EMPOWERMENT BY ARCHITECTURE
DESIGN OF AUCKLAND'S REHABILITATION UNIT

AN EXPLANATORY DOCUMENT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
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ABSTRACT

The purpose of this study is to examine what elements of design architecture should provide to empower the patient in rehabilitative care. The project is a specialised building type, a multidisciplinary, rehabilitation unit which will be built in two stages. The unit will share the site of Manukau SuperClinic Great South Road, Manukau. Manukau District Health Board focuses on implementing new models of healthcare, under the umbrella of Towards 20/20, and have prepared two architectural draft briefs. This project has applied these briefs in two ways. First, to formulate an ethos for the Unit that relates to the patients’ needs. Second, the functional requirements contained in the briefs are based on the American rehabilitation model so they have been reconstrued to apply to the New Zealand paragon. To complete this emphasis was placed on the patients’ instrumental and psychological requirements so that their recovery occurs in an environment of safety and belonging. These objectives were realised by using case studies, both national and international, and supporting literature that gave an insight into historic and current trends in healthcare and health architecture. Using this information the project explored issues such as the solution to loss of control, privacy and contact together with factors such as movement and the nature-healing relationship to create an enabling environment. In the end, it was found that the solution includes not only the patients’ needs but also consideration of the patient’s visitors and human resources. The inclusion of these aspects results in architecture that is democratic while also meeting Vitruvius’ commodity, firmness and delight. The resultant building is then a therapy in itself.
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INTRODUCTION

This research investigates how the design of a multipurpose rehabilitation centre has the ability to empower the patient. The philosophy that underpins healthcare architecture, both past and present, has been briefly presented, but not as it applies to the New Zealand paradigm and a specialised building type. This project will define rehabilitation and what causes disablement, a necessary starting point from which to set out the architectural question, its objectives and a design methodology namely how best to provide for this unique building use.

Architectural theorists categorise the history of healthcare architecture in two ways; however, it is the resultant shifts in the last sixty years that this paper principally addresses. The first grouping is the Minimalist Megahospital (1950-1980) which is broken into two sub-categories: Hospital as a Machine for Healing (1950-60) and An Imperfect Machine for an Imperfect System (1970-80). During the Minimalist Megahospital era, hospitals were perceived as large institutions run by Government agencies. The machine and technology were pre-eminent and family/patient support was barely tolerated. The second stage is the period we are now in, the Virtual Healthscape. The virtual healthscape stage runs parallel to Cor Wagenaar’s latter two revolutions which focus on empowering the patient and returning the hospital to the people.

With the patient empowerment paradigm (humanisation), care focuses on the patient rather than the machine. Architecture pays attention to the patient’s environment, concentrating on surface, texture and ornament together with legible interior spaces and circulation. All of these elements contribute to the recuperation of the patient. We also see the introduction of metaphors to describe the architecture, including “shopping mall”, “residential” and “hotels”. Consequently healthcare architecture is no longer thought of in the institutional or megahospital context, but rather in a social context. The importance of social context in healthcare architecture is clarified by Stephen Verderber who specialises in design therapeutics and healthcare. He summarises that healthcare facilities are faced with the challenge of not only being a model of ecological stewardship but also a model of ecological stewardship in society. The question then is how can New Zealand’s healthcare architecture respond to these paradigms and empower the patient?

Counties Manukau District Health Board’s answer is the development of a multidisciplinary rehabilitation unit (the Unit) at 901 Great South Road, Manukau, which will be built in two stages.

Presently the site accommodates the Manukau SuperClinic (SuperClinic) which is used for elective surgery. During 2009, in the midst of the worst global recession since the Great Depression, the New


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3 Verderber and Fine, Healthcare Architecture, 3-5.
4 Mardelle McCuskey Shepley, Design for Critical Care: An Evidence-Based Approach (Burlington: Elsevier Science, 2009), 21.
5 Wagenaar in “Five Revolutions,” The Architecture of Hospitals, 3-5.
7 Wagenaar in “Five Revolutions,” The Architecture of Hospitals, 41.
The patient empowerment paradigm has been introduced, specific to healthcare; however, this phrase is multidisciplinary. Psychology, education, health promotion and management literature all use the term "empowerment" and its associated synonyms within their cultures. Latin used the word posse, meaning power, with a derivative to be able. Empowerment is a transitive verb that is an action verb expressing a doable activity that must have a direct thing or person receiving the action of the verb. It further defines empower as: "authorize, license, (person to do); give power to, make able (person to do)." Empower has the synonyms: "authorize, warrant, license, commission, entitle, sanction, permit, allow, enable and qualify."  

This paper will use the definitions of empowerment “make able, give power to, and enable” and apply it to the disabled in the architectural context of a rehabilitation unit. After providing a brief outline of this project, the terminology of disability and rehabilitation will be put into context with a discussion of the architectural questions and objectives of how to create empowerment by architecture and the design methodology used. Finally, it will set out a precursory discussion of the terminologies and the functional, aesthetic and psychological requirements.

OUTLINE OF THE PROJECT

The Unit is to be built alongside the Superclinic. Currently rehabilitation services are carried out in multiple sites, either satellite based, such as Auckland Spinal Unit at Barra Road, Otara, or within the confines of pre-existing large institutional care facilities, such as Middlemore Hospital. A Schedule of Accommodation Draft and Functional Brief for Rehabilitation Centre (the Briefs) was prepared by "Towards 20/20" during 2009, for Manukau District Health Board and are contained in Appendix A.

From the Briefs it was ascertained that the Unit is to be completed in two stages. The first stage provides for spinal, stroke and neurological patients and their requisite therapy and social areas. The second stage is the accommodation of brain, amputee and vascular patients. The Unit intends to be multidisciplinary, either replacing outdated facilities or moving care for patients who, for example, have suffered a stroke, to a purely rehabilitative atmosphere.

WHAT IS REHABILITATION?

Definitions of rehabilitation have an underpinning theme emphasizing the need for:

... a learning/behaviour change process, involving skill acquisition and generalization for disability-related procedural learning, development of problem-solving and psychosocial coping skills and motivational enhancement.

For these reasons, the Unit must provide resources and tools to allow the individual to psychologically and physically adjust and cope with challenges as they arise. These resources and tools must be included in both inpatient and outpatient facilities in an enabling environment.
ARCHITECTURAL QUESTION AND OBJECTIVES

Why is architectural empowerment required in healthcare architecture? Wayne Ruga identifies three major stresses the patient will undergo in the healthcare environment as loss of “control,” “privacy” and “contact.” The aim of this project then is to eliminate these stresses and provide an empowering environment.

A partial solution is seen in Maslow’s pyramid of hierarchy. Verderber and Fine explain that the move to patient empowerment was reinforced in the late 1960s with Abraham Maslow’s philosophy (Fig. 5). Maslow’s ideology is based on motivation of personal needs using a tier system with physiological, health, food, sleep being the lowest, and self actualisation being the highest. Therefore, a person must fulfill their physiological needs of health, food and sleep, before those of safety and belonging. This philosophy also links to Middleton and Craigs’ psychological needs hierarchy.

Using this rationale the design of the Unit must identify the patient’s preferences and acknowledge the effect of the environment on the patient’s health and wellbeing. The Unit must also consider that patients will come from differing cultural and socioeconomic groups. As a consequence, there are many considerations. Designing the Unit with all these considerations in mind is fraught with problems. In relation to the role of human resources, but they will not be the primary focus. Instead this project adopts the patient empowerment paradigm. The outcome of this research project will be the exploration of the design of the Unit using national and international case studies, together with supporting literature. This project has taken the initial terminology of function and aesthetics and narrowed it to psychological needs hierarchy. It is these factors, this paper will need to explore, alongside issues of loss of control, privacy and contact. As a result the design of the Unit will achieve its ultimate goal of giving power within a specialised building type.

FUNCTION

A definition of function is “shaped or construed with regard mainly to its function rather than to aesthetic considerations.” In this regard much architectural writing highlights the negatives of hospitals. For example, Betsky describes hospitals as, “not a nice place” while Verderber says that often there is a “... weakening of the hospital’s civic functions and potential” leading to “institutional rootlessness.” To eliminate these problems, in the design of the Unit, the design process will eventually be treated as a whole. Functionality and the appearance or building aesthetic needs will be addressed using the umbrella term of functional, psychological, and aesthetic criteria. This is the terminology the research project will adopt, to provide empowerment.

PSYCHOLOGICAL NEEDS

Maslow, Middleton, and others use the universal term of psychological needs with the strong theme of safety, belonging and self actualisation. It is these factors, this paper will need to explore, alongside issues of loss of control, privacy and contact. As a result the design of the Unit will achieve its ultimate goal of giving power within a specialised building type.

AESTHETICS

Maslow explains that people may have an aesthetic need. When this requirement is fulfilled they are...cured by beautiful surroundings... Problematically beauty in architecture is subjective. What is tasteful to one may be abhorrent to another. What Maslow explains is that there is an inherent human requirement... for order, for symmetry, for closure, for completion of the act, for system and for structure which may be indiscriminately assigned to our cognitive, conative, aesthetic or even to neurotic needs. With emphasis on order and structure, together with the goals of commodity, firmness and delight a holistic approach to the design of the Unit is required.

information will then be unified into architectural hypothesis to provide a framework, to create architectural empowerment within a specialised building type - the Unit.

