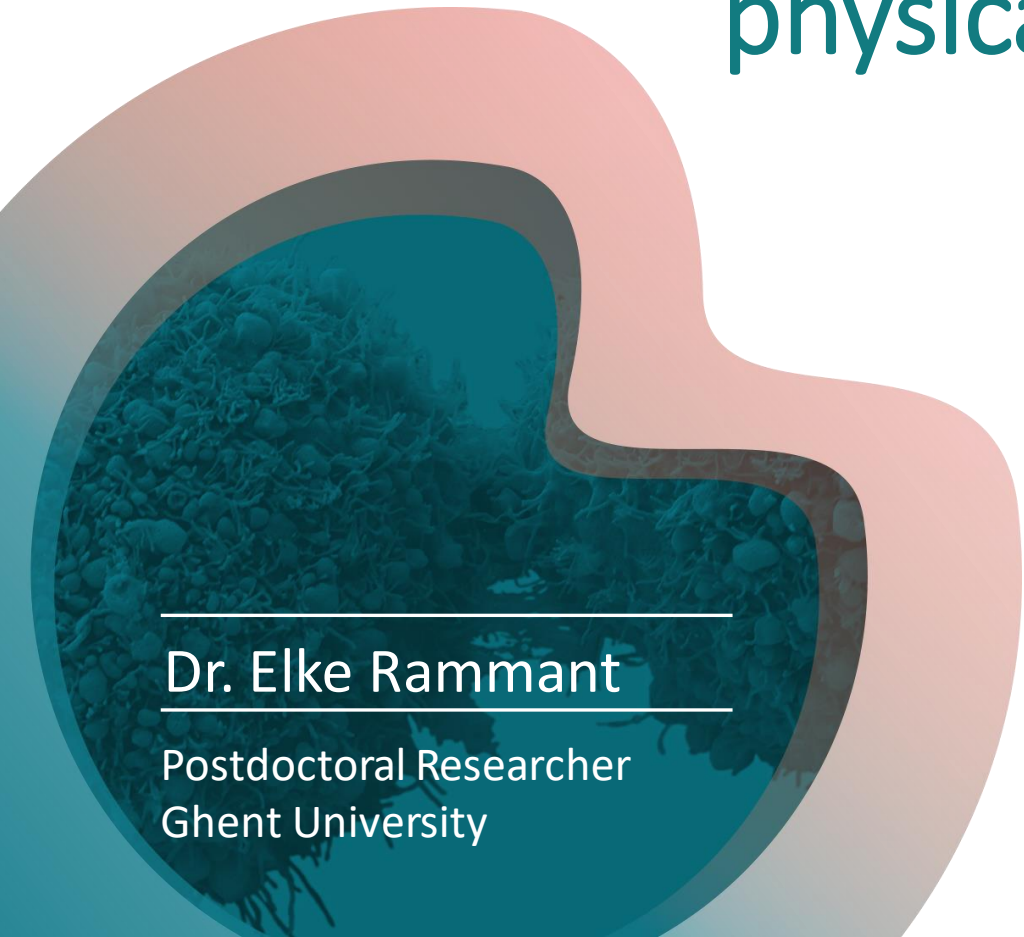


Effect of prehabilitation interventions in people affected by bladder cancer on physical, clinical and patient-reported outcome measures



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12th Belgian Multidisciplinary
Meeting on Urological Cancers

PREHABILITATION

WHAT IS PREHABILITATION?

PREHABILITATION

Prepares the patient for major surgery (or other treatments)
Optimize patients' physical and mental health status before treatment

↑ acute and chronic treatment-related toxicities
↑ symptom burden (e.g. fatigue)
↓ health-related quality of life
↑ risk of all-cause and cancer specific mortality

↑ mortality risk
↓ recovery trajectories in quality of life, health status and wellbeing

WHAT IS PREHABILITATION?

PREHABILITATION

Prepares the patient for major surgery (or other treatments)
Optimize patients' physical and mental health status before treatment



WHY?

“Better in, better out”
Reducing complications and improving post-operative recovery

Durrand, J. (2016); Giles, C. (2019); Coderre (2022); Simcock, R. (2019)

WHY PREHABILITATION?

