

Surgery

Prehabilitation service provision and preoperative clinical pathways for major oesophagogastric cancer surgery patients: A service evaluation.

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Abstract

Background

Prehabilitation is a multidisciplinary intervention aimed at optimising patients prior to surgery. Locally, integration of prehabilitation within the major oesophagogastric (OG) cancer preoperative clinical pathway is unclear.

Aim

To evaluate the prehabilitation service provision and preoperative clinical pathways for OG patients at a regional cancer centre.

Methods

A retrospective service evaluation of electronic patient records and staff survey was undertaken. Adults undergoing elective OG cancer resection surgery between October 2022 to October 2023 were included. Patient characteristics and details of preoperative interventions were collected, and a survey sent out to staff involved in the preoperative pathway. The findings were evaluated against the Macmillan prehabilitation guidance.

Results

Ninety-five patients were evaluated, of which 70 (73.7%) received physiotherapy as part of prehabilitation. Reasons for non-receipt included: no referral (n=12, 48%), clerical errors (n=5, 20%), and missed appointments (n=8, 32%). Patients not receiving physiotherapy were older (median 70 years, IQR 58-77 vs. 66, IQR 61-73), had a higher proportion of open surgeries (53% vs. 47%), heart disease (28% vs. 8.5%) and obesity (72% vs. 2.8%) compared to those who did. Only 29/95 (30%) received dietetics input and none received psychological support. The staff survey identified that there is no funded prehabilitation service for dietetics or psychological medicine. Potential areas of improvement to align with the Macmillan guidance included: starting interventions promptly, and to develop dietetics and psychological medicine services as part of the prehabilitation service.

Conclusions

These findings will contribute to the development of the current prehabilitation service and inform future research.

INTRODUCTION

Oesophagogastric (OG) cancer is the 14th most common cancer in the UK, accounting for 9,300 new cases annually.¹ This type of cancer typically presents with dysphagia, indigestion, and reflux, which can lead to malnutrition and affect functional and psychological health.^{2,3} OG cancer

is usually managed by radical treatment of neoadjuvant chemotherapy and surgical resection.⁴

Pre-treatment fitness assessment and optimisation can improve patients' ability to undergo these interventions.⁴ Cardiorespiratory fitness is an independent risk factor for morbidity and mortality following surgery, and by optimising this through prehabilitation, it can improve overall post-operative outcomes.⁵ The gold standard for assessment of patient cardiorespiratory fitness is through car-

diopulmonary exercise testing (CPET) which can determine a patient's physiological reserve to undergo neoadjuvant chemotherapy and surgical resection.⁶ Prehabilitation is a multidisciplinary preoperative approach delivered by physiotherapists, dietitians, and psychiatrists to improve patients' functional, nutritional, and mental wellbeing before cancer resection surgery.⁷ Prehabilitation has been found to be safe and effective at optimising patient function preoperatively⁸ and potential benefits post-operatively.⁹⁻¹²

The optimal prehabilitation content is currently unknown due to heterogeneity of delivery and outcome measures in current literature.⁸ Studies suggest that improving physical conditioning can reduce hospital stays, post-operative complications, and costs, while boosting patient outcomes and satisfaction.⁹⁻¹² Prehabilitation guidance has been created by Macmillan Cancer Support and suggests prehabilitation should include 150 minutes of moderate intensity activity and two resistance training sessions per week, healthy eating conversations, and compassionate communication and information giving.⁷ This guidance includes all other aspects of prehabilitation including professions involved in delivering prehabilitation, timing of interventions before treatment, and prehabilitation setting.⁷

Locally, a prehabilitation service for OG surgical patients has been in place since 2015, however, its integration into the wider preoperative pathway has yet to be evaluated. Given the potential benefits of prehabilitation, understanding prehabilitation within the preoperative clinical pathway is crucial for enhancing patient care and surgical outcomes.

Aim: To evaluate the prehabilitation service provision and preoperative clinical pathway for OG patients.

