Prehabilitation: Optimizing Patients to Improve Outcomes - Part 2

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INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER Conquering Thoracic Cancers Worldwide



Prehabilitation: Optimizing Patients to Improve Outcomes

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Disclosures



- Stephen Wootton, PhD, FAfN, OBE discloses he is on an advisory board and has an investigator-led institutional collaborative research agreement with Seca GmBH
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How should we be delivering prehabilitation?

Exercise interventions before and during active cancer treatment. A systematic review

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Cancer Prehabilitation

An Opportunity to Decrease Treatment-Related Morbidity, Increase Cancer Treatment Options, and Improve Physical and Psychological Health Outcomes

ABSTRACT

Silver JK, Baima J: Cancer prehabilitation: an opportunity to decrease treatmentrelated morbidity, increase cancer treatment options, and improve physical and psychological health outcomes. Am J Phys Med Rehabil 2013;92:00–00. Meneses-Echávez et al. Systematic Reviews (2020) 9:3 https://doi.org/10.1186/s13643-020-1282-3

(2020) 9:34

Systematic Reviews

PROTOCOL

Prehabilitation programs for cancer patients: a systematic review of randomized controlled trials (protocol)

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Types of cancer prehabilitation



- > Unimodal
 - > Exercise based
 - > Preoperatively Improves cardiopulmonary fitness
 - Postoperatively Reduces stress, complications, and length of stay, improves quality of life
- > Multimodal
 - > Exercise, nutrition, psychological interventions, behaviour change and patient education
 - Preoperatively Improves cardiopulmonary fitness, reduces stress, reduce risk factors related to lifestyle
 - Postoperatively Reduces stress, complications and length of stay, improves nutritional outcomes, improves aspects of neuro-cognitive function, improves quality of life

Crevenna, R., Palmer, S., & Thomas, L. (2021). Cancer Prehabilitation - a short review. *Magazine of European Medical Oncology, 14*, 39-42. <u>https://link.springer.com/article/10.1007/s12254-021-00686-5</u>

Lukez, A., & Baima, J. (2020). The Role and Scope of Prehabilitation in Cancer Care. *Seminars in Oncology Nursing, 36 (1).* <u>https://doi.org/10.1016/j.soncn.2019.150976</u>

Macmillan Cancer Prehabilitation Guidance



Principles and guidance for prehabilitation within the management and support of people with cancer



- > Multimodal intervention
- Optimise physical and mental health exercise, nutrition and psychological interventions
- Multidisciplinary approach
- Stratified intervention: Universal, targeted and specialist



Nutritional considerations in the management of patients with lung cancer







Key messages

- Nutrition is an essential part of the management of lung cancer and a key consideration in prehabilitation.
- Malnutrition is common and impacts on morbidity and mortality.
- Need to identify those most at risk and offer nutritional support.
- Interventions can improve experience and outcomes
- Evidence specific to nutritional management of lung cancer is limited



Sarcopenia, cachexia and malnutrition



Decreased resilience, response and outcomes

Malnutrition in patients with lung cancer **NIHR**

Anorexia and weight loss prior to diagnosis ~40% Malnourishment during treatment 35 to 69% Modest weight loss during treatment predicts poor response, QoL and survival

Cancer and Nutrition

Collaboration

~ 80% experiencing cancer-related fatigue during or after treatment that impedes QoL

Weiss J. Expert Rev Pharmacoecon Outcomes Res 11, 441–446.



Weight loss primarily due to decreased food intake

- Poor appetite and early satiety
- Symptoms of illness breathlessness, pain, fatigue
- Inanition due to depression, anxiety, change in taste and smell
- Treatment side-effects surgery, chemoradiotherapy, biologics
- Social isolation, significant life change, mental illness



Symptoms affecting intake:

- Fatigue
- Nausea / Vomiting
- Taste alterations
- Smell alterations
- Oral mucositis
- Diarrhea
- Constipation
- Dry mouth
- Anorexia / satiation
- Pain on eating
- Dysphagia
- Strictures / obstruction

Nutrition Impact Symptoms

Associated with the cancer &/or treatment All impact on intake and nutritional state



More symptoms, more undernourishment



Isenring et al. Nutr Cancer. 2010;62(2):220-228.

More than just weight, body composition matters.



