Universally recognized post-nephrectomy cancer treatment. Sampling:
National Comprehensive Cancer Network (NCCN)
NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines)
Kidney Cancer Version 2.2011: [tests and treatment] After Nephrectomy:

Follow-up for patients with completely resected disease includes an abdominal and chest CT scan obtained approximately 4 to 6 months after surgery and then as clinically indicated. Chest x-ray and ultrasound may also be performed to assess patients especially in patients with small tumors and low risk of recurrence. ...
Patients are seen every 6 months for the first 2 years after surgery and annually thereafter and each visit should include a history, physical examination, and comprehensive metabolic panel (e.g., blood urea nitrogen, serum creatinine, calcium levels, LDH, and liver function tests.)

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Management Update in Reviews in Urology (Vol. 8 No. 1, 2006)
Surveillance Strategies for Renal Cell Carcinoma Patients Following Nephrectomy
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Metastatic lung lesions are typically identified … in asymptomatic patients more readily through imaging tests (over 90%). A history and physical examination are performed, and serial chest radiographs are obtained. We found chest computed tomography (CT) scans to be more sensitive in detecting lung metastases. In the same study, only 60 % of recurrences were identified secondary to symptoms. Along with a careful history and physical examination, abdominal CT scars are critical because resection of the renal fossa bed has been shown to improve survival.

The majority of recurrent disease is detected by surveillance laboratory or radiographic studies in asymptomatic patients 50% to 80% of the time, with the remainder detected by either work-up of patient symptoms, including decreased appetite, weight loss, decreased energy, fever, and night sweats, or physical findings of cachexia, abdominal mass, localized neurologic symptoms, or adenopathy. Surveillance tools include a careful history and physical examination; laboratory tests for serum calcium level, alkaline phosphatase level, and liver transaminases; and plain chest radiographs and CT scans.

Montie proposed a generic protocol for RCC surveillance following nephrectomy with a history, physical examination, and laboratory tests every 6 months for 5 years starting 1 month following surgery, a chest radiograph every 6 months starting at 6 months, and an abdominal CT scan after 12, 24, and 48 months.

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Surveillance Strategies for Renal Cell Carcinoma Patients Following Nephrectomy

Stringent surveillance to detect recurrences in areas most amenable to further therapy is paramount. ... The high rate or recurrence for clinically localized disease after nephrectomy underscores the importance of post-surgical surveillance. With the availability of treatment modalities offering improved survival in recurrent cases, the physician is challenged to identify treatable recurrence, ....

RCC has been shown to metastasize to almost all soft tissues in the body, but most commonly to the lung, followed by bone, liver, brain, and local recurrence. Stringent surveillance to detect recurrences in areas most amenable to further therapy is paramount. RCC metastases occur most commonly in the lung, affecting 3% to 16% of patients after nephrectomy. Metastatic lung lesions are typically identified through symptoms such as cough, dyspnea, pleuritic chest pain, or hemoptysis (over 70%), although other reports find that these lesions are detected in asymptomatic patients more readily through imaging tests (over 90%).

A history and physical examination are performed, and serial chest radiographs are obtained. We found chest computed tomography (CT) scans to be more sensitive in detecting lung metastases. Studies report the incidence of local recurrence ranging from 1.8% to 27%, with 1 study reporting a 5-year incidence of 1.8% from a population undergoing nephrectomy for localized RCC.

Traditional Surveillance Protocols.
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Stage-Based Surveillance Protocols
Surveillance for T3 and T4 disease increases abdominal CT surveillance. Along with a history and physical examination, laboratory tests, and chest radiograph every 6 months for 3 years, then yearly until 5 years follow-up, most reports advocated routine abdominal CT scans, with scans at years 2 and 5, or 1, 3, and 5. Some reports advocate a first visit at 3 months.

Based on UISS stratification, the natural history of RCC, and available treatment modalities, we recommend the following guidelines. For low-risk patients, we recommend yearly history and physical examination, laboratory tests, and chest CT for 5 years and an abdominal CT scan at years 2 and 4, with no further surveillance beyond 5 years.

For intermediate-risk patients [T3], we recommend history and physical examination, laboratory tests, and chest CT every 6 months for the first 3 years, then yearly for 10 years follow-up, with an abdominal CT scan at 1 year then every 2 years until 10 years follow-up.
We recommend more intensive abdominal surveillance for high risk patients, with recommendations identical to those for the intermediate-risk group except with more frequent abdominal CT scans at a rate of once every 6 months for the first 2 years, then yearly for years 2 to 5, then every 2 years until 10 years follow-up.

**Future Directions**

New technologies and progressive understanding of RCC biology promise enhanced treatments as well as detection of metastases. Positron emission tomography (PET) may soon have a larger role in renal tumor imaging. Studies suggest promising results for detection of lymph node involvement and improved differentiation of local recurrence and metastasis. In a study of 8 patients, PET imaging upstaged tumor burden in 3 patients and excluded recurrence in 1 patient.

