With traditional radiosurgery, clinicians can treat only intracranial tumors. The CyberKnife® Robotic Radiosurgery System not only removes this limitation—it takes radiosurgery to a new level.

A true robotic radiosurgery system, the CyberKnife System’s innovative design enables clinicians—for the first time—to target tumors anywhere in the body with sub-millimeter accuracy.

Due to its autonomous robotic ability to track, detect and correct for tumor and patient movement throughout the treatment, the CyberKnife System gives clinicians a pain-free treatment alternative for their patients without the use of head and body frames.

“Accuray’s CyberKnife System offers patient treatment options that, before now, were not available. Accuray has partnered with clinicians, researchers and patients to develop a system that redefines radiosurgery and provides a new standard of patient care. The fact that clinicians the world over have successfully treated tens of thousands of patients is testament to their confidence in the effectiveness of the CyberKnife System.”

Euan S. Thomson, Ph.D.
President and Chief Executive Officer
Accuray Incorporated
Providing highly conformal radiosurgery anywhere in the body with unprecedented sub-millimeter accuracy.

Delivering non-invasive radiosurgery with unlimited reach anywhere in the body.

Enhancing precision with the continuous ability to track, detect and correct for tumor and patient movement.

Dynamically delivering radiation in sync with real-time tumor motion.
Accuray has created the world’s only autonomous robotic radiosurgery device: the CyberKnife® Robotic Radiosurgery System.

Based on over a decade of collaboration with clinicians, researchers and patients, the CyberKnife System offers new hope to formerly untreatable patients while dramatically improving their quality of life. A truly innovative technology, the CyberKnife System offers a number of unique benefits including:

Sub-millimeter accuracy – Enables clinicians to confidently treat tumors with minimal harm to surrounding healthy tissue while delivering high doses of highly conformal radiation with proven sub-millimeter accuracy.

Continuous imaging – Delivers continual imaging that ensures targeting accuracy throughout the entire treatment, from the first beam to the last—instantly correcting for the slightest patient or tumor movement.

Track, detect and correct – Continuously tracks tumor position, detects any movement and corrects beam delivery throughout the entire treatment—without having to manually reposition the patient or interrupt the treatment.

Anywhere in the body – Moves beyond traditional radiation delivery systems with unsurpassed flexibility and maneuverability. By delivering radiation beams from virtually unlimited positions, the system can deliver superior conformality to tumors anywhere in the body including the brain, spine, lungs, liver, pancreas and prostate.
“Respiration and tumors – the CyberKnife System solves the equation.”

Professor Peter C. Levendag, M.D., Ph.D.
Chairman, Department of Radiation Oncology
Erasmus MC-Daniel den Hoed, Rotterdam, The Netherlands

“The addition of the CyberKnife System to Hong Kong Adventist Hospital means that for the first time ever, patients in Hong Kong and the surrounding region have access to the most advanced cancer treatments available today. The CyberKnife System complements our Cancer Center and will enable us to treat complex tumors in the brain, spine, lung and prostate effectively and with unprecedented accuracy.”

Frank Yeung
CEO and President
Hong Kong Adventist Hospital, Hong Kong, China
The CyberKnife® System is the only radiosurgery system that delivers high-dose non-isocentric beams to the tumor from virtually unlimited positions, enabling physicians to aggressively treat tumors with sub-millimeter accuracy while minimizing damage to surrounding healthy tissue.

With its autonomous robotic ability to track, detect and correct for even the slightest tumor and patient movement throughout the entire treatment, the CyberKnife System gives clinicians a more effective, uninterrupted and accurate treatment alternative.

The CyberKnife System’s accuracy is based in part on the following system capabilities:

Fiducial-free spine and lung tracking – The only radiosurgery treatment delivery software that eliminates the need for surgically implanted fiducials and relies on advanced algorithms to accurately track and detect the tumor location.

Real-time synchronization to tumor position – The only radiosurgery system designed to track tumor position by instantly synchronizing radiation delivery to the respiration-induced motion of the tumor throughout the treatment session.

Precise alignment to patient position – The only radiosurgery system that moves to and with the patient. High-resolution image detectors continuously track and detect patient position providing the input to correct for any motion – eliminating time-consuming manual adjustments, inaccurate gating techniques and significantly enhancing treatment accuracy.

“After extensively researching other radiosurgery systems, we chose the CyberKnife System because it’s the only true robotic radiosurgery system available today. The System’s conforming capabilities and sub-millimeter accuracy ensures a highly effective treatment plan.”

Irving Kaplan, M.D.
Radiation Oncologist
Beth Israel Deaconess Medical Center, Boston, USA

The CyberKnife System and CyberKnife options may not be available in some countries. For a complete list of CyberKnife Systems and options available, please contact Accuray at sales@accuray.com.
With the CyberKnife® System, physicians can treat tumors anywhere in the body—including the brain, spine, lungs, liver, pancreas and prostate—without the limitations of time-consuming, uncomfortable head and body frames or other immobilization devices.