Prehabilitation can =

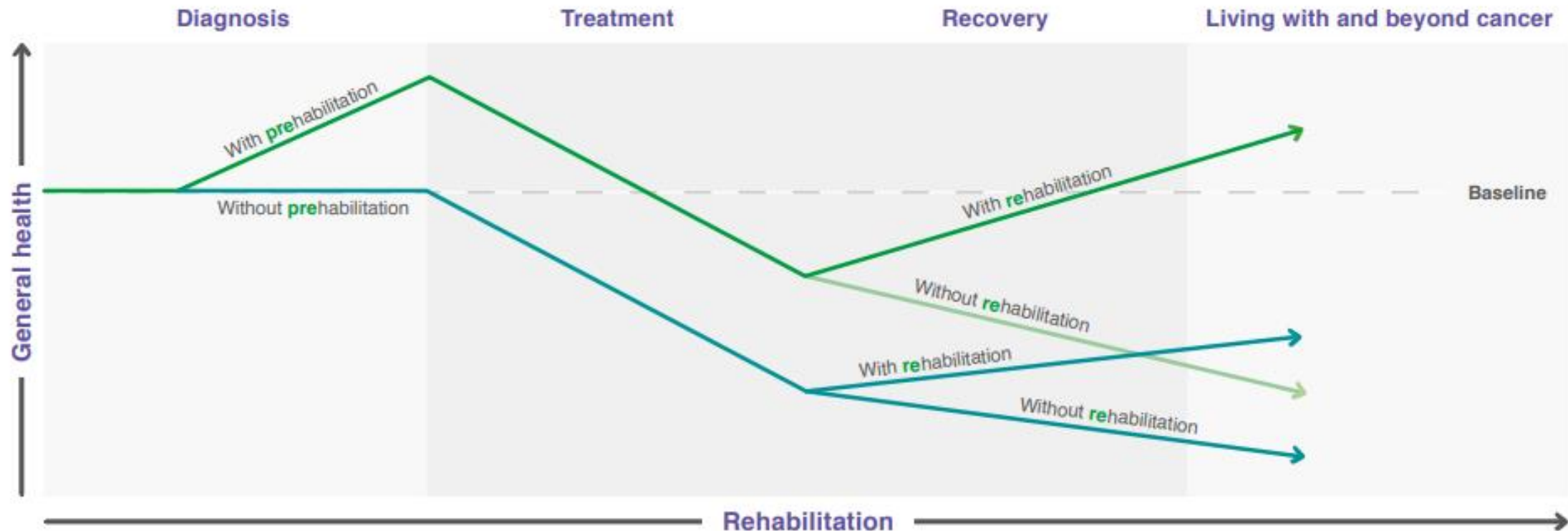
- Decrease mortality
- Decrease post-operative complications
- Decrease hospital stay & readmission
- Improve postoperative functional capacity
- Improve wellbeing & QoL

(Coderre et al. 2022; Simcock, R., 2019)



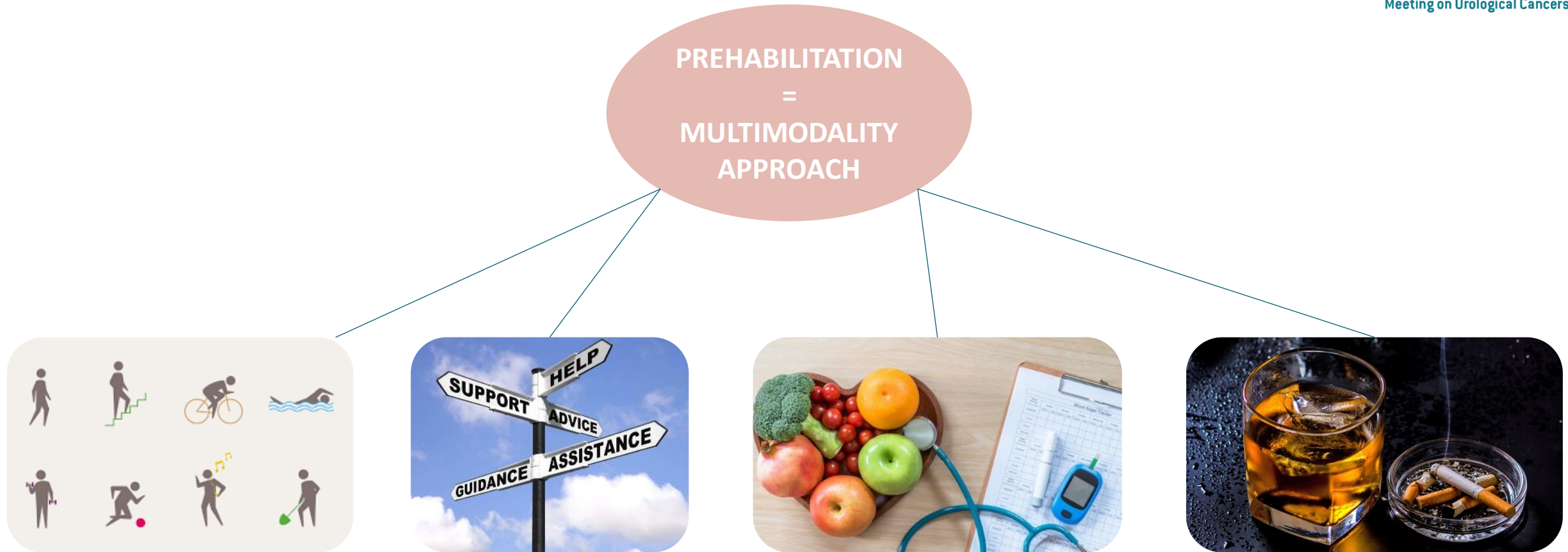
WHAT IS PREHABILITATION?

