

National Rehabilitation Hospital – Universal Design Approach

The National Rehabilitation Hospital (NRH) is the only facility that provides specialist accredited in-patient and out-patient rehabilitation in the Republic of Ireland. The Hospital is a stand-alone facility and it treats patients with Spinal Injury, Amputation or Limb Absence, Paediatrics and patients with Acquired Brain Injury, including Stroke. Over 80% of the hospital's patients are wheelchair users.

The brief for this project was to construct the first phase of a new fit for purpose hospital. This new 17,800m² building provides 120 single rooms with en-suite facilities, programme specific integrated therapy spaces on each ward and living and social spaces. Links are provided at Level 00 and Level 01, to fully integrate the new development with the existing hospital. Although links to the existing building were required the design was developed without any reliance on ramps to address the changes in level between the old and the new building.

The design includes a new Hydrotherapy Suite and Sports and Fitness Department comprising of a Sports Hall, Gym, Aerobics Studio, Shooting Range, a Therapy Pool and a 25m Lap Pool. A new Entrance Hall, Coffee Shop and Playground are also incorporated into the design. All spaces in the brief were to be fully accessible by all patient cohorts.

The strategic vision of the NRH is to provide an environment specifically meeting the requirements of the end users. Understanding the physical and cognitive abilities of the end users was essential to ensure that the building supports healing and recovery. From the outset the design process involved regular meetings with patients, their families, carers and voluntary agencies and these all had an integral role to play in the hospital's development and the design process.

A National Rehabilitation Hospital Universal Design Evaluation Tool was developed in conjunction with Professor Sue Hignett of Loughborough University during the design stage; Prof. Hignett is Professor of Healthcare Ergonomics and Patient Safety at Loughborough University. The Universal Design Evaluation Tool adopted 6 patient personas; the personas requirements from both the built environment and assistive technologies were assessed and the design was developed around their needs. Innovations include access push buttons, eye gaze control nurse call and lift call possibilities, lighting controls and blind controls from the patient's bed. The outcome is an inclusive and empowering environment reflecting the diversity of the hospital's end users and one which breaks down unnecessary barriers.

The Health and Safety Authority have published a case study on the NRH which outlines how the design of patient en-suite toilet and shower facilities through the new hospital building managed ergonomic risks in patients within the building. The hygiene care needs of individuals with complex rehabilitation requirements can change from needing the assistance of two staff to becoming fully independent in meeting their own hygiene needs. The principles which had to be met in the room design of patient en-suites were to ensure that there was sufficient space for all activities to be performed; sufficient space for transfers from shower chair, space for use of shower trolley and space for carers' activities while assisting the patient. Poor design and layout of spaces could unintentionally create barriers for patients in maximising their fullest potential for independence in self-care.

A 6m² independent en-suite and a 9m² assisted en-suite were developed and a mock-up of both rooms was built on campus to assist in the design layout and optimal arrangement of all sanitaryware and fittings that would meet the varying requirements of the broad patient cohort. Samples of sanitary ware were installed on mobile plinths so they could be easily relocated for testing and review around

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the mock-up rooms. Weekly visits were set up and input was sought from healthcare professionals and patients across all disciplines within the hospital. Feedback was given on the space allocation for the various activities, the types of sanitaryware proposed and heights of sanitaryware; some patients with spinal cord injuries require the use of special types of equipment to facilitate their independence. Comments were addressed and changes were incorporated into the final design.

Patients were also consulted during the selection of other key products such as the bedroom sliding door and signage. A clear wayfinding and signage strategy was essential to avoid unnecessary confusion and a bespoke solution was developed with patients of wide-ranging cognitive difficulties.

The form and massing of the building are generated by the design concept for the wards which are arranged around two large and two smaller courtyards bringing landscaping, views, natural light and ventilation into all of the patient spaces in the building. Access to nature is integral to the design as there is significant research-based evidence confirming that nature supports a healing environment however many patients cannot leave their ward for physical or safety reasons. To address this the design incorporates a number of accessible terraces and/ or courtyards within every ward. The external spaces provide a setting where activities that support rehabilitation can take place, for example, gardening projects, informal gatherings, group work and mobility skills training.

It was essential that the built environment would be as inclusive as possible and users' abilities were considered throughout the design detail and specification. Therapy kitchens are included on every floor and incorporate adjustable height sinks and cookers and high-level shelving is automated.

Furniture and fitments have all been selected with the end-users in mind. Seating is provided at varying heights and all seating areas includes space for wheelchair users; this avoids segregation and ensures that patients with different physical abilities can socialise and further encourages peer support.

Patient bedrooms have large full height windows, views of the mountains and good daylight from a South facing aspect. Natural ventilation and purge ventilation can be controlled by the individual patient; empowering patients is key to their healing and recovery.

Unlike in an acute hospital setting each ward in the brief included bedrooms, programme specific therapy spaces, living, dining and social spaces, and ward clinical facilities. The requirement to provide spaces for 'work, rest and play' within each ward offered a unique challenge to ensure the design is compassionate and does not feel too clinical; colour was selected to reflect the activity levels of each area, from vibrant and energizing in the Sports and Therapy rooms to calming in the Family Rooms and Bedrooms, further enhancing the therapeutic environment. Careful consideration was given to light reflectance values in the colour scheme and pattern finishes were avoided.

The developed design is patient centred and based on the principles of empowerment, dignity, privacy, confidentiality and choice.

Professor Mark Delargy, Consultant in Rehabilitation Medicine

"The new hospital far exceeds expectations. Each patient now has an en-suite single room designed for their comfort and rehabilitation needs. For years we had to fit our patient services into a suboptimal environment...This facility sets a new standard for accessibility and rehabilitation functionality for patients with significant disability. The provision of integrated therapy sessions delivered by interdisciplinary teams in the new ward-based therapy facilities will be a huge benefit to patients. Each of our treatment units set new standards for bespoke adult and paediatric rehabilitation. Staff are enjoying seeing their patients explore the new facilities and take in the unparalleled views over the Dublin Mountains."