

# Prehabilitation: what it is and why it is important in gastrointestinal nursing

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This paper provides an overview of the Association of Coloproctology Nurses' (ACPN) plenary session on prehabilitation, delivered at the Association of Coloproctology of Great Britain & Ireland (ACPGBI) Annual Meeting in July 2022. Prehabilitation is defined as a 'process of enhancing the functional capacity of the individual to enable him/her to withstand an incoming stressor' (Mayo et al, 2011). For this plenary session, the incoming stressor of interest was colorectal surgery. The session comprised of five presentations, from speakers with experience of the topic, providing a range of perspectives.

The session was chaired by Gabrielle Thorpe, chair of the ACPN, and Tracey Becker, an ACPN committee member.

## Presentation 1. Impact on fitness on surgical recovery

**Susan Moug, Consultant Surgeon and Honorary Professor, University of Glasgow, and Surgical Specialty Lead for Colorectal Surgery, Royal College of Surgeons**

Susan Moug commenced by focussing on the problem that prehabilitation seeks to address: that unfit, high-risk patients have poorer outcomes following surgery, citing evidence from Pearse et al (2006): 'a large high-risk surgical population accounts for 12.5% of surgical procedures, but for more than 80% of deaths'. Further evidence suggests that patients who are independent with good functional ability have a better chance of recovery from the effects of surgery and those who are dependent are more likely to experience complications

that may negatively impact on their quality of life and level of dependence following surgery (Clegg et al, 2013).



Drawing on the joint NIHR Cancer and Nutrition Collaboration, 'Macmillan and Royal College of Anaesthetists guidance for rehabilitation for people with cancer', published by Macmillan Cancer Support (2020), Moug identified three key components of prehabilitation: physical activity/exercise, psychology and nutrition. She argued that prehabilitation is both safe and feasible in improving fitness and strength prior to surgery, with the less-fit having more to gain. She outlined three approaches of universal, targeted or specialist prehabilitation over a period of 2–4 weeks prior to surgery to promote adherence and optimise benefit for patients. Optimal interventions are tailored to the individual patient and are likely to include varied exercises such as high intensity interval training, resistance training and endurance training, along with guidance and support regarding diet and/or to address pre-operative anxiety. All possible combinations can be successfully delivered virtually or face-to-face, in primary or secondary care settings. Citing a wide range of recent evidence, Moug presented potential benefits of prehabilitation relating to short-term surgical outcomes: 10.9% reduction in severe complications (Bojesen

et al, 2022); 51% reduction in complications (Barberan-Garcia et al, 2018), enhanced functional capacity; reduced emergency admission rates (Molenaar et al, 2022); and improved cancer survival rates (Iyengar and Jones, 2019; West et al, 2019).

## Presentation 2. Patient perspective on colorectal prehabilitation research

**Mike Kelly, Senior Visiting Fellow in Public Health and Primary Care, University of Cambridge**

The Edward Salt Lecture, delivered by Mike Kelly, entitled '*When physical activity and surgery were thought to be incompatible: the patient's perspective*', focussed on his own experience of diagnosis with ulcerative colitis as a young man, the need for surgery at aged 30 due to neoplastic changes in the colon and the role that exercise played in his recovery. Already an active person, Kelly increased his activity levels in preparation for surgery, running 14 miles and doing regular press-ups in the days preceding his surgery. Although he was convinced about the beneficial impact of exercise on both his symptoms and his post-operative recovery, Kelly's medical team remained sceptical. However, his physiotherapist was supportive, supervising light exercise in the hospital gym after post-operative day 10 and continuing with the gym work after his discharge home on post-operative day 20. Gradual building of physical activity levels, despite some light bleeding around the stoma and fatigue early on, led to a speedy return to pre-operative fitness levels. Kelly ended his presentation by emphasising

how a good level of fitness and motivation pre-operatively enabled him to recover quickly and enjoy a full active life long before 'prehabilitation' was defined.

## Presentation 3. Improving fitness with an eBike intervention

**Paul Kelly, Reader in Physical Activity for Health, University of Edinburgh**

Moving on to recent research conducted in Scotland, Paul Kelly presented the Forth Valley Electric Bike (eBike) Pilot Project, which aimed to improve the fitness (prehabilitation and post-operative rehabilitation) of people undergoing surgery for colorectal cancer by providing them with an eBike and full wrap-around personal support. The purpose was to evaluate the feasibility of the project, its impact on patients and capture learning for future delivery and improvement. Of the 62 patients screened, 14 consented to participate. The presenter provided an overview of the planning and delivery of the project and presented his findings, highlighting that 5/13 (~40%) of participants used the eBike in a way that was consistent with contributing to the health benefits of physical activity, while 3/13 (~20%) did not engage with the intervention as planned. Qualitative interviews highlighted key themes around recruitment and participation; usage and cycling patterns; health benefits (mental, physical and rehabilitation/returning to previous fitness); nature and distraction; and goals and targets, with positive experiences articulated across all themes. Specifically, the project gave participants something to look forward to, enabled a feeling of normality and made a difference to their recovery, both physically and mentally, while enabling them to enjoy nature. Lessons learned included the importance of good planning and delivery with a strong partnership of experts and the clinical team, high-quality technical support to maintain the equipment and promotion of the project at the earliest opportunity through colorectal specialist nurse contact with patients. The project

findings emphasised the need for an individualised approach to prehabilitation due not only to patients' own values and preferences, but also because of the wide variation in comorbidities, cancer diagnoses and treatment timelines.

