



# Ernæringstiltak før og etter kreftkirurgi

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UNIVERSITY OF BERGEN





# prehabilitering

Sette pasienten i stand til å motta kreftbehandling

Genialt



# Prehabilitering

- Er dette keiserens nye klær – kanskje.....
- Termen prehabilitering ble introdusert på 1940 tallet for å gjøre unge soldater klar til å kjempe ved fronten
  - Mange av dem hadde dårlig allmenntilstand og de var fysisk i dårlig form
- De sist 10 årene har begrepet blitt lansert på nytt i kjølvannet av ERAS (Enhanced Recovery After Surgery).
- Rettet mot kreftpasienter og da spesielt pasienter med kreft i gastrointestinaltraktus – AHUS har et velfungerende program og andre sykehus kommer etter
- Individbasert – behandler ser pasienten i hele forløpet av kreftsykdommen

# Onkologisk forum 2024

## 13:30 - 14:45 - TEMA: PREHABILITERING - EXERCISE ONCOLOGY

**13:30 - 13:55** - **Gerrit Slooter**, Máxima MC Eindhoven-Veldhoven, The Netherlands • **Prehabilitation: the revolution in peri-operative care**

**13:55 - 14:05** - **Geir Bøhler**, Akershus universitetssykehus • **Prehabilitering ved kolorektal cancer**

**14:05 - 14:15** - **Ingvild Vistad**, Sørlandet Sykehus, Krsitiansand • **Exercise during treatment LETSGO**

**14:15 - 14:25** - **Tormod Skogstad Nilsen**, Norges Idrettshøyskole • **Hvilken effekt har trening for langtidsoverlevende etter brystkreft?**

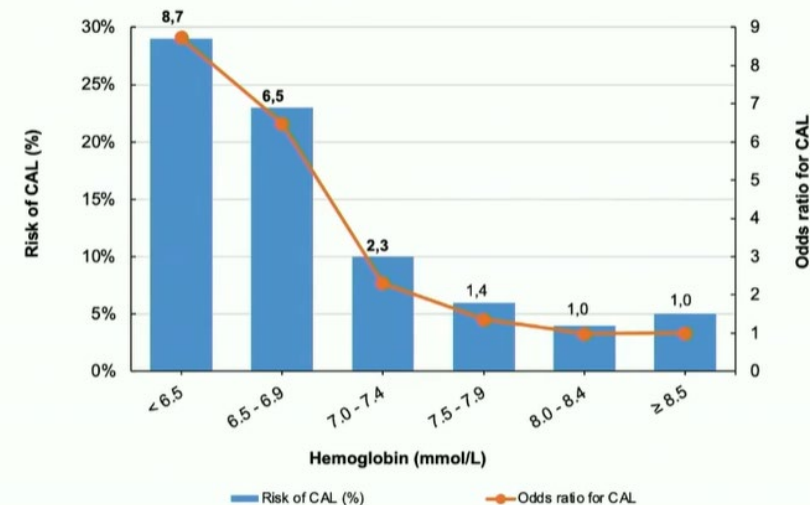
**14:25 - 14:30** - **Sigbjørn Smeland**, Oslo universitetssykehus • **Helle Aanesen**, Aktiv mot Kreft • **Presentation of the new AKTIV Innovation Center in Oslo**

**14:30** - Avslutning

# Pass på at Hb ikke er for lav

Lav Hb øker sannsynligheten for anastomoselekkasje

## Hemoglobin and anastomotic leakage



Lysbilde er lånt fra presentasjonen til Gerrit Slooter holdt på onkologisk forum høsten 2024

Gerrit D. Slooter, Department of Surgical Oncology, Máxima MC, 5500MB, Veldhoven, the Netherlands, E-mail: [g.slooter@mmc.nl](mailto:g.slooter@mmc.nl), [prehab.resurge@mmc.nl](mailto:prehab.resurge@mmc.nl)  
Innov Surg Sci 2019; 4(4): 132–138

