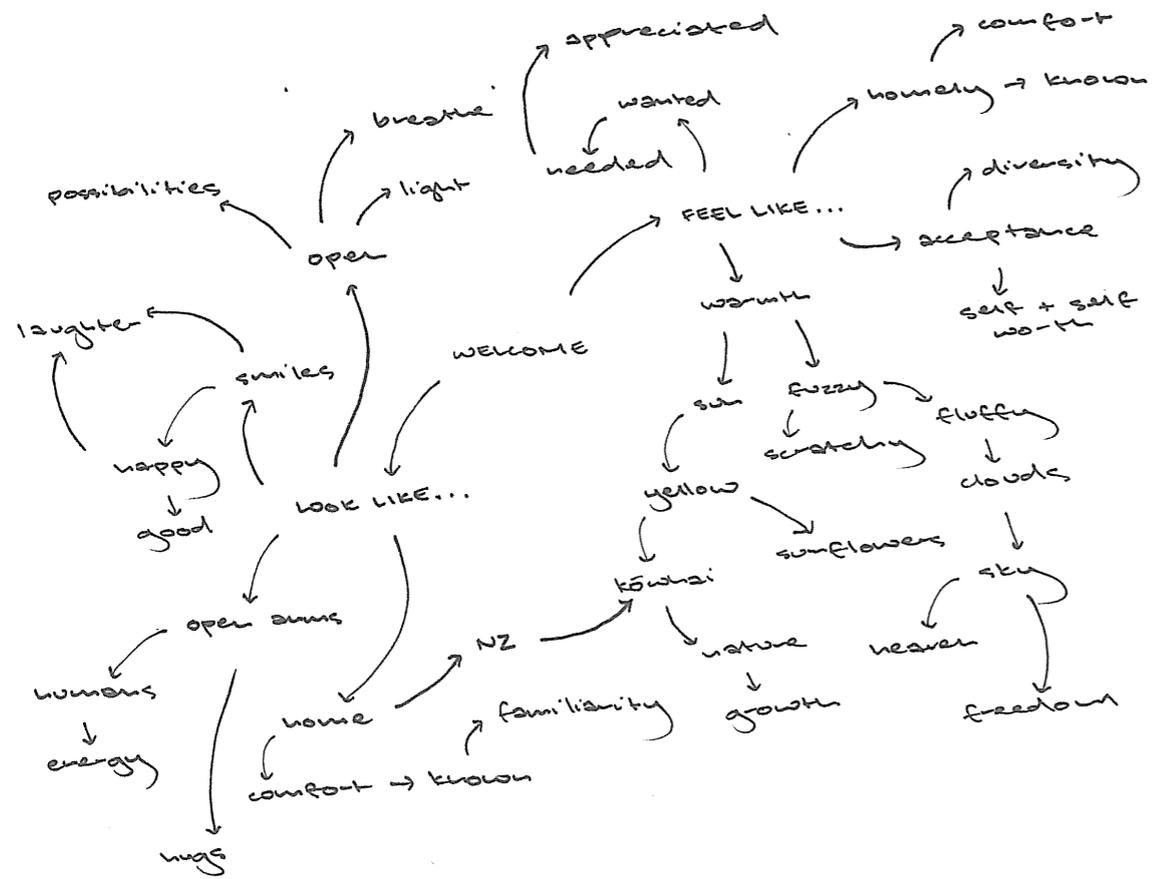


Figure 43. Brainstorm on what welcome feels and looks like.

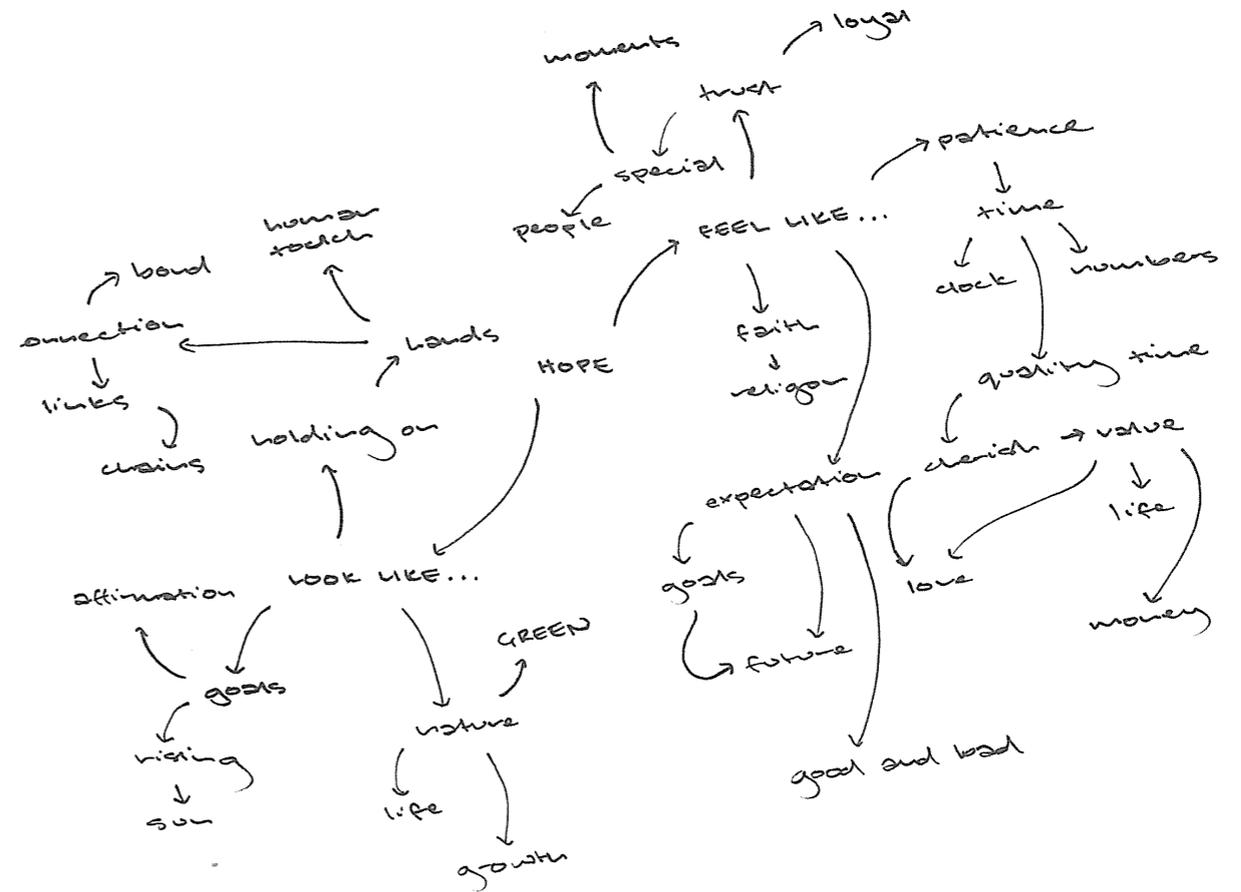


Figure 44. Brainstorm on what hope feels and looks like.

From my observations in the 'welcome area', I wanted the windows to be my area of focus. By using a holistic approach I started to create patterns that mimicked those seen in nature. This included water, trees, and mountains.

The first exploration was inspired by the artwork of Rangitoto on the stroke ward. This then led on to further exploration into the patterns of water and a forest.

After conversations with my supervisors and staff at North Shore Hospital it was agreed that although these displayed a way of conveying nature it probably wasn't ideal for stroke patients in particular. As the pattern of the water and the trees may make patients dizzy and cause fatigue.

Although this was one way of identifying how nature could be brought into the ward, I continued to develop ideas and designs further.

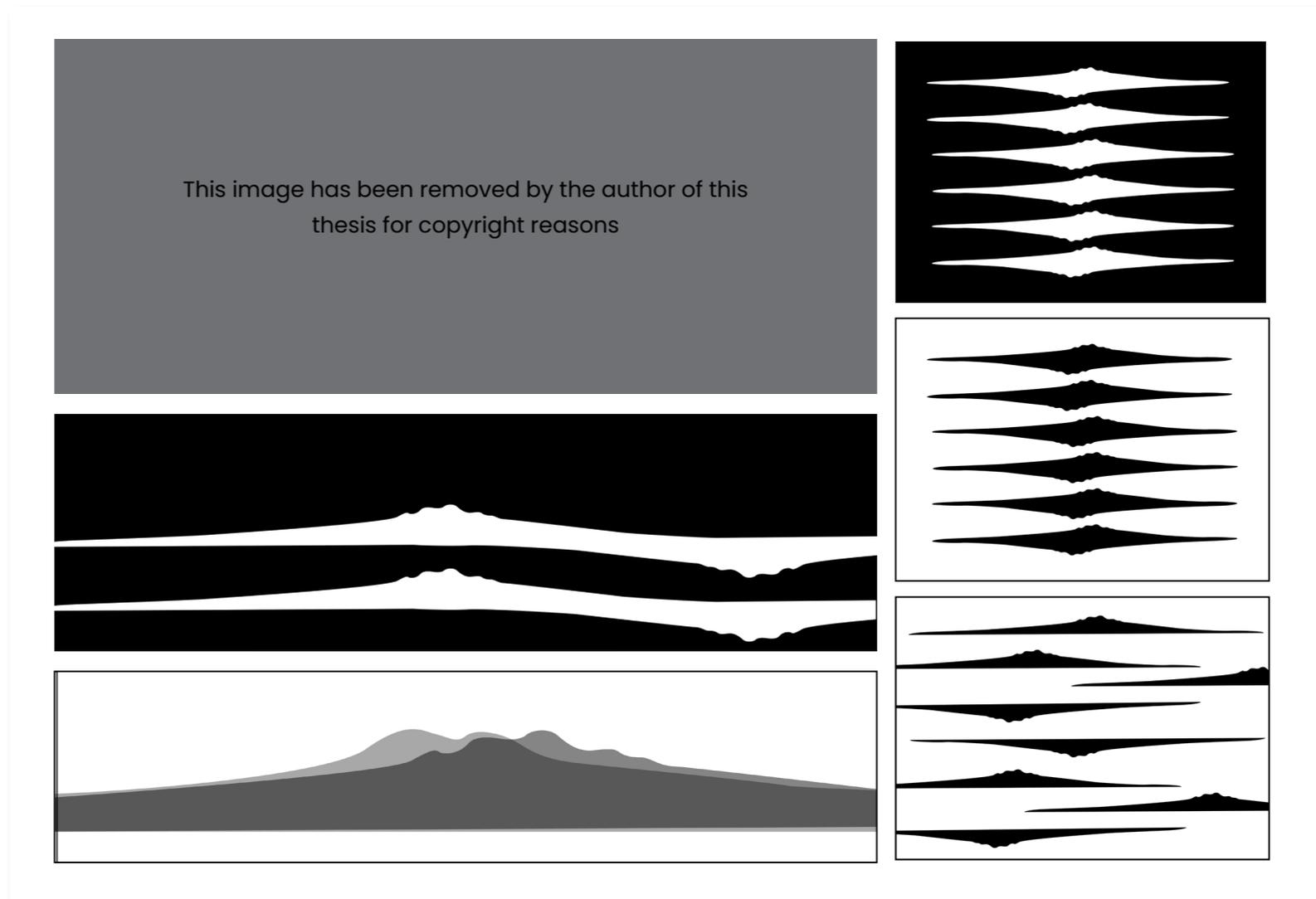
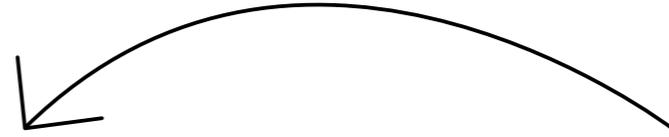
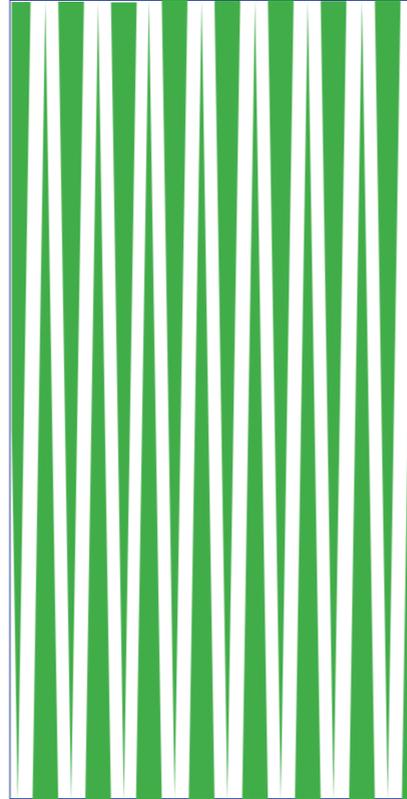
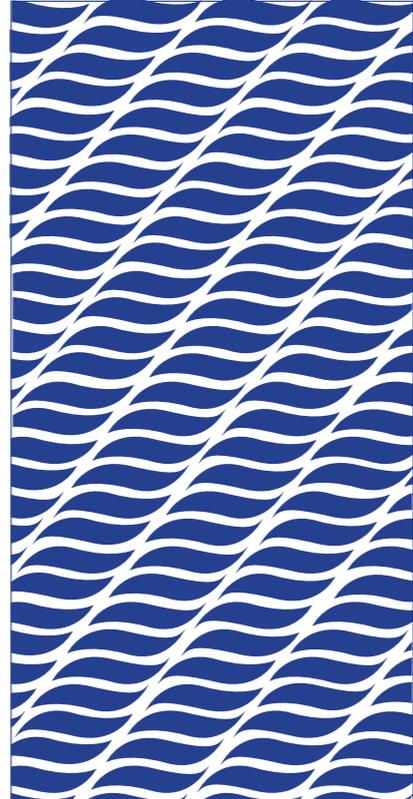
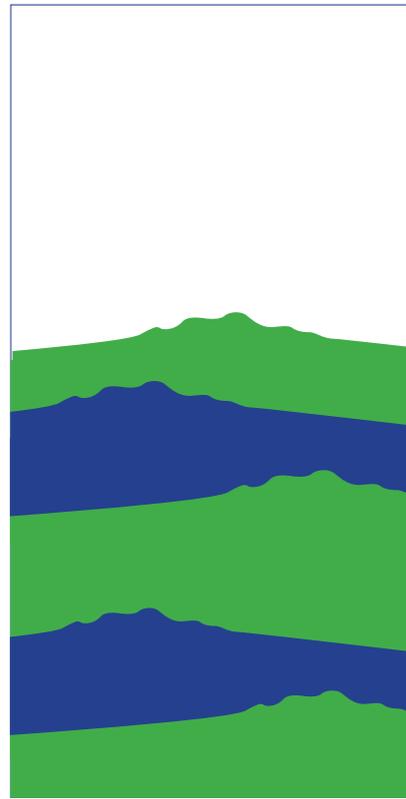


Figure 45. Moodboard of responses to Rangitoto.



This particular pattern is inspired by the Redwood Forrest in Rotorua, New Zealand.



Figure 46. First 'nature' inspired concept for 'welcome area'.

Figure 47. RNZ (2018). *Redwood Forrest*.

After creating a patterned response to nature I started to question how I could utilise what was already there. Using humor I decided to create signage to point out certain things that you could see from out the windows. This graphic focused on the window to the left of the elevators. The three main spots I pointed out, are some trees close to the main road (the botanical gardens), a seagull's nest on the roof of the hospital (wild bird conservatory), and a flock of pigeons also on the roof (pigeon highway). The first concept of this mimicked road signs. I chose to use the colours of blue and green and they are more natural and calming than other bright colours. I questioned the typeface as although Nanum Pen seemed to fit the idea behind the graphic it felt childlike, taking away the little Independence stroke patients have.

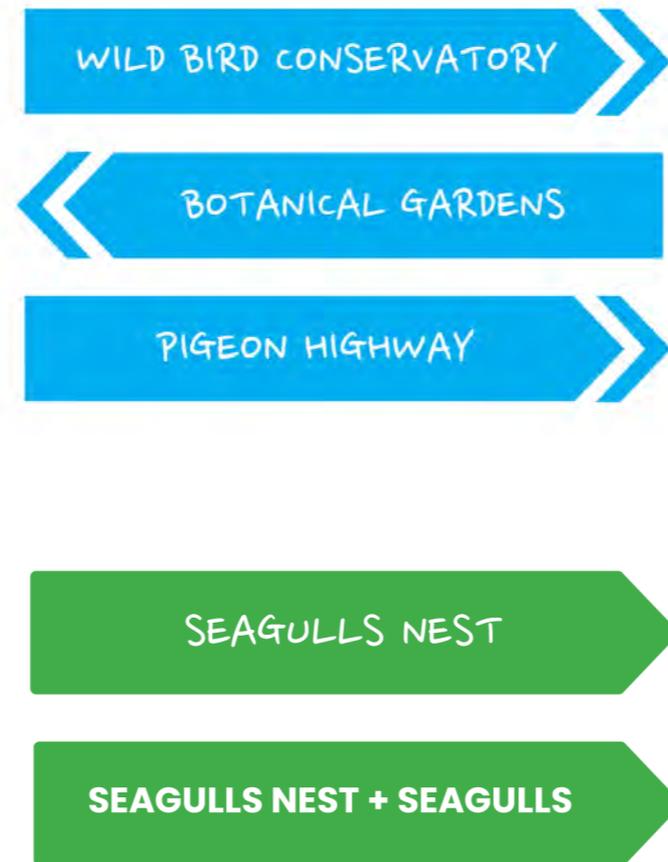


Figure 48. Signage concept

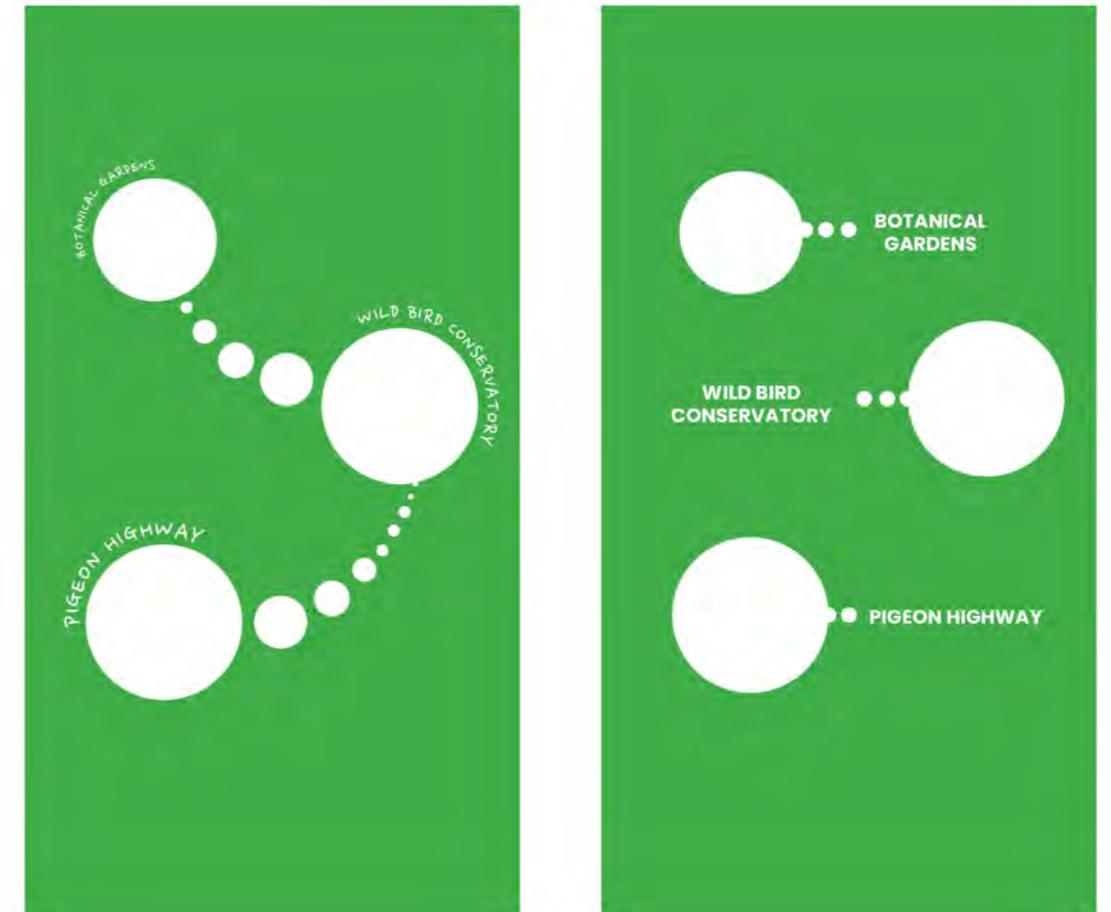


Figure 49. 'Eye-spy' concept

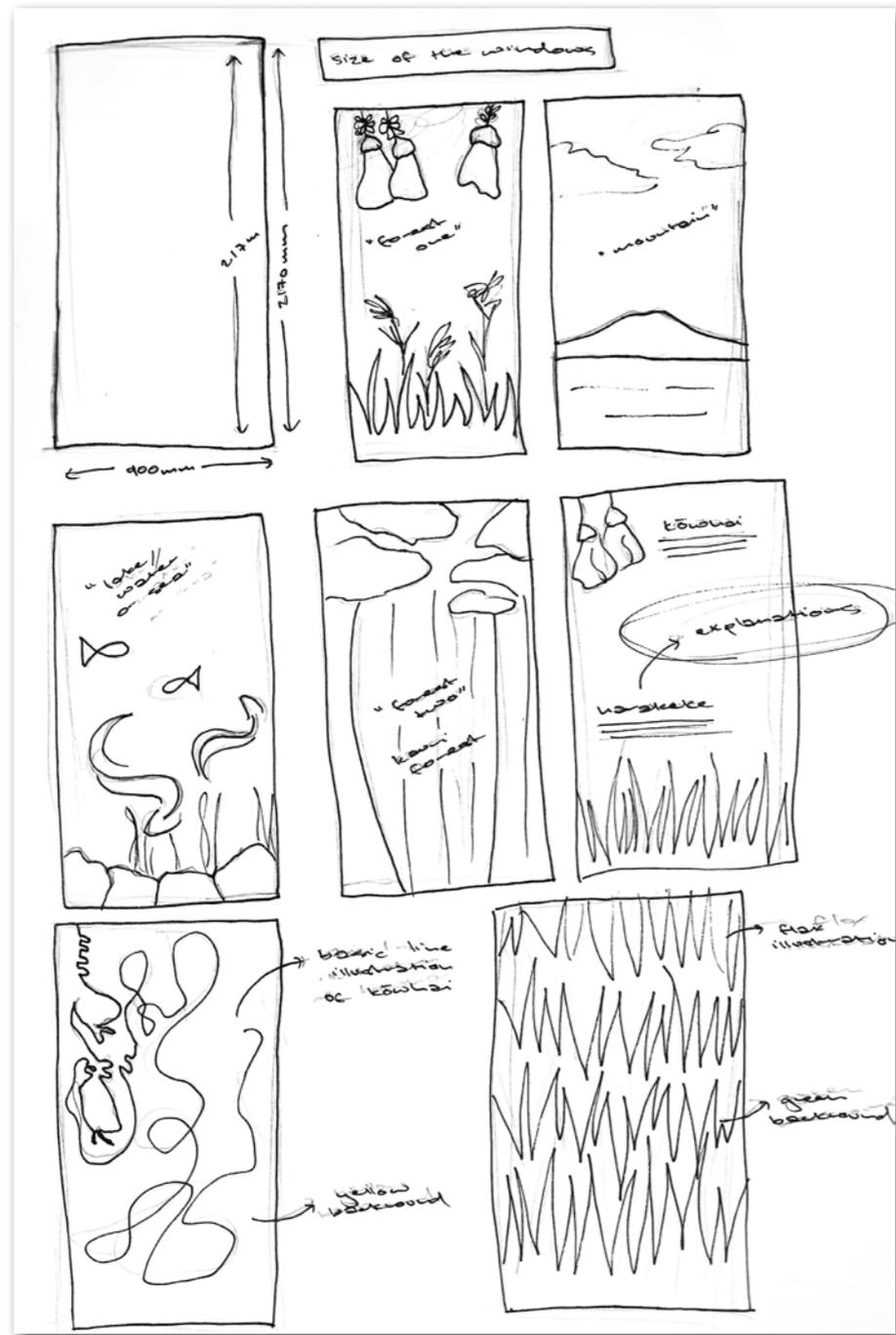


Figure 50. Sketches of potential nature prototypes.



