



# Die Zukunft der Nuklearmedizin

## Die digitale Atemkorrektur MotionFree

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MotionFree



JB61606XX

# MotionFree

Die einzige digitale Korrektur der Atembewegung

Bis zu **30%** verbesserte  
**quantitative Genauigkeit**  
(SUVmean)<sup>6</sup>

Bis zu **67%** verbesserte  
**Genauigkeit** der Größe der  
Läsionen <sup>6</sup>

Konventionell  
Statisch



MotionFree



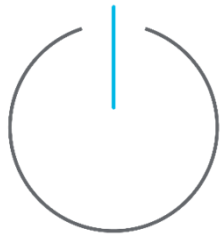
Courtesy: USZ, Zurich, Switzerland



# MotionFree

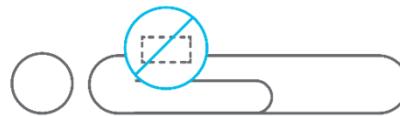
Nahtlose Integration der Atemkorrektur in Ihren Workflow

Always on



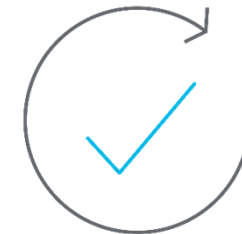
Kein externes Gerät  
Kein manuelles Setup

Verbesserter Patientenkomfort



Patienten müssen nicht für  
den Umgang mit externem  
Gerät trainiert werden

Routine im existierenden  
Workflow