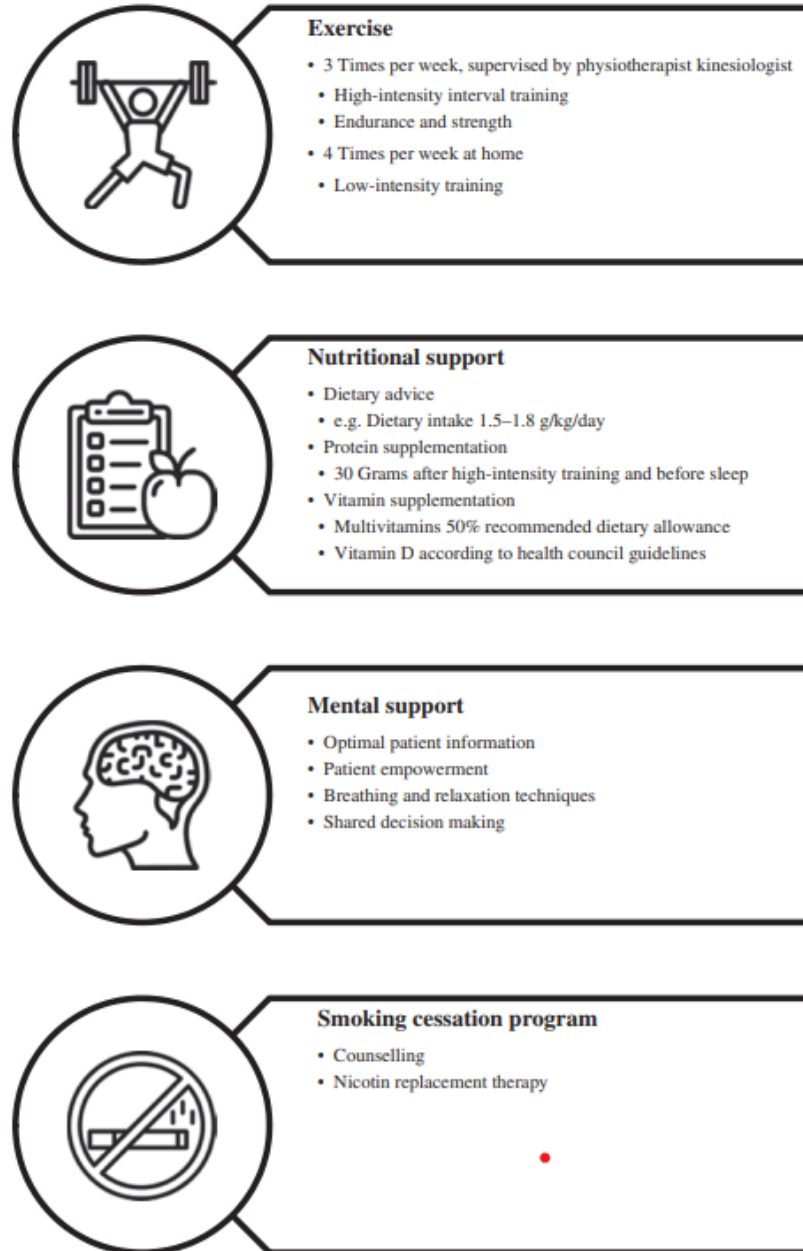


Figure 2: International prehabilitation protocol.



**Det handler om å se hele  
mennesket ikke bare sykdommen  
og kreftbehandlingen**

Spredning?



**Deprimert**

Kvalm

Obstipert

**Angst**

Operasjon – cytostatika - sykmelding

**Redd for å dø**

Utredning

**Tomt**

**Redusert matlyst**

Uforberedt på det som kommer til å skje

**Utmattet**

**Vekttap**



Nesten alt handler om penger

Har Helsenorge råd til å gi pasientene et slikt tilbud?

Er tiltaket kost effektivt?

Blir pasientene bedre rustet  
til å tåle kreftbehandlingen?





# Kjernedata om kreft

- 2023 – 38094 nye krefttilfeller i Norge
- 2023 – 336855 personer har hatt eller lever med kreft i Norge – ca 6% av Norges befolkning
- 2022 11451 pasienter døde av kreft
- Hyppigst – cancer mamma, cancer pulm, ca prostata og cancer coli
- 50% av de som får en kreftdiagnose er eldre enn 71 år

# Kan vi lykkes med et prehabiliteringsprogram



- Ca 60% av Norges befolkning trener regelmessig
- Ca 7% av Norges befolkning røyker




STUDY PROTOCOL

Open Access



# Multimodal prehabilitation in colorectal cancer patients to improve functional capacity and reduce postoperative complications: the first international randomized controlled trial for multimodal prehabilitation

Stefanus van Rooijen<sup>1</sup> , Francesco Carli<sup>2</sup>, Susanne Dalton<sup>3</sup>, Gwendolyn Thomas<sup>1</sup>, Rasmus Bojesen<sup>4</sup>, Morgan Le Guen<sup>5</sup>, Nicolas Barizien<sup>6</sup>, Rashami Awasthi<sup>2</sup>, Enrico Minnella<sup>2</sup>, Sandra Beijer<sup>7</sup>, Graciela Martínez-Palli<sup>8</sup>, Rianne van Lieshout<sup>9</sup>, Ismayil Gögenur<sup>4</sup>, Carlo Feo<sup>10</sup>, Christoffer Johansen<sup>3,11</sup>, Celena Scheede-Bergdahl<sup>4,12</sup>, Rudi Roumen<sup>1</sup>, Goof Schep<sup>13</sup> and Gerrit Slooter<sup>1,14\*</sup>

## CLINICAL PRACTICE

## Towards a common definition of surgical prehabilitation: a scoping review of randomised trials

Chloé Fleurent-Grégoire<sup>1,7,†</sup>, Nicola Burgess<sup>3,†</sup>, Daniel I. McIsaac<sup>4,5,6</sup>, Stéphanie Chevalier<sup>1,7,8</sup>, Julio F. Fiore Jr<sup>9</sup>, Francesco Carli<sup>10</sup>, Denny Levett<sup>2</sup>, John Moore<sup>11</sup>, Michael P. Grocott<sup>2</sup>, Robert Copeland<sup>12</sup>, Lara Edbrooke<sup>13,14</sup>, Dominique Engel<sup>15</sup>, Giuseppe Dario Testa<sup>16</sup>, Linda Denehy<sup>13,14,\*</sup> and Chelsia Gillis<sup>1,9,10,\*</sup>

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## Editor's key points

- Despite the widespread acceptance of surgical prehabilitation, there is no universally accepted definition.
- This scoping review aimed to identify how surgical prehabilitation is defined across randomised controlled trials and use this information to propose a common definition.
- A synthesis of 76 randomised controlled trials identified a common definition as a first step towards standardisation to guide future research of surgical prehabilitation.



## ESPEN Guideline

ESPEN guidelines on nutrition in cancer patients<sup>☆</sup>

Jann Arends<sup>a</sup>, Patrick Bachmann<sup>b</sup>, Vickie Baracos<sup>c</sup>, Nicole Barthelemy<sup>d</sup>, Hartmut Bertz<sup>a</sup>, Federico Bozzetti<sup>e</sup>, Ken Fearon<sup>f,†</sup>, Elisabeth Hütterer<sup>g</sup>, Elizabeth Isenring<sup>h</sup>, Stein Kaasa<sup>i</sup>, Zeljko Krznaric<sup>j</sup>, Barry Laird<sup>k</sup>, Maria Larsson<sup>l</sup>, Alessandro Laviano<sup>m</sup>, Stefan Mühlebach<sup>n</sup>, Maurizio Muscaritoli<sup>m</sup>, Line Oldervoll<sup>i,o</sup>, Paula Ravasco<sup>p</sup>, Tora Solheim<sup>q,r</sup>, Florian Strasser<sup>s</sup>, Marian de van der Schueren<sup>t,u</sup>, Jean-Charles Preiser<sup>v,\*</sup>

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<sup>e</sup> University of Milan, Milan, Italy

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<sup>g</sup> Medical University of Vienna, Austria

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<sup>l</sup> Karlstad University, Karlstad, Sweden

<sup>m</sup> University of Rome La Sapienza, Roma, Italy

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<sup>t</sup> VU University Medical Center (VUmc), Amsterdam, Netherlands

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## SUMMARY

Cancers are among the leading causes of morbidity and mortality worldwide, and the number of new cases is expected to rise significantly over the next decades. At the same time, all types of cancer treatment, such as surgery, radiation therapy, and pharmacological therapies are improving in sophistication, precision and in the power to target specific characteristics of individual cancers. Thus, while many cancers may still not be cured they may be converted to chronic diseases. All of these treatments, however, are impeded or precluded by the frequent development of malnutrition and metabolic derangements in cancer patients, induced by the tumor or by its treatment.