Figure 51. Kōwhai photographed through the seasons. Left (kōwhai in winter), Right (kōwhai in summer).

The full window concepts were created to help people on the ward identify objects quickly. The first concept blocked the rest of the view out the window. Although I had already identified that the typeface was problematic when making the design more childlike I decided to develop the idea further. This time using nature to add to bring more joy and light to the graphic.

After prototyping these designs I questioned whether they still felt childlike. As the graphic itself felt like a game of 'eye-spy'. When looking at the designed prototype, my eye was immediately drawn to the kōwhai and harakeke.



Figure 52. Development of 'Eye-spy' concept



Figure 53. 'Eye-spy' concept digitally mocked up in Ward Two

Reflecting on the strengths of the previous concept, I decided to develop the flora concepts further. The kōwhai and harakeke seemed like strong flora to include moving forward, especially when reflecting rongoā\*. These are plants that were utilised by Māori for their medicinal properties.

Kōwhai holds the unofficial title as New Zealand's national flower and was an important medicinal tree for many Māori tribes. Dizziness and an range of diseases were treated by kōwhai. The flowers were often soaked in water to create a healing concoction. Although the healing properties of the kōwhai are miraculous if consumed it can be poisonous. In modern times, kōwhai is planted in garden to attract birds like the tūī who travel far for it's nectar (Vennel, 2019).

Harakeke s has been used by Māori for everyday things. This includes clothing, cloaks, fishing lines, baskets and more. Harakeke are also known to have soothed and healed soldiers during war. Thick leaves provided soldiers with bandages for wounds and its roots helping heal wounds and stop bleeding (Vennel, 2019).

\* Rongoā is traditional medicinal practices used by Māori in New Zealand (HealthInfo, 2021).

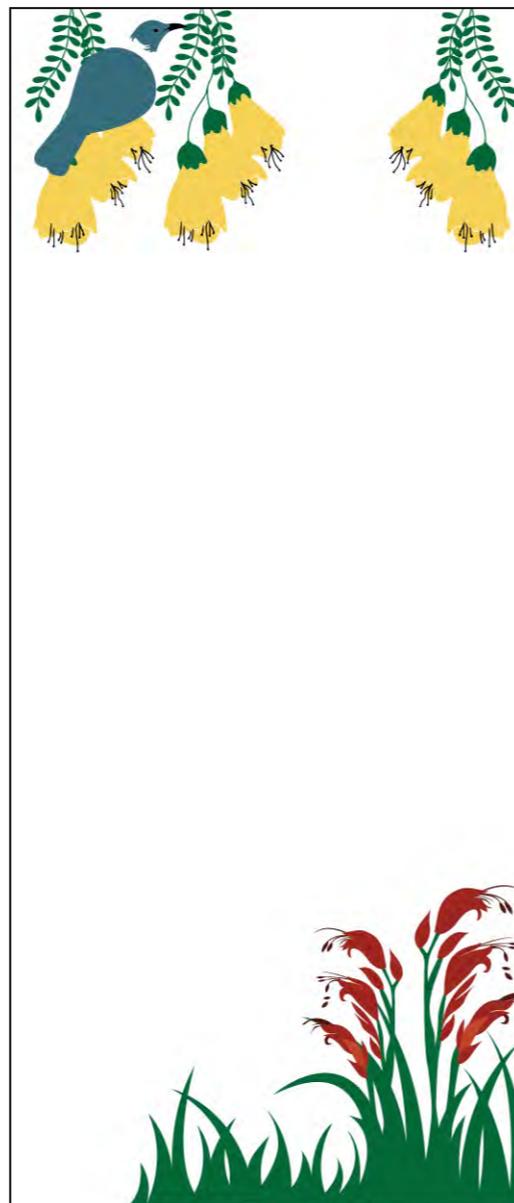


Figure 54. Kōwhai and Harakeke concept



Figure 55. Kōwhai installed in Ward Two

Figure 56. First installation in the 'welcome area' of the stroke ward.



# First Install at North Shore Hospital

In order to see how graphic design impacted the experience of those in a stroke ward I started to prototype in the space. As a graphic designer, I never thought I would be able to walk into Ward Two and install a design without any hesitation from medical staff. After reading and hearing about the struggle that many Master of Design students faced, I was wary of how my design would be received. I emailed a senior staff member on the ward a couple of days before the installation, asking to put it up. There was a little bit of hesitation as the question of infection control arose. I explained that the concept was made out of vinyl so it could be cleaned easily and removed if there were any problems.

I had arrived at the ward before visiting hours and asked a senior member of staff if I was able to put up my designs. They agreed as long as they could be cleaned. Previous to putting up the first installation, I hadn't measured the windows in the welcome area. When I started to install the vinyl I realised quickly that I would need to scale my graphics up.

Staff and patients made comments as they passed by, often commenting on the kōwhai graphic. A member of staff commented on how it didn't feel like you were in Ward Two anymore. At one point a nurse mistook me for a patient, asking if I was being looked after. Although I thought it was humorous at the time, I questioned if nurses and occupational therapists allowed patients to be creative or facilitated creative activities during rehabilitation.

Vinyl being the main material for my prototypes in the ward meant that my designs are temporary in this space and could be easily removed. This made it easier to prototype in this space.

I have never seen the welcome area of Ward Two be cleaned until installation day. A cleaner hung around the area, watching me put up the vinyl's whilst cleaning. They were hesitant to leave the space until they came across one of my observation advertisements still up in the ward. I informed a senior member of staff after the installation was complete. I informed them that they were able to contact me if the design needed to be removed. I did not hear back for over a week until the next installation occurred.



Figure 57. Setting up for the install



Figure 58. Preparing to install vinyl



Figure 59. Installation of vinyl



Figure 60. Installation of vinyl

# Expert Interview with Senior Rehabilitation Lecturer

Before this interview, I had a few informal conversations with a Senior Rehabilitation Lecturer around the needs of stroke patients and their needs. They were able to advise me on literature and similar studies around people's journey of stroke and the recovery journey within a stroke ward. After creating a few designed prototypes, I reached out to the senior lecturer through email. I asked if they would be interested in looking through my designs and providing feedback on what would be beneficial for those in a stroke ward environment. Because I wasn't able to work with stroke patients it was important for me to gain an understanding of what designs would address their needs. The lecturer has had previous experience researching with stroke patients and was able to advise on what designs would meet their needs in the environment of a stroke ward.

The interview was audio-recorded and later transcribed along with the support of written notes. Questions asked were constructed to gain feedback and use designed prototypes to prompt further conversation around what is appropriate in a stroke ward and what would be of benefit to patients and their families. These questions included;

***Is anything popping out to you from the examples that I have shown and why?***

***When having the knowledge you have and having worked with patients in an inpatient acute stroke ward, what do you think would be beneficial in this environment?***

When revealing the designed prototypes, the lecturer was immediately drawn to the risograph version of the Chris Knox zine.

They advised me to look at literature by David Herkt who was a New Zealand television director and writer and Christopher Green who was a well-known Australian pediatrician. Both of them have written about their experiences of having a stroke quite young. Throughout the interview, the lecturer reiterated the importance of the words and stories of stroke survivors when guiding those who follow. Survivors' stories provide hope for those who feel like there is none.

When discussing this, I expressed my concern when blowing the zine up and putting it on the walls of the stroke ward. I felt that although the words of others can be enlightening, that the lyrics that Chris Knox uses are quite confronting. Although Knox wrote Sympathy for the Cripple and Meat before having his stroke in 2006, the lyrics are quite dark and emotional.

The lecturer commented on this and said it was really interesting because they are also facing a similar issue around timing in their research at the moment. Commenting

**“But this big question for me about what’s appropriate at what times and it’s like I’ve been watching these clinicians interact with patients and I’m going, you’re not talking about the future at all, you are talking about discharge.”**

Although it felt important and necessary for patients to know what the journey looks like and what the future holds, they may not be able to comprehend this information or cause more anxiety when facing what they have lost and the impairments they now have.

Having worked with many stroke patients, I asked the lecturer;

***From your research and background with stroke patients do you think that there’s anything in particular that needs to be addressed or needs to be seen straight away when entering the ward?***

They commented on the importance of identity and the value of being able to identify something of themselves in that space. But although this is the case the communal space of the ‘welcome area’ is used mostly by families who are waiting, not the patients who are mostly bedridden. The senior rehabilitation lecturer commented on how this could be used as an opportunity to support and educate family members in this space.

Connectedness was further highlighted when discussing developments of designs for the ward. I had the opportunity in this space to create and facilitate connections. The lecturer mentioned work by Karen McLellan and her article ‘Māori experiences of aphasia therapy: “But I’m from Hauiti and we’ve got shags’ (McLellan, 2014). Highlighting the importance of incorporating views of Māori and understanding their connection to their culture and land.

Expressing that the hospital environment was not inviting and failed to communicate that this was a space for them and their whānau to heal. The lecturer reflected on one encounter they had with a previous patient. This patient compared the journey of a stroke to the Māori creation story of Te Ao Mārama (Te Ara, 2021).

Explaining that this story emphasises the journey from darkness to light and that they have

“Come back to this quite a few times when talking to clinicians about it and kind of going if we think about it in this way and we think about people post-stroke. If you’re in this state of nothingness what does that mean, how do we create an environment that helps to let a little bit of light in so you can see that there isn’t just darkness, that there are things there and gradually move further and further into the light”

This sparked ideas and inspiration for the concepts that followed. Throughout my research, the journey from dark to light had been very apparent. It started with the house metaphor and had developed along the way. The story of Te Ao Mārama seemed like a step in the right direction when addressing the journey of a stroke as well as incorporating the views of Māori.

# Inspiration of Te Ao Mārama

After the interview with the senior lecturer, I started to think about the story of Te Ao Mārama and the journey it represents. I read the story of Te Ao Mārama on Te Ara (Te Ara, 2021) and started to connect it to the journey a patient may go through after experiencing a stroke.

## **Te Ao-Mārama – Māori Creation Story (Darkness to Light)**

**Te Kore**  
**the void, nothingness, potential**  
**Te Kore-tē-rawea**  
**the void in which nothing is felt**

Te Kore was the void, for those who have had a stroke it is the beginning of their journey to recovery. Due to the damage to the brain, many people lose the skills they once had and are often unable to communicate or move.

This can be a time of confusion and sadness (Bright, 2019). One day you go from being a capable adult to then having to fully rely on the support of others to do even the most basic things (Bright, 2019).

Although there is hope it is hard to see. Many are ashamed that they are no longer independent and may not be for the rest of their lives (Bright, 2019).

**Te Pō-roa**  
**the long night**  
**Te Pō-tangotango**  
**the intensely dark night**  
**Te Pō-tahuri-atu**  
**the night of restless turning**  
**Te Pō-tahuri-mai-ki-taiao**  
**the night of turning towards the revealed world**

Te Pō was the night. The night is still dark and dreary, but the potential can now be visualized by those who have experienced a stroke.

This was the beginning of their rehabilitation. Like anything, re-learning skills will take time, the journey to recovery is long but people will get there. Everyone moves at their own pace, but with the support of healthcare professionals and whānau, patients will recover from their stroke to a certain extent.

**Te Whai-ao**

**the glimmer of dawn**

**Te Ao-mārama**

**the bright light of day**

Te Ao-mārama was the light. Like every morning it is a new beginning. For those who have experienced a stroke the journey to recovery is long. Even after they leave the ward, they will continue to re-learn the skills once lost. People may not be able to do what they once did but appreciate what you can do, even though the future may look different there is still hope (Bright, 2019).

From this story, I created concepts that portrayed this story visually. Starting with some flora and fauna of New Zealand. The kiwi representing the night and darkness, followed by the tūī, kōwhai, and harakeke to represent the light. On each side of the graphics is the part of Te Ao Mārama to which the graphic relates to.

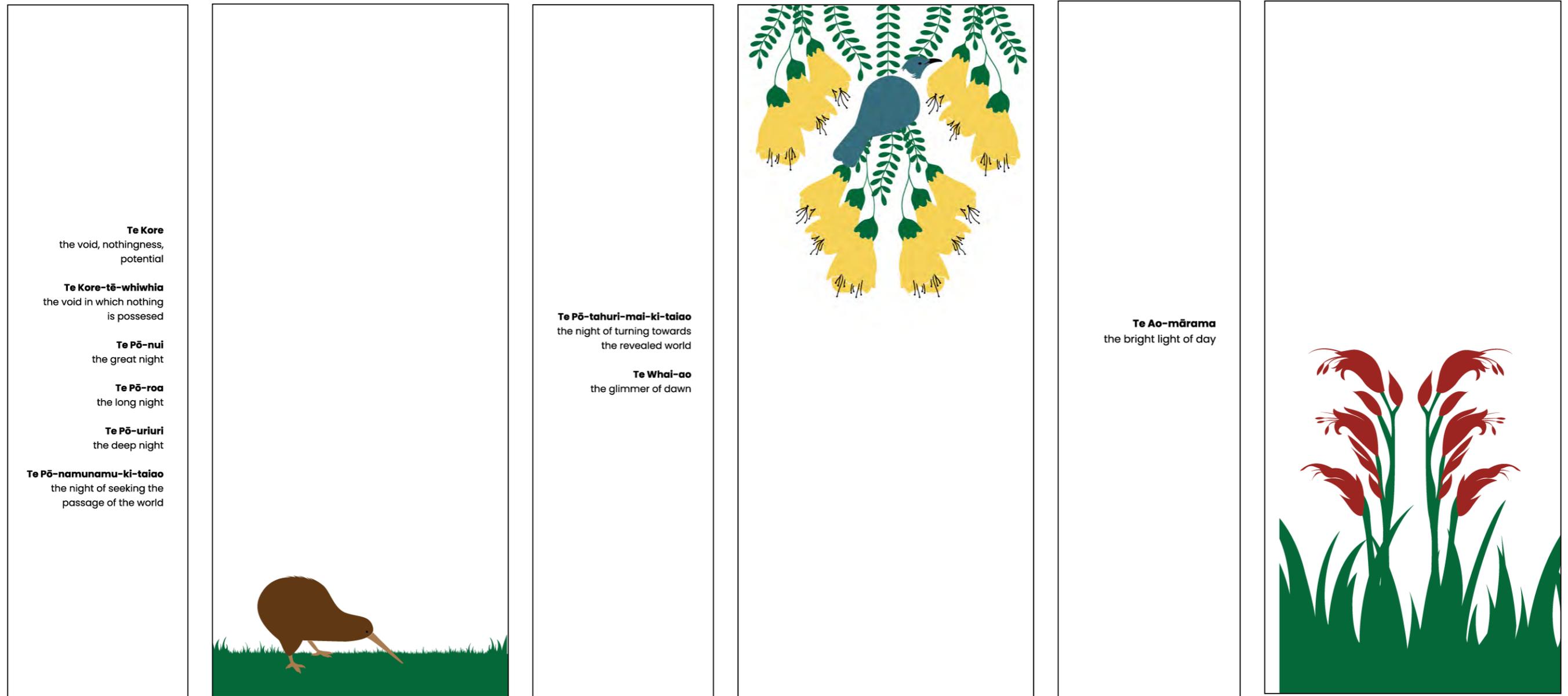


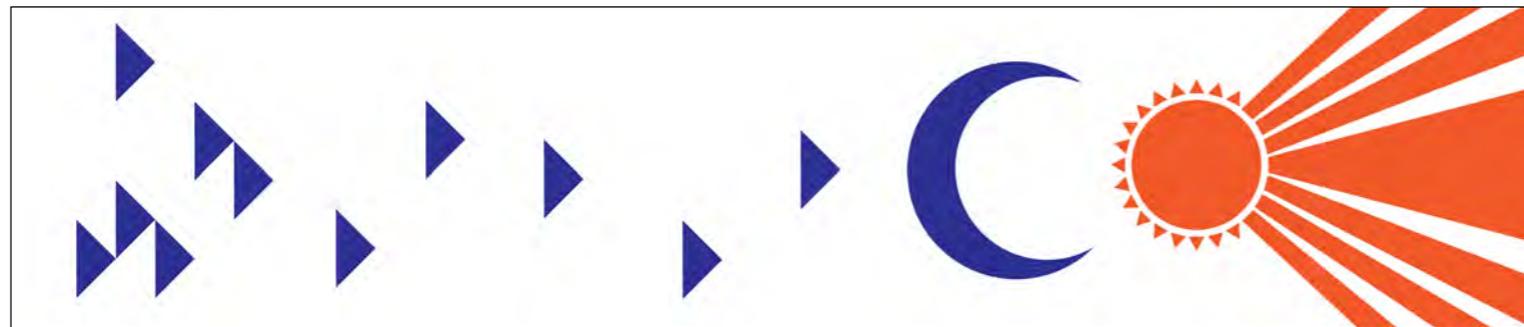
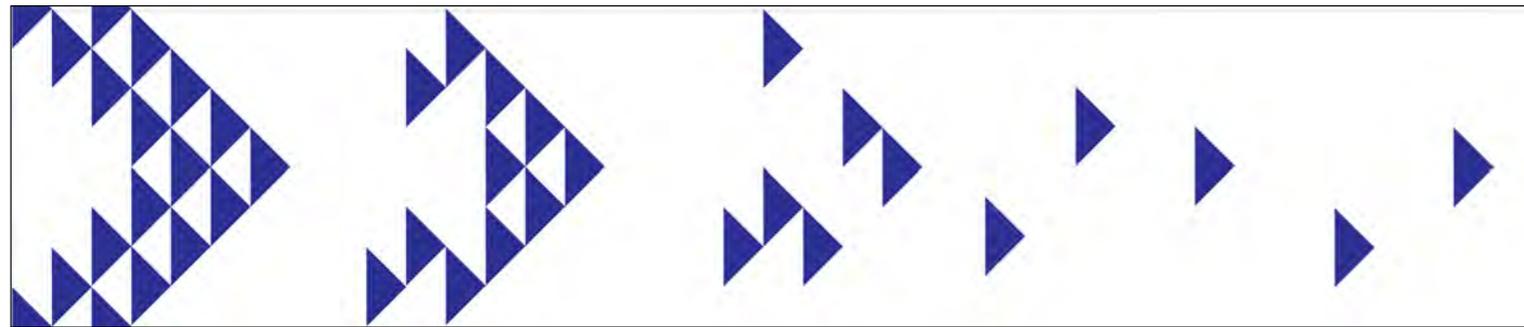
Figure 61. First Te Ao Mārama Concept

The second version incorporated the graphics from the Chris Knox Zine. The scribbles and blotches smoothen out into the outline of the harakeke and kōwhai. In between the graphics, the story of Te Ao Mārama is displayed.

After creating these two concepts I asked myself if these were reflective of the story I was trying to portray and reflective of Māori culture. This led me to create designs incorporating triangular Māori patterns.



Figure 62. Second Te Ao Mārama Concept



The patterns are inspired by Tāniko and refer to Aramoana which is the pathway of the sea (He Ao Kotahi, 2021). The triangular shapes convey the pathways of the ocean and reveal the many destinations (He Ao Kotahi, 2021). When communicating the stroke journey, I felt like this pattern communicated the various destinations people arrive to or journeys they go on after experiencing a stroke.

I also used the colours blue and orange and include graphics that resembled the moon and the sun to communicate the story better. When deciding on what concepts to next install in the 'welcome space' I decided to simplify the sun and moon concept as well as include the kōwhai and the harakeke which had been scaled up since the last installation. I decided not to install the kiwi as feedback from other students revealed it wasn't the strongest graphic and could probably be developed further before installation.

Figure 63. *Third Te Ao Mārama Concept*

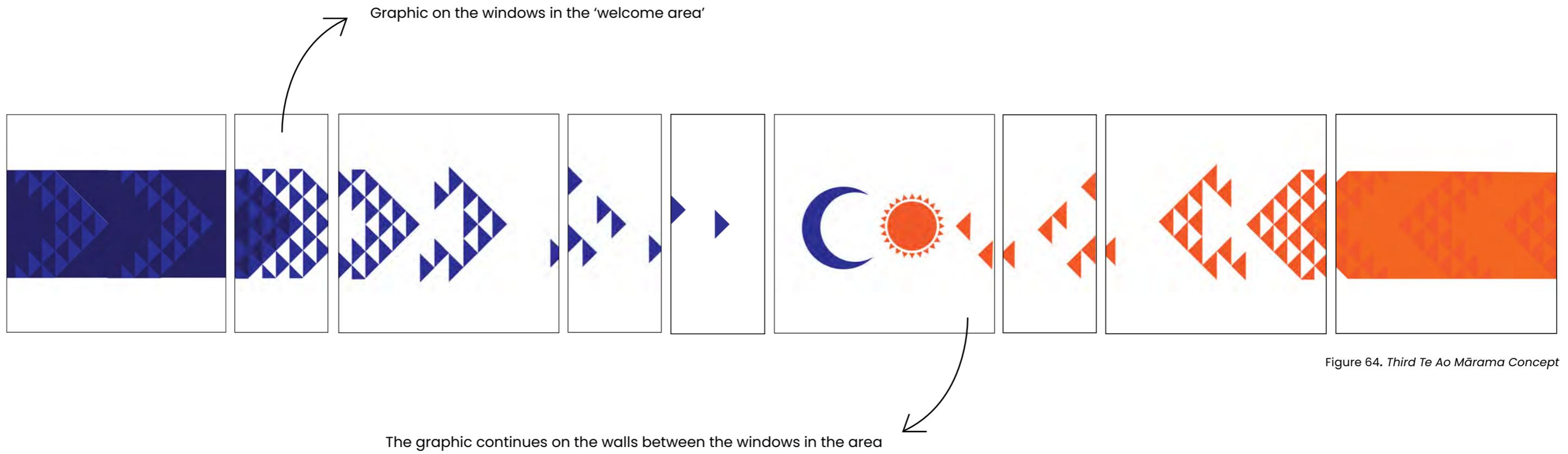


Figure 64. *Third Te Ao Mārama Concept*

Figure 65. Te Ao Mārama Concept installed in the 'welcome area' of the stroke ward at North Shore Hospital.



# Second Install at North Shore Hospital

A week after I installed the first prototype, I returned with two new ideas. I decided to install two ideas at the same time to see what design people preferred or were drawn to more. I arrived on the ward and informed a senior member of staff that I would be installing the second and third installation.

A few of the nurses approached me and asked if I was putting more installations up but were sad to hear that the first installation would be coming down. They commented on how it has made a difference as they will take their patients out into the welcome area to see the images. It was also mentioned that the graphic has been used in physiotherapy exercises. Occupational Therapists will get patients to point and certain parts of the graphic as well and look at them.

The atmosphere was positive, and many members of staff were interacting with me.

