



PROSTATE CANCER TREATMENT

INFORMATION GUIDE



Several effective treatment options exist today for men diagnosed with prostate cancer. Each man's particular cancer, overall health, age, and lifestyle will play an important role in determining which option seems most appropriate.

This guide provides information about the **CyberKnife®** Radiosurgery System.

CyberKnife®

ACCURAY®

Quick facts about The CyberKnife® System

- The FDA provided clearance for the CyberKnife® Radiosurgery System in 2001 for tumors anywhere in the body, including prostate
- Patient outcomes with the CyberKnife System are comparable to other prostate cancer treatments at six years¹; it is a recognized treatment option by the American Society for Radiation Oncology (ASTRO)²
- Compared to surgery, the CyberKnife System is an outpatient procedure that does not require general anesthesia or hospitalization
- The entire CyberKnife treatment for prostate cancer can be completed within four to five sessions
- The CyberKnife System delivers stereotactic radiation, providing high doses of radiation with precise sub-millimeter accuracy
- The CyberKnife System utilizes real-time image guidance to target radiation beams to the prostate, continually adjusting beam delivery for normal movement of the prostate in order to treat the cancer while sparing healthy tissue
- Designed to avoid healthy tissue and critical anatomy, the CyberKnife System's precise stereotactic radiation can minimize side effects on urinary, bowel, and sexual function that can reduce a patient's quality of life



What exactly is the CyberKnife® System?

The CyberKnife System is an image-guided linear accelerator mounted on a robotic arm that is designed to deliver a very precise type of external radiation treatment known as Stereotactic Body Radiation Therapy (SBRT) also known as stereotactic radiosurgery. It is the only radiation therapy technology that automatically tracks tumor motion and adjusts the treatment beam as natural prostate motion is detected.

The CyberKnife System is extraordinarily precise, enabling clinicians to deliver individualized treatment with sub-millimeter accuracy through the use of continual image guidance and robotic mobility. As a result, the radiation is targeted to the prostate, minimizing exposure of healthy tissue.

Using the CyberKnife System, physicians can precisely maximize dose in four to five treatment sessions, minimize side effects, and maximize patient comfort during treatment.



Overview of RADIATION

Radiation therapy is a treatment that uses high energy x-rays (photons) to kill, shrink, or control the growth of tumors. Radiation therapy works by damaging cells, disabling them from growing and dividing. The goal of any radiation treatment is to destroy cancer cells while minimizing the side effects on healthy tissue. As imaging technologies have improved over the last several decades, radiation therapy has integrated those improvements to enhance dose delivery and minimize side effects.

Radiation may be recommended as an alternative to surgery or in addition to other therapies. There are several kinds of radiation therapy. SBRT is one of them, and the CyberKnife® System is a leading-edge SBRT technology.

What is SBRT?

Stereotactic Body Radiation Therapy (SBRT) is a radiation treatment that couples a high degree of targeting accuracy with very high doses of extremely precise, externally delivered radiation, thereby maximizing the cell-killing effect on the tumor(s) while minimizing radiation-related injury in adjacent normal tissues.

What are the advantages of all SBRT therapies including the CyberKnife® System?

1. SBRT takes into account the interaction between prostate cancer cells and radiation

Studies have indicated that prostate cancer cells have a high sensitivity to the amount of radiation delivered in each treatment session. This sensitivity suggests that a larger radiation dose delivered in a smaller number of sessions may be an advantage.¹

2. SBRT reduces treatment time

Compared to other radiation treatments for prostate cancer that require approximately 35–45 sessions of radiation therapy over six to nine weeks, SBRT — by definition — can be completed in four to five sessions. Sessions are usually given over one to two weeks.^{3,4} This substantially reduced treatment timeframe is advantageous for men seeking the least amount of disruption to their daily lives.

How does my doctor typically determine if I am a candidate for CyberKnife® treatment?

Each patient should consult his physician regarding his own specific case. Among the considerations that a physician will factor into a treatment recommendation is the patient’s prostate cancer classification, often referred to as “risk” profile.

SBRT (such as the CyberKnife System) is recognized by the American Society of Radiation Oncology (ASTRO) as an appropriate treatment option for low-to-intermediate risk prostate cancer. Patients with high-risk or more advanced prostate cancer may qualify for CyberKnife System treatment combined with other treatments.

