



Developing cancer prehabilitation and rehabilitation programmes to optimise physical and psychological health and reduce healthcare utilisation.

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Description & Context

These pilot programmes were designed to evaluate and demonstrate the effects of multimodal prehabilitation and rehabilitation on the health-related quality of life (QoL) of people affected by cancer. Programmes were delivered by a Lead Senior Physiotherapist and an Allied Health Professional (AHP) Cancer Assistant Practitioner. People diagnosed with colorectal or breast cancer, and listed for surgery, were invited to join programmes consisting of education and supervised exercise specific to each tumour site. Upon completion of the programmes people reported an improved QoL, reduced fatigue, anxiety and depression. People who completed the breast cancer shoulder programme reported a reduction in upper limb disability.

Following colorectal prehabilitation, people demonstrated an improvement in their physical fitness levels reflected by a reduction in average hospital length of stay by at least two days. Post-surgery, where a rehabilitation component was not provided, people reported regression in pre-intervention levels of fatigue, anxiety and depression, highlighting a need for a restorative component to treatment optimisation approaches. Moreover, people attending the programme reported that the peer support of others with a similar diagnosis had a positive effect on their motivation and emotional wellbeing.

The NHS Long Term Plan¹ outlines an ambition to enhance cancer survival and QoL. It is recommended that to achieve this, people should have access to physical, nutritional and psychological optimisation². Within a Macmillan funded two-year scoping project, two AHP-led pilot programmes were developed based on the requirements of people affected by cancer in a district general hospital in North Derbyshire, a breast prehabilitation and shoulder rehabilitation programme and a colorectal prehabilitation programme. These particular tumour sites were selected as patients require contrasting management approaches and primary treatment is delivered at Chesterfield Royal Hospital (CRH). Studies have demonstrated clinically significant physical and psychological health improvements in both tumour sites^{3,4,5}, with reduced healthcare utilisation post-operatively^{5,6}, the pilot interventions provided an opportunity to explore and test these concepts locally.

The aim of the pilot programmes was to deliver personalised, AHP-led interventions which would:

- Increase treatment options for people considered “high-risk for surgery”.
- Improve post-operative outcomes.
- Improve QoL and experience throughout and after treatment.
- Reduce length of stay.
- Support the cancer pathways.

Treatment complications lead to poorer health related QoL, increased length of stay (LoS) and increased overall expenditure on health care⁷. Advanced age and frailty are associated with increased risk of developing post-surgical complications, longer LoS and discharge to a care facility⁸. Approximately 30% of people in North Derbyshire are aged 65 years or older, compared to the national average of 18%⁹, suggesting a need to optimise the local population prior to cancer treatment.

People affected by cancer in North Derbyshire report that they do not know what they can do to improve their own treatment outcomes. Up to 82% of people undergoing cancer treatment do not meet physical activity guidance and many patients do not understand the benefits of lifestyle changes to mitigate the long-term risks of cancer treatment¹⁰. Fatigue, managing symptoms, nutrition and “how to be more active” are among the top five information needs reported by people affected by cancer in North Derbyshire during holistic needs assessments¹¹. AHPs are well placed to support people with all aspects of their physical wellbeing, however prior to these pilot interventions, there were only very limited AHP services implemented within cancer pathways at CRH.

Method

Each programme was co-developed with the respective MDT to define pathways which would allow the minimum required time to stimulate fitness improvements, whilst minimising delays to surgery. Patient and public involvement was also incorporated throughout, utilising surveys, interviews and focus groups. A key focus from this feedback was to provide information at the right time and minimise hospital attendances. The unique requirements of each patient group resulted in two very different programmes.

