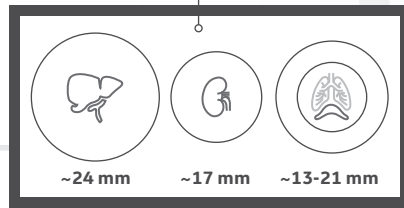
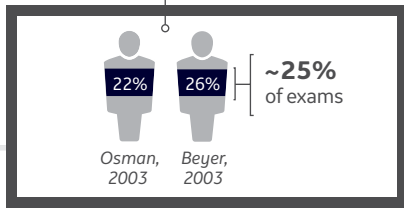


WHAT HAPPENS WHEN YOU WORK AROUND MOTION INSTEAD OF SEEING THROUGH IT?

Research has proven that ungated PET/CT exams near the diaphragm can lead to blurred margins, artificially reduced SUV values, lesion localization errors and lesions that appear larger, but fainter.^{1,2,7-9}

Respiratory motion causes significant artifacts in ~25% of scans in anatomy near the diaphragm.^{5,6}

Average respiratory motion in cranio-caudal direction.^{2,8}



25+ journal publications on the clinical impact of respiratory motion.¹⁻¹⁴

CLINICAL IMPACT OF RESPIRATORY MOTION MANAGEMENT

- Gated PET/CT
- Ungated PET/CT

Gated vs. ungated scans in the liver

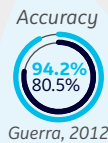
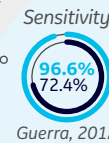
Gated vs. ungated scans in the lungs

Improve lesion detection

Gating improves both sensitivity and diagnostic accuracy when imaging lung lesions¹⁰

Published literature demonstrates respiratory gating is a valid technique to improve quantitation and lesion detectability of lung and liver tumors.⁷

24% more sensitive

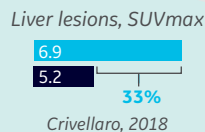


14% more accurate

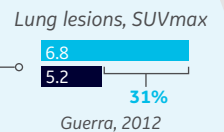
Improve quantitation

Gating clears the way for an increase in quantitation^{10,12}

33% increase in quantitation



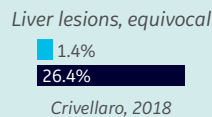
31% increase in quantitation



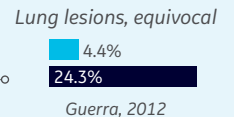
Reduce equivocal lesions

Minimize the number of indeterminate findings in lung and liver imaging^{10,12}

95% fewer equivocal lesions



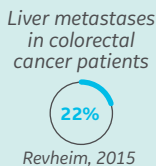
82% fewer equivocal lesions



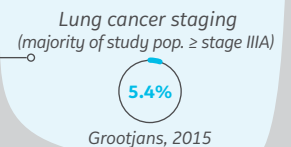
Improve staging accuracy

Gating can help with staging accuracy, especially for patients in early disease stages^{13,14}

22% of patients with change in treatment plan



5.4% of patients with change in treatment plan



Improve radiotherapy planning

Reassure yourself with more accurate target volumes for liver lesions¹¹

33% planning target volume (PTV) optimization
Liver lesion PTV, in ml
22 33
Riou, 2014

Non respiratory-gated PET exams can both misdiagnose liver metastases and underestimate the real internal target volumes.¹¹



Respiratory motion correction with MotionFree

Conventional Static
No respiratory motion correction



SUVmax: 4.99
Volume: 0.84 cm³

MotionFree
Reconstructed with Q.Static



SUVmax: 6.74
Volume: 0.50 cm³

Images courtesy of Dr. Huellner, University Hospital Zurich
Acquired by Discovery™ MI 5R with MotionFree enabled

References:

1. Kesner et al. "On transcending the impasse of respiratory motion correction applications in routine clinical imaging - a consideration of a fully automated data driven motion control framework." EJNMMI Physics. 2014; 1(8): 1-11.
2. Callahan, et al. "The clinical significance and management of lesion motion due to respiration during PET/CT scanning." Cancer Imaging. 2011; 11:224-36.
3. Kasuya, et al. "Role of respiratory-gated PET/CT for pancreatic tumors: A preliminary result." 2013; 82 (1): 69-74.
4. Tonkopi, et al. "Average CT in PET studies of colorectal cancer patients with metastasis in the liver and esophageal cancer patients." Journal of Applied Clinical Medical Physics. 2010; 11(1): 217-228.
5. Osman, et al. "Respiratory motion artifacts on PET emission images obtained using CT attenuation correction on PET-CT." Eur J Nucl Med Mol Imaging. 2003; 30:603-606.
6. Beyer, et al. "Dual-modality PET/CT imaging: the effect of respiratory motion on combined image quality in clinical oncology." Eur J Nucl Med Mol Imaging. 2003; 30: 588-596.
7. Guerra, et al. "Respiratory Motion Management in PET/CT: Applications and Clinical Usefulness." Current Radiopharmaceuticals. 2017; 10 (2): 85-92.
8. Walker, et al. "Evaluation of principal component analysis-based data-driven respiratory gating for positron emission tomography." Br J Radiol. 2018; 91(1085): 1-18.
9. Osman, et al. "Clinically Significant Inaccurate Localization of Lesions with PET/CT: Frequency in 300 Patients." Journal of Nuclear Medicine. 2003; 44 (2): 240-243.
10. Guerra, et al. "Respiratory gated PET/CT in a European multicentre retrospective study: added diagnostic value in detection and characterization of lung lesions." Eur J Nucl Med Mol Imaging. 2012; 39: 1381-1390.
11. Riou, et al. "Integrating respiratory-gated PET-based target volume delineation in liver SBRT planning, a pilot study." Radiation Oncology. 2014; 9 (127): 1-9.
12. Crivellaro, et al. "Added diagnostic value of respiratory-gated 4D 18F-FDG PET/CT in the detection of liver lesions: a multicenter study." Eur J Nucl Med Mol Imaging. 2018; 45:102-109.
13. Grootjans, et al. "The impact of respiratory gated positron emission tomography on clinical staging and management of patients with lung cancer." Lung Cancer. 2015; 90: 217-223.
14. Revheim, et al. "Respiratory gated and prolonged acquisition 18F-FDG PET improve preoperative assessment of colorectal liver metastases." Acta Radiol. 2015; 56(4):397-403.

These results are for illustrative purposes only and represent specific customer experiences; actual results could vary depending on clinical practice and circumstances.

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