

Supplementary Material 1

MyStay development Framework

The development of *MyStay* intervention involved sequential processes.

1. Evidence review and context specific material

To identify key components of recovery after TKR surgery the following steps were undertaken:

- a. Systematic data base search using key words identified by liaison librarian and *MyStay* development team;
- b. Grey literature and websites were examined; and
- c. Hospital based clinical pathways were sourced

2. Consultation and stakeholder engagement

- a. Interviews with patients post TKR surgery, from the study site, to elicit their experiences of care and recovery after surgery and information they would 'like to have known' during their hospitalisation;
- b. Physiotherapists involved in the postoperative care of patients and key nursing staff were invited to consult on exercises and specific components of the program related to physical recovery and nursing management respectively;
- c. Orthopaedic surgeons contributed to the overall content of *MyStay* to ensure constancy of information; and
- d. Nursing staff from all three wards were involved in the development of the implementation protocol
 - i. Staff involvement comprised group interviews, in-service sessions and ward meetings to ensure the intervention would be implemented into daily practice without significant impact on workload.

3. Design

- a. The seven principles of universal design¹ were applied to developing the intervention as described in Table 1. These principles guided the design of the multimedia intervention, as patients in the acute phase of their hospitalisation, commencing Day one after major orthopaedic surgery, were expected to be in some discomfort, tired and medicated, and, consequently may have had limited energy or concentration to read material or listen to a verbal presentation.
- b. The intervention was designed to be self-directed and easy to use for patients with a wide range of abilities;
- c. *MyStay* was presented in a chapter-based format that combined text, sound, graphics and animation to provide information to patients in relation to postoperative recovery and goals of care following TKR surgery;
- d. *MyStay* was packaged for iPad™ presentation, which allowed patients to easily navigate

- the various parts of the program;
- e. The information provided was explicit, actionable, non-ambiguous and tailored specifically to the goals of recovery after TKR surgery;
 - f. Information included:
 - i. expected mobility for each day of the inpatient recovery period,
 - ii. acceptable pain scores and the importance of managing pain, and
 - iii. animations demonstrating exercises to promote mobility in the new knee joint to improve function and to avoid complications such as thromboembolism

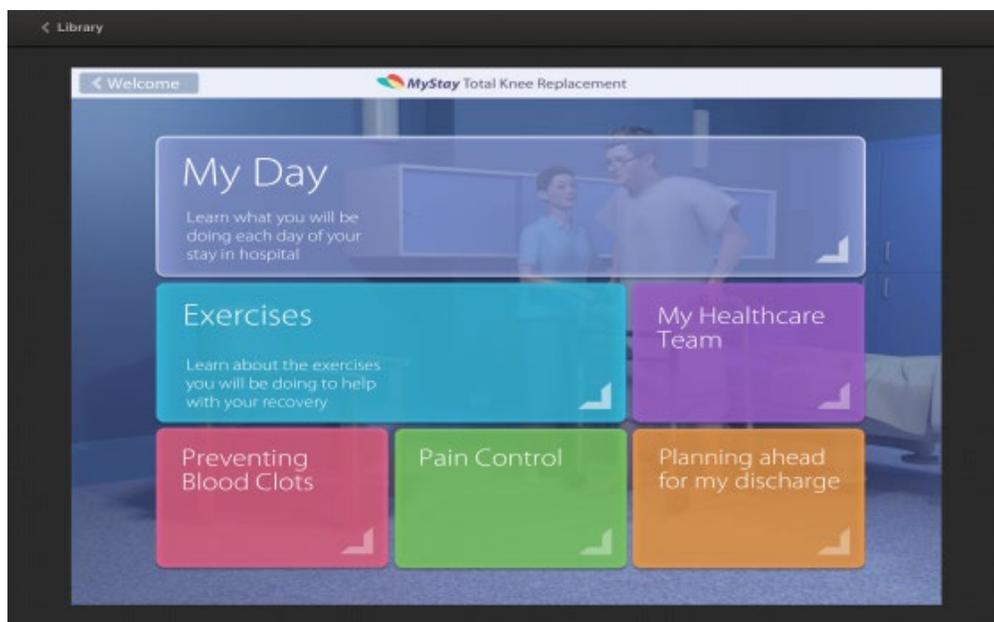


Figure 1 Screenshot MyStay TKR home page

4. MyStay Testing

- a. Pre-testing of the *MyStay* program was conducted with five (5) patients post TKR surgery, at the study site, prior to commencement of the trial to ensure the program, via iPad™ was accessible and worked as designed in the ward environment.

Table 1. Seven Principles of Universal Design¹

Principle	Explanation	Application
1: Equitable Use	The design is useful and marketable to people with diverse abilities.	The Apple iPad™ is made for finger touch integration and provides a high level of convenience in terms of ease of use and portability. Information was easily accessible and identical content could be delivered for all patients using multiple iPads™. The intuitive and user friendly interface removed the need for complex instructions from nurses assisting patients
2: Flexibility in Use	The design accommodates a wide range of individual preferences/abilities.	The multi-media intervention was usable in terms of flexibility for a wide range of patients, for example those with arthritis of the fingers. The program could be navigated at patients' own pace, allowing patients to view presentations forwards or backwards. The iPad™ also accommodates right or left handed persons and those with sight or physical impairment.
3: Simple and Intuitive Use	Use of the design is easy to understand, regardless of users' experience, knowledge, language skills, or current concentration.	In order to eliminate unnecessary complexity and be consistent in terms of accessibility, the program was written at a literacy level of Year 8 English. This was verified with a third party linguistic specialist.
4: Perceptible Information	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.	Pictorial, written, and tactile modes were incorporated in the development of the multimedia program. The iPad™ has the capability to be navigated with a finger or stylus (if required), the brightness can be increased for use in ambient light and the wording can be enlarged with the touch of a finger.
5: Tolerance for Error	The design minimizes hazards and the adverse consequences of accidental or unintended actions.	The program had a built in safety feature to ensure no alterations could be made to individual presentations by anyone other than the account holder.
6: Low Physical Effort	The design can be used efficiently and comfortably, with minimum fatigue.	The iPad™ allowed patients less than 24 hours following major orthopaedic surgery to visualise the program with minimal effort.
7: Size and Space for Approach and Use	Appropriate size and space is provided for approach, reach, manipulation, and use regardless of users' body size, posture, mobility.	The iPad™ can be held or rested on a table and is large enough to be readable for patients with sight impairment with advantages such as touchscreen, no mouse required, lightweight & portable. Patients could view the intervention sitting in bed or in a chair. It was large enough for multiple viewers.

1. The Center for Universal Design at North Carolina State University, Mace R. What is universal design. Retrieved November 1997; 2004.