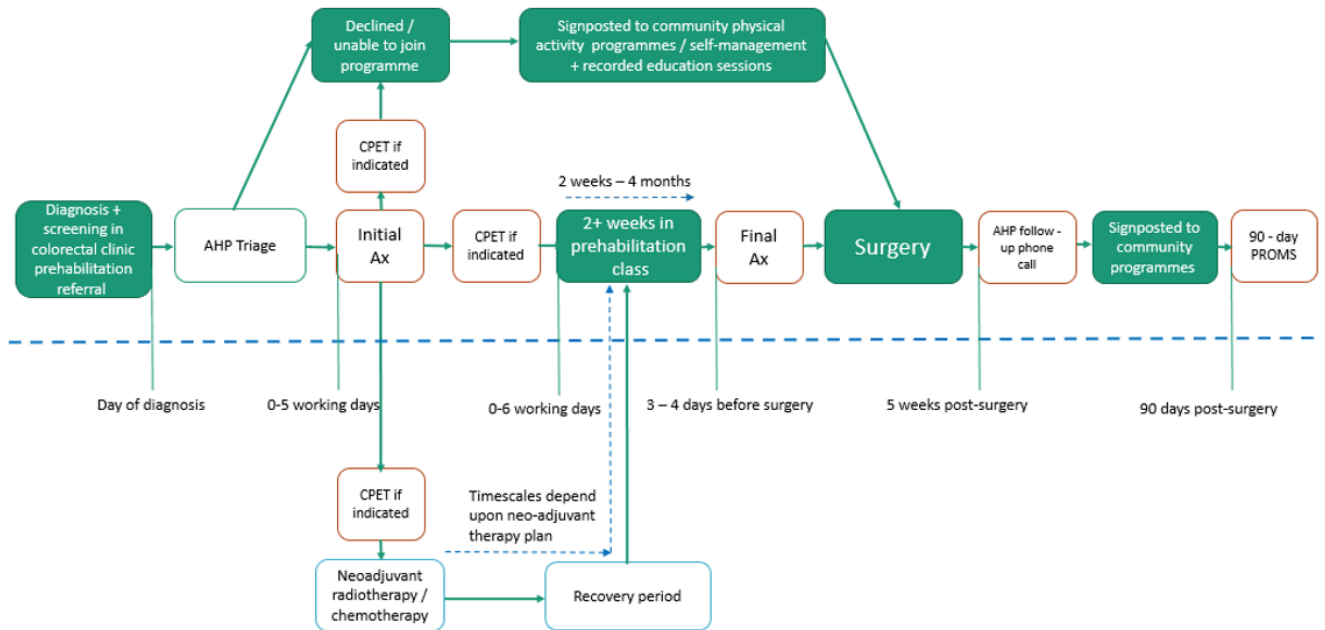


Figure 1: Colorectal Prehabilitation Pathway

Colorectal cancer

The colorectal programme (figure 1) provides supervised exercise for people considered “high risk” for surgery, those considered lower risk are also invited to join or are provided with a home exercise programme. Education sessions are provided before each class covering four core themes, to help people to prepare for their surgery (figure 2).

Overview of the colorectal prehabilitation pilot

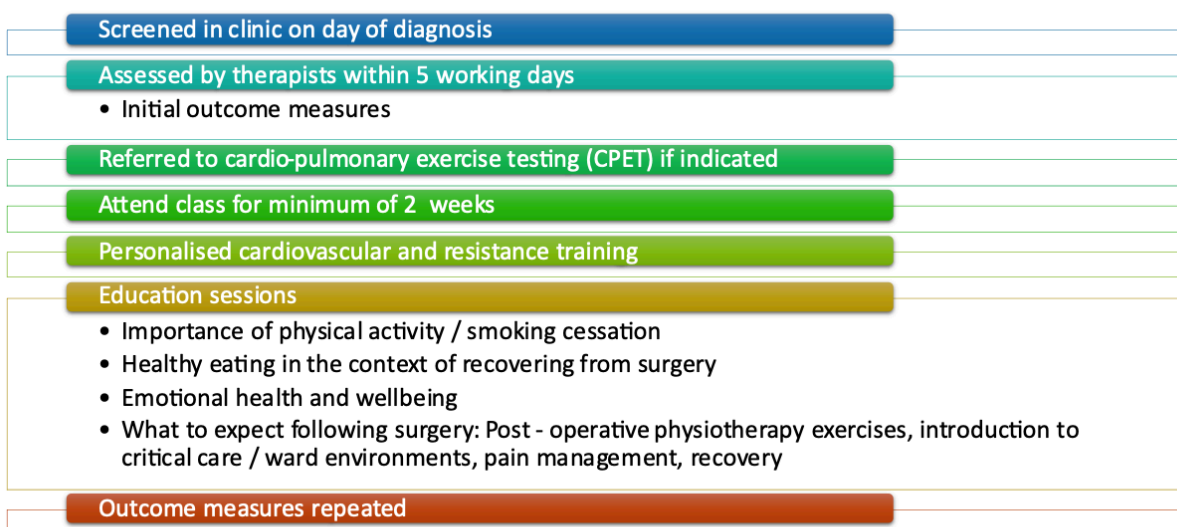


Figure 2: Overview of the colorectal prehabilitation pilot

Following surgery, people are visited on the ward by the team and where indicated, ward-based rehabilitation is provided. Working with therapists with whom patients already have an established rapport eliminates barriers to early mobilisation, particularly where people are anxious or experiencing delirium. Each person is contacted by telephone five weeks following surgery for a progress check and at this point are sign-posted to local physical activity or other wellbeing programmes as required.

