



Lung carcinomas

What it is:

A cancer that starts in the lung itself (not spread from elsewhere). The most common type is adenocarcinoma (arising from the small airway/alveolar lining). Dogs and cats can also develop other lung carcinomas, but adenocarcinoma is the “typical” primary lung cancer.

How common:

Primary lung cancer is uncommon—roughly ~1% of all tumors in dogs, and <1% in cats.

Main treatment:

Surgical removal (lung lobectomy) is the backbone of therapy when a single lobe is affected and the pet is a good anesthesia candidate. Survival can be months to years, highly dependent on tumor size, stage, and whether nearby lymph nodes are involved.

Pathophysiology (why these tumors behave the way they do)

Where the cancer begins. Primary pulmonary carcinomas arise from the lung’s epithelial lining (bronchiolar/alveolar cells). Adenocarcinoma and related patterns (papillary, bronchioloalveolar/bronchoalveolar) are most common. These cancers can spread via lymphatic channels (to tracheobronchial/hilar lymph nodes) and through the bloodstream (within the chest and to distant organs). Dogs can also have intra-airway spread within the lungs.

Unique syndromes you might notice:

- Dogs: a minority develop hypertrophic osteopathy (HO)—painful, swollen limbs with new bone formation linked to thoracic tumors; it’s a paraneoplastic (body-wide) reaction to lung cancer. Treating the primary tumor can help the limb changes.
- Cats: beware the “lung–digit syndrome.” Some feline lung carcinomas preferentially metastasize to the toes, so unexplained lameness or swollen/lytic digits may actually be a sign of a primary lung tumor. In one large series of cats with lytic digital lesions, 87.5% were metastases from a primary pulmonary carcinoma. Median survival after this syndrome appears is unfortunately short (often ~2 months).

How vets stage (classify) them.

- Tumor size (strongly prognostic in dogs)
- Lymph node status (whether tracheobronchial/hilar nodes have tumor)
- Presence/absence of metastasis elsewhere (M0 vs M1)
- Clinical signs (pets discovered incidentally on X-ray sometimes do better than those in respiratory distress at diagnosis)

Imaging matters. Thoracic CT is more sensitive than radiographs for finding small lung changes and for evaluating tracheobronchial lymph nodes. Reported sensitivity of CT to detect lymph-node metastasis is ~83%, versus 0% for radiographs in one study.

What owners often see

- Dogs: cough, exercise intolerance, laboured breathing, weight loss, lethargy; sometimes no obvious signs—a mass is found incidentally on chest imaging. Rarely, limb pain/swelling from hypertrophic osteopathy.
- Cats: increased breathing rate/effort, weight loss, lethargy; lameness or sore/swollen toes can be the first clue (lung–digit syndrome)



First steps after a suspicious lung mass

- Confirm where it started. Your vet will rule out a primary cancer elsewhere that has spread to the lung (metastasis).
- Staging tests: bloodwork; thoracic CT; abdominal ultrasound as indicated; sometimes sampling of lymph nodes. If surgery is planned, many surgeons biopsy intrathoracic nodes during the same anesthesia because node status strongly affects prognosis and treatment planning.

Talk goals: If imaging suggests a single, resectable mass, surgery is usually the best path to long-term control or cure. If disease is multifocal or the pet isn't a surgical candidate, palliative approaches (medical therapy, radiation) are discussed.

Treatment overview

- Why surgery is the star (when feasible)
If a pet has a single primary tumour in one lung lobe and is otherwise stable, lung lobectomy (removing the affected lobe) offers the best chance for long-term control or cure. Modern anesthesia and pain control make thoracic surgery much more comfortable than most owners expect; many pets are home within a couple of days.
- Approaches:
Open thoracotomy (traditional rib-spreading incision)
Thoracoscopic-assisted/VATS (video-assisted “keyhole” approach) — increasingly used in specialty centers; in selected dogs this has low major-complication rates and short hospital stays. Some cases require conversion to open surgery for safety or access.
- What's removed: The entire affected lobe (partial lobe resections are uncommon for carcinomas).
- Regional lymph nodes are sampled or removed whenever possible for accurate staging—even nodes that look normal can harbor microscopic metastasis.

Surgical outcomes & what influences prognosis

- Dogs

In a 52-case study of surgically resected canine pulmonary adenocarcinoma, median overall survival (OST) was ~716 days (~23.5 months). Tumor size was key: dogs with lesions ≤3 cm had an OST around 1,064 days, while tumors >7 cm had ~110 days median survival. Clinical signs and lymph-node metastasis also tracked with worse outcomes. 1-year survival 63.5%; 2-year 49%. □

PMC

When lymph nodes are positive at surgery, outcomes drop, but modern cohorts still achieve months of survival: one multicenter series reported median survival ~167 days for node-positive (LN+) vs 456 days for node-negative (LN-) dogs after lobectomy; adjuvant chemotherapy did not significantly improve survival in that dataset. □

PMC

Broader reviews describe overall canine primary lung carcinoma survival around ~1 year on average, again with better outcomes for smaller tumors and no nodal involvement. □

Wiley Online Library

Recent multi-institution reports (2025) reiterate the same message: maximum tumor diameter <5 cm and no lymph-node metastasis predict longer survival after lobectomy. □

PubMed

- Cats

Feline primary lung tumors are rarer and often more aggressive, particularly when cats have clinical signs at diagnosis. In one study of 20 cats that underwent surgery, the overall median survival was 11 days; however, cats without clinical signs at diagnosis had a median ~578 days after surgery—showing how stage at discovery dramatically changes prognosis. Cats with pleural effusion, metastasis (M1), or poorly differentiated tumors fared worse.

