Home-Hospital-Home (H3) Study: digitally enabled prehabilitation and rehabilitation for colorectal cancer surgery patients

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Introduction

The delivery of preoperative patient optimisation (prehabilitation) improves patient outcomes and is recommended by UK consensus guidelines on perioperative care[1]. A crucial component of effective prehabilitation is to help patients to become more physically active. Increased physical activity improves patients' fitness and this is associated with fewer surgical complications and faster recovery. The minimum level of weekly physical activity advised to patients is 150 mins of moderate intensity, this aligns with the recommendations for all adults (Figure 1).

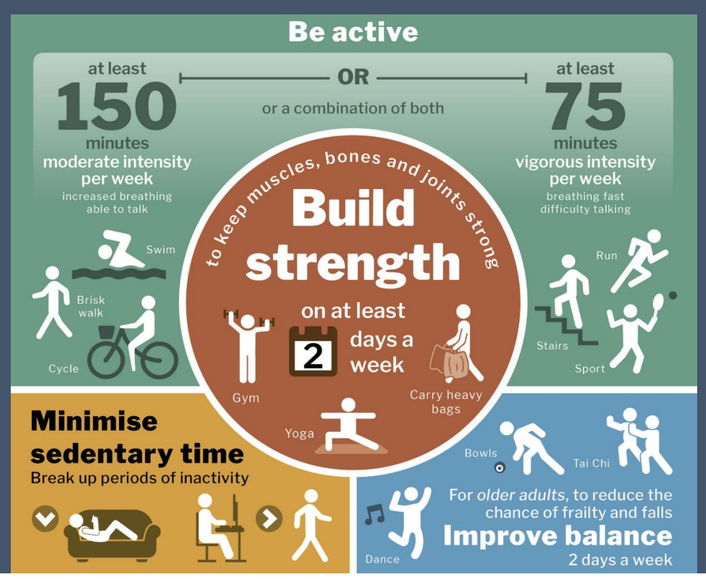


Figure 1. The UK Chief Medical Officer Physical Activity Guidelines (2019)[2]

Previous studies investigating prehabilitation have had low enrolment and retention rates. The reason for this has not been well studied, however given the benefit of prehabilitation it is vital to ensure inclusive interventions and services are developed to prevent healthcare inequality.

Aims

1. To understand the spectrum of baseline activity in our colorectal cancer population awaiting surgical resection
2. Identify barriers to the delivery of physical activity promotion and engagement in this population
3. Use this knowledge to develop an effective prehabilitation intervention

Methods

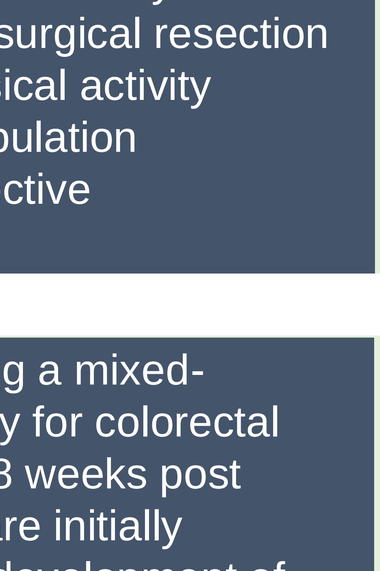
A non-randomised interventional trial using a mixed-methods design. Patients awaiting surgery for colorectal cancer were recruited. Follow up data at 8 weeks post surgery. Control cohort receiving usual care initially recruited. Interim data analysis informed development of digitally enabled intervention with subsequent recruitment of intervention cohort (HRA REC reference: 20SS/0088).

Intervention

Interim control patient data revealed:

- Short lead time from notification of plan for surgery to operation date
- Large geographical spread of patients
- Variable access to transport and time available for travel
- High rates of digital literacy/capability

A digital intervention was developed (Fitbit watch, online exercise videos, personalised target setting).



1. Centre for Perioperative Care. Preoperative Assessment and Optimisation for Adult Surgery [Internet]. 2021. Available: https://www.cpoc.org.uk/sites/cpoc/files/documents/2021-06/Preoperative%20assessment%20and%20optimisation%20guidance.pdf
2. The Chief Medical Officers. United Kingdom Chief Medical Officer Physical Activity Guidelines [Internet]. The UK Government; 2019 Jul. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf
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Results

	Control	Intervention
Patients assessed for eligibility	40	57
Ineligible patients	5	11
Patients who declined	2	9
Patients recruited	**33**	**37**
Patients lost to follow up	7	11
Patients interviewed	19	15
Mean age (± SD)	66.1 (12.6)	67.5 (12.5)
Female sex (%)	10 (40)	11 (42)