= Optimization physical and mental wellbeing before major cancer surgery



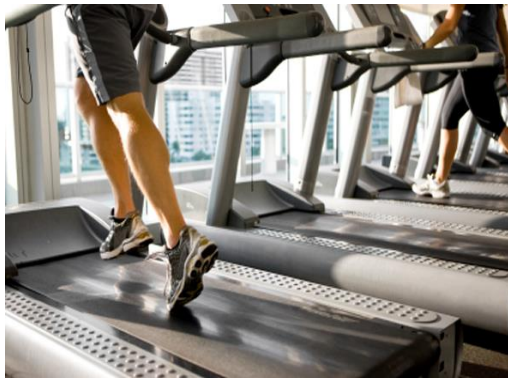
Simcock, R. (2019)

WHAT IS PREHABILITATION?



Giles, C. (2019); Scheede-Bergdahl, E. (2019)

PHYSICAL ACTIVITY INTERVENTIONS



- **AEROBIC TRAINING**

- 3 times/week 30 minutes
- Type of activities: cycling, walking, swimming, cross-trainer



- **STRENGTH TRAINING**

- 2 times/week
- 8-10 exercises of the major muscle groups
- 8 to 15 repetitions per exercise
- 2 sets per exercise



- **FLEXIBILITY TRAINING**

- All major muscle groups and joints
- On days of other exercises

NUTRITIONAL INTERVENTIONS

Goal: Optimize nutritional status before treatment to improve outcomes and recovery

Nutritional screening & assessment

Identify malnutrition risk (e.g. MUST, NRS-2002)

Protein Optimization

↑ Protein intake (1.2–2.0 g/kg/day) to support muscle mass and healing.

Adequate energy intake

Prevent catabolism and support recovery; address weight loss.

Micronutrient Support

Correct deficiencies (e.g. vitamin D, B12, iron, zinc) to support immune function and healing.

Immunonutrition

Specialized supplements (e.g. arginine, omega-3) to reduce complications.

Oral Nutritional Supplements

High-protein, high-calorie drinks for 1–4 weeks pre-surgery.

Dietary Counseling

Personalized advice by a dietitian; adapted to comorbidities.



PSYCHOSOCIAL INTERVENTIONS

Goal: Reduce psychological distress and enhance mental readiness for treatment.

Psychological Screening

Identify anxiety, depression, distress (e.g. with HADS, distress thermometer).

Stress Management Techniques

Breathing exercises, relaxation training, mindfulness, guided imagery.

Cognitive-Behavioral Support

Address negative thoughts, build coping strategies, promote resilience

Patient Education & Expectations

Clear information on procedures, recovery process, and self-management

Motivational Interviewing

Enhance engagement, address ambivalence, support behavior change (e.g. smoking cessation).

Peer or Psychosocial Support

Group sessions, peer mentors, or support from psychologists or social workers.

Sleep & Fatigue Management

Sleep hygiene education, relaxation techniques, and routine planning.



