Prehabilitation to improve lung cancer outcomes 2: putting it into practice

Key points

- Undertaking prehabilitation before cancer treatment can help patients to improve their health and fitness, with the aim of optimising treatment outcomes and improving their quality of life. In lung cancer, as in other cancers, the principles of prehabilitation are fairly well established for patients who are eligible for surgery. However, there is an unmet need for inoperable cancers, particularly late-stage cancer (stage-3 and stage-4 disease), in which prehabilitation could improve patients’ performance status, quality of life and their access to systemic anticancer treatment.

- Prehabilitation should be tailored to the individual and empower patients to take an active role in improving their own wellbeing.

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Abstract Prehabilitation helps patients who have cancer to prepare for treatment through physical and mental health training to improve health outcomes and quality of life. In the first part of this two-part series, we looked at the principles and benefits of individualised prehabilitation before cancer treatment and the case for establishing this for non-operative cancers, using the example of advanced lung cancer. In this article, we discuss how prehabilitation for late-stage lung cancer could be integrated into lung cancer services.

should be patient centred and tailored to the individual, building resilience and empowering people to change their behaviours.

There is a growing requirement to include prehabilitation as part of the cancer pathway (Macmillan Cancer Support, 2020). However, evidence that prehabilitation translates into better long-term patient outcomes beyond the initial 30 days’ post-treatment complications is lacking, requiring further patient-focused research.

Prehabilitation programmes may include one or more of the following:

● Exercise;
● Smoking cessation;
● Dietary interventions;
● Psychological assessment and intervention;
● Medical optimisation (Fenemore and Roberts, 2021).

Currently, prehabilitation programmes for lung cancer are mainly targeted at patients awaiting lung resection, with the primary goal being to increase functional exercise capacity. Systematic reviews demonstrate that prehabilitation across several cancer sites, including lung cancer, may be associated with improved functional exercise capacity and patient-reported outcomes (Shukla et al, 2020). Given this, prehabilitation could potentially benefit those with inoperable cancer before systemic anticancer treatment, including patients with advanced-stage cancer.

We discuss below how prehabilitation for late-stage lung cancer could be introduced as part of an integrated lung cancer service, along with some factors that should be considered.

Patient engagement considerations

High symptom burden

Patients with end-stage lung cancer have a high symptom burden, often complicated by coexisting health conditions such as chronic obstructive pulmonary disease (COPD) (Peddle McIntyre, 2019). The effect of living with long-term respiratory symptoms, which can adversely affect exercise tolerance and the ability to live independently, may reduce engagement with prehabilitation programmes. Late diagnosis is more likely to result in a patient being deconditioned and the window of opportunity for prehabilitation may be small if treatment is needed urgently.

COPD is common in patients with lung cancer due to the shared risk factor of cigarette smoking. Patients diagnosed with advanced lung cancer who have existing COPD may have already accessed pulmonary prehabilitation programmes and whether their experience was positive or negative may affect their attitude to prehabilitation. Their COPD may also mean they are physically deconditioned and less resilient emotionally; the lung clinical nurse specialist (CNS) has a role in supporting patients to understand the importance of managing and improving their symptoms before undergoing cancer treatment.

The diagnostic pathway in lung cancer is also complex, involving multiple investigations often at different hospital sites. This places an extra burden on patients in terms of travel time and costs, and may present a further disincentive for them to attend a prehabilitation programme if this cannot be provided locally.

“There is a strong argument for prescribing prehabilitation and considering it as a treatment”

Stigma

Patients with lung cancer, more than those with other cancers, may feel stigmatised by their disease; this can increase their subjective distress and may negatively influence help-seeking behaviours and overall patient outcomes. In lung cancer, health-related stigma often results from the:

● Association with smoking;
● Perception that the disease is ‘self-inflicted’, has high morality, and people’s preconceptions of the type of death that may be experienced (Chambers et al, 2015).

Prehabilitation at diagnosis and throughout treatment could:

● Help patients manage the distress and stigma associated with the disease;
● Support individual coping strategies;
● Improve quality of life (Jabbarian et al, 2019).

Anxiety and depression

The increased burden of physical symptoms experienced by patients with advanced lung cancer increases their likelihood of mental ill health, which could make it harder for them to engage with, and adhere to, a prehabilitation programme. As an example, patients with lung cancer experience high rates of dyspnoea (breathlessness), which is associated with an increased prevalence of anxiety and depression (Dudgeon et al 2001; Smith et al, 2001). Problems can be further exacerbated by the stigma surrounding lung cancer, as well as associated comorbidities such as COPD, which is itself associated with high rates of anxiety and depression (Gore et al, 2000). Levels of anxiety and depression also depend on patients’ coping ability; despite extensive studies on coping with cancer, few focus on patients with lung cancer (Mosher et al, 2015).

