In this project we seek to develop and evaluate a digi-physical tool for in-home training of best breathing technique. We follow the quadruple helix model for innovation, where the patients, the clinic, academia and industry work in co-production to ensure a safe, quality assured, feasible and sustainable process that can lead to an evidence-based result.

The purpose is to describe and evaluate a person-centered model to practice the most optimal breathing technique for breath-adapted postoperative radiotherapy of women affected by left-sided breast cancer.

Using qualitative and quantitative methods, the project will examine how the model affects health-related outcome measures such as perceived health literacy (HL), distress (worry, anxiety) and the feeling of being prepared. It will also determine whether this training may be time and cost effective for the health service.

What is DIBH?

Deep Inspiration Breath Hold (DIBH) technology is increasingly used with radiation therapy to protect healthy organs from unwanted absorbed dose. Using deep breaths, this technique creates a larger distance between the heart and the chest wall.

DIBH has shown good results, but requires a well-prepared, involved patient who has learned the correct breathing technique so that optimal position and breathing patterns can be reproduced during each treatment session. There is no evidence regarding which type of inhalation is optimal or how to best practice this.

A person-centered model for DIBH training has been developed in co-design with relevant stakeholders, and this will be integrated into a digital information and instruction tool enabling training undertaken at home.

The two X-ray images illustrate the same patient when free-breathing (A) and deep breathing (B). Darker grey areas are the lungs. In image B a drawn projection shows the heart (red) and target volume (turquoise). RT is delivered within the yellow demarcation. Yellow area shows RT blockage. At deep breathing, the chest is widened, and the volume of the heart is transferred downwards together with the diaphragm (B). Images show how the anatomy at deep breathing is preferable and, in this specific case, RT can reach target volume without affecting the heart.