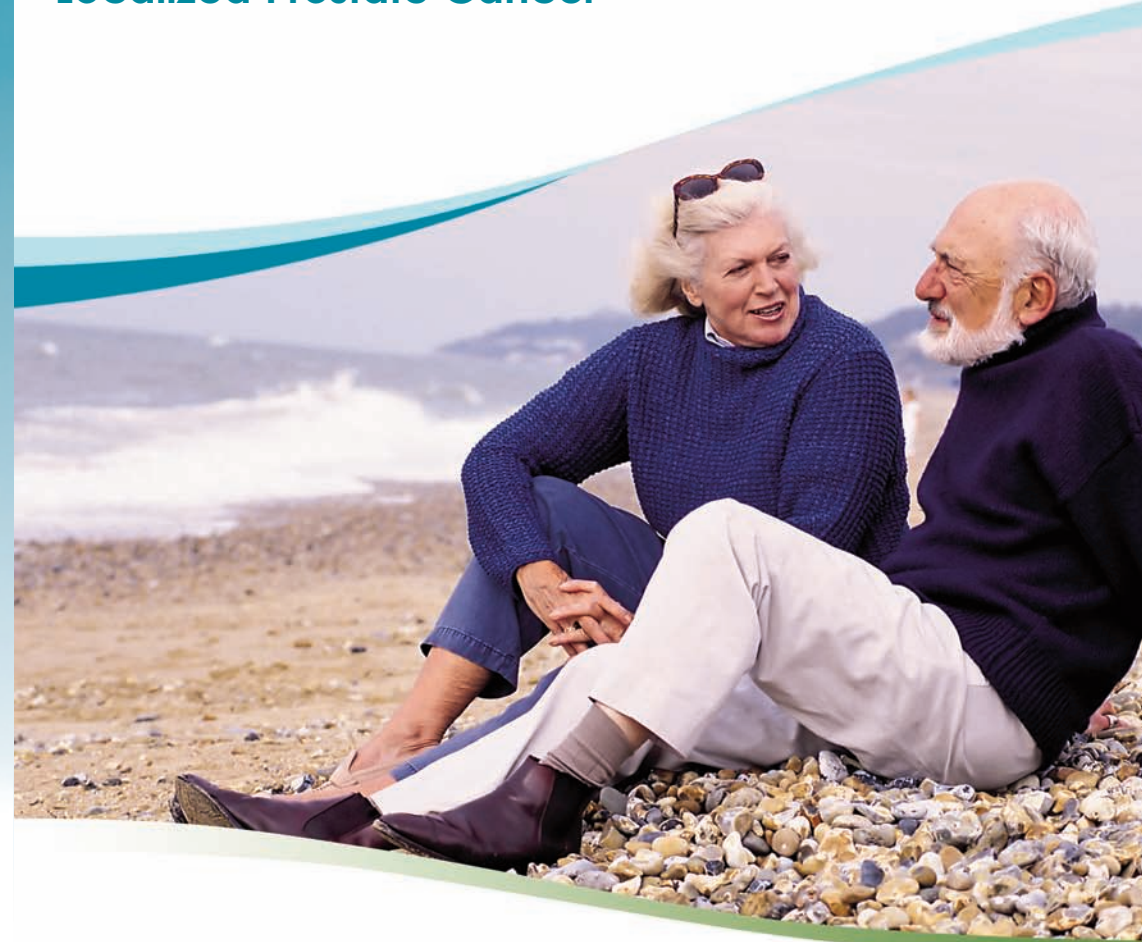




MAPLE LEAF HIFU CO.



High Intensity Focused Ultrasound Treatment for  
**Localized Prostate Cancer**



MAPLE LEAF HIFU CO.

[www.hifu.ca](http://www.hifu.ca)  
1-877-370-4438



Patient Information

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The United States Food and Drug Administration has not approved the **Ablatherm®** or any **HIFU** device for use in the treatment of prostate cancer in the United States and there is no assurance when or if such approval will be forthcoming. The only **Ablatherm® HIFU** device in North America is located in Toronto, Canada.

This brochure is for general information purposes only and is not intended as medical advice. Medical advice regarding prostate cancer and its appropriate treatment should only be obtained from a qualified licensed physician. Patients needing medical treatment should consult with their personal physician.

