# AbstractID: 3014 Title: CCTV-based Patient Setup Aids and Monitoring System in RT

**Purpose:** To analyze patient motions as well as patient positioning during conventional radiation therapy, a radio frequency (RF)-based CCTV system with semi-beam's eye views (BEV's) is to verify patient setup.

**Method and Materials:** In order to capture patient images in semi-beam's eye views, 4 small cameras are installed in the blocking tray, which is mounted in the treatment head of linear accelerators: right, left, superior, and inferior oblique angles towards the isocenter of the linear accelerator. Each camera has its own 2.7GHz RF module (minimize the cross-talk interference between RF source of linear accelerator and the CCTV system), and transmits the signal to the receivers, which are placed in the wall of the treatment room. The semi-BEV images are monitored before and during irradiations and saved in the computer. The CCTV images and port films taken and analyzed in the first day, then are used as reference images. Also, a special laser with a point and a circle is attached in the tray to make a reference point for 4 cameras and a magnification factor (can be used as SSD meter)

**Results:** The CCTV images are captured in semi-BEV's, thus very useful to compare the room lasers, cross hairs, and anatomical landmarks in patient contours. Because of wide dynamic range of the video amplifier, it can provide the patient images as well as room laser, and light field with room lights off. The radiation effects appear as a pepper and salt noise, which can be eliminated by employing averaging kernel in the computer.

**Conclusion:** This CCTV system will be expanded to correlate with CT images in future and under progress. Also, the CCTV-based images will be connected to the internet, so that the doctors can be able to monitor patient setup in remote site.