**DESIGN METHODOLOGY**

As the ideal of this project was to empower the patient, the catalyst for the design process was from the inside, out. It was decided that initial focus should be on the areas in which the patient first spends time, and then on the areas with which they subsequently interact (Fig. 6). Consequently, the design process began with the development of a proto-patient room, which was then incorporated into three patient care units. The patient care unit that best meets the philosophy for the Unit was further developed, using research and a concept, to design a Unit that is an enabling environment. It was at this point that the plan became omnipresent. In considering the plan, issues arose as to what makes space appealing and gives rise to spatial diversity. On that basis architectural interventions were used, including hierarchy of space, projections and recessions, to continue developing the plan. The ideal became that the plan, when broken into the positive and negative, would lead to a composition of space that has aesthetic value. Finally, ecological stewardship and the skin of the building were explored under the heading of commodity and delight. Supporting these investigations were sections and proto-models which led to the final design.

**SUMMARY**

At the start of this project the writer did not consider that the idea of empowerment in healthcare architecture was original, research shows it is not. What this project does, however does, is to apply the hypothesis of instrumental criteria and psychological needs to a specialised building type; the Unit. This methodology provides an understanding of how empowerment using architecture can occur within the New Zealand healthcare system. Research will need to look at both international and national models, to create architecture that is specific to a range of medical disorders, a multicultural population, and our particular healthcare model.

Figure 7 summarises the elements for consideration under the broad terms of psychological requirements and instrumental needs. It has been established that to create architecture that empowers factors such as loss of architectural barriers, legible spaces as well as architecture that looks to surface, texture and ornament need to be considered. The result of these considerations will be a contemporary social organisation, where the activities of rehabilitation, learning/behaviour changes and motivational enhancement can occur.

This explanatory document has two points of focus. First, chapters one to three introduce principal elements of the project. Case studies, a research synopsis, including the ethos of the Unit, the site and context are discussed to provide background information. This research supports the second part of the document, chapters four to six. These chapters present a summary of the design process. They introduce what quality of architectural experience the architect needs to include to create empowerment.
CHAPTER ONE, REVIEW OF CASE STUDIES

The precursor to the rehabilitation unit was Florence Nightingale’s convalescent homes for veterans. Nightingale, a founder of modern nursing, wrote standards for hospital design. Nightingale believed that the veteran’s convalescent homes should be a “string of cottages,” rather than a single building. Yet, it was not until the end of World War II that rehabilitation units were founded in the basements of hospitals for injured war veterans. To design a rehabilitation centre that meets today’s standards, it was necessary to complete case studies, both national and international, to understand perceived instrumental and psychological needs of patients. The assessment of these studies assisted in the development of a philosophy for the Unit. Likewise, the design process for this project draws upon the case studies, followed by a path of discovery, rather than following fixed guidelines from the beginning.

ReHab Basel Centre for Spinal Cord and Brain Injuries, Basel, Switzerland (2002), Herzog and de Meuron

To achieve this Herzog & de Meuron used several architectural measures. The form of ReHab Basel is rectilinear. It uses horizontality to accommodate the programme, with therapy treatment and staff functions on the ground floor, patient rooms and support services on the second floor, and a roofscape created for both patient and family use of conference rooms, staff exercise rooms and overnight accommodations. Democratic spaces are achieved by incorporating ramps and elevators into the design for vertical circulation, so that the building user is not architecturally disabled. Herzog & De Meuron set the goal of...

... designing a multifunctional, diversified building, almost like a small town with streets, plazas, gardens, public facilities and with more secluded residential quarters where occupants may take different paths to move from A to B ... allowing the patient as much autonomy as possible.

This aim was completed by having a successful relationship with the exterior environment. From a birds eye view of the centre, (Fig. 9) it is evident that the design of the roofscape makes it difficult to locate the building in its context. Five courtyards have been cut into the rectangular volume. These courtyards are of differing scale and materiality. These courtyards allow diffused light to enter the building. Likewise, an increased perimeter surface is achieved. This results in increased solar gain within the building envelope, and the courtyards act as a means of way-finding and socialising in a safe environment.

The relationship to the exterior environment is continued with the design of the windows. The patient rooms on...
the first level, have floor to ceiling windows that open on to a deck. Similarly, throughout the facility, large windows are used at every opportunity. By using timber flooring and ceilings, the relationship to nature is promoted and the idea that the building links to the “mythical, restorative properties of the primal forest” is captured.

The writer believes that Herzog and de Meuron have fulfilled their client’s mission statement. Democratic spaces developed from a consideration of movement through the building, both horizontally and vertically. Attention to materiality results in aesthetics that appeal to the human imagination. By using several architectural interventions in a considered and sympathetic manner, architecture that humanizes the patient is accomplished.

Maggie Centres, England

An example of the refinement of palliative care facilities can be found in the English Maggie Centres which are day care facilities for the terminally ill. The idea for the Maggie Centres came from Maggie Keswick following a diagnosis of cancer. During her illness, she realized facilities were not available that provided the patient with a humanized environment within which to receive treatment or consultations.

“… waiting in itself is not so bad – it’s the circumstances in which you have to wait that count. Overhead (sometimes even near) lighting, interior spaces with no views out and miserable seating against the walls all contribute to extreme mental and physical vexation. Patients who arrive relatively hopeful soon start to wilt.”

Together with her husband, Charles Jencks, architectural theorist and designer, the idea for the Maggie Centres was developed. The hope for the Centres was that “art and landscape” would become an important part of the brief.

The Centres were designed by leading designers such as Zaha Hadid, Frank Gehry, and others. The consequence of this is that the Maggie Centre’s successfully fulfill the post-modern requirements of nature, contact, texture and ornament.

Also of interest to this project, is Charles Jencks’ explanation of the underpinning philosophy for the Maggie Centres. Jencks reasons that the buildings are not a type, that is, they are an informal building which is “welcoming, domestic, warm, skittish, personal, small-scaled and centred around the kitchen.” He uses the analogy that the Centres are “… like a house which is not a home, a collective hospital which is not an institution, a church which is not religious, and an art gallery which is not a museum.” He believes it is a “hybrid,” that is an amalgamation of these four building types and to this he applies the metaphor “the Architecture of Hope.” Metaphors are often used in architecture because “… metaphors of the body and human relationship, pervade all thinking, not just rhetorical speech, and drive us in certain directions.”

In review, the Maggie Centres evolved from the need for a day care facility for cancer patients, outside of the hospital environment, that provided a humanized environment. The writer believes that the founders of the centres successfully achieved their goal by using several methodologies. First, in relation to the philosophy, they understood that they required an amalgamation of building types, together with the use of metaphors, to create centres that focus on integrating art and landscape. The architects also sought an aesthetic that relates to domestic architecture by using post-modernism elements, such as texture and ornament, to create architecture with an identity of its own. It is these design manoeuvres that the Unit will seek to include.

Bairds Road Spinal Unit, Otara, New Zealand

Bairds Road Spinal Unit opened in 1977. To complete a study of the unit several interviews were conducted. Marianne Cox was the principle interviewer, with supplementary advice received from Dr. Cynthia Burnett.

When the unit first opened, a spinal injury was fatal and invariably the patient did not leave the centre. Fortunately, this is not the situation today. Now, the patient will leave the clinic with skills providing independence enabling a “reintegration into the community.”

This study will look at the functionality and philosophy of the Bairds Road unit, resulting in an understanding of what architectural elements facilitate the patient’s recovery process and the development of skills during their recovery.

The Bairds Road Unit has a catchment area from the Far North to Gisborne. The centre treats patients who have sustained damage to the spinal cord, resulting in limited movement and, often, feeling. They may also have additional injuries, such as to the brain, although first treatment is to the spinal injury.

In relation to the time period a patient spends at the unit, Marianne indicated that the length of stay at patients at Bairds Road is on average 108. In comparison the American model of

42  Yelavich, Contemporary World Interiors, 460.
43  Founded by Charles Jencks, writer and architectural theorist, and others in support and memory of his wife Maggie Jencks, 2002.
54  Interview Marianne Cox, Operations Manager, Counties Manukau District Health Board, 27 July 2009.
rehabilitation, which the Briefs are based on, uses a 30 day stay model. The unit does not provide care for critical patients.

The writer’s initial visit to the unit was on Sunday, 26 July 2009. On first impression it appeared that the facility was vacant. This is because the unit is located in a semi-industrial area in Otara, consequently, during the weekend, there is little foot or road traffic. Further, the gym is the first point of contact on arrival. This building has an unadorned concrete block wall facing the roadside, with adjacent parking, which was empty.

The writer’s second visit was to meet Marianne Cox on 27 July 2009. Likewise, impressions of the unit were disappointing. The adjacent mental health facilities are clearly sign-posted, and are the first point of contact after the carpark. If you are not familiar with the site, therefore, it is difficult to know if the accommodation includes the spinal unit. The spinal unit is not sign-posted and as a result the entrance is difficult to locate.

Several issues arose from critiquing functionality. With the exception of the therapy area, the form of the unit is one block, rather than a cluster of units. Circulation within the patient care unit is by way of a central spine, without views to the outside. The Unit was designed at a time when the patient’s right to privacy was not an issue. This is apparent in two areas. First, accommodation is for 20 patients in a ward of four to a room (visitations were not made to the rooms because of privacy issues). Second, there are no private ensuites, personal hygiene is provided by way of one large shower room. (It was advised there is an area that can be adapted to provide individual bathing.) Loss of privacy also becomes an issue when attempting to accommodate the mixture of society that the unit receives ranging from gang members, to adolescents who refuse to go to Starship and the elderly.