The number of CyberKnife extracranial treatments grew by over 185% between 2004 and 2006. And a record number of presentations on extracranial applications have been delivered at both clinical and scientific meetings worldwide. The increase in extracranial treatments and presentations demonstrates the growing worldwide clinical acceptance for the CyberKnife System in treating tumors anywhere in the body.

“The CyberKnife System now allows us to track unpredictable tumor motion due to normal bodily functions, such as movement due to digestive functions around the prostate. It tells us when the tumor moves even when the patient is stationary and takes the ‘guessing’ out of tumor positioning. The System shows us—in real-time—tumor position from the beginning to the end of the treatment and automatically corrects for tumor movement.”

Robert Meier, M.D.
Radiation Oncologist
Swedish Cancer Institute, Seattle, USA
Continuous image guidance

Without the need for staff intervention or treatment interruption, the CyberKnife® System’s revolutionary image guidance technology continuously works in concert with the treatment delivery system to instantly track, detect and correct—managing even the slightest target movements throughout the entire treatment.

Flexible robotic maneuverability

Driven by continual imaging and intelligent movement corrections, the CyberKnife’s robotic manipulator automatically positions the linear accelerator to an unprecedented range of positions—allowing access to virtually any tumor from any direction.
Dynamic motion targeting

With constant updates of target position throughout the respiratory cycle, the CyberKnife System delivers beams synchronized in real-time to the target position while adapting to changes in breathing patterns—delivering highly conformal radiation with considerably smaller margins and unprecedented accuracy.

Intelligent patient positioning

Fully integrated with the CyberKnife image guidance and treatment delivery system, the CyberKnife’s robotic patient positioning system automatically moves the patient to the exact treatment position with immediate accuracy—providing greater setup precision while significantly streamlining the patient setup process.
In order to achieve meaningful clinical solutions, Accuray continually refines and updates the CyberKnife® System based on close cooperation with clinicians, researchers and patients. The result is an elegant, state-of-the-art treatment experience admired by clinicians and patients alike.

The Accuray CyberKnife System offers clinicians limitless possibilities:

**Synchrony® Respiratory Tracking System** – Continuously synchronizes beam delivery to the motion of the tumor, allowing clinicians to significantly reduce margins while eliminating the need for gating or breath-holding techniques.

**Xsight™ Spine Tracking System** – Eliminates the need for surgical implantation of fiducials by using the bony anatomy of the spine to automatically locate and track tumors, making radiosurgery less invasive along the spinal column.

**Xsight™ Lung Tracking System** – Tracks the movement of lung tumors directly, without fiducials, with precision, reliability and self-adjusting repeatability.

**Xchange™ Robotic Collimator Changer** – Automatically exchanges collimators robotically, maintaining highly conformal treatments delivered more efficiently.

**4D Treatment Optimization and Planning System** – Takes into account not only the movement of the target but also the movement and deformation of the surrounding tissue.
The Accuray CyberKnife System offers clinicians limitless possibilities:

**RoboCouch™ Patient Positioning System** – Robotically aligns patients precisely with six degrees of freedom, reducing patient setup times and enabling faster treatments.

**X-ray Sources** – The low-energy X-ray sources generate orthogonal diagnostic X-ray images to determine the location of bony landmarks, implanted fiducials or soft tissue targets throughout the entire treatment.

**Image Detectors** – The flush mounted detectors capture high-resolution anatomical images throughout the treatment. These live images are continually compared to previously captured DRR’s to determine real-time patient positioning and target location. Based on this information, the robotic manipulator instantly corrects for any detected movement.

**Robotic Manipulator** – The high precision robotic manipulator capable of delivering repeatable sub-millimeter accuracy, positions the linear accelerator in almost any direction providing non-coplanar and non-isocentric beam delivery.

**Linear Accelerator** – This compact, light weight 6MV X-band linear accelerator with an output of 600 MU/min, precisely delivers highly collimated beams of radiation, providing superior conformality when treating patients.

**MultiPlan™ Treatment Planning System** – This intuitive workflow-based workstation designed for radiosurgery, enables the creation of plans that have excellent conformality and coverage with steep dose gradients.
A safe and effective treatment program proven by clinical research

The clinical success of the CyberKnife® System is due in large part to the collaborative partnerships Accuray has developed over the last decade with clinicians, researchers and patients. The company proactively seeks out and relies on feedback from CyberKnife users, to learn what’s needed to advance the technology.

Due to this collaborative process, Accuray continually refines and upgrades the CyberKnife System – ensuring the technology is always on the cutting edge while staying patient focused.

Industry partnerships

Accuray Clinical Advisory Board

A diverse group of respected and experienced physicians and physicists, the Clinical Advisory Board advises Accuray on the CyberKnife System’s clinical direction and product technology.

