

AbstractID: 9191 Title: The Role of MRS in Radiation Therapy: Correlation between T2-weighted MRI , Biopsy and MRS

**Purpose:** To investigate the possibility of using objective parameters in MRS of the prostate to identify areas of viable cancer that might need higher radiation therapy dose. Clinically, MRI and biopsy results may not always agree. MRS data can be very helpful in objectively defining a set of parameters that can positively identify cancerous regions.

**Method and Materials:** Patients who are treated for prostate cancer using radiation therapy in our department are analyzed retrospectively. These patients are imaged using a GE 1.5T MRI scanner. T2-weighted MRI images and MR spectroscopy are performed on these patients. MR spectroscopic data, in particular the ratio of Choline and Creatine to Citrate can be used to identify areas of the prostate, which could be boosted with additional dose since those areas are more prone to radiotherapy failure. In this study an attempt is made to define a set of parameters that will enable identifying areas of the prostate needing higher dose. As a first step, the correlation of biopsy-positive data, MRS data, and expert reading of the T2-weighted MR images by a radiologist is investigated. The prostate is divided into six parts, namely Right and Left parts of the Base, Mid, and Apex regions for this study. MRS data is gathered using the GE prostate protocol PROSE. An endorectal coil with the balloon filled with perflubrom is used in the MRS data acquisition.

**Results:** Preliminary results from the analyses of four patients show a varied degree of correlation between the biopsy, MRS data, and the radiologist's readings although a minimum MRS ratio for the cutoff of cancer-positive identification can be found.

**Conclusion:** Objective cutoff parameters can be found for a population of prostate cancer patients to identify regions of the prostate, which are candidates for additional higher radiation dose.