Organisational barriers

Organisational barriers to setting up prehabilitation programmes include the lack of a robust evidence base, particularly around outcomes, effectiveness and cost effectiveness (Bloom, 2017), funding constraints, clinician knowledge and acceptability (Granger et al, 2017; Granger et al, 2016).

Evidencing the benefits of prehabilitation is also important in enabling patients to understand why they are having prehabilitation and how it can improve their treatment and quality of life.

Offering prehabilitation

The National Optimal Lung Cancer Pathway was designed to provide a fast, efficient and patient-centred pathway to improve poor survival rates for lung cancer; it emphasises the key role of the lung CNS “in communication, coordination and as a point of contact throughout the patient journey” (NHS England, 2020). This includes assessing and supporting the patient throughout the pathway, ensuring holistic care is provided, and supporting patients and carers with distressing and complex physical, psychological, social, spiritual and financial needs. Providing access to prehabilitation is a part of this.

Health providers should ensure prehabilitation is a standard process in the continuum of care that forms an intrinsic part of the patient pathway and is available for anyone undergoing cancer care. This includes patients undergoing chemotherapy with curative and palliative intent, radiotherapy and surgical interventions. Care needs to be tailored to individual needs and patients must have specialist support to manage their condition. This can empower them to take an active role in improving their overall wellbeing, leading to better outcomes (Macmillan Cancer Support, 2020).

There is no clearly defined model of prehabilitation, but Bloom (2017) suggests it comprises three different stages:

● Pre-assessment – used to measure the patient’s baseline, identify risk factors, inform patients about their treatment,
Box 1. Business case support

The following resources may be helpful in preparing a business case for a lung cancer prehabilitation service:
- Covid 19: Cancer Prehabilitation Toolkit – Bit.ly/NHSCancerPrehab
- Prehabilitation Evidence and Insight Review – Bit.ly/MCSPrehabReview
- Prehabilitation for People with Cancer: Principles and Guidance for Prehabilitation within the Management and Support of People with Cancer – Bit.ly/MCSPrehabGuide
- Cancer Prehabilitation: Building a Business Case – Bit.ly/businesscaselungprehab

Preparing a business case

The lung CNS, cancer team and business managers should prepare a business case justifying the service need, funding and workload implications, focusing on the potential benefits for optimising patients’ treatment, improving health outcomes and quality of life, and reducing health and social care costs, among other factors (Healthy London Partnership, 2020). Evidence should be drawn from multidimensional and multimedia programmes (Healthy London Partnership, 2020).

Box 2. Top tips for preparing a business case for cancer prehabilitation

- Evidence the benefits – Healthy London Partnership (2020) gives a useful summary of key findings
- Show patient need – conduct simple audits using patient screening tools
- Consider the benefits in the timeframe before treatment – some patients can experience benefit in as little as two weeks (Macmillan Cancer Support, 2020)
- Develop simple outcome measures for each element of prehabilitation – for example, improvements in weight and appetite, activity and performance status
- Use what you already have – is there capacity in existing services, staff who can coordinate/support prehabilitation, interventions clinical nurse specialists are doing already to help patients manage symptoms and improve their quality of life?
- Do your sums – consider resourcing, additional staffing needs and anticipated financial savings

Discussion

NHS clinical practice (Moore et al, 2021). Notably, few centres offer it for inoperable lung cancer, particularly that which is late stage (Peddle-McIntyre et al, 2019; Driessen et al, 2017). More research is needed on patient experience and quality of life to develop prehabilitation models for late-stage lung cancer.

Prehabilitation services for lung cancer vary, with many centres using established pulmonary prehabilitation services because of their knowledge of chronic respiratory conditions, and due to funding constraints. However, the standard length of pulmonary prehabilitation programmes does not fit in the timescales and targets of the cancer pathway; as such, this is less suitable for patients with lung cancer (Peddle-McIntyre et al, 2019).

Ricketts et al (2020) attributed the variable content and length of prehabilitation programmes nationally to obstacles such as lack of funding and resources. One successful model is Prehab4Cancer (prehab4cancer.co.uk), a large-scale, multimodal prehabilitation programme, developed and adopted as a standard of care by Greater Manchester Cancer (Fenemore and Roberts, 2021). There is a real opportunity for such standards to be adopted by other UK authorities, although further evaluation is needed to assess the programme’s transferability nationally (Moore et al, 2021).