The objectives are to: (1) identify which patients access prehabilitation services, (2) understand the preoperative clinical pathways, (3) gain insights from specialist prehabilitation clinicians, and (4) evaluate the findings against Macmillan prehabilitation guidance.

METHODS

STUDY DESIGN

A mixed-methods retrospective service evaluation including a review of relevant electronic patient records and staff survey.

SETTING AND SAMPLE

The service evaluation took place at a regional cancer centre in South East England, UK. All adult patients undergoing elective OG cancer resection surgery between October 2022 and October 2023 were included. Participants undergoing emergency or non-cancer OG surgery were excluded. Purposive sampling was used for the staff survey with only specialist clinicians with experience of managing patients during the preoperative pathway invited.

ELECTRONIC RECORD DATA COLLECTION

The patient characteristic data collected included: procedure type, age, sex, ethnicity, index of multiple deprivation,

smoking status, and comorbidities. The following intervention dates were collected: surgery referral, diagnostic assessments, OG surgery clinic, dietetics initial assessment, physiotherapy initial assessment, psychological medicine initial assessment, neoadjuvant chemotherapy start/end, CPET, patient education, surgery decision, and procedure date. Additionally, the number of attended and missed physiotherapy appointments were collected. The data were verified through random cross-checking against the patient record.

STAFF SURVEY

An online cross-sectional staff survey covering referrals, service provision, and outcome measure use was developed (Supplementary material). It included 39 possible questions (quantitative and qualitative) with conditional branching. Piloted by a third-party clinician, it was adjusted based on feedback. Hosted via Microsoft Teams, participants had six weeks to complete the survey.

DATA ANALYSIS

Patient and quantitative survey data were analysed with descriptive statistics. All data were assessed for normality of distribution with means and standard deviations of medians and interquartile ranges (IQR) being used. A narrative analysis was undertaken for the qualitative elements of the staff survey. All findings were evaluated against the Macmillan prehabilitation guidance.

ETHICAL CONSIDERATIONS

The project underwent a research classification review within the NHS Trust's research and development department. It was determined that ethical approval was unnecessary, and the project was registered as a service evaluation (Ulysses ID: 8756). All methods were performed in accordance with the relevant guidance and regulations.

RESULTS

Between October 16, 2022, and October 15, 2023, 152 patients were identified for elective OG cancer resection surgery. After applying exclusion criteria, 95 patients were included in the analysis (Figure 1). Patient characteristics are shown in Table 1, with the majority being male (n=71, 75%), a median age of 67 (IQR 59-74), and most undergoing an oesophagectomy (n=61, 64%).

PREOPERATIVE INTERVENTIONS

Of the patients eligible to attend a preoperative education session, 79% (71/90) attended. 7/25 (28%) of patients who did not receive physiotherapy underwent neoadjuvant chemotherapy. 69/95 (73%) received a CPET assessment before undergoing surgery. Only 29/95 (30%) received preoperative dietetics input. No patients were identified as having depression, therefore none received preoperative psychological support.