These evidence-based guidelines were developed to translate current best evidence and expert opinion into recommendations for multi-disciplinary teams responsible for identification, prevention, and treatment of reversible elements of malnutrition in adult cancer patients.

The guidelines were commissioned and financially supported by ESPEN and by the European Partnership for Action Against Cancer (EPAAC), an EU level initiative. Members of the guideline group were selected by ESPEN to include a range of professions and fields of expertise.



## Review

Charlotte J.L. Molenaar, Nicole E. Papen-Botterhuis, Florian Herrle and Gerrit D. Slooter\*

# Prehabilitation, making patients fit for surgery – a new frontier in perioperative care

<https://doi.org/10.1515/iss-2019-0017>

Received December 9, 2019; accepted December 9, 2019

**Abstract:** Optimizing a patients' condition before surgery to improve the postoperative outcome can be achieved by using prehabilitation; preoperative interventions focusing on modifiable risk factors to improve the physical, nutritional, and mental status of the patient. A multimodal, multidisciplinary approach induces a synergistic effect between the various interventions and affects the outcome postoperatively. While awaiting higher-quality evidence, the worldwide implementation of prehabilitation programs has started, resulting in a true revolution in perioperative care.

**Keywords:** functional capacity; multimodal; perioperative care; prehabilitation; surgical complications.

of treatment as well as long-term behavioral changes can be altered [3]. It leads to an improved functional capacity [4–7], improved nutritional [8, 9] and mental status [9, 10], reduction of complications [11–13], faster recovery [7, 14, 15], a reduced length of stay in the hospital [16], an improved quality of life [10, 17], and potentially a reduction in costs. While the evidence for improvement of clinical outcomes is growing, prehabilitation is at the threshold of worldwide implementation and already included in guidelines [18–20].

A growing interest in the postoperative outcome (e.g. quality of life) is the result of rising life expectancy and increasing survival rates of cancer [21, 22]. The fact that metabolic and behavioral risk factors are rising and will continue to do so [23] makes it a necessity for healthcare professionals to raise awareness and emphasize the role

## Effects of Nutritional Prehabilitation, With and Without Exercise, on Outcomes of Patients Who Undergo Colorectal Surgery: A Systematic Review and Meta-analysis


Chelsia Gillis,<sup>1</sup> Katherine Buhler,<sup>1</sup> Lauren Bresee,<sup>1,2,3</sup> Francesco Carli,<sup>4</sup> Leah Gramlich,<sup>5</sup> Nicole Culos-Reed,<sup>6,7</sup> Tolulope T. Sajobi,<sup>1,3</sup> and Tanis R. Fenton<sup>8,9</sup>
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**BACKGROUND & AIMS:** Although there have been meta-analyses of the effects of exercise-only prehabilitation on patients undergoing colorectal surgery, little is known about the effects of nutrition-only (oral nutritional supplements with and without counseling) and multimodal (oral nutritional supplements with and without counseling and with exercise) prehabilitation on clinical outcomes and patient function after surgery. We performed a systemic review and meta-analysis to determine the individual and combined effects of nutrition-only and multimodal prehabilitation compared with no prehabilitation (control) on outcomes of patients undergoing colorectal resection. **METHODS:** We searched Medline, EMBASE, CINAHL, CENTRAL, and ProQuest for cohort and randomized controlled studies of adults awaiting colorectal surgery who received at least 7 days of nutrition prehabilitation with or without exercise. We performed a random-effects meta-analysis to estimate the pooled risk ratio for categorical data and the weighted mean difference for continuous variables. The primary outcome was length of hospital stay; the secondary outcome was recovery of functional capacity based on results of a 6-minute walk test. **RESULTS:** We identified 9 studies (5 randomized controlled studies and 4 cohort studies) composed of 914 patients undergoing colorectal surgery (438 received prehabilitation and 476 served as controls). Receipt of any prehabilitation significantly decreased days spent in the hospital compared with controls (weighted mean difference of length of hospital stay = −2.2 days; 95% confidence interval = −3.5 to −0.9). Only 3 studies reported on functional outcomes but could not be pooled owing to methodologic heterogeneity. In the individual studies, multimodal prehabilitation significantly improved results of the 6-minute walk test at 4 and 8 weeks after surgery compared with standard Enhanced Recovery Pathway care and at 8 weeks compared with standard Enhanced Recovery Pathway care with added rehabilitation. The 4 observational studies had a high risk of bias. **CONCLUSIONS:** In a systematic review and meta-analysis, we found that nutritional prehabilitation alone or combined with an exercise program significantly decreased length of hospital stay by 2 days in patients undergoing colorectal surgery. There is some evidence that multimodal prehabilitation accelerated the return to presurgical functional capacity.

Prehabilitation: The Emperor’s New Clothes or a New Arena for Physical Therapists?

Mari Lundberg, Kristin R. Archer, Caroline Larsson, Elisabeth Rydwik

The phase before a surgical procedure is said to be the ideal time to prepare patients for an optimal surgical outcome by carrying out prehabilitation.<sup>1</sup> Prehabilitation, a term introduced in the 1940s,<sup>2</sup> has recently regained interest among clinicians and researchers alike. The concept has been applied in various contexts, such as oncology,<sup>3</sup> cardiology,<sup>4</sup> and orthopedics.<sup>5</sup> Preoperative preparation is familiar to physical therapists worldwide but is not systematically applied. So is prehabilitation, in its scientific guise, something we can learn from or is it just a case of the “Emperor’s new clothes”? This article aims to clarify what prehabilitation is and what physical therapists need to elaborate on to bring this important area forward.

treatment components and exercise progression.<sup>11–14</sup> Some systematic reviews have examined the general effect of exercise on all types of surgical procedure.<sup>1,9,10</sup> Valkenet et al<sup>10</sup> chose to study the effects of “preoperative exercise therapy,” Santa Mina et al<sup>1</sup> investigated the effect of “preoperative total-body exercise,” whereas Cabilan et al<sup>9</sup> chose to study the effect of “any preoperative exercise interventions identified in the study as part of a prehabilitation or preoperative exercise program.”<sup>9</sup> A general conclusion from these studies was that the effect varies depending on the context and content of the intervention.