Breast cancer

In the breast cancer programme, every person who will undergo primary breast cancer surgery is invited to join an online webinar (figure 3) which contextualises the importance of physical and emotional wellbeing and signposts to relevant local services, to increase resilience to treatments.



Figure 3: Breast prehabilitation webinar content

People considered at “high risk” (figure 4) of developing shoulder problems^{5,12} are provided with an outpatient physiotherapy appointment approximately seven days following their surgery.

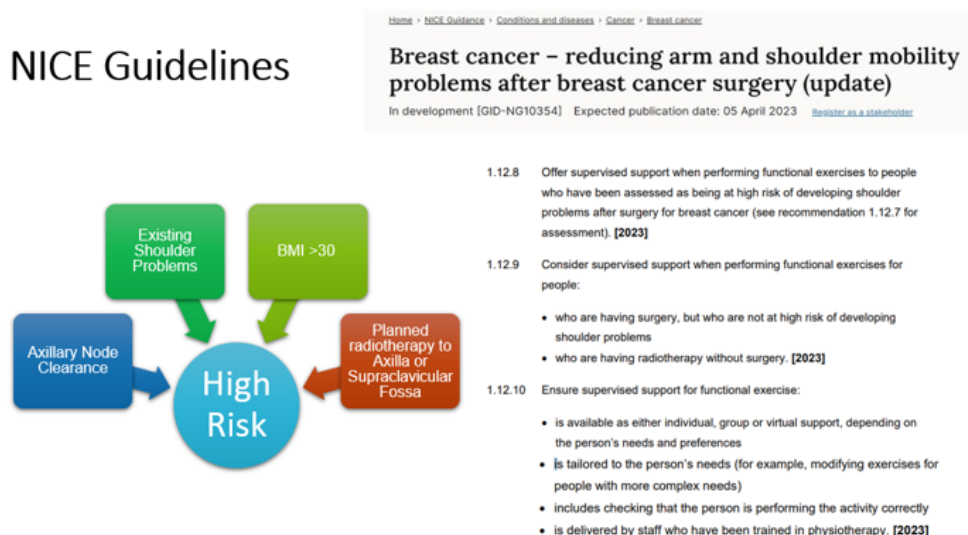


Figure 4: High risk of developing shoulder problems and relevant NICE guidelines

Outcome measures (figure 5) were chosen to reflect physical improvements, the perceived impact upon each person’s quality of life and to benchmark with other established services and current evidence. Physical testing takes place during assessments, with questionnaires completed for each patient related outcome measure (PROM). PROMs are then repeated via post following discharge, to evaluate the longer-term impact of interventions.

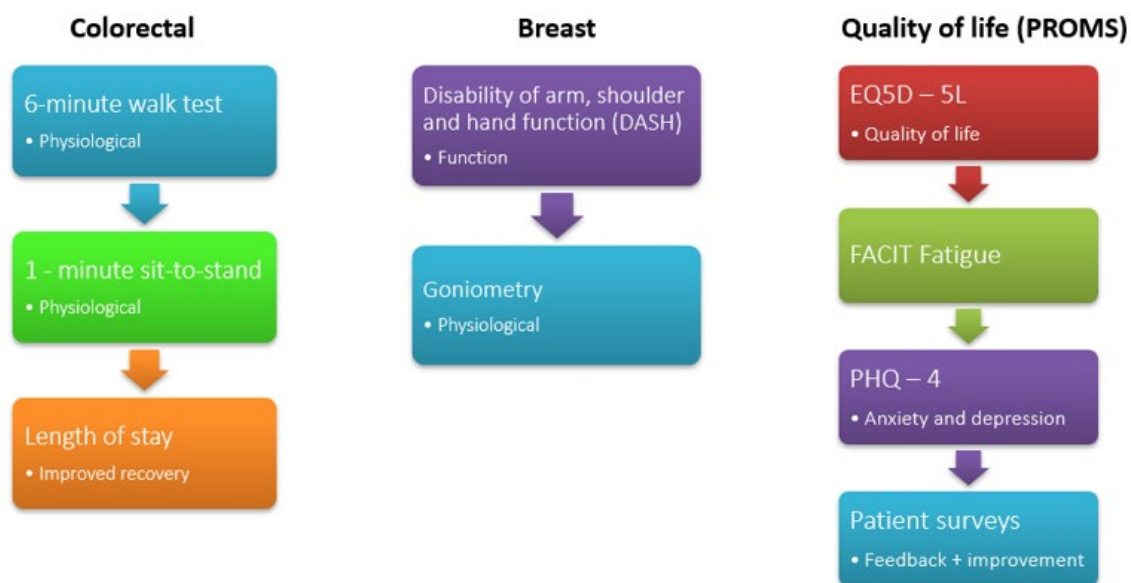


Figure 5: Outcome measures for pilot programmes

Outcomes

Colorectal programme

People demonstrated clinically significant improvement in fitness reflected by improvement in six-minute walk tests (6MWT) and one minute sit-to-stand scores (figure 6).

