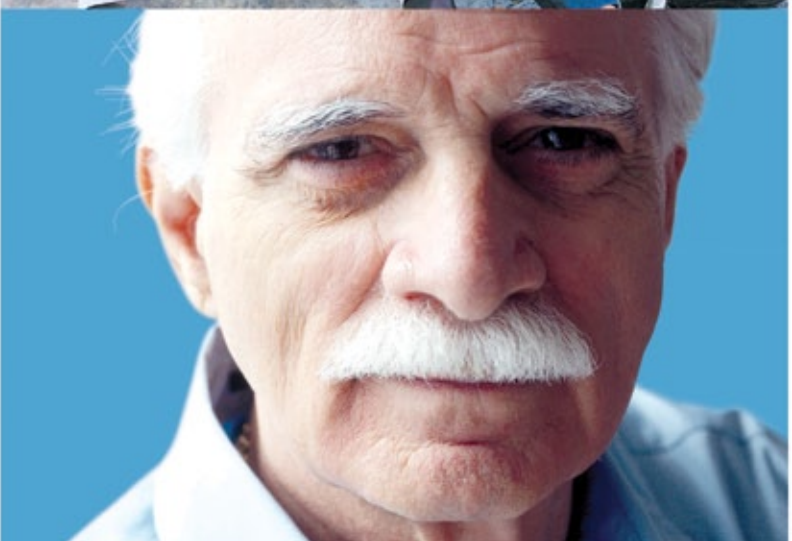

# Minimally Invasive Kidney Cryotherapy

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## [mini·mal·ly in·va·sive]

**minimally:** [adv] to a minimal degree; the least or smallest possible

**invasive:** [adj] relating to a technique in which the body is entered by puncture or incision

## [cry·o·ther·a·py]

**cryo:** [adj] very cold or freezing

**therapy:** [noun] treatment or healing method

# Understanding Cryoablation of Kidney Tumors

This booklet is intended to help you understand cryoablation of kidney tumors better by giving you the opportunity to go over the details at your leisure. We believe it is important for you to have as complete an understanding of your procedure as possible and hope that this booklet answers some of your questions.

Based on the results of your tests, you and your doctor have decided that it may be advisable to treat your kidney tumor by freezing it (cryoablation or cryotherapy).

## What are kidney tumors?

The kidneys are a pair of organs located in the back of the upper abdomen that filter blood to remove waste products which they convert into urine. Urine is then carried from the kidney to the bladder by a tube called the ureter.

If you have been diagnosed with a tumor in the kidney, you should understand that most, but not all, tumors in the kidney are cancerous. Biopsies are usually taken at the time of the cryoablation procedure with the intention of determining whether the tumor is cancerous. In some circumstances, a biopsy is done before any treatment is carried out. Occasionally, the biopsy does not make a definite diagnosis. Your doctor will discuss the biopsy results with you after the procedure.

Small kidney tumors are usually cancerous and so many patients are advised to undergo treatment. Occasionally despite successful treatment of the tumor in the kidney, the cancer comes back elsewhere in the body and requires further treatment. Treatment of small kidney tumors is intended to reduce this risk as much as possible. Treatment is available for metastatic kidney cancer (cancer which has spread to other parts of the body), but it tends to be less effective than treatment for localized kidney cancer.

## What are the treatment options?

Kidney tumors traditionally have been treated by removal of the entire kidney as well as the adrenal gland and the fat around the kidney (radical nephrectomy). While this remains the most definitive form of treatment for kidney tumors, it may not be necessary for patients with small tumors. Radical nephrectomy can be carried out either through an open surgical incision or laparoscopically (keyhole surgery).

For smaller kidney tumors, it may not be necessary to remove the entire kidney. The part of the kidney containing the tumor may be removed while leaving the remainder of the kidney intact (partial nephrectomy). This may be of crucial importance in patients with a single kidney or in patients with poor kidney function. Partial nephrectomy can also be carried out through open or laparoscopic surgery.

Finally there are newer minimally invasive techniques involving heating the tumor, namely, radiofrequency ablation (RFA) and high intensity focused ultrasound (HIFU)-investigational in the USA. It may be worthwhile discussing these options with your doctor. This booklet is directed towards informing patients about cryoablation of their kidney tumor.