Other historical and summary sources align: solitary, well-differentiated tumors detected earlier carry a much better outlook than advanced or metastatic disease.



Lung-digit syndrome is a poor prognostic marker; mean/median survivals around ~58–67 days post-diagnosis are reported once digital metastasis is present.

What about radiation or medical therapy?

1. Stereotactic/precision radiation (SBRT/SRT)

When a tumor is not surgically resectable (location, comorbidities) or an owner declines surgery, some centers offer stereotactic body radiation therapy (few highly focused treatments). Early veterinary reports suggest SBRT can be a safe, effective alternative to surgery in selected dogs and may benefit later-stage cases. Acute radiation side effects were seen in ~23% of dogs in one series (mostly low-grade). Ask your radiation oncologist about candidacy and expected control rates for your pet's tumor size and stage.

2. Chemotherapy & targeted drugs

Evidence for adjuvant chemotherapy (after complete lobectomy) in canine primary lung carcinoma is mixed/limited; several studies (including dogs with nodal metastasis) did not show a clear survival benefit from standard chemo protocols overall. That said, vinorelbine and similar agents can be used for non-resectable or metastatic disease and may yield partial responses or disease stabilization in some dogs; small studies document feasibility and biologic activity. Your oncologist will discuss realistic goals (usually palliation/control, not cure).

In cats with metastatic or non-surgical disease, small series suggest chemo can occasionally achieve stable disease and meaningful palliation for months in selected patients; responses are variable.

Bottom line: Surgery remains the best path to long-term control for localized primary lung tumors. Radiation is a reasonable local option if surgery isn't possible. Chemotherapy can be considered for advanced or non-resectable cases, with expectations set for palliation rather than cure.

The surgical experience: what to expect

- Before surgery
 - CT scan of the chest to map the tumor and lymph nodes; bloodwork and anesthesia assessment.
 - Discussion of open vs thoracoscopic-assisted approach based on tumor size & location and the hospital's expertise.
- During surgery
 - Lung lobectomy removes the entire affected lobe using stapling or suture/sealant techniques.
 - Intrathoracic lymph nodes are sampled/removed for definitive staging. This can be technically challenging but strongly recommended, because microscopic nodal disease can change aftercare recommendations.
- After surgery
 - Most dogs are discharged ~3-4 days after thoracoscopic-assisted lobectomy; open cases may stay a bit longer based on pain control and oxygen needs.
 - Temporary chest tubes remove air/fluid; oxygen and pain control are used as needed.
 - Pathology results (tumor type, grade, margins, node status) usually return in ~5–10 days and guide next steps.

Complications & their typical rates

No surgery is risk-free, but modern teams minimize risk with experienced anaesthesia, careful pain control, and intensive monitoring. Here is what the literature shows:



- Across thoracic procedures in mixed cohorts, postoperative complications can run in the 20–30% range in some series (most are minor and manageable). Thoracostomy tubes themselves can cause issues in a subset of cases (older work cites ~22% overall complications around tube placement in dogs across indications).
- Lung lobectomy for primary tumors:
Open thoracotomy series vary, but in one retrospective cohort of dogs with primary lung tumors that proceeded to treatment, ~13.6% died during or shortly after surgery (note: this is a small cohort and includes dogs with significant disease; modern series often report lower peri-op mortality in carefully selected candidates).
- Post-thoracic complications to watch for:
 1. Air leak/pneumothorax (managed via chest tube until the leak seals)
 2. Arrhythmias (usually transient, monitored)
 3. Aspiration pneumonia (low incidence but serious; one pneumonectomy series across indications reported ~2/16 dogs developed aspiration pneumonia)
 4. Infection/pyothorax (uncommon but serious; in a broader thoracic cohort unrelated to tumor, ~6.5% developed pyothorax).
- Radiation therapy (SBRT/SRT)
Acute skin/lung effects were reported in ~23% of dogs in one large veterinary series, usually grade 1–2 and self-limiting; grade 3 events were uncommon. Late effects depend on dose/volume and planning technique.
- Chemotherapy
Side effects depend on the drug. With vinorelbine (commonly chosen for pulmonary carcinomas), expect possible transient low white blood cells and GI upset—typically manageable with dose holds and anti-nausea meds in experienced hands. Evidence for survival extension after complete lobectomy is inconclusive; small studies of advanced/non-resectable disease show partial responses or disease stabilization in some dogs.