► More on Risk Stratification

Risk stratification assesses the possibility of recurrence by a combination of PSA, Gleason score, and clinical stage from biopsy.

D’Amico Prostate Cancer Risk Stratification⁵

	PSA	GLEASON	CLINICAL STAGE
LOW-RISK	≤ 10	≤ 6	T1-2a
INTERMEDIATE-RISK	10-20	7	T2b
HIGH-RISK	> 20	≥ 8	T2c-3a

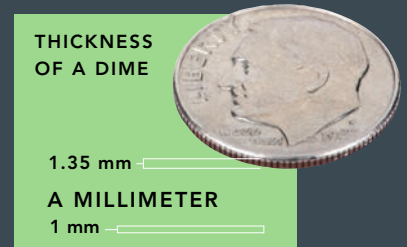
For more information on Risk Stratification, check the National Cancer Institute website: <http://www.ncbi.nlm.nih.gov>.

- Also, please be aware that there are other classification approaches that your doctor may use in evaluating your cancer and assessing your best treatment option.

Please note: Most side effects of radiotherapy, including radiotherapy delivered with Accuray systems, are mild and temporary, often involving fatigue, nausea, and skin irritation. Side effects can be severe, however, leading to pain, alterations in normal body functions (for example, urinary or salivary function), deterioration of quality of life, permanent injury and even death. Side effects can occur during or shortly after radiation treatment or in the months and years following radiation. The nature and severity of side effects depend on many factors, including the size and location of the treated tumor, the treatment technique (for example, the radiation dose), the patient’s general medical condition, to name a few. For more details about the side effects of your radiation therapy, and if treatment with an Accuray product is right for you, ask your doctor.

What are the advantages of CyberKnife® prostate treatment?

It is the precision of the CyberKnife System, delivered uniquely by its robotic arm and continual tumor tracking throughout treatment, that makes such a difference for patients. In fact, CyberKnife accuracy is sub-millimeter, meaning its pinpoint precision is within the thickness of a dime.



CyberKnife Advanced Robotics

Accuray, the manufacturer of the CyberKnife System, has been recognized in the Top 10 on *Fast Company's* list of most innovative robotic companies.⁶ Its CyberKnife System is an image-guided linear accelerator mounted to a robotic arm that is specifically designed to deliver beams of stereotactic radiation from multiple angles.

The robotic arm is not fixed; it moves in multiple directions to precisely target the prostate. With this robotic range of motion, the CyberKnife System can avoid healthy tissue and deliver a highly individualized treatment for the prostate that conforms to the shape of the patient's prostate (see Figures 1 and 2).

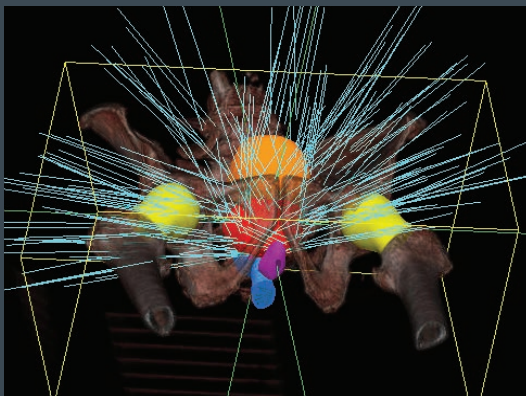


Fig. 1 The CyberKnife System can deliver beams from multiples of unique angles around the patient.