Other systematic reviews and meta-analyses have analyzed the effect of prehabilitation in relation to a specific

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JMIR RESEARCH PROTOCOLS

Raso et al

Protocol

Prehabilitation Before Gastrointestinal Cancer Surgery: Protocol for an Implementation Study

Kristy-Lee Raso<sup>1,2</sup>, BNDiet; Michael Suen<sup>2,3\*</sup>, BSc, MSc; Jane Turner<sup>4\*</sup>, BSc, MPhil; Sonia Khatri<sup>3,4\*</sup>, BNur; Yanlan Lin<sup>3\*</sup>, BNur; Carolyn Wildbore<sup>4,5\*</sup>, BNur; Guillermo Becerril-Martinez<sup>2,5\*</sup>, BSc, MSc; Philip Le Page<sup>5\*</sup>, BSc, MSc; Sim Yee Tan<sup>1,2,4\*</sup>, BAppSci, MNDiet, PhD; Sam Egger<sup>6\*</sup>, BSc, MBiostat; Janette Vardy<sup>2,4\*</sup>, BMed, PhD

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<sup>6</sup>The Daffodil Centre, The University of Sydney, A Joint Venture with Cancer Council New South Wales, Sydney, Australia



Cancer Prehabilitation in Practice: the Current Evidence

Danielle Coderre<sup>1</sup> · Priya Brahmabhatt<sup>2,3</sup> · Tracey Louise Hunter<sup>4</sup> · Jennifer Baima<sup>5</sup>

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Abstract

**Purpose of Review** This article serves to describe recent controversies in cancer prehabilitation including efficacy, dose, cost effectiveness, stakeholder input, and international implementation.  
**Recent Findings** Appropriate frequency, type, and timing have yet to be determined, but high intensity exercise is recommended. Costs are favorable when modeled and information on costs of real-world application are forthcoming. Patients are interested in and willing to attend cancer prehabilitation. Cancer prehabilitation research is spreading throughout the world.  
**Summary** Cancer prehabilitation includes assessment of a newly diagnosed cancer patient’s baseline fitness and targeted interventions to improve their health before surgery, chemotherapy, or radiation. Cancer prehabilitation improves fitness as measured preoperatively and improves outcomes postoperatively.

**Keywords** Preoperative rehabilitation · Neoplasms · Exercise · Surgical procedures · Cardiorespiratory fitness · Prehabilitation

Engel et al. *Perioperative Medicine* (2023) 12:48  
https://doi.org/10.1186/s13741-023-00338-8

Perioperative Medicine

REVIEW

Open Access



Reporting quality of randomized controlled trials in prehabilitation: a scoping review

Dominique Engel<sup>1,2</sup>, Giuseppe Dario Testa<sup>2,3</sup>, Daniel I. McIsaac<sup>4</sup>, Francesco Carli<sup>2</sup>, Daniel Santa Mina<sup>5</sup>, Gabriele Baldini<sup>6</sup>, Celena Scheede-Bergdahl<sup>7</sup>, Stéphanie Chevalier<sup>8,9</sup>, Linda Edgar<sup>10</sup>, Christian M. Beilstein<sup>1</sup>, Markus Huber<sup>1</sup>, Julio F. Fiore Jr.<sup>11†</sup> and Chelsia Gillis<sup>2,8,11†</sup>

Abstract




**Background** Inadequate study reporting precludes interpretation of findings, pooling of results in meta-analyses, and delays knowledge translation. While prehabilitation interventions aim to enhance candidacy for surgery, to our knowledge, a review of the quality of reporting in prehabilitation has yet to be conducted. Our objective was to determine the extent to which randomized controlled trials (RCTs) of prehabilitation are reported according to methodological and intervention reporting checklists.  
**Methods** Eligibility criteria: RCTs of unimodal or multimodal prehabilitation interventions. Sources of evidence: search was conducted in March 2022 using MEDLINE, Embase, PsychINFO, Web of Science, CINAHL, and Cochrane. Charting methods: identified studies were compared to CONSORT, CERT & Modified CERT, TIDieR, PRESENT, and CONSORT-SPI. An agreement ratio (AR) was defined to evaluate if applicable guideline items were correctly reported. Data were analyzed as frequency (n, %) and mean with standard deviation (SD).  
**Results** We identified 935 unique articles and included 70 trials published from 1994 to 2022. Most prehabilitation programs comprised exercise-only interventions (n = 40, 57%) and were applied before oncologic surgery (n = 32, 46%). The overall mean AR was 57% (SD: 20.9%). The specific mean ARs were as follows: CONSORT: 71% (SD: 16.3%); TIDieR: 62% (SD: 17.7%); CERT: 54% (SD: 16.6%); Modified-CERT: 40% (SD: 17.8%); PRESENT: 78% (SD: 8.9); and CONSORT-SPI: 47% (SD: 22.1).  
**Conclusion** Altogether, existing prehabilitation trials report approximately half of the checklist items recommended by methodological and intervention reporting guidelines. Reporting practices may improve with the development of a reporting checklist specific to prehabilitation interventions.  
**Keywords** Prehab, Pre-rehab, Perioperative medicine, ERAS (enhanced recovery after surgery)





Review

# Prehabilitation in Adults Undergoing Cancer Surgery: A Comprehensive Review on Rationale, Methodology, and Measures of Effectiveness

Carlos E. Guerra-Londono <sup>1</sup>, Juan P. Cata <sup>2</sup>, Katherine Nowak <sup>1</sup> and Vijaya Gottumukkala <sup>2,\*</sup>