This was a massive contrast to earlier attempts to engage staff where they were reluctant and too busy. Staff commented on the designed prototypes whilst I was installing them.

This was a surprise when comparing the response of staff during observations and expert interviews. I felt that maybe because my presence in the space had gone from carrying out research to a more casual and less intimidating stance, that staff felt more comfortable with talking to me and providing feedback. They also were able to interact as they pleased and enjoyed seeing someone work on something different.

I had a few family members also speak to me while installing the new concepts. Many were drawn to the kōwhai. Both times I have been in to install these graphics, the kōwhai seems to draw the most attention.

One family member asked if I installed vinyl professionally as they were looking to get some in their father's home after his father had recently had a heart attack and a stroke. He commented on how it lifts the energy and creates a positive aura, which was good to hear.

A patient who was being transported in her bed commented on how it didn't "feel like she was in a hospital anymore". This was extremely reassuring to me and helped me feel supported when knowing that the my designs have had a positive impact of those in the stroke ward at North Shore Hospital.

Beside each installation, I placed a plaque that described each of the designs and the story behind them. I used a sans serif typeface and made sure to have it no lower than 14-point size to ensure that it was easily readable, even by patients who were able to do so. I left this installation up for just over a week before returning to install the next two concepts.

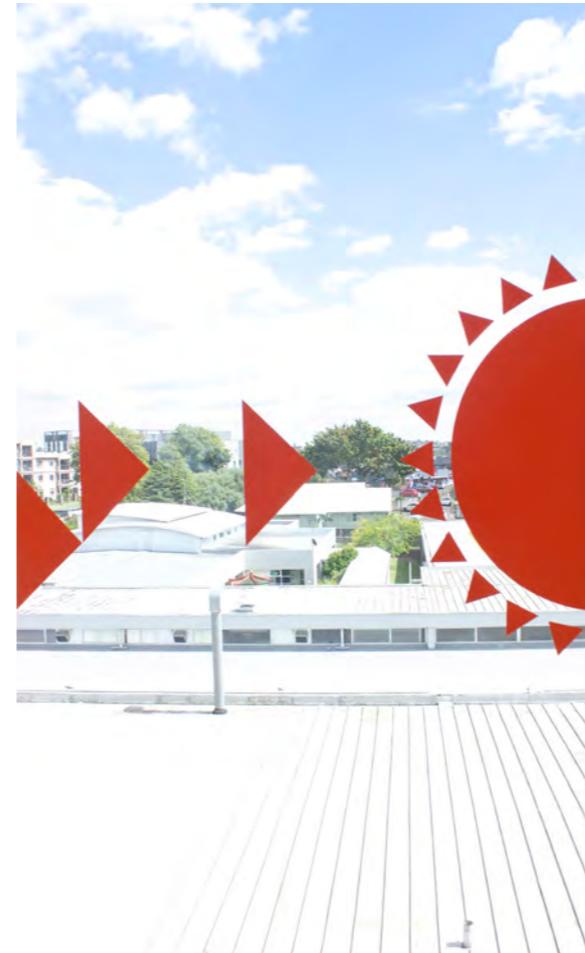


Figure 66. *Te Ao Mārama* inspired concept installed in 'welcome area'.

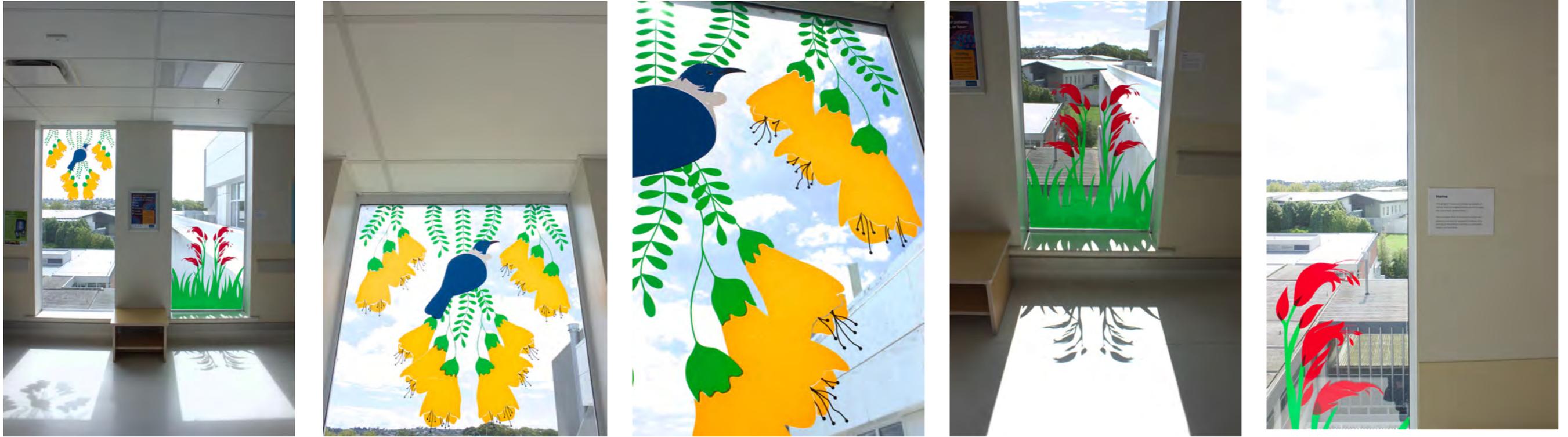


Figure 67. Scaled up kōwhai and harakeke concept installed in 'welcome area'

# Observation of the Stroke Ward with the Second Installation

This was the first observation I did in the space with the installations present in the welcome area. I arrived in the ward and notified a senior staff member before positioning myself once again amongst the furniture in the welcome area.

Like previous observations, people still passed through the space quite quickly. But instead of looking down, they were looking up and out through the windows. Many of the healthcare professionals commented on how cool and nice the graphics were in the space. One patient that I had seen the previous week while putting up the vinyl came into the space to drink her tea and read a magazine. She stayed in the area for a long time. This reflected that the 'welcome area' is a space away from the confinement of the rooms within the ward.

One thing that was surprising to me was the interaction and partnership between myself and the healthcare professionals. Many staff on the ward approached me when putting up the vinyl, having conversations around how excited they were to see the new concepts and expressing how they had been using the previous vinyl for OT exercises. Staff also mentioned they had started bringing patients into the space more often. I felt like after all the time I had spent on the ward I had finally had a breakthrough and that may be more healthcare professionals had gained my trust. I hoped they would be willing to have more conversations with me around what challenges they faced on the ward and how it could be improved through the graphics I was experimenting with.

But when I went back into the space to carry out an observation, the majority of healthcare professionals avoided having conversations with me. I wonder if because when I was putting up the vinyl it became a less formal atmosphere so staff felt comfortable with interacting with me versus an observation where they may feel like they are being watched or have to give more of their time and feel like they have to work more professionally.

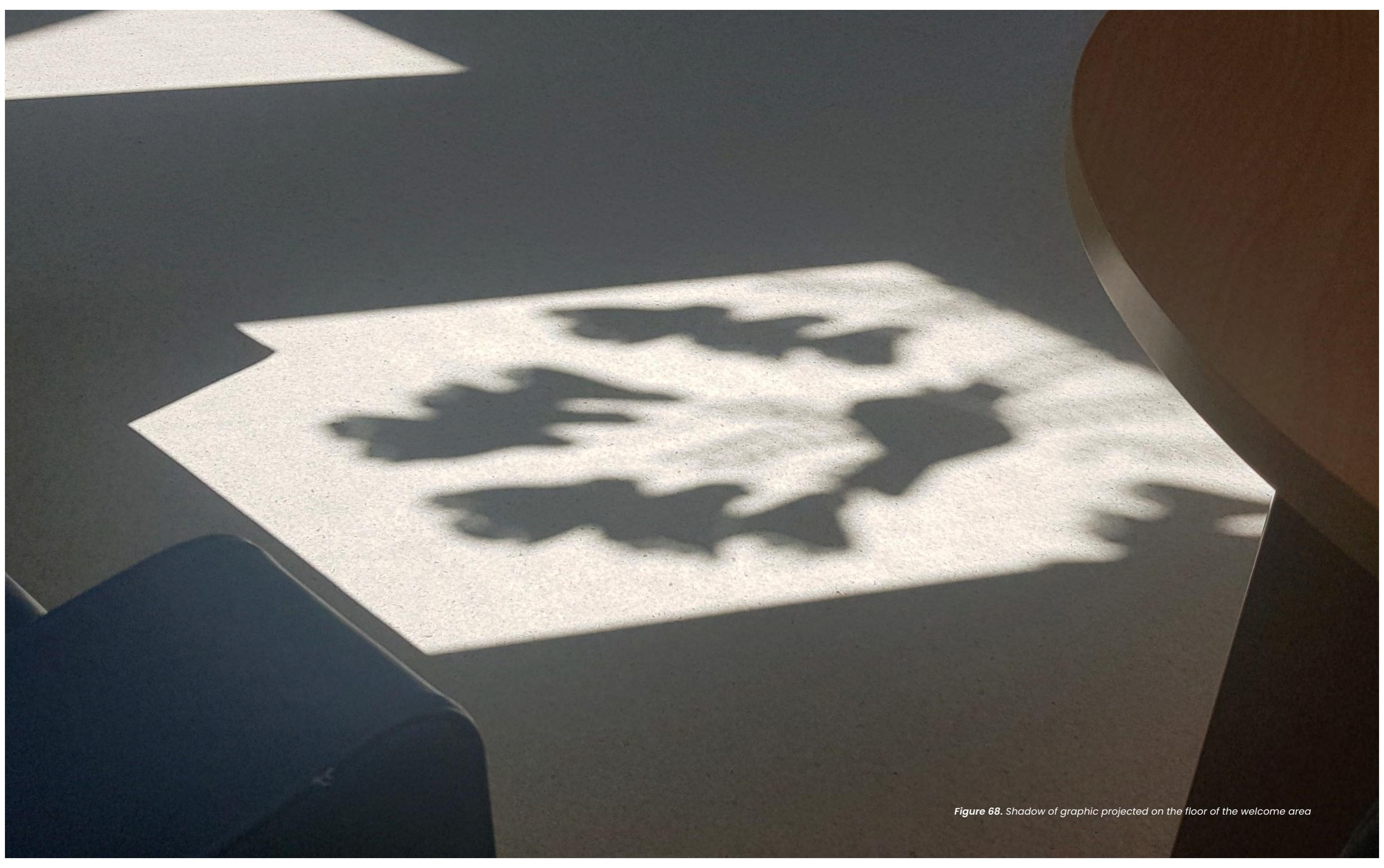


Figure 68. Shadow of graphic projected on the floor of the welcome area

# Third Install at North Shore Hospital

Before installing the third installation, I had a brief conversation with a member of staff who was part of the Māori patient and whānau experience team in Waitematā. During this conversation, I shared a few of my concepts that had been inspired by Te Ao Mārama. They mentioned that this was probably not the most appropriate or informative for the demographic on the stroke ward. They revealed that having graphics of healing flora in this space would probably be more informative and calming than the story of Te Ao Mārama.

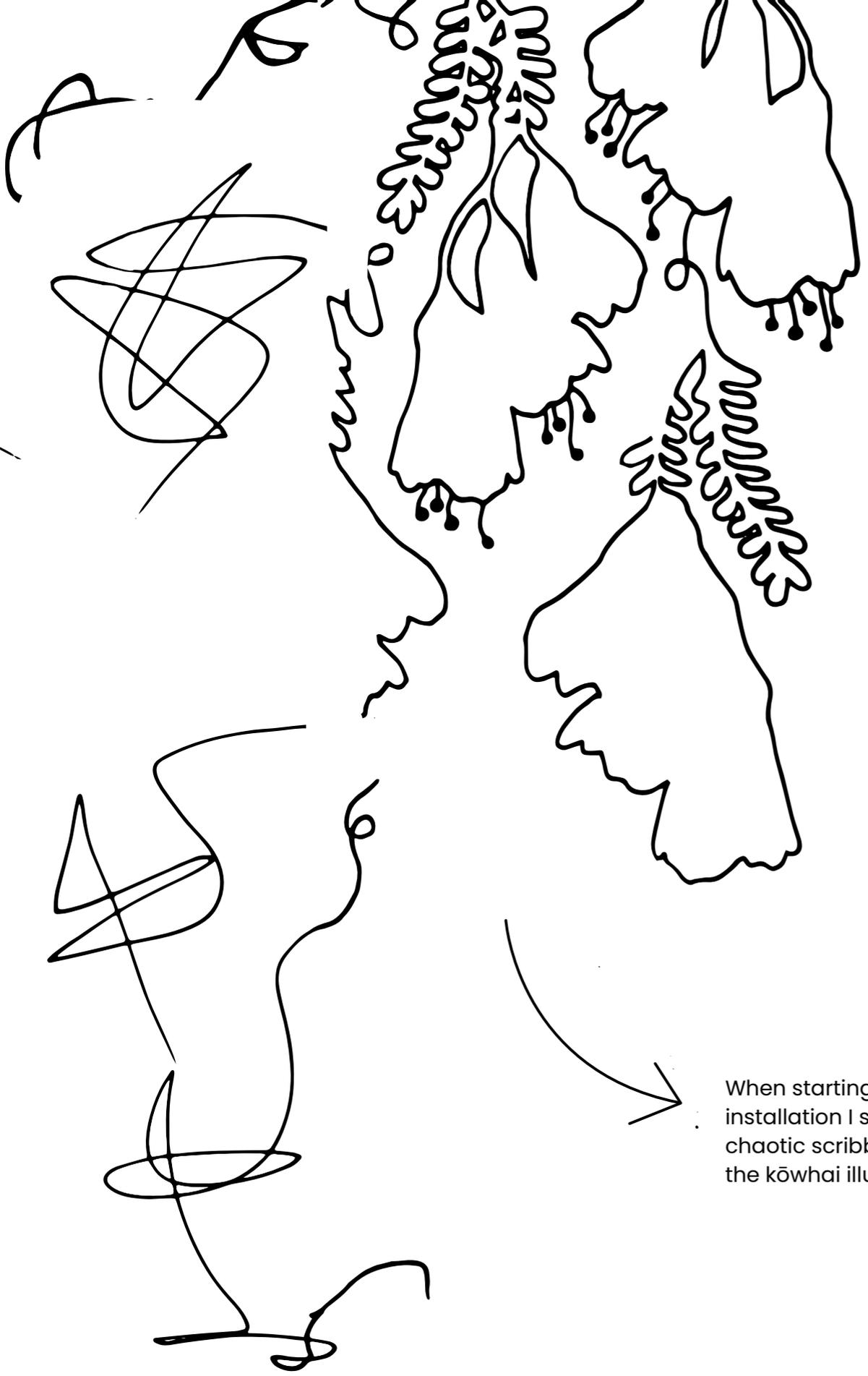
When commenting on the graphics, in particular, they mentioned that having a silhouette of the fauna would be better than the previous one. In particular, the original graphic of the tūī included its eye. The patient experience member commented that for Māori, being looked in the eye by a bird is seen as bad karma and can often bring bad news.

This was good to know and informed the development of my design when moving forward. I also altered the design of the harakeke to be less dense compared to the previous design, allowing more light to shine through.

This led to the installation of the third and fourth concepts. The third concept included a silhouette version of the flora and fauna. This included the harakeke along with a takahe. I chose to incorporate the Takahe as a symbol of hope. Before 1948, the takahe was presumably extinct and is often referred to as the bird that came back from the dead (Te Ara, 2021).

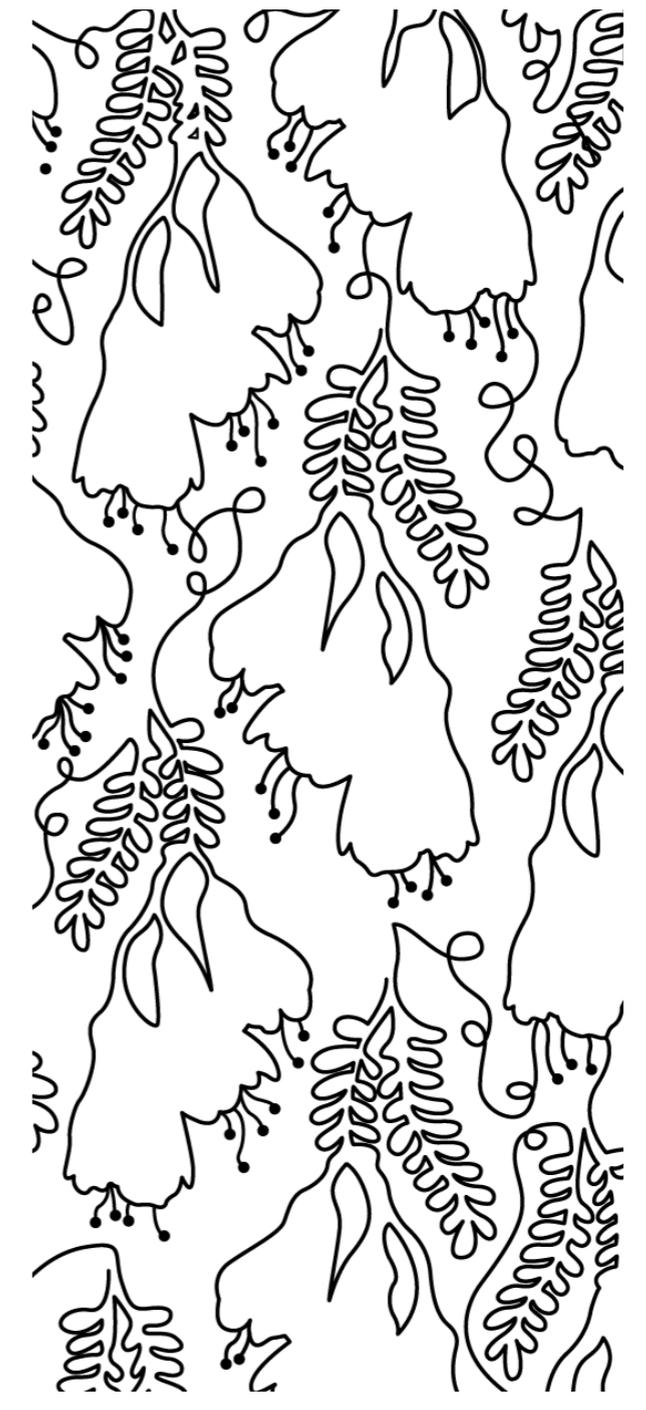
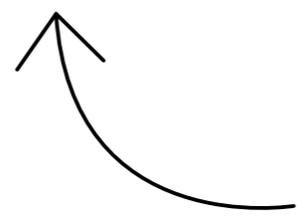
This was followed by the pohutukawa and kereru. The pohutukawa is a tree that many New Zealanders identify with and the nectar produced by the flowers was used by Māori to soothe sore throats (Vennel, 2019).

The second concept was inspired by one of the concepts I created in response to Te Ao Mārama. Combining graphics from the Chris Knox zines and the outlined graphic of the kōwhai and harakeke.



When starting to conceptualise the next installation I sketched out how the chaotic scribbles would transition into the kōwhai illustrations.

The design was created by tracing over the previous kōwhai design and repeating down the art board.



Although I was no longer using the story of Te Ao Mārama, it still inspired a few of my designs as it reflected the story and the patient journey I had been referring to throughout my research.

When I went into North Shore Hospital for the third install I did not notify anyone on the ward. The two senior members of staff that I keep in contact with weren't on the ward this day but informed me over email that I could install the next concepts. This particular install was the first time I had been present in the space in the evening. I was on the ward between 3 pm–7.30 pm. This was interesting when seeing the changes in light in the space. One staff member emailed me a few days after the install mentioning how beautiful and calming the kereru and pohutukawa looked at sunset.

I had never met the staff who worked in the evening, so it was interesting seeing a few new faces. I felt like I was on the ward for the first time again, and that staff had no idea what I was doing or were hesitant when interacting with me. Although one staff member who was transporting patients in and out of the ward kept commenting on the designs and asking questions.

I asked permission to record their comments as data and after reading the information sheet they signed a consent form. They commented on how they missed the tūī and how they felt a connection to it. They mentioned how enlightening nature and art was, especially for those staying on a stroke ward. When I asked what concept they preferred, they mentioned the outlines of the kōwhai were interesting and they had always believed that art had the ability to heal. However, they did add that, unlike the other ones the outlined design felt more like a mural than bringing nature in like the other concepts did.



Figure 69. Concept of outlined kōwhai installed in 'welcome area'



Figure 70. Third and fourth concepts in the 'welcome area' of the stroke ward.



Figure 71. *Silhouette of nature installed on left two windows*



Figure 72. *Chis Knox inspired graphic installed on windows opposite the elevators*



Figure 73. *Takahe and harakeke concept.*



Figure 74. *Kereru and pōhutakawa concept.*

# Feedback from Staff

After installing the third and fourth concepts in the 'welcome area' of the stroke ward, I mentioned to two senior staff members that to move forward I needed to receive feedback on designed concepts. I knew from previous and interviews that due to the tight schedules of staff that it would be hard for them to sit down and take some time to provide feedback.

I thought it would be interesting to see the reaction of staff if I were to remove the installations in the space before carrying out the feedback sessions. Previous installments have consisted of removing the previous installation before putting up another one. Because of this, when removing the current installation, I got the feeling that many of the staff expected me to put something new up in the space. They seemed excited and even mentioned they were interested to see what was to be put next.

The next day, a senior member of staff emailed me commenting on how empty the space felt without the designs and that hopefully, staff would be able to sit down with me and provide feedback.

A few days after removing the installations I returned to North Shore Hospital to carry out one on one feedback sessions with staff. I arrived on the ward and notified a senior member of staff I was here. They directed me to a quiet office space on the ward where the interviews could be conducted. They then sat down with me to provide me with feedback. Questions asked during these feedback sessions included;

***Out of all the installations, which one was more memorable and why?***

***Have the designs impacted your experience on the ward in any way?***

***What colours benefited patients or were there any colours that were a bit too much?***

I interviewed three members of staff, and all of them were drawn to installation that included the kōwhai and the tūī. Commenting on how the brightness of the yellow and the blue lifted the space and gave it a more positive feel. This project is focused on the needs of patients as well their families so it was uplifting to hear one of the staff members say that

***“One lady (patient), in particular, said it was kind of her reason to go out there for a walk... she said it was meaningful to her which I thought was really nice”***

It was interesting to hear one staff member say that they loved the

**“colour and brightness to the space and I think that was more noticeable by the fact that I’ve really noticed that they are not there anymore, and the space feels dull”**

They followed up by saying that they never saw the environment of the ‘welcome area’ as a dull space until I put up something and took it away. This was the one area in the ward that received the most light so it was unusual to now see it as a dull and blank space.

All of the staff interviewed mentioned they use the designs for OT exercises by getting patients to orientate themselves and point out colours. One staff member also mentioned that the designs helped promote the independence of patients.

**“We were saying would you like to come out to the foyer there are some nice designs and artwork. It got people up and about and encouraged them to come back as well and brighter than the mundane repetition of the ward”**

Another staff member commented on how nice it was to go into that space and look out the window and with these colourful graphics and not just the “view of these awful buildings”.

Overall, the staff were drawn to the nature-based designs commenting on how it made the space feel less clinical and that they found many of their patients were now going out to this area of the ward. Not only did it create a nice and calming space for them, but it was also functional when carrying out exercises used in occupational therapy.

# Final Design Output

This project is ongoing. After receiving feedback from staff, I highlighted that the designed concepts of New Zealand flora and fauna were best received by patients and their families. In addition to this, after the feedback sessions, I asked a senior member of staff about activating a corridor on the ward. This corridor was an area that wasn't utilised by patients or staff and was identified as an area where designed installments could be used to communicate the stroke journey.