There is a commercial kitchen which is no longer used, as meals are prepared off site. However it has not been altered for reuse. In addition, although social areas are provided, the writer believes they lack any atmosphere and are unappealing.

The philosophy, adopted by caregivers at Bairds Road, has been the basis for many of the design decisions within this project (because it makes sense to the writer). Marianne explained it as follows. First, there is a strong emphasis on the support of the family. Not only in relation to the patient’s needs but also in supporting the family to adapt and cope with the changed lifestyle resulting from the patient’s medical condition. For example, partners of the patient may need to be taught everyday skills, like managing finances. This support is also provided within the unit.

In relation to the clinic room, there are often several people attending such as: doctor, nurse, family members and others. With allowances for movement using a wheelchair or walker, the room is already larger than normal. However, in the case of rehabilitation, spatial allowances must be made for the support team required by the patient. These factors will impact on the overall volume of the centre as it is designed.

The study of Bairds Road provided an opportunity to understand the relationship of inpatients, outpatients and therapy. Outpatients are considered strong role models for inpatients. They provide a mentoring system that is used in physical and occupational therapy for achieving goals and counselling. As a result, accommodation for outpatient and inpatient therapy is provided in one building. In addition, a connection is seen with the community, with the gymnasium providing a training area for para Olympics contestants and other sporting activities. Marianne advised that “ownership” by the community is continued with fundraising, volunteering and programmes such as the community garden. It is important that these areas are included together with space for social areas for barbecues, reflection and informal meetings in the end design.

The proximity of Bairds Road and the ability to visit on more than one occasion has been invaluable to this project. Early on it was established that the unit is out of date with international trends. For example, the loss of privacy the patient experiences is, as would be expected, from the minimalist hospital era. However, what was invaluable to this project is the understanding of the New Zealand rehabilitation model and the goal orientated recovery. At all times the writer understood from Marianne that it was the patient’s and family’s best interests that provided the primary basis for their decisions. This project will strive to maintain that emphasis. Additional information that drove design decisions will be explained as it is applied to the design.

Burwood Spinal Unit, Burwood, Christchurch

The study of Burwood Spinal Unit took place on 7 May of 2010. Liz Oliver, Service Manager, explained the philosophy and functionality of the unit. Located on the site of Burwood Hospital, Burwood Spinal Unit has a catchment area from Giborne on south. The unit was opened during 1979 and is a 26 bed ward with a hostel space for four patients, and four self care units.

Unlike Bairds Road, but similar to the proposed Unit, acute patients are admitted. Burwood has the same philosophy as Bairds Road regarding family importance and goal orientated recovery, nevertheless several differences between Bairds Road and Burwood were noted.

Burwood receives extra funding from Canterbury Health Board and charitable organisations such as Rugby NZ, that Bairds Road does not. This additional funding has allowed for improvements to existing facilities and building of new facilities. Liz explained that a recent upgrade to their facilities has provided for the inclusion of isolation rooms, with upgraded ventilation for critical patients. The four bed wards, have been altered to accommodate three patients and a shared en suite. (Although as Liz pointed out, the en suites only cater for right handed patients.) Some rooms have also been altered to be single rooms. Liz answered the query as to how they choose who has a private room or shared room, with references to needs and what is available, it is recognised that “some people heal better when sharing.” All patient rooms include the nature healing experience by having large window openings, often onto a patio.

56 Interview Marianne Cox, 27 July 2009
The extra funding has also allowed for an upgrade of the kitchen and dining facilities. Like Bands Road the kitchen had a commercial aspect as meals were previously prepared on site. This is now completed off site. Funding has also provided a shared rehabilitation garden and children's playground, which are invaluable to patients and their family.

A further positive aspect to Burwood is the recent addition of the library building. If the whole unit was of the standard of this building it would be unbeatable. Built in bookcases, together with an island of computer desks, make the patient, family and staff feel valued. The architects have included everything of merit mentioned in healthcare architecture: natural timber lined ceilings, the nature, daylight contact provided by a large picture window and clerestory windows. A comfortable waiting area is at the entrance to the library. The writer thought “it is a place you just want to be!”

It was at this point that Liz discussed the social aspects of being in rehabilitation. When they designed the library block, quiet rooms were included (a number of these are provided for in the Briefs). Unfortunately, these do not get used. They have also experimented with providing patients with access to the internet. Besides the huge cost involved, it was found that patients then tended to spend more time in their room rather than, as is required in the rehabilitation process, socialising. To avoid this situation they have limited access to the internet in the patient room to those that are bedridden.

Although Burwood has hostel space for staged recovery the centre has also had the opportunity to include an adoption apartment within the ward envelope. This apartment includes a kitchen with benches of varying heights to cover differing disabilities. The dining area and lounge open onto a private courtyard garden. Liz advised that they have found this facility invaluable as part of the rehabilitation process, allowing patients to gain their confidence and independence in a mentored and safe environment.

Burwood Spinal Unit shares facilities with Burwood Hospital, including a chapel. In addition, the therapy areas are located in the hospital and reached via a long connecting corridor. The writer observed that the journey to the therapy areas did not feel a hindrance. Rather, it provided the opportunity to leave the ward atmosphere, pass other people and acknowledge them, as they returned from therapy.

From this visit, the writer concluded that Burwood achieves a healing environment. The nature-healing relationship occurs with the provision of large windows. In some cases this connection is improved as patient rooms open onto a deck with views to a forest. Furthermore, small details, such as bird feeders hanging from the eaves, reinforce this relationship while also providing positive distraction to the patient. Aesthetically, because of its age, a lot of Burwood’s interior detailing seemed uninspiring, and more in line with the minimalist megahospital period. However, with the addition of new facilities and upgrading of old the environment did not feel stagnant.

[58] These could not be visited as they were in use.


[60] Email advice from William Levack, Senior Lecturer in Rehabilitation, Rehabilitation Teaching & Research Unit, University of Otago, 17 September 2009.
In many ways the philosophy of the centre is the same as those of the spinal facilities. First, family are encouraged as part of the healing process and overnight visitation is encouraged. Second, concern for the safety of the patient arises with such a wide population base. Third, as with spinal patients, sufficient space for allocation and storage of equipment, for example wheelchairs and hoists, is required. Fourth, therapy areas are provided, albeit in a separate building. The distinguishing point of difference between spinal rehabilitation and brain injury philosophy is that outpatient therapy is completed off site. However, Jonathan advised that this is currently being reviewed, and they may merge it in the future.

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**CHAPTER 2. SYNOPSIS OF RESEARCH ENQUIRIES**

Hospitals were in existence as early as 1200BC. During this time patients were cared for in Greek temples and religion played a strong influence. The commonality of approach between then and now is that care focused on the patient as did design. They were bedridden therefore the bed area was central to the design. If healthcare architecture has been around as early as 1200BC with focus on the patient, and rehabilitation care initiated in the mid 1940s, then it stands to reason there should be a body of research relative to rehabilitation centres. There is not. While there are international guidelines available they have the drawback of expressing the opinions of individuals without the benefit of research and are not particular to New Zealand. While helpful, these do not provide an overall reference for the design of the Unit.

Earlier issues of loss of control, privacy and contact were raised under the umbrella of psychological needs. Now, these topics, together with instrumental criteria and their interlocking relationships, will be discussed. As architectural design relates to not only the creation of the new but also the improvement of existing objects, this body of research will be used to form the philosophy of the Unit which will be based on the principles of creating an empowering environment.

**PSYCHOLOGICAL NEEDS**

Maslow categorises psychological needs (health, food and sleep) as the base need in his hierarchy. In the case of a rehabilitation unit it is taken that health is disrupted as the patient is unwell; food is provided as part of the patient’s daily care; and sleep is available by way of a bed within the patient’s room. Later in the hierarchy pyramid Middleton and Craig link rehabilitation and its goal orientated programme, to Maslow’s self esteem and self actualisation. How are self esteem and self actualisation disrupted during rehabilitation? As identified earlier Ruga’s argument is that the patient becomes part of a system, although their basic needs are provided for, it is more overt factors such as loss of privacy, contract and control, the social/self esteem needs that influence the patient’s recovery.

**Loss of Privacy**

For over 150 years there has been a debate over the role of privacy in patient wellbeing, and the single bed patient room versus open wards and semi-private rooms. Throughout history, the single room is seen as the domain of the privileged, with the less affluent being cared for in the open ward. Florence Nightingale asserted that the single room was unsanitary, because they were small and confining, fresh air could not freely circulate. Likewise, staff may be distracted from the majority of the patients to care for the individual. These issues, together with infection and safety, and a divide between American, European and Asian cultures, continue to be a source of debate. Since the Briefs for the...
Unit are based on the American rehabilitation model, it is interesting to consider why an American source advocates the single patient room:

1. Lower hospital-induced nosocomial infections.70
2. Reduction in the requirement for room transfers and associated medical errors.
3. Improved staff communication with patients.
4. Improved patient confidentiality, privacy.
5. Improved accommodation for family.
6. Reduced noise levels.71

The subject of legislation and confidentiality is interesting. Like America, New Zealand has legislation that protects the patient regarding disclosure of personal information.72 This legislation makes medical staff accountable for confidentiality. In this environment, the single room naturally gains validity.