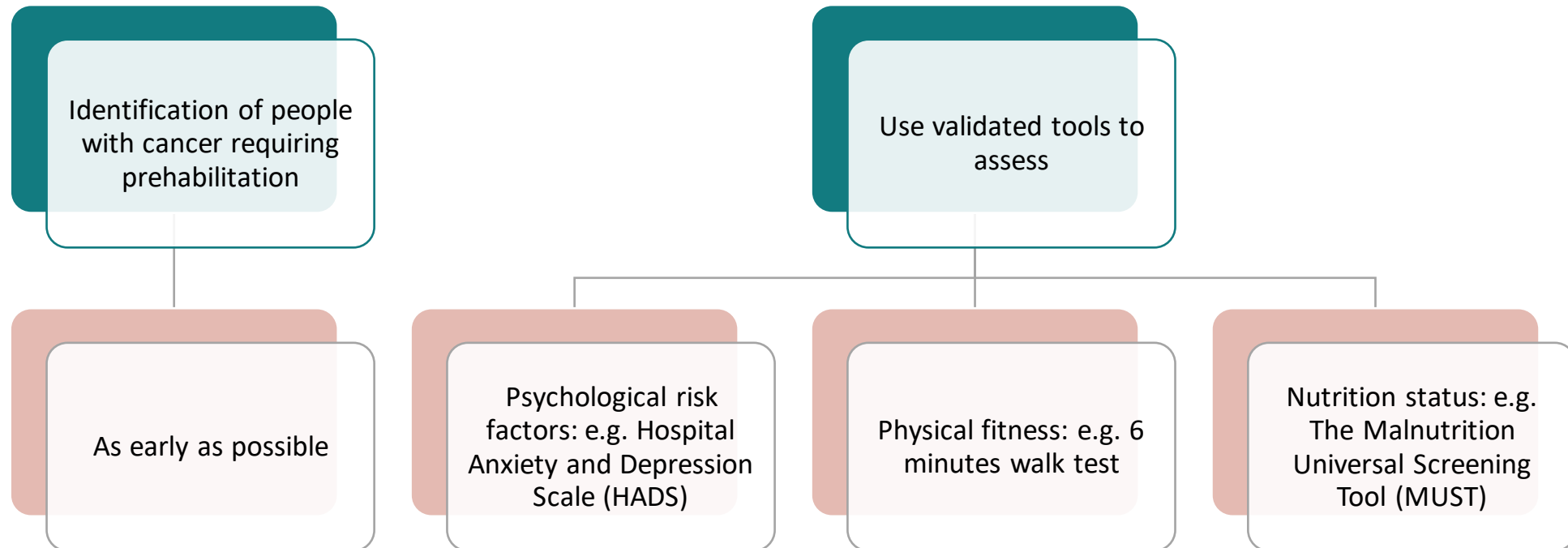
GUIDANCE ON HOW TO DELIVER PREHAB

SCREENING

ASSESSMENT

INTERVENTION

A) SCREENING



B) ASSESSMENT

COMPREHENSIVE EVALUATION
OF NEEDS IDENTIFIED DURING
SCREENING

INCLUDES TAKING A HISTORY,
EXAMINING THE PATIENT AND
CONDUCTING SPECIAL TESTS

ASSESSMENTS SHOULD INFORM
THE INDIVIDUALISED
PRESCRIPTION OF EXERCISE,
NUTRITION AND
PSYCHOLOGICAL
INTERVENTIONS

ASSESSMENT MAY ALSO BE
USED TO DETERMINE THE
EFFECTIVENESS OF ANY
INTERVENTION OVER TIME

C) INTERVENTION

4–6 weeks depending
on the length of time
between diagnosis and
starting treatment

Can still be effective if
begun two weeks prior
to treatment

Can continue
throughout treatment

BLADDER CANCER

WHY PREHABILITATION IN BLADDER CANCER?

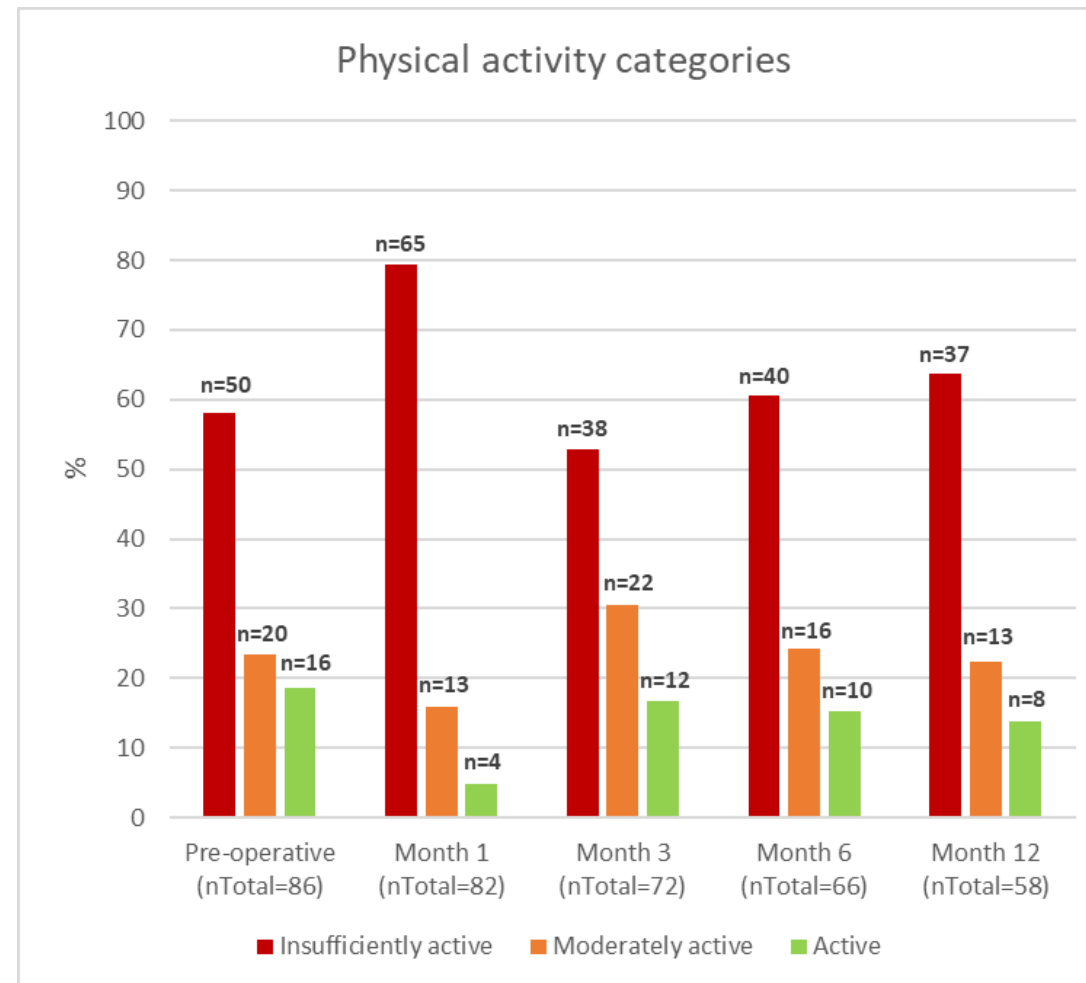
- Older & vulnerable population
- Invasive treatment & follow up
- Severe side effects
- Uncertain future
- High recurrence risk
- Poorer HRQoL
- Worse patient experience vs. Other cancers



