



Advanced Radiation Therapy for Pets: IMRT and VMAT Explained

Radiation therapy is a cornerstone of modern cancer care in veterinary medicine, and two of the most advanced techniques now available are Intensity-Modulated Radiation Therapy (IMRT) and Volumetric Modulated Arc Therapy (VMAT). These technologies allow for highly targeted treatment of tumors while minimizing the radiation dose to surrounding healthy tissues, ultimately improving outcomes and quality of life for canine and feline patients.

IMRT works by shaping radiation beams to conform to the exact three-dimensional shape of the tumor. This is achieved through dynamic movement of small metal “leaves” within the treatment machine, which modulate the intensity of the beam across different areas. As a result, radiation oncologists can deliver a higher, more effective dose directly to the tumor while sparing nearby organs and healthy tissue. IMRT is particularly useful for treating tumors in sensitive or anatomically complex locations, such as brain tumors (e.g., meningiomas), nasal tumors, and oral cancers, where precision is essential to reduce side effects.

VMAT is a more advanced evolution of IMRT. While IMRT typically delivers radiation from multiple fixed angles, VMAT delivers radiation continuously as the treatment machine rotates around the patient in an arc. The dose intensity and shape are adjusted in real time during the rotation, allowing for faster treatment sessions—often under two minutes—without sacrificing accuracy. This speed reduces the duration of anesthesia, which is especially beneficial for senior or fragile pets.

VMAT is frequently used for treating a wide range of tumors, including brain tumors, spinal tumors, adrenal tumors, nasal tumors, oral tumors, and peripheral nerve sheath tumors. The ability to deliver precise doses in fewer, more efficient sessions makes VMAT an excellent option for pets needing stereotactic radiation therapy (SRT), also known as stereotactic radiosurgery (SRS), where one to five high-dose treatments are delivered with sub-millimeter precision.

Both IMRT and VMAT are designed to maximize tumor control while minimizing side effects such as inflammation or damage to adjacent healthy structures. These therapies are planned using advanced imaging and software to ensure every treatment is tailored to the individual patient’s anatomy and condition. Most patients experience minimal side effects, which may include mild, localized skin irritation or fatigue, depending on the treatment area and protocol used.

If you are a pet owner exploring treatment options or a referring veterinarian seeking advanced cancer therapies for your patient, IMRT and VMAT represent two of the most precise and effective tools in veterinary radiation oncology today.



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