Prado et al. Lancet Oncol 2008; 9, 629-35



Muscle mass – measuring different things





Additive effects of prognostic body composition variables on overall survival



Prognostic variables:

- Lack of muscle
- Low muscle attenuation
- > 8% weight loss

Patients with lack of muscle, poor muscle quality and weight loss, survived 8.4 months regardless of their presenting weight

(cf 28.4 months for those with no features)

Martin et al. JCO 2013;31:1539-1547

Approach to care

NIHR Cancer and Nutrition Collaboration

Intervene through nutrition [with exercise and psychological support] to improve resilience, response & outcomes

Cancer cachexia cannot be fully reversed by nutritional support Can improve experience, treatment tolerance and outcomes

Who is at risk? How to triage? How to monitor?



Lots of guidance....



ESPEN guideline: Clinical nutrition in surgery

Arved Weimann ^{a, *}, Marco Braga ^b, Franco Carli ^c, Takashi Higashiguchi ^d, Martin Hübner ^e, Stanislaw Klek ^f, Alessandro Laviano ^g, Olle Ljungqvist ^h, Dileep N. Lobo ⁱ, Robert Martindale ^j, Dan L. Waitzberg ^k, Stephan C. Bischoff ¹, Pierre Singer ^m

ESPEN guidelines on nutrition in cancer patients*

Jann Arends ^a, Patrick Bachmann ^b, Vickie Baracos ^c, Nicole Barthelemy ^d, Hartmut Bertz ^a, Federico Bozzetti ^e, Ken Fearon ^{f, †}, Elisabeth Hütterer ^g, Elizabeth Isenring ^h, Stein Kaasa ⁱ, Zeljko Krznaric ^j, Barry Laird ^k, Maria Larsson ¹, Alessandro Laviano ^m, Stefan Mühlebach ⁿ, Maurizio Muscaritoli ^m, Line Oldervoll ^{i, o}, Paula Ravasco ^p, Tora Solheim ^{q, r}, Florian Strasser ^s, Marian de van der Schueren ^{t, u}, Jean-Charles Preiser ^{v, *}

ESPEN expert group recommendations for action against cancerrelated malnutrition

J. Arends ^{a, b, *}, V. Baracos ^c, H. Bertz ^{a, b}, F. Bozzetti ^d, P.C. Calder ^e, N.E.P. Deutz ^f, N. Erickson ^g, A. Laviano ^h, M.P. Lisanti ⁱ, D.N. Lobo ^j, D.C. McMillan ^k, M. Muscaritoli ^h, J. Ockenga ¹, M. Pirlich ^m, F. Strasser ⁿ, M. de van der Schueren ^{o, p}, A. Van Gossum ^q, P. Vaupel ^r, A. Weimann ^s

American Society for Enhanced Recovery and Perioperative Quality Initiative Joint Consensus Statement on Nutrition Screening and Therapy Within a Surgical Enhanced Recovery Pathway

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Cumulative experience



Need to consider how to:

- 1. Identify risk screen, assessment, nutritional diagnosis
- 2. Optimise patient *throughout* their journey – nutrition, exercise and psychological support
- 3. Maintain / improve metabolic, nutritional and physiological fitness



Identifying patients at nutritional risk

ltem	MUST	Short form PG-SGA	Scored PG- SGA	GLIM
Low BMI	Х	х	x	Х
Weight loss	Х	х	х	Х
Poor intake	Х	х	х	Х
Nutrition Impact Symptoms		Х	х	
Muscle loss			х	Х
Inflammation			х	Х
			L	Y
	Screening		Assessment	



Patient-generated Subjective Global Assessment (PG-SGA ©)

Patient-generated:

- Weight History
- Food intake
- Symptoms
- Activity & Function

Professional:

- Diagnosis
 - Age

+

- Metabolic stress
- Physical exam

Score:

A: Well nourished B: Moderate malnutrition C: Severe malnutrition

PG-SGA score/category linked to:

- Mortality
- Post-op complications
- LOS
- Overall survival
- Hospital costs

Nutritional triage: Eating guidance Symptom management

Nutritional support

Jager-Wittenaar & Ottery (2017). Curr Opin Clin Nutr Metab Care 20(5):322-329.



Making a nutritional diagnosis - dietitian





Nutritional Assessment

- Weight
- Body composition
- Appetite
- Eating history
- Supplements

Nutrition Impact Symptoms

- Dysphagia
- Nausea & vomiting
- Mucositis
- Taste & smell
- Anorexia
- Maldigestion
- Malabsorption

Other considerations

- Anxiety about food
- Beliefs, culture, faith
- 'Dr Google'
- Co-morbidities
- Education
- Socio-economic



Principles and guidance for prehabilitation in oncology - evidence domains



In partnership with RC⁰A

NIHR Cancer and Nutrition

HT THERE WITH YOU

Implementation within health system

Work force development - capability & capacity



Triage to nutritional care



NIHR Cancer and Nutrition Collaboration

Artificial Nutritional Support Complex needs & care Nutrition Support Teams (IF Teams) [Hospital-based, In Patient]

