



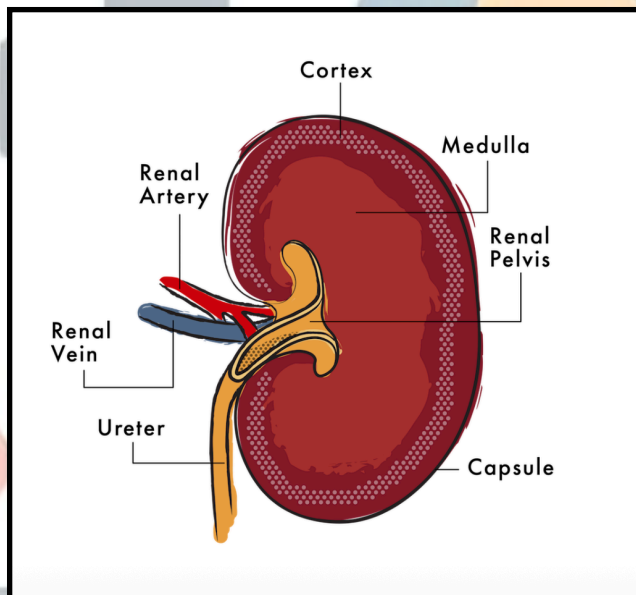
## Renal Tumours in Dogs and Cats

Renal tumours are masses arising from the kidney. They may be **primary kidney tumours** or **metastatic tumours** that spread from elsewhere.

In both dogs and cats, the main surgical treatment for a removable one-sided kidney tumour is usually unilateral nephrectomy — removal of the affected kidney and its ureter if needed.

For most renal tumours except lymphoma, surgery is the main treatment when the opposite kidney works well and staging shows the disease is removable. Renal lymphoma is different: it is usually treated with chemotherapy, not nephrectomy.

### 1) What's going on inside?



The kidneys **filter blood, balance water and electrolytes, and remove waste.**

A tumour can:

- replace normal kidney tissue
- bleed into urine
- cause abdominal pain or swelling
- obstruct urine flow
- invade nearby vessels
- spread to lungs, lymph nodes, liver, or the opposite kidney

Dogs most often develop **renal carcinoma**, including renal cell carcinoma. Cats may develop renal carcinoma, renal lymphoma, or metastatic disease.

### 2) Signs owners may notice

Signs are often vague:



- weight loss
- poor appetite
- lethargy
- vomiting
- abdominal discomfort
- blood in urine
- increased drinking/urination
- pale gums if bleeding or anaemia develops

Some renal tumours are found incidentally during ultrasound or bloodwork.

### 3) Diagnosis and staging

Your vet may recommend:

- blood work and urine testing
- blood pressure measurement
- abdominal ultrasound
- CT scan for surgical planning
- chest imaging to check for metastasis
- urine culture if infection suspected
- biopsy or cytology in selected cases. Be aware that sampling of certain tumour types can cause the tumour to seed in the abdominal cavity, can cause bleeding and may prevent curative excision afterwards. Only tumours with features that are typical of lymphoma should be sampled prior to excision.

Before removing one kidney, the team must confirm the other kidney is functional, because the remaining kidney must support the pet long term.

Renal tumours can be divided between **primary** and **secondary**: **Primary** tumours arise from the kidney and may still be only present in the kidney, whereas **secondary** tumours are developing in the kidney but the primary tumour is found elsewhere in the body. The latter type of tumours is not cured with surgery, but surgery can still be done palliatively to address bleeding or pain.

Renal tumours are then subdivided in **benign or malignant (cancer)**. Benign tumours can be cured with surgery whereas malignant tumours still carry a risk to spread after surgery. Some can still be cured when they are removed early enough in the process.

