

1: Igaku Butsuri. 2001;21(1):11-16.

[CyberKnife]

[Article in Japanese]

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The CyberKnife is an image-guided robotic system designed for stereotactic radiosurgery. This system uses a lightweight, x-band linear accelerator, computer-controlled robotic arm, a pair of orthogonal x-ray imagers (TLS: Target Locating System), and a computer workstation. During the treatment, the TLS determines the location of the lesion and communicates these coordinates to the robot. The robot adjusts the position of the beam to the target. The accuracy of this system is 0.7 mm (median) at Osaka University. The CyberKnife system offers new options for radiosurgery/therapy. Stereotactic fractionated radiotherapy can now be performed with the same accuracy as single-fraction stereotactic radiosurgery. The frameless nature of CyberKnife allows tumors in the chest and abdomen to be treated as well. The real time tracking system option enables one to treat tumors that move with respiration, such as lesions in lung. Tumors in the lower spine, pancreas, and lung have already been treated in the USA. A description of the components, accuracy, and future of the CyberKnife will be presented.

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