

STUDENT FEEDBACK FORM

This section details the *extent* to which the assessment criteria are demonstrated by you, which in turn determines your mark. The marks available for each category of skill are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Generic Assessment Criteria	Marks available	Marks awarded
1. Engagement with Literature Skills		
	25	
2. Knowledge and Understanding Skills		
	25	
3. Cognitive and Intellectual Skills		
	30	
4. Practical Application Skills		
	10	
5. Transferable Skills for Life and Professional Practice		
	10	

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		%
	Up to 1 week late (40% Max)		
	Over 1 week late (0%)		

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Research Question

How effective is prehabilitation in colorectal cancer and is the evidence evaluated within the review sufficiently strong to support a recommendation for mandating physical prehabilitation interventions in colorectal cancer treatment protocols?

1 Introduction

Every year bowel cancer results in an average of 16,500 UK deaths making it the second largest cause of cancer deaths per annum (Bowel Cancer UK, 2022a). With 44,706 new bowel cancer diagnoses in the UK in 2019, it was the second most common cancer in males and third in females (World Cancer Research Fund, 2022). Bowel cancer prevalence is strongly associated with age, 43% of all diagnoses between 2016 and 2018 occurred in the 75+ age group (Cancer Research UK, 2022). Worryingly, a 2019 population-based study reported a significant (1.8%) increase in incidence in the under 50s in the UK (Araghi *et al.*, 2019).

In Wales, 2513 colorectal cancer diagnoses were made in 2019, a 8.6% increase over the previous year and the highest annual increase since 2002 (Bowel Cancer UK, 2022b). When detected early, bowel cancer has a far greater 5-year survival rate (Cheng *et al.*, 2021). However, in 2018 Wales ranked 25th out of 29 European countries for five-year bowel cancer survival rates (Bowel Cancer UK, 2018)

From October 2022, Public Health Wales has reduced its bowel cancer screening age from 58 to 55 years. This age will further reduce to 50 from October 2024 (Public Health Wales, 2022). It would be reasonable to predict that an increase in screening across a larger proportion of the population will lead to an increase in detected cases and individuals requiring cancer treatment.

The Covid-19 pandemic caused unprecedented delays in both detection and treatment of all types of cancer (Macmillan Cancer Support, 2020). Detection rates dropped as screening programmes and diagnostic services were paused or scaled back. Endoscopic diagnoses of colorectal cancer reduced by 72% (Rutter *et al.*, 2021) and treatment was only provided for symptomatic cases meaning waiting times for treatment have increased. Research by Maringe *et al* (2020) calculated that delays in detection and treatment would lead to increases in colorectal cancer deaths of between 15.3% and 16.6% in England. As at October 2021, none of the Welsh regional health boards had met their 75% target for commencement of bowel cancer treatment within 62 days of diagnosis (Bowel Cancer UK, 2021). The current

outlook appears bleak for colorectal cancer patients in Wales as both incident rates and treatment times increase.

Benefits of physical activity on cancer risk are universally accepted (World Health Organization, 2022). Physical activity has also been indicated as a factor in improved pre/post-surgery functional capacity (Minnella and Carli, 2018) and overall survival (Meyerhardt *et al.*, 2006; Choy, Lam and Kong, 2022). Whilst surgical resection is the main treatment for colorectal cancer (Brown *et al.*, 2019), it is becoming accepted that “prehabilitation” alongside traditional pre and perioperative neoadjuvant therapies can influence patient outcomes (Moug *et al.*, 2019). Many prehabilitation definitions exist. An appropriate definition in the context of colorectal cancer management would be: “a systematic process of improving the physical, psychosocial, and nutritional status of cancer patients between diagnosis and post treatment recovery to increase the ability to cope with the upcoming physiological stress of the specific cancer-related therapy” (Palma *et al.*, 2021).

Best practice colorectal cancer prehabilitation tends to be multimodal in nature to assess and provide appropriate physiological, nutritional and psychological interventions (Bolshinsky *et al.*, 2018; van Rooijen *et al.*, 2019). The 2018 ERAS® Society guidelines for enhanced recovery from colorectal surgery include nutritional prehabilitation however evidence reviewed for physical prehabilitation interventions was graded as ‘moderate’. The guidelines acknowledged that evidence existed to support structured physical prehabilitation and that for functional recovery, prehabilitation ‘shows promising results’. Despite this, based on the strength of evidence at the time, the Society was unable to recommend physical prehabilitation as a protocol in its 2018 guidelines (Gustafsson *et al.*, 2019).