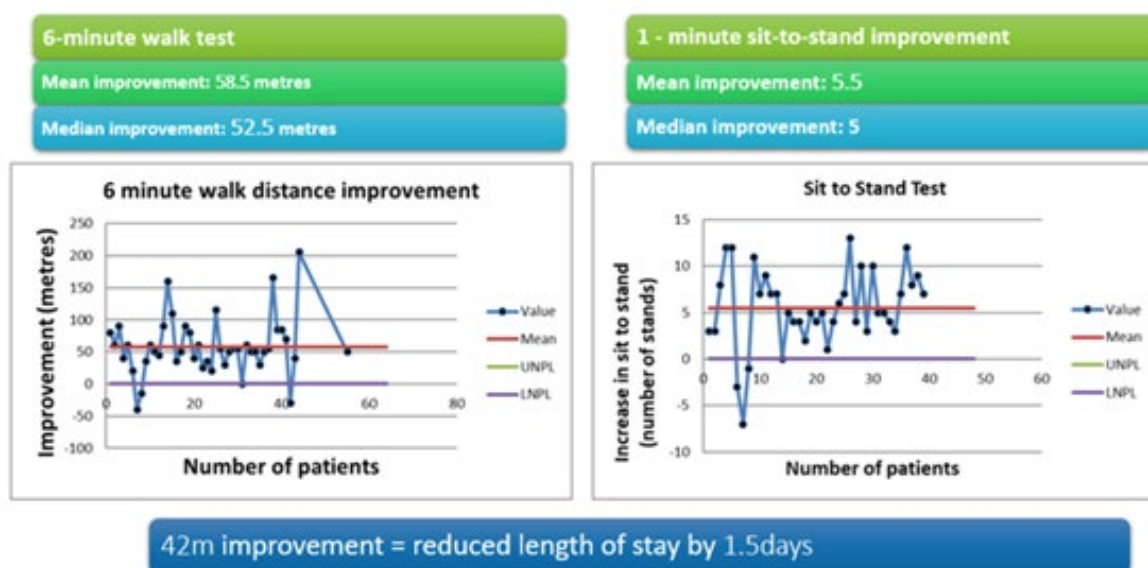


Figure 6: Colorectal prehabilitation physical outcome measure results

The average length of stay was reduced by two days versus CRH legacy data (figure 7) and correlates with an average 6MWT distance improvement above 42 metres, as demonstrated in other independently evaluated services⁶.

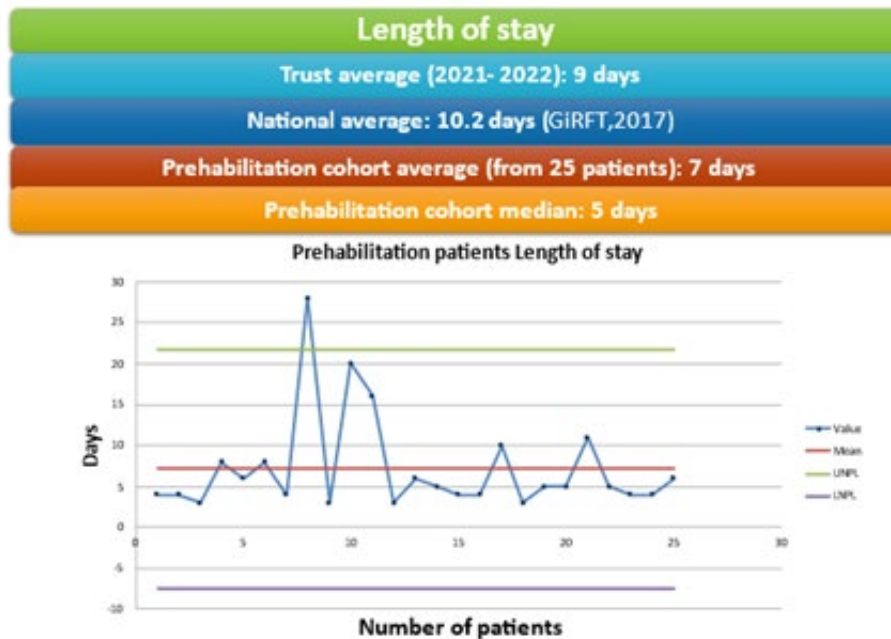


Figure 7: Length of stay comparisons

Breast programme

DASH scores improved with clinical significance at the point of discharge, which compares well with the study on which the programme was based⁵. However, outcomes in the study are based on surveys at 12 months, in this programme surveys are returned between four and six months.