		Primary (%)				
	Total	Primary (%)	Epithelial	Mesenchymal	Both	Secondary
Canine	579	187 (32)	140 (75)	40 (21)	7 (4)	392 (68) <sup>a</sup>
		Benign	4 (3)	12 (30)		
		Malignant	135 (97)	68 (68)		
Feline	252	30 (12)	23 (77)	7 (23)		222 (88) <sup>b</sup>
		Benign	0	0		
		Malignant	23	7		

	Studies					Total (%)
	1	2	3	4	5	
Tumor, n	187	523	54	48	82	894
Carcinoma (%)	124 (66)	280 (54)	35 (65)	31 (65)	40 (49)	510 (57)
Adenoma	4	16	1	5	0	26 (3)
UC (TCC)	12	18	5	4	9	48 (5)
Papilloma	1	0	3	2	0	6 (0.7)
Nephroblastoma	6	40	2	2	5	55 (6)
SCC	0	11	0	0	0	11 (1.2)
Fibroma	9	4	1	0	0	14 (1.7)
Fibrosarcoma	5	40	0	2	0	47 (5)
Lipoma/sarcoma	0	7/1	0	0	0	8 (1)
Hemangioma/sarcoma	0	7/67	1	1	0/12	88 (10)
Leiomyoma/sarcoma	3	1/3	0	0	0/5a	12(1.3)
Lymphoma	0	0	1	1	0	2 (0.2)
Rhabdomyosarcoma	1	1	0	0	0	2 (0.2)
Undifferentiated SA	22	17	3	0	1	43 (5)
Other mesenchymal	0	5b	0	0	3c	8 (1)
Other diagnoses	0	5d	2e	0	7f	14 (1.7)
Epithelial	141 (75)	325 (62)	44 (82)	42 (88)	49 (60)	601 (67)
Mesenchymal	40 (21)	158 (30)	6 (11)	4 (8)	28 (34)	236 (26)
Nephroblastoma	6 (4)	40 (8)	2 (4)	2 (4)	5 (6)	55 (6)
Benign	17 (9)	35 (7)	5 (9)	8 (16)	0	65 (7)
Malignant	164 (88)	438 (84)	47 (87)	38 (80)	82	769 (86)



## 4) Treatment options: surgery is the main treatment for most renal tumours

### A) Nephrectomy

A nephrectomy removes the affected kidney. The ureter is often removed or ligated as part of the procedure.

This is the standard approach for many **one-sided renal tumours** when:

- the tumour is confined to one kidney
- the opposite kidney works adequately
- there is no widespread metastasis
- the pet is stable enough for anaesthesia

Why surgery is emphasised

Surgery can:

- remove the primary tumour burden
- **stop bleeding** from the kidney: a large proportion of patients diagnosed with renal tumours
- **relieve pain** or mass effect: distension of the renal capsule is known to be painful
- provide a **definitive diagnosis**
- offer long-term control in selected patients

### B) Partial nephrectomy

Partial removal of the kidney is uncommon in dogs and cats because kidney tumours are often large, central, vascular, or difficult to separate from normal tissue. It may be considered only in highly selected specialist cases.

This treatment option is

### C) Chemotherapy

Chemotherapy is most important for **renal lymphoma**, especially in cats. For renal carcinomas and many other solid renal tumours, chemotherapy has limited proven benefit. Merck notes lymphoma is best managed with combination chemotherapy, while most other renal tumours are treated surgically.

### D) Palliative care

If surgery is not possible, care may include **pain relief, anti-nausea medication, appetite support, blood pressure control, fluids, and management of kidney disease.**

## 5) Surgical procedure: nephrectomy

### What happens

The surgeon opens the abdomen, examines the organs, isolates the kidney, ligates the renal artery, renal vein, and ureter, and removes the affected kidney. The abdomen is checked for spread or bleeding before closure.

### Laparoscopic nephrectomy

Some centres offer laparoscopic nephrectomy in selected cases, but large tumours, vessel invasion, or suspected spread often require open surgery.



## 6) Outcomes and prognosis

### Dogs

Prognosis depends strongly on **tumour type, spread, and histologic grade**.

In canine renal carcinoma, mitotic index is an important prognostic factor: one study reported **median survival of 1184 days for low mitotic index tumours, 452 days for intermediate, and 187 days for high mitotic index tumours**.

Some dogs without metastasis may **live years after nephrectomy**, but dogs with metastasis or aggressive histology have a more guarded prognosis.