Dietetic counselling + ONS Address nutrition impact symptoms [Community-based, Out-patient]



Supportive, self-care Advice [Home-based, remote support]



Dietetic counselling - nutritional care









Addressing Nutrition Impact Symptoms -/+ supplements

Understanding Enabling Confidence



Dietetic counselling - nutritional care

- Start early and continue
- More than simply giving a high-protein supplement
- Workforce constrained, so enable others
- Limited evidence of effectiveness [Baguley, 2019]
 - Improve intake and symptom control
 - No definitive effect on cancer-related fatigue (6 studies SMD 0.18) or QoL (8 studies SMD 0.07)
 - Where nutritional status improved, CRF and QoL improved.

Baguley B et al (2019). Br J Nutr 122, 527-41



Pre-op nutrition (ONS) improves outcomes

- Lower mortality
- Fewer postop complications
- Shorter LOS
- Earlier return of GI function
- Lower rate of re-operations
- Attenuates gut permeability
- Improved wound healing
- Less PN use
- Reduced hospital costs

Nutritional interventions within multimodal prehabilitation - Length of Stay





Nutritional interventions poorly reported

- Goal
- Delivery
- Change in nutritional state

Gillis et al. Frontiers in Nutrition (2021), 8, 63.

Figure 2. Effect of nutrition-only prehabilitation and multimodal prehabilitation on length of hospital stay after colorectal surgery. *Denotes studies using the Enhanced Recovery Pathway. Cl, confidence interval; WMD, weighted mean difference.

2d reduction in LOS

Gillis et al. Gastroenterology (2018), 155; 391-410

In summary, nutrition matters !



- Malnutrition common and impacts on morbidity and mortality.
- Cancer cachexia cannot be fully reversed by nutritional support
- Lessons from all cancers, less evidence in lung cancer
- Screen, assess and diagnose from first presentation and monitor
 - weight loss, body composition and dietary impact factors
- Key role of dietetic counselling and access to Nutrition Support
- Nutrition interventions (within multimodal care) can impact on perioperative morbidity, QoL, fatigue, treatment tolerance, costs
- Need more evidence of clinical effectiveness



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- NIHR Cancer & Nutrition Collaboration (cancerandnutrition.nihr.ac.uk)
- Macmillan Cancer Care & Royal College of Anaesthetists
- Macmillan Review Nutritional Support working group
- Colleagues at Southampton
 - Clinical Nutrition Group
 - Nutrition Support Team & Intestinal Failure Unit
 - Dietetic colleagues
 - Prehabilitation Medicine Team & Fit4Surgery School Team



Key Resources



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Objective measure for functional capacity in patients with lung cancer pre diagnosis – The 6-Minute Walk Test as a pre-treatment predictor for adverse events in patients with lung cancer: A feasibility study

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- > Five year survival rate = 16-20%
- Patients >70 years, low socioeconomic status, inactive lifestyle
- Higher burden of treatment related side effects in lung cancer
- > Tolerability to treatment











Eastern Cooperative Oncology Group (ECOG) Performance Status (PS)¹

	ECOG Performance Status
0	Fully active
1	Restricted in physically strenuous activity but able to carry out housework
2	Being up and about more than 50% of waking hours
3	Confined to bed or chair more than 50% of waking hours
4	Completely disabled and totally confined to bed or chair
5	Dead

1: Group E-ACR. ECOG-ACRIN Cancer Research Group. Available at: http://ecog-acrin.org/resources/ecog-performance-status



Concerns about PS:

- It is based on work from the 1940's²
- > Low-moderate reliability³
- Basing comprehensive medical decisions on subjective measures



2: Scott JM, Stene G, Edvardsen E, Jones LW. Performance Status in Cancer: Not Broken, But Time for an Upgrade? J Clin Oncol. Jun 25 2020: Jco2000721.

3: Chow R, Chiu N, Bruera E, et al. Inter-rater reliability in performance status assessment among health care professionals: a systematic review. Ann Palliat Med. Apr 2016;5(2):83-92.

Functional capacity (6 minute walk distance < 400 m)²

Higher disease progression

Higher mortality

- Functional capacity (6 minute walk distance < 500 m)³
 - > Older
 - worse pulmonary function tests
 - higher complication rate
 - Longer postoperative hospital stay



5: Marjanski T, Wnuk D, Dziedzic R, et al. 500 Meters Is a Result of 6-Minute Walk Test WhichDifferentiates Patients with High and Low Risk of Postoperative Complications after Lobectomy—A Validation Study J Clin Med. 2021 Apr 14;10(8):1686.