Physical activity and health-related quality of life from diagnosis to one year after radical cystectomy in patients with bladder cancer: a longitudinal cohort study.

Elke Rammant, Ann Van Hecke, Jelle Van Cauwenberg, Karel Decaestecker, Lindsay Poppe, Beth Russel, Renée Bultijnck, Maarten Albersen, Sofie Verhaeghe, Mieke Van Hemelrijck, Roos Colman, Benedicte Deforche, Valérie Fonteyne

November 2021 – *Bladder Cancer Journal*



Physical activity and health-related quality of life from diagnosis to one year after radical cystectomy in patients with bladder cancer: a longitudinal cohort study.

	TCI	Pre-operative	Month 1	Month 3	Month 6	Month 12	P-value
EORTC QLQ-C30							
Physical functioning	83	69.6 [64.2-75.0] ^a	59.4 [53.8-65.0] ^b	71.5 [65.8-77.2] ^a	74.3 [68.6-79.9] ^a	72.5 [66.7-78.3] ^a	<0.001
Emotional functioning	71	68.6 [63.9-73.2] ^a	73.3 [68.4-78.1] ^b	77.0 [72.1-81.9] ^{b, c}	80.3 [75.5-85.2] ^c	78.1 [73.0-83.1] ^{b, c}	<0.001
Role functioning	58	61.8 [55.1-68.5] ^a	41.7 [34.5-48.8] ^b	62.9 [55.6-70.2] ^a	72.3 [65.1-79.5] ^c	71.5 [64.0-79.0] ^c	<0.001
Social functioning	58	74.3 [68.5-80.1] ^a	62.9 [56.8-68.9] ^b	76.1 [69.9-82.3] ^a	79.5 [73.3-85.6] ^a	80.2 [73.8-86.6] ^a	<0.001
Cognitive functioning	75	82.5 [78.2-86.8]	78.9 [74.4-83.4]	81.1 [76.5-85.8]	79.2 [74.6-83.8]	80.3 [75.6-85.1]	0.561
Global health status	/	53.8 [49.8-57.9] ^a	51.4 [47.2-55.7] ^a	63.9 [59.5-68.2] ^b	65.7 [61.3-70.0] ^b	66.1 [61.5-70.6] ^b	<0.001
Fatigue	39	46.6 [40.9-52.3] ^a	55.2 [49.2-61.1] ^b	34.8 [28.7-40.8] ^c	32.6 [26.6-38.6] ^c	35.3 [29.1-41.5] ^c	<0.001
Nausea/vomiting	8	9.5 [5.7-13.3] ^{a, b}	12.0 [7.9-16.0] ^b	5.8 [1.6-10.0] ^{a, c}	4.3 [0.2-8.4] ^c	4.9 [0.6-9.2] ^{a, c}	0.011
Pain	25	23.0 [17.1-28.8] ^a	25.1 [18.9-31.2] ^a	15.5 [9.2-21.8] ^b	16.2 [10.0-22.4] ^b	18.6 [12.2-25.0] ^{a, b}	0.014
Dyspnea	17	24.1 [17.6-30.7] ^a	31.7 [24.9-38.4] ^b	21.6 [14.7-28.5] ^a	23.1 [16.2-29.9] ^a	24.8 [17.8-31.9] ^a	0.028
Sleep disturbances	50	41.4 [35.0-47.8] ^a	45.5 [38.8-52.3] ^a	24.0 [17.0-30.9] ^b	26.3 [19.5-33.2] ^b	21.6 [14.5-28.8] ^b	<0.001
Appetite Loss	50	18.0 [12.4-23.5] ^a	31.9 [26.0-37.8] ^b	11.4 [5.4-17.5] ^{a, c}	9.7 [3.7-15.7] ^c	9.8 [3.5-16.0] ^c	<0.001
Constipation	50	19.8 [13.7-25.9] ^a	33.5 [27.0-40.0] ^b	20.5 [13.8-27.2] ^{a, b}	18.1 [11.6-24.7] ^a	16.0 [9.2-22.9] ^a	<0.001
Diarrhoea	17	8.7 [3.4-14.0] ^a	16.9 [11.2-22.5] ^{b, c}	13.3 [7.5-19.1] ^{a, c}	8.4 [2.8-14.1] ^a	15.7 [9.8-21.7] ^c	0.033
Financial difficulties	17	10.8 [5.9-15.7] ^{a, d}	15.4 [10.4-20.5] ^{b, c}	13.2 [8.1-18.4] ^{a, c, e}	10.6 [5.6-15.7] ^{d, e}	7.6 [2.3-12.9] ^d	0.027
EORTC QLQ-BLM30							
Urinary problems	/	32.8 [28.1-37.5] ^a	39.9 [35.0-44.8] ^b	28.1 [23.1-33.1] ^{a, c}	25.9 [20.9-30.9] ^c	24.5 [19.3-29.7] ^c	<0.001
Bowel problems	/	18.0 [13.3-22.6]	23.2 [18.2-28.2]	18.2 [13.2-23.2]	14.4 [9.5-19.3]	17.6 [12.5-22.7]	0.064
Body image	/	75.3 [69.5-81.1] ^a	65.8 [59.7-71.9] ^b	74.9 [68.8-81.1] ^a	71.3 [65.2-77.4] ^{a, b}	72.2 [65.9-78.5] ^{a, b}	0.025
Future perspectives	/	49.6 [44.0-55.2] ^a	57.6 [51.7-63.4] ^b	62.0 [56.1-67.9] ^{b, c}	64.9 [59.0-70.7] ^{c, d}	68.7 [62.7-74.6] ^d	<0.001
Sexual functioning	/	14.2 [10.3-18.2] ^{a, b}	5.4 [1.2-9.5] ^c	11.3 [7.2-15.4] ^a	16.9 [12.8-21.1] ^b	15.1 [10.8-19.4] ^b	<0.001

