

Advanced Imaging Digest

Positron emission tomography

Non-contrast enhanced computed tomography versus contrast-enhanced computed tomography

The utility of positron emission tomography-computed tomography (PET-CT) in oncological imaging is well documented and the standard of care for some malignancies, such as certain types of lung cancer, lymphoma and cervical cancer. Traditionally, 18F-fluorodeoxyglucose (FDG) PET-CT was performed with a low-dose CT portion for attenuation correction of the PET data and to localize 18F-FDG radiotracer uptake, while preventing increased radiation burden which is associated with full-dose (diagnostic) CT. PET-CT can now be performed with full-dose CT; however, its effective benefit is still being debated. Currently, there are no large multicenter trials documenting the comparison of non-contrast enhanced (low-dose) CT (NECT-PET) versus contrast-enhanced CT (CECT-PET) imaging.

Several smaller studies comparing traditional low-dose NECT-PET versus diagnostic CECT-PET scans have been conducted. A number of these studies have documented no significant differences between CECT-PET and the traditional low-dose NECT-PET, spanning a variety of malignancies. Moreover, the addition of contrast and diagnostic CT has some disadvantages, including increased radiation dose to the subset of patients who will require multiple imaging exams and the risks associated with intravenous contrast administration, including renal failure in patient populations whose renal function may already be compromised.

Some studies suggest CECT-PET is potentially useful in deciding management. In one of these studies, Pfannenbergl et al. (2007) correlated a variety of pathologies, including lung, gastrointestinal and neuroendocrine tumors. However, this was a small study (100 patients) that included many cancer types.

Magellan Healthcare recommends that CECT not be applied to all patients undergoing PET-CT and be approached on a case-by-case basis, where CECT imaging may affect the therapeutic decision-making process. It is also Magellan's position that if equivocal findings are noted on PET-CT and additional imaging is needed, MRI should be considered in patient populations with high-diagnostic imaging radiation exposure. However, in keeping with national society guideline recommendations, Magellan guidelines allow diagnostic-quality CTs in addition to PET exams, especially when the presence of lesions may be amenable to surgery.

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Dr. Khalid joined Magellan in 2014. As a board-certified diagnostic radiologist with a career spanning more than twenty years, he has a thorough understanding of the complexities of the U.S. healthcare system and current standards of care. In his current role, Dr. Khalid is involved in training new physicians, auditing, continuing education and policy development.

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