## Introduction

You have just been diagnosed with prostate cancer. You probably have many questions concerning your disease, treatment options, and the possible effects on your future.

This brochure contains information on prostate cancer, its diagnosis, and the various treatment options available, including High Intensity Focused Ultrasound (HIFU). It will also explain the disease and help you to understand how HIFU could be right for you.

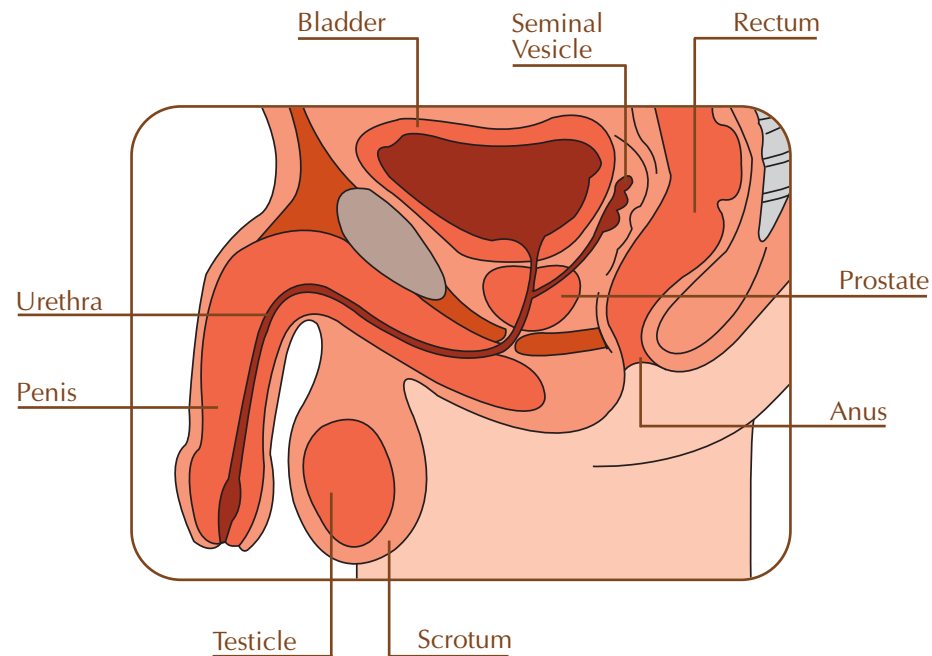
After reading this, you and your family will have a better understanding of the disease and why treatment with **Ablatherm® HIFU** is safe, effective, and has fewer side effects than other forms of treatment. Comprehensive patient information can also be found at [www.hifu.ca](http://www.hifu.ca).

# The prostate

**The prostate is a male genital gland, about the size of a chestnut.**

It varies in size according to age. Located under the bladder and in front of the rectum, the prostate gland forms a type of sheath around the upper part of the urethra (the canal which discharges urine from the bladder).

Contrary to many generally accepted ideas, the prostate is not directly involved in sexual intercourse: it does not affect the mechanisms of libido and erection. However it is involved in the ejaculation mechanism, since it secretes most of the fluid which is used to transport and activate sperm.



# What is cancer?

**All body organs are composed of cells that are specialized to the type of job that they do. Our cells are dying and being replaced constantly and this process occurs by cell division.**

Cancer is caused by a defect during the division of normal cells which turns them into malignant (cancerous) cells. Malignant cells grow much faster than healthy ones and can spread into surrounding tissue.

Eventually these growing malignant cells will form a mass of tissue known as a tumor. First located in one organ, a tumor may then spread to surrounding ones.

When tumor cells are transported through the blood and lymph systems to reach remote organs, we use the term metastases (from the Greek word meaning displacement).

# Prostate Cancer

**Prostate cancer is the most common cancer in men, responsible for one in three of all male cancers.**

The aggressiveness of prostate cancer can vary; some cancers develop very slowly and have no symptoms, whereas others spread quickly, invade surrounding tissue, and form metastases.

The risk of prostate cancer increases with age.

Prostate cancer is the most frequently diagnosed cancer in North America. There are generally no signs or symptoms during the early stages of the disease, and these appear depending on where the cancer is located in the prostate and whether it has spread.