Accuray Research Grant Program

Accuray funds clinical studies in all areas of the body and physics technology research. Accuray also works with researchers in providing assistance for research grants with other organizations. Grant process and applications are available on Accuray’s Website.
Peer-to-peer interaction and patient education

CyberKnife Society

The CyberKnife Society brings together diverse medical professionals affiliated with radiosurgery worldwide and fosters scholarly exchange of clinical information.

CyberKnife Patient Support Group

An organization founded and managed by former CyberKnife patients, the Patient Support Group, provides support to patients undergoing CyberKnife Robotic Radiosurgery treatment, and offers meetings, online patient and doctor message boards, CyberKnife information and other resources in a warm and supportive environment.

Peer-reviewed articles and case studies

Over 100 peer-reviewed articles and dozens of academic journals have established the CyberKnife System as a safe and highly effective technology.

“The partnerships being developed between the surgery and oncology departments will allow us to quickly investigate the most sophisticated aspects of the CyberKnife System for treating lung cancer—it involves true team collaboration, focusing intently on the health and welfare of our patients.”

James D. Luketich, M.D.
Sampson Family Endowed Professor of Surgery
Chief, The Heart, Lung and Esophageal Surgery Institute
University of Pittsburgh Medical Center, Pittsburg USA
Because the CyberKnife® System enables the treatment of intracranial and extracranial tumors that cannot be addressed with traditional radiation delivery systems, it has proven to attract new patient populations to physicians’ practices. By treating patients with surgically complex and inoperable tumors, the CyberKnife System has been shown to complement existing radiation therapy, IMRT or IGRT programs.

Medical institutions worldwide have expanded their clinical programs using the CyberKnife System by treating patients that may have been considered untreatable, while building a more comprehensive oncology practice. The total number of worldwide CyberKnife treatments rose over 430% since 2002, while extracranial treatments rose over 900%.

“Not only has the CyberKnife Robotic Radiosurgery System expanded our ability to help our existing cancer patients, it has enabled us to treat an entirely new group of patients that we could not adequately serve with radiotherapy alone. By expanding our capabilities to treat more patients, Accuray’s CyberKnife System has contributed greatly to the growth of the hospital’s revenue.”

Linda Winger
Vice President of Professional Services and Research Administration
Georgetown University Hospital, Washington DC, USA
The CyberKnife® System improves patients’ lives during and after treatment. The ability to receive pain-free, non-invasive treatment for aggressive and/or unresectable tumors means patients can resume their normal lives with renewed hope and vigor.

**Extends patients’ lives** – Because the CyberKnife System allows clinicians to treat tumors previously considered “inoperable”, patients’ lives are extended.

**Pain-free, non-invasive treatment** – The CyberKnife System eliminates invasive surgery and frames, offering patients a pain-free treatment experience with minimal risk and few post-treatment complications.

**Minimal recovery time** – Treatment durations average from 30-90 minutes depending on tumor location, size and complexity. And with a total of 1-5 treatments, patients can return to normal living immediately after treatment in most cases.

“I looked for an alternative when I was told a 7-hour surgical procedure would result in the loss of a balance nerve and possible damage to a facial nerve. It has been four years since my treatment – the CyberKnife System gave me a second chance at life.”

Donald Sabin
Acoustic Neuroma

“I was so worried I’d never work again, and then began to worry about never walking again. Today, I can wear my funky shoes and dine out with friends. More importantly, I don’t need walking assistance, even when climbing stairs. The CyberKnife System gave me my future back, the CyberKnife System saved my life.”

Victoria Leone
Spinal Tumor
Accuray offers unique service programs to ensure that clinicians get the full benefits of their technology investment, now and in the future.

**Working together for success** – Accuray has dedicated account managers to coordinate teams through the many aspects of startup and initial patient treatments. This teamwork enables fast, effective startups with immediate clinical results while optimizing utilization.

**Supporting success with technology and value** – Accuray offers a unique upgrade program designed to address key clinical and business needs during the life of the system. Created from customer input, Accuray offers the Diamond Elite Service Agreement, which provides system modular enhancements to protect against obsolescence in addition to high quality service programs.

“We placed our first CyberKnife System in 2003 and have recently placed a second system. Although our 2003 system is the “previous generation”, we are able to upgrade it using our upgrade service agreement. Now we have two identical systems, with the latest system features – making it difficult to tell the difference between the two.”

Linda J. Rogers
Administrative Director
The Alvin & Lois Lapidus Cancer Institute
Sinai Hospital/LifeBridge Health, Baltimore, USA
For more information on the CyberKnife® Robotic Radiosurgery System, please contact Accuray Incorporated.

www.accuray.com

sales@accuray.com

The CyberKnife System and CyberKnife options may not be available in some countries. For a complete list of CyberKnife Systems and options available, please contact Accuray at sales@accuray.com.