TCI, threshold for clinical importance.

TCI for the functioning scales: the higher the better. TCI for the symptom scales: the lower the better.

Red – estimated mean score is worse than TCI

Orange – TCI is included in the 95% confidence interval

Subscripts (a, b, c, d) - Values with different subscript differ significantly from each other, values with the same subscript do not

WHAT DO WE KNOW?

WHAT DO WE KNOW?

Effect of Prehabilitation Interventions in People Affected by Bladder Cancer on Long-Term Physical, Clinical, and Patient-Reported Outcome Measures: A Systematic Review

Catherine Paterson, PhD, MSc, RN^{1,2} ; Jessie Nguyen, MD³ ; Gillian Fraser, MSc, RN³; Ganes Pranavan, MD³; and Elke Rammant, PhD⁴ 

DOI <https://doi.org/10.1200/OP-24-00984>

February 20, 2025; JCO Oncol Pract



STUDY OBJECTIVE



Identify the most effective interventions



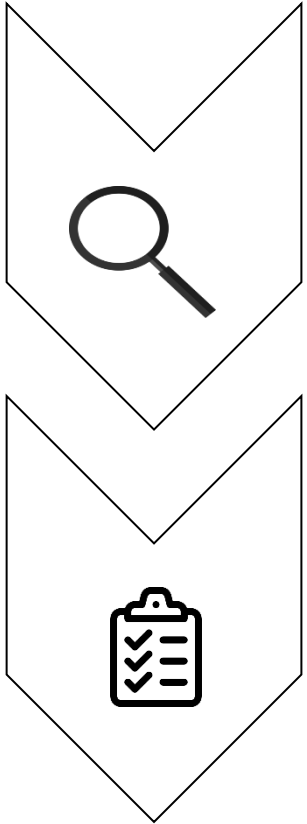
Understand the effect of
prehabilitation in bladder cancer



Explore research gaps



METHODS



Database search:

- MEDLINE, Embase, CINAHL, Cochrane (2012–2023)

Study selection:

- Titles/abstracts screened by 2 reviewers.
- Inclusion: all cancer stages and prehabilitation types
- Exclusion: abstracts, editorials, non-English articles