## How is cryoablation done?

Kidney tumors are treated with cryoablation by placing one or more fine needles into the tumor which are then cooled to below –100º C. The procedure can be carried out either through a traditional open incision or by choosing a minimally invasive method that is performed either under laparoscopic or CT/MRI guidance. Your recovery depends in large part on which of these approaches is taken. Depending on your health as well as the size and location of the tumor, your surgeon will discuss the different guidance methods available:

**Laparoscopic Guided.** Laparoscopic cryoablation of kidney tumors typically involves three or four small incisions in order for the surgeon to isolate the kidney tumor. Nearby organs such as the colon, liver or spleen as well as large blood vessels are moved away from the tumor so that they are not injured by the freezing process. Finally, the needles are passed through the skin and are precisely positioned into the tumor in such a way to ensure that the entire tumor and a small margin of normal kidney are thoroughly frozen. Procedure is guided and monitored by ultrasound imaging.

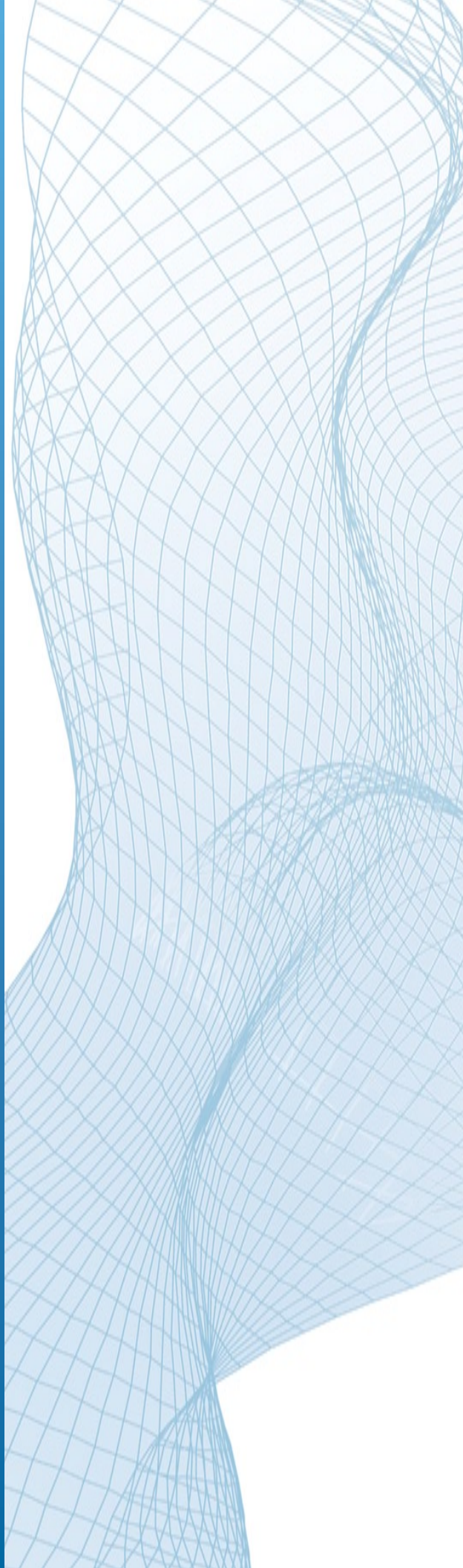
**CT/MRI-Guided.** In CT/MRI-guided cryotherapy, the surgeon operates while viewing a 3D image taken by CT or MRI scans. In the CT/MRI-guided procedure, ultrathin needles and thermal sensors are inserted.

**Open.** The kidney is identified and isolated, and cryotherapy is performed under direct vision.

## How does cryoablation work?

Argon gas is delivered under pressure into a small chamber inside the tip of the needle where it expands and cools. The needles typically reach a temperature of –125°C, depending upon the needle type. This produces a frozen area around the needle. Temperatures below –20ºC result in the death of the tissue, a process similar to frostbite. The tumor is usually frozen twice during the procedure to ensure that the temperature in the tumor reaches below –20ºC.

