

AbstractID: 1753 Title: Observer Variations and Patient Characteristic Correlations in EPID Based Prostate Localization

Accurate routine use of localization tools such as an EPID, relies on an efficient and reliable daily alignment procedure. Target position variations may also be correlated with patient characteristics, such as prostate volume, rectal size or patient weight. Data from daily fiducial-based EPID localization of 84 prostate patients was analyzed retrospectively for correlations of the initial setup position of the prostate with patient characteristics as well as inter and intra observer variations. Inter observer variations were obtained from the standard deviation of the difference between the localization performed by the group of therapists (~20) that routinely perform this procedure and expert observers (one M.D. and one physicist who evaluated every image of every patient). Intra user variation was determined through a single user performing the same matching numerous times. Correlations were assessed for the prostate position versus patient weight, prostate volume and rectal diameter (at CAX) in 3D and for each body axis. Inter observer variation for the prostate, RTT to expert was $\sigma = 2.2\text{mm}$, while from expert to expert the value was 0.88mm . For intra observer it was 0.26mm . These data suggest that reliable localization (within 2mm) can be reasonably achieved in routine clinical practice. A clinical threshold of 3-5mm is practical. Correlation evaluations indicate mild relationships may exist between prostate volume, rectal size and the ability to localize the prostate as evidenced by its position the standard deviation. Such data may indicate which prostate patients would benefit most from daily localization and which would not need it.