I plan for the final output of this project to communicate the journey from darkness to light. This story was continuously reiterated throughout my project. The corridor would communicate the 'darkness' that is faced after having the stroke, but with the support of whānau and healthcare professionals, patients head toward hope. This is communicated in the 'welcome area' of the stroke ward. Through observations, I identified the 'welcome area' as an initial touch-point for patients arriving on the ward and the final destination as they leave the ward to continue their recovery journey at home. These installed designs will be supported by a zine communicating this journey.

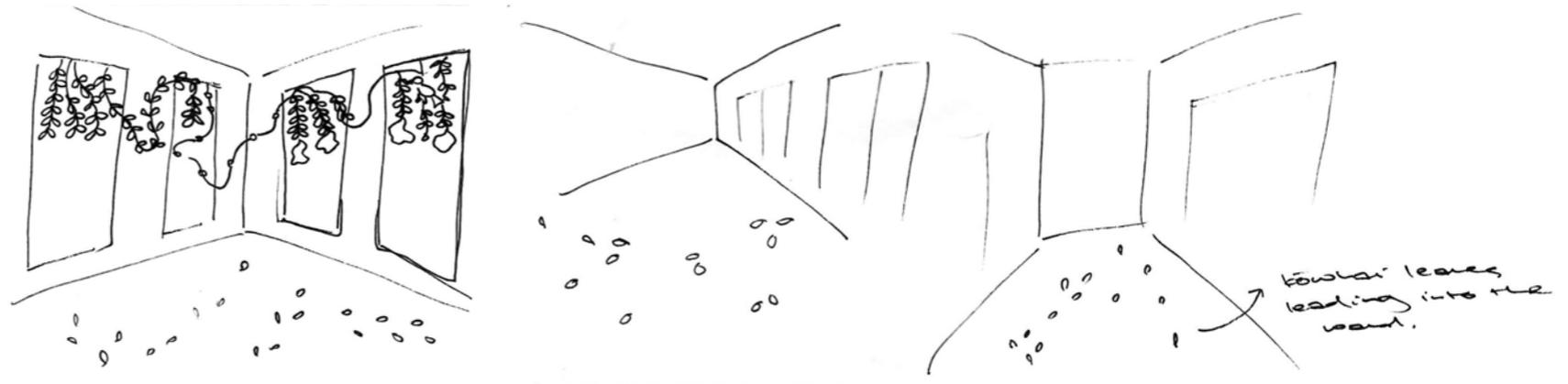


Figure 75. Sketches of what the final output could potentially look like.

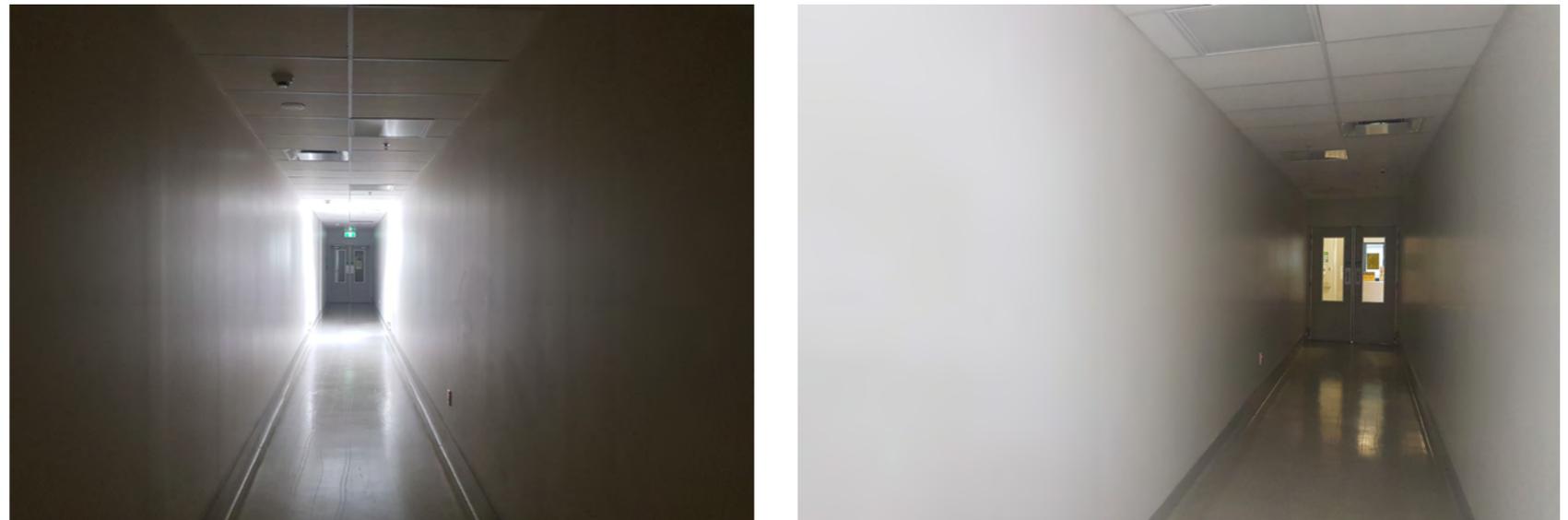


Figure 76. Corridor on ward that has the potential to be activated through graphic design.

# **Discussion**

Throughout this research, I aimed to discover how graphic design could be used to positively impact the stroke ward experience of the patients, and their families and healthcare professionals. Through action research and human-centered design (HCD) methods, I intended to gain an understanding of the lived inpatient experience of a stroke ward, and seek to discover how graphic design could support the recovery of patients in this space. Feedback from staff as well as supporting observations on North Shore Hospital's stroke ward suggested that the installation of designed prototypes created a positive atmosphere on the ward. This confirmed that graphic design has the potential to create a positive experience for those in a hospital environment.

Previous research suggested that the hospital environment is detrimental for those who are healing from a stroke (Daemen, 2014). Through HCD methods, staff working in North Shore Hospital's acute stroke ward were given the opportunity to share information and thoughts around the needs of stroke patients.

This was principally by participating in expert interviews and being part of observations. Staff shared their experiences of how a clinical environment can impact the healing process of stroke patients and added how often the impairments caused by a stroke can affect how people respond to their surrounding environment.

This project did not set out to 'cure' stroke patients through graphic design but rather explore the potential of a graphic design intervention when impacting the experience in the hospital environment. Through activating the 'welcome area' of North Shore Hospital's stroke ward through graphic design, I aimed to provide some hope and possibly even joy to those healing and recovering from stroke.

Throughout my research, I was inspired by Elke Daemen's research. Her project 'The Impact of the Environment on the Experience of Hospitalized Stroke Patients' (Daemen, 2014) sought out how the physical environment of a hospital affects the experience of neurology

patients and their families. Daemen carried out a contextual inquiry as well as participant observations to gather data around the healing journey of patients who have experienced a stroke and how the environment of a hospital can aid this journey. From this, she discovered that brain damage caused by a stroke can affect how they do or do not respond to an environment. When presented in the environment of a hospital, patients are often more fearful and feel unsupported. In addition, Daemen (2014) suggests that the environment can aid the healing process of stroke patients through little changes in health spaces.

These include the control of stimulus load, social support, balance between clinical and personal environment, structured days, undisturbed sleep, and providing patients and their families through information. The importance of holistic healing was highlighted throughout Daemen's (2014) research. Prompting the question of how do you bring nature into a sterile environment of a hospital where infection control is the main concern? Through two-dimensional graphics of

nature, I was able to remind visitors of aspects of the 'natural world'. Graphically re-imagining the space for those on a stroke ward to relax and become detached from the reality of the ward for a moment.

Graphic design vinyl applied prototypes tested in the stroke ward environment were positively received by healthcare professionals on the ward as well as a senior rehabilitation lecturer who has previously carried out research with stroke patients. When sharing feedback on the designed prototypes, one staff member described how the second and third installation that included the kōwhai and tūi were one of their patient's "reasons to go out there for a walk...she said it was meaningful to her". This comment affirmed that the New Zealand nature installations had a positive impact on the intended user despite not being able to gather direct feedback from patients due to ethical reasons.

# Graphic Design in the Stroke Ward Environment

Past literature confirmed that clinical environments have a negative impact on the recovery of patients. The 'welcome area' of the ward was identified as an area of opportunity by staff on North Shore Hospital's stroke ward to create a positive experience through designed installations. Staff highlighted that this area that was commonly used by healthcare professionals, patients, and their families as it is the first point of contact when they enter the ward. Through observations it was also a space that was the last point of contact for patients as they were leaving the ward and continuing on their recovery journeys at home.

The 'welcome area' was a space where I could prototype and experiment, minimizing the potential impact in clinical spaces or areas where patients undergo rehabilitation. It also meant I could carry out research without getting in the way of healthcare professionals and patients on the ward. There is further opportunity to implement graphic design in

family rooms on the ward as well as spaces that are not utilized by staff or patients and could be activated for future rehabilitation purposes. Tanuwidjaja (2015) revealed that in patients' rooms, something so minimal as colour can lower the stress and anxieties many people face in the healthcare environment.

Through multiple observations at North Shore Hospital's Stroke Ward, I was able to gain further understanding of how people responded to the surrounding environment. A key observation that was made was the lack of interaction people had with the environmental cues present in the space. This was emphasized in the 'welcome area' of the ward. A communal space that was supposed to be used by patients and their families and encourage interaction was used merely as a passage way for staff, patients, and their families to come and go. Healthcare professionals and visitors would move quickly through the space, not acknowledging the environment

around them, making the environment feel uneasy. Patients would avoid the area and utilize the corridors of the ward instead.

When determining what visuals would support the lived experience of a stroke ward, I referred to previous literature surrounding holistic healing. After observing the effect holistic environments have on the recovery of patients, English Nurse Florence Nightingale pushed for hospitals to become less clinical to improve the patient experience (Fornara, 2012). I hoped to incorporate the same values of holistic healing by replicating nature through visual design. Visuals of nature brought brightness and colour to the space. I referred to the Maggie centers in the UK (Maggie's, 2021) when identifying how nature could be incorporated into a health environment. Although I couldn't physically change the architecture of the stroke ward at North Shore Hospital it gave me an idea of how nature can create a calming environment for those who are healing.

Research has suggested that natural scenes and domestic scenery in art support the recovery of patients compared to more abstract artwork that can increase the anxiety many patients already face (Daykin, 2008). Nature-orientated designs in the environment of a stroke ward provided a positive distraction for patients and their families as well as being utilized by healthcare professionals when facilitating physiotherapy exercises (Ulrich, 1991). The well-being of people is often cultivated when the surrounding environment provides some degree of constructive stimulation. Colour and artwork that have positive meanings are known to have an affirmative impact on patients (Jiang, 2020). When returning to replace each installation, staff on the ward would express the difference the designs have made when making patients and visitors feel relaxed and supported. When comparing observations in the 'welcome area' before and during the installments of designed prototypes reassured me that the designs created interest from

patients and staff and encouraged them to spend more time in the area. Staff affirmed that the installments had made a difference in their daily routines and even prompted patients to be more independent and gave them a reason to interact with the 'welcome area' more.

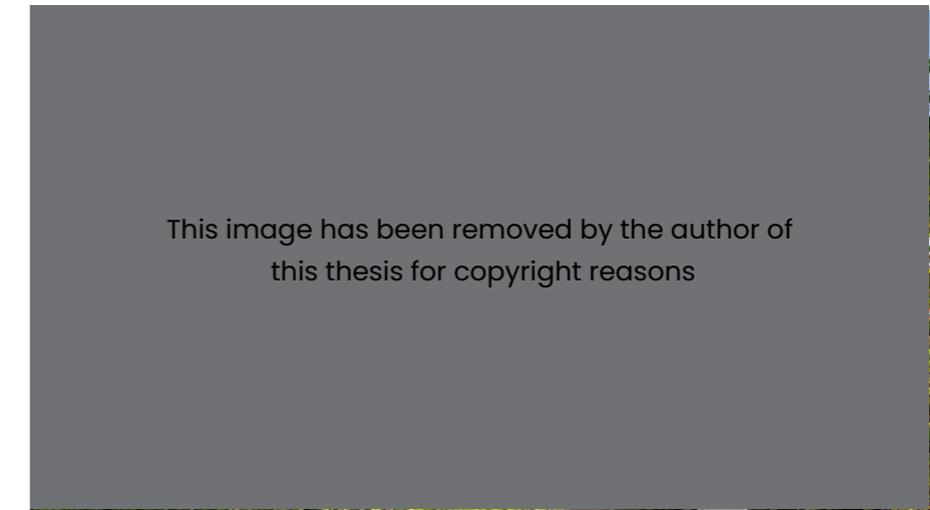


Figure 77. Maggie's (2021). *Maggie's Centres Leeds*

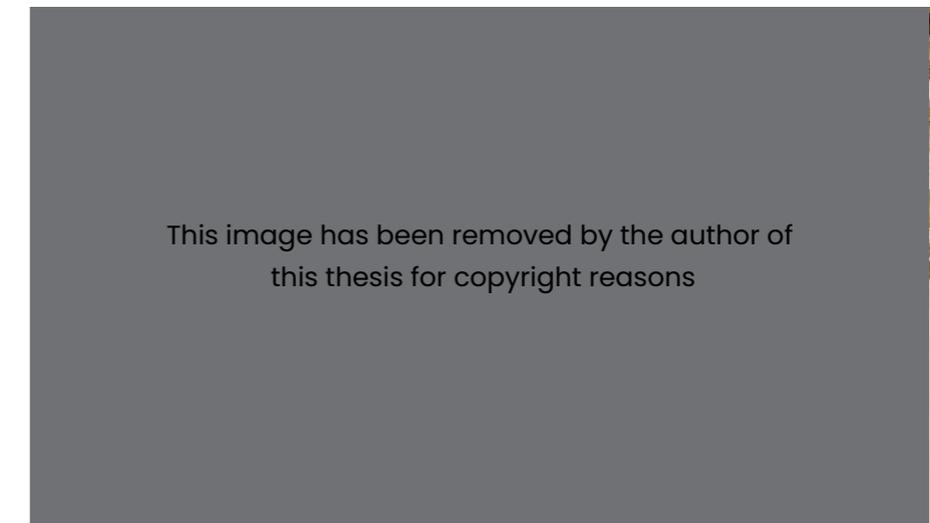


Figure 78. Maggie's (2021). *Maggie's Centres Leeds*

# Design Research in Healthcare

It was important to adopt principles of human-centered design by using the data I received from staff to influence the creation of designed outcomes in a healthcare environment. This approach offers designers the opportunity to have a direct impact on a health outcome through empathizing with healthcare users and focusing on the developments in healthcare rather than the disease. (Naar, 2015). Despite this, Groenvelde (2018) highlights that there are many challenges when undertaking design research in a healthcare setting.

One challenge identified is the involvement of end-users in the research (Groenvelde, 2018). Due to ethical constraints I was not permitted to work directly with stroke patients. However I was able to work with Healthcare Professionals, which brought integrity to my approach. The time restrictions healthcare professionals faced was made obvious when carrying out expert interviews with staff in North Shore Hospitals' stroke ward.

Although I informed staff on the ward of the reasoning behind my research and the importance of their contribution, there was little participation despite the apparent interest and enthusiasm for the research. Senior members of staff would often comment on the lack of time they had and how it impacted their ability to facilitate meaningful relationships with their patients.

The patterns of staff's shifts can also hold staff back from participating in research (Roxburgh, 2006). Although this was the case, when I started installing the designed prototypes in the ward, staff started interacting in frequent conversation with me. This helped reassure me that graphic design has the ability to create a positive impact on the space and bring some joy to the healthcare professionals in that space. When I returned to carry out a final observation and feedback sessions in the space, the staff went back to having little or no interaction with me.

The implications not being able to talk to patients was made even more obvious from the lack of participation by staff. Staff approached me whilst I was installing but because of the informality of these reactions I was not able to record their feedback as data. With further involvement of staff, I may have had a deeper understanding of the journey of stroke and be able to communicate this further in my research.

Before starting this research project, I was aware of a few of the challenges most designers face when performing research in healthcare. One of these challenges being the difficulty of becoming acquainted with the procedures and culture of healthcare (Groenvelde, 2018). I thought that my biggest challenge in this project would be getting permission from staff to install my designed outcomes, but instead it was the navigation around the schedules of staff. One of the senior staff members on the ward informed me that

they often are unaware of how their shift will run and that the easiest way to get staff to participate in research is through a tick-box survey rather than a sit-down interview around the schedules of staff.

I understood that the patients are the number one priority of staff and not the participation in my research. I was unaware of the implications that the lack of involvement from staff would have caused. I was unable to get an in-depth understanding of the challenges stroke patients face in the environment of a stroke ward and what the recovery journey looks like for patients. This meant that when creating designed outcomes (from the Chris Knox zine to the designed installations on the ward) I was relying heavily on past literature.

The lack of participation led me to strategize as I removed the third installation before feedback sessions with staff. Although I understood the lack of time healthcare professionals

had when participating in research, I felt in order to gain constructive feedback I needed to make a statement about how important their participation was in design research. When engaging stakeholders (healthcare professionals) in research, Rodriguez-Calero (2020) used designed prototypes as a strategy to engage stakeholders in research to facilitate conversations between designers and stakeholders.

Through installing designed prototypes in the 'welcome area' of the stroke ward I witnessed how design can aid participation and communication between staff and designers researching in a healthcare space. I had not anticipated that my designed installations would create engagement with staff. Through designed prototypes designers have the ability to learn the unknown from contributing stakeholders (Jensen, 2017).

This is an opportunity for future research whereby prototyping and installing phases

of the research are planned as a method of engagement from the outset as from my project this was an effective means of engagement with staff on the stroke ward. By incorporating making and prototyping in earlier phases of the research, designers have the ability to evoke discussion and co-create with stakeholders to develop in-depth ideas (Sanders, 2013).

# Limitations of Research

Patients were unable to be recruited in this research as it was outside of the scope of this research due to ethical limitations. I was advised this was due to patients in this space being vulnerable due to the impairments caused by a stroke and it would not be appropriate to engage with them if they were not able to comprehend the reasons behind my research and give written and verbal consent. This meant that the demographic of patients wasn't thoroughly represented during observations and expert interviews.

Given that they are key users in the environment of a stroke ward, it was unfortunate when not receiving their opinions around the issues the healthcare environment has on their recovery journey. In Belinda Paulovich's research (2015) she was also unable to work with patients when creating a designed resource to aid communication between healthcare professionals and paediatric patients. She was unable to work with patients as there was a fear that the presence of an unfamiliar researcher would impact the outcomes of the research (Paulovich, 2015. p12).

Although this was the case, she worked closely with healthcare professionals to gain a deeper understanding of the patient's journey. I considered this when working with healthcare professionals to gain a further understanding of the inpatient experiences on a stroke ward.

Many opportunities that were planned as part of this research including talking to previous patients who had experienced a stroke, ward visits were disrupted by the events of COVID – 19 and weren't able to take place. This meant I was unable to gather information from essential end-users of my project and affected the partnership between myself and key stakeholders. I would have had more opportunities to prototype and even talk to staff on the ward I feel that they could have shown more interest when wanting to participate in my research. From emails with staff during covid lockdowns, I got a sense that being a healthcare professional working in a hospital space during a pandemic had added further stress to their roles.

Like myself, they were now also restricted in terms of contact with patients and giving time outside of their rostered shifts. While I acknowledge that the events of coronavirus made research in a healthcare space difficult it also showcased the future reality of design research projects in healthcare to come.

Another limitation that could have impacted the research was the lack of awareness I had around the benefits my designed installations could have had if the view of Te Ao Māori was at the first and foremost center of the HCD design process. From conversations with a patient experience staff member it was clear that if I intended to carry on creating designs inspired by the creation story of Te Ao Marama, that the involvement of Māori participants from the beginning would have been beneficial. Māori remained a key role throughout my research, but I acknowledge that the outcome of my research would have been different if there was the participation of Māori from the beginning.

# Further Research

This project only engaged healthcare professionals and experts who have previously worked with stroke patients. I have identified several opportunities to build on this exploratory research. Graphic design has the ability to activate more spaces in the ward other than the 'welcome area' to impact the overall experience of healthcare professionals, patients and their families in this space. In addition to supporting the recovery journey of patients through graphic design, there is also an opportunity to inform them of this journey and provide hope that there is more to life after experiencing a stroke.

There is also further opportunity when gathering feedback on designed installations in the 'welcome area' of space and receiving feedback from patients and families on the final designed installation. When previously installing designed prototypes in this space, healthcare professionals as well as family members and patients engaged with me.

Although I couldn't record the feedback patients shared with me, it reflected the impact that patients' voices may have when designing in the environment of a stroke ward. Future research has the potential to include stroke patients who are back in the community in the process to better understand the opinions of healthcare professionals in the research. This research engaged healthcare professionals at the beginning of the research (observations and expert interviews) and toward the end when receiving feedback on designed prototypes. There is an opportunity to include these participants in the concept development phases of the research. This would allow the researcher to be aware of the needs of the user at all times and carry out the methods and process of EBCD (Experience-based co-design) properly. When addressing the needs of patients, the inclusion of Māori from the beginning of the project would be beneficial when addressing the needs of stroke patients in a stroke ward and designing through a Māori lens.

Graphic design (unlike spatial and product etc) can be relatively fast when creating low-cost interventions. This was useful when experimenting and prototyping in the 'welcome area' of the stroke ward and meant that my designs were low risk whilst still having the potential to positively impact people in a healthcare space. There is further opportunity for graphic design to influence a cultural change in healthcare.

This could be done by engaging staff through creative methods, including prototyping. As more engagement by staff could mean that designers in the future are able to design better experiences through a patients and family lens. This adds to the bigger opportunity when designing through a Maori lens and engaging with whānau from the beginning of a project.

It is also important to acknowledge that although graphic design has the potential to change the feel of a healthcare environment that this can be supported by communication material. During my research staff on the ward as well as a senior rehabilitation lecturer informed me that many stroke patients are bed ridden due to impairments caused by stroke. So, although graphic design had the ability to activate the 'welcome area' of the stroke ward, many patients who are bed ridden may only experience it for a moment when being transported to different areas of the hospital. There is an opportunity to create material that supports the designed installations in this space and that can carry what is experienced in the 'welcome area' to the bed sides of patients.

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# **Appendices**

Appendix 1 - Ethics Application 20/258

Appendix 2 - Consent Form

Appendix 3 - Information sheets and supporting advertisement material.

Appendix 4 -Final Installation at North Shore Hospital

# Appendix One

Please do not staple your application

**AUT**  
TE WHANAKA AROHĀ  
O TĪMĀKĀRIKĀKAU

**Auckland University of Technology Ethics Committee (AUTEC)**

**EA1**

**APPLICATION FOR ETHICS APPROVAL BY AUTEC**

Please print this application single sided in grayscale and do not staple. Once this application has been completed and signed, please read the notes at the end of the form for information about submission of the application for review.