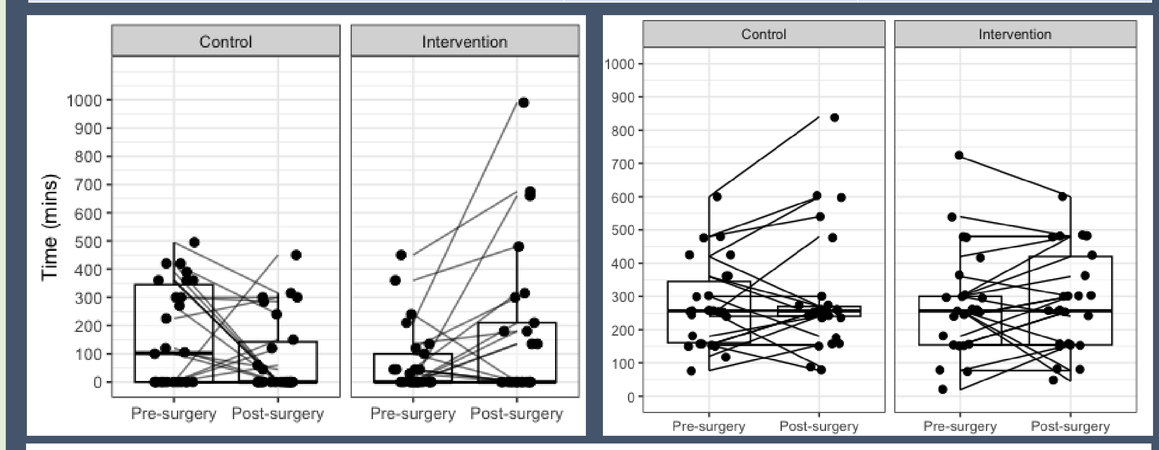

Figure 2. Left: weekly physical activity at or above moderate intensity for each patient pre/post-surgery. Right: weekly sedentary time for each patient pre/post-surgery. No significant difference between groups or time points.

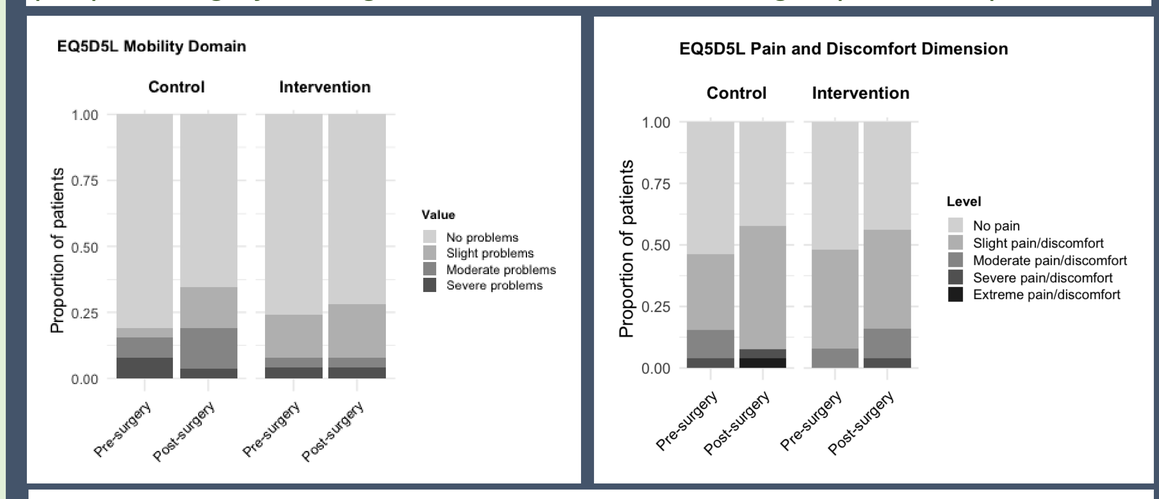

Figure 4. EQ5D5L quality of life responses pre/post-surgery. No significant difference between groups or time points.

Key themes identified from semi-structured interviews:

- Recognition of low baseline physical activity levels and desire to change once benefit communicated
- Trust in healthcare team and perceived importance/relevance of advice/information
- Need for personalised and incremental approach/targets
- Small window of opportunity (typically < 3 weeks) to undertake prehabilitation

Discussion/Conclusion

- Over 50% of patients presenting for colorectal cancer surgery are not sufficiently physically active to reduce pre-operative risk. Compounded by high sedentary time.
- Majority of patients do not have significant functional limitation/symptom burden to prevent prehabilitation
- Multiple challenges to implementation but patients are receptive and keen to engage with concept of prehabilitation
- Remote, digital prehabilitation solutions are feasible and can integrate into existing surgical care pathways
- However digital interventions not appropriate for all patients and alternative modalities required
- Prehabilitation may augment the recovery/rehabilitation process and interventions should span the entire perioperative period

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