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**Abstract:** Cancer surgery places a significant burden on a patients' functional status and quality of life. In addition, cancer surgery is fraught with postoperative complications, themselves influenced by a patient's functional status. Prehabilitation is a unimodal or multimodal strategy that aims to increase a patient's functional capacity to reduce postoperative complications and improve postoperative recovery and quality of life. In most cases, it involves exercise, nutrition, and anxiety-reducing interventions. The impact of prehabilitation has been explored in several types of cancer surgery, most commonly colorectal and thoracic. Overall, the existing evidence suggests prehabilitation improves physiological outcomes (e.g., lean body mass, maximal oxygen consumption) as well as clinical outcomes (e.g., postoperative complications, quality of life). Notably, the benefit of prehabilitation is additional to that of enhanced recovery after surgery (ERAS) programs. While safe, prehabilitation programs require multidisciplinary coordination preoperatively. Despite the existence of numerous systematic reviews and meta-analyses, the certainty of evidence demonstrating the efficacy and safety of prehabilitation is low to moderate, principally due to significant methodological heterogeneity and small sample sizes. There is a need for more large-scale multicenter randomized controlled trials to draw strong clinical recommendations.



## Pasienten overlates til seg selv og tankene sine

**Diagnose**

**Behandling**

[Best mulig rustet til kreftbehandling on Vimeo](#)



# I et prehabiliteringsforløp

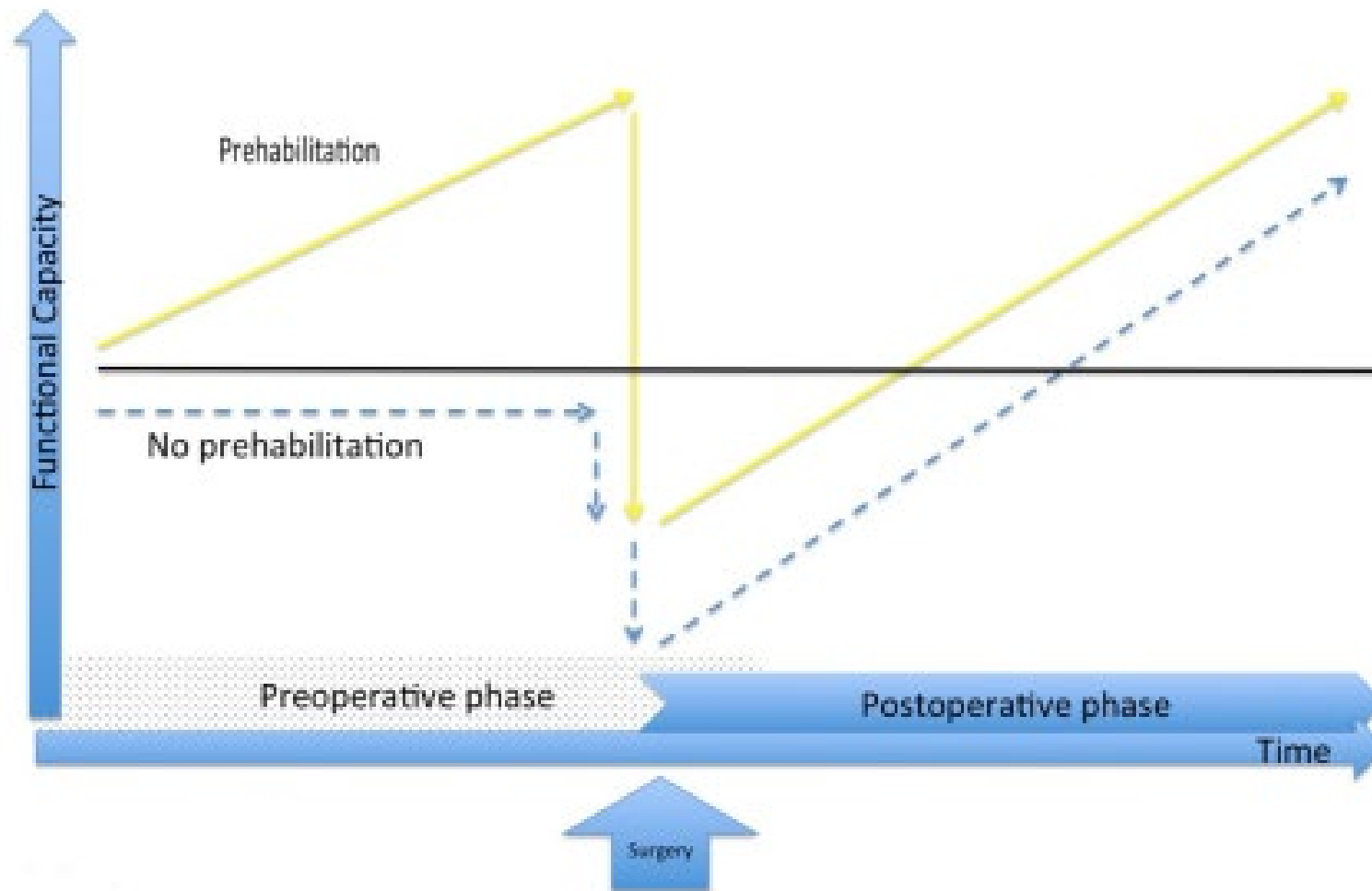


[Best mulig rustet til kreftbehandling on Vimeo](#)



# Mål

- Mental forberedelse
- Bevare funksjon
  - Fysisk styrke
  - **Muskelmasse**
  - Muskelstyrke
  - Vekt
- Humør



Topp R, Ditmyer M, King K, et al. The effect of bed rest and potential of prehabilitation on patients in the intensive care unit. AACN Clin Issues. 2002;13:263–276.