Scans are carried out at intervals following the treatment in order to ensure the treatment has been successful. Your doctor will discuss this with you in terms of setting out a schedule.



## Is any special preparation needed prior to surgery?

No special diet is required prior to your procedure. You will be admitted to the hospital the day before surgery or the morning of your operation. You will be instructed when to stop eating and drinking. Your doctor will make a mark on your body to indicate which kidney is to be operated on.

## How long will the procedure take and what will happen afterwards?

Depending on the required approach to the kidney, you and your surgeon will decide whether regional or general anaesthesia should be used. The operation typically takes two-three hours, but operative time is variable. You will wake up in the recovery room. Your vital signs will be monitored regularly as will your urinary output. You will have a catheter and possibly a drain. You may want to discuss this with your doctor prior to surgery. You will have dressings over any incisions and where the cryoablation needles were placed.

You will be able to drink fluids immediately after your surgery and then food if you are managing to take the fluids well.

## Will the procedure be painful?

Pain relief may be necessary after the procedure related to the open surgery or laparoscopic approach. You may be given painkillers by mouth and possibly as a suppository. The aim will be to make you as comfortable as possible. It must be said that many patients experience very little pain after the procedure but each patient is treated individually.

## How long will I be in the hospital?

You will stay in the hospital until you are eating, drinking, walking and urinating satisfactorily. This may involve staying only one night in the hospital after your procedure. Additionally, if there are any complications after your operation, you may need to stay in the hospital longer.

## Are there any possible complications?

Complications can occur after any procedure but your doctors and nurses will do everything possible to avoid these. Some complications may occur, at the time of surgery and others at a later point during your recovery. Complications that can occur after any surgery include problems with general anaesthesia or cardiovascular problems which include heart attack, stroke, deep vein thrombosis (blood clot in the leg) or pulmonary embolus (blood clot in the lung). While these problems rarely occur the risk to you does depend on your fitness for surgery and any previous medical problems that you may have. Your overall risk is worthwhile discussing with your doctor. The risks of these complications following this particular procedure are minimized compared to traditional surgery because of the small wounds and lower risk of bleeding. You can help prevent some of these complications by carefully returning to activities, such as walking after surgery.

Other complications include bleeding from the kidney, wound infections, a hernia through one of the wounds, and injury to nearby structures such as blood vessels, spleen, liver, pancreas or bowel. This may require more extensive surgery. Great care is taken to avoid these injuries during the procedure.

### Call your doctor or specialist nurse if you have:

- Fever or chills
- Nausea or vomiting
- Urine that is cloudy or smells
- Persistent abdominal or back pain
- Signs of infection in a wound. This may take the form of a foul smelling discharge or redness spreading out from the sides of the wound.

## What can I expect when I go home?

The recovery time greatly depends upon the approach of the procedure (laparoscopic, CT/MRI-guided, open). By the time you leave the hospital you will be able to do basic things for yourself such as washing and dressing. Once your wounds are dry you can shower or bathe. You will need to build up your appetite and your strength. You will find that you are very tired when you go home and you will need to rest during the day. You will gradually be able to do more and more by building up your activities.

It is wise not to drive for at least four weeks after the procedure and you should not drive if you are in any pain. Check with your insurance company to ensure that you have proper coverage before driving. It is wise not to do any heavy lifting or very strenuous activity for at least six weeks. Driving and activities after laparoscopic procedures may be able to resume after two weeks. There are no hard and fast rules but generally you can do activities provided they do not hurt.

Going back to work depends on the nature of your work and how fit you feel.

