Purpose: The purpose of our study was to fabricate in-house web-camera based automatic continuous patient movement monitoring device and control the movement of the patients during EXRT.

Methods: Web-camera based patient movement monitoring device consists of a computer, digital web-camera, mounting system, breaker circuit, speaker, and visual indicator. The computer is used to control and analyze the patient movement using indigenously developed software. The speaker and the visual indicator are placed in the console room to indicate the positional displacement of the patient.

Results: Studies were conducted on phantom and 150 patients with different types of cancers. Our preliminary clinical results indicate that our device is highly reliable and can accurately report smaller movements of the patients in all directions. The results demonstrated that the device was able to detect patient's movements with the sensitivity of about 1 mm. When a patient moves, the receiver activates the circuit; an audible warning sound will be produced in the console. Through real-time measurements, an audible alarm can alert the radiation technologist to stop the treatment if the user defined positional threshold is violated. Simultaneously, the electrical circuit to the teletherapy machine will be activated and radiation will be halted.

Conclusions: Patient's movement during the course for radiotherapy was studied. The beam is halted automatically when the threshold level of the system is exceeded. By using the threshold provided in the system, it is possible to monitor the patient continuously with certain fixed limits. An additional benefit is that it has reduced the tension and stress of a treatment team associated with treating patients who are not immobilized. It also enables the technologists to do their work more efficiently, because they don't have to continuously monitor patients with as much scrutiny as was required.