PROMS

A clinically significant QoL improvement was observed in both programmes¹³, whilst anxiety and depression scores reduced to within a “normal” range on final assessment following the colorectal prehabilitation programme (figure 8). This suggests that, despite being closer to surgery, people feel better prepared and less anxious and depressed, potentially contributing to enhanced recovery times (as demonstrated in multimodal prehabilitation randomised control trials in colorectal cancer patients)¹⁴.

Patient reported outcome measures

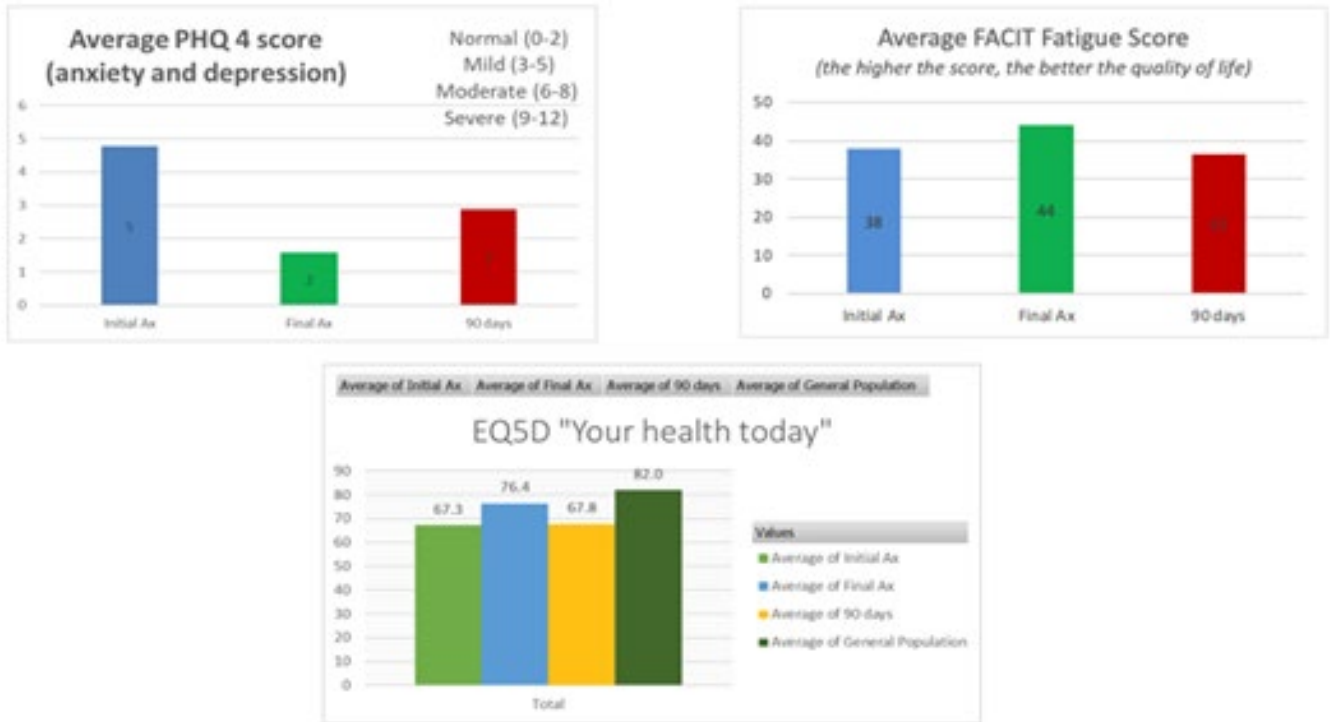


Figure 8: Patient reported outcome measures

Patient and staff evaluation

A number of themes were highlighted during evaluation of the interventions (figure 9).