When is surgery enough, and when do we add more?

- **Dogs**
Best surgical candidates: a single tumor, small (ideally ≤ 3 –5 cm), no nodal or distant metastasis, and the pet is comfortable breathing. Many such dogs can enjoy a year or two (or more) after lobectomy, particularly in the ≤ 3 cm group.

Higher-risk features (large tumor, positive node, clinical signs at diagnosis): surgery still offers benefit, but median survival shortens. Your oncologist may discuss SBRT or adjuvant medical therapy; keep expectations realistic, as chemo benefit is unproven overall in these settings.
- **Cats**
If found early and localized, lobectomy can be worthwhile. But cats with clinical signs, pleural effusion, or metastasis (especially digits) face a guarded to poor outlook despite intervention. Quality-of-life–focused care is appropriate and compassionate in many advanced feline cases.

Practical decision pathways

- Dog, solitary mass ≤ 3 cm, no node enlargement on CT, no other spread
→ Lung lobectomy (+ intra-thoracic node sampling). If nodes are negative and margins are complete, surgery alone is typically recommended. Published medians: ~1,000+ days possible in the smallest-tumor group.
- Dog, mass > 5 –7 cm and/or suspicious/positive lymph node



→ Lobectomy + node removal/biopsy, then discuss SBRT (if residual/recurrence) or chemo (palliation). Expect shorter medians (months), though individual outcomes vary.

- Dog, not a good surgical candidate (location/health) or owner declines surgery
→ Consider SBRT as a local control option and palliative meds for cough/breathing comfort.
- Cat, solitary surgically accessible tumor, no signs
→ Lobectomy can still give many months (even ~1–1.5 years in some). Close monitoring for recurrence/spread.
- Cat with lameness from a swollen toe + chest mass (lung–digit)
→ Prognosis is poor; discuss comfort care vs systemic therapy aimed at palliation. Median survivals ~2 months once digital metastasis is present.

Life after surgery: home care & monitoring

Incision/chest-tube site care: follow discharge instructions; activity restriction until cleared.

Breathing checks: call immediately for increased effort, rapid rate at rest, blue/pale gums, collapse, persistent cough, or fever.

Rechecks: surgeons typically recheck 7–14 days post-op; oncologist review follows once pathology returns.

Long-term: periodic chest imaging (X-rays or CT intervals chosen by your team) to look for recurrence/metastasis. Early detection enables earlier intervention.

Key takeaways

- Surgery is the cornerstone for a single, resectable lung carcinoma—especially in dogs with small (≤ 3 cm) tumors and no node involvement, where year-plus survival is realistic. Tumor size and lymph-node status are the biggest drivers of prognosis.
- Lobectomy is increasingly used and, in selected cases, carries low rates of major complications and short hospital stays; conversion to open surgery sometimes occurs for safety.
- Cats often present later; prognosis depends on stage and clinical signs at diagnosis. The lung–digit syndrome (toe metastasis) signals poor outcomes; care usually focuses on comfort.
- SBRT can be a non-surgical local option with a favorable acute-toxicity profile in experienced hands. Chemotherapy can palliate advanced disease, but clear survival benefit after complete lobectomy is unproven. □

Selected English-language veterinary references

Ichimata M et al., 2023. Prognosis of primary pulmonary adenocarcinoma after surgical resection in small-breed dogs. Strong size-based survival data (≤ 3 cm vs larger).

Rose RJ et al., 2020. Survival in dogs with primary lung tumors and intrathoracic nodal metastasis. Node-positive median ~167 d; no clear chemo benefit in that cohort.

Marcinowska A et al., 2025. Canine lung carcinoma—descriptive review. Incidence, staging, CT sensitivity for node metastasis.

Scott JE et al., 2023. Complications and outcomes of thoracoscopic-assisted lung lobectomy in dogs. Low major-complication rates; quick discharges.

Park K et al., 2024. Thoracoscopic resection of lung masses in dogs vs open thoracotomy. Intra-op ~16%, post-op ~8% complications in VATS cohort; survival to discharge good



Martin TW et al., 2023. SBRT for canine primary pulmonary carcinoma. Safe, effective alternative in selected dogs; potential advantage in stage 3–4.

Dunfield EM et al., 2018. Survey of SRT in vet radiation oncology. Context for techniques and use.
Hahn KA et al., 1998. Cats after removal of primary lung tumor. Prognostic markers; value of surgery in selected cats.

Maritato KC et al., 2014. Feline primary lung tumors outcomes. Clinical signs/effusion/grade predict survival; striking split between asymptomatic vs symptomatic cats.

Goldfinch N et al., 2012; Thrift E et al., 2017. Feline lung–digit syndrome. Pattern, frequency, and survival expectations.

Withers SS et al., 2013. Hypertrophic osteopathy in dogs. Classic paraneoplastic syndrome linked to thoracic tumors.
SBRT adverse effects (2019). Acute effects ~23%, mostly low-grade, in dogs receiving stereotactic radiation.