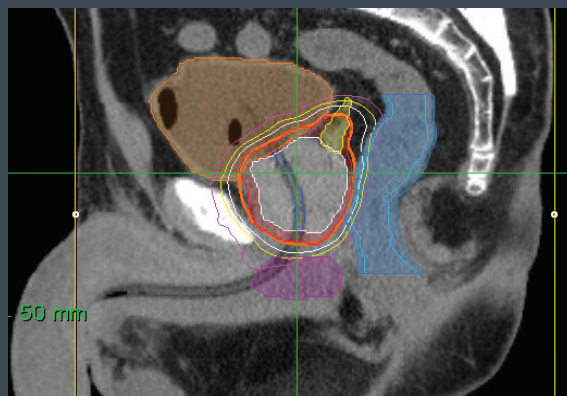
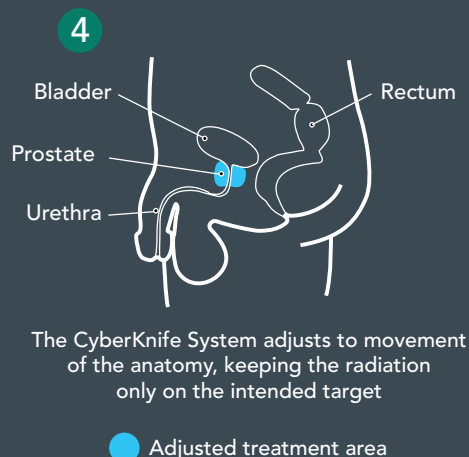
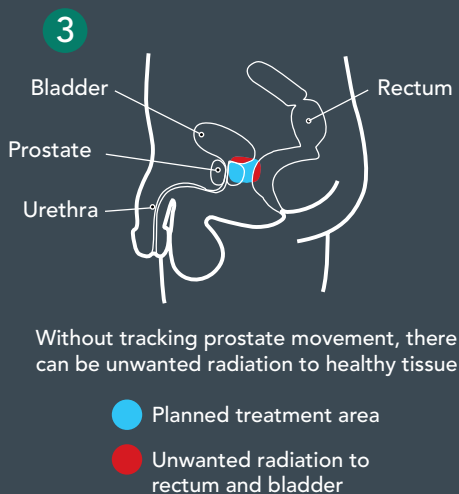
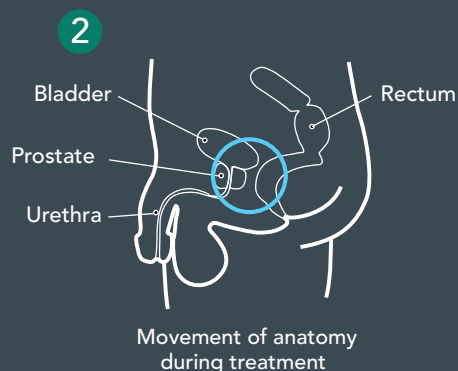
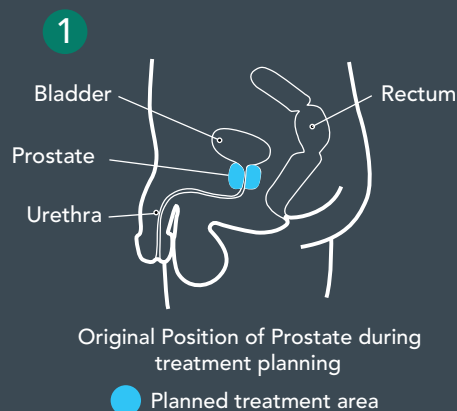


Fig. 2 A 3-D CT image of a CyberKnife System treatment plan shows that the highest concentration of radiation is directed to the prostate.

The CyberKnife® System uniquely compensates for prostate movement

The prostate gland can move unpredictably throughout the course of treatment, making the ability to track, detect and correct for motion critically important. In fact, the prostate has been documented to move as much as 10 mm in as little as 30 seconds due to normal patient bodily functions – such as filling of the bladder, gas in the bowel, or even slight patient movement during the procedure.⁷

Unlike any other radiation treatment, the CyberKnife System continually tracks and automatically corrects the beam for movement of the prostate in real-time throughout the entire treatment session. With this automatic motion tracking and adjustment, the CyberKnife System enhances the doctor's ability to treat with unparalleled preservation of healthy tissue.



OTHER COMMONLY ASKED QUESTIONS

How effective is the CyberKnife® System in treating prostate cancer?

Over two dozen peer-reviewed articles since 2002 have been published evaluating the use of the CyberKnife Radiosurgery System in the treatment of prostate cancer. The largest study – 1,100 patients in eight leading medical centers – was published in 2013 and showed an overall Biochemical Relapse-Free Survival (bRFS) of 93% at five years. All patients were treated with the CyberKnife System.⁸ Additionally, a 304-patient study also published in 2013 showed similar disease-free survival at six years.¹

These clinicians also compared patient relapse-free survival across different treatments as published in several studies. They considered “outcomes of >90% among all of the therapeutic options to be essentially equivalent.”⁸



Treatment Results with the CyberKnife System

Associated Biochemical Relapse Free Survival (bRFS)⁸

GLEASON	bRFS 5 YEAR Based on Gleason	RISK	bRFS 5 YEAR Based on Risk
< 6	95%	LOW	95%
7	83%	INTERMEDIATE	84%
> 8	78%	HIGH	81%

NOTES:

N = 1,100. Overall bRFS = 93%.

