

## **Research project on effect of singing training in post-operated lung cancer patients**

Lung cancer confers a poor prognosis compared to other common cancer diseases (breast, colon, prostate). Survival rate and symptom burden depends on cancer type (small cell, SCLC, or non-small cell, NSCLC) and stage. In localised or minimally local-advanced NSCLC (stage I and II), intended curative treatment is offered as either surgery or by stereo stereotactic radiation therapy. Currently, around 30% of patients with NSCLC are offered (intended) curative treatment, however, this percentage is expected to increase. Compared to age-matched control subjects without lung cancer, patients who survive their lung cancer have persistently reduced QoL, reduced social activity, and more comorbidities (some but not all tobacco-related). Five-year survival is mere 75% even in the lowest NSCLC stage (tumor under 10 mm and no dissemination, T1aN0M0). In comparison, average five-year-survival across all stages of breast cancer is around 95%. The follow-up programme is rehabilitation after ended intended curative NSCLC therapy, is clinical assessment after 4 months in a respiratory ward, and CT control for 5 years to detect cancer recurrence (every 3<sup>rd</sup> month for two years, and every 6<sup>th</sup> month for the next three years). Thus, the current programme does not address the long-term decline in QoL and social activity.

The post-doc project will build upon results from Sing-a-Lung 1.0, within a framework of four years, as singing training for lung cancer patients after intended curative treatment has not yet been investigated. Singing training is an activity that both comprises elements of physical training and psychosocial aspects, which meets the needs of lung cancer patients. Previous studies suggest that lung cancer patients gain a physiological training effect from participating in singing training and that singing training lead to increased respiratory control, less dyspnoea, improved QoL, and reduced anxiety and depression. Patients experienced to be among peers, participating in a fun and meaningful activity. Thus, singing together may support and strengthen physiological parameters, and moreover, break the vicious circle of loneliness, isolation, and hopelessness that many people with lung diseases – including patients with lung cancer – struggle with.

We will conduct a two-armed, multicentre-RCT with 10 weeks intervention as add-on just after completion of usual care (community-based PR with physical training) after intended curative NSCLC therapy (surgery/stereotactic radiation) and with singing training as active intervention and film club attendance as comparator. Besides objective outcomes such as walking distance and lung function, we will investigate effects on physical activity, QoL, and symptoms burden (e.g. pain, cough, nausea, dyspnoea, dysphonia), health care usage, GP visits, hospital visits, and drug prescriptions as secondary outcomes. Moreover, we will include a qualitative study about living with lung cancer after PR and about the experience of singing together with peers.

The project will be cross-regional (at least comprising Region Zealand, Capital Region of Denmark, and Region of Southern Denmark through recruitment of patients via "Rigshospitalet" and "OUH"), and cross-disciplinary (surgery, respiratory medicine, oncology, health economics, qualitative research, and "Arts-in-Health"-aspects). Besides the Danish Research Center for Lung Cancer, the post-doc-project will be affiliated with Pulmonary Research Unit, Region Zealand (PLUZ), Department of Respiratory Medicine, NSR Hospitals (professor and head of research, Uffe Bødtger) and with university affiliation at Institute of Regional Health Research, University of Southern Denmark (head of institute, Rikke Leth-Larsen). Furthermore, the project will be affiliated with the research unit PROgrez, Department of Physiotherapy and Occupational Therapy, Næstved-Slagelse-Ringsted Hospitals (professor and head of research, Søren Thorgaard Skou), and "Dansk Forskningscenter for Lighed i Kræft", University Hospital Zealand (professor Susanne Dalton).