RESULTS

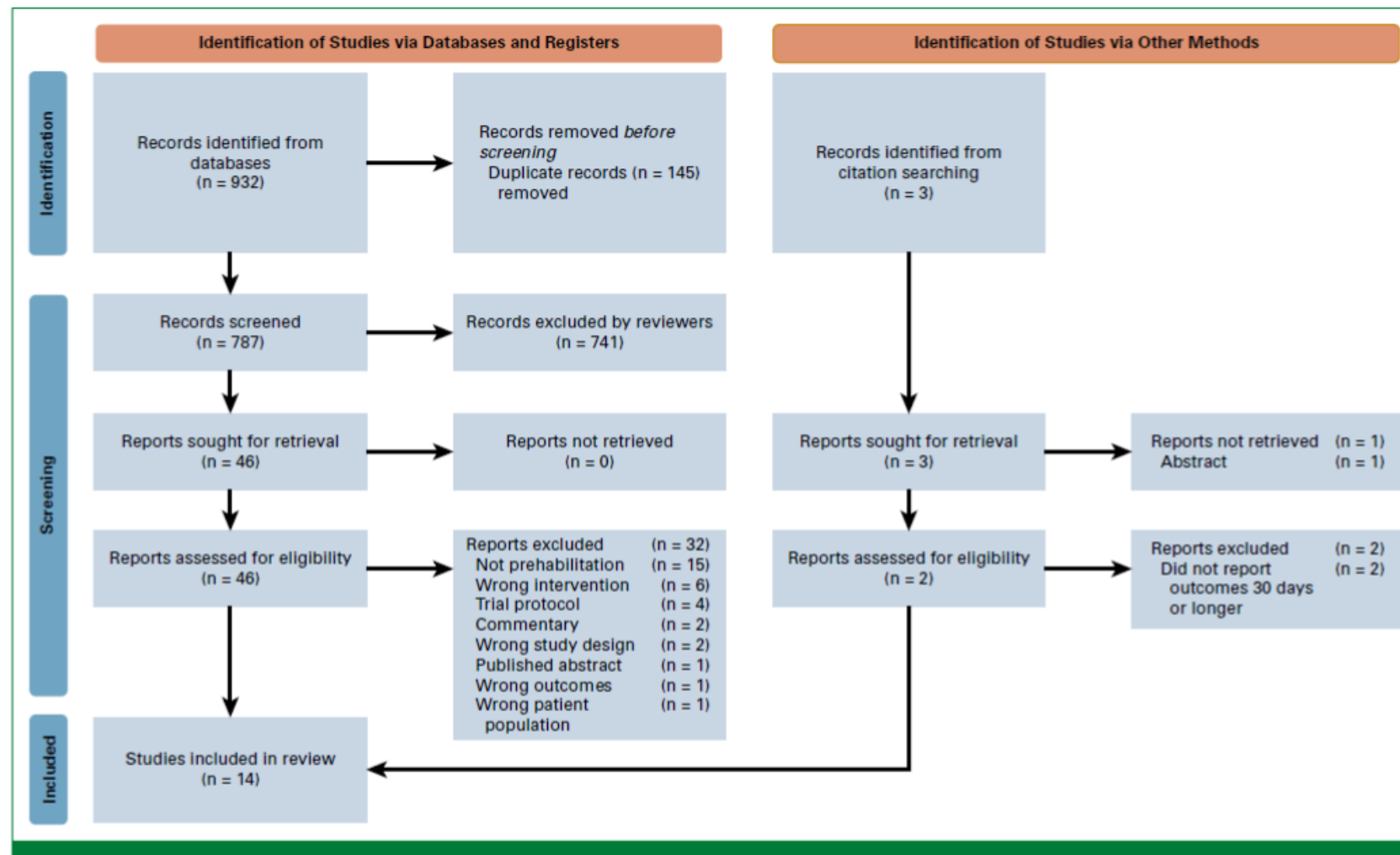


FIG 2. PRISMA flow diagram.

RESULTS

Type of Prehabilitation	Physical Outcomes	Clinical Outcomes	Patient-Reported Outcomes
Multimodal (N=5)	✓ Improved mobility, physical fitness	⚠ Mixed: some studies showed fewer complications	✗ No improvement in HRQoL
Exercise (N=3)	✓ Improved physical fitness (strength and aerobic levels)	✗ No clear clinical benefits	⚠ Limited evidence for QoL improvement
Nutrition (N=2)	✗ No significant improvement in physical function	✗ No significant differences in recovery or inflammation	✗ No reported improvements in HRQoL
Education (N=3)	✗ No direct effect on physical performance	✗ No effect on medical complications	✓ Improved self-care, stoma confidence, patient satisfaction
Smoking/Alcohol Cessation (N=1)	✗ No physical outcomes reported	✓ Reduced complications and abstinence	⚠ Higher QoL but not significant

Legend:

- ✓ = Positive effect observed
- ✗ = No effect observed
- ⚠ = Limited or mixed evidence