No differences observed for ADT (Androgen Deprivation Therapy or hormone therapy as part of the treatment plan).

No differences observed as a function of the total radiation dose.

Nomogram Analysis⁸

	ASSOCIATED bRFS 5 YEAR
RADICAL PROSTATECTOMY	95 - 98%
EXTERNAL BEAM RADIOTHERAPY	91 - 94%
PERMANENT BRACHYTHERAPY	80 - 90%
SBRT (CYBERKNIFE)	93%

Nomograms have been developed for a variety of malignancies in an attempt to improve outcome prediction and provide patients and physicians with a more understandable outcome measure when making treatment-related decisions. These statistically based tools provide the overall probability of a specific outcome.⁹

Clinically Proven Outcomes

A 21-center study presented at the 2016 American Society for Radiation Oncology meeting showed excellent cancer control for low- and intermediate-risk prostate cancer patients five years after receiving SBRT administered with the CyberKnife System¹⁰.

KEY FINDINGS

EXCELLENT CANCER CONTROL

Prostate cancer was controlled in 97 percent of patients.

Five-year rates almost identical for low- and intermediate-risk patients.

LOW SIDE EFFECTS

Toxicity and serious side effects were uncommon and similar to other radiation therapy treatments.

What do prostate cancer patients have to say about their CyberKnife® System experience?

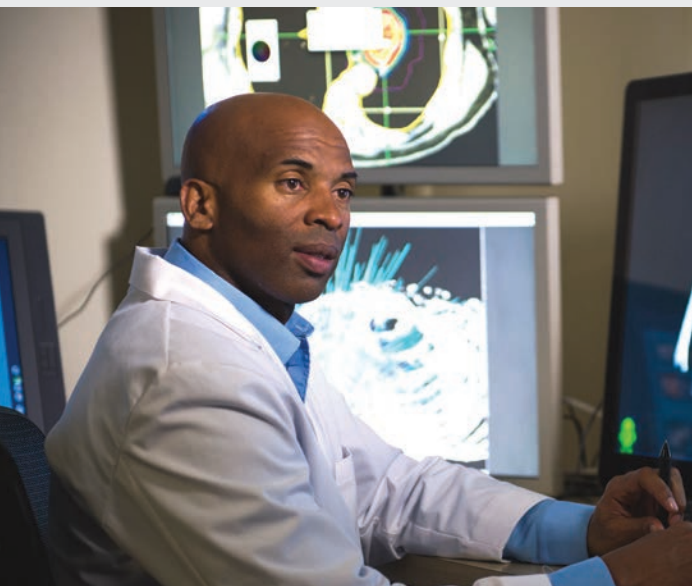
In a 2010 CyberKnife Coalition survey, 304 participants were asked about their satisfaction with their CyberKnife SBRT treatment.

Here is what they said:¹¹

- 99% of patients indicated that they would again choose to be treated with the CyberKnife System
- 93% of patients indicated that SBRT did not interrupt their normal life routine
- 98% of patients indicated they would recommend SBRT treatment to others

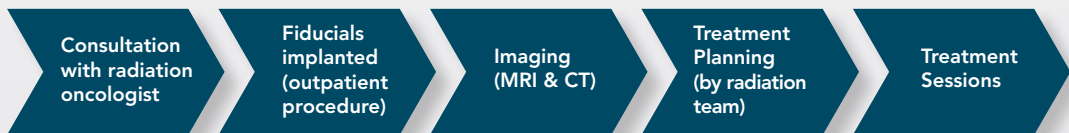
Is the CyberKnife Radiosurgery System cleared by the FDA?

Yes. In 2001 the CyberKnife System received 510(k) clearance from the FDA to treat anywhere in the body where radiation is indicated.



What is an example of a CyberKnife® System treatment process*?

- ▶ The CyberKnife® System treatment process begins with a consultation with a radiation oncologist who will provide perspective on this as a treatment option specific to the patient's condition. The physician will review the patient's PSA, Gleason score, biopsy results, imaging, and other medical conditions.
- ▶ Should the patient and doctor agree to proceed with CyberKnife treatment, gold pellets (fiducials) will be implanted in the prostate. (Stainless steel pellets are used in the rare instance that a patient is allergic to gold.) These fiducials are used in many SBRT procedures as imaging reference points so that the tumor can be tracked. These three to four gold pellets are implanted about two weeks before the actual treatment sessions in an outpatient procedure, like a prostate biopsy, under conscious sedation.



