

Prehab2Rehab Theory of Change Narrative

This Theory of Change model aims to depict how and why the Prehab2Rehab programme is intended to bring about its impact by indicating the interventions that may contribute to various outcomes through change pathways. The Prehab2Rehab programme aims to address cancer risk factors and maximise patient outcomes from cancer treatment.

Assumptions

Partners identified a series of underpinning assumptions that would need to be in place for the change pathways (model) to work. Assumptions are defined as something **outside the scope** of the programme that could have an impact on the short, medium, and long-term outcomes. Five key assumptions are thought to underpin the change pathways. These are:

1. Personalised, multi-modal and needs-based prehabilitation prior to cancer treatment, with sufficient investment and time (e.g. workforce, resources etc.), leads to improved patient health and well-being, reduced complications post treatment and improved treatment outcomes.
2. Structured health and wellbeing education empowers patients to actively engaged in their own prehabilitation.
3. Following education people understand the risks associated with specific health behaviours/lifestyle and will have sufficient psychological capability and social relationships and networks, to modify their behaviours.
4. Patients believe that the intervention will make a difference to their cancer outcomes and are able to access, and willing to engage with, the service and complete their personalised programme.
5. There is a shared vision of the importance of prehabilitation that leads to effective collaboration and a coordinated approach between a number of multidisciplinary healthcare professionals.

The evidence underpinning these assumptions was reviewed and are presented below:

Assumption 1: Personalised, multi-modal and needs-based prehabilitation prior to cancer treatment, with sufficient investment and time (e.g. workforce, resources etc.), leads to improved patient health and well-being, reduced complications post treatment and improved treatment outcomes– there is

evidence to suggest that each component of Prehab2Rehab can be beneficial to a patient's pre-treatment health and in-turn lead to better post-treatment outcomes and reduced complications. An exercise component of prehabilitation can significantly improve a patient's baseline fitness and functional capacity (13), while nutritional prehabilitation can address malnutrition prior to surgery (14). A wellbeing element of prehabilitation can significantly improve a patient's resilience against anxiety, depression and cancer-related cognitive impairment (15). A number of studies and systematic reviews have indicated that prehabilitation that includes these three elements can have a significant positive impact on the post-treatment outcomes of cancer patients, including reduced rates of post-operative pneumonia (16), reduced length of stay in hospital (17), improved functional capacity (18), and lower risk of complications (19).

Assumption 2: Structured health and wellbeing education empowers patients to actively engaged in their own prehabilitation - education has been evidenced to be a useful approach to prehabilitation for cancer surgery. A systematic review and meta-analysis of cancer prehabilitation (with one or more of the following components: psychological support, education and exercise) found that prehabilitation with an educational component has a significant positive impact on the pre-treatment knowledge and behaviours of patients, compared to those who do not receive educational prehabilitation (2). In a recent evaluation of educational sessions (which are part of the content of P2R) an online pre-operative prehabilitation education session (attended by 31 of 71 eligible patients) covering topics including exercise and nutrition was developed for patients preparing for major cancer surgery. Evaluators found that 77% of patients reported that they had acted on the recommendations two weeks after the session, with over 50% acting on the oral care (using mouthwash, brushing teeth twice a day) and exercise (smoking cessation, reducing inactivity, meeting physical activity guidelines, breathing exercises) recommendations (3). This indicates that tailored education can enable patients to take an active role in their pre-surgical behaviour. Equally, 29% of patients watched the online session with a support person (family or friend) (3), suggesting that engaging carers with education can enhance the support that patients have to participate in prehabilitation. This study used a relatively small sample of patients, meaning the validity of the findings is undermined. Nonetheless, when considered alongside other evidence such as that in the systematic review and meta-analysis (2), there is promising evidence that education can empower patients to participate in their own prehabilitation.