Loss of Contact

Maslow recognised the value in belonging. Although he considers these factors are less important than the psychological need for safety, the importance of family/peer support on recovery is emphasised throughout healthcare writing. The family deals with emotional, social and medical problems during the patient’s recovery. At the same time, at the Unit, they require comfort, privacy, education and confidentiality. Room is therefore required for family and visitors within the patient care unit, as well as a separate dedicated area.

From the ancient Greeks, to the medieval monastic hospital and the work of Florence Nightingale,73 the value of nature has always been recognised in healthcare architecture. The nature contact provides the opportunity for relaxing views and pleasant places to interact, with the result that patients, family and staff have reduced stress levels and “improved emotional wellbeing.”74

Loss of Control

The loss of control a patient experiences, if they cannot alter their personal space, impacts adversely on their healing. It can also disturb behavioural patterns, such as sleep, and result in noncompliance with medication regimes.75 Technology, such as remote controls, can allow the patient to personally adjust aspects to personal preferences, such as air quality and lighting. Audio communication systems can also increase communication between staff and patients.

While the physical environment can be under accommodating there is a risk that it can be over accommodating. An over accommodating environment can “… engender premature dependence upon needlessly accommodating features that accelerate the erosion of functional abilities.”76 The example of reliance on an elevator rather than the use of stairs is given.77 These are all considerations for the design of the Unit.

Healthcare architecture writing often cites movement/way-finding as having a negative impact on the building user. For example, a problem of the megahospital was that way-finding “lack of effective directional signs,”78 together with confusing internal circulation, caused high stress levels.79 As a solution, Verderber suggests the analogy of residential imagery: “The feeling of a private residence cannot be created if long monotonous corridors must be traversed.”80 He eliminated the megahospital corridor with the use of “… window seats, … views to the outdoors” and “ceiling and floor changes in materials, colour and pattern.”81

INSTRUMENTAL CRITERIA

Movement and way-finding have been discussed under the title of psychological needs. Similarly, it also relates to instrumental criteria. For example, the requirement for a corridor to be wide enough to accommodate the traffic of patients, equipment, visitors and others falls under the heading of function. It is recognised that each term is likely to have a degree of overlap. This reinforces the theory that the design process will need a holistic approach synthesising instrumental and psychological requirements, ultimately resulting in the physical environment becoming a healing environment. In order to gain a more comprehensive understanding of what is required, aesthetics will be clarified and broken into the sub groups of surface/texture and ornament.

Surface

It is beneficial to provide a combination of hard and soft surfaces within healthcare buildings. Similarly, consideration of the effect of colour on healing is required. International lecturer and teacher, Theo Umbel’s research and writings on colour and its effect on healing will be used as a basis for design decisions.82 While unpopular in the megahospital phase, under the post-modernism wood has been reintroduced for its healing value.83 It is a natural material representative of the changing of seasons, with its rings as it ages, is also timeless.84 Further, it has maintained a fundamental, long-term place in human awareness through the millennia.85

Ornament

Architectural ornament is produced across diverse historical periods and geographical cultures.86 Often it occurs in “the margins and between things”87 to either “highlight or

72 In 1939 America passed the Health Insurance Portability and Accountability Act.
74 In 1993, New Zealand enacted the Privacy Act.
75 The information is principally sourced from Thompson and Goldin, The Hospital.
76 Edward Danford and Gary Scott Danford in “The Influence of the Physical Environments,” Enabling Environments, 112.
77 Draper and Steinfeld in “The Influence of the Physical Environments,” Enabling Environments, 112.
78 Verderber and Fine, Healthcare Architecture, 90.
79 Verderber and Fine, Healthcare Architecture, 90.
81 Verderber and Rafuaro, Innovations in Hospice Architecture, 74.
83 Verderber and Rafuaro, Innovations in Hospice Care, 190.
84 Verderber and Rafuaro, Innovations in Hospice Care, 190.
85 Verderber and Rafuaro, Innovations in Hospice Care, 190.
disguise a joint. What this project will seek to do, however, is to look at how ornament can be used to protect the patient, provide a sense of place and introduce texture to the Unit.

CONTRIBUTORS TO THE ETHOS OF THE UNIT

Hospitals are powerful symbols in society – they are seen as representing the value placed on healthcare by government. An important part of the design brief for healthcare architecture is to set out the “ethos.” The Briefs supplied did not do this. In order to complete this for the design of the Unit it was necessary to understand any parallels and points of difference between healthcare architecture and another civic building type. This would provide a point of view to the value that can be placed on the key users of the building. The second step was to compare the ethos of a design brief for a similar building type. The third step, to interpret the case studies of New Zealand rehabilitation units and understand their culture, and see how this would be applied to the Unit.

In comparing another building type, prisons, to the Unit, parallels were found to exist. For example, both can be state owned and accommodate the prisoner/patient for short and/or long periods of time. Similarly, employees work for short/long periods for example, shift work and may be employed at the one place of employment for many years, or only days. Both accommodate a transient population, which stays there night and day, and a permanent population, which is on an eight-hour rotating shift.

It is these similarities which validate the application of the metaphors that are often applied to healthcare architecture. In relation to this, and a point of difference, is that prisoners are accommodated because they are considered to have broken society’s code of conduct, whereas patients are there, generally, through no fault of their own. Does the Government place a higher value on the patient, or the prisoner? Figure 21 illustrates Auckland Central Remand, which when compared to Bairds Road, is certainly more up to date. Referring to the design of the Supreme Court and Counties Manukau Police Station (chapter three), it is concluded that there is a clear emphasis on design in judicial/law enforcement civic buildings. This project, will take the stance that the Government empathises with the patient, and sees the importance of rehabilitating its injured citizens. Consequently, this project is completed on the basis that there are no political restraints, and the budget is realistic. The result of this is that the design of the Unit should meet Vitruvius’ standard of architecture, commodity, firmness and delight.

As identified earlier, the underpinning philosophy for the design of ReHab Basel, was that it should not appear or feel like a hospital. Herzog and de Meuron’s solution was to design the centre using the ideal of a small town, where movement was varied and autonomous. Reinforcing the ethos of ReHab Basel in designing a small town, Wagenaar also compares the hospital to a city, commenting: “like cities hospitals reflect life. This is because hospitals accommodate a cross section of professions, culture and social status.” While initially thought to be original and because of the varying functionality required for the Unit, it is this analogy of creating a city within a city which the Unit used.

A further consideration, when designing the Unit, was whether it is “a hospital based unit” or a “cluster of units.” Because the site is exposed, and the patient may have a weakened immune

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88 Domeisen, in “The Quest for Ornament” Detail Review of Architecture, 574.
93 James and Nicole, introduction to Hospital Architecture, 1.
94 Verderber, Innovations in Hospital Architecture, 250.
95 Guenther and Vittori, Sustainable Healthcare Architecture, 364.
96 Verderber, Innovations in Hospital Architecture, 250.
98 Australian Health Facility Guidelines, 6 October 2007, Revision 2, 206.
system, it was decided to design the Unit as one building. As a consequence, the patient is not subjected to adverse weather conditions as they move between, say, the patient care unit and therapy. This decision continues the idea of providing a safe environment.

Also contributing to design decisions are several points realized from the requirement to translate the Briefs (Appendix A) into a design and the application of information from case studies of New Zealand rehabilitation facilities. For example, America uses a 30 day rehabilitation model, whereas New Zealand’s model allows patients to stay in care from one week to 18 months. This paper takes the stance that New Zealand’s philosophy is “as long as it takes.”

The Unit also needs to accommodate the familiar to provide a feeling of safety. This is when terminology such as a more homelike atmosphere becomes appropriate.

Three studies, Bairds Road, Burwood, and CaviNABI stressed the importance of the inclusion of family members. Not only is family required for emotional support by the patient, but family members also need counselling and advice on how to adjust to the changed circumstances. Subsequently, the patient’s family and peers’ spatial and psychological needs became an important part of the design.

The case studies highlight the needs of staged recovery. First, on arrival, the patient is accommodated in the patient room; second, the patient moves from care in the room to accommodation within the patient care unit, similar to a small apartment but where staff are still close by to assist if necessary (assisted apartment); third, the patient is moved into an apartment with others, prior to their return home, where they can test and learn final adapting skills in a mentoring environment. Finally, the patient moves to a self contained unit to ensure their confidence before going home. This staged recovery reinforces Middleton and Craig’s goal approach and is a point of difference to other healthcare facilities. It is noted that the Briefs does not provide for the latter two steps in attaining the goal of independence. It has been decided for the purposes of this project to indicate where the apartments could be located, allowing them to be designed at a future date.

While carrying out case studies of New Zealand Rehabilitation facilities, scepticism arose about creating a multidisciplinary unit that accommodated patients with such differing medical conditions, as spinal, stroke and brain. Skaggs and Mann apply the term “Centres of Excellence” to centres that provide high quality care for a specific disease, specific population group or a multidisciplinary unit. The philosophy behind this is that using one healthcare facility to accommodate specialised medical knowledge, expertise and technology improves the patient’s recovery. While Skaggs and Mann’s theory can be tested in this design, the planning of the Unit will need to provide a degree of separation between the differing medical conditions. Additionally, the model of the Maggie Centres has parallels that are desired for the culture of the Unit, for example the art and nature relationship. In contrast to the Maggie Centres, that provide for the patient only, the Unit will also provide support for family and peers.

The decision of how to accommodate inpatients and outpatients was explored throughout the project, as information was obtained. In the end the decision was made based on what best empowers the patient. It is believed that the best result is facilities that are all inclusive. This allows outpatients to act as mentors/role models to patients, and enhance the goal orientated recovery.

