western veterinary Cancer Centre

A Member of the BrightHeart Veterinary Network

Radiation Therapy Quick Reference Guide:

Protocols:

- Definitive protocols
  - Carcinomas and Hematopoietic: 18 fractions M-W-F.
  - Sarcomas: 21 fractions M-W-F.

- Palliative/Coarsely fractionated protocols
  - A protocol of 4 weekly fractions is most typical.
  - Sometimes weekly to desired effect (example: bone pain and OSA).

- Intensity Modulated Radiation Therapy (IMRT):
  - The most technically demanding form of radiation therapy. Uses the dynamic multileaf collimator to continually change the shape of the treatment field while radiation is being delivered. This allows for very precise localization and treatment of tumors, while simultaneously sparing critical normal structures within the treatment field. IMRT allows the treatment of tumors that would be too dangerous with conventional radiotherapy techniques.

Tumor Types:

- **Highly Treatable:** Tumors in this category have a very good chance of long term control (long term is typically defined as 2 years or longer for veterinary patients), with a low incidence of systemic spread.

  - Cutaneous tumors:
    - Mast cell tumor: 86 % 5 year disease free, 95 % overall survival.
    - Soft tissue sarcomas: 75 % 5 year disease free survival.
    - Squamous cell carcinoma: 50 % 2 year survival.
    - Basal cell carcinoma: limited data, expect long term control for solitary lesions.
    - Perianal gland tumors: long term control expected.

  - Nasal tumors:
    - Adenocarcinoma: 13 months median survival, >30 % 2 years or longer.
    - Nasal sarcomas: best chance of long term control (2+ years).

- Brain tumors:
  - Glial tumors (astrocytoma, glioma, oligodendroglioma): Median survival of 14 months, 35 % 2+ year survival.
  - Pituitary: Median survival of 4 years for dog treated for Cushings syndrome. Survival decreases if neuro signs present.
  - Meningioma: Good local control, slowly responsive due to mesenchymal nature.

- Lymphoid Malignancies:
  - Solitary skeletal plasmacytoma: 2+ years control
  - Multiple myeloma: emergency use to decompress lytic bone lesions. Most typically used to treat vertebral body collapse.
  - Lymphoma: typically used in combination with chemotherapy for patients with solitary foci of lymphoma.
  - Anterior mediastinal mass
  - Nasal
  - Jugular furrow (Hodgkin's-like)
  - Bone, obstructive nodes, etc
  - Lymphoid Thymoma (primarily cats)

- Oral Tumors:
  - Ameloblastoma: reasonable expectation of cure. 5+ year survival.
  - Acanthomatous Epulis: As above – 5+ year survival.

- **Moderately Treatable:** Individual patients in this group can still do very well, many with survival times of 18-24 months or longer. However, they have a higher incidence of resistant variants and/or a higher chance of systemic metastasis than those tumors in the Highly Treatable category.

  - Cutaneous tumors:
    - Sweat gland carcinoma: Median survival of 1 year, ~40 % chance of metastasis.
    - Adnexal gland carcinoma: As above.

  - Oral Tumors:
    - Sarcomas: (chondrosarcoma, fibrosarcoma). Median survival of 11 months. May be considerably longer if tumor can be resected down to minimal/no gross residual disease.
    - Melanoma: Median survival approaches 1 year if treated with a coarse fractionation protocol and concurrent Carboplatin chemotherapy.

  - Anal Sac Adenocarcinoma: Median survival of 15 months, even with nodal metastasis. Typical course of therapy will incorporate surgery, radiation, and chemotherapy.

- **Poorly responsive tumors:** Individual patients with these tumors may respond to radiation therapy. However, there is a high incidence on non-responders, and adjuvant therapy is frequently necessary.
  - Nasal Tumors:
    - Non-keratinizing squamous cell carcinoma: Median 7 months

- Oral Tumors:
  - Oral Squamous cell carcinoma (cats)
  - Tonsillar Squamous cell carcinoma (dogs)

- Bone:
  - Osteosarcoma: Radiation therapy can be a very potent and effective tool for relieving bone pain resulting from primary or metastatic bone tumors. However, it is relatively ineffective at gaining local long term control as a single agent.

This quick reference guide is not, by any means, a complete list of tumors that can be treated with radiation therapy. We tried to pick the tumor types most commonly treated with RT, focusing on those with the most data and/or those with the best anticipated outcome. Radiation therapy may be a rational treatment option for any cancer patient where improving local control is the desired goal.

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