### Cats

A 2023 study of cats with renal carcinoma undergoing nephrectomy reported an all-cause median survival time of 203 days, but when cats that did not survive to discharge were excluded, median survival increased to 1217 days.

One-, two-, and three-year survival rates were each 40.4%.

This means cats that recover from surgery can sometimes do very well long term, but **perioperative risk is important**.

### Renal lymphoma in cats

Renal lymphoma is generally treated medically.

In one feline renal lymphoma study, median survival was short, around 50 days for abdominal-stage cats and 114.5 days for mixed-stage cats.

In cats, renal lymphoma has some fairly characteristic imaging findings, especially on ultrasound. An experienced ultrasonographer will help in narrowing the differentials and avoid unnecessary sampling in selected cases that are typical for renal carcinoma or hemangiosarcoma.

Ultrasonographic features (most common)

- Renomegaly / nephromegaly (enlarged kidneys), often bilateral and symmetrical. This is one of the most common findings.
- Hypoechoic subcapsular rim (subcapsular thickening) — a circumferential or crescent-shaped hypoechoic band beneath the renal capsule. This is strongly associated with feline renal lymphoma.
- Increased cortical echogenicity (often diffuse).
- Focal or multifocal hypoechoic nodules/masses within the renal parenchyma.
- Loss or reduction of corticomedullary distinction in some cases.
- Diffuse heterogeneous renal parenchyma or irregular echotexture.
- Pyelectasia may occasionally be present.

CT findings (when performed)

- Typical CT findings include:
  - Bilateral renal enlargement.
  - Multiple hypoattenuating infiltrative lesions or diffuse parenchymal infiltration.
- Variable contrast enhancement patterns.
- Possible concurrent involvement of retroperitoneal lymph nodes and other organs.

## 7) Complications and realistic rates

Nephrectomy is major surgery. A 2024 JAVMA study reported that unilateral nephrectomy in dogs was associated with high intra-operative and postoperative complication rates;



Postoperative issues included haematuria, stranguria, abdominal pain, and anorexia.

Typical risks include:

- Bleeding: Important risk because renal vessels are large
- Low blood pressure during surgery; can affect kidney perfusion
- Acute kidney injury: especially if the remaining kidney is compromised
- Urinary leakage: uncommon but serious
- Infection or incision complications: usually manageable
- Pancreatitis or GI upset: possible after abdominal surgery
- Tumour recurrence/metastasis: depends on tumour biology

For cats with renal carcinoma nephrectomy, peri-operative mortality is a key concern: the 2023 feline study reported that 8 cats did not survive to discharge, including some euthanised intra-operatively or after advanced disease was found.

## 8) Recovery and aftercare

Most pets require:

- hospitalisation for pain control and IV fluids
- monitoring kidney values after surgery
- appetite support
- restricted activity for 10–14 days
- incision monitoring
- follow-up blood work

Repeat imaging depending on tumour type

Long term, the remaining kidney should be monitored with blood-work, urinalysis, blood pressure, and sometimes ultrasound.

## 9) Long-term expectations

If the tumour is localised and the remaining kidney is healthy, many pets can live well with one kidney. Dogs and cats do not need two kidneys to have a good quality of life, but they do need the remaining kidney to be functional.

Long-term monitoring is important because:

- kidney function can decline with age
- metastasis can develop later
- blood pressure and urine protein may need treatment

## Selected references

- Edmondson et al., canine renal carcinoma histologic prognostic study — mitotic index survival differences.
- Kenny et al., 2023 feline renal carcinoma nephrectomy outcomes.
- Johnson et al., 2024 JAVMA unilateral nephrectomy complications in dogs.
- Williams et al., feline renal lymphoma outcomes.

**Renal tumours are serious but often very treatable when managed at an early stage. For most one-sided solid kidney tumours, nephrectomy is the key surgical treatment, provided the opposite kidney works well and staging shows the cancer is removable. Cats and dogs can live well with one kidney, but surgery carries a risk and the expertise of the surgeon is critical. Long-term monitoring is essential.**

**Renal lymphoma is the major exception and is usually treated with chemotherapy rather than kidney removal.**