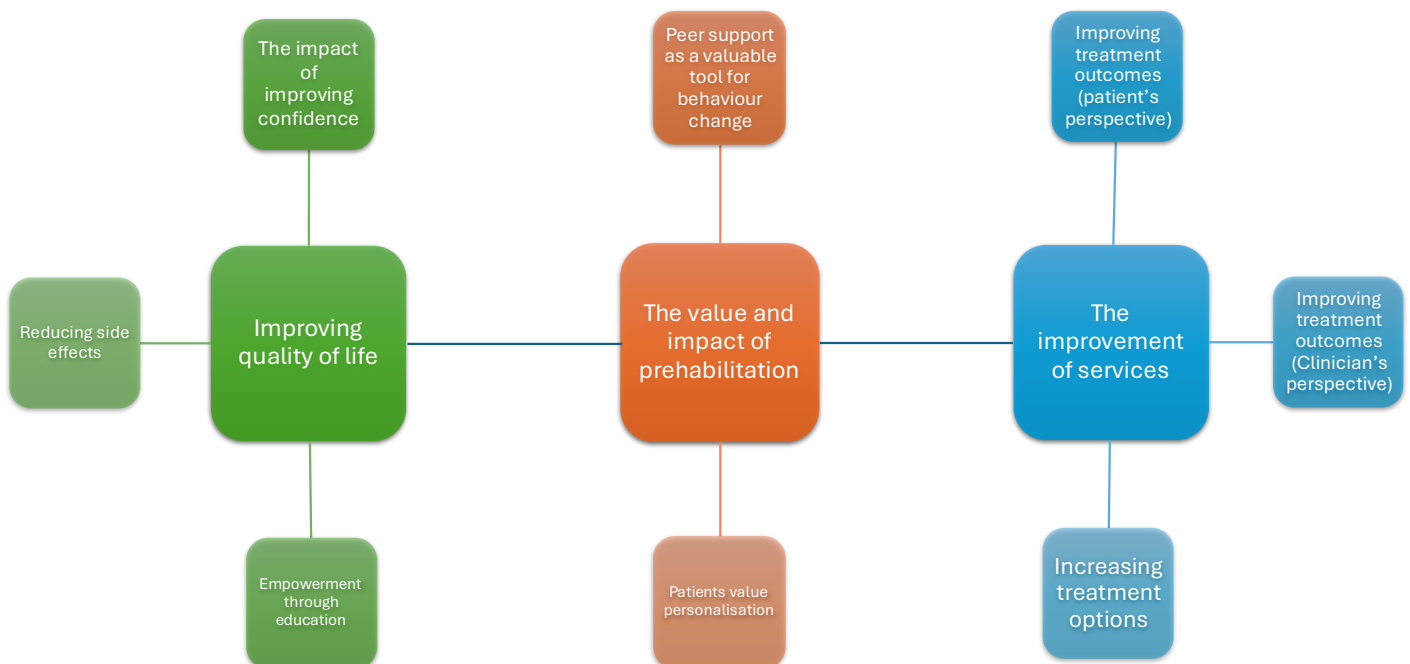


Figure 9: Thematic map of service evaluation

Patients highly valued the opportunity to partake in each programme, citing the opportunity to be supported by others sharing a similar experience particularly beneficial. Improved 6MWT values combined with education, reportedly made people feel more confident, better prepared for and less anxious about their treatment. 92% of patients reported a better understanding of what to expect from surgery and 100% would recommend the programme to others.

