CTrue[™] Imaging Technology

Every fraction, every patient, every day



Every patient, every day[™]

From the ground up, the TomoTherapy[®] Hi·Art[®] treatment system was designed to incorporate advanced, helical fan-beam CT imaging. The resulting platform, a true step change for radiation therapy, paves the way for the most precise treatment possible.

With CTrue imaging technology from TomoTherapy Incorporated, daily on-line images are quantifiable representations of the patient's anatomy. Derived from a combination of a megavoltage x-ray source, fan-beam geometry and a rigid ring gantry to which the source and detector are firmly affixed, CTrue images go far beyond facilitating patient set-up, to fulfilling the promise of dose-guided radiation therapy.



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Hi-Art treatment system ring gantry geometry with rigidly mounted source and MVCT detector





"Checkerboard" display facilitates image alignment

See True Position with Simple, Accurate Patient Set-up

The *TomoTherapy Hi*·Art treatment system has been built on a proven CT imaging platform. Having the source and detector firmly attached to a rigid ring gantry helps eliminate mechanical sag, sway and repetitive geometry calibration steps common to traditional radiation therapy systems. The results are accurate and consistent 3D image pixel locations relative to the treatment machine—precisely what is needed for sub-millimeter patient set-up accuracy with every fraction.

Moreover, with every fraction, only one image volume needs to be acquired for all targets. The ensuing helical delivery pattern enables single or multiple targets to efficiently and effectively be treated, without interruption.

See True Delivery with Efficient 3D Image Guidance for Every Patient

With the *Hi*·*Art* treatment system, image guidance can be performed for every patient, at every treatment fraction. There are no restrictions on daily usage to consider with the system's megavoltage imaging beam. With a *TomoTherapy* system, IGRT means a new volumetric image every time the patient is treated—no need for a statistical analysis of past image registration results, no spreadsheets, no thermal cool-down period and no compromises. Simply image, register and treat, every time.

See True Density with Consistent Image Quality at a Low Dose

The *TomoTherapy Hi*·Art treatment system's unique megavoltage fan-beam imaging enables consistent, high-contrast imaging of all patients at all anatomical locations, with a very low delivered dose. The direct, linear relationship between megavoltage x-ray absorption and material density also means image quality is maintained regardless of prosthetic implants or dental fillings. Images free of high-Z and scatter artifacts afford accurate conversion to patient density maps. The quantitative nature of *CTrue* image data, therefore, lays the foundation for reliable dose-based guidance throughout the treatment course.

See True Dose-guided Daily Treatment

The *Hi*·*Art* treatment system makes use of MVCT images in ways that go beyond simple patient positioning. Because anatomy can change during the course of treatment, our Planned Adaptive[™] feature accounts for those changes, ensuring that dose remains focused on the target volume and avoids critical normal tissue. In some cases, the *Planned Adaptive* feature may simply provide peace of mind, while in others it may highlight the need for treatment plan modification. In either case the quality of dose delivery remains intact—and according to plan—from the first fraction to the last.



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