## Presentation 4. Cost-efficacy of prehabilitation in major abdominal surgery

**James Hernon, Consultant General and Colorectal Surgeon, Norfolk and Norwich University Hospital NHS Foundation Trust**

The fourth presentation in the plenary session was from James Hernon, the chief investigator for PREPARE-ABC, a multicentre randomised controlled trial of the clinical and cost-effectiveness of prehabilitation in major abdominal surgery. Hernon presented a process evaluation (PE) and pilot data from the trial, currently in progress. The study aim is to establish the effectiveness and cost-effectiveness of a hospital- and home-based exercise programme in relation to short- and long-term clinical outcomes following abdominal surgery, and to generate cost-effectiveness data to underpin clinical guidance on how exercise programmes should be implemented. A mixed-methods PE involving 18 centres ran alongside the main study to evaluate site setup and patient recruitment, including acceptability of the interventions by patients. This was to determine the optimal length of intervention duration, using a combination of questionnaires to colorectal nurses to understand each centre's resources, qualitative observations of standard care and semi-structured interviews with staff and patients. The PE identified that exercise advice in standard preoperative preparation was generally limited to advice on maintaining existing activity levels, with some patients receiving no exercise advice. Although perceptions of healthcare professionals delivering the motivational components of the intervention were influenced by patients' exercise history and motivation prior to surgery, there was a high level of fidelity to exercise intervention

delivery. Patients interviewed (n=28) as part of the PE greatly valued the enhanced level of social support (versus standard care) provided by staff, with all but one reporting increased exercise levels due to receiving the intervention. Greater details about these findings can be found in the PE publication (Murdoch et al, 2021).

Hernon then provided an overview of the PREPARE-ABC trial design (PREPARE-ABC Trial Collaborative, 2021a) involving random assignment to hospital-supervised exercise, home-supported exercise or treatment as usual (TAU). Primary outcomes are 30-day morbidity (Clavien-Dindo) and 12-month health-related quality of life (Medical Outcomes Study Health Questionnaire). The pilot phase results (PREPARE-ABC Trial Collaborative, 2021b) involved 200 patients randomised to either hospital-supervised exercise (n=68), home-supported exercise (n=69) or TAU (n=63). Across the groups, 19 patients did not proceed to surgery or withdrew, and 52% experienced a complication (majority Clavien-Dindo grades 1–2, with 16 participants experiencing one or more Clavien-Dindo grade 3–4). A total of 57% of the hospital-supervised group attended six or more preoperative sessions, with 50% attending five or more monthly postoperative exercise booster sessions. Adherence was greater in the home-supported group, with 70% patients engaged with two or more preoperative telephone support sessions and 80% engaged in five or more monthly postoperative telephone support booster sessions. The internal pilot phase confirmed that the study is safe and well tolerated, with good adherence, and the main trial will complete in October 2022.

## Presentation 5. Implementation of prehabilitation services

**Annie Anderson, Professor of Public Health Nutrition, University of Dundee, and Chair, Prehabilitation Implementation Steering Group, Scottish Cancer Prevention Network**

With a focus on implementation of prehabilitation services, Annie Anderson

started her presentation by emphasising that prehabilitation must be seen as part of rehabilitation, with both associated with better outcomes for patients overall than either one or the other. She reinforced a key message from 'Recovery and redesign: an action plan for cancer services' (Scottish Government, 2020a) that prehabilitation is not just about physical activity, but also nutrition, psychological support, smoking cessation and alcohol reduction. This supported the arguments offered by the other presenters in this plenary session, that prehabilitation must be flexible and personalised to accommodate individual patients' needs and preferences. Considering barriers to access to prehabilitation services in Scotland for people diagnosed with cancer, Anderson cited her own research, highlighting a lack of understanding about prehabilitation among some GPs and variation in referral patterns among GPs who had access to prehabilitation activities locally, which must be considered in any implementation strategy. Eight key principles (Table 1) have been identified for implementing prehabilitation across Scotland and can be used as a template for setting up prehabilitation services across the UK. A website for patients and professionals to access relevant prehabilitation information ([www.prehab.nhs.scot](http://www.prehab.nhs.scot)) was also endorsed, providing an opportunity for online training and networking for professionals. Anderson concluded her presentation by referring to a pilot study of prehabilitation implementation with 342 patients conducted at eight Maggie's Centres in Scotland, which found great improvements in physical and emotional wellbeing and nutrition.

## Conclusion

All five presentations in this plenary session used evidence-based arguments to support the implementation of prehabilitation for patients undergoing gastrointestinal surgery. Key take-home messages reinforced across the session were:

- Effective prehabilitation requires multidisciplinary buy-in across primary

and secondary care, involving the voluntary sector and wider community

- A flexible, individualised approach will enhance motivation and adherence
- Prehabilitation should be offered as part of a wider rehabilitation pathway extending into the postoperative period
- Prehabilitation should incorporate nutritional advice, psychological support and guidance about smoking cessation and reducing alcohol intake, in addition to encouraging increased physical activity.

The ACPN extends enormous thanks to the presenters involved in this excellent plenary session. For further information about the ACPN or to enquire about joining the Association, please contact Nicole on [ntaub@acpghi.org.uk](mailto:ntaub@acpghi.org.uk) or Gabby (ACPN Chair) on [gabrielle.thorpe@uea.ac.uk](mailto:gabrielle.thorpe@uea.ac.uk) **GN**

### Declaration of interest None

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## Box 1. Key principles for implementing prehabilitation

1. Start as early as possible
2. Run in parallel with usual decision-making processes
3. Be part of the rehabilitation continuum
4. Be multi-modal, including exercise/activity, nutrition and psychological support
5. Be screened to determine the level required (universal, targeted, specialist)
6. Screen record at MDT alongside performance status
7. Use validated tools for individualised assessment, care planning and outcomes measurement (targeted and specialist)
8. Have a co-produced personalised care plan

Source: Scottish Government (2022b)