

Outline of PhD in progress (2016 – 2021)

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Improving COMFOrt for cancer patients receiving RadioTherapy: integrating a acceptability study (COMFORT study)

Principle Aim

The overarching aim of this project is to develop a comfort intervention for patients receiving radiotherapy with extended treatment times, and to explore in an acceptability study.

Objectives

1. Explore patient experiences of comfort during radiotherapy, and to explore radiographer views of managing patient comfort during the delivery of radiotherapy (Work Package 1)
2. Develop a comfort intervention based on the experiences of patients and radiographers and the available evidence and prepare training and associated materials required to deliver the intervention (Work Package 2)
3. Conduct an acceptability study of the developed comfort intervention (Work Package 3).

Outcomes

The findings of the study will provide an in-depth understanding of patient comfort during radiotherapy and develop a comfort intervention to improve the care and treatment of cancer patients. This comfort intervention will be tested in an intervention acceptability study. We believe that the study will deliver:

- Examples of good and bad practice, challenges to comfort management, and the ideal comfort management based on patients' and radiographers' views and experiences
- A comfort intervention deliverable in daily radiotherapy practice
- The findings of the three studies will help to design a larger study.

Review of literature and identification of current gap in knowledge

Radiotherapy uses high-energy radiation in the treatment of cancer. Over 125,000 patients are treated each year across 50 NHS Trusts in England¹⁻². Radiotherapy is an effective treatment resulting in 40% of patients being cured³. It is usually delivered in less than 10 minutes delivered in 20 to 37 fractions over a course of 4

to 8 weeks for an optimal therapeutic dose. Patients receiving radiotherapy first have a planning computerised tomography (CT) scan to plan the treatment by defining parameters such as target area and position of radiotherapy beams. During treatment and verification scans, patients are positioned to restrict motion and ensure that normal tissues are avoided⁴. It is essential that the daily treatment position replicates patient position and tumour delineation on the planning CT to ensure reproducibility and accuracy of radiotherapy and to minimise the acute, late and long term side effects of treatment⁴⁻⁶. Thus, patient positioning is a crucial part of treatment and use of immobilisation devices such as full head masks or knee rests to reduce positioning errors are common. Immobilisation can be uncomfortable and patient comfort is managed by radiographers daily, usually by enquiring whether the patient is comfortable and adjusting patients' position. This is completed 'ad-hoc' without any evidence⁷. Therefore, practice may be variable within and between radiotherapy departments.

Advancements in radiotherapy, such as stereotactic ablative body radiotherapy (SABR), are improving cure rates and reducing side effects⁸⁻⁹ but are impacting on radiotherapy practice in relation to patient positioning and comfort as times are extended from 10 up to 30 minutes or longer¹⁰⁻¹¹. Dawson and Balter¹¹ suggest that the main consideration for extended treatment times, which can lead to organ motion and involuntary patient movement, is to ensure patient comfort. Currently, there is little research or guidance how best to assess and manage patient comfort in radiotherapy practice¹².

Patient comfort in radiotherapy has been observed in a few studies. Cox and Davison¹² proposed comfort may be determined by treatment position (prone or supine) in patients receiving treatment for prostate cancer. Patients treated prone or supine reported similar levels of comfort; however, the authors did not evaluate positional stability or accuracy of radiotherapy. Bartlett et al¹³⁻¹⁴ investigated a cardiac sparing technique in patients undergoing radiotherapy for breast cancer in a series of studies. They compared a supine breath holding technique to a prone technique where the ipsilateral breast hung below the patient¹⁴. Improved patient comfort coincided with a statistically significant ($p=0.04$) improvement in accuracy in the ventro-dorsal direction. These authors have demonstrated a link between comfort and accuracy in radiotherapy that supports the exploration and development of a radiotherapy comfort intervention.