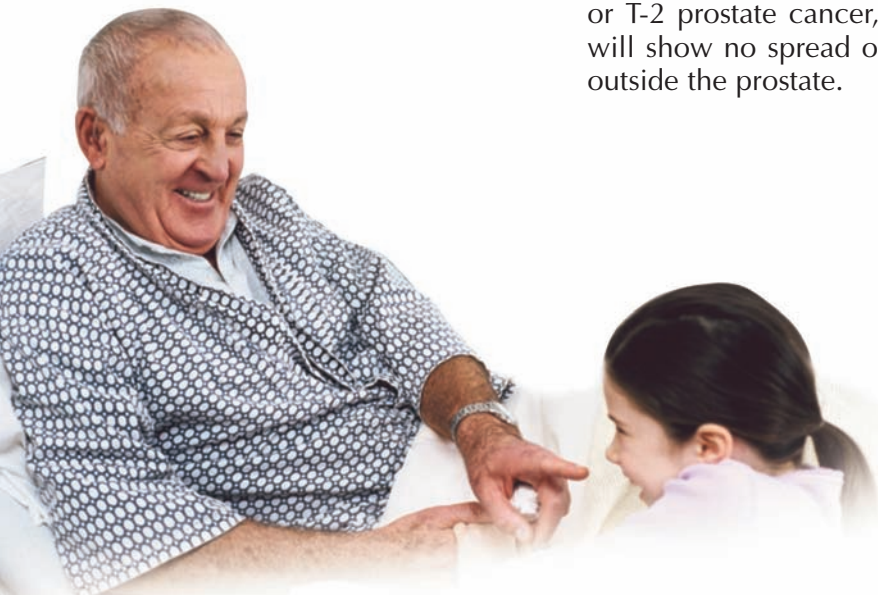
# Assessment & diagnosis

**If diagnosed early the chance of recovery from prostate cancer is very high.**

Prostate cancer can be suspected in routine investigations. A doctor will perform a digital rectal examination of the prostate to feel for any abnormalities such as hardness or increased size. A doctor will also carry out a blood test to record levels of prostate specific antigen (PSA). PSA is a protein produced by both normal and cancerous prostate cells and high levels of PSA can be a sign of cancer. The PSA test identifies tumors that cannot be detected by digital rectal examination (about 30% of cases of all prostate cancers).

The only way to confirm the diagnosis of prostate cancer is to perform a biopsy. Once a definite diagnosis of cancer has been made, the next step is to know the extent of the disease (clinical stage). This cancer staging helps determine which treatment will work the best.

After a biopsy has proven the existence of prostate cancer, patients may undergo imaging studies including scans as part of the investigation. One of the scans that may be performed is a bone scan. Bone scans rule out the spread of the cancer to the bone. Patients may also undergo MRI or CT scans. These imaging scans try to detect cancer which has spread outside the prostate to other organs such as the lymph nodes, the liver, etc. If the patient has T-1 or T-2 prostate cancer, these tests will show no spread of the tumor outside the prostate.



# Classification

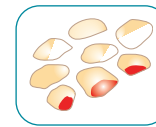
**Cancers are diagnosed at different stages and are classified into:**

more areas of firmness and later biopsies reveal the cancer. The PSA is also usually higher than normal.

## ■ Localized prostate cancer (stages T1 or T2).

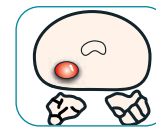
The tumor is confined to the prostate (intracapsular).

### Stage T1



This cancer has no signs or symptoms and is not suspected. The prostate feels normal to the physician upon rectal exam. This cancer may be detected in two ways. The first is by a blood test for high levels of PSA and later biopsies. The second is by examining the tissue removed during treatment of an enlarged prostate.

### Stage T2



This is a tumor which is suspected upon rectal exam. The prostate has one or

## ■ Advanced prostate cancer (stages T3 and T4)

The tumor spreads into surrounding organs

### Stage T3



This is a tumor that has spread outside the prostate and may have reached the seminal vesicles.

### Stage T4



This tumor may have spread to the rectum or bladder or to distant organs or bone.