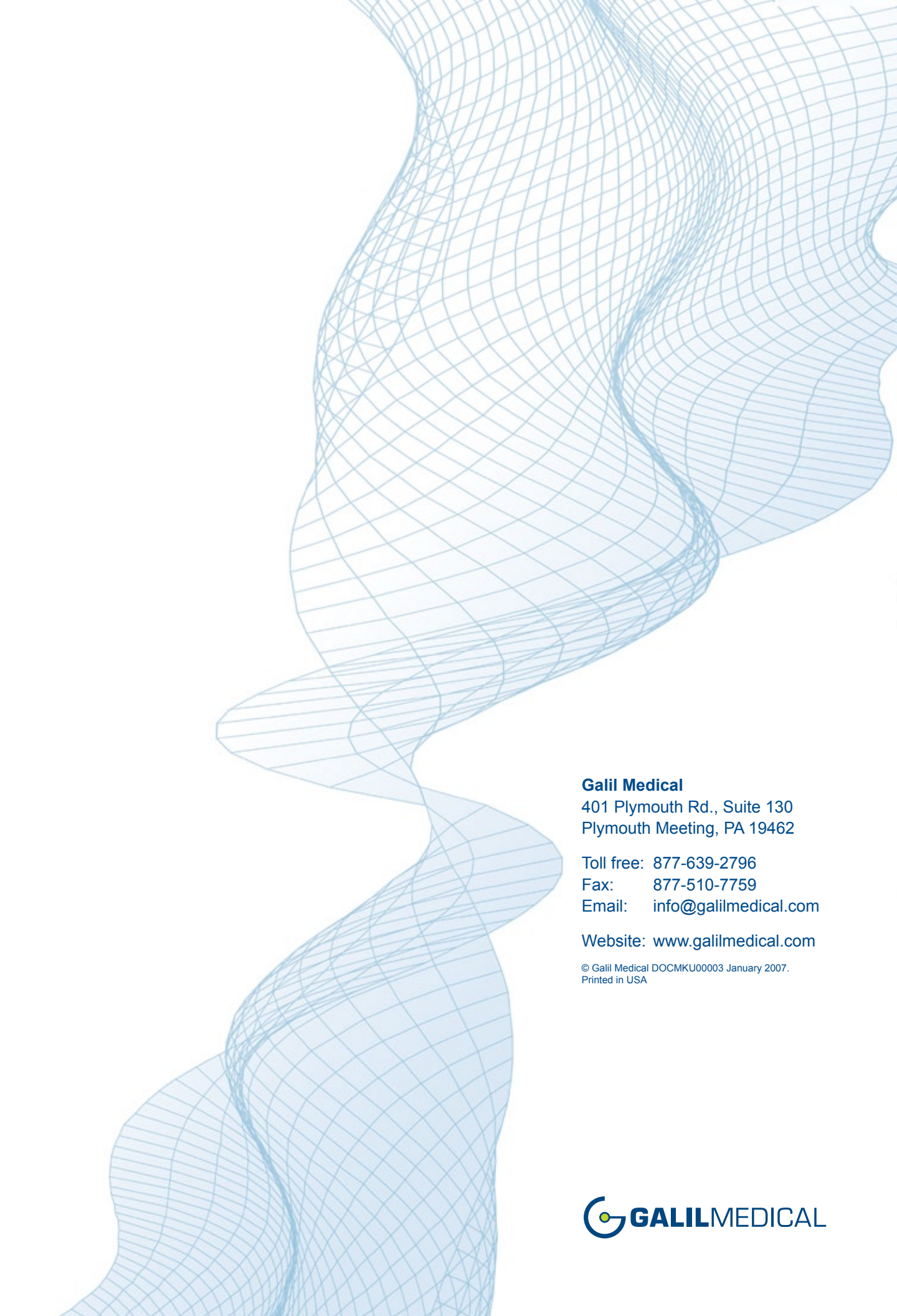
## When will I be seen by my doctor after surgery?

You will be seen a few weeks after your surgery to discuss the results of your biopsy and to make sure that you are making a good recovery. You will have regular check ups which typically will involve either a CT scan or an MRI scan. The CT or MRI help to insure that the tumor has been well treated. While there is no standard schedule for these tests, your doctor will help decide when these should be scheduled. These become less frequent provided the results are satisfactory.

## Will I need any further treatments?

Once you have had your operation there are no other treatments that are needed routinely. However, depending on the success of your operation based on the follow up scans, further treatment may be necessary. Occasionally, it is necessary to repeat the cryoablation procedure or even to remove the kidney. The likelihood of needing further treatment depends in large part on the size and location of the kidney tumor. Your doctor will discuss this with you.

We hope that this booklet has answered most of your questions. If there is anything else that you would like to know please contact your doctor or specialist nurse.



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