2 Aims

Since the 2018 ERAS® guidelines review, research into physical prehabilitation has continued. The aim of this review is to evaluate the strength of evidence published since 2018, specifically focussed on physical prehabilitation interventions. To do this, it will be necessary to systematically evaluate:

1. Relevant evidence published since 2018
2. The quality of evidence published using established critical appraisal tools
3. Whether any new evidence strengthens the use of physical prehabilitation in colorectal cancer
4. Whether any new evidence would be sufficient to support an upgrade of the ERAS® recommendation to mandate physical prehabilitation for colorectal cancer treatment in its guidelines

Colorectal resection surgery routinely performed on Inflammatory Bowel Disease (IBD) patients is similar to that for colorectal cancer and in the lead up to surgery, physical condition can be extremely poor. This research may also be relevant for physical prehabilitation guidelines for IBD patients undergoing elective surgery.

3 Method

The proposed systematic review will follow the PRISMA-P checklist, use PICO processes and utilise relevant MeSH terms for literature searches. The described protocol will be registered with PROSPERO.

3.1 Inclusion Criteria

3.1.1 Types of Studies

The review will examine prehabilitation evidence cited in the ERAS® 2012 and 2018 guidelines. It will also review human Randomised Controlled Trials (RCTs) published between 2018 and 2022. Inclusion of items found during the systematic search will be selected or rejected based on the following criteria and summarised on the PRISMA flow diagram in Appendix 1. In the event that insufficient RCTs are found, it may be necessary to widen the search to non-RCTs.

3.1.2 Participants

Studies which include adults (aged 18+) with a diagnosis of colorectal cancer. Studies which include a diagnosis of grade IV colorectal cancer, metastasis or other forms of cancer will be excluded.

3.1.3 Interventions

Studies where physical prehabilitation was provided will be included.

3.1.4 Comparisons

Studies which include 'standard', 'usual' or no treatment. Studies which do not include physical prehabilitation will be excluded.

3.1.5 Outcomes

Primary outcomes: studies where survival/mortality, morbidity, physical function/condition, complications and quality of life have been measured.

Secondary outcomes: studies identified during the search where improvement in symptoms have been recorded and directly attributed to physical prehabilitation

3.2 Search Methods

3.2.1 Systematic electronic database search

A systematic search of Cochrane, PubMed, EMBASE databases and Google Scholar will be completed between 26th November and 9th December 2022.

3.2.2 Hand Searches

A hand search of journals related to colorectal cancer and research cited in prehabilitation related systematic reviews published between 2018 and 2022 and not captured as part of the electronic database search will be completed between 26th November 2022 and 6th January 2023.

3.2.3 Grey literature Searches (if appropriate)

Dependent on the results of searches for RCTs, additional searches of related “grey literature” ie. related materials not formally published. These will include governmental technical reports/policies; related scientific research group working papers; unpublished PhD dissertations; conference notes/slides; charity publications; preprint versions of unpublished articles. Grey literature searches will be completed following the stated scheduled search dates.

3.2.4 Specific Registered Trial Database Search

For completeness, a cross reference to prehabilitation related registered trials will be completed using Clinicaltrials.gov and <https://trialsearch.who.int>.

3.3 Search Parameters

PICO process (Richardson *et al.*, 1995) search parameters are detailed in Appendix 2.

A second search as described above will be completed in February 2023 to identify any new studies published or registered since the scheduled search date.

4 Data Analysis

4.1 Data Extraction

Articles meeting the selection criteria will be summarised on an excel spreadsheet to facilitate a thematic analysis from which key findings and conclusions will be determined. Indicative headings are shown in Appendix 3.

A pilot test of the summary tables will be completed using a small selection of studies to validate the data extraction captures all relevant information.

4.2 Critical Appraisal of the Quality of Evidence

Validation the quality of evidence in studies meeting the review selection criteria will be assessed in two ways:

4.2.1 Quality of Trial Design and Risk of Bias

The quality of RCT design, method, reporting will be assessed using the Cochrane Risk of Bias tool, “RoB 2” (The Cochrane Collaboration, 2022) with the resulting rating (Low, High or Some Concerns) recorded in the excel summary tables.

