# AbstractID: 1486 Title: The effect of gantry angle on megavoltage photon beam attenuation by carbon fiber couch inserts.

The use of rigid carbon fiber couch inserts in radiotherapy treatment couches is a well-established method of reducing patient set-up errors associated with couch sag. Several published studies have described such inserts as radiotranslucent with negligible attenuation of the radiation field. Another investigation concluded that the presence of carbon fiber inserts in the beam significantly increased the surface dose to the patient, but reported minimal beam attenuation. An attenuation of 15% has been reported when head and neck IMRT treatments were replicated and assessed using film dosimetry but the magnitude of beam attenuation reported could be attributed to the couch rails and immobilization devices as opposed to the carbon fiber insert panel. These studies were conducted with the radiation field normally incident on the couch and there appears to be no evidence in the literature of the effect of gantry angle on beam attenuation during external beam radiotherapy. This study examined the magnitude of this effect over a range of posterior oblique gantry angles using a cylindrical solid water phantom containing an ionisation chamber placed at the isocenter. It was found that a 6MV photon beam, field size 10x5cm, was attenuated significantly as gantry angle approached the plane of the couch, from 2% at normal incidence and reaching a maximum of 9% attenuation at 110°. This could have significant implications regarding dose to the treatment volume in cases requiring beams with posterior oblique angles of incidence and introduces the requirement for a correction factor in monitor unit calculations.