# Hva ønsker en å oppnå?

- Holde en stabil vekt (energi og protein)
- Bruk de gode dagene til å få i seg nok energi og nok protein
- Fokus på proteininntak i løpet av dagen
- Spis variert (frukt og grønt, bær, fisk)
- Unngå strenge dietter
- Unngå kosttilskudd

Informasjonsbrosjyre. Prehabilitering: Bedre helse med tiltak før operasjon. Oslo Universitetssykehus



# Hvorfor mye protein?

- Vedlikeholde muskelmassen og dens funksjon
- Best mulig grunnlag for sårtilheling etter operasjonen
- Anbefalt proteindose **1,5 g/kg kroppsvekt/24 t**
- Øke inntaket med 20 -25 g/måltid
- Væskeinntak minimum 1,5 l/24 t

Informasjonsbrosjyre. Prehabilitering: Bedre helse med tiltak før operasjon. Oslo Universitetssykehus



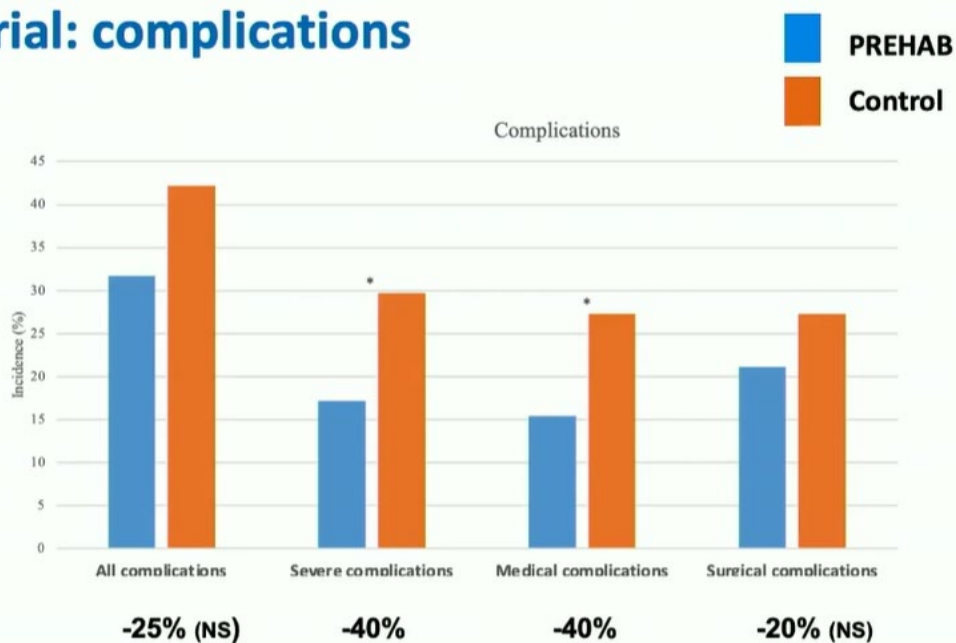
# Næringsdrikker

- Eks
- Fresurbin 2 kcal fiber – 200 ml gir 400 kcal og 20 g protein
- Resource 2.0 + fiber – 200 ml gir 400 kcal og 18 g protein

Informasjonsbrosjyre. Prehabilitering: Bedre helse med tiltak før operasjon. Oslo Universitetssykehus



## PREHAB trial: complications



máxima  
medisch centrum

Molenaar C. et al. JAMA Surg. (158) 2023:572-5

Rooijen et al. BMC Cancer (2019) 19:98  
<https://doi.org/10.1186/s12885-018-5232-6>

BMC Ca

### STUDY PROTOCOL

Open A

## Multimodal prehabilitation in colorectal cancer patients to improve functional capacity and reduce postoperative complications: the first international randomized controlled trial for multimodal prehabilitation

Stefanus van Rooijen<sup>1</sup>, Francesco Carli<sup>2</sup>, Susanne Dalton<sup>3</sup>, Gwendolyn Thomas<sup>1</sup>, Rasmus Bojesen<sup>4</sup>, Morgan Le Guen<sup>5</sup>, Nicolas Barizien<sup>6</sup>, Rashami Awasthi<sup>2</sup>, Enrico Minnella<sup>2</sup>, Sandra Beijer<sup>7</sup>, Graciela Martínez-P Rianne van Lieshout<sup>9</sup>, Ismayil Gögenur<sup>4</sup>, Carlo Feo<sup>10</sup>, Christoffer Johansen<sup>3,11</sup>, Celena Scheede-Bergdahl<sup>4,12</sup>, Rudi Roumen<sup>1</sup>, Goof Schep<sup>13</sup> and Gerrit Slooter<sup>1,14\*</sup>

Lysbilde er lånt fra presentasjonen til Gerrit Slooter holdt på onkologisk forum høsten 2024

# JAMA Surgery

## RCT: Effect of Multimodal Prehabilitation on Reducing Postoperative Complications and Enhancing Functional Capacity Following Colorectal Cancer Surgery

### POPULATION

138 Men, 113 Women



Adults scheduled for elective surgical resection of nonmetastasized primary colorectal cancer

Median age, 69 y

### INTERVENTION

251 Participants randomized and analyzed



**123 Multimodal prehabilitation**  
4-wk High-intensity supervised exercise and nutritional, mental health, and smoking cessation support



**128 Standard care**  
Perioperative care per local standards

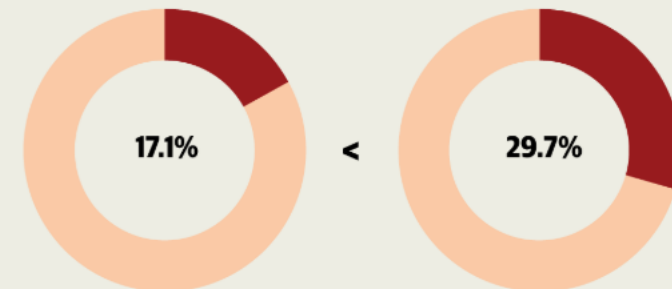
### FINDINGS

30 d Postprocedure, the prehabilitation group had a significantly lower rate of severe complications than the standard care group, but no significant difference in functional capacity

