AbstractID: 3920 Title: Comparison of Chest Radiographs, Fluoroscopy and Seed-migration Detector for the Detection of Embolized Seeds to the Lung

Purpose:
To evaluate the efficacy of a seed-migration detector and to compare its performance to fluoroscopy and to the postoperative chest radiographs generally recommended.

Method and Materials:
A low energy gamma scintillation survey meter, used together with a count rate meter, was converted to a seed-migration detector. The detector was used to perform a chest evaluation on 155 patients (8717 seeds) at their first postoperative visit. When the detector showed activity around a patient's chest, it was confirmed by taking an antero-posterior chest radiograph and by looking at the region with fluoroscopy.

Results:
33 patients (21.3%) present at least one embolized seed. That is a 0.47% seed migration rate (41/8717). 37 (90%) of the seeds were visible under fluoroscopy and 28 (68%) appeared on x-rays. Rapid movement of the seeds, due to breathing or to a location close to the heart or the diaphragm, makes nine seeds to be visible with fluoroscopy but not on the radiograph. Moreover, four seeds were not visible with fluoroscopy neither with radiograph. In comparison to the seed-migration detector, detection based on fluoroscopy would have led to four false-negative detections (out of 33 or 12.1%) while the radiograph would have resulted in thirteen (out of 33) false-negative detections or 39.4%. Finally, standard chest x-ray would have required a survey, and extra radiation dose to lung, to 100% of the patients rather than the 21.3% who needed it in this study.

Conclusion:
Because of the high false-negative rate and the superior efficacy of a scintillator-based seed-migration detector, the usual recommendation to perform chest radiographs should be revised. X-rays should remain for documentation purposes of positive cases only. Our clinical experience also allowed us to conclude that the detector is convenient, cost-effective and non-invasive, meaning that it does not require any additional radiation to the patient.