4.2.2 Quality of Reporting

The Consensus on Exercise Reporting Template (CERT) checklist will be used to evaluate the quality of reporting within included RCTs (Slade *et al.*, 2016) with the checklist score recorded in the excel summary tables.

5 Research Timetable

An indicative timetable for the completion of each section of the proposed review is detailed in the table 1 below:

Table 1: Indicative Timetable for Review Completion

Task No	Review Section	Target Completion Date
1	Literature Search and Review	8 th January 2023
2	Preliminary drafting of Introduction section for submission for feedback	
3	Drafting of Aims section for submission for feedback	5 th February 2023
4	Secondary Literature Search	12 th February 2023
5	Draft Method section for submission for feedback	3 rd March 2023
6	Drafting of Results section for submission for feedback	2 nd April 2023
7	Drafting of Discussion section for submission for feedback	19 th April 2023
8	Drafting of Conclusion section for submission for feedback	19 th April 2023
9	Final Revisions	25 th April 2023
10	Review Submission	28 th April 2023

Word Count: 1409

REFERENCES

- Araghi, M. *et al.* (2019) 'Changes in colorectal cancer incidence in seven high-income countries: a population-based study', *The Lancet Gastroenterology & Hepatology*, 4(7), pp. 511–518. Available at: [https://doi.org/10.1016/S2468-1253\(19\)30147-5](https://doi.org/10.1016/S2468-1253(19)30147-5).
- Bolshinsky, V. *et al.* (2018) 'Multimodal Prehabilitation Programs as a Bundle of Care in Gastrointestinal Cancer Surgery: A Systematic Review', *Diseases of the Colon and Rectum*, 61(1), pp. 124–138. Available at: <https://doi.org/10.1097/DCR.0000000000000987>.
- Bowel Cancer UK (2018) *Spotlight on Bowel Cancer in Wales*.
- Bowel Cancer UK (2021) *All Health Boards in Wales fail to reach 75% target for cancer waiting times*.
- Bowel Cancer UK (2022a) *Bowel Cancer*. Available at: <https://www.bowelcanceruk.org.uk/about-bowel-cancer/bowel-cancer/> (Accessed: 13 October 2022).
- Bowel Cancer UK (2022b) *Highest number of colorectal cancer diagnoses in Wales reported in latest figures*. Available at: <https://www.bowelcanceruk.org.uk/news-and-blogs/news/highest-number-of-colorectal-cancer-diagnoses-in-wales-reported-in-latest-figures/> (Accessed: 16 October 2022).
- Brown, K.G.M. *et al.* (2019) 'Management of colorectal cancer', *BMJ*, p. l4561. Available at: <https://doi.org/10.1136/bmj.l4561>.
- Cancer Research UK (2022) *Bowel Cancer Incidence Statistics*. Available at: <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bowel-cancer/incidence#heading-One> (Accessed: 13 October 2022).
- Cheng, E. *et al.* (2021) 'Analysis of Survival among Adults with Early-Onset Colorectal Cancer in the National Cancer Database', *Annual Review of Plant Biology*, 4(6). Available at: <https://doi.org/10.1001/jamanetworkopen.2021.12539>.
- Choy, K.T., Lam, K. and Kong, J.C. (2022) 'Exercise and colorectal cancer survival: an updated systematic review and meta-analysis', *International Journal of Colorectal Disease*. Springer Science and Business Media Deutschland GmbH, pp. 1751–1758. Available at: <https://doi.org/10.1007/s00384-022-04224-5>.
- Gustafsson, U.O. *et al.* (2019) 'Guidelines for Perioperative Care in Elective Colorectal Surgery: Enhanced Recovery After Surgery (ERAS®) Society Recommendations: 2018', *World Journal of Surgery*. Springer New York LLC, pp. 659–695. Available at: <https://doi.org/10.1007/s00268-018-4844-y>.
- Macmillan Cancer Support (2020) *The Forgotten 'C'?*

Meyerhardt, J.A. *et al.* (2006) 'Physical activity and survival after colorectal cancer diagnosis', *Journal of Clinical Oncology*, 24(22), pp. 3527–3534. Available at: <https://doi.org/10.1200/JCO.2006.06.0855>.