#### Rate of severe postoperative complications (CCI >20):

Multimodal prehabilitation

Standard care



#### Between-group differences, prehabilitation vs standard care:

**Decrease in severe complications (CCI >20):**  
Odds ratio, 0.47 (95% CI, 0.26 to 0.87);  $P = .02$

**Mean difference in 6-min walking distance:**  
15.6 m (95% CI, -1.4 to 32.6);  $P = .07$

### SETTINGS / LOCATIONS



7 Hospitals from  
7 countries

### PRIMARY OUTCOME

Rate of severe postoperative complications, measured by the Comprehensive Complication Index (CCI; range 0-100; score >20 indicates severe complications), and functional capacity, measured by the 6-min walking distance, at 30 d

Molenaar CJL, Minnella EM, Coca-Martinez M, et al; PREHAB Study Group. Effect of multimodal prehabilitation on reducing postoperative complications and enhancing functional capacity following colorectal cancer surgery: the PREHAB randomized clinical trial. *JAMA Surg*. Published online March 29, 2023. doi:10.1001/jamasurg.2023.0198

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## Costs of PREHAB

Activity		Costs since standard care
Physical therapy	Personal intake (60 min) 11 group sessions	303
Dietitian	1 consultation	65
Products	Protein & Vitamins	50
Smoking cessation	External program	0
Mental support	Session case manager	49
	10% referral to psychologist → 2%	2
CPET	40% indication → 10%	18
Organization	Specialized nurse/casemanager (90min)	98
	Surgeon	50
	Administrative staff (70 min → 15 min)	10
Initiation bonus	Project manager	0
Total		<b>€ 635</b>

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# PREHAB in 18 hospitals in the Netherlands

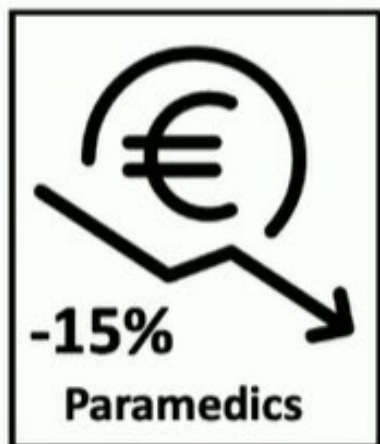
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	PREHAB (n=1192)	No- PREHAB (n=1192)	Relative reduction	p-value
Overall complications			- 21 %	0.000
Medical complications			- 37 %	0.000
Surgical complications			- 14 %	0.046
Anastomotic leakage			- 20 %	0.218
Hospital stay in days	5.8	7.6	- 1.8 days	0.000
Readmission			- 26 %	0.017
IC admission			- 46 %	0.000



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# Hva skal jeg ta med meg hjem?

- Prehabilitering synes å være effektivt i alle fall hos pasienter med colorectal kreft
- Pasienten kommer seg raskere
- Det er færre komplikasjoner
- Kortere liggetid
- Sykehuset sparer penger
- Har også positiv effekt også på de pasientene som får komplikasjoner



# Hvordan komme videre?



# Lekre, lett tilgjengelige brosjyrer



Digitale  
treningsvideoer  
som kan brukes  
hjemme



Film om ernæring  
før kirurgi



Informasjon fra  
fysioterapeut  
til deg som skal  
opereres i magen



Påmelding til kurset  
Kreft – hva nå?

OSLO UNIVERSITETSSYKEHUS



**Prehabilitering:**  
Bedre helse med tiltak før operasjon

# I et prehabiliteringsforløp



[Best mulig rustet til kreftbehandling on Vimeo](#)

# Kvalitetsprosjekt i egen avdeling



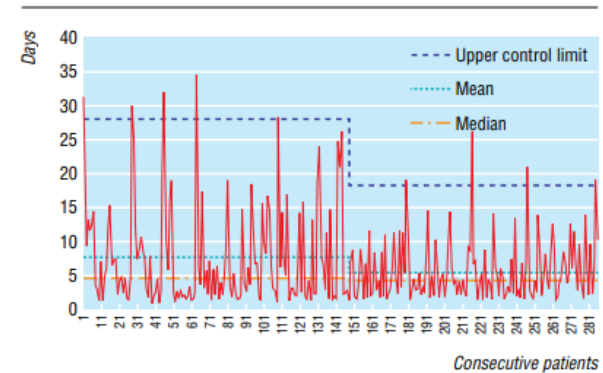
## Education and debate

### *Quality improvement report*

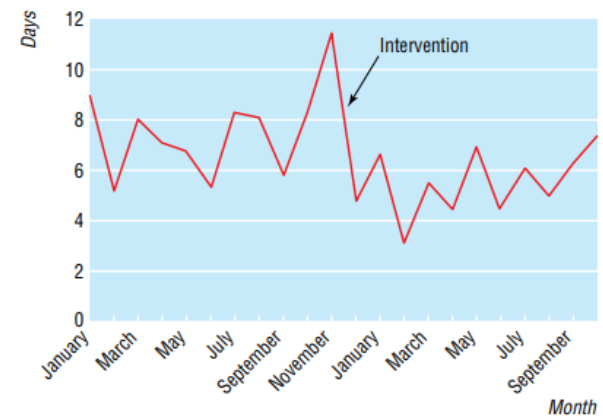
### Effect of a scoring system and protocol for sedation on duration of patients' need for ventilator support in a surgical intensive care unit

Guttorm Brattebø, Dag Hofoss, Hans Flaatten, Anne Kristine Muri, Stig Gjerde, Paul E Plsek

BMJ 2002;324:1386-9



**Fig 1** XmR chart for 285 consecutive adult patients (147 before and 138 after adoption of a sedation protocol and guidelines), showing reduction in daily average ventilator time and also in its variation (indicated by lowering of the upper control limit)