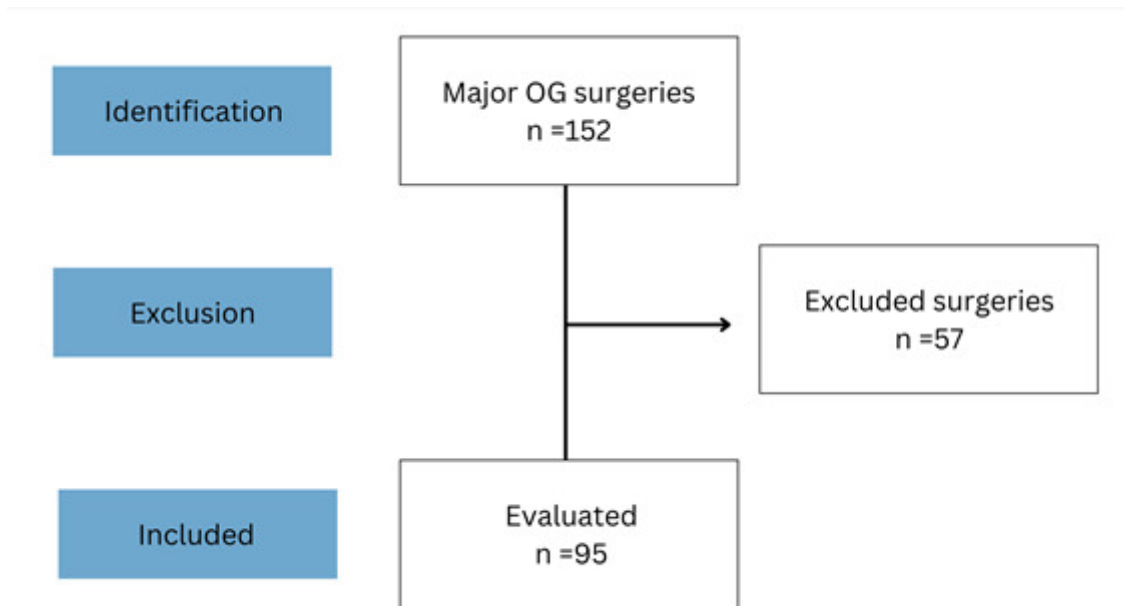


Figure 1. Flow diagram

Of the 95 patients, 70 (73.7%) received physiotherapy as part of prehabilitation. Reasons for not receiving physiotherapy included no referral ($n=12$, 48%), clerical errors ($n=5$, 20%), and missed appointments ($n=8$, 32%) (Figure 2). The reasons for clerical errors or missed appointments were unavailable. The median (IQR) number of physiotherapy appointments was 2 (1-5), with 33/202 (16%) missed. Patients not receiving physiotherapy had more open surgeries (53% vs. 47%), were older (median age 70, IQR 58-77 vs. 66, IQR 61-73), and had more comorbidities like heart disease (28% vs. 8.5%) and obesity (72% vs. 2.8%) compared to those who received physiotherapy (Table 1).

PREOPERATIVE PATHWAY

All aggregated data are presented as median (IQR). Figure 3 outlines the OG preoperative pathway. The referral-to-surgery duration was 153 (132-183) days. After the OG surgery clinic, days to dietetics review was 4 (0-78), physiotherapy referral 22 (4-35) days, neoadjuvant chemotherapy start 49 (30-64) days, and initial physiotherapy assessment 51.5 (32.5-74.5) days. Preoperative patient education occurred 98.5 (75-114.75) days before surgery, with surgery decisions made 21 (12.25-30) days prior, and CPET 16.5 (12.25-30) days before surgery.

STAFF SURVEY

The survey was sent to seven specialist clinicians working during the data collection period, including one physiotherapist, three dietitians, one psychiatrist, and two psychological medicine nurses. Four responses were received (one physiotherapist, two dietitians, and one psychological medicine nurse). It identified that there is no funded prehabilitation service for dietetics or psychological medicine.

REFERRALS

Dietitians review all OG cancer resection surgery patients due to their high malnutrition risk, identified in OG MDT meetings or referred by other clinicians. Dietitians find this system effective in ensuring no patients are missed. Psychological medicine screens all general oncology patients for depression, treating those who meet the criteria, and accepts referrals from other clinicians. Physiotherapists rely solely on referrals and believe the process could improve with clearer referral criteria and clinician awareness.

SERVICE PROVISION

Physiotherapy, dietetics, and psychological medicine are offered in a multimodal format including face to face, via telemedicine, or virtually. Dietetics and psychological medicine use screening tools for assessment, while physiotherapy does not. Dietitians assess weight loss, hand grip strength, symptom and malnutrition severity, while psychological medicine uses the PHQ-9. Dietitians attend OG MDT meetings, but physiotherapy and psychological medicine do not. Due to staffing constraints, dietitians prioritize high-risk patients and feel they do not provide adequate subsequent follow-up treatments. Physiotherapy follows Macmillan guidance, offering personalized exercise programs, including resistance training, aerobic and inspiratory muscle training using a POWERbreathe medic device. Lack of face-to-face contact remains a challenge for physiotherapy.