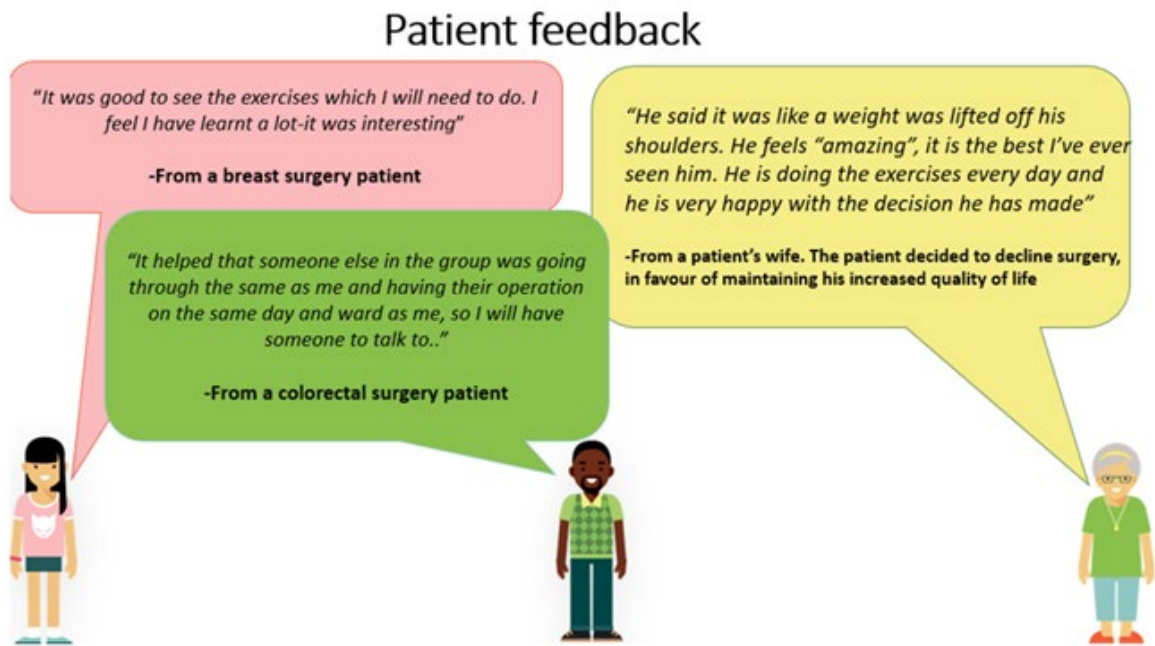


Figure 10: Patient feedback

The results observed in physical and patient reported outcome measurement are echoed in feedback surveys of people who have completed the programme. Physical improvements and peer support contribute to improved QoL and longer-term behaviour changes (figure 10).

