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.1,6

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

~24 mm ~17 mm ~13-21 mm

~25% of exams


22% 26%

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

CLINICAL IMPACT OF RESPIRATORY MOTION MANAGEMENT

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 lesions.10

Improve quantitation
Gating clears the way for an increase in quantitation.10, 12

Reduce equivocal lesions
Minimize the number of indeterminate findings in lung and liver imaging.10,12

Improve staging accuracy
Gating can help with staging accuracy, especially for patients in early disease stages.11,16

Improve radiotherapy planning
Reassure yourself with more accurate target volumes for liver lesions.11

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

Liver lesions, SUVmax

Liver lesions, equivocal

Liver metastases in colorectal cancer patients

Liver lesion PTV, in ml

22% 33%

26% 24.2% 33%

22% 24.3%

26% 96.6% 72.4%

Guerra, 2012 Guerra, 2012 Guerra, 2012

25% of patients with change in treatment plan

6.8 5.2

4.4% 23.4%

6.9 5.2

96.6% 72.4%

Crivellaro, 2018

Crivellaro, 2018

Revheim, 2015

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

22% 33% increase in quantitation

31% increase in quantitation

95% fewer equivocal lesions

82% fewer equivocal lesions

5.4% of patients with change in treatment plan

5.4% of patients with change in treatment plan

22% 33% of patients with change in treatment plan

33% planning target volume (PTV) optimization

Lung cancer staging
(majority of study pop. ≥ stage IIIA)

Lung lesions, SUVmax

Lung lesions, equivocal

Grootjans, 2015

Guerra, 2012

22% 33% increase in quantitation

24% more sensitive

14% more accurate

95.6% 72.4%

6.8 5.2

4.4% 24.5%

Guerra, 2012

Guerr, 2012

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

Sensitivity

Accuracy

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

~25% of exams

22% 26%
Respiratory motion correction with MotionFree

Conventional Static
No respiratory motion correction

MotionFree
Reconstructed with Q.Static

SUVmax: 4.99
Volume: 0.84 cm³

SUVmax: 6.74
Volume: 0.50 cm³

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

References:

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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