



Positron Emission Tomography/ Computed Tomography (PET/CT)



The PET/CT is a state-of-the-art imaging machine and the first of its kind at the VMC, which is one of six North American veterinary academic institutions that offer this type of advanced diagnostic imaging tool for dogs and cats with cancer.

Cutting-edge reliability

The PET/CT scanner is innovative because of its capability to help clinicians determine cancer spread with more certainty than current modalities, making it extremely useful in performing sensitive, full body staging of oncology patients. The PET/CT offers the most comprehensive, high detail information about the patient's stage of cancer, all in one machine.

Without the PET/CT, performing multiple tests using X-rays, ultrasound and conventional CT is standard protocol, while still leaving some risk of not detecting areas of spread or other problems.



How it Works

The PET/CT scanner has two imaging components: the CT component, which operates with X-rays that rotate around the patient's body, and the PET portion, which uses nuclear medicine to allow radiologists to see actual physiological changes in the body.

The PET/CT scanner process includes an IV injection of a radiotracer — typically an analog of glucose tagged with radioactive fluorine — that concentrates in tissues with high metabolic activity (glucose usage). The PET portion of the scanner will highlight where the radioactive material has localized. It is most commonly employed in cases involving cancer, measuring brain activity, cardiac muscle activity, or identifying infection/inflammation and any potential spread.

PET/CT at the Veterinary Medical Center - continued

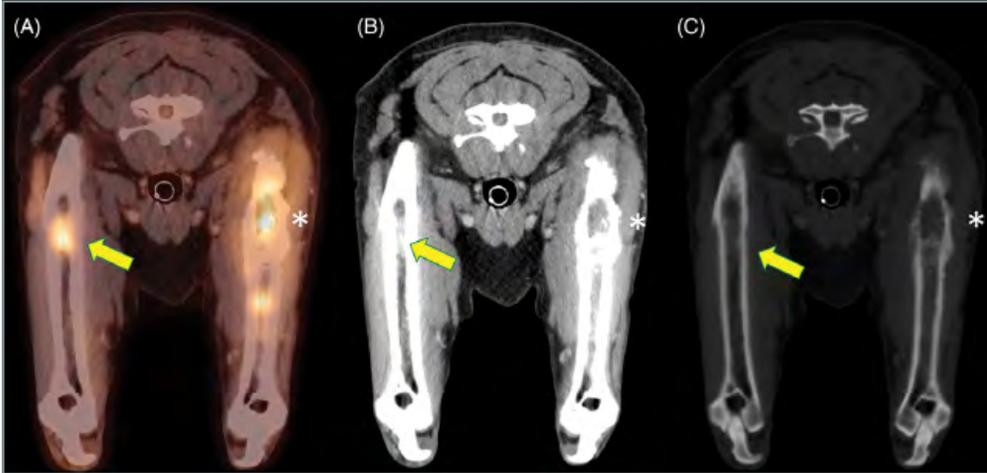
Benefits to Patients

The most appropriate patient for the PET/CT would be one with highly metastatic cancer but unknown spread, or patients that present with what looks to be metastasis, such as an enlarged lymph node, but with an unknown origin.

Patients benefit because there is more certainty about cancer spread, which means better-informed decisions about appropriate therapy and whether or not an aggressive surgery or chemotherapy is worth the risk of potential morbidity or associated health risks.



Within the control room, the computer fuses CT and PET images, with the CT providing anatomic resolution and the PET providing metabolic information.



PET/CT provides a more precise view, enabling VMC specialists to identify any previously undetected and unidentified nodules, and/or areas of disease spread.

Brody A, Crooks JC, French JM, Lang LG, Randall EK, Griffin LR. Staging canine patients with appendicular osteosarcoma utilizing fluorine-18 fluorodeoxyglucose positron emission tomography/computed tomography compared to whole body computed tomography. *Vet Comp Oncol.* 2022 Sep;20(3):541-550. doi: 10.1111/vco.12805. Epub 2022 Mar 11. PMID: 35166445.

What to Expect

The PET/CT imaging process involves the following procedures and time line:

1. General Anesthesia
2. Radiotracer injected in PET/CT room, followed by a 45-60 minute waiting period, where patients are closely monitored
3. CT scan (pre-IV contrast)
Whole body scan lasting 1-2 minutes
4. PET scan
Whole body scan lasting 15-20 minutes
5. CT scan (post-IV contrast)
Whole body scan lasting 1-2 minutes
6. Patient moved to recovery in cool down kennel, located within the PET/CT suite
7. Patient returns to ward
(working with Ohio State Radiation Safety)
8. Go home occurs approximately 6-7 hours after injection

If you have any questions, please reach out to Eric Green, DVM, professor, Radiology and Radiation Oncology and Diagnostic Imaging service head, at cvm-osu_radiologydepartment@osu.edu