- ▶ About one week after the fiducials are implanted, the patient will return for imaging that then allows the radiation team to develop an individualized treatment based on the patient's unique anatomy.
- ▶ Approximately one week later the treatment sessions will begin. There are usually four to five sessions of short duration over one to two weeks. The patient lies on the table, and the CyberKnife System tumor tracking software adjusts the radiation beam for any slight patient movement.
- ▶ Treatment sessions are non-invasive outpatient procedures, and no anesthesia is required.

*Actual treatment plans and timelines may vary and are as advised by a physician



What are the side-effects of treatment?

Despite the higher dose rate associated with SBRT, multiple studies have validated that there are no worse side effects with CyberKnife® SBRT than with traditional radiation.^{1,8} The ability to deliver precise doses of radiation enables clinicians to decrease exposure to surrounding healthy tissue and minimize negative side-effects on urinary, bowel, and sexual function that can reduce a patient's quality of life. Most patients resume normal activity immediately after treatment sessions. Nonetheless, urinary incontinence, bowel issues, and erectile dysfunction are all possible complications with any treatment option, and should be discussed with your physician.

As the American Urological Association states in its Prostate Cancer Treatment Guidelines:

“Synthesizing the findings of studies featuring quality-of-life data with those featuring treatment complications data leads to the conclusion that many men treated for clinically localized prostate cancer will experience some post treatment problems that may impact their daily lives. Thus, there are trade-offs that must be considered and each patient needs to determine which side-effect profile is most acceptable to them when making a decision about treatment.”¹²

What if I am not a candidate for the CyberKnife® System?

Not every patient's prostate cancer is best treated with SBRT. Talk to your physician about your best options and come to a joint decision. If whole-bed pelvic radiation – radiation for disease outside the prostate – is required,

Accuray's Radixact™ or TomoTherapy® System may be a good option: Radixact and the TomoTherapy Systems leverage CT-image guidance to ensure highly conformal dose delivery to the tumor with each treatment.

Is CyberKnife®/SBRT covered by private insurance and Medicare?

As of the publishing date of this information guide, SBRT treatment for prostate cancer is covered by Medicare in all 50 states and the District of Columbia. In addition, many private insurance payers and health exchange insurers cover SBRT treatment for prostate cancer.

It is always best to check your insurance policy and if applicable, be sure to review your employee contract to determine if your insurance coverage benefits are limited. If you live outside of the United States, typically the CyberKnife Center that you would choose for treatment can answer coverage questions.

What other questions should I ask?

In Critical Decision-making: How You and Your Doctor Can Make the Right Medical Choices Together, Dr. Peter Ubel gives several pointers to help remind the patient that they do have a role to play in their own healthcare. He recommends patients become informed about their alternatives, communicate what they care about, and understand the timeframe for making a decision.¹³

SPECIFICALLY, TAKE THE TIME TO UNDERSTAND:

- What are my treatment options?
- What is my recommended treatment option and why?
- What are the side effects and risks of the procedure? Which side effects are short-term and which are long-term?
- How many of these procedures has the physician done and what are patients' results?
- What would the physician recommend for the physician's own brother or father?

Additional Resources

www.CyberKnife.com

*Critical Decision-making: How You and Your Doctor
Can Make the Right Medical Choices Together*
by Peter Ubel, M.D.

Cancer Support Community
www.cancersupportcommunity.org
1-888-793-9355

PHEN (Prostate Health Education Network)
www.prostatehealthed.org

PCRI (Prostate Cancer Research Institute)
www.pcri.org
1-800-641-7274

Us TOO
www.ustoo.org

Zero - The End of Prostate Cancer
www.zerocancer.org



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- 11 CyberKnife Coalition patient survey: 304 patients that received SBRT to treat prostate cancer. 2010.
- 12 <http://www.aunet.org/common/pdf/education/clinical-guidance/Prostate-Cancer.pdf> (p.42.)
- 13 Ubel, Peter. Critical Decision-making: How You and Your Doctor Can Make the Right Medical Choices Together. *HarperOne*. 2012.



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<http://www accuray.com/CyberKnifeInMotion>

Important Safety Information:

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