In Rotherham, re- and prehabilitation is provided for people with respiratory conditions, including lung cancer, in conjunction with a well-established pulmonary rehabilitation service for people with COPD; the service is called BreathingSpace (Bit.ly/RotherhamBreathing). In addition, a prehabilitation programme at Nottingham University Hospitals NHS Trust is aimed at patients receiving systemic anti-cancer treatment (SACT) and provides a structured approach to developing a prehabilitation programme (Ricketts et al, 2020).
programme. Further information can be found at Bity[PrehabSACT].

Measuring effectiveness
Evidence for the effectiveness of prehabilitation in advanced-stage lung cancer is limited, mainly due to the small number of centres offering this nationally (Moore et al, 2021). Effectiveness of prehabilitation has traditionally been measured against specific outcomes, such as reduced length of stay, enhanced quality of life, reduced complications, improved cardiovascular fitness and nutritional status (Bloom, 2017); however, Moore et al (2021) recommend further ‘real-world’ evaluation. The case study in Box 3 shows how prehabilitation can potentially improve patient access to and suitability for treatments.

When measuring effectiveness, it is important to clarify a patient’s concordance with prehabilitation and why patients might not fully adhere to their programme, as this can distort the outcome (Macmillan Cancer Support, 2020). Whether a patient is willing to commit fully or can adhere to the programme can also affect the choice of care pathway. Monitoring adherence using validated tools to measure outcomes in a standardised way is the only way to evaluate the effectiveness of interventions (Macmillan Cancer Support, 2020; Driessen et al, 2017).

Conclusion
A prehabilitation programme can help patients with cancer manage their symptoms and improve their fitness for treatment, but is currently only well established for operable cancers. Introducing prehabilitation for late-stage lung cancer could improve patients’ fitness for systemic treatment, as well as health outcomes and quality of life for this group NT.

References
Macmillan Cancer Support (2020) Prehabilitation for People with Cancer: Principles and Guidance for Prehabilitation within the Management and Support of People with Cancer. MCS.

Box 3: Case study
Mr Leonard is a 68-year-old male admitted to the emergency department with increased shortness of breath, fever, fatigue, productive cough with green sputum and three episodes of haemoptysis. Flu-like symptoms starting three weeks earlier had worsened over recent days. The patient has a medical history of COPD, depression and hypertension. He is an ex-smoker of 10 years and lives with his wife. He is normally mobile and self-caring with a World Health Organization PS of 1 (0 = fully functional, 4 = bedridden) and manages stairs without difficulty. Following a chest X-ray, he is treated for community-acquired pneumonia, but his condition deteriorates, and a CT scan shows a large, right upper lobe mass in his lung, extensive lymphadenopathy and a metastatic liver deposit. An endobronchial ultrasound confirms metastatic adenocarcinoma of the lung. On discharge after a prolonged hospital stay due to the co-existing pneumonia, he is less mobile and independent, with a PS of 3. Multidisciplinary team discussion confirms stage-4 cancer. The plan is to offer him systemic treatment, but only if his PS improves.

At review two weeks post discharge, his PS remains at 2-3, his appetite is poor and his cancer diagnosis has exacerbated his depression. He is reviewed by the lung cancer CNS and told that, given his poor PS, he is not fit enough for treatment but could be supported to improve his fitness and general wellbeing. Alongside ongoing support from the lung cancer CNS, Mr Leonard is referred to a dietitian, occupational therapists, clinical psychology, and a palliative care team.

At a telephone follow-up two weeks later, Mr Leonard reports some improvement in his general wellbeing; his PS is now 2, but his mood is still low and his antidepressants have been increased. He agrees his reduced mobility and fatigue could be mood-related and consents to more input from clinical psychology and the CNS team.

An oncology review two weeks later notes further improvement: his PS is now close to his baseline at 1-2. The oncologist agrees to commence an initial systemic anti-cancer therapy (SACT). Mr Leonard completes four cycles of this treatment, and then continues on a maintenance SACT. He continues his exercise regime and psychological support throughout treatment, and has few side-effects, except mild nausea and fatigue.

*Patient’s name has been changed.

CNS = clinical nurse specialist; COPD = chronic obstructive pulmonary disease; CT = computed tomography; PS = performance status.

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