# Treatments for localized prostate cancer

## ■ Treatments for prostate cancer include:

### **Surgery (radical prostatectomy)**

The whole prostate is removed with the seminal vesicles (which produce semen), the connected canals (which carry the sperm), part of the neck of the bladder and the surrounding lymph nodes. This surgical intervention is invasive and involves the use of general anesthesia for 3 to 4 hours and hospitalization for a number of days. At the localized stage (stages T-1 or T-2) a radical prostatectomy is usually curative but it frequently results in impotence and can result in severe urinary incontinence. Like any other major surgery you can also have complications and can have a prolonged recovery time.

### **External Beam Radiotherapy (EBRT)**

This treatment involves the use of radiation (very high energy rays) directed at the prostate gland to kill cancerous cells. Radiotherapy does not require anesthesia and treatment is usually done on an outpatient basis. Patients are usually treated five days per week in a cancer clinic over a period of seven or eight weeks with each session lasting a few minutes. Complications include marked

inflammation of the bladder and/or rectum as well as impotence as a late complication (6 to 12 months after treatment). Late side effects can also include soilage of stool because of damage to the rectal sphincter. Recurrent cancer after EBRT is not uncommon and is very difficult to treat.

### **Brachytherapy**

During this treatment 50 – 150 small radioactive seeds are implanted directly into the prostate gland using 20 - 40 needles. This procedure is usually done under general anesthesia (2 to 3 hours). It is recommended that the patient avoid close contact with children and pregnant women for two months after seed implant. As with EBRT, recurrent disease is not uncommon and is difficult to treat. Brachytherapy cannot be utilized when a patient has symptoms of prostate obstruction, when he has a Gleason stage above 7, or when he has had a previous transurethral resection of the prostate (TURP).

### **Cryotherapy**

In cryotherapy, probes are surgically placed into the prostate and the gland is frozen solid. The procedure is done under anesthesia. The patient must stay at least one night in

the hospital. This technology has improved in recent years but there is still a high chance of impotence and urinary incontinence. Many patients undergo cryotherapy after unsuccessful EBRT. These patients often experience chronic pelvic and/or rectal pain. In addition, holes or fistulae between the prostate and rectum can occur. These holes are particularly common in patients who have already been treated with unsuccessful EBRT.

### **High Intensity Focused Ultrasound**

High Intensity Focused Ultrasound (HIFU) is a non-invasive treatment for localized (contained) prostate cancer. Ultrasound waves are focused with extreme precision instantly and effectively destroying the targeted cancerous cells in the prostate.

The ultrasound waves are delivered via a probe which is inserted into the rectum. The treatment lasts an average of two hours and is performed under spinal anesthesia with intravenous sedation.

## Potential Complications of Ablatherm HIFU

### ■ What Are the Potential Complications from the Treatment?

#### **Digestive System**

For patients in which **Ablatherm® HIFU** was the first procedure used to treat T-1 or T-2 prostate cancer, no digestive system complications were reported.

#### **Urinary System**

The urethra is the channel which carries urine from the bladder, through the prostate, and out the penis. Narrowing of the urethra where it passes through the prostate can appear in the months following the treatment. This is due to the forming of scar tissue which normally replaces the treated prostate

tissue. A simple treatment called a transurethral urethrotomy may be needed to re-establish the normal urethral channel.

#### **Impotence**

A study released in 2007 reported 57% retention of sexual potency with another 17% of patients with partial potency. These results are better than those of patients who have undergone surgery. In patients treated with nerve sparing techniques, erectile function is retained in approximately 75%-80% of cases according to various published case studies. In addition, the majority of patients who suffer erectile dysfunction following treatment by **Ablatherm® HIFU** usually will

respond to oral medications (Viagra, Levitra, Cialis). Fortunately, many patients regain potency six to twelve months after treatment.

### Incontinence

Almost all reports of incontinence are mild and can generally be managed with drugs and/or muscle training. Most of the symptoms go away in about one to three months.

There are three types of incontinence:

**Type 1:** the leakage of urine with marked straining. This can be controlled with medication and pelvic floor exercises. This type of incontinence is temporary usually lasting about one to three months.

**Type 2:** the leakage of urine with mild to moderate straining. This can be controlled with medication and pelvic floor exercises.

This type of incontinence is also usually temporary usually lasting about one to three months.

