

why PET only?

lower cost of ownership

The Attrius was designed with the private practice in mind; with a small design footprint, and a significantly lower cost when compared to the purchase, install and on-going maintenance of PET/CT. These factors make it more difficult to financially justify the use of combined PET/CT units within cardiology practices.

improved service uptime

PET/CT devices have two imaging modalities, so when one or the other is inoperable, the camera is down. CT X-ray tubes tend to be susceptible to fault resulting in downtime affecting the imaging center's ability to generate revenue. The Attrius PET scanner product line has been designed to provide the high level of reliability that our customer's expect. After 15 years, many customers say that their scanner is still standing the test of time.

no need for specialized CT trained technologists

Some states require a CT certified technologist to work along with a nuclear medicine technologist and/or require certified CT training for the nuclear medicine technologist operating the PET/CT camera, even if the CT portion is only for transmission scanning use. Most states require certified CT training for the interpreting physicians as well.

lower patient radiation exposure

PET only imaging, utilizing ^{82}Rb , has been shown to have a lower patient radiation exposure level in comparison to CT based methods of transmission. Current CT based protocols involve multiple scans, blurring the data, which is contradictory to what CT is used for in clinical medicine. The typical radiation dose from a ^{68}Ge transmission scan is about 8 mrem (0.08 mSv). Newer PET/CT scanners use CT for attenuation correction and this has also been shown to produce a radiation dose of about 80 mrem (0.8 mSv)¹. Dr. K. Lance Gould has published

data to represent that in order to resolve the artifacts caused by CT based transmission imaging, a helical CT needs to be performed exposing the patient to 2.36 mSv, approximately 300% more than previously published CT transmission exposure levels².

smaller footprint compared to PET/CT

We know that space is limited in cardiology offices so Positron's Attrius was designed with a smaller footprint, compared to PET/CT systems, allowing the system to be placed in a 15' x 20' area.

similar scanning times at a reduced cost and exposure

Positron's rapid segmented attenuation correction scanning allows for scan times competitive to that of PET/CT. Positron's segment scan times are approximately 3-5 minutes depending on patient BMI. CT protocols call for multiple scans slowing the rotation producing images similar to that of ^{68}Ge . The image below demonstrates the 25 minute protocol currently recommended by Positron.



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elimination of inaccuracies of CT based transmission scanning

Cardiac PET combined with CT is expanding despite artifactual defects and false-positive results due to misregistration of PET and CT attenuation correction data - the frequency, cause, and correction of which remain undetermined. Misregistration of CT attenuation correction and PET emission data with associated artifactual PET defects is due to momentary helical CT “snapshots” at some point in the respiratory cycle of changing attenuating thoracic-diaphragmatic structures during breathing. The brief CT snapshots commonly do not match the actual average attenuation of the constantly changing thoracic-diaphragmatic structures over longer emission scans during normal breathing. A recent study published in the Journal of Nuclear Medicine by D. K. Lance Gould, demonstrated that there was a misregistration of standard helical CT PET images causing artifactual PET defects in 40% of patients and were moderate to severe in 23%².

reduced liability associated with incidental findings reporting responsibility

Since the very first cardiac images were created, cardiologists have struggled with what to do about “incidental” abnormalities in structures outside the heart. Similar issues confront the nuclear cardiologist. Because there is limited guidance on how to handle these findings, each interpreter likely approaches them in a different manner. Some may ignore them, others may comment along the lines of “abnormality noted requiring further testing. Some sites may even choose to pay for a radiologist to “review” the CT portion of the study in an effort to reduce their liability.

Studies have shown that using 16 or 64-slice multi-detector CT scanners result in extra-cardiac findings in 58%, with 22.7% being clinically significant³. For a physician who assumes responsibilities for CT imaging exclusively in a specific anatomical area such as cardiac CT, this includes the following:

- Completion of an Accreditation Council for Graduate Medical Education (ACGME).
- Supervision, interpretation, and reporting of 500 cases, at least 100 of which must be a combination of thoracic CT or thoracic CT angiography during the past 36 months in a supervised situation. Coronary artery calcium scoring does not qualify as meeting these requirements⁴.
- Included in the above, completion of at least 30 h of category I CME in cardiac imaging, including CCT, anatomy, physiology, or pathology or documented equivalent supervised experience in a center actively performing cardiac CT.
- The interpretation, reporting, or supervised review of at least 50 cardiac CT examinations in the last 36 months. Coronary artery calcium scoring does not qualify as meeting these requirements⁴.

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