Hypothesis

An objective measure of functional capacity can predict tolerance to first-line treatment in patients with lung cancer

Aim

The aim of this exploratory feasibility study was to investigate the feasibility of a 6-Minute Walk Test to predict complications to first-line treatment in patients with newly diagnosed lung cancer.



Inclusion

- Histologically confirmed lung cancer
- Danish language competencies

Exclusion

- Anti-neoplastic treatment within last 5 years
- Other cancer diagnoses Not ambulatory
- Hospitalized





Methods



- > 6-Minute Walk Test close to diagnosis
- 6MWT, American Thoracic Society Guidelines⁶
- Endpoints: indicators of the 6MWT as a potential predictor for complications to treatment

6: ATS statement: guidelines for the six-minute walk test. Am.J.Respir.Crit Care Med. 2002;166(1):111-117.



Methods

Minor complications

Grade 1	n	Grade 2	n
Subcutaneus emphysema	1	Tinnitus	1
Prolonged airleak	1	Subcutaneous	
Small pneumothorax	1	emphysema	1
Hyperthyreose	1	Dyspnea	2
Constipation	3	Anemia	1
Radiation-induced		Leukopenia	1
pneumonitis	1	Pneumonia	1
Leukopenia	1	Radiation-induced	
Orthostatic hypotension	1	pneumonitis	2
Hypokalemia	1		

Major complications

Grade 3	
Pneumothorax	1
Arrhythmia	1
Renal affection	1
Pneumonia	1
Anemia	1
Pleural effusion	1

Outcome measures:

Clavien-Dindo Classification of Surgical Complications and NCI's Common Terminology Criteria for Adverse Events (CTCAE) v. 3.0)⁷

7: Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. Ann Surg. Aug 2004;240(2):205-213.





Results

	No complications	Minor complications	Major complications	р
n/N	4/18	8/18	6/18	
6MWD, m (m ±SD)	530 ± 68	436 ± 62	360 ± 136	0.043
[95CI]	[422; 639]	[384; 487]	[217; 503]	
Performance Status				
PS 0	4	7	4	0.562
PS 1	0	1	1	
PS 2	0	0	1	
Type of treatment				
Surgery	1	2	1	0.537
Chemotherapy + Radiation	2	4	2	
Chemotherapy only	1	1	1	
Radiation only	0	0	2	
Immunotherapy	0	1	0	



Strengths and limitations



- > Small sample size
- > Heterogenous population
- > Time of testing
- > Methodological consistency

IASLC

Conclusion and Summary



- Trends towards 6MWT being able to predict complications to first-line treatment
- Should be tested in a larger homogenous trial
- The subjective evaluation of performance status needs an update or replacement of an objective evaluation
- More patients with lung cancer will get a treatment option

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The role of psychology in lung cancer prehabilitation







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Peter MacCallum Cancer Centre, Melbourne













- > Why is psychology important in lung cancer and prehabilitation?
- > What is the role of psychology in lung cancer and prehabilitation?
- > **How** does a psychologist work in this setting?

Lung cancer and wellbeing



- Clinically significant **distress** reported in 51% of lung cancer patients ³
- Prevalence rates of **depression** and **anxiety** range 11% to 40% ^{4, 5}
- Greater symptom burden across the disease trajectory (e.g. fatigue, loss of appetite, shortness of breath, cough, pain)⁶
- Highest rates of **suicide** within the cancer population ⁷
- Spouses exhibit high levels of distress and lower quality of life ⁸
- Significantly more unmet supportive care needs than other cancer patients ⁹



Why focus on wellbeing?

- Patients experience less hopelessness and distress
- Improved treatment adherence
- Increased satisfaction with treatments
- Improved quality of life
- Improved clinical effectiveness and reduced health care costs



But...



- Despite the challenges, wellbeing and psychosocial care remains relatively understudied in lung cancer
- > This is mirrored in the prehabilitation literature





"Prehabilitation enables people with cancer to prepare for treatment through promoting healthy behaviours and through needs based prescribing of exercise, nutrition and **psychological** interventions" ¹⁰

Literature



- Psychological factors have an impact on surgical outcomes in both the short and long term ¹¹
- Psychological prehabilitation interventions have an impact on cancer patients' reported outcome measures including psychological outcomes, quality of life, and somatic symptoms ¹²
- Increasing recognition of the importance of strategies to enhance motivation and maximize compliance in cancer populations ¹³
- Clear recommendations that multidisciplinary cancer prehabilitation programs incorporate a psychological component ¹⁴
- Lung cancer patients arguably population in great need of access to prehabilitation given medical and psychological vulnerabilities ¹⁵

