

AbstractID: 3154 Title: In vivo dosimetry using disposable MOSFET dosimeters for total body irradiation

**Purpose:** The “OneDose” MOSFET dosimeter, manufactured by Sixel Technologies, is used for individualized patient dosimetry measurements for radiation therapy. These dosimeters, which are pre-calibrated by the manufacturer, are designed for single use for conventional radiation therapy treatments. We tested the usefulness, reliability and applicability of these dosimeters for use in total body irradiation procedures, where the field sizes, distances, and irradiation conditions differ substantially from the standard conditions used for factory calibration

**Method and Materials:** We have compared the response of OneDose dosimeters with that of Thermoluminescent Dosimeters (TLDs) calibrated ‘in-house’. OneDose dosimeters were paired with two TLDs and were placed beneath bolus to provide adequate build-up. The detectors with build-up were then taped to the skin of the patient at various sites of interest, including the head, neck, umbilicus and lungs. In most cases, cerrobend lung blocks were used. Readings of the OneDose were taken immediately following irradiation. The TLDs were read 2 – 4 days later.

**Results:** Of the four patients studied thus far, the doses measured at the head, neck, and umbilicus fell between 105 and 210 cGy. For these sites agreement with the TLDs was generally within  $\pm 5\%$ . Measured doses for the regions of the lung showed greater variability. This may be due to placement errors or the lower doses ( $< 20$  cGy) and steeper dose gradients that occurred when the lungs were shielded with cerrobend blocks.

**Conclusion:** The dose measured by the OneDose detector shows relatively good agreement with that measured by TLDs in total body irradiation. Our research plan includes study of another six patients, with the intent of being more precise in the placement of the dosimeters in the region of the lung.

**Conflict of Interest Information:** ASB has a sponsored research agreement with Sixel Technologies, Inc. for the study of implantable sensors.