In the first patients treated with **Ablatherm® HIFU** approximately 1 in 12 experienced either Type 1 or Type 2 incontinence. Recent advancements in **Ablatherm® HIFU** have resulted in even fewer cases of initial Type 1 and Type 2 incontinence.

**Type 3:** severe incontinence.

Type 3 incontinence is essentially not a risk unless patients have already been treated with radiation or surgery. It is seen in significantly less than 1% of cases for patients who were treated with **Ablatherm® HIFU** as a primary treatment for T1 or T2 prostate cancer.

## About Ablatherm® HIFU treatment

### ■ About Ablatherm® HIFU

**Ablatherm® HIFU is a non-invasive medical device which uses HIFU (High Intensity Focused Ultrasound) to treat localized (contained) prostate cancer.**

The prostate will be destroyed by the thermal effect of **HIFU** (temperature rising to 85°C / 185°F), therefore there is no radiation involved.

### ■ Who should have this type of treatment?

Your urologist may recommend **Ablatherm® HIFU** if:

- you require treatment for contained prostate cancer.
- you have had radiotherapy in the past and your cancer has now returned.

### ■ Are there reasons why or circumstances in which HIFU treatment is not a possible option?

Almost none – however, when a patient has an enlarged prostate, hormone therapy may be prescribed to reduce the size of the gland so that **Ablatherm® HIFU** treatment is made possible.

In some cases **Ablatherm® HIFU** is not recommended for men who have experienced thickening of the rectal wall due to previous cancer treatments. Also, if you have a confirmed latex allergy, **HIFU** is not a treatment option.

### ■ Who produces Ablatherm® HIFU?

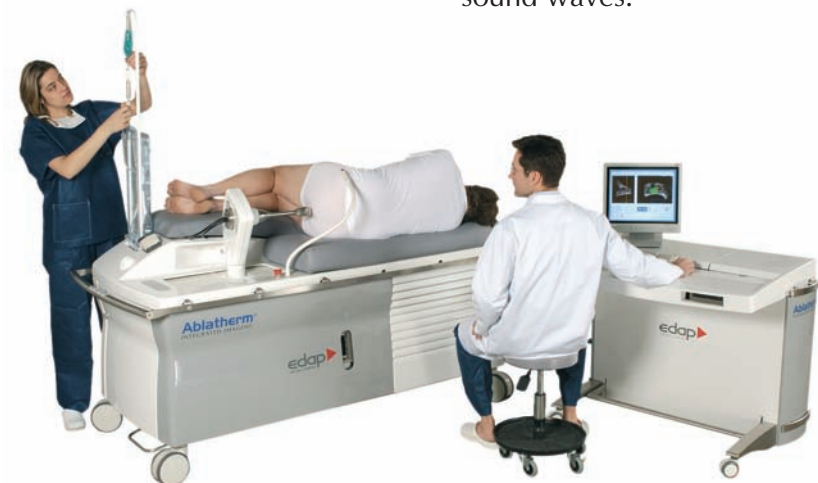
The **Ablatherm® HIFU** technology was developed, in 1989, by the urology department of the Hospital Edouard Herriot in Lyons (France) and INSERM, the French National Institute for Medical Research. It

has been developed on an industrial scale by EDAP. The first treatment was performed in 1993, and **Ablatherm® HIFU** was given market approval for Europe in 2000. In Canada, Health Canada gave approval for use in March 2003.

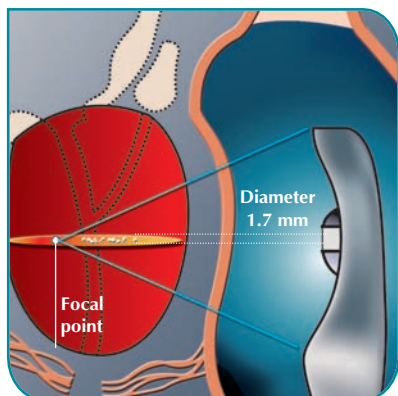
**As of March 2008, over 15000 patients had benefited from Ablatherm® HIFU treatment in 176 centers around the world.**

### ■ How does Ablatherm® HIFU work?

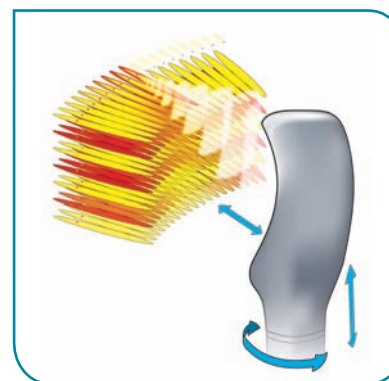
The urologist uses the **Ablatherm® HIFU** device to treat the prostate cancer. The doctor inserts a probe into the rectum. This probe includes an imaging component which allows the doctor to view the prostate and adjacent nerve bundles on the computer as the procedure is taking place. The probe also includes a transducer which emits the focused ultrasound waves.