**NOTES ABOUT COMPLETION**

- Ethics review is a community review of the ethical aspects of a research proposal. Responses should use clear everyday language with appropriate definitions being provided should the use of technical or academic jargon be necessary.
- The AUTEC Secretariat and your AUTEC Faculty Representative are able to provide you with assistance and guidance with the completion of this application which may help expedite the granting of ethics approval.
- The information in this application needs to be clearly stated and to contain sufficient details to enable AUTEC to make an informed decision about the ethical quality of the research. Responses that do not provide sufficient information may delay approval because further information will be sought. Overly long responses may also delay approval when unnecessary information hinders clarity.
- AUTEC reserves the right not to consider applications that are incomplete or inadequate. Please do not alter the formatting or numbering of the form in any way or remove any of the help text.
- Comprehensive information about ethics approval and what may be required is available online at <http://aut.ac.nz/research/ethics>.
- The information provided in this application will be used for the purposes of granting ethics approval. It may also be provided to the Graduate Research School, the Research and Innovation Office, or the University's insurers for purposes relating to AUT's interests.
- The form is focussed around AUTEC's ethical principles, which are in accordance with the Guidelines for the approval of ethics committees in New Zealand.

To respond to a question, please place your cursor in the space following the question and its notes and begin typing.

**A. Project Information**

**A.1. What is the title of the research?**

If you will be using a different title in documents to that being used as your working title, please provide both, clearly indicating which title will be used for what purpose.

Stroke of Communication (working title)

**A.2. Is this application for research that is being undertaken in stages?**  Yes  No

If the answer is 'Yes' please answer A.2.1 and the following sections, otherwise please answer A.3 and continue from there.

**A.2.1. Does this application cover all the stages of the research?**  Yes  No

If the answer is 'No' please provide details here of which stages are being covered by this application, otherwise please answer A.3 and continue from there.

**A.3. Who is the applicant?**

When the research is part of the requirements for a qualification at AUT, then the applicant is always the primary supervisor. Otherwise, the applicant is the researcher primarily responsible for the research, to whom all enquiries and correspondence relating to this application will be addressed.

Dr Stephen Reay

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**A.7. Further information about the applicant.**

**A.7.1. In which faculty, directorate, or research centre is the applicant located?**

Art and Design, Design and Creative Technologies

**A.7.2. What are the applicant's qualifications?**

PhD, MPhil, MForSc, BSc

**A.7.3. What is the applicant's email address?**

An email address at which the applicant can be contacted is essential

stephen.reay@aut.ac.nz

**A.7.4. At which telephone numbers can the applicant be contacted during the day?**

0212727332/921 9999 ext.6719

**A.8. Research Instruments**

**A.8.1. Which of the following does the research use:**

a written or electronic questionnaire or survey  focus groups  interviews  
 observation  participant observation  ethnography  photographs  
 videos  other visual recordings  a creative, artistic, or design process  
 performance tests  
 some other research instrument (please specify)

Please attach to this application form all the relevant research protocols. These may include: indicative questions (for interview or focus groups); a copy of the finalised questionnaire or survey in the format that it will be presented to participants (for a written or electronic questionnaire or survey); a protocol indicating how the data will be recorded (e.g. audiotape, videotape, note-taking) for focus groups or interviews (Note: when focus groups are being recorded, you will need to make sure there is provision for explicit consent on the Consent Form and attach to this Application Form examples of indicative questions or the full focus group schedule. Please note that there are specific confidentiality issues associated with focus groups that need to be addressed); a copy of the observation protocol that will be used (for observational); full information about the use of visual recordings of any sort, including appropriate protocols and consent processes; protocols for any creative, artistic, or design process; a copy of the protocols for the instruments and the instruments that will be used to record results if you will use some other research instrument.

**A.8.2. Who will be transcribing or recording the data?**

If someone other than the applicant or primary researcher will be transcribing the interview or focus group records or taking the notes, you will need to provide a confidentiality agreement with the Application Form.

The primary researcher, Katie Twisleton

**A.8. Please provide a brief plain English summary of the research (300 words maximum).**

Please provide a simple response to each of these three questions: What are you trying to find out? Who are you wanting to involve? and What would you like them to do for you?

After experiencing 3 stroke many people are left with communication difficulties. Not being able to communicate means people are unable to convey experiences, needs and thoughts to their families and need support from healthcare professionals. The many workloads of healthcare professionals means they often don't have the time to communicate thoroughly with their patients, unable to support their individual needs as well as mental wellbeing.

New Zealand's New Zealanders experience a stroke each year, with two thousand of these people living away due to stroke-related issues. This project explores how digital design can provide an opportunity to aid communication between those experiencing an stroke and, aiming to improve the mental experience of healthcare professionals, patients and their families in the stroke world. Through human-centred design and design thinking, I aim to gain an understanding of healthcare professionals' experiences in a stroke ward and identify opportunities when aiding communication between those awaiting in a stroke ward through, for example, using environmental graphics.

<sup>1</sup> Emily S. J. King, Nicola M. Kaye, Kathryn M. S. Phoenix, Lisa E. Arnold. "Using a Human-Centred Design Approach to Improve the Usability of Stroke Rehabilitation: A Qualitative Study." 2018.

<sup>2</sup> The Stroke Foundation. "What's After a Stroke?" The Stroke Foundation NZ. Last modified 2020. Accessed 2021. <https://www.stroke.org.nz/the-after-stroke>.

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**A.7. Additional Research Information**

**A.7.1. Is this research an intervention study?**  Yes  No

An intervention study is defined in NEAC's [Approved Ethical Standards for Health and Disability Research and Quality Improvement](#) as "A study in which an investigator controls and studies an intervention(s) provided to participants for the purpose of adding to knowledge of the health effects of that intervention(s). The term 'intervention study' is often used interchangeably with 'experimental study'. Many intervention studies are clinical trials." (p.247)

**A.7.2. Is this Health and Disability Research?**  Yes  No

Broadly speaking, health and disability research should:

- aim to answer a question or solve a problem and therefore generate new knowledge to prevent, identify and treat illness and disease
- have the ultimate purpose of maintaining and improving people's health – in the sense of a state of physical, mental and spiritual wellbeing, rather than simply the absence of disease or injury
- support disabled people to be included, participate more, exercise choice and control, and be more independent
- address health and disability disparities
- contribute to whānau ora.

This description is necessarily broad; we acknowledge that people's health is influenced by a much wider range of social factors than their health care. (NEAC's [Approved Ethical Standards for Health and Disability Research and Quality Improvement](#) p.25)

**A.7.3. Does this research involve people in their capacity as consumers of health or disability support services, or in their capacity as relatives or caregivers of consumers of health or disability support services, or as volunteers in clinical trials (including, for the avoidance of doubt, bioequivalence and bioavailability studies)?**  Yes  No

**B. The Ethical Principle of Research Adequacy**

AUTEC recognises that different research paradigms may inform the conception and design of projects. It adopts the following minimal criteria of adequacy: the project must have clear research goals; its design must make it possible to meet those goals; and the project should not be trivial but should potentially contribute to the advancement of knowledge to an extent that warrants any cost or risk to participants.

**B.1. Is the applicant the person doing most of the research (the primary researcher)?**  Yes  No

If the answer is 'No' please answer B.1.1 and the following sections, otherwise please answer B.2 and continue from there.

**B.1.1. What is the name of the primary researcher if it is someone other than the applicant?**

Katie Quinn Twisleton

**B.1.2. What are the primary researcher's completed qualifications?**

Bachelor of Design (Communication Design)

**B.1.3. What is the primary researcher's email address?**

An email address at which the primary researcher can be contacted is essential.

kqt212831@gmail.com

**B.1.4. At which telephone numbers can the primary researcher be contacted during the day?**

(+64)021 150 8302

**B.2. Is the primary researcher**

an AUT staff member  an AUT student

If the primary researcher is an AUT staff member, please answer B.2.1 and the following sections, otherwise please answer B.3 and continue from there.

**B.2.1. In which faculty, directorate, or research centre is the primary researcher employed?**

If the response to this section is the same as that already given to section A.4.1 above, please skip this section and go to section B.2.2.

**B.2.2. In which school or department is the primary researcher employed?**

**B.3. When the primary researcher is a student:**

**B.3.1. What is their Student ID Number?**

16946184

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B.3.2. In which faculty are they enrolled?

Faculty of Design and Creative Technologies

B.3.3. In which school, department, or Research Centre are they enrolled?

School of Art and Design

B.4. What is the primary researcher's experience or expertise in this area of research?

Where the primary researcher is a student at AUT, please identify the applicant's experience or expertise in this area of research as well.

The applicant Stephen Reay is the director of Good Health Design, which is a team of interdisciplinary researchers and creatives based in AUT's School of Art and Design and aims to use design to empower and enrich the lives of those in our communities. He has supervised several undergraduate and postgraduate design and health related research projects.

The primary researcher, Kate Twissleton, has experience using design thinking approaches through her Bachelor of Design (Communication Design) at AUT, with her 'The New Zealand Curriculum' project that used design thinking as a method to communicate coherently to teachers and students around creative freedom in New Zealand's education system. She has had some experience working on a healthcare project through her summer studentship with Good Health Design. Through communicating with healthcare professionals at the Fraser McDonald Unit located at Auckland Hospital, Kate was able to design a web-based service resource for older adults with dementia.

B.5. Who is in charge of data collection?

The primary researcher, Kate Twissleton

B.6. Who will interact with the participants?

The primary researcher, Kate Twissleton

B.7. Is this research being undertaken as part of a qualification?

If the answer is 'Yes' please answer B.7.1 and the following sections, otherwise please answer B.8 and continue from there.

B.7.1. What is the name of the qualification?

Master of Design

B.7.2. In which institution will the qualification be undertaken?

Auckland University of Technology

B.8. Details of Other Researchers or Investigators

B.8.1. Will any other people be involved as researchers, co-investigators, or supervisors?

If the answer is 'Yes' please answer B.8.1.1 and the following sections, otherwise please answer B.8.2 and continue from there.

B.8.1.1. What are the names of any other people involved as researchers, investigators, or supervisors?

Stephen Reay

David Cowston

B.8.1.2. Where do they work?

School of Art and Design

B.8.1.3. What will their roles be in the research?

Co-Supervisors

B.8.1.4. What are their completed qualifications?

Dr Stephen Reay, PhD, MPhil, MForSc, BSc

David Cowston, MA, PGCE

B.8.2. Will any research organisation or other organisation be involved in the research?

If the answer is 'Yes' please answer B.8.2.1 and the following sections, otherwise please answer B.9 and continue from there.

B.8.2.1. What are the names of the organisations?

Yes  No

Yes  No

Yes  No

B.8.2.2. Where are they located?

B.8.2.3. What will their roles be in the research?

B.9. Why are you doing this research and what is its aim and background?

Please provide the key outcomes or research questions and an academic rationale with sufficient information, including relevant references, to place the project in perspective and to allow the project's significance to be assessed.

Background

After experiencing a stroke many people are left with a communication disability, leaving them unable to read, write or comprehend speech.<sup>3</sup> This creates challenges for healthcare professionals and family members when trying to communicate with stroke patients.

Healthcare professionals also see the environment of a stroke ward adding to difficulties faced when communicating with stroke patients due to it being a place of unfamiliarity and could be described as "being in a foreign country."<sup>4</sup>

The ability graphic design has when being able to communicate to a wide range of audiences is often overlooked by the healthcare system as "the use of graphics is not a strategy generally accepted and adopted by health authorities."<sup>5</sup>

By exploring how those operating in a stroke ward interact with visual and graphic cues present within this environment, I aim to identify an opportunity to aid communication between those operating in a stroke ward in order to positively impact the overall experience of healthcare professionals, patients and families in North Shore Hospital's Stroke Unit.

Aim

This project will explore and question: How might graphic design initiate opportunities to support better user-experiences in a stroke ward?

B.10. What are the potential benefits of this research to the participants, the researcher, and the wider community?

Participants

This research will benefit those working and recovering in North Shore Hospital's Stroke Unit. Healthcare professionals will be invited by the primary researcher to take part in this research practice. For example, nurses and occupational therapists (and other clinical experts) will be asked to reflect on their practice/experiences within the environment of a stroke ward and what opportunities they see for graphic design when impacting the overall experience of those within the ward.

The staff at North Shore Hospital believe that the outcome will not only be valuable for them when assisting communication between themselves and their patients, but also provide some relief for patients and their families when undergoing treatment in the ward. This project will also benefit patients who are admitted into North Shore Hospital's Stroke Unit in the future, when focusing on positively impacting their overall experience within the environment of a stroke ward.

Researcher

As a graphic designer newly introduced to the potential design has in healthcare, the researcher aims to improve their skills when using human-centered design as well as using graphic design as a tool to make a positive contribution to the healthcare system. The researcher would also like to contribute to the field of stroke care and rehabilitation further.

Wider Community

<sup>3</sup> Felicity A.S Bright, Nicola M Rajes, Kathryn M McPherson, Linda E Wormal. "Engaging People Experiencing Communication Disability in Stroke Rehabilitation: A Qualitative Study." 2018

<sup>4</sup> Carley, Louise, Rachel Peery, Karen Ashburn. "Living in a foreign country": experiences of staff-patient communication in inpatient stroke settings for people with post-stroke aphasia and those supporting them. Disability and Rehabilitation, 2020

<sup>5</sup> Dowse, R. Using visuals to communicate medical information to patients with low literacy. Adult Learning, 15(1-2), 22-25, 2004

The research will benefit those within the wider community from the information gathered as it may have broader applicability to the field of healthcare, particularly around understanding how graphic design can positively impact those within healthcare.

As design "rather than being centered on the disease, these developments shift the focus of healthcare more towards the experiences, values, and quality of life of patients and their participation in care and treatment."<sup>6</sup> The developments Greenfield<sup>7</sup> talks about is the progress the healthcare system has made by being open to designed solutions to problems rather than relying solely on medicine based solutions.

This research will contribute to the rehabilitation of stroke patients within North Shore Hospital's Stroke Unit, providing healthcare professionals in this area to better communicate to patients and their families, which will positively impact their recovery as well as the overall experience of current and future stroke patients within the ward.

B.11. What are the theoretical frameworks or methodological approaches being used?

Human-Centered Design

Human-centered design is a "unique approach to problem solving."<sup>8</sup> This approach ensures that the researcher learns directly from the people who create a final output that is the most "desirable, feasible, and viable for the people you are designing for."<sup>9</sup> Having had no experience with stroke myself or within my family, I have little tacit knowledge around what it feels like to go through a stroke and undergo rehabilitation. Through human-centered design, I aim to learn from the user to identify an opportunity to improve the experience of those within a stroke ward.

Co-Design

Co-design expands on human-centered design as it allows "users to become part of the design team as experts of their own experience."<sup>10</sup> This methodology allows me to acknowledge the needs of the users during every step of the design process and makes sure that participants engage in chosen methods in the research. Through using co-design I aim to observe, consider and understand the needs of the user to design an outcome that will positively impact the experience of those in a stroke ward.

B.12. How will data be gathered and processed?

Please provide your data collection protocols, describing step by step how you will be interacting with participants when collecting data.

Expert Interviews

Healthcare professionals working on Ward 2 (NSH stroke ward) (e.g. nurses and occupational therapists) will be invited to participate in the research to reflect on their experience within a stroke ward and what opportunities they think graphic design could have in this environment when positively impacting the overall experience of those operating in a stroke ward. These interviews will be conducted with Nurses and Occupational Therapists working in North Shore Hospital's Stroke Unit.

Academics experts (researchers) with experience and knowledge with stroke and communication disabilities of stroke patients will also be recruited into the research.

Each interview will be 30-60 minutes. Data will be collected through notation as well as audio recording with participants given written and verbal consent. The questions will be open-ended and semi-structured, allowing for discussion around the topic related to each question. This will allow participants to openly share their views on how graphic design might be used in the environment of a stroke ward to positively impact the experience of those in the ward and to help aid communication between staff and patients (and families). Participants may also be asked to reflect on designed concepts and prototypes in subsequent interactions.

Observations

Observation is a key method used in human-centered design to get a realistic idea of what specific needs of the user are and "understand the nature of the problem itself."<sup>11</sup>

<sup>6</sup> Kucemond, Rio, Trissa Delam, Rowdyen Boon and Patricia O'Grady. Challenges for design researchers in Australia. Design for Health, 2:2, 305-320, (2018). DOI: 10.1080/24733142.2018.1541089

<sup>7</sup> Ibid

<sup>8</sup> IDEO. (2011). The Field Guide to Human-Centered Design. Retrieved from <http://www.ideo.com/resources/>

<sup>9</sup> Ibid

<sup>10</sup> Nair, Jenny, Andrew Zimmerman, Kirk Boland, Aaron Sklar. The Human-Centered Health System. Transforming Healthcare with Design. Orlita, Qatar World Innovation Summit for Health, 2019

<sup>11</sup> Doblin A. Norman. 2011. The Design of Everyday Things: Revised and expanded edition. Basic Books.

The primary researcher will approach the Charge Nurse operating in Ward Two, North Shore Hospital's Stroke Unit to gain approval for each observation that will take place. The observations will take place in the public areas of the ward (e.g. the welcome area of the ward and corridors) and not in the rooms of patients or where they are undergoing treatment and rehabilitation (see Appendix 8). Public areas are those areas that any member of public (e.g. family member) would be able to normally access when visiting on the ward.

Any patients that are in these areas will not be observed and will be excluded from any data collection. The primary aim of the observations will be to observe the 'public' environment of the stroke ward and see how people (excluding patients) use, respond to, or engage with any graphic or visual information presented in these areas (e.g. signage).

The primary researcher will not interact with stroke patients or their families present in the hospital directly and will carry a high level of conduct when observing the ward environment.

The researcher will be observing the public areas (welcome area and corridors) of the stroke ward in order to identify an opportunity to create better user-experiences for healthcare professionals, patients and their families through the use of graphic design. By observing environmental cues and the broader hospital environment, the primary researcher aims to identify an opportunity where graphic design may be used to aid communication between those present in North Shore Hospital's stroke ward to positively impact their overall experience in the ward. For example, potential solutions may include the use of environmental graphics in public areas (welcome area and corridors) to communicate welcoming and wellbeing messages holistically through the use of illustration and colour. Verbal consent will be given by healthcare professionals on ward 2 (e.g. Charge Nurse on Ward Two) before any observation takes place (e.g. the researcher will check in each time an observation activity is to be conducted to ensure that it is appropriate at that time).

Observations will take a maximum of 6 sessions (c.1 hours in duration), and will be 'scattered' over a 2-4 month period. Notes/sketches will be recorded during each observation as a method of data collection. See Appendix 9 for a floor plan of Ward Two and where the primary researcher is to be positioned during observations.

In response to the exploratory research, visual communication material (e.g. posters, murals, leaflets etc.) will be designed. These may be temporarily installed in the 'public' areas of ward 2 as responses/engagement with these observed as above. Any designed material installed/used for testing will be approved by the appropriate Ward Two staff and WCHB prior to its temporary installation.

Photographs

Photographs will be taken of the space/environment of the stroke ward in order to gain better understanding of how my final designed outcome could contribute and 'fit into' the stroke ward. Photographs of the environment are important to provide 'pre-visualisations' of any potential design concepts/solutions prior to installation etc.

Consent will need to be given by the Charge Nurse on the ward before photographs can be taken. Photos will be taken outside of visiting hours and will not include people or any identifiable belongings or personal information. The researcher will ensure that there are no people present in the space before taking the photos.

B.13. How will the data be analysed?

Please provide the statistical (for quantitative research) or methodological (for qualitative or other research) justification for analysing the data in this way.

The primary researcher will collect and analyse the data by sorting out the main ideas and identifying themes. Each piece of data will be reviewed to gain an understanding of the needs and thoughts of both healthcare professionals when it comes to addressing communication between those in Ward Two and how graphic design can have a positive impact on a stroke patient's experience of their treatment.

B.14. Has any peer review taken place?

If your answer is 'Yes', please specify and provide evidence e.g. a letter of confirmation.

- External Competitive Research Grant
Independent Peer Review\*
AUT Competitive Grant
PGR1 PGR2 PGR3

Optional examples for evidencing peer review are available from the Ministry of Health (HREC) website (http://www.health.govt.nz) or from the Forms section of the Research Ethics website (http://www.researchethics.org.nz)

C. General Project Details

C.1. Likely Research Output

C.1.1. What are the likely outputs of this research?

- a thesis a dissertation a research paper a journal article
a book a conference paper a documentary an exhibition

- a film some other artwork other academic publications or presentations
Some other output, please specify

A form of graphic design, either a printed resource or visual infographic/mural.

C.2. Research Location and Duration

C.2.1. In which countries and cities/localities will the data collection occur?

Auckland, New Zealand

C.2.1.1. Exactly where will any face-to-face data collection occur?

If face-to-face data collection will occur in participants' homes or similarly private spaces, then a Researcher Safety Protocol needs to be provided with this application.

With ward 2 healthcare professionals interviews will take place in an office/room in North Shore Hospital, away from Ward Two where the anonymity of the participant could be breached.

For academic experts, interviews will occur in their place of work (office) or online using zoom or equivalent.

C.2.2. In which countries and cities/localities will the data analysis occur?

Auckland, New Zealand

C.2.3. When is the data collection scheduled to commence?

September/October 2020

C.3. Research Participants

C.3.1. Who are the participants?

Healthcare Professionals (e.g. Nurses and Occupational Therapists) who work in Ward Two at North Shore Hospital

Academics who are published in the area of stroke and communication disabilities of stroke patients.

Ward 2 Visitors (e.g. family and friends of stroke patients)

C.3.2. How many participants are being recruited for this research?

If you are unsure, please provide an indicative range.

Healthcare professionals in North Shore Hospital Ward Two - 5-10 Healthcare Professionals

Academic experts - 3-5

Ward 2 visitors (no specific number being recruited- recruitment will be based on how many people are in the 'public' areas at the time of observations)

C.3.3. What criteria will be used to choose who to invite as participants?

- Must be competent in speaking English.
Over 18 years of age.
Are able to give consent either verbally or in written form to the research and understand what is involved and understand the purpose of the project.
Participants must have the time/availability to participate in this research and understand that their contribution to this research should not add stress to their already stressful schedules.
Be enthusiastic and willing to contribute to this research as well as take the time to understand how their contribution will positively impact the end result of the designed outcome.

C.3.3.1. How will you select participants from those recruited if more people than you need for the study agree to participate?

It is unlikely that more than the 10 healthcare professionals will be selected due to their heavy workloads and the number of staff present on the ward.

3-5 academics will be identified through academic literature and will be recruited by the primary researcher via email.

Ward 2 visitors (no specific number being recruited- recruitment will be based on how many people are in the 'public' areas at the time of observations)

C.3.4. Will any people be excluded from participating in the study?

Yes No

Exclusion criteria apply only to potential participants who meet the inclusion criteria. An exclusion criterion is any characteristic that ought to disqualify any potential participant from recruitment into the study. Consider exclusion criteria where there are heightened risks due to power differences in the relationship, recent injury, or other characteristics that might place potential participants at unreasonable risk of harm.

If the answer to this question is 'Yes' please answer C.3.4.1 and the following sections, otherwise please answer C.3.5 and continue from there.

C.3.4.1. What criteria will be used to exclude people from the study?

- Participants unable to understand or be confident when both understanding and verbally communicating in English.
People below the age of consent or are unable to consent.
Patients who are present in North Shore Hospital's stroke unit at the time of any data collection.

C.3.4.2. Why is this exclusion necessary for this study?

This exclusion is necessary for this study as if participants are unable to understand English they will not be able to understand what is being asked from them and the purpose of the research, putting them in a vulnerable position. Patients will be included as they are in a vulnerable position when undergoing treatment for stroke at North Shore Hospital and depending on the severity of the stroke this research may cause further confusion around their treatment and interfere on their recovery. For the safety of both the primary researcher and stroke patients in Ward Two, patients will not be included in this study or approached at any time during their time on the ward.

C.3.5. Recruitment of participants.

Please describe in detail the recruitment processes that will be used. If you will be recruiting by advertisement or email, please attach a copy to this Application Form.