**Fig 2** Mean monthly patient ventilator times before and after adoption of a sedation protocol and guidelines





# prehabilitering

Sette pasienten i stand til å motta kreftbehandling

Genialt

# Digital prehabilitering

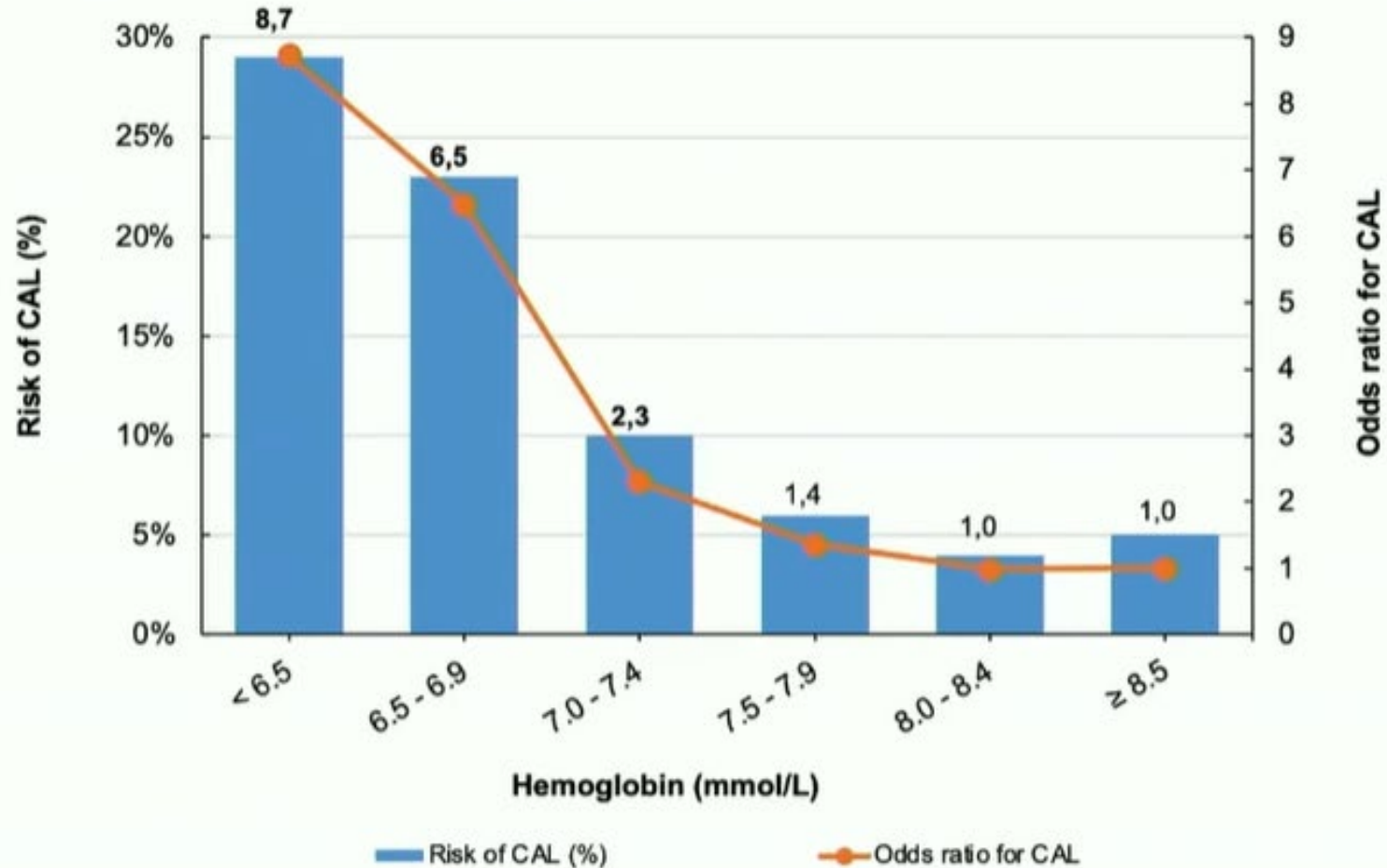


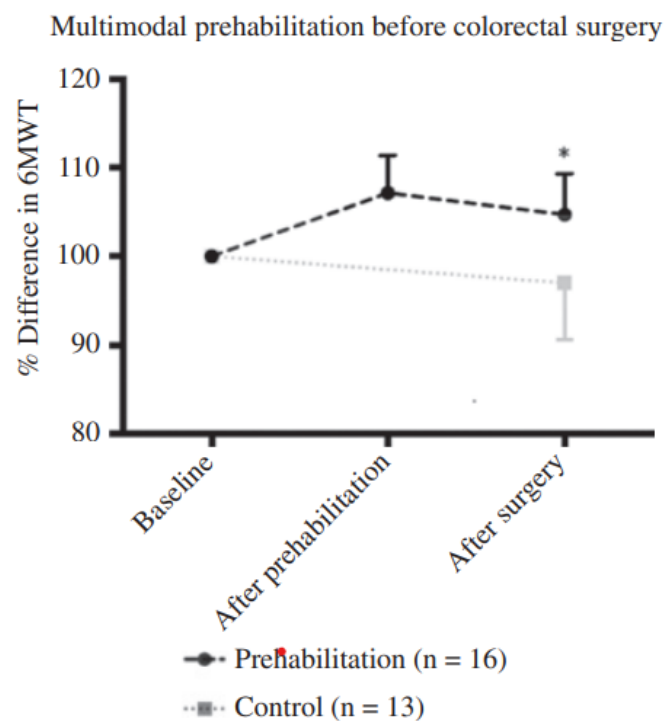
<https://www.youtube.com/watch?v=w7mEgQtLiR4>

# Læring og mestringskurs 2

- Ernæringsfysiolog underviser om:
- Generelle kostråd etter gjennomgått kreftbehandling (sekundærforebygging)
- De norske kostrådene fra Helsedirektoratet
- Sammensetning av måltidene for å dekke behov for alle næringsstoffer (tallerkenmodellen)
- Brødskalaen og nøkkelhullsmerket
- Redusert matlyst og utfordringer med matinntak/vekttap
- «Fordøyelsesplager», tar opp det som er aktuelt for pasientene som er tilstede.
- Råd ved ileostomi og kolostomi (ev. høy output).

# Hemoglobin and anastomotic leakage





**Figure 3:** Pilot study on multimodal prehabilitation before colorectal cancer surgery.

Patients who underwent a prehabilitation program of 4-weeks before colorectal cancer surgery showed progress after training and performed better 4-weeks postoperatively ( $p < 0.05$ , analysis of variance) on functional capacity (6MWT) compared to controls who received standard preoperative care.