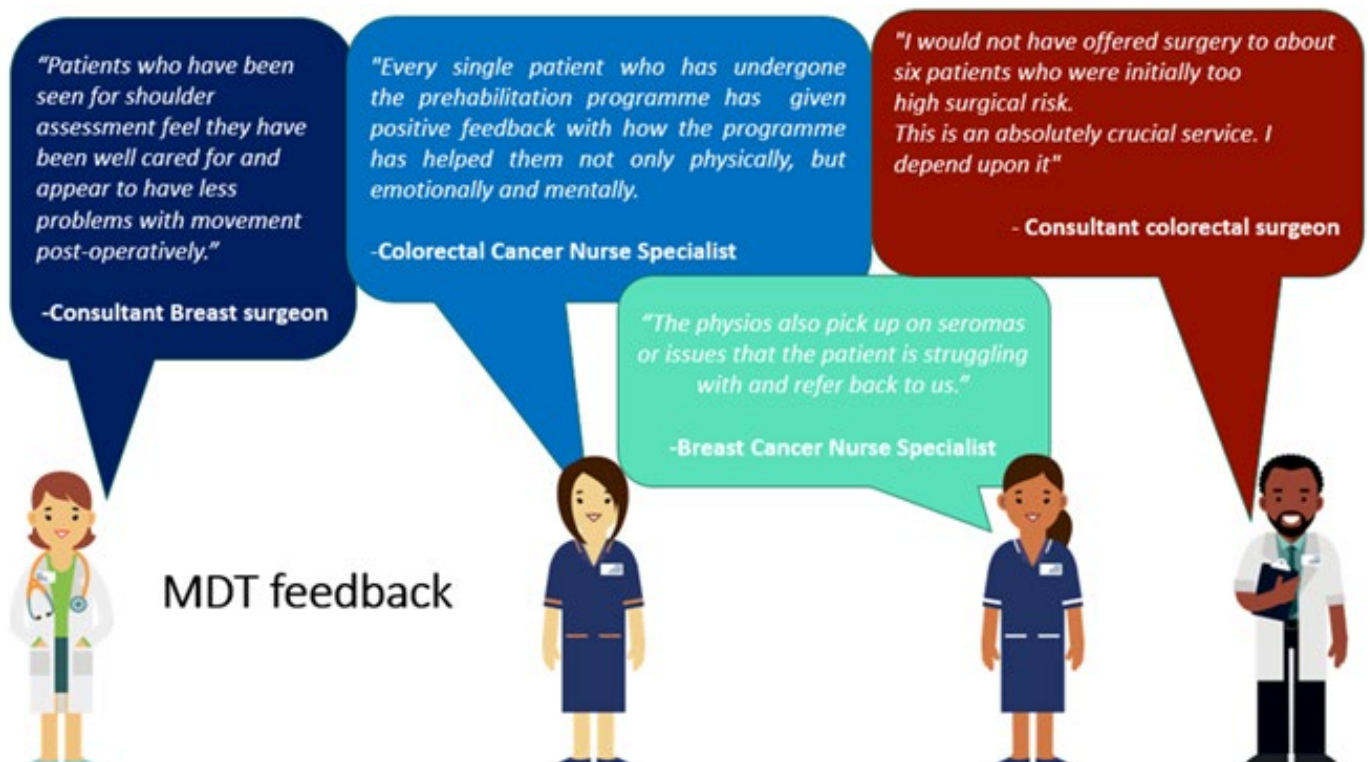


Figure 11: MDT Feedback

Crucially, the MDTs of each tumour site have seen the impact of the interventions on their patient groups, enabling an ongoing collaborative approach. AHPs were not involved in either pathway prior to these pilot programmes but are now considered to be integral to each pathway, as part of high-quality patient care (figure 11).

Return on investment

Capacity	Length of stay (CRH)	Re-admissions (CRH)	ED attendances (CRH)	Critical care (CRH)
Colorectal	296	15	15	22
Breast	-	-	20	-

Table 1.1: Estimated capacity savings at CRH through prehabilitation / rehabilitation programmes

Based on the evidence of these pilot interventions, relevant RCTs⁵ and independent evaluations of larger scale services⁶, it is hypothesised that bed capacity would be increased by a minimum of 296 days and 22 critical care days at CRH, with reduced re-admissions and ED attendances (Table 1.1). Based on economic analyses^{5, 6} and 2022/23 tariff tables, financial savings would be expected as consequence of the efficiencies associated with improved outcomes (table 1.2).

Tumour site	Estimated annual financial savings
Colorectal	£152,179
Breast	£27,090

Table 1.2: Estimated cost savings for from CRH prehabilitation /rehabilitation programmes

The implementation of AHP-led programmes shows a positive influence on the capacity of cancer MDTs by adding an extra network of professionals to support case management. Those patients who do experience side effects receive rehabilitation and support, improving outcomes and reducing calls and clinic appointments longer term.

Key Learning Points

Despite the challenging financial climate, the impact of these interventions on people’s QoL, in combination with the efficiency savings to the healthcare system has resulted in substantive funding of an “Oncology Prehabilitation and Therapy Service” at CRH. The service will see these pilot interventions developed into comprehensive services; however, work is ongoing to develop programmes to support other tumour sites, to minimise healthcare inequalities. Much has been learned throughout this process in terms of gaps in healthcare provision, service development and maximising the effectiveness of behaviour change interventions (figure 12).

The importance of a collaborative approach from the outset

- With MDTs and patient groups
- Improved understanding of roles, service delivery and "buy-in" to service change / improvement

Importance of outcome measures

- Using a range of validated outcome measures was key to corroborating a qualitative narrative of these services being "the right thing to do"

Stakeholder engagement

- There are always "hidden stakeholders"
- Communicate a vision for a service development project early, provide regular updates and present to various forums / stakeholder groups
- Gathering support for new services is crucial to their success, particularly if they will require funding

Peer support

- Key to sustainable behaviour change
- People highly valued the opportunity to attend webinars / exercise classes with people going through similar treatments / experiences
- People developed helping relationships with peers which lasted beyond treatment completion and promoted ongoing physical activity in the community setting

Rehabilitation remains an essential component

- In the colorectal programme, which was prehabilitation only, people reported increased fatigue and anxiety and reduced quality of life at 90-days post-operatively.
- There is an apparent need to offer restorative input based on this small scale pilot
- Physical capacity was not assessed at 90-days post-operatively during this pilot

Figure 12: Learning points from pilot oncology prehabilitation and rehabilitation programmes

Perhaps the key learning point is the power of peer support in motivating people to make and sustain a behaviour change and the long-lasting effect this can have. This is something that the team is very keen to promote and underpins the ethos of the Oncology Prehabilitation and Therapy Service. There were initial challenges in engaging the MDT in the absence of established AHP roles within cancer pathways. This was overcome over time through engagement exercises identifying perceived gaps in the pathways; from a clinician's and patient's perspective, providing an opportunity to highlight how AHPs may provide services to fill these gaps. Ultimately, delivering successful pilot interventions as a proof of concept, served to develop trust and understanding and now AHPs are considered a key part of each respective MDT.

Final advice

For those looking to do similar work in future, the advice would be to cast a wide scoping net, learn from what others are doing (or would like to do!) Select outcome measures which allow benchmarking with other services, but also provide information that is clinically useful. Communicate the vision and the progress that you make to all stakeholders; to generate support and engagement with the intervention longer term. Peer support is invaluable to patients, but also for healthcare professionals, so develop a support network of people working on similar projects.

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