Discussions with Marianne and Liz confirmed that the proposed spinal accommodation will have acute patients, and the Unit will be categorized as a “hospital” rehabilitation facility.

Attention on the patient and a distinction from hospital/ rehabilitative care is reinforced by simple things, such as the use of terminology. The ward, a term adopted from hospital care, is not the terminology used for the Unit. Instead this project adopts the phrase Patient Care Unit, because it describes not only a place for the patient to be cared for, but also for social development and interaction.
CHAPTER THREE, CREATING A SENSE OF PLACE

The site for this project is pre-designated, yet it was still necessary to understand the site and context of the area (Manukau). The concern, however, in creating a civic building like the Unit was that it may lack a sense of place in the community. In healthcare architecture, placelessness results from a lack of "civicness, environmental sustainability and stewardship."

To create civic identity, the integration of cultural and vernacular elements of the community is required with the end result being architecture that has "a unique aesthetic expression." Further, the term community can include "... the immediate neighbourhood, a portion of the city, the entire city, the metropolitan area, or beyond."

Since New Zealand is a comparatively small nation, this paper will refer to New Zealand as a whole.

The central question in this chapter became how can patients architecturally identify with the wider environment to feel a sense of community within the context of the Unit? To answer this it was first necessary to understand what elements constitute New Zealand vernacular architecture and, second, how do we use these elements, when designing civic architecture, to create architecture unique to New Zealand. To understand this case studies of two existing civic buildings were undertaken; one local, Manukau Counties Police Station, Auckland and the other the national Supreme Court, Wellington.

These studies provide a foundation from which to consider the creation of a sense of place in the context of the Unit.

SITE

The site chosen for the Unit lies between Manukau and Manurewa, until the advent of Auckland Supercity, Manukau City was one of New Zealand’s youngest cities. At the same time it is one of New Zealand’s oldest settled areas.

Historically the area supported farming and flax industries. Today industry and housing are replacing farmland, and the area is considered to be home to one of New Zealand’s largest multicultural populations.

The writer’s first impression of the site, in August 2009, was that it was expansive and inhospitable. Neighbouring buildings were distant, there was a lack of mature planting and there is a large tract of vacant land surrounding the Superclinic. A second visit, in September 2009, reinforced this viewpoint; even though it was a sunny spring day, with no shelter a strong, cold, south-westerly wind was experienced.

Way finding was easy because of the scale of the building and contours of the site – the Superclinic sits as a significant civic building within its context. The Superclinic is encircled by car parking. Although there has been a planting scheme, using native flora, the trees have not reached maturity.

A proposed new road bisecting the northern and western parcel of the site will be used for access to the Unit and as a connection to the Superclinic. Also, a waterway is proposed that links to Puhuni Stream. The development of this waterway will allow for improved environmental qualities such as the use of grey water. Additionally, the developed retention water way, together with adjacent walkway, will assist in a connection to the local community, while also giving a park like feel to the development.

The Superclinic is a satellite facility to Middlemore Hospital, carrying out specialist consultations and elective surgery. Chow-Hill Architects, with Simmonds Healthcare US as consultants, were commissioned to design the healthcare facility in 1997. Chow-Hill describe their design as not being "ostentatious or overdone." To develop a relationship to the context they used "familiar domestic details (such as rooflines) ... albeit on a larger scale." The end result is a building that has a concrete tile hipped roof, exposed rafters, eaves and gutters. The skin is coloured concrete block veneer with punched windows, rather than a curtain glass wall.
Maori architecture, in the twelfth century, developed a rectilinear building type known as the “Mokoau house.”119 These buildings were identifiable by... a very small door, an extension of roof and walls at the door end to form a porch.120 Early accounts of Maori architecture, including the whare, were made by an ensign from the French ship Mascarin Jean Roux, in April 1772. Roux describes the Maori whare as “Each house had a sliding door... Above it there were two small windows and a very fine lattice.”121 Interestingly, as early Europeans settled in New Zealand, a similarity in materials, earth and timber,122 and construction methods between the two cultures became apparent.123 During the 1970s, New Zealand began to create architecture that used contemporary international trends, together with local techniques and historical references, to create architecture that represented a multicultural society.124 With an initial understanding of traditions in New Zealand architecture iv is useful to understand how New Zealand architects have included these elements in recent civic buildings.

VERNACULAR ARCHITECTURE

Maori architecture, in the twelfth century, developed a rectilinear building type known as the “Mokoau house.”119 These buildings were identifiable by... a very small door, an extension of roof and walls at the door end to form a porch.120 Early accounts of Maori architecture, including the whare, were made by an ensign from the French ship Mascarin Jean Roux, in April 1772. Roux describes the Maori whare as “Each house had a sliding door... Above it there were two small windows and a very fine lattice.”121 Interestingly, as early Europeans settled in New Zealand, a similarity in materials, earth and timber,122 and construction methods between the two cultures became apparent.123 During the 1970s, New Zealand began to create architecture that used contemporary international trends, together with local techniques and historical references, to create architecture that represented a multicultural society.124 With an initial understanding of traditions in New Zealand architecture iv is useful to understand how New Zealand architects have included these elements in recent civic buildings.

Designed by Opus Architects, Manukau Police Station was completed in 2007. Opus sought to identify with the local context, by using references to Nature. Precast concrete walls have been designed that rise and fall in a flax-like pattern. These panels play with light and shadow throughout the day with the result that the building does not appear stagnant. The Nature relationship is further solidified with the used of native planting, in particular flax, to link to context and concept.

The Supreme Court in Wellington, is one of New Zealand’s most recent civic buildings and houses the highest court in the land. Prior to this, New Zealand’s highest court was the Privy Council based in London, England. The building, therefore, is symbolic of our burgeoning independence as we cut our colonial ties. Designed by Warren & Mahoney the Supreme Court was completed in 2010. A connection to the context occurs with the design of the exterior bronze screen. Warren & Mahoney believe that the screen relates to the surrounding Victorian buildings and also cultural influences of “Maori of leadership and shelter,” with Natural influences to the “pohutukawa and rata trees.”125

In conclusion both Opus and Warren & Mahoney created civic buildings with cultural and vernacular qualities, by referring to Nature in an abstract way. In addition, Warren & Mahoney incorporated bicultural references. To create vernacular architecture for the Unit, therefore, Natural and cultural references will need to be included.

117 Interview, Robyn Hughes, Service Improvement Manager, TOWARDS: 25/26, Counties Manukau, DHB, 30 July 2009.
118 Interview, Tim Robinson, Jasmax Architects, 23 March 2010.
120 Sir Warren introduction to A History of New Zealand Architecture, 15.
121 Sir Warren introduction to A History of New Zealand Architecture, 10.
122 Sir Warren introduction to A History of New Zealand Architecture, 11.
CHAPTER FOUR, THE PATIENT ROOM

The patient room is often referred to as the most important room in the Unit. There are several reasons for this. First, it is where the patient is admitted after discharge from the hospital; second, they spend a quantity of time recovering there, often after having experienced a traumatic event; and finally, it is where the patient receives medical attention and visitors.

By understanding the functionality requirements within the patient room, including the needs of caregivers and others, hygiene and other aspects the room was divided into several zones (Fig. 28). Universal standards, information from reviewed literature, and the importance of family visitation and their accommodation requirements for overnight stay will now be applied to the zones. The outcome from these investigations, together with conclusions from studies looking at the effect of daylight, patient line of vision and other factors in the room, were used to design the model patient room. A comparative study was also completed using the Superclinic to understand the differences in scale. Finally, the resultant prototype was presented for external critique. The result of all of these studies is a room that has "safety, intrinsic meaning, and value."

Fig. 28 Zones within the Patient Room

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126 This is supported by John Thompson and Grace Goldin. "Because patients are bedridden, the central and most important part of a nursing ward is the bed area." Thompson and Goldin, The Hospital, 3.
127 Verderber, Innovations in Hospital Architecture, 67.
128 Verderber and Refuerzo, Innovations in Hospice Architecture, 69.
129 Kirk Hamilton & Mardelle McCuskey Shepley, Design for Critical Care.
132 Kirk Hamilton & Mardelle McCuskey Shepley, Design for Critical Care.
134 Verderber, Innovations in Hospital Architecture, 65.
DAYLIGHT AND THE NATURE RELATIONSHIP

There is evidence from studies that the relationship the patient has to the outside world and to daylight, plays a role in their recovery. For example, although a patient may not be fully aware of their surroundings they may be conscious of “… the window and its view and the amount of light in the room.”\(^{130}\) Likewise, patients in a bright room experience “… lower levels of stress and pain, took 22% less pain medication, and had lower medication costs.”\(^{131}\) Additionally aesthetic experience is derived from “… form, sunlight or shadow, smoothness or roughness and materiality.”\(^{132}\) Accordingly, the design of the window is recognized as part of the healing process.

Early preferences were to go with the last image. However, as the Unit design evolved (Fig. 30) became more appropriate. This design provides several benefits: the use of a large picture window allows interior spaces to merge with the outdoors; access to the outside is provided by a generously proportioned glass door, and opening windows are included, allowing the patient to have fresh air and control over their internal environment.

 PATIENT LINE OF VISION

The patient’s line of vision falls into the category of psychological need, namely safety. Visibility and access is required on all four sides of the bed for family and staff.\(^{133}\) This rationale gains further importance when the patient’s mobility is affected. If movement of the upper body is limited, or pain exists in localised areas, then the line of vision may be as depicted (Fig. 31).