Peter Mac Prehabilitation model

- Medical, Nursing and Anaesthetics
- > Educational component
 - Surgery school
 - > Educational materials
- > Exercise +/- Nutrition, Psychology (based on screening)

IASLC

> Weekly surgical MDTs

Tiered model of psychosocial interventions





Hutchinson et al., 2006

- Importance of information and education for all patients
 - Formal vs informal
 - Surgery school
 - Written resources (including psychoeducational materials)
- Not all will require individual psychological support
 - Role of screening

Screening for prehab psychology



- > MacMillan (2020)¹⁴ recommends (but not limited to):
 - > Patient Health Questionnaire (PHQ-9)
 - Generalised Anxiety Disorder Assessment (GAD-7)
 - Hospital Anxiety and Depression Scale (HADS)

Peter Mac Prehab – Screening tool



Table 1. Four Item Patient Health Questionnaire (PHQ-4)¹⁹

Over the last 2 weeks, how often have you been bothered by the following problems?

	Not at All	Several Days	More Than Half the Days	Nearly Every Day
Feeling nervous, anxious, or on edge	0	1	2	3
Not being able to stop or control worrying	0	1	2	3
Feeling down, depressed, or hopeless	0	1	2	3
Little interest or pleasure in doing things	0	1	2	3

Peter Mac Prehab – Screening process

Patients referred to Allied Health Prehab team by medical team

IASLO

- Screened by member of allied health team alongside other prehab screening measures (physio, nutrition)
- > PHQ-4 >3 = referral to psychology (if consent)
- Psychologist phone call confirms eligibility and screens psychological concerns in more detail
- Patients may also be referred directly by medical/allied health team if clinically indicated

Common emotional responses

- Shock
- Anger
- Exhaustion
- Overwhelmed
- Fear
- Lack of control
- Isolated

- Sadness
- Anxiety
- Hopelessness
- Grief and sadness

IASLC

- Guilt
- Self blame
- Uncertainty

Psychosocial interventions



MacMillan, 2020

Specialist: Specialist psychological and psychiatric interventions such as psychotherapy, including CBT (*Psychologists, Psychiatrists*)

Targeted: Psychological techniques such as problem solving and solution-focused therapy (*health professionals with additional training*)

Universal: Effective information giving, compassionate communication and general psychological support (all health professionals)



Psychological Prehabilitation Assessment

- Individual consultations (50 minutes)
- > Reaction to diagnosis, proposed treatment
- > Understanding of procedure and expectations of recovery
- Anticipation/worry
- > Concerns about pain
- > Motivation for prehab tasks and associated barriers
- > Plans to keep self occupied before procedure, whilst inpatient and during recovery period

IASL

- Social, emotional and practical supports
- Fears relating to procedure and recovery
- > History of previous major life/medical events and coping strategies at this time
- Screening of mood, anxiety, psych history
- > Identifying primary presenting concerns, barriers to preparation, surgery, recovery
- > Identifying patient goals

What are the patient's goals?

- > Key to engaging the patient
- Role of psychology in supporting attainment of patient goals
- Supporting broader team in helping patient attain goals and addressing barriers to doing so



Interventions include



- > Psycho-education on how to mentally prepare for surgery
- Stress-management and problem-solving to overcome obstacles that interfere with exercise and nutrition
- Behaviour therapy and motivational therapy to help change behaviors that will interfere with recovery (e.g., smoking, drinking, inactivity) and enhance wellbeing
- Cognitive behavioural approaches to managing worry, depression, fatigue, pain
- Communication skills (e.g., supporting communication with medical team, family)
- Maintaining motivation
- > Activating supports for the treatment period

Role of psychology within the team



- Role of MDT
- > Understanding the role of each discipline
- Supporting behaviour change processes
- Identifying and highlighting barriers to prehabilitation
- Providing psychological formulation to the team when useful
- Contributing to development of resources and education

Next steps



 Measuring impact of psychological interventions in prehabilitation IASL

- > Quality appraisal of current models of care
- > Routine care vs optimal screening
- > Bias of those who do/do not engage in these programs

Summary



- > Growing evidence for Prehabilitation and role of psychology
- Lung cancer is under-represented in the literature, yet one of the most vulnerable physically and psychologically
- Psychologists have a role to play in addressing individual psychological concerns in prehabilitation while also supporting behaviour change processes more broadly
- This includes development and dissemination of education materials, individual patient work, MDT
- More service appraisal and research is required in this patient population

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