C.3.5.1. How will the initial contact with potential participants occur?

Ward Two Staff (Healthcare professionals)- Staff in North Shore Hospital's stroke unit will be informed of the study and what participation involves and invited to participate via an information sheet and advertisement (see Appendix 1 and 5) present in the stroke ward staff room.

Academics- Academics who are published in the area of stroke and communication disabilities of stroke patients will be recruited by the primary researcher through academic literature. Experts will be invited to participate in the research via email using contact details/information available in the public domain.

Ward 2 visitors- will be informed of the study and what participation involves and invited to participate via an information sheet and advertisement (see Appendix 2 and 4) present in the 'public' areas of the ward 2 and the elevator that provides access to ward 2.

C.3.5.2. How will the contact details of potential participants be collected and by whom?

Healthcare professionals will be invited by placing the Participant Information Sheet (see Appendix 1 and 5) and advertisement on the wall of the stroke ward staff room, inviting staff to participate in the research. Healthcare professionals who are interested will be asked to email the researcher.

Contact details of clinicians and academics will be collected by the primary researcher from information available in the public domain.

Ward 2 visitors- No details or information will be collected.

C.3.5.3. How will potential participants be invited to participate?

Healthcare professionals will be invited by placing the Participant Information Sheet (see Appendix 1 and 5) and advertisement on the wall of the stroke ward staff room, inviting staff to participate in the research. Healthcare professionals who are interested will be asked to email the researcher.

Academics will be invited through an email sent by the primary researcher, informing them of the research and what it involves. They will be informed that choosing not to participate will not affect the end outcome of the research in any way.

Ward 2 visitors will be invited to participate via an information sheet and advertisement (see Appendix 2 and 4) present in the 'public' areas of the ward 2 and the elevator that provides access to ward 2.

C.3.5.4. How much time will potential participants have to consider the invitation?

The participants will be given 2 weeks to consider/accept or decline the invitation.

C.3.5.5. How will potential participants respond to the invitation?

Potential participants will contact the primary researcher via email.

**C.3.5.6 How will potential participants give consent?**

Potential participants will either give written (using attached consent form) and verbal consent.

For participants who wish to conduct and interview using Zoom (or equivalent) the following protocol will be used: Potential participants will be required to consent to the research before they are able to participate in the research. Once participants have consented to take part in the research, consent will be evidenced as follows: Participants will be given two options:

- They will be sent a consent form with the information sheet which they sign, scan or photograph, and return to the researcher.
- They will be asked to copy the content of the Consent Form into an email and send that to the researcher with a sentence indicating their agreement (ensuring that the email is clearly from the participant.)

In addition, participants will be asked to give verbal consent at the time of interview, and also reminded that they can withdraw from the research at any time.

**C.3.5.7 How and when will the inclusion criteria and exclusion criteria given in sections C.3.2 and C.3.3 be applied?**

People who do not meet the inclusion criteria and who have not expressed interest in participating in the research will not be approached.

**C.3.5.8 Will there be any follow up invitations for potential participants?**

Healthcare professionals who have participated in the research will be invited to comment on any potential design prototypes/solutions.

**D. Partnership, Participation and Protection**

**D.1. How does the design and practice of this research implement the principle of Partnership in the interaction between the researcher and other participants?**

How are the researcher and the participants working together? How will your research design and practice encourage a mutual respect and benefit and participant autonomy and ownership? How will you ensure that participants and researchers will act honestly and with good faith towards each other? Are the outcomes designed to benefit the participants and/or their social or cultural group? How will the information and knowledge provided by the participants be acknowledged?

Mutual respect and participant autonomy will be aimed throughout the research project by constantly ensuring that those involved are free to leave the research at any time. Potential participants can contact the primary researcher at any time during the research, regarding questions and information about the project. They can reach the primary researcher via email or phone.

The opinions and ideas of participants will be valued at all times and respected throughout the project. This is to ensure that the outcome of the project benefits them, allowing participants to be experts of their own experiences through human-centered design and design thinking. Through valuing participants, concerns and ideas surrounding the different cultural backgrounds of participants will be raised, further ensuring that the research and outcome of the project does not discriminate against other cultures.

The primary researcher will acknowledge the information provided by participants in the outcome of the research, in particular the final thesis. This information will uphold the participants confidentiality and will not compromise their anonymity.

**D.2. How does the design and practice of this research implement the principle of Participation in the interaction between the researcher and other participants?**

What is the actual role of participants in your research project? Will participants be asked to inform or influence the nature of the research, its aims, or its methodology? Will participants be involved in conducting the research or in their principal involvement one of sharing information or data? Do participants have a formal role as stakeholders e.g. as the funders and/or beneficiaries of the research? What role will participants have in the research outputs (e.g. will they be asked to approve transcripts or drafts)?

Participants will be asked to reflect on their practice/experience of communication within the environment of a stroke ward and the opportunities that graphic design could provide in the environment of the stroke ward. Healthcare professionals will work with the primary researcher through human-centred design to open up a discussion about the stories, needs and experiences of them as healthcare professionals working in a stroke ward as well as the patients themselves.

Participants will not be required to fund or be beneficiaries of the project nor will they be asked to approve drafts or transcripts.

**D.3. How does the design and practice of this research implement the principle of Protection in the interaction between the researcher and other participants?**

How are the researcher and the participants protecting each other? How will you actively protect participants from deceit, harm and coercion through the design and practice of your research? How will the privacy of participants and researchers be protected? How will any power imbalances inherent in the relationships between the participants and researchers be managed? How will any cultural or other diversity be respected?

When initially contacting potential participants, the primary researcher will inform them of the purpose of the project and give them a time to decide whether or not they want to participate and ask questions. Once a participant decides to participate in the research, they will be asked by the primary researcher to give verbal consent as well as fill out a consent form. They will be free to leave and stop participation at any time and will be reminded they can do so for any reason. Participants will remain anonymous throughout the documentation of the research and their privacy will be respected during every stage of the project.

Participants opinions will be valued regardless of their cultural background. The data collected from participants will only be seen by the primary researcher and supervisors and if it is a part of the final output it will remain anonymous.

**E. Social and Cultural Sensitivity (including the obligations of the Treaty of Waitangi)**

**E.1. What familiarity does the researcher have with the social and cultural context of the participants?**

The primary researcher has completed a summer studentship with Good Health Design where she had conversations around the importance of social and cultural context when designing for healthcare. Throughout the research the primary researcher will be aware of difficulties participants may face during participation in regards to social and cultural contexts.

**E.2. What consultation has occurred?**

Research procedures should be appropriate to the participants. Researchers have a responsibility to inform themselves of, and take the steps necessary to respect the values, practices, and beliefs of the cultures and social groups of all participants. This usually requires consultation or discussion with appropriate people or groups to ensure that the language and research approaches being used are relevant and effective. Consultation should begin as early as possible when designing the project and should continue throughout its duration.

All researchers are encouraged to make themselves familiar with Te Ara Ika: Guidelines for Maori Research Ethics: A framework for researchers and ethics committee members which is able to be accessed through the Research Ethics website. Researchers may also find Te Kaitiaki Māori a directory of iwi and Māori organisations to be helpful. This may be accessed via the Te Puni Kōwhiri website (<https://www.tepuni.govt.nz/>). As well as these documents, the Health Research Council has published Pacific Health Research Guidelines, and Guidelines on research involving children. (<http://www.hrc.govt.nz/>). There are also guidelines by various organisations about researching with other populations that researchers will find helpful.

Consultation has taken place between the primary researcher, Stephen Reay (GHD), Cassie Khoo (GHD), Luke Skinner (WDHB), Jason Russell (Charge Nurse on Ward Two), Lynda Moloney (Occupational Therapist on Ward Two), Megan White (Nurse on Ward Two) and Kate Twidston.

This project arose at the end of 2019, when the staff on Ward Two recognised an opportunity to make improvements on the ward and contacted WDH's Institute of Improvement and Innovation, who subsequently contacted AUI's Good Health Design as part of their ongoing collaboration to discuss the opportunity. Through a series of consultative meetings led to the identification of this masters research as it was an appropriate opportunity that was of value to the ward.

The primary researcher (Kate Twidston) met again with Jason Russell (Charge Nurse on Ward Two), Lynda Moloney (Occupational Therapist on Ward Two), Megan White (Nurse on Ward Two) on 12/03/2020 to discuss the project further. These consultations identified the project specifics, including scope and informed what would be possible in context of the ward environment.

**E.2.1. With whom has the consultation occurred?**

Please provide written evidence that the consultation has occurred. Consultation took place in person with interested Ward Two staff who initiated the project - Stephen Reay (GHD), Cassie Khoo (GHD), Luke Skinner (WDHB), Jason Russell (Charge Nurse on Ward Two), Lynda Moloney (Occupational Therapist on Ward Two), Megan White (Nurse on Ward Two).

**E.2.2. How has this consultation affected the design and practice of this research?**

The consultations provided the primary researcher and North Shore Hospital staff with a better understanding of the difficulties healthcare professionals face when communicating with stroke patients as well as identifying an opportunity to aid the communication between those operating in North Shore Hospital's stroke ward through graphic design. They also informed what would be appropriate for the researcher do in the environment, from the perspective of data collection and access to areas) as well as approach to participant recruitment.

**E.3. Does this research target Māori participants?**

All researchers are encouraged to make themselves familiar with Te Ara Ika: Guidelines for Maori Research Ethics: A framework for researchers and ethics committee members.

If your answer is 'No', please go to section E.4 and continue from there. If you answered 'Yes', please answer the next question.

**E.3.1. Which iwi or hapu are involved?**

Yes  No

**E.4. Does this research target participants of particular cultures or social groups?**

AUIEC defines the phrase 'specific cultures or social groups' broadly. In section 2.5 of Applying for Ethics Approval: Guidelines and Procedures it uses the examples of Chinese mothers and paraplegics. This is to identify their distinctiveness, the first as a cultural group, the second as a social group. Other examples of cultural groups may be Korean students, Samoan academics, Cook Islanders etc., while other examples of social groups may be nurse aides, accountants, rugby players, rough sleepers (homeless people who sleep in public places) etc. Please refer to Section 2.5 of AUIEC's Applying for Ethics Approval: Guidelines and Procedures (accessible in the Ethics Knowledge Base online via <http://www.aui.ac.nz/ethics/ethics/>) and to the relevant Frequently Asked Questions section in the Ethics Knowledge Base.

If your answer is 'No', please go to section E.5 and continue from there. If you answered 'Yes', please answer the next question.

**E.4.1. Which cultures or social groups are involved?**

Health professionals (clinicians) from a range of different disciplines (e.g. nurses, OT's, physios, doctors etc.) working in Ward Two (Stroke Ward), North Shore Hospital.

**E.5. Does this research focus on an area of research that involves Treaty obligations?**

All researchers are encouraged to make themselves familiar with Te Ara Ika: Guidelines for Maori Research Ethics: A framework for researchers and ethics committee members.

If your answer is 'No', please go to section E.6 and continue from there. If you answered 'Yes', please answer the next question.

**E.5.1. Which treaty obligations are involved?**

Yes  No

**E.6. Will the findings of this study be of particular interest to specific cultures or social groups?**

If the answer is 'Yes' please answer E.6.1 and the following sections, otherwise please answer 'I don't know' and continue from there.

**E.6.1. To which iwi, hapu, culture or social groups will the findings be of interest?**

Healthcare professionals, stroke patients and their families present in the hospital environment of a stroke ward at North Shore Hospital.

**E.6.2. How will the findings be made available to those groups?**

An overview will be published by AUI at the end of the research, as part of the final output. An summary of the research will be emailed to those participants (Healthcare professions and academic experts) who request this.

Yes  No

**F. Respect for the Vulnerability of Some Participants**

"Vulnerable persons are those who are relatively (or absolutely) incapable of protecting their own interests. More formally, they may have insufficient power, intelligence, education, resources, strength, or other needed attributes to protect their own interests. Individuals whose willingness to volunteer in a research study may be unduly influenced by the expectations, whether justified or not, of benefits associated with participation, or of a voluntary response from some members of a hierarchy in case of refusal to participate may also be considered vulnerable." (Standards and Operational Guidance for Ethics Review of Health-Related Research with Human Participants, World Health Organisation).

**F.1. Will your research involve any of the following groups of participants?**

If your research involves any of these groups of participants, please clearly indicate which ones and then answer F.2 and the following sections, otherwise please answer G.1 and continue from there.

- people unable to give informed consent?  you (or your supervisor's) own students?
- preschool children?  children aged between five and sixteen years?
- legal minors aged between sixteen and twenty years?
- People lacking the mental capacity for consent?
- people in a dependent situation (e.g. people with a disability, or residents of a hospital, nursing home or prison or patients highly dependent on medical care)?
- people who are vulnerable for some other reason (e.g. the elderly, persons who have suffered abuse, persons who are not competent in English, new immigrants)? – please specify

Yes  No

F.2. How is respect for the vulnerability of these participants reflected in the design and practice of your research?

F.3. What consultation has occurred to ensure that this will be effective? Please provide evidence of the consultation that has occurred.

G. Informed and Voluntary Consent

G.1. How will information about the project be given to potential participants?

A copy of all information that will be given to prospective participants is to be attached to this Application Form. If written information is to be provided to participants, you are advised to use the information sheet examples. The language in which the information is provided is to be appropriate to the potential participants and translations need to be provided when necessary.

Information will be given to potential participants verbally as well as an available information sheet (see Appendix) that will be given to participants.

G.2. How will the consent of participants be obtained and evidenced?

AUTEC requires consent to be obtained and usually evidenced in writing. A copy of the Consent form which will be used is to be attached to this application. If this will not be the case, please provide a justification for the alternative approach and details of the alternative consent process. Please note that consent must be obtained from any participant aged 16 years or older. Participants under 16 years of age are unable to give consent, which needs to be given by their parent or legal guardian. AUTEC requires that participants under the age of 16 consent to their participation. When the nature of the research requires it, AUTEC may also require that consent be sought from parents or legal guardians for participants aged between 16 and twenty years. For further information please refer to AUTEC's Application for Ethics Approval: Guidelines and Procedures.

Consent from participants will be obtained through a consent form.

G.3. Will any of the participants have difficulty giving informed consent on their own behalf? Yes No

Please consider physical condition, cognitive status, age, language, legal status, or other barriers.

If the answer is 'Yes' please answer G.3.1 and the following sections, otherwise please answer G.4 and continue from there.

G.3.1. If participants are not competent to give fully informed consent, who will consent on their behalf?

Researchers are advised that the circumstances in which consent is legally able to be given by a person on behalf of another are very constrained. Generally speaking, only parents or legal guardians may give consent on behalf of a legal minor and only a person with an enduring power of attorney may give consent on behalf of an adult who lacks capacity.

G.3.2. How will these participants be asked to provide consent to participation?

Whenever consent by another person is possible and legally acceptable, it is still necessary to take the wishes of the participant into account, taking into consideration any limitations they may have in understanding or communicating their.

G.4. Is there a need for translation or interpreting? Yes No

If your answer is 'Yes', please provide copies of any translations with this application and any Confidentiality Agreement required for translation or interpreting.

H. Respect for Rights of Privacy and Confidentiality

H.1. How will the researchers respect the privacy and confidentiality of participants?

Please note that anonymity and confidentiality are different. For AUTEC's purposes, 'anonymity' means that the researcher is unable to identify who the participant is in any given case. If the participants will be anonymous, please state how, otherwise, if the researcher will know who the participants are, please describe how the participants' privacy issues and the confidentiality of their information will be managed.

Information will be gathered by participants will be kept and stored either on a digital document that is password protected. The information gathered will only be viewed by the primary researcher and co-supervisors and will not be identifiable or traced back to individuals, if published as part of the final output. Any images used will be modified to ensure that no identifiable information regarding any people, their information or their belongings is possible.

H.2. Will any participants be identifiable in the research outputs or findings? Yes No

If your answer is 'Yes', please answer H.2.1, otherwise please answer H.3

H.2.1. What level of confidentiality is able to be offered to participants and how will this be managed?

If the research involves small or distinctive groups of participants or procedures such as interviews conducted at the workplace, or focus groups with peers, researchers should identify the level of participant confidentiality that can be offered in the Information Sheet. If participants or groups will be identifiable, please state why this is appropriate, how this will happen, and how the participants will give consent.

H.3. What information on the participants will be obtained from third parties?

This includes use of third parties, such as employers or professional organisations, in recruitment.

H.4. How will potential participants' contact details be obtained for the purposes of recruitment?

Participants' information will be obtained when they respond to the invitation in the staff room in Ward Two (North Shore Hospital).

H.5. What identifiable information on the participants will be given to third parties?

Identifiable information will not be given to third parties.

H.6. Who will have access to the data during the data collection and analysis stages?

The applicant, supervisors and primary researcher.

H.7. Who will have access to the data after the findings have been produced?

The applicant and primary researcher.

H.8. Are there any plans for the future use of the data beyond those already described? Yes No

The applicant's attention is drawn to the requirements of the Privacy Act 1993 (see Appendix 1 of AUTEC's Application for Ethics Approval: Guidelines and Procedures). Information may only be used for the purpose for which it was collected, or if there are plans for the future use of the data, then this needs to be explained in the Information Sheet for participants. If you have answered 'Yes' to this question, please answer section H.8.1.1 and continue from there. If you answered 'No' to this question, please go to section H.9 and proceed from there.

H.8.1.1. If data will be stored in a database, who will have access to that information, how will it be used, for what will it be used, and how have participants consented to this?

H.8.1.2. Will any contact details be stored for future use and if so, who will have access to them, how will they be used, for what will they be used, and how have participants consented to this?

H.9. Where will the data be stored once the analysis is complete?

Please provide the exact storage location. AUTEC normally requires that the data be stored securely on AUT premises in a location separate from the consent forms. Electronic data should be downloaded to an external storage device (e.g. an external hard drive, a memory stick etc.) and securely stored. If you are proposing an alternative arrangement, please explain why.

Data will be stored in a lockable cabinet in Stephen Reay's office at AUT City Campus. Digital data will be stored on an external hard drive in a lockable cabinet in Stephen Reay's office. Consent forms will be stored in a lockable cabinet away from the data in the Good Health Design Studio at AUT.

H.9.1. For how long will the data be stored after completion of analysis?

AUTEC normally requires that the data be stored securely for a minimum of six years, or ten years for health data. If you are proposing an alternative arrangement, please explain why.

H.9.2. How will the data be destroyed?

If the data will not be destroyed, please explain why, identify how it will be safely maintained, and provide appropriate informed consent protocols.

Electronic data will be deleted using erase through disk utility on a mac. Hard copy data will be shredded along with written consent forms.

H.10. Who will have access to the Consent Forms?

The primary researcher and supervisors.

H.11. Where will the completed Consent Forms be stored?

Please provide the exact storage location. AUTEC normally requires that the Consent Forms be stored securely on AUT premises in a location separate from the data. If you are proposing an alternative arrangement, please explain why. Consent forms will be stored in a lockable cabinet located in the Good Health Design studio at AUT.

H.11.1. For how long will the completed Consent Forms be stored?

AUTEC normally requires that the Consent Forms be stored securely for a minimum of six years, or ten years in the case of research involving health data. If you are proposing an alternative arrangement, please explain why.

H.11.2. How will the Consent Forms be destroyed?

If the Consent Forms will not be destroyed, please explain why. Electronic data will be deleted using erase through disk utility on a mac. Hard copy data will be shredded along with written consent forms.

H.12. Does your research involve the collection of personally identifiable and sensitive data? Yes No

Sensitive data can be used to identify an individual, object or location and has a risk of discrimination, harm or unwanted attention. Sensitive data potentially poses a substantial threat to those who are or who have been involved in it, especially if it is shared inappropriately, or if it falls into the wrong hands. If you have answered 'Yes' please identify what data is being collected and how it is sensitive and provide a Data Safety Management Protocol (see the Forms section of the Research Ethics website for a guide to drafting one). If the answer is 'No', please answer H.13 and continue from there.

H.13. Does your project involve the use of previously collected information or biological samples for which there was no explicit consent for this research? Yes No

If the answer is 'Yes' please answer H.13.1 and the following sections, otherwise please answer H.14 and continue from there.

H.13.1. What previously collected data will be involved?

H.13.2. Who collected the data originally?

H.13.2.1. Why was the information originally collected?

H.13.2.2. For what purposes was consent originally given when the information was collected?

H.13.3. How will the data be accessed?

H.14. Does your research involve the collection of information about organisational practices? Yes No

AUTEC applies a broad definition to the term 'organisations'. It could include for example, businesses, health or clinics, schools, or sports clubs and teams. If the answer is 'Yes' please answer H.14.1, otherwise please answer H.13 and continue from there.

H.14.1. How will the authorisation to access the organisation or its staff for research purposes be obtained?

H.14.2. Could disclosure of this information potentially disadvantage the organisation or the participants? Yes No

If your answer is 'Yes', please answer H.14.2.1, otherwise please answer H.14.3

H.14.2.1. How will the risks associated with potential disadvantages be managed?

H.14.3. Will the participants or anyone else in the organisation be identified in this information?  Yes  No

H.14.3.1 How will the potential risks involved be managed?  Yes  No

I. Minimisation of risk

I.1. Risks to Participants

Please consider the possibility of mental, physical, psychological or emotional risks to participants, including issues of confidentiality and privacy, from the perspective of the participants, and not only from the perspective of someone familiar with the subject matter and research practices involved. Please clearly state what is likely to be an issue, how probably this, and how this will be minimised or mitigated (e.g. participants do not need to answer a question that they find embarrassing, or they may terminate an interview, or there may be a qualified counsellor present in the interview, or the findings will be reported in a way that ensures that participants cannot be individually identified, etc.) Possible risks and their mitigation should be fully described in the Information Sheet for participants.

I.1.1. How much time will participants be required to give to the project?  Yes  No

Healthcare professionals and academic expert participants will be required to give 30-60 minutes for an expert interview to reflect on their practice and provide the primary researcher with insight into how graphic cues could be used in the stroke ward environment to positively impact communication between themselves, patients and families.

Visitors to ward 2 will not be required to give any time to the researcher other than by being present in the 'public' areas as part of their visit.

I.1.2. What level of discomfort or embarrassment may participants be likely to experience?  Yes  No

There would be minimal discomfort as the primary researcher aims to identify an opportunity within the stroke ward to help aid the communication between healthcare professionals, patients and their families through graphic design. Because only willing participants will be involved in the study, people for whom these discomforts are a barrier to participation will not be involved.

I.1.3. In what ways might participants be at risk in this research?  Yes  No

It is unforeseen that the participants will be exposed to any risk during their participation in the research.

I.1.4. In what ways are the participants likely to experience risk or discomfort as a result of cultural, employment, financial or similar pressures?  Yes  No

It is very unlikely that participants will experience discomfort as a result of cultural, employment or financial pressures and will again be reminded they are free to leave at any time.

I.1.5. Will your project involve processes that are potentially disadvantageous to a person or group, such as the collection of information, images etc. which may expose that person/group to discrimination, criticism, or loss of privacy?  Yes  No

If your answer is 'Yes', please detail how these risks will be managed and how participants will be informed about them.

I.1.6. Will your research involve collection of information about illegal behaviour(s) which could place the participants at current or future risk of criminal or civil liability or be damaging to their financial standing, employability, professional or personal relationships?  Yes  No

If your answer is 'Yes', please detail how these risks will be managed and how participants will be informed about them.