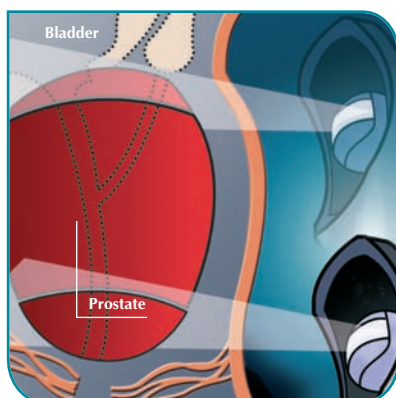
The doctor inputs a treatment plan into the computer which then controls and aims the ultrasound waves. These are focused with extreme precision onto the prostate, causing a very brief rise in temperature (around 85° C / 185° F). The targeted tissue is then instantly and effectively destroyed, while the surrounding tissue is preserved.



At the focal point of the ultrasound beam, a sharp temperature rise destroys the cancer cells.



The Ablatherm® HIFU probe is controlled by a computer to generate the ultrasound waves.



The targeted prostatic volume is localized with a transrectal ultrasound imaging probe.

The **Ablatherm® HIFU** machine has numerous safety checks which are constantly monitored throughout the treatment to ensure patient safety. This means that the treatment is always delivered to the same high standard and quality.

### ■ Treatment

You will be asked to come for a consultation the afternoon before your

treatment. You will be provided with an enema to be used the morning of your procedure. The treatment is performed under spinal anesthesia with intravenous sedation to ensure you are comfortable and that you remain completely still. You will lie on your right-hand side and the doctor will place a gel-coated probe into your rectum. The doctor maps out your prostate and the **HIFU** treatment can then start – 400 to 600 shots of High Intensity Focused Ultrasound waves are generally given. On average the treatment lasts two hours.

### ■ Why is catheterization needed?

The prostate swells after treatment and presses on the urethra (canal which discharges urine from the bladder) so catheterization to remove urine is necessary until the swelling subsides.

and sometimes urgent urination, urine leakage during physical exertion or coughing and sometimes the elimination of dead cancer cells in the urine. Infections with fever are rare but possible and require antibiotics. These side effects disappear in the weeks following the treatment.

### ■ What long-term follow up is required?

PSA levels are checked every three months for the first two years following treatment, semi-annually the next two years, and then annually thereafter. Quality of life surveys are completed every six months. All results are recorded in our patient registry.

### ■ How successful is Ablatherm® HIFU?

An independent European study of 402 patients with localized prostate cancer showed that after **Ablatherm® HIFU** treatment no cancer was found in biopsy tests for 92.1% of low risk patients.

A more recent study confirmed these results and involved performing biopsies on 137 patients. 93% of these patients did not show cancer. 87% of these patients had constant PSA levels of less than 1.0 ng/ml up to five years after the treatment.

### ■ Is the Ablatherm® HIFU procedure painful?

The treatment itself is not painful as it is carried out under spinal anesthesia. Pain after treatment is rare, although most patients feel a slight discomfort which disappears after a few days. The procedure is non-invasive so there are no wounds and patients do not experience the burning sensation often associated with radiotherapy.

### ■ What happens after treatment?

Most patients can go back to eating normal food the evening of treatment. The urinary catheter is removed two weeks later. Medication is prescribed for the following two weeks to prevent any infection of the urethra or bladder. In the period after treatment you may experience some discomfort including mild bleeding at the start of urination, frequent



Over 90% of patients undergoing **Ablatherm® HIFU** treatment will not require further treatment for their prostate cancer. If a patient's cancer returns they have not eliminated treatment options as they remain candidates for **Ablatherm® HIFU** treatment, surgery, radiation, or hormone therapy. **Ablatherm® HIFU** treatment has a similar success rate to radical prostatectomy but it is not as invasive and has fewer side effects.