Assumption 3: Following education people understand the risks associated with specific health

behaviours/lifestyle and will have sufficient psychological capability and social relationships and networks, to modify their behaviours- prehabilitation provides patients with the opportunity to reflect on their lifestyle and their understanding of the risks associated with their health behaviours (4). Prehabilitation interventions that seek to change behaviour should consider the needs of individual patients and provide them with opportunities to ask the questions most pertinent to them (4). Previous prehabilitation interventions have found that patients understand they may need to make lifestyle changes and will actively seek out advice from specialists (5). There are various challenges that may limit the capacity of patients to change their behaviours prior to surgery, identified as family needs, work, anxiety, illness, and comorbidities (6). However, studies have found that patients are often capable of changing their health behaviours before surgery (2, 3) and that the support of their families and being recommended manageable actions were important to this (6). Patients with social support, knowledge of the benefits of prehabilitation, access to resources and time, and financial capacity are capable of making significant pre-surgical lifestyle changes (7). Due to the nature of prehabilitation, some patients may undergo treatment (e.g. chemotherapy, surgery) within days or weeks, while others may wait longer to have treatment. Therefore, in some of these studies, there were variations in the length of time between the intervention and surgery (3). However, it is assumed that prehabilitation can facilitate behaviour change that positively impacts the patient's pre-treatment health and lifestyle, no matter the length of time it is delivered, due to it being a teachable moment for the patient.

Assumption 4: Patients believe that the intervention will make a difference to their cancer outcomes and are able to access, and willing to engage with, the service and complete their personalised programme- Evidence suggests that a proportion of people undergoing cancer surgery do want to prepare for surgery. One study found that 85% of colorectal cancer patients and 76% of ovarian cancer patients prepared themselves in additional ways to the recommendations made by health specialists around exercise, nutrition and relaxation (6). These "additional" preparations included having control of work and finances as well as the support of relatives to make the recovery period practically easier. However, this study used a relatively small sample, meaning the validity of these findings are undermined. Studies have also explored patients' feelings towards prehabilitation and their motivations for participating. Among cancer patients in Canada, the primary motivating factor to participate in prehabilitation was to be as physically prepared for treatment as possible (8). This indicates that patients perceive prehabilitation as beneficial. Equally, qualitative studies have shown that patients felt that a prehabilitation programme that was tailored to their needs improved their emotional and physical preparedness for treatment (9). Accessibility is a key issue with prehabilitation

programmes, with evidence to suggest that travel/transport needs and time commitments are significant barriers to people engaging (10). This is a particularly pertinent challenge for Prehab2Rehab which currently only operates in one Health Board, meaning patients may need to travel significant distances to engage with the programme. There is, however, evidence to suggest that patients will engage with home-based prehabilitation, over the phone or online (11). To overcome barriers of transport and time, while maintaining opportunities for personal encouragement, it is recommended that prehabilitation programmes offer a combination of home-based and in-person activities (11, 12) - both of which are included in the current Prehab2Rehab programme design.

Assumption 5: There is a shared vision of the importance of prehabilitation that leads to effective collaboration and a coordinated approach between a number of multidisciplinary healthcare professionals - the degree to which there is a shared vision and coordinated collaboration between the key actors involved in Prehab2Rehab will be assessed through the process evaluation. However, there is evidence to suggest that the most effective prehabilitation programmes have principles of a shared vision and cross-sectoral collaboration. A review of scientific articles found that successful prehabilitation services require cooperation across a multidisciplinary team (featuring surgeons, anaesthetists, nurses, physiotherapists, exercise specialists, dietitians, finance experts and information technology experts), with the shared goal of improving patient experience and outcomes (20). Another study that used qualitative interviews to evaluate a cancer prehabilitation programme attributed success to strong leadership and a diverse range of professionals from multiple disciplines that were highly engaged with the programme (21). Multidisciplinary, cross-sectoral prehabilitation programmes have also been found to bring about significant behaviour change and reduced pre-surgical risk in patients (22).