Minnella, E.M. and Carli, F. (2018) 'Prehabilitation and functional recovery for colorectal cancer patients', *European Journal of Surgical Oncology*. W.B. Saunders Ltd, pp. 919–926. Available at: <https://doi.org/10.1016/j.ejso.2018.04.016>.

Moug, S.J. *et al.* (2019) 'Prehabilitation is feasible in patients with rectal cancer undergoing neoadjuvant chemoradiotherapy and may minimize physical deterioration: results from the REx trial', *Colorectal Disease*, 21(5), pp. 548–562. Available at: <https://doi.org/10.1111/codi.14560>.

Public Health Wales (2022) *Bowel Screening Wales*. Available at: <https://phw.nhs.wales/services-and-teams/screening/bowel-screening/> (Accessed: 16 October 2022).

Richardson, W.S. *et al.* (1995) 'The well-built clinical question: a key to evidence-based decisions.', *ACP journal club*, 123(3), pp. A12-3. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/7582737>.

van Rooijen, S.J. *et al.* (2019) 'Making Patients Fit for Surgery: Introducing a Four Pillar Multimodal Prehabilitation Program in Colorectal Cancer', *American Journal of Physical Medicine and Rehabilitation*, 98(10), pp. 888–896. Available at: <https://doi.org/10.1097/PHM.0000000000001221>.

Rutter, M.D. *et al.* (2021) 'Impact of the COVID-19 pandemic on UK endoscopic activity and cancer detection: A National Endoscopy Database Analysis', *Gut*, 70(3), pp. 537–543. Available at: <https://doi.org/10.1136/gutjnl-2020-322179>.

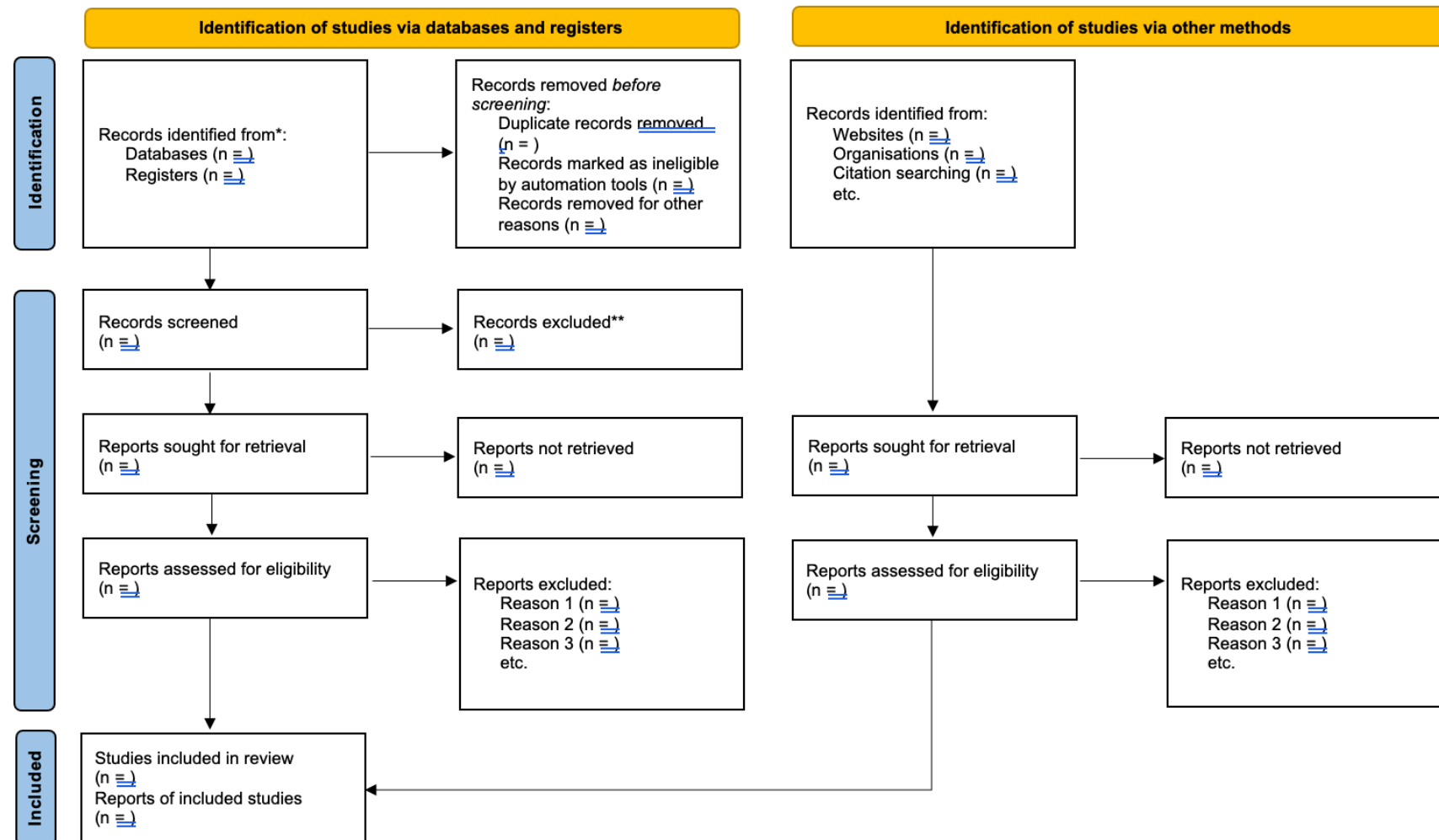
Slade, S.C. *et al.* (2016) *Consensus on Exercise Reporting Template (CERT): Modified Delphi Study*. Available at: <http://www.equator->.

