The purpose of this work is to introduce a video-based technique to reduce CT-to-treatment transfer errors. System hardware includes a PC, digital frame grabber and two B&W CCD cameras mounted in the treatment room on the ceiling near the AP laser and on the wall near the right-lateral laser. Aimed at the linac isocenter, the cameras provide orthogonal views of the patient on the treatment table. The cameras were calibrated to determine the distance to the isocenter, pixel coordinates of the isocenter in projection, polar and azimuthal angles of incidence, and field of view. The procedure begins with the acquisition of a CT scan of the patient in the treatment position. In computer space, the calibration parameters are used to view the CT data from the lateral and AP camera's-eye-views. Volume-rendering software is used to create a pair of '3D' skin images with viewing perspectives identical to those of the two cameras. On the first day of treatment, patients are positioned initially using skin marks and isocentric lasers. The setups then are fine-tuned using a pair of live overlay images, in which the skin images (indicating the correct setup) are layered on top of live video (of the slightly misaligned patient). With the aid of a computer monitor in the treatment room, therapists use the layered images to interactively return the patient to the correct position in 1 – 2 minutes. Sample images and results of clinical trials with and without video-assisted correction of CT-to-treatment transfer errors will be presented.