OUTCOME MEASURE USE

All specialities use outcome measures, but there is no wider service evaluation or patient feedback. Dietitians track weight and intake, while physiotherapists use 30-second sit to stand tests, 60-second step up test, 60-second wall

Table 1. Patient Characteristics

| Patient Characteristic | Total Patients (n=95) | Patients who did receive preoperative physiotherapy (n=70) | Patients who did not receive preoperative physiotherapy (n=25) |
|---|-----------------------|--|--|
| Procedure n (%) | | | |
| Oesophogogastrectomy | 61 (64%) | 53 (76%) | 8 (32%) |
| Gastrectomy | 34 (36%) | 17 (24%) | 17 (68%) |
| Open procedures | 46 (48%) | 33 (47%) | 13 (52%) |
| Minimally invasive procedures | 49 (52%) | 37 (53%) | 12 (48%) |
| Index of multiple deprivation (median (IQR)) | 8 (6-9) | 8 (6-9) | 8 (6-9) |
| Age median (IQR) | 67 (59-74) | 66 (61.25-73) | 70 (58-77) |
| Sex n (%) | | | |
| Male | 71 (75%) | 54 (77%) | 17 (68%) |
| Female | 24 (25%) | 16 (23%) | 8 (32%) |
| Comorbidities n (%) | | | |
| Asthma | 17 (18%) | 14 (20%) | 3 (12%) |
| Heart disease | 13 (14%) | 6 (9%) | 7 (28%) |
| Obesity or BMI of > 30kg/m2 | 20 (21%) | 2 (3%) | 18 (72%) |
| Functional comorbidity Index (median (IQR)) | 1 (0-2) | 1 (0-2) | 1 (1-2) |
| Eligible patients' attendance at a preoperative patient education session n (%) | 71/90 (79%) | 60/70 (86%) | 11/20 (55%) |
| Neoadjuvant chemotherapy n (%) | 41 (43%) | 34 (49%) | 7 (28%) |
| Cardiopulmonary Exercise Test n (%) | 69 (73%) | 58 (83%) | 11 (44%) |
| Preoperative dietetics input n (%) | 29 (31%) | 26 (51%) | 3 (12%) |
| Preoperative psychological input n (%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Attended preoperative physiotherapy sessions (median (IQR)) | - | 2 (1-3) | - |
| Missed preoperative physiotherapy sessions n (%) | - | 33/202 (16%) | - |

push up test, BORG rate of perceived exertion, and resistance level of the POWERbreathe medic device for inspiratory muscle training. Prehabilitation lacks leadership and collaboration with cancer networks.

MACMILLAN GUIDANCE

This evaluation identified potential areas for improvement to align with Macmillan prehabilitation guidance, as shown in [Figure 4](#). Potential areas for improvement include reviewing all OG patients, physiotherapists attending cancer MDT meetings, timely interventions, physiotherapy screening tools, community-based delivery, better outcome monitoring, and developing dietetics and physiological medicine services to become part of prehabilitation.

DISCUSSION

This retrospective, single-centre service evaluation of prehabilitation before OG surgery identified potential areas for improvement. While physiotherapy was funded for prehabilitation, dietetics and psychological medicine were not.

Despite all OG patients being eligible, not all received physiotherapy due to no referral into the service, clerical errors, and missed appointments. Evaluating prehabilitation in the context of the preoperative patient pathway demonstrated the delay in physiotherapy interventions relative to the start of neoadjuvant chemotherapy treatment. It also demonstrated that other important testing such as CPET is used towards the end of the preoperative pathway rather than during the patient optimisation period. Evaluating the service against the Macmillan guidance allowed for the identification of further areas for improvement, specifically exploring the setting in which prehabilitation takes place. Locally, further work is required to meet this guidance, and we recommend engaging stakeholders to create sustainable change.