The Cochrane Collaboration (2022) *RoB 2: A revised Cochrane risk-of-bias tool for randomized trials*. Available at: <https://methods.cochrane.org/bias/resources/rob-2-revised-cochrane-risk-bias-tool-randomized-trials> (Accessed: 28 October 2022).

World Cancer Research Fund (2022) *UK Cancer Statistics*. Available at: <https://www.wcrf-uk.org/preventing-cancer/uk-cancer-statistics/> (Accessed: 11 October 2022).

APPENDIX 1 – PRISMA FLOW DIAGRAM

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: <http://www.prisma-statement.org/>

APPENDIX 2 – INDICATIVE PICO PROCESS SEARCH PARAMETERS

PICO ELEMENT	KEY WORDS	SEARCH TERMS	SEARCH STRATEGIES
Population	Patients undergoing colorectal surgery Colorectal Cancer Bowel Cancer Colon Cancer Rectal Cancer	Colorectal Cancer Colon Cancer Rectal Cancer Bowel cancer surgery Colorectal cancer surgery Right hemi-colectomy Left hemi-colectomy Sub-total colectomy Pan-procto colectomy High anterior resection Low anterior resection Abdomino-perineal resection Transanal endoscopic microsurgery Transanal minimally invasive surgery Anterior resection Total mesorectal excision Colo-anal anastomosis J pouch (colo-anal J pouch surgery)	Colorectal Cancer OR Colon Cancer OR Rectal Cancer OR Bowel cancer surgery OR Colorectal cancer surgery OR Right hemi-colectomy OR Left hemi-colectomy OR Sub-total colectomy OR Pan-procto colectomy OR High anterior resection OR Low anterior resection OR Anterior resection Total mesorectal excision OR Colo-anal anastomosis OR J pouch (colo-anal J pouch surgery)
Intervention	Prehabilitation	Prehabilitation	Prehabilitation AND CPET OR Physical Activity OR Exercise
Comparison	No treatment Standard Treatment Usual Care		
Outcome	Survival Morbidity Physical Function Physical Condition Complications Mortality	Survival Morbidity Physical Function Physical Condition Complications Mortality 6MWT VO2 Max	Survival OR Morbidity OR Physical Function OR Physical Condition OR Complications OR Mortality OR 6MWT OR VO2 Max

APPENDIX 3 – INDICATIVE DATA SUMMARY TABLE HEADINGS

Study Type	Published Date	Author(s)	Title	Key Words	Population	Intervention Development	Intervention	Comparator	Outcome(s) Measured	Assessment/ Exercise Type	HRQOL Measure	RoB 2 Score	CERT Score
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