

AbstractID: 13188 Title: Evaluation of Xofter Electronic Brachytherapy system for intraoperative treatments

**Purpose:**

The main objective was to evaluate and commission the Xofter Electronic Brachytherapy System for intraoperative treatments.

**Method and Materials:**

Using the manufacturer supplied phantom, we evaluated and commissioned the Xofter Electronic Brachytherapy system. We tested well-chamber constancy and intercomparison, beam output stability with time, start/end effects, and performed radiation surveys. Other checks recommended by the AAPM TG152 were evaluated.

**Results**

1. The Ir-192 calibrated well chamber is 3.7 times more sensitive when irradiated with the Xofter source than the Xofter calibrated well chamber. Expectation was that both chambers would give approximately the same reading because the Xofter integrated well chamber is cross calibrated in I-125 source.
2. It takes about 28s for the dose rate from the Xofter Unit to ramp up to the treatment dose rate. The unit delivers 9s worth of treatment during the ramp up phase. For treatment times less than 100s, this would introduce a dosimetry error of about 10% which will be repeated if there is a treatment interruption.
3. Xofter Unit output may vary by up to 5% between 0.25 and 30 minutes. This variation is source dependent. So the minimum time used to collect charges for the AAPM-TG61 calibration should be 1 minute, not 0.25 minute.
4. Radiation surveys during treatment indicate that surface and intraoperative treatments give rise to exposure rates of 200mR/hr, 30cm from treatment area.

**Conclusions:**

1. Well chamber calibration inconsistency for Xofter Unit needs further investigation.
2. Ramp up time accounts for 9s equivalent treatment time. Correction needed for treatment time less than 150 seconds.
3. Charges for TG61 calibration should be collected for at least 1 minute, not 0.25 minute.
4. Intraoperative and surface treatment produces exposure rate of 200mR/hr at distances of 30 cm. Exercise extreme caution by standing behind lead shield or wearing a lead apron.