In this service evaluation, physiotherapy was the main component of prehabilitation; however, a multimodal approach may better improve post-operative outcomes.^{13,14} The LIPPSMAck POP trial¹⁰ demonstrated that a single preoperative physiotherapy session reduced post-operative pulmonary complications, however others suggest that a multi-professional prehabilitation service may be more effective in reducing all post-operative complications.¹³

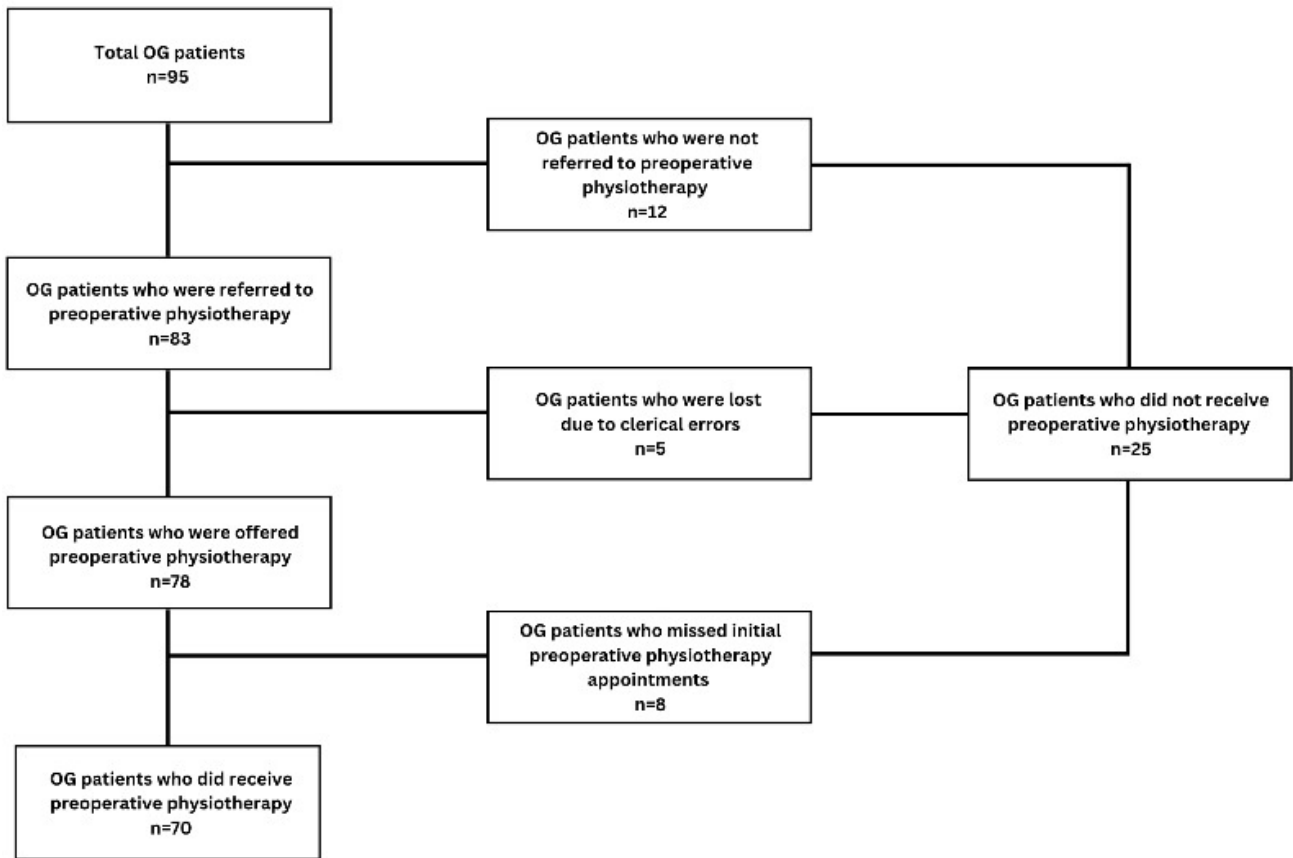


Figure 2. A flow diagram showing reasons patients did not receive preoperative physiotherapy.