RESULTS - MULTIMODAL

Author + year	Design	N	Treatment	Intervention					Findings
				Exercise	Nutrition	Stoma	Psycho	Smoking cess	
Aldhaam et al, 2020 United States	Retrospective review of a prospectively maintained database	n=192 I=64 C=128	Radical cystectomy – MIBC	✓	✓	✓	✓	✗	Improved functional mobility ($P < .01$), faster bowel recovery ($P < .01$), shorter hospital stay ($P < .01$), and lower complication rates ($P = .022$), including fewer high-grade complications ($P = .02$). Pain levels were lower in the intervention group on postoperative days 1–3.
Jensen et al, 2019 United States	Prospective trial study	N=32	Radical cystectomy – MIBC	✓	✓	✓	✗	✗	Significant improvements in walking distance ($P = .03$), bone mass ($P = .04$), BMI ($P = .001$), and body weight ($P = .01$).
Metcalf et al, 2019 United States	Prospective, pilot clinical/feasibility trial	N=15	Radical cystectomy – MIBC	✓	✗	✓	✗	✗	Improved mobility during admission; moderate rates of complications (67%) and readmissions (33%).
Minnella et al, 2021 Canada	RCT	N=58 I=30 C=28	Radical cystectomy – MIBC	✓	✓	✗	✗	✗	Significant improvement in functional mobility during hospital physiotherapy sessions ($P < .01$) and in 6-minute walk distance at 4 weeks postoperatively ($P = .014$)
Smelser et al, 2023 United States	Prospective single arm study	N=67	Radical cystectomy – MIBC	✓	✓	✓	✓	✓	High early complication rate (56%), with 42% major ($\geq$ Grade 3); late complications mostly minor. 90-day mortality 6%.





RESULTS - EXERCISE

Author + year	Design	N	Treatment	Intervention	Findings
Jensen et al, 2015 Denmark	RCT	N=107 I=50 C=57	Radical cystectomy – MIBC	2 weeks 2 times/day Endurance & strength exercises Step training using a step trainer	Greater postoperative mobility ($P < .001$) and faster return to activities of daily living ($P \leq .05$)
Strother et al, 2021 United States	RCT	N=33 i=22 C=11	Radical cystectomy – MIBC	3-14 days daily step goals (fitbit): walking program	No significant differences
Kaye et al, 2020 United States	Prospective single-arm study	N=43	Radical cystectomy – MIBC	4 weeks 3 sessions of 90 min/ week whole-body resistance training program, aerobic exercise, abdominal and back strengthening exercises, and assisted stretches	Significant improvements in 6MWD ($P < .001$), VO2 ($P < .001$), gait speed ($P = .015$), and TUG ($P = .024$) Mental health improved (MCS $P = .014$)





RESULTS - NUTRITION

Author + year	Design	N	Treatment	Intervention	Findings
Hamilton-Reeves et al, 2018 United States	RCT	N=30 I= 14 C=16	Radical cystectomy – MIBC	Specialized immunonutrition 5 days before surgery	No significant differences
Patel et al, 2022 United States	Non-RCT	N=107 i=78 C=92	Radical cystectomy – MIBC	Immunonutrition 5 days before surgery + a complex carbohydrate beverage the night before surgery and 2 hours before surgery	No significant differences





Stoma Care

RESULTS - EDUCATION

Author + year	Design	N	Treatment	Intervention	Findings
Jensen et al, 2017 Denmark	RCT	N=90 I=44 C=46	Radical cystectomy – MIBC	Instructions to basic stoma care and change of appliance using a training kit with an artificial stoma.	Significant improvement in stoma self-care scores at 35 days (P < .01), 120 days (P < .01), and 365 days (P < .01) postoperatively.
Wulff-Burchfield et al, 2021 United States	Qualitative study	N=47	Radical cystectomy – MIBC	In-person, 2-hour stoma-education program + take home materials (2x/month)	Found the education session informative and helpful
Zganjar et al, 2021 United States	Prospective longitudinal, Quality-improvement feasibility study	N= 51	Radical cystectomy – MIBC	3-hour group stoma-education session within 2 weeks of the surgery date + hands-on supply kits (3sessions)	SF-36 scores on general health improved at 6 and 12 weeks compared to enrollment.





RESULTS – SMOKING AND ALCOHOL CESSATION

Author + year	Design	N	Treatment	Intervention	Findings
Lauridsen et al, 2022 Denmark	RCT	N=94 I=47 C=47	Radical cystectomy – MIBC	4 weeks five counseling sessions + Nicotine replacement therapy and medication was offered to manage withdrawal symptoms. + planning stop date	Intervention group had fewer complications after 30 (P = .02) and 90 days (P = .003). More abstinence from alcohol and smoking (P = .01).

RESEARCH GAPS



Only studies in MIBC patients
receiving radical cystectomy

-> Only stoma education



Limited long-term outcome data



Limited research: only 14
studies, few RCT's, limited
representation of women,
no patients with NMIBC,...



CONCLUSION

Prehabilitation shows promise in bladder cancer



Exercise



Stoma Care

BUT WE NEED:



Greater focus on non-surgical treatments



Larger, robust studies with long-term follow-up needed



THANK YOU

Contact: elke.rammant@ugent.be