Preliminary data

In a preliminary patient consultation round, the lead applicant explored comfort with patients with head and neck cancers who had undergone radiotherapy¹⁵. Comfort was important to them and three major themes emerged: physical comfort, mental perception, and passivity. One patient described the use of a face mask for immobilisation like "being suffocated with cling-film and immersed into a vacuum former". Patients' discussion of their experiences during head and neck radiotherapy indicated that radiographers may not fully appreciate the level of

patient discomfort and supported further focus on patient comfort during radiotherapy. Importantly the findings indicated that something needs to be done to improve comfort in patients undergoing radiotherapy. Kolcaba et al¹⁶⁻¹⁷ developed a theory of patient comfort in nursing. They described comfort as existing in three forms; relief, ease, and transcendence and identified four contexts of comfort including physical, psycho-spiritual, environmental and socio-cultural. Kolcaba's comfort theory has informed interventions that have been shown to improve patients' comfort. These include hand massage (HM) for nursing home residents¹⁸ and guided imagery (GI)¹⁹ for psychiatric in-patients with depression. These studies indicate that a comfort intervention could be developed for radiotherapy.

Further work includes systematic literature reviews (SLR) of quantitative studies to appraise comfort interventions in healthcare disciplines for applicability to radiotherapy, and qualitative studies to explore the lived experiences of patients undergoing a healthcare procedure while receiving a comfort intervention. The quantitative SLR has identified potentially suitable comfort interventions. These include music and relaxation-based interventions for patients undergoing local anaesthetic surgical procedures²⁰; relaxation techniques including guided imagery, progressive relaxation, self-hypnosis and deep breathing exercises for patients undergoing endoscopy²¹; and in stereotactic lung cancer radiotherapy a thin mattress emphasising patient comfort which reduced treatment times compared to that reported with a restraining immobilisation systems²². This work will be completed in July 2017 but indications are that there are several pre-existing interventions that may improve patient comfort during radiotherapy.

The lead applicant is also the co-innovator of a motion capture pillow (MCP) which aims to improve patient comfort during radiotherapy using a robotic solution²³. Preliminary proof of concept studies in patients with head and neck cancer have shown the MCP to be a very good position tracking tool and has the potential to improve patient comfort through soft supports and replacing the thermoplastic mask²³.

Potential comfort intervention: The comfort intervention is likely to be a bundle of care that may be self-managed by patients, delivered by radiographers, or a combination of before-and-during radiotherapy to improve comfort. Resource constraints will be an integral consideration when deciding on the design of the intervention.

Summary of Methodology

Work Package 1

This study plans to gain insight into the most ideal solution for managing patient comfort from both patients and radiographers using qualitative methods to explore

their experiences and views on comfort during radiotherapy and how it can be managed²⁴⁻²⁵.

Work Package 2

This study concentrates on development of the comfort intervention with mapping of the findings from WP1 into a comfort framework for radiotherapy. The mapping process involves six steps: preparation, generation, structuring, representation, interpretation and utilisation²⁶⁻²⁹ and concludes with a draft comfort intervention with a training and implementation guide to use in radiotherapy practice.

Work Package 3

The objective is to undertake an intervention acceptability study of the comfort intervention in radiotherapy practice. This study will focus on evaluating acceptability among patients and radiographers. Successful implementation depends on the acceptability of the intervention to both intervention deliverers (e.g. radiographers) and recipients (e.g. patients)³⁰.

Potential impact

There are indications that better patient comfort may improve treatment accuracy but it is not consistently considered in practice. This study has the potential to provide a patient-centred approach and improve patients' comfort during treatment through a better understanding of their experiences and developing and testing comfort intervention for radiotherapy. Through filling this gap in clinical knowledge, the profile of patient experiences and outcomes including comfort will be improved. Successful application of the comfort intervention will improve radiotherapy practice and advance the evidence base for radiographers' clinical skills. It will also enable further research to be led by radiographers.

Dissemination Strategy

The dissemination of the findings will take place through publication in peer-reviewed journals. It is anticipated that there will be three main publications from this work including the interviews from the exploratory phase, the development of the comfort intervention and the feasibility RCT. The results will be presented at the host site, regional symposiums and (inter)national radiography conferences. The University of the West of England, where I will undertake the PhD, has a Research Repository blog to disseminate the findings. The NHS communications team will be consulted and news release will be made via trust internet, twitter, Facebook, YouTube, SCoR research forums leading to newspaper, radio and hopefully TV coverage. This will enable professional, patient and public feedback as the study is in process.

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