

AbstractID: 8410 Title: The role of the radiotherapy physicist in intraoperative partial breast irradiation using a low energy X-Ray source, based on 10 years clinical experience.

Purpose: To describe the role of the radiotherapy physicist in the clinical implementation of the Intrabeam™ system for intraoperative radiotherapy (Carl Zeiss, Germany), based on 10 years experience at University College London Hospital. **Method and Materials:** On delivery of the 50kVp electronic X-Ray system, the Radiotherapy Physics Group undertook acceptance and commissioning. Half-value layer measurements were made using a PTW 23342 0.02cc ion chamber. A dedicated water phantom was employed to measure variation of dose rate with radial distance from the X-Ray source in 5 orthogonal directions and in one direction for each of 8 spherical applicators. These measurements were compared with the manufacturer supplied QA peripherals and with radiochromic film to assess radial isotropy and output constancy and stability. A radiation protection survey and risk assessment was performed for unshielded operating rooms (OR) prior to clinical introduction. The routine physics requirement comprises: pre-treatment QA and calculation of applicator treatment times; in the OR: actively delivering and monitoring the radiation treatment, monitoring and enforcement of staff radiation protection in and around the OR and measurement of patient skin dose by TLD. **Results:** UCLH physicists have commissioned 4 such X-Ray sources for clinical use. We have treated 134 patients over a period of 10 years. To date, dose rate surveys during treatment have demonstrated the safe usage of the system under controlled conditions and no member of staff has had a recordable radiation dose. **Conclusions:** The Intrabeam™ device has been shown to be very stable dosimetrically and also practical within a standard clinical environment. The involvement of the radiotherapy physicist in the commissioning and clinical implementation of this intraoperative radiotherapy system is imperative to ensure safe treatment delivery and radiation protection of staff and patients.