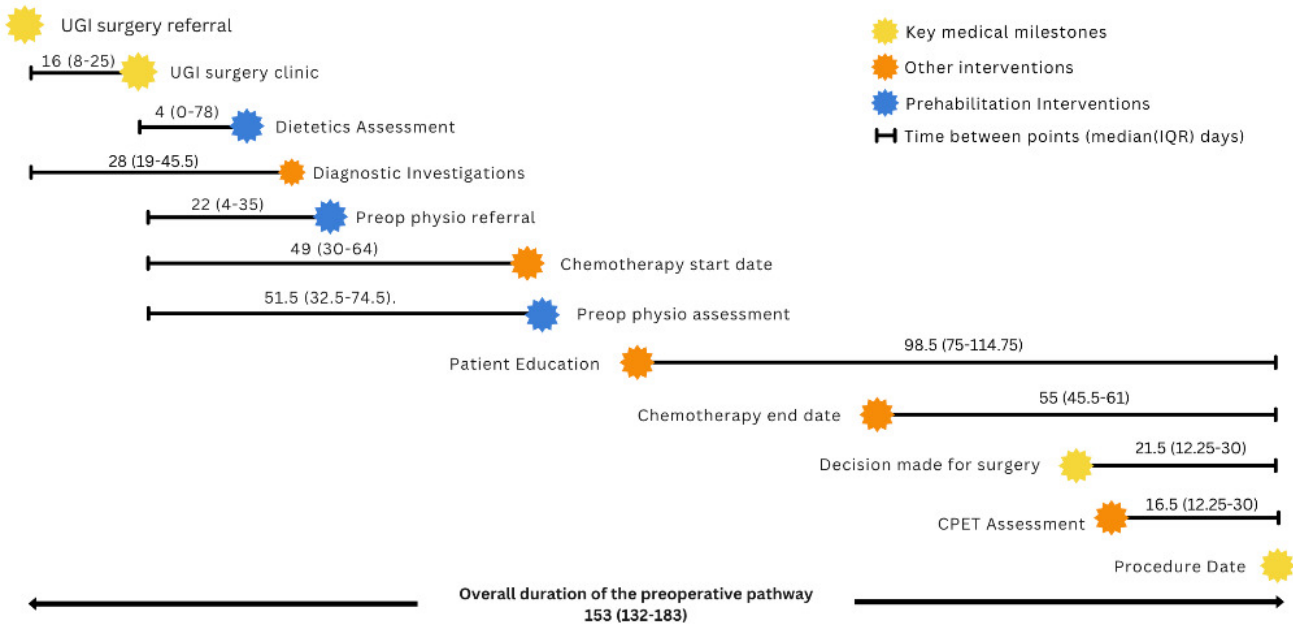


Figure 3. OG preoperative pathway. The timeline shows the time frames between preoperative interventions.

Macmillan guidance recommends multiprofessional input into patient physical, nutritional, and psychological health.⁷ However, in a Macmillan evidence review, it was found that physical fitness optimisation by physiotherapy is commonly included within prehabilitation programmes, but input from professions such as dietetics and psycho-

logical medicine vary.¹⁴ Due to the ongoing heterogeneity of prehabilitation interventions within the evidence base there are no conclusions that can be made regarding the optimal approach.

The assessment of prehabilitation within the preoperative pathway revealed physiotherapy interventions are de-

| Macmillan Prehabilitation Guidance | Physiotherapy | Dietetics | Psychological Medicine | |
|---|---------------|-----------|------------------------|----------------------|
| Fitness, diet, and psychological wellbeing should be optimised. | | | | |
| Attendance at MDT meetings from all specialist prehabilitation clinicians. | | | | = achieved |
| Interventions should start as early as possible and before treatment. | | | | = partially achieved |
| Screening should be done to determine the speciality of treatment required. | | | | = not achieved |
| Individual assessment should be guided by screening tools | | | | = unknown |
| Interventions should have tiered input depending on need | | | | |
| Monitoring and evaluation to monitor effectiveness of the service | | | | |

Figure 4. Traffic light table.

