Project Title: **Correlating Chest wall OAR doses with clinically relevant chest wall pain and rib fractures in the cohort of patients receiving Lung Stereotactic Ablative Radiotherapy**

Brief Description

Stereotactic Ablative radiotherapy (SABR) is the preferred treatment technique for early stage non-small cell lung cancer. Using this technique, patients are planned to receive either 55Gy in 5 fractions or 60Gy in 8 fractions according to the established protocol. Due to the involved high dose and proximity of the tumour to the normal organs, complications from this technique are not always avoidable. In this retrospective study, chest wall toxicity is to be analysed in detail in co-relation to the predicted dose delivery from the treatment planning process.

Materials and Methods

In this study, the clinical treatment plans used for 30 Ca. Lung patients treated with SABR treatment technique will be retrospectively analysed to correlate the chest wall dose to the chest pain and rib fractures. All the patients' dicom RT data will be anonymised using the department's approved anonymiser program and will be transferred to the 'training database' of the Raystation treatment planning system. The evaluation of the volume delineation and dose-volume estimation will be performed using the anonymised data. Delivered dose to the chest wall and its correlation to the chest wall complications will be analysed through suitable radiobiological indicators and that will be compared with the clinical follow-up information for respective patients.

Outcome of the project

The project outcome may highlight the possibilities to improve the patient preparation, volume rendering for regions of interest in the thoracic region and possibly establish alternative treatment delivery technique strategies if there is a correlation observed between delivered dose and observed complications.

Stakeholders

Dr. Zoya Habib	M.Sc Medical Imaging Student, Biomedical Engineering, University of Dundee	Researcher
Mr. Sankar Pillai	Head – RT Physics Medical Physics Department Ninewells Hospital & Medical School, Dundee	Radiotherapy Physics Supervisor
Mr Adrian Lonsdale	Head – Treatment Planning Radiotherapy Physics Medical Physics Department Ninewells Hospital & Medical School, Dundee	Treatment Planning and IT Advisor
Dr. Humza Javed	ST6 Clinical Oncology Ninewells Hospital & Medical School, Dundee	Clinical Supervisor
Dr. Vincent Wong	ST6 Clinical Oncology Ninewells Hospital & Medical School, Dundee	Clinical Supervisor
Dr. Chunhui Li	Senior Lecturer, Biomedical Engineering University of Dundee	Academic Supervisor
Dr. Hannah Lord	Consultant Clinical Oncology Ninewells Hospital & Medical School, Dundee	Clinical Advisor

Time Scale

Period	Task
18th April 2022 to 29th April 2022	Familiarisation of SABR treatment process at Ninewells Hospital
09th May 2022 to 20th May 2022	Literature Review; Treatment Planning tasks
25th May 2022	Literature Review submission to UoD
01st June 2022 – 05th Aug 2022	Data collection ; Data analysis ;
08th Aug 2022 – 19th Aug 2022	Thesis preparation , Review & Completion ;
22nd Aug 2022 – 26th Aug 2022	Thesis presentation; Final Viva.