I.1.7. If the participants are likely to experience any significant discomfort, embarrassment, incapacity or psychological disturbance, please state what consideration you have given to the provision of counselling or post-interview support, at no cost to the participants, should it be required.  Yes  No

All research participants in Auckland are able to utilise counselling support from the AUT Counselling Team, otherwise you may have to consider local providers for participants who are located nationwide, or in some particular geographical area or who are children. You may discuss the potential for participant psychological impact in harm with the Head of AUT Counselling, if you require. Please check the relevant frequently asked question on the research ethics website as well and ensure the appropriate wording is included in the Information Sheet when counselling opportunities need to be offered.

I.1.8. Will any use of human remains, tissue or body fluids which does not require submission to a Health and Disability Ethics Committee occur in the research?  Yes  No

e.g. finger pricks, urine samples, etc. (please refer to section 13 of AUTEC's Applying for Ethics Approval: Guidelines and Procedures). If your answer is yes, please provide full details of all arrangements, including details of agreements for treatment, how participants will be able to request return of their samples in accordance with right 7(b) of the Code of Health and Disability Services Consumers' Rights, etc.

I.1.9. Will this research involve potentially hazardous substances?  Yes  No

e.g. radioactive material, biological substances (please refer to section 15 of AUTEC's Applying for Ethics Approval: Guidelines and Procedures) and the Hazardous Substances and New Organisms Act 1996. If the answer is 'Yes', please provide full details, including hazardous substance management plan.

I.2. Risks to Researchers

If this project will involve interviewing participants in private dwellings, undertaking research in unfamiliar cultural contexts either in New Zealand or overseas, doing research in a place to which a travel warning applies, or going into similarly vulnerable situations, then a researcher safety protocol should be designed and appended to this application. This should identify simple and effective processes for keeping someone informed of the researcher's whereabouts and provide for appropriate levels of assistance. A guide to drafting one is provided in the form section of the Research Ethics website.

I.2.1. Are the researchers likely to be at risk?  Yes  No

If the answer is 'Yes' please answer I.2.1.1 and then continue, otherwise please answer I.3 and continue from there.

I.2.1.1. In what ways might the researchers be at risk and how will this be managed?  Yes  No

I.3. Risks to AUT

I.3.1. Is AUT or its reputation likely to be at risk because of this research?  Yes  No

If the answer is 'Yes' please answer I.3.1.1 and then continue, otherwise please answer I.3.2 and continue from there.

I.3.1.1. In what ways might AUT be at risk in this research?  Yes  No

Please identify how and detail the processes that will be put in place to minimise any harm.

I.3.2. Are AUT staff and/or students likely to encounter physical hazards during this project?  Yes  No

If yes, please provide a hazard management protocol identifying how harm from these hazards will be eliminated or minimised.

J. Truthfulness and limitation of deception

J.1. How will feedback on or a summary of the research findings be disseminated to participants (individuals or groups)?  Yes  No

It is normally courteous to provide participants with a one or two page summary of the findings of the research. Please ensure that this information is included in the Information Sheet.

J.2. Does your research include any deception of the participants, such as non-disclosure of aims or use of control groups, concealment, or covert observations?  Yes  No

Deception of participants in research may involve deception, concealment or covert observation. Deception of participants conflicts with the principle of informed consent, but in some areas of research it may sometimes be justified to withhold information about the purposes and procedures of the research. Researchers must make clear the precise nature and extent of any deception and why it is thought necessary. Emphasis on the need for consent does not mean that covert research can never be approved. Any departure from the standard of properly informed consent must be acceptable when measured against possible benefits to the participants and the importance of the knowledge to be gained as a result of the project or teaching session. This must be addressed in all applications. Please refer to Section 2.4 of AUTEC's Applying for Ethics Approval: Guidelines and Procedures when responding to this question.

If the answer is 'Yes' please answer J.2.1 and the following sections, otherwise please answer J.3 and continue from there.

J.2.1. Is deception involved?  Yes  No

J.2.2. Why is this deception necessary?  Yes  No

J.2.3. How will disclosure and informed consent be managed?  Yes  No

J.3. Will this research involve use of a control group?  Yes  No

If the answer is 'Yes' please answer J.3.1 and the following sections, otherwise please answer K.1 and continue from there.

J.3.1. How will the Control Group be managed?  Yes  No

J.3.2. What percentage of participants will be involved in the control group?  Yes  No

J.3.3. What information about the use of a control group will be given to the participants and when?  Yes  No

K. Avoidance of Conflict of Interest

Researchers have a responsibility to ensure that any conflict between their responsibilities as a researcher and other duties or responsibilities they have towards participants or others is adequately managed. For example, academic staff members who propose to involve their students as participants in research need to ensure that no conflict arises between their roles as teacher and researcher, particularly in view of the dependent relationship between student and teacher, and of the need to preserve integrity in assessment practices. Likewise researchers have a responsibility to ensure that any conflict of interest between participants is adequately managed for example, managers participating in the same research as their staff.

K.1. What conflicts of interest are likely to arise as a consequence of the researchers' professional, social, financial, or cultural relationships?  Yes  No

There are no foreseen conflicts of interests.

K.2. What possibly coercive influences or power imbalances are there in the professional, social, financial, or cultural relationships between the researchers and the participants or between participants (e.g. dependent relationships such as teacher/student, parent/child, employer/employee, pastor/congregation etc.)?  Yes  No

There may be a power imbalance between the primary researcher an expert participant due to it being a qualitative study where the primary researcher (also a graphic designer) is carrying out research in a medicalised environment that they are less familiar with. Ward 2 visitors may not wish to be observed in the 'public' areas of the hospital.

K.3. How will these conflicts of interest, coercive influences or power imbalances be managed through the research's design and practice and how will any adverse effects that may arise from them be mitigated?  Yes  No

Power imbalances will be managed through constantly keeping in contact with expert participants as well as making sure I am clearly communicating the purpose of the research and what I am aiming to achieve, and how their participation will contribute to a successful outcome. Care will be taken to ensure observe cue (e.g. body language) of any visitors that may not be wanting to participate in the research and will be excluded from the data if this is the case.

K.4. Does your project involve payments or other financial inducements (including koha, reasonable contribution towards travel expenses or time, or entry into a modest prize draw) to participants?  Yes  No

If the answer is 'Yes' please answer K.4.1 and the following sections, otherwise please answer K.5 and continue from there.

K.4.1. What form will the payment, inducement, or koha take?  Yes  No

K.4.2. Of what value will any payment, gift or koha be?  Yes  No

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**K.4.3.** Will potential participants be informed about any payment, gift or koha as part of the recruitment process, and if so, why and how?

**K.5.** Have any applications for financial support for this project been (or will be) made to a source external to AUT?  Yes  No

*If the answer is 'Yes' please answer K.5.1 and the following sections, otherwise please answer K.6 and continue from there.*

**K.5.1.** What financial support for this project is being provided (or will be provided) by a source external to AUT?

**K.5.2.** Who is the external funder?

**K.5.3.** What is the amount of financial support involved?

**K.5.4.** How is/are the funder/s involved in the design and management of the research?

**K.6.** Have any applications been (or will be) submitted to an AUT Faculty Research Grants Committee or other AUT funding entity?  Yes  No

*If the answer is 'Yes' please answer K.6.1 and the following sections, otherwise please answer K.7 and continue from there.*

**K.6.1.** What financial support for this project is being provided (or will be provided) by an AUT Faculty Research Grants Committee or other AUT funding entity?

**K.6.2.** What is the amount of financial support involved?

**K.6.3.** How is/are the funder/s involved in the design and management of the research?

**K.7.** Is funding already available, or is it awaiting decision?

**K.8.** Do the applicant or the researchers, investigators or research organisations mentioned in Part B of this application have any financial interests in the outcome of this project?  Yes  No

*If the response is 'Yes', please provide full details about the financial interests and how any conflicts of interest are being managed, otherwise, please respond to section K.9 and continue from there.*

**K.9.** Are the participants expected to pay in any way for any services associated with this research?  Yes  No

*If the response is 'Yes', please provide full details about the charges and describe how any benefits will balance the burdens involved as well as how any conflicts of interest are being managed. Otherwise please respond to section L.1 and continue from there.*

---

**L. Respect for Property**

*Researchers must ensure that processes do not violate or infringe legal or culturally determined property rights. These may include factors such as land and goods, works of art and craft, spiritual treasures and information.*

**L.1.** Will this research impact upon property owned by someone other than the researcher?  Yes  No

*If the answer is 'Yes' please answer L.1.1 and the following sections, otherwise please answer L.2 and continue from there.*

Feedback: EA Form 03/2020 V3 of 08/11 This version was last edited in March 2020

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**L.1.1.** How will this be managed?

**L.2.** How do contexts to which copyright or Intellectual Property apply (e.g. research instruments, social media, virtual worlds etc.) affect this research and how will this be managed?

*Particular attention should be paid to the legal and ethical dimensions of intellectual property. Care must be taken to acknowledge and reference the ideas of all contributors and others and to obtain any necessary permissions to use the intellectual property of others. Teachers and researchers are referred to AUT's Intellectual Property Policy for further guidance.*

Any IP generated through the research will be owned by the researcher as per AUT's IP policy.

---

**M. References**

*Please include any references relating to your responses in this application in the standard format used in your discipline.*

Bright, Felicity A.S., Nouri, M. Khatib, Kathryn M. McPherson, Linda E. Worrall. "Engaging People Experiencing Communication Disability in Stroke Rehabilitation: A Qualitative Study." 2018.

Duane, B. Using visuals to communicate medical information to patients with low literacy. *Adult Learning*, 15(1-2), 22-25, 2004.

Greenwood, Bob, Tania Sanders, Rosaleen's Bann and Patrick D'Elia. "Challenges for design researchers in healthcare." *Design for Health*, 2-2, 301-326, (2018). DOI: 10.1080/24743133.2018.1541699

IDEO. (2013). The Field Guide to Human-Centered Design. Retrieved from <http://www.ideo.com/ideas/resources/>

Near, Lenny, Andrew Zimmerman, Kira Bolmer, Aaron Star. The Human-Centered Health System: Transforming Healthcare with Design. *Design: World Innovation Summit for Health*, 2018.

Norman, Donald A. *The Design of Everyday Things*. Revised and expanded edition. Basic Books, 2013. [https://www.amazon.com/essential-design-ideas-7401914145/dp/0465020614/ref=sr\\_1\\_1?pf\\_rd\\_p=52481228&pf\\_rd\\_r=786](https://www.amazon.com/essential-design-ideas-7401914145/dp/0465020614/ref=sr_1_1?pf_rd_p=52481228&pf_rd_r=786)

The Stroke Foundation. "Life after Stroke." The Stroke Foundation NZ. Last modified 2020. Accessed 2020. <https://www.stroke.org.nz/life-after-stroke>

Feedback: EA Form 03/2020 V3 of 08/11 This version was last edited in March 2020



**AUT**  
TUHANGA AHOHŌ  
O TAMAKAU MAKAU BURI

**Auckland University of Technology Ethics Committee (AUTEC)**

Auckland University of Technology  
D-18, Private Bag 10506, Auckland 1142, NZ  
T: +64 9 322 3100 ext. 8234  
E: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)  
[www.auckland.ac.nz/autethics](http://www.auckland.ac.nz/autethics)

17 September 2020

Stephen Reay  
Faculty of Design and Creative Technologies

Dear Stephen

Ethics Application: 20/258 Stroke of Communication

We advise you that a subcommittee of the Auckland University of Technology Ethics Committee (AUTEC) has approved your ethics application.

This approval is for three years, expiring 17 September 2023.

**Non-Standard Conditions of Approval**

1. Include in the first Consent Form a yes/no check box for participants to choose whether or not they wish to be contacted in the future.
2. Remove the expert interview paragraph from the second Observation Poster

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

**Standard Conditions of Approval**

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.

AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz). The forms mentioned above are available online through <http://www.auct.ac.nz/research/researchethics>

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat  
Auckland University of Technology Ethics Committee  
E: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), [david.zou@aut.ac.nz](mailto:david.zou@aut.ac.nz)

Appendix Two

**AUT**  
TE WHANAKA MĀHURI  
O TAMAKI MAKAU EAU

### Consent Form

*Project title:* **Stroke of Communication**  
*Project Supervisor:* **Stephen Reay and David Coventon**  
*Researcher:* **Katie Twisleton**

- I have read and understood the information provided about this research project in the Information Sheet dated 14/09/2020.
- I have had an opportunity to ask questions and to have them answered.
- I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- I agree to take part in this research.
- I am happy to be approached to provide feedback on design concepts (please tick one): Yes  No
- I wish to receive a summary of the research findings (please tick one): Yes  No

Participant's signature: .....

Participant's name: .....

Participant's Contact Details (if appropriate):  
.....  
.....  
.....

Date: .....

*Approved by the Auckland University of Technology Ethics Committee on 17th September 2020 AUTEK Reference number 20/258*

*Note: The Participant should retain a copy of this form.*

Consent Form Exemplars (03/2020).docx      page 1 of 5      This version was last edited in March 2020

## Appendix Three



### HI I'M KATIE!

Hello, my name is Katie Twisleton. I am currently completing a Master's in Communication Design at Auckland University of Technology.

I am interested in creating graphic design that makes a difference to people within our community. As a part of my postgraduate study, I am currently undergoing research that aims to create a positive experience for those staying in a stroke ward.

I would like to extend an invitation to take part in my research to help me better understand how the environment of a stroke ward adds to challenges patients face after experiencing a stroke, and how graphic design may be used to positively impact the overall experience of those on a stroke ward.

*Information sheet produced on 14/09/2020*

#### WHO DO I CONTACT FOR FURTHER INFORMATION ABOUT THIS RESEARCH

Researcher Contact Details

**Katie Twisleton**  
(+64) 021 130 8802  
katie2831@gmail.com

Project Supervisor Contact Details

**Stephen Reay**  
stephan.reay@aut.ac.nz

**David Coventon**  
david.coventon@aut.ac.nz

#### WHAT IS THE PURPOSE OF THIS RESEARCH?

After experiencing a stroke, many people are admitted to an acute stroke ward where they begin their recovery journey. The purpose of this research is to understand how graphic design can be used in the environment of a stroke ward to create a positive experience for healthcare professionals, stroke patients, and their families. With your help and contribution to this research, the outcome I will create will likely include printed and physical resource in a stroke ward to create a positive and uplifting space for those who have experienced a stroke.

#### HOW WAS I IDENTIFIED AND WHY AM I BEING INVITED TO PARTICIPATE IN THIS RESEARCH?

You have been identified to be a part of this research, as you have had previous experience with stroke patients and have expertise in stroke rehabilitation and care. You now have two weeks to decide whether or not you would like to participate in this research. Your participation is voluntary, and you can withdraw from participation at any time during this research.

#### HOW DO I AGREE TO PARTICIPATE IN THIS RESEARCH?

If you would like to participate, let me know by completing the attached consent form and sending it to katie2831@gmail.com.

#### WHAT WILL HAPPEN IN THIS RESEARCH?

You will be asked to an expert interview. During this interview I will ask you questions about your practice and how patients face communication challenges.

#### WHAT ARE THE DISCOMFORTS AND RISKS?

It is expected that there will be no discomfort or risk in this research. However, you may feel uncomfortable sharing information and your expertise, and reflecting on your experiences as a clinical practitioner or academic expert.

#### HOW WILL THESE DISCOMFORTS AND RISKS BE ALLEVIATED OR REDUCED?

I hope that by knowing the information you provide will be used with good intentions that you are more comfortable when sharing

information. You can leave research at any time, not questions asked or refuse to answer particular questions.

#### WHAT ARE THE BENEFITS?

As the primary researcher, I will benefit through reflecting on and using the insights I gather in my research. These insights will help me to create a designed outcome that will help me complete my qualification. I will also benefit as a graphic designer working in a healthcare environment as it will give me further insight into the area of design for health as well as the potential for the use of graphic design in healthcare.

In return, I hope I can make a difference in the lives of healthcare professionals, stroke patients, and their families. The difficulties both clinicians and patients face in a stroke ward when trying to communicate is becoming a more widely recognised. Through graphic design, I hope I can make communication easier for those in stroke wards.

#### HOW WILL MY PRIVACY BE PROTECTED?

You will not be anonymous to me the researcher (and my supervisors) throughout the research. This means the researcher will know your name and what you say during the expert interview. It is expected that you and the researcher are respectful towards each other and the researcher. The researcher will make sure the information you share will be protected and kept private.

In any research documentation, your name will be removed from any examples, photos, or audio recordings for your privacy and protection. Everything the researcher collects will be kept for a minimum of six years and then destroyed.

#### WHAT ARE THE COSTS OF PARTICIPATING IN THIS RESEARCH?

There is no cost of you participating in this research other than a maximum of 30-60 minutes of your time for the expert interview.

#### WHAT OPPORTUNITY DO I HAVE TO CONSIDER THIS INVITATION?

You have a period of two weeks to consider and accept the invitation to participate in this research.

#### WILL I RECEIVE FEEDBACK ON THE RESULTS OF THIS RESEARCH?

If you would like to receive information regarding the results of this research, you can let me know and a summary of the research will be sent to you once the research is completed.

#### WHAT DO I DO IF I HAVE CONCERNS ABOUT THIS RESEARCH?

Any concerns about the nature of this research should be notified immediately to the project supervisors Stephen Reay: stephan.reay@aut.ac.nz, (+64) 021 2772 552 and David Coventon: david.coventon@aut.ac.nz.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, ethics@aut.ac.nz, (+649) 921 9999 ext 6038.

**Approved by the Auckland University of Technology Ethics Committee on type the 17th September 2020, 20/258**





## Observation of Ward Two



Hello, my name is Katie Twisleton.

Hello, my name is Katie Twisleton. I am currently completing a Master's in Communication Design at Auckland University of Technology.

I am interested in creating graphic design that makes a difference to people within our community. As a part of my postgraduate study, I am currently undergoing research that aims to aid communication in a stroke ward.

I would like to extend an invitation to be a part of a series of observations that aim to gain further understanding into how the environment of a stroke ward impacts the overall experience of those operating on a stroke ward, gaining insight into how graphic design can aid communication in a stroke ward.

During these observations, the researcher, Katie Twisleton, will be observing the 'public' areas environment of North Shore Hospital's stroke ward. These observations will take place in the welcome areas of Ward Two and will allow the researcher to gain an understanding around how environmental cues within the stroke ward affect the overall experience of those staying in the ward.



I may be taking written notes about some of the things that I observe but I am not recording any information that might identify individual users of the space.

You will be anonymous to me as the researcher, which means that I will not know your name or who you are. I will not collect any information that might be used to identify you and as such you will not be identifiable in any of the outcomes of my research.

**If you are uncomfortable with the observation being undertaken you may ask me to pause, stop, or leave the space at any time, and I will respect your wishes.**

**If you have any questions or queries, please approach me - I am present in Ward Two - and take a written information sheet.**

Approved by the Auckland University of Technology Ethics Committee on the 17th September 2020, 20/258.



## Research of Ward Two



**Hello, my name is Katie Twisleton.**  
I am currently completing a Master's in Communication Design at Auckland University of Technology.

I am interested in creating graphic design that makes a difference to people within our community. As a part of my postgraduate study, I am currently undergoing research that aims to understand how graphic design can be used in the environment of a stroke ward to improve the overall experience of healthcare professionals, stroke patients, and their families in this space.

I would like to extend an invitation to take part in my research to help me better understand how the environment of a stroke ward adds to challenges patients face after experiencing a stroke, and how graphic design may be used to positively impact the overall experience of those on a stroke ward.

With your help and contribution to this research, the outcome I will create will likely include printed and physical resource to aid communication within the ward.



You have been identified to be a part of this research, as you have had previous experience with stroke patients and have expertise in stroke rehabilitation and care. You now have two weeks to decide whether or not you would like to participate in this research. Your participation is voluntary, and you can withdraw from.

**If you would like to participate, let me know by emailing me at [katiet2831@gmail.com](mailto:katiet2831@gmail.com).**

**Approved by the Auckland University of Technology Ethics Committee on type the date final ethics approval was granted, 17th September 2020, 20/258.**



## Interviews on Ward Two



**Hello, my name is Katie Twisleton.**  
I am currently completing a Master's in Communication Design at Auckland University of Technology.

You may have seen me carrying out observations on the ward over the past month. I would like to extend an invitation to take part in an expert interview to help me better understand how the environment of a stroke ward adds to challenges patients face after experiencing a stroke, and how graphic design may be used to positively impact the overall experience of those on a stroke ward.

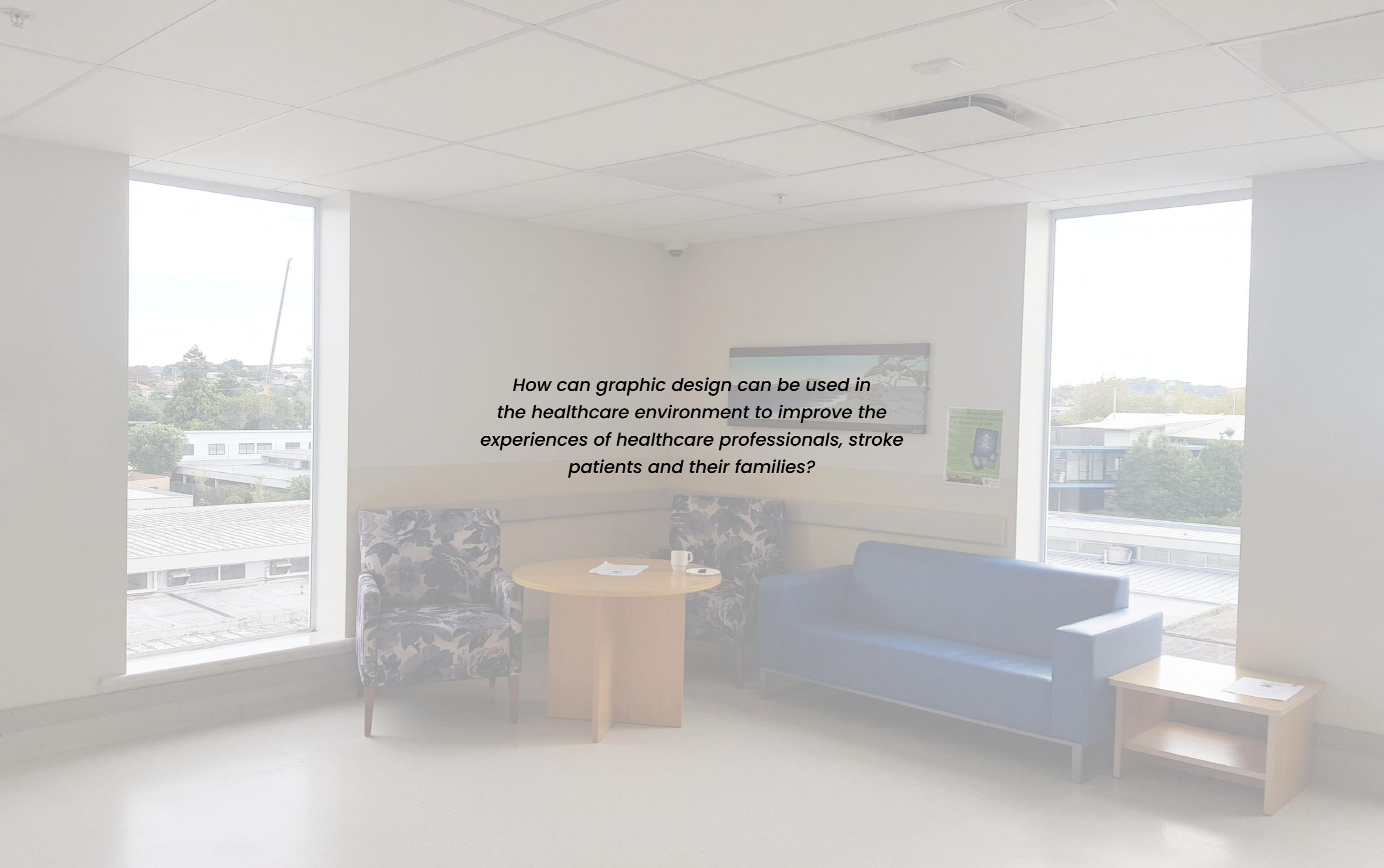
I am carrying out these expert interviews on the 1st of December on Ward Two and should take between 15-20 minutes. Notes and audio will be recorded during the interview after consent is given. You will only be known to me and will remain anonymous throughout my research.