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Follow-up guidelines after radical or partial nephrectomy for localized and locally advanced renal cell carcinoma. **Rationale for surveillance**

Surveillance after surgery allows the urologist to monitor for postoperative complications, renal function, local recurrence, recurrence in the contralateral kidney and development of metastasis. Renal function and postoperative complications are commonly assessed by history, physical examination, and measurement of serum creatinine and hemoglobin at 4-6 weeks post surgery. Long-term monitoring of serum creatinine is recommended particularly in patients with compromised renal function prior to surgery, or significant increase in creatinine after surgery (Grade B).

[Advantage is] Tumours that develop in the contralateral kidney can be treated with nephron-sparing surgery when detected at a small size. Patients who underwent surgery when local recurrences became symptomatic have a higher rate of incomplete resection of recurrence, positive surgical margins and poorer survival. Furthermore, an early diagnosis of disease relapse may enhance efficacy of systemic therapy if the tumor burden is low. Hence, this supports the rationale for surveillance of patients to detect recurrences and metastases early (Grade B).

**Surveillance**

The intensity of radiological surveillance or patients will vary depending on the risk of developing recurrence or metastases. Intensity and type of surveillance will be tailored according to a risk-adapted approach. Most contemporary surveillance protocols have been formed on stage-based stratifications (Fig. 1). The Canadian guidelines for stratifications after nephrectomy for nonmetastatic renal cell carcinoma will be based on pathologic stage. To evaluate recurrence in the lung, routine chest x-ray is recommended. CT of the chest may be performed instead.

Creatinine levels go up when the kidneys aren't operating efficiently. Contrast-induced nephropathy is defined as a 25 percent or great increase in creatinine within 48 hours of receiving contrast agent. Tablets of prescription-strength N-acetylcysteine (500 milligram table) have been found to decrease the risk of contrast-induced nephropathy.

**American Society of Clinical Oncology** ([www.cancer.net](http://www.cancer.net)) states:

“As part of this follow-up care, patients should receive regular blood tests to check kidney function, chest x-rays, CT scans of the abdomen and chest, and other imaging tests to watch for recurrence or metastasis. Patients should have a checkup every three months for the first year, every four months for the second to fifth year, and once a year after that.”
American Cancer Society (www.cancer.org) “For people whose kidney cancer has been removed by surgery, doctor visits (which include physical exams and blood tests) are usually recommended about every 6 months for the first 2 years after treatment, then yearly for the next several years. A CT scan is usually recommended about 4 to 6 months after surgery and may be repeated later if there's reason to suspect the cancer may have returned. Patients who have a higher risk of their cancers coming back after surgery, such as cancer that had spread to lymph nodes, may be seen more often with CT scans repeated at least every 6 months for the first few years.”

In Cancerguide.org: After Nephrectomy: Long Term Follow-Up.

After your surgery you will need life-long periodic follow-up to make sure your cancer has not recurred. Follow-up includes a doctor's visit, blood work, and imaging scans such as CT scans or X-Rays. Follow up will, be more frequent and more intense the higher your risk which depends on stage [III], grade [pT3a], and also your sub-type.

Measuring Kidney Function. Creatinine: Creatinine is a waste product of muscle metabolism which is filtered by the kidney. It's not affected greatly by activity or hydration. The normal range is: 0.5--1.2 mg/dL (your lab may have a slightly different rating).

Blood Urea Nitrogen (BUN). Urea is a breakdown product of protein metabolism which is filtered by the kidney. It can be affected by physical activity. The normal range is 9--8 mg/dL. (Your lab may have a slightly different range.)

CT Scans: Consider Non-Ionic Contrast: Non-ionic contrast isn't as hard on the kidney [Rudnick 1995] but isn't always used because it's more expensive. It's standard at many centers. N-Acetylcysteine: This anti-oxidant has been shown in a randomized trial [Tepel 2000] to prevent renal toxicity due to contrast in patients with somewhat impaired renal function. Does was 600 mg orally twice a day before the scan and the day of the scan.

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First Post-nephrectomy CT scan at 3 months. The high rate of recurrence for clinically localized disease after nephrectomy underscores the importance of post-surgical surveillance. ... laboratory tests for serum calcium level, alkaline phosphatase level, and liver transaminases, and plain chest radiographs and CT scans. ....generic protocol for RCC surveillance following nephrectomy with ... laboratory tests every 6 months for 5 years starting 1 month following surgery, a chest radiograph every 6 months starting at 6 months, and an abdominal CT scan after 12, 24, and 48 months.

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In patient reports at www.acor.org, hundreds of kidney cancer patients have repeated scans following removing of one kidney.
Incredibly, despite the overwhelming amount of reports stressing the requirement for periodic CT scans starting at six months or sooner after surgical removal of a kidney, a series of Kaiser oncologists and Assistant Physician-in-Chief, refused to conduct any blood tests or CT scans of Rodney Stich. Their decisions were to deny any blood tests or CT scans, or any other treatment, until he experienced positive personal symptoms of the spreading cancer. Since spreading cancer is often without symptoms until near the terminal end of life, the only money that Kaiser Corporation would be out would be palliative pain-relieving medication.

At the time of surgery, the pathology report on the removed right kidney and related lymph node showed non-small-cell papillary cancer, Type II, Fuhrman G3, pT3a, with extension beyond the lymph node into the renal vein.