 

Privacy

The single versus semi-private patient rooms provided in the Briefs were also considered. With reference to privacy, confidentiality and safety, initial focus was on the single room. However, an analysis of safety in healthcare architecture found that “people not architecture – are responsible for such (medical) errors.”\(^{135}\) During the study of the Burwood Clinic Liz Oliver said “They don’t know why, but some patients heal better when they share a room.”\(^{136}\) Research also found an interesting suggestion regarding the patient room and choice: “some inpatients aren’t mobile – as they spend most of the time in the wards, they should have the freedom to choose how they want to be accommodated.”\(^{137}\) The writer believes that this approach has the potential to become an administrative nightmare! Consequently, it was decided, with the best interests of the patient in mind, that a mixture of private and semi-private rooms is desirable. When sharing a room, the ensuite would be shared as well.

MOVEMENT

As described earlier there is the potential for a patient room to be over-accommodating or under-accommodating. As the empowerment paradigm is based on the disabled, studies of the patient room were based on movement using a wheelchair\(^{134}\) together with allowances for movement of a gurney. The minimum spatial requirements are depicted in Fig. 32. These allowances do not over-accommodate the patient, but rather provide a level of comfort and mobility within and around the room.

PRIVACY

The ensuite has the option of being located inward, middle or outward in relation to the patient room. (Fig. 33) A room layout was prepared using an outward ensuite, not contained in the patient room envelope. This decision continues the nature-daylight relationship.
However, having the ensuite in this position increases walking distances and footprint of the Unit. This problem is often found in healthcare facilities, \(^{138}\) therefore, a solution was sought. An inward ensuite was selected as it does not interfere with the exterior patient room window. This decision also reduced walking distances and footprint of the Unit. Often in healthcare architecture a "wholly institutional-looking bathroom" is common practice. \(^{139}\) Therefore, the end design of the ensuite must pay attention to aesthetics.

CONTACT

The additional zone, recently included in the patient room by healthcare specialists, is the "family zone." \(^{140}\) Internationally, critical care and hospice philosophies consider significant benefit to the patient being in contact with family. \(^{141}\) As a result, provision for overnight accommodation has been included in the design of these facilities. \(^{142}\) When completing national case studies of existing facilities it is noted that none of the centres provided for this.

Originally, spatial allowances for overnight visitation in the patient room, for this project, relied on those used in the design of a proto-type room for Minnesota Children’s Hospital. \(^{143}\) While not as generous as Minnesota Children’s Hospital, the resulting room design does allow for built-in room elements for users, and for movement. However, even with these adjustments, the writer considered the room too large.

As rehabilitation requires a specialised building type, further research was carried out into the requirements and impact of visitation of family on the patient. In rehabilitative care overnight visitation and prolonged visits by family members can be viewed as detrimental. \(^{144}\) Often family will carry out tasks for the patient, with the consequence that the patient’s independence and recovery is affected. Research at Bard’s Road and Cavit ABI, however, identified family support as being important to the patient’s recovery. \(^{145}\) As a result of these studies, the design was ultimately scaled down; overnight visitation is provided by way of a chair that can be altered into a bed. Additionally, critical care rooms will provide for a family member to stay overnight, without the inclusion of an ensuite and each patient care unit will provide for overnight accommodation by way of a small apartment.

The proto-room designed for the Unit was compared to the Superclinic for scale. The writer felt concern so presented the project’s proto-room to Rachael Rush for her comments. She supported the logic of the design, saying that, although it was larger than the standard patient room, validity is achieved as it addressed movement for the impaired. \(^{146}\)

HUMANISING THE PATIENT ROOM

In her study of institutional care, Jules Henry, describes the emotions a patient may experience in hospitals:

So they feel they’re not human and from this comes anguish that expresses itself in clinging. But silence is not the only form of dehumanizing communication to which these people feel exposed. Empty walls, rows of beds close together, the dreariness of their fellow inmates, the bed pans, the odours, the routinization, all tell them they have become junk. \(^{147}\)

138 Verderber, Innovations in Hospital Architecture, 79.
139 Verderber and Refuerzo, Innovations in Hospice Architecture, 73.
140 Hamilton & Mardelle McCuskey Shepley, Design for Critical Care, 21.
141 Verderber, Innovations in Hospital Architecture, 79.
142 “Patient and family centered care is grounded in mutually beneficial partnerships among the patient, family and healthcare professional.”
Verderber, Innovations in Hospital Architecture, 78 and 81.
143 Stephen Verderber, Innovations in Hospital Architecture, 73 and 74.
144 Interview Penny Sender, Rehab Plus, Pt. Chevalier, date unknown.
146 As critical care patients are bedridden they are unable to use an ensuite.
147 Klein Architects are specialists in medical care and have carried out work on the SuperClinic as well as alterations to Burwood Spinal Unit. Interview Rachael Rush, Managing Director, Klein Architects, 26 July 2010.
Medical equipment reminds the patient of their illness and is generally unattractive to look at. A simple solution is provided with the headwall. The headwall can be used to accommodate medical equipment, lighting, audio controls and other equipment. The headwall, therefore, assists in increasing the patient’s level of control and safety and improves the aesthetics of the room.

**FORM OF THE PATIENT ROOM**

The form of the patient room (Fig. 37) was experimented with. The writer thought that by manipulating the external wall the patient may have an increased sense of individuality. However, patients who have received brain injuries may react adversely to irregularities in their room. Consequently, the square/rectangle was used as the base geometry of the room.

The points of difference between spinal and brain patients also led to further development of a non-generic patient room. Brain patients, like spinal patients, have increased spatial requirements. On arrival to the Unit, depending on their injuries, they may need increased quietness. So, the room was designed with a double entry.

With terminology such as “homelike” and the ideal that the patient feels they are safe and belong, the threshold was introduced at the entry to the patient room (Fig. 39). A “lowered ceiling” was also included over the patient bed to add another layer within the room. This potentially provides the patient with limited movement a means of positive distraction, as imagery will be projected on the ceiling like a screen.

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149 A visit to Rehab Plus, Pt Chevalier, April 2009; these were not included in the design. As opposed to the SuperClinic, where they are thought to be invaluable.

150 Stephen Verderber supports this stating “the headwall is the most equipment-intensive fixed feature part of an inpatient room.” Verderber, Innovations in Hospital Architecture, 77.

151 Interview with Jonathan Armstrong, November 2010.

152 “The square represents the pure and rational. It is a static and neutral figure having no preferred direction. All other rectangles can be considered variations of the square...” Francis D.K. Ching, Architecture, Form, Space and Order, 2nd ed. (New York: Van Nostrand Reinhold, 1998) 41.
CHAPTER FIVE  CONCEPTUALIZING THE UNIT

Charles Moore, says about a house: “… a single thing, as well as a collection of many, and to make it requires a conceptual leap from the individual components to a vision of the whole.” This metaphor of the house can be applied to the Unit, because patients are resident for varying periods of time. The Unit temporarily becomes their home and it is this environment that this project is concerned with. As the patient room has been designed, next will be the patient care unit, with the semi-final stage being unification into the Unit. The problem, as Moore identified, is linking the established hypothesis, the Briefs, and the site into a homogenous design that empowers.

THE PATIENT CARE UNIT

Three initial patient care units were designed (Fig. 40), using the requirements for the spinal patient care unit contained in the Briefs. It was decided to continue the development of the second depicted patient care unit since, this design exemplifies the underpinning philosophy sought for the Unit. It also continues the development of the nature-healing relationship, initiated in the design of the patient room, by inserting three courtyards into the form. Additionally, other design elements, for instance, movement, nurse’s stations, family areas and safety must all be considered in the design process.

Freedom of movement for building users, is a contributing factor in the creation of an enabling environment. A point of focus of this project, consequently, become the journey within the Unit, leading to the question “what is the architectural catalyst for circulation?” Ching says that “architectural form occurs at the juncture between mass and space.” The proto-patient care unit clearly has mass and space. A consistent design issue then was how a spatial sequence of paths and courtyards, within the patient care unit could be varied and connect to social, care and administration areas giving the patient a sense of control and safety.

Nursing requirements of the patient relates directly to the psychological need to be in a safe environment. Studies by Hendrich found that floor layouts with decentralized nurse’s stations, and supplies located close at hand to patient rooms had the advantage of reducing walking and fetching time for staff. The spin off from this is that there is increased observation and care time for patients. The Briefs provided for four nurse’s station per patient care unit. As it was considered that this would be difficult to staff, two are used.

An important part of the rehabilitation process is ensuring that the patient has social contact with peers and family. Social areas in the Burwood and Bards Road Spinal Units are large in scale. Consequently, the writer thought they are not private or inviting. They are also some distance from the patient rooms. Reinforcing these concerns, Kirk Hamilton explains that the social areas they designed in a recent healthcare facility were eventually converted to another use. He speculated that the reason for this was that private patient rooms reduced the need for additional family space. In addition the family rooms located too far from most patient rooms. As in the proto-patient care unit, this project will experiment with smaller family/kitchen rooms that create an atmosphere of intimacy and conviviality with the use of “...tasteful furniture, (and) select artwork.” They will have a connection to the exterior environment, and, where possible, be visually linked to each other.