**If you would like to participate, let me know by emailing me at [katiet2831@gmail.com](mailto:katiet2831@gmail.com).**

**Approved by the Auckland University of Technology Ethics Committee on type the date final ethics approval was granted 17th September 2020, AUTEK Reference number 20/258.**

**Appendix Four - Final Installation at North Shore Hospital**

*How can graphic design can be used in  
the healthcare environment to improve the  
experiences of healthcare professionals, stroke  
patients and their families?*



# Final Consultation with Staff on Ward Two

After the hand-in of my exegesis, I focused on working on the final design for the 'welcome area' on the Acute Stroke Ward at North Shore Hospital. The concluding phase of the designs in this project planned to activate a corridor in the ward through designed installations.

The final designs were created using the feedback from staff and reflecting on previous data collected throughout my research.

I proposed a 'continuous' design that started in the corridor and directed staff, patients, and their families out into the welcome area. The design in the corridor is the beginning of the journey to recovery for patients. The splotches and scribble resembling the darkness and confusion many experience after having a stroke.

The scribble leads users through the corridor, eventually turning into the outline of kōwhai leaves leading you out of the corridor and into the ward. The design continues into the 'welcome area' of the ward where the outlined kōwhai leaves then expands into a garden of kōwhai and harakeke.



*Mock-up of potential final design in corridor*



Mock-up of potential final design in 'welcome area'



*Mock-up of potential final design in 'welcome area'*

I presented these designs to two senior staff members on the ward to receive a confirmation to go ahead and get their last opinion on the designs.

They approved with the designs and seemed impressed that I was able to capture the recovery journey of stroke patients through my designs. They were drawn to the corridor design and although they previously agreed for this design to be installed in the corridor they changed their minds as a result of seeing the designs. Through our discussions they recognised the impact the designs might make in the entrance area to the ward.

Although this area hadn't previously been pointed out as an area of interest or was open to having installed designs on the walls the staff were excited and said it would have a bigger impact on both patients and staff.

They offered to take down the posters and art off the wall in preparation for my installation. They also suggested that instead of completing four windows that I only do two as having designs on all four windows could create a visually busy space that may be overwhelming for their patients.

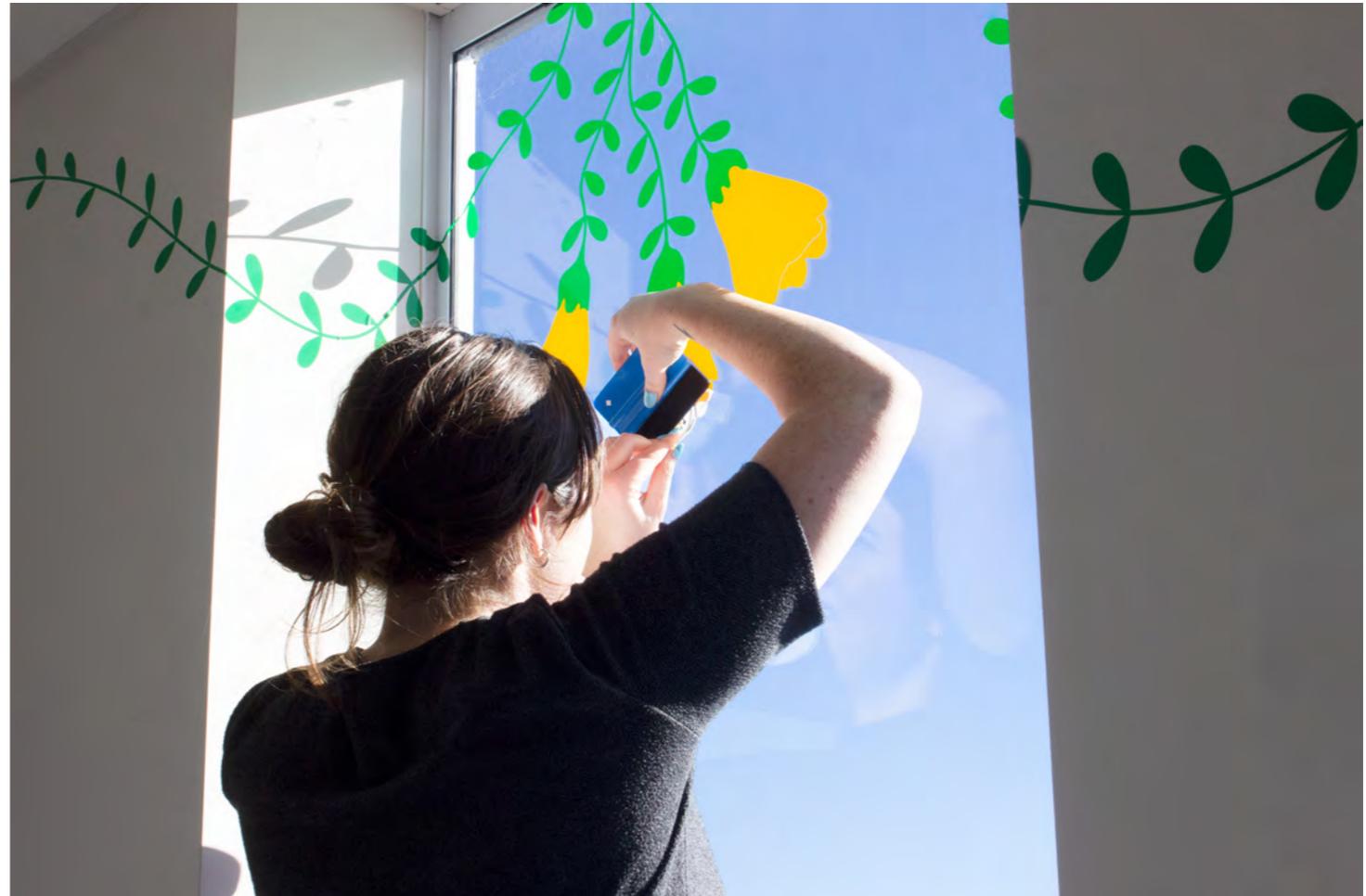


*Wall outside whānau room where the splotch/scribble design is to be installed*

# Final Design and Installation at North Shore Hospital

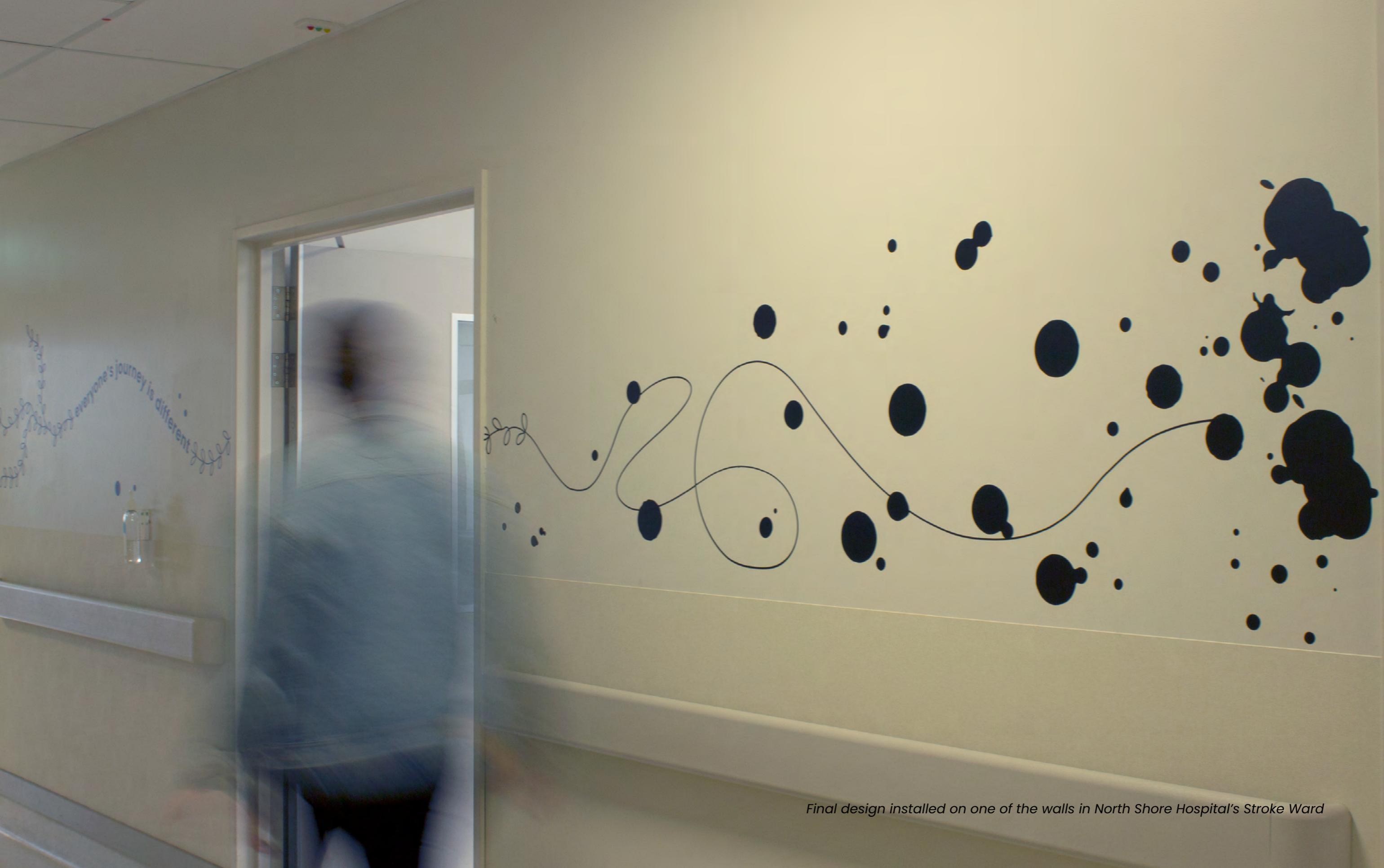
The consultation with staff led to the development of the final design. The design in the corridor is resized to fit the wall in the ward and make space for the door to the whānau room that splits the design in half. The design includes the text 'everybody's journey is different' as this was one of the main insights from my research and is what the final design aims to address.

For the two windows, I combined the previous four ideas to make up the two windows. Including the transition from the outlined kōwhai leaves to the flourishing garden of the kōwhai and harakeke. The kōwhai leaves from the final window continue onto the wall to lead patients and staff to the elevators. The last touch-point before patients leave the ward to carry on their recovery journey in other care.



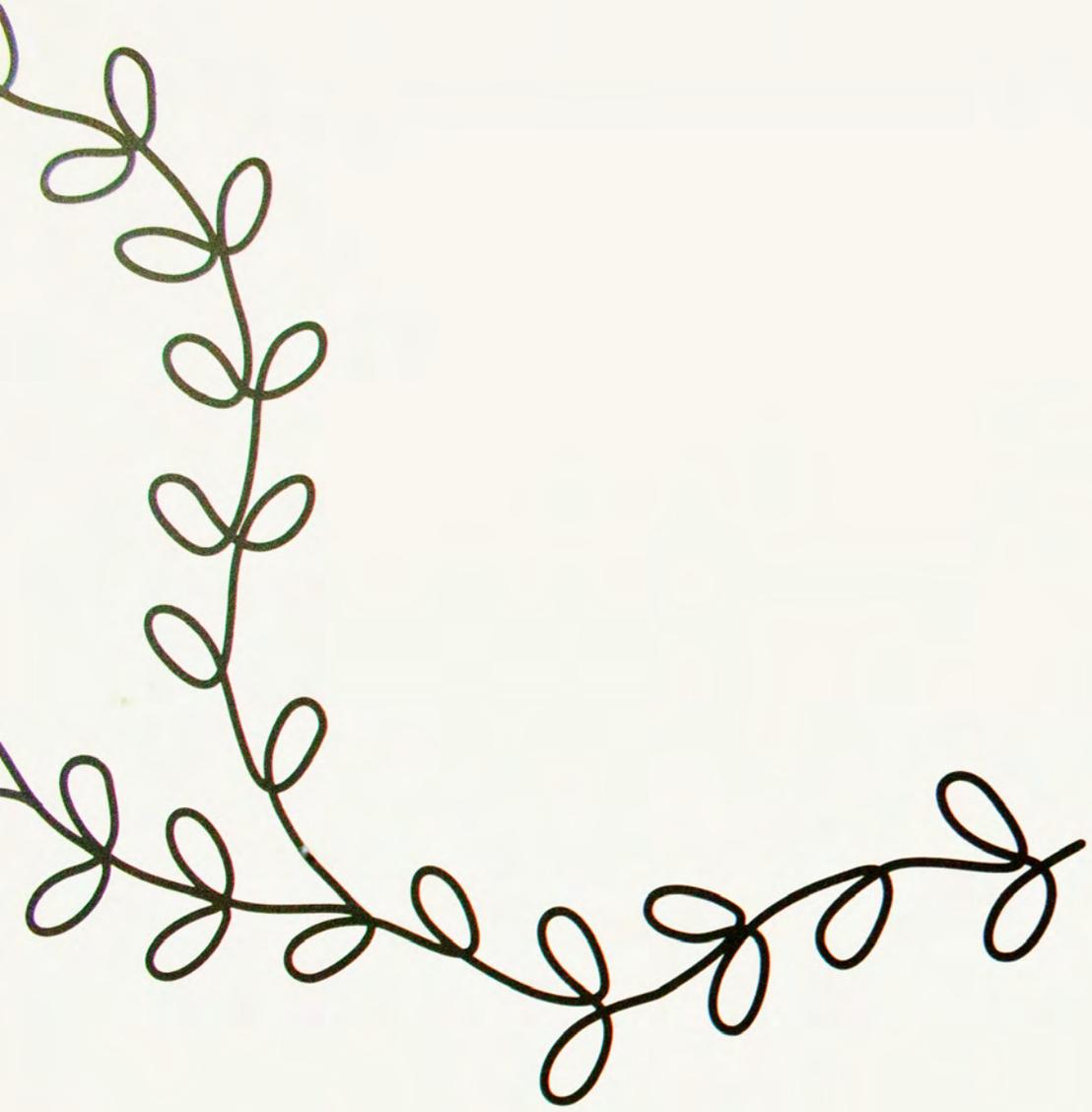
*Installing the kōwhai designs on the window in the 'welcome area'*





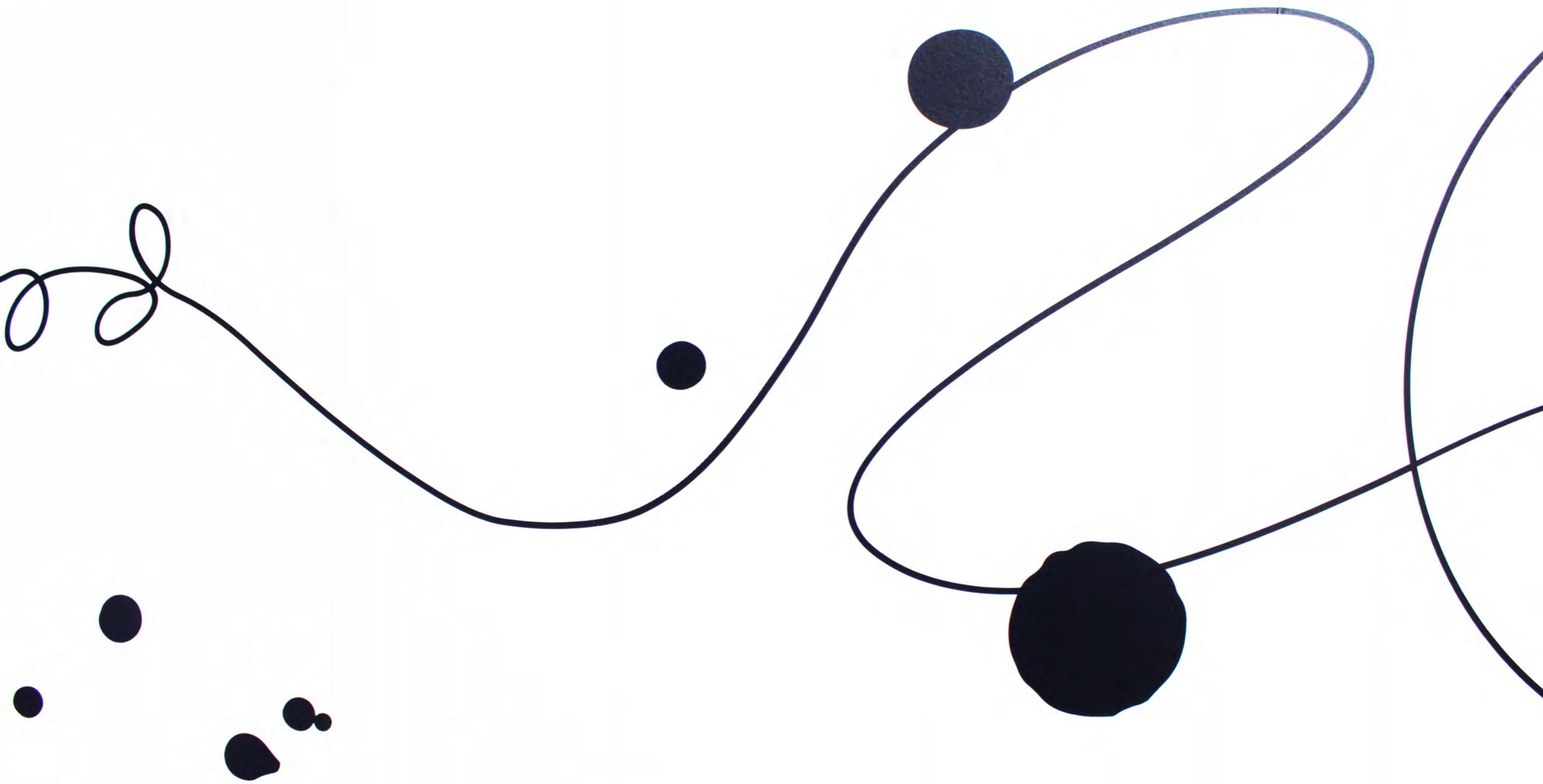
*Final design installed on one of the walls in North Shore Hospital's Stroke Ward*





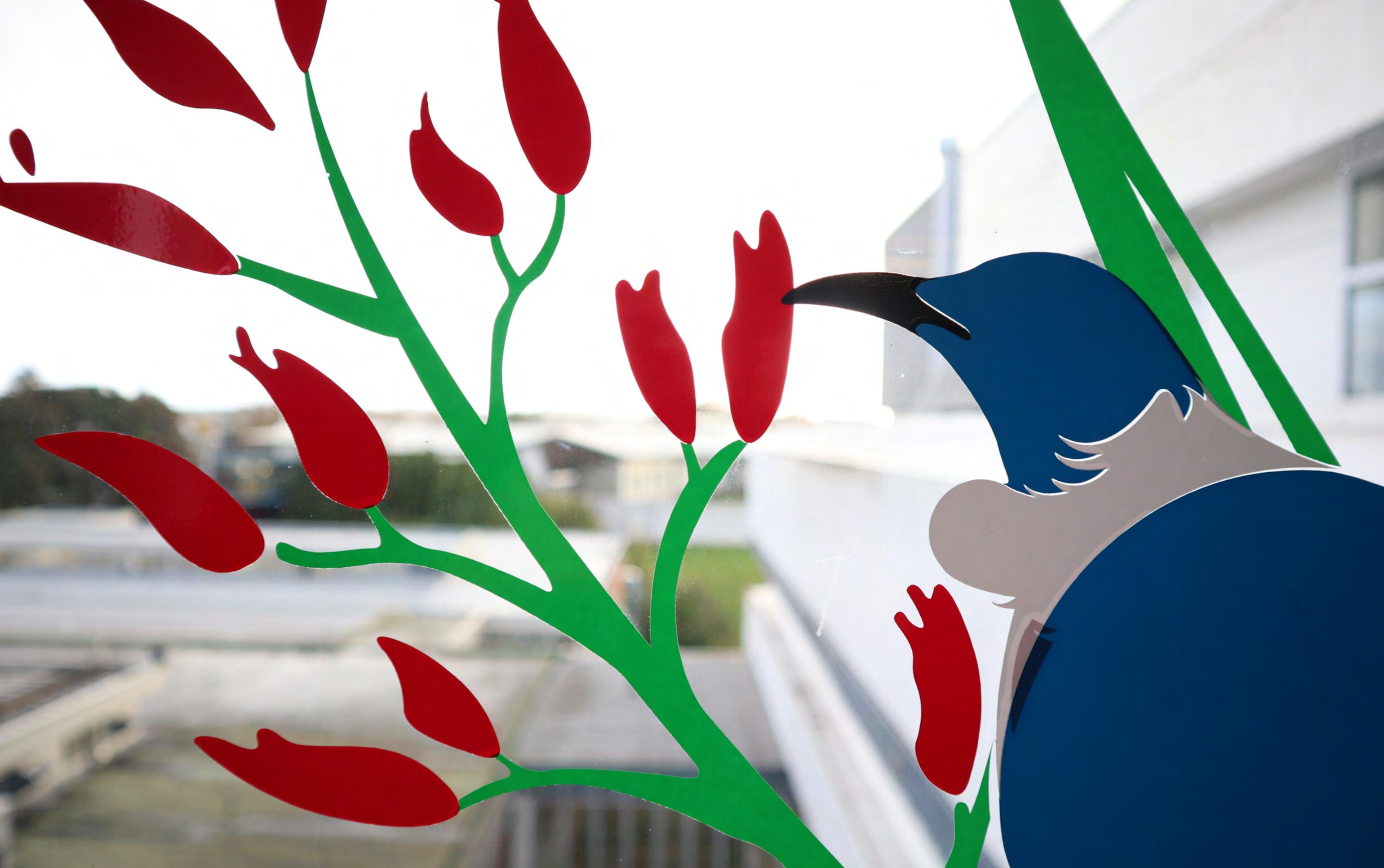
**everyone's journey is**







*Final design installed in the 'welcome area' in North Shore Hospital's Stroke Ward*







# Project Zine

After installation, many staff and fellow students suggested creating a zine or some collateral to tell the story of the designs in North Shore Hospital as well as my personal journey through the project.

This led to the creation of a concertina zine. I chose a concertina format to reiterate the idea of a journey. The journey to recovery and also my personal journey through this research and the collaboration with healthcare professionals.

This zine is intended to be left in the welcome area of the Acute Stroke Ward at North Shore Hospital as well as be given to staff.



Project zine that explores the journey of my research



The splotches and scribble begin the journey within the ward. The ink splotches represent the sadness and confusion many experience after having a stroke.

The scribble emerges from the splotches on the wall, eventually transforming into the beginning of a tūwhaka branch.

Although a stroke can create many challenges, through the support of healthcare professionals and whānau there is hope.

I hope that these designs bring light and a sense of calm to the stroke ward environment, aiding patients and their whānau on their journey to recovery.

**Designs created by Katie Twisleton**  
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