### ■ What are the side effects?

Studies of **Ablatherm® HIFU** treatment have found few side effects. Only the prostate is destroyed while adjacent tissue is preserved. The procedure is non-invasive which means it does not involve an incision through the skin..

You will be able to return to normal activity after only a few days. **HIFU** patients may experience a temporary burning sensation with voiding, but not the burning sensation associated with radiotherapy.

### ■ Ablatherm® HIFU treatment after radiotherapy

**Ablatherm® HIFU** treatment can be given to patients whose cancer has returned after radiotherapy, although some patients are not suitable due to abnormal thickening of the rectal wall (about 5% of cases) or because the cancer has spread.

Complication rates are significantly lower with **Ablatherm® HIFU** than with salvage cryotherapy or salvage surgery. Severe Type 3 incontinence occurs in 8% of **Ablatherm®** salvage treatments as opposed to 50% or more with other treatment options. Similarly, impotence occurs in approximately 40% of **Ablatherm®** salvage treatments which is much better than the rates seen in salvage cryotherapy and salvage surgery.

Unlike treatment with salvage cryotherapy or salvage surgery, there have been zero incidents of rectal fistulae in patients treated with **Ablatherm® HIFU** since 2002.



## Key Differences Between Ablatherm® HIFU & Sonablate® 500

	ABLATHERM®	SONABLATE® 500
Image Quality	Dual US Transducers in treatment probe provide superior 7.5 MHz real-time imaging while allowing optimum high intensity shock wave production with separate generator.	Single 4.0 MHz transducer compromises image quality and treatment results.
TURP required? (A TURP is a surgical procedure with some risk of complications.)	At Maple Leaf HIFU, fewer than 2% of patients have required a TURP prior to Ablatherm® HIFU.	Willing to treat larger prostates but frequently require TURP post treatment or prolonged catheterization.
Nerve Detection	Superior imaging allows precise visualization and localization of neurovascular bundles allowing improved nerve sparing.	No data available on preservation of erectile function with suboptimal visualization of 4.0 MHz probe.
Energy Control	Computer controlled. Auto detection of possible danger to rectum allows uniform application of energy level to effectively treat prostate.	Requires physician input to reduce power and, in some cases, this could result in a failure to completely treat prostate tissue.
The Probe	After initially positioned by physician, probe is fine tuned by robotic control and image recognition software to ensure accurate treatment. Allows very accurate delivery of energy to tolerance of 0.1 mm. Fully automated.	Probe must be manually placed and manipulated. Very operator dependent.
Power Adjustment	Three scientifically tested and optimal energy levels for de novo, radiation failure, or HIFU retreatment conditions.	Must vary energy based on visual clues to avoid periprostatic tissue injury. Significant risk of rectal injury.
Precision	Variable height of focal area in single probe allows energy to be delivered in pattern conformed to prostate anatomy	Probe geometry poorly configures to prostate anatomy.
Safety Features	Includes external motion detector, rectal wall temperature monitoring, rectal wall thickness and “probe to rectal wall” distance protect against rectal or preprostatic tissue injury. Automatic disengagement of firing device if parameters are violated. Image guided robotic fine tuning of probe position to ensure effective treatment.	Safety devices require constant operator attention to monitor limited safety parameters and adjust device energy output to prevent rectal injury (fistula) or injury to surrounding tissue.
Treatment Time	Integrated imaging with single probe and automated control keep treatment time under 2 hours in the majority of cases.	Poor image quality and small treatment field extend treatment time up to 8 hours with an average treatment time of 2.8 hours.