A traffic light table outlines how well the prehabilitation service is performing in relation to the Macmillan prehabilitation guidance. Green shows this is being achieved by the prehabilitation speciality. Yellow shows that it is partially being achieved and red shows that it is not being done.

livered late, with CPET instigated immediately before surgery to inform patient fitness for surgery. Optimising patient fitness before the start of chemotherapy treatment has been shown to improve the tolerance¹⁵ and completion of chemotherapy.¹⁶ In the local preoperative pathway, neoadjuvant chemotherapy started a median (IQR) of 49 (30-64) days after the OG clinic, whereas the initial physiotherapy assessment was a median (IQR) of 51.5 (32.5-74.5) days after. This shows that physiotherapy is commencing after the start of neoadjuvant chemotherapy treatment. Locally, physiotherapy interventions should be deployed sooner to potentially improve the completion of neoadjuvant chemotherapy treatment. Cardiorespiratory fitness is an independent risk factor for post-operative morbidity and mortality,⁵ therefore, this assessment should be adopted earlier in the preoperative pathway as a screening tool to assess patient risk and guide further assessment and treatment.⁶ CPET should be explored earlier in the preoperative pathway to guide individual prehabilitation and exercise prescription. Anaesthetists complete the local CPET evaluation in an isolated room, which prevents technicians from performing the test, making it costly to complete. By evaluating prehabilitation in the context of the preoperative pathway, it has demonstrated areas for change including timing of interventions and identifying suitable alternatives for fitness testing.

The local prehabilitation service operates face to face in the hospital, via telemedicine, or virtually. Home-based and telemedicine prehabilitation programmes have been found to be accessible, feasible, and easy to follow by patients for older patient groups,¹⁷ but others have found the benefits of community and face to face support ben-

eficial for their mood and adherence to prehabilitation.¹⁸ A qualitative review of patients undergoing telemedicine prehabilitation found they appreciated the flexibility and accessibility but felt peer support would have been beneficial.¹⁹ Understanding the barriers to receiving prehabilitation should be investigated to ensure those most at risk receive prehabilitation treatment. Tailoring the setting of prehabilitation to accommodate the diverse needs of the patient population may create an environment conducive to prehabilitation uptake and should be investigated in the future.

This evaluation has limitations. Findings are not generalizable beyond the local NHS Trust, but practical recommendations can be applied for service improvement. The staff survey was not validated, though it was refined through pilot testing. Some data were unavailable due to incomplete documentation. Strengths include the mixed-methods approach, consecutive sampling to reduce bias, and inclusion of multi-professional interventions. Prehabilitation was evaluated within the preoperative pathway, providing a comprehensive service review.

CONCLUSION

This retrospective, mixed-method, service evaluation identified several areas for improvement in the local prehabilitation service. 25/95 (26%) of OG patients were not identified to receive preoperative physiotherapy, despite all patients undergoing an elective cancer resection surgery. The preoperative pathway identified intervention timing and highlighted areas for optimising treatment. Evaluation of the service against the Macmillan guidance provides in-

sight into compliance and shows areas for improvement. Future areas for investigation should include audit against the Macmillan guidance, evaluation of prehabilitation on post-operative outcomes, exploring the role of CPET within the preoperative pathway, and understanding patient preferences regarding prehabilitation setting.

Key Points

- Prehabilitation should include optimisation of a patients functional, nutritional, and psychological health, yet physiotherapy is only funded profession in this local prehabilitation service.
- Understanding the prehabilitation service in context of the wider preoperative pathway will allow for optimisation of patient treatment.
- Evaluating the service against the Macmillan prehabilitation guidance shows clear areas for local improvement.

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SUPPLEMENTARY MATERIALS

Supplementary Material

Download: https://acprjournal.scholasticahq.com/article/124348-prehabilitation-service-provision-and-preoperative-clinical-pathways-for-major-oesophagogastric-cancer-surgery-patients-a-service-evaluation/attachment/248110.pdf?auth_token=BPnt4Dh3_ZDH22pHIKbO