A final, but important, point taken into consideration regarding the arrangement of patient rooms, their functionality and the patient’s safety, was Jane Malkin’s commentary of mirror image patient rooms, versus identical image layouts. Malkin explains that identical patient rooms eliminate their functionality and the patient’s safety, was Jane Malkin’s commentary of mirror image patient rooms. Reinforcing these concerns, Kirk Hamilton explains that areas in the Burwood and Bards Road Spinal Units are large in scale. Consequently, the writer thought they are not private or inviting. They are also some distance from the patient rooms. Reinforcing these concerns, Kirk Hamilton explains that the social areas they designed in a recent healthcare facility were eventually converted to another use. He speculated that the reason for this was that private patient rooms reduced the need for additional family space. In addition the family rooms located too far from most patient rooms. As in the proto-patient care unit, this project will experiment with smaller family/kitchen rooms that create an atmosphere of intimacy and conviviality with the use of “...tasteful furniture, (and) select artwork.” They will have a connection to the exterior environment, and, where possible, be visually linked to each other.

A model for the patient care unit has been decided on that includes the needs of the patient. However, it is not only the patient’s primary requirements that create empowerment. Other contributing factors include family, caregivers and room layout. Consequently, a holistic approach will be required during the next stage of the design.
CONCEPT FOR THE WHOLE

The idea of this project, a rehabilitation centre, originated from the writer’s perception that injuries to the spine are common. Also injury of the spine may be central to paralysis. Figure 43 initiated the concept of the spine acting as a central corridor to link the patient care units and other functions within the Unit. It is acknowledged that the major corridor is often criticized in healthcare architecture: “... elevators and corridors, flanked by countless doors leading to patient rooms and examination rooms, a waiting lounge at the end of the hall or next to the elevator.”161 As a result, the challenge with this decision became the composition of the central corridor and making it a democratic space. A democratic environment in healthcare architecture is “… about legibility of organization, explicitness of intention.” and “democratic ideals where the arrival ramp at the main entrance, the waiting areas, the circulation patterns (are) designed to facilitate way-finding…” 162

Earlier, the use of architectural gestures such as views to the outdoors, ceiling and floor changes were identified as solutions to get away from the institutional corridor. Building on this are the three approaches found in the modernist healthcare architectural experience, first is that spatial experience involves an integration of the senses of touch and vision. Second, is that the object of attention consists of fragmentary perceptions, not a building as a whole. Third, is that architecture is primarily expressed in movement.163

As a consequence, the conclusion was drawn that design of the central spine, including elevators, stairs and ramps, will provide freedom of movement equaling control in a safe environment. Also, the insertion of seating niches will provide opportunity for social contact for the building users. Finally, by using the contours of the site the spine will provide a cinematic experience as the occupants move through differing level changes, catching fragmentary glimpses of building features, such as the courtyards.

161 Verderber, Innovations in Hospital Architecture, 250.
162 Verderber and Fine, Healthcare Architecture, 283.

SPATIAL RELATIONSHIPS OF THE PROGRAMME

The next step was to understand the relationships for functionality (Fig. 45) and the best way of accommodating the staged development of the Unit. The proto patient care unit had an external courtyard, therefore, it was decided to place the patient care units alongside each other with an intervening courtyard. This decision is seen as having two benefits. First, the courtyard provides the benefits mentioned earlier. Second, as the building is being completed in two stages the courtyard will act as a buffer against noise and dust to the existing patient care unit.
The view the patient has affects their recovery, so the initial objective was to avoid the patient room having a view of an adjoining part of the building. With such a large programme, however, this proved impossible. Subsequently, the challenge became the minimisation of the impact of south facing patient rooms. What aspect of the project provides the best visual outlook for the patient? The options were the entry or therapy areas. The writer believes therapy areas may be associated with a painful and slow recovery process, while the entrance lobby is a social place. With that in mind the entrance lobby was positioned adjacent to the patient care unit to act as a mediator between the residential and active sides of the Unit.  

By using the concept of a central spine for democratic movement within the building, and then paying attention to aspects of hierarchy, site, psychological needs and future requirements, an idea of form and arrangement of functionality occurred. It was from this point that proto-models were developed in conjunction with the plan and section. The resultant changes, generally took place as case studies were completed.

UNIFYING FORM AND FUNCTION

The design process, at this stage, focused on including the programme (contained in the Briefs) and the hypothesis into a concept form. It was assumed that the Briefs were programmatically correct. In addition, at this phase of the design, comprehensive case studies had not been completed. It is these factors that lead to the following design decisions.

Initial arrangement of the programme within the building envelope had the outcome that functionality is broken into zones, described as: a central public zone (the entrance), linking elements, residential areas in the north and the therapy area in the south.

The Briefs specified 36 patient beds in the spinal patient care unit. The writer believed that, if these rooms all had external windows, the scale of the patient care unit would be too large. As a result, the critical care rooms were placed on the perimeter of the internal courtyard. Also the writer thought that movement of staff/or patients between the patient care units was required. Therefore, vertical movement was provided in several areas, including the courtyards.

The location of entrances was determined by public and private requirements. The main entrance is public. The writer believes that a patient would not want to be admitted through this entrance on discharge from hospital. A separate entrance was therefore included, which could also be used by staff. At this point in time, as outpatient and inpatient therapy are not interconnected, outpatients have a separate entrance.

The management suites believed to be for Manukau Counties head office management, are located some distance from the patient care unit as the writer did not believe interaction between these two functions was required. Likewise, outpatients are accommodated in a separate building, while the inpatient therapy programme and supporting administration are accommodated on level one.

The result of such a large programme and spatial requirements was that, in some parts, the Unit was three stories high as opposed to the desired two.

164 This decision was reinforced in an interview with Marianne Cox 17 September 2010.
165 Marianne Cox agreed with this decision but said swipe cards would be used to keep the entrance secure. Meeting 17 September 2010.
The form and functionality continued to develop, leading to several alterations. The patient care units were juxtaposed so as not to interfere with the entrance area, leading them to act as sliding elements opposing each other. Likewise the therapy areas were rotated to create a compacted form. It was this model, together with supporting plans that was presented to Marianne Cox, on 17 September 2010 for critique.

The courtyards were perceived as an asset, not only for the reasons discussed, but also because they provide an informal area for meetings between caregivers, patients and families (which is encouraged). Marianne also noted several other factors. There was not an allowance for examination rooms and patient file rooms within the patient care unit. The management suites are for medical and administration staff for the patient care unit, not head office administration. As a consequence accommodation should be closer.166 At present nursing duties are carried out from one centralised station. The provision for two stations is workable, but may involve additional staffing.

The changes to form and plan largely resulted from the September critique with Marianne. For instance, the patient room numbers were reduced. Marianne explained that Bairds Road has never had 36 patients at one time. With increased medical knowledge, and a reduction in motor vehicle injuries, Marianne believed that the number of spinal patients would reduce over time. It was thought that 20 beds would be sufficient, five of these being for acute patients. Likewise changes also occurred to the therapy area as Marianne explained that the New Zealand model does not have the administration requirements the American model provides. In addition she pointed out the difficulty of staffing so many clinic rooms, so these were reduced in number.

As the design developed, it was realised that the Briefs were inaccurate. For example the spatial requirements provided for the spinal gym were not consistent with those at Bairds Road. By correcting this, the gym became the overall hierarchal element within the form. Finally, the skin was developed to introduce texture and ornament to the facade.

166 This model is not currently in practice at either spinal facilities in New Zealand. Although there were some reservations, Marianne thought it might be successful.
Focus of the design process now shifted to resolving the therapy area and patient accommodation. A final visit to Bards Road was completed together with a case study of CavitABI. These studies proved invaluable in resolving the final design.

Scepticism had been voiced regarding the inclusion of more than one medical condition within the Unit, so vertical circulation from the courtyard areas was removed. Likewise with the differing patient accommodation requirements for brain and amputee patients provided in the Briefs and ascertained from case studies, re-configuration of the patient care units resulted in an outdoor area (on the second level) for amputee patients. This created the advantage of the brain and amputee patient care units having their own internal courtyard. Now there are three distinct patient care unit configurations within the Unit. This then, avoids the pitfall Verderber refers to in healthcare architecture of: “the same pattern repeated on many floors as permitted ... it is repetitious to the extreme, and requires no modification of staff behaviour.”¹⁶⁷

The therapy requirements were re-examined. First, the requirement of goal orientated recovery in a mentored environment (under debate with acquired brain injury patients). The decision was made to treat inpatients and outpatients as inclusive. This resulted in a change to the overall form of the Unit. Second, it was noted that a strong focal point of rehabilitation is the need for future proofing, storage and flexibility. Brain injury patients, for example, require quiet and large spaces. Therefore therapy spaces have been designed for flexibility, with the use of sliding doors. This also accommodates different cultural mixes within the Unit. Third, the writer wondered whether the Briefs provided an over accommodation of programme. Marianne¹⁶⁸ advised that it is best to have multi use areas cutting down on the movement and duplication of equipment.

¹⁶⁷ Verderber, Innovations in Hospital Architecture, 250.
¹⁶⁸ Interview Marianne Cox, November 2010.
Throughout this design process the question was asked what creates empowerment in architecture? Alongside that question was what makes space appealing? Is it internal spatial diversity or something else? Bryan Lawson explains space as “…that which bring us together and simultaneously that which separates us from each other.” He maintains that “…to create space that is appealing one should …create settings, which organise our lives, activities and relationships.” Creating this setting then became a focus for enquiry.