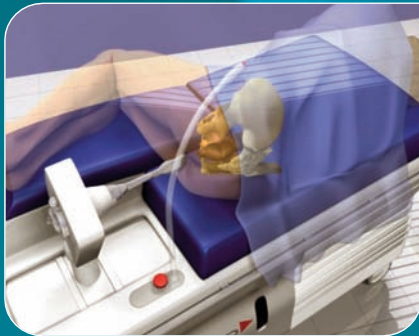


# Ablatherm® HIFU

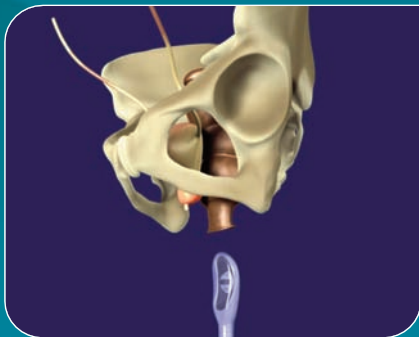
## Treatment step by step



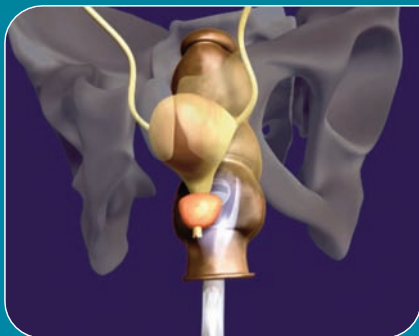
1 The patient lies down on his right hand side and stays in this position throughout the treatment.



2 This picture illustrates the position of the probe in relation to the rectum and the prostate (here in orange colour).



3 Due to the closeness of the prostate to the rectal wall, the treatment is performed optimally using the transrectal approach.



4 The probe is lubricated and then inserted into the rectum via the anus. The prostate is then accessible for ultrasound treatment.

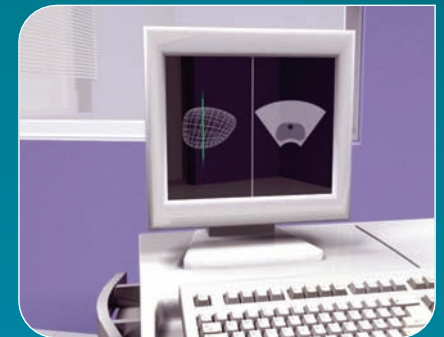
5 The imaging transducer in the middle of the probe allows a very precise three-dimensional reconstruction of the area to be treated and to be seen on a monitor.



6 The whole prostate is scanned and visible on the computer screen.



7 On the screen, the surgeon plans each step of the treatment with a microscope precision.



8 Finally, the machine produces High Intensity Focused Ultrasound waves which destroy the cancer cells.



# The benefits

The treatment of localized prostate cancer with **Ablatherm® HIFU** is a treatment option with many advantages:

- **Non-invasive treatment**
- **Destruction of the cancerous tissue with minimal effect to the surrounding organs**
- **Treatment does not use radiation**
- **Treatment can be performed under spinal anesthesia**
- **Treatment can be performed in one session**
- **No hospital stay required**
- **Treatment can be repeated**
- **Other therapeutic alternatives can be considered if results are unsatisfactory**
- **Ablatherm® HIFU can be used for the treatment of local recurrences (i.e. after external beam radiotherapy)**

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**Please consult your urologist for more information or log on to the Maple Leaf HIFU website at [www.hifu.ca](http://www.hifu.ca)**



# Canadian experience

Maple Leaf HIFU has been treating patients since May 2005. Our results have proven to be durable to 30 months and are detailed below:

PSA NADIR < 0.5 NG/ML AT 3 MONTHS BY T STAGE	
≤ T-2	84.7%
T-1 & T-2-A	86.9%

PSA NADIR < 0.5 NG/ML AT 3 MONTHS BY GLEASON GRADE	
Gleason ≤ 6	85.2%
Gleason 6 and 7 (3+4)	85.0%
Gleason ≤ 7 (4+3)	82.0%

We analyzed the following subset of our patient population:

- **T1 & T2**
- **Gleason 6 and 7 (3+4)**
- **PSA < 10**
- **volume less than 40 cc.**

Of the patients that fit this profile, 87.7% had a PSA < 0.5 ng/ml at 3 months.

2.1% of the group represented biochemical (PSA nadir + 2.0) or pathological (Biopsy proven local recurrence/persistence) failures.

The remaining 10.2% currently show no evidence of biochemical or pathological failure. It is probable that the success rates for this group as a whole will prove to be even higher than the current 87.7%.





For further information about  
Ablatherm® HIFU treatment visit



[www.hifu.ca](http://www.hifu.ca)

“ Keeping you and your  
family **informed** ”