The writer believes the entrance lobby should be the heart of the building. Likewise, it is the first point of contact, so focus of the design shifted to this area. A significant design move was shifting the chapel to be connected to the lobby area (Fig 51). The circle was chosen for the form of the chapel to signify the independence of religion, while at the same time referencing the historic connection of religion and medicine. This move created a heart to the building which is social, intellectual and spiritual.

By using layering, the lobby is now a generously proportioned foyer with a gallery. This area now synthesizes several concepts; first, the idea of the urban living room as the point of entry. The cafe draws the user into the building with the feeling of entering a dining room with an adjacent study. This area was designed with the idea of increasing communication and interaction between the users – staff, family and patient. The research facilities, although private, have connectivity to the public area. Second, spirituality is introduced. Third, natural light will be judiciously drawn into the lobby with the use of the skin for shadows, and a lightwell.

Movement within the building was considered throughout the design process. How best could an atmospheric environment be designed that was not over, or under, accommodating? In the end it was decided that vertical circulation via ramps along the central spine would occur so as not to interfere with the social atmosphere of the lobby. In addition, to remove an institutional or museum-like feeling and encourage socialising, seating has been designed in the corridors. Elevators and stairs have been treated as one and, with the use of consistent materiality, they become a sculptural element within the Unit.
Fig. 54 Ground Floor Plan, Therapy Area

Fig. 55 Level One Plan, Entrance Lobby, including Cafe, Children’s Play Area, Patient Learning Centre, and Chapel, together with Spinal and Brain Patient Care Units
Fig. 56 Level Two Plan, Staff Learning Centre, together with Stroke and Amputee and Vascular Patient Care Units

Fig. 57 Roofscape
CHAPTER SIX: COMMODITY, FIRMNESS, DELIGHT

The design is nearing completion. What is necessary is to explain how instrumental and psychological needs meet the criteria of commodity, firmness and delight, resulting in “…a close fit between the environment and the people by whom it is intended to be used.”171 An analogy of production design/art direction in relation to healthcare architecture is that “…the set should provide a tapestry of images that help connect the characters to the story by setting mood, psychological triggers and establishing an emotional matrix.”172 This became the catalyst to provide empowerment.

COMMODITY

The inclusion of sustainable design principles in buildings should be common practice. What is interesting, however, is the symbiosis of the Nature-healing relationship and sustainable design principles. For example, opening windows and doors designed for the patient rooms and family areas will diminish the requirement for mechanical ventilation; larger windows result in solar gains as well as a reduction in the need for artificial lighting. Further, the use of a concrete floor pad results in thermal mass, and a reduction in the need for artificial heating. Solar shading devices when included in the design will also reduce energy demands.

Consideration of Nature and the desire that the Unit sit in a park like environment also complements the requirement for a green building in several ways. The water feature adjacent to the entrance, flowing to the waterway and wetlands will divert storm water, with the added benefit of use as a fire fighting reservoir. Native planting, indicated in the plan, will reduce the impact of heat and humidity gain within the Unit. In addition, if native rather than exotic plants are used, spraying and special water needs are reduced. Finally, the use of natives will assist in giving the Unit a sense of place.

The materiality of the building will be comprised of steel, concrete and timber. These materials are all recyclable and have low embodied energy, as well timber forms part of New Zealand’s vernacular architecture. Concrete will be used for internal walls such as the patient rooms, and, as well as being a firebreak, has the added benefits of a noise separator, thermal insulator and storing heat.

Heat pumps using solar hot water systems will provide hot water and under floor heating systems. Additionally, water collected from the roof can be filtered and stored in a basement for use.

FIRMNESS

The structure of the Unit was used to appeal to the covert human requirement for order. During the design process, while attempting to solve what makes space appealing, the grid was introduced. This grid was based on the patient room and brought order to space arrangement. Likewise, (the grid) was used as a mechanism for the arrangement of the structure. Near the end of the design process, consideration was made as to how this integral part of the design (structure) could be used to create a dialogue with the user, leading to an exploration of materiality and integration of furniture.


Gottfried Semper, identified the wall as “…the architectural element that formally represents and makes visible enclosed space…”[175] and that “clothing is the most important element of architecture.”[176] With these rationales in mind and the prerequisite to look to site and context for a concept to create a sense of place, the skin of the Unit developed.

Fig. 62 Initial Proto Model of Skin

Fig. 61 Development of Skin

Flax weaving is part of Manukau’s (and wider New Zealand’s) history.[177] While textiles, which come about from weaving, are inclusive to all cultures, the exterior facade rather than having a heavy aesthetic, will play with transparency, shadow and texture. The end effect of this is that the facade of the Unit will be softened by the shadows created by the play of sunlight through its fabric. Likewise, when illuminated, the Unit becomes a lantern to the outside world, with the appearance of warmth emanating from inside.

CHAPTER SEVEN, CONCLUSION

LIMITATIONS OF THIS RESEARCH

There are several factors inhibiting research based decisions that also occur in healthcare architecture research, that this project encountered. First, medicine has largely overlooked the role of the physical environment in patient wellbeing, second, research of healthcare facilities is difficult, but perhaps foremost, is that healthcare architecture lacks a tradition of research.[178] This latter point is proven with the lack of a body of research relevant to rehabilitation architecture. Further, for many reasons New Zealand case studies of rehabilitation centres did not always provide a fit. Facilities were, for example, built over 30 years ago when needs were different, or there were no specialty centres, such as stroke centres, for comparison. Another methodology of research, to gain insights particular to New Zealand, was the formation of user group studies.[179] It was hoped that observation at Baird’s Road Spinal Unit would have resulted in an understanding of the patient’s perceived needs and desires both instrumentally and psychologically, this could not happen. This methodology of research clearly has limitations as “observation can lead to a misinterpretation of events… interviewing it may be difficult to engage the person and not to lead with your own ideas.”[179] It is recognised that the relationship healthcare architects have to evidence based design is invaluable “research is necessary to support design and design is necessary to corroborate findings and provide settings for future research.”[180]

Because of the above limitations, research for the design of the Unit has relied on case studies and literature to provide preliminary knowledge. This information is recorded in this document as it was applied to the design of the Unit to give validity to design decisions. Moreover, as an understanding and rationalisation of the Briefs occurred, it became apparent that healthcare architecture can no longer be designed by the architect and administrator alone. Instead it is a holistic approach drawing on information from patient, landscape architects, structural engineers and others that are required.[181]

Several topics mentioned in this paper provide only an introductory understanding, and could be researched further. For example, New Zealand’s vernacular architecture and cultural requirements, the metaphor of the “city” and how the layout of a city relates to the functionality and plan, and lastly “commodity” and how the Unit can attain ecological stewardship.

These limitations, if addressed, will assist the healthcare architect to become further aware of the physical and cultural needs of the users, and to develop a building that meets their needs to empower. Consequently, this explanatory document has only looked at one side of the process – the patient. This paper, therefore, is a discussion from the point of view of the architect seeking a base knowledge to enter the design phase. Validity of design decisions has occurred in a small part, with feedback from architects such as Rachael Rush and Pete Bossley, who have experience with New Zealand healthcare architecture. This has the end result that the proposed design and research could

174 Semper, Style, 123.
175 To the Verderber, applies the term biophilia and defines it as design with an “organic or naturalistic dimension”. Verderber, Innovations in Hospital Architecture, 48.
176 Jane Malkin reinforces this view with the comment “the gap between architects and researchers is vast.” Jane Malkin, Hospital Interior Architecture Creating Healing Environments for Special Patient Populations, (New York: Van Nostrand Reinhold, 1992), 4.
177 It is realised that this methodology of research would require ethics approval.
EMPOWERMENT AND ARCHITECTURE

This paper focused on how the architect looks at the humanistic paradigms in healthcare architecture, to create empowerment in a specialised building type, the rehabilitation centre. Using the broad terminology of instrumental and psychological needs, together with research findings, it was realised that the patient requires an environment that rebuilds. Consequently, design considerations included the patient’s physical environment: democratic spaces and architectural gestures that relate to the patient’s aesthetic needs. Further, this project rejected the impersonal and large scale modernist hospital for horizontality, genius loci and ecological stewardship. It is these paradigms that provide patient awareness, leading to empowerment.

The design process occurred from the “inside out.” It focused on functionality, and user experience. Two drawbacks are identified with this process. First, with a focus on functionality, theraserialization does not occur. This was included in several areas, for example, the entrance lobby and central corridor. Second, an organising idea is required. This project used the concept of the central spine, together with the nature-healing relationship, to develop the Unit as a whole. This project took the importance of goals and family as a strong factor in the planning and outcome of the building. It attempts not only provide for the family’s requirements, by introducing the idea of the living room in the patient care unit, but also as a point of entry.

Often residents in an institutional atmosphere develop “... stereotypic repetitive behaviours ...” and “... significantly fewer independently generated behaviours.” Consequently, throughout the design process the question addressed was what makes space appealing to create architecture that looks at the whole rather than the part. This line of enquiry resulted in creating empowerment through architecture in the design of a multidisciplinary rehabilitation unit, as applied to the New Zealand context, with the result that the environment becomes therapy within itself, and is the underpinning philosophy behind rebuilding the human.

181 Theraserialization should occur both horizontally and vertically. It is a space that is serialized as “layered, collaged, superimposed, transparent and fluid. It is about the creation of serialized space from the public, to semi public to semi private to private — The net effect is that indoor and outdoor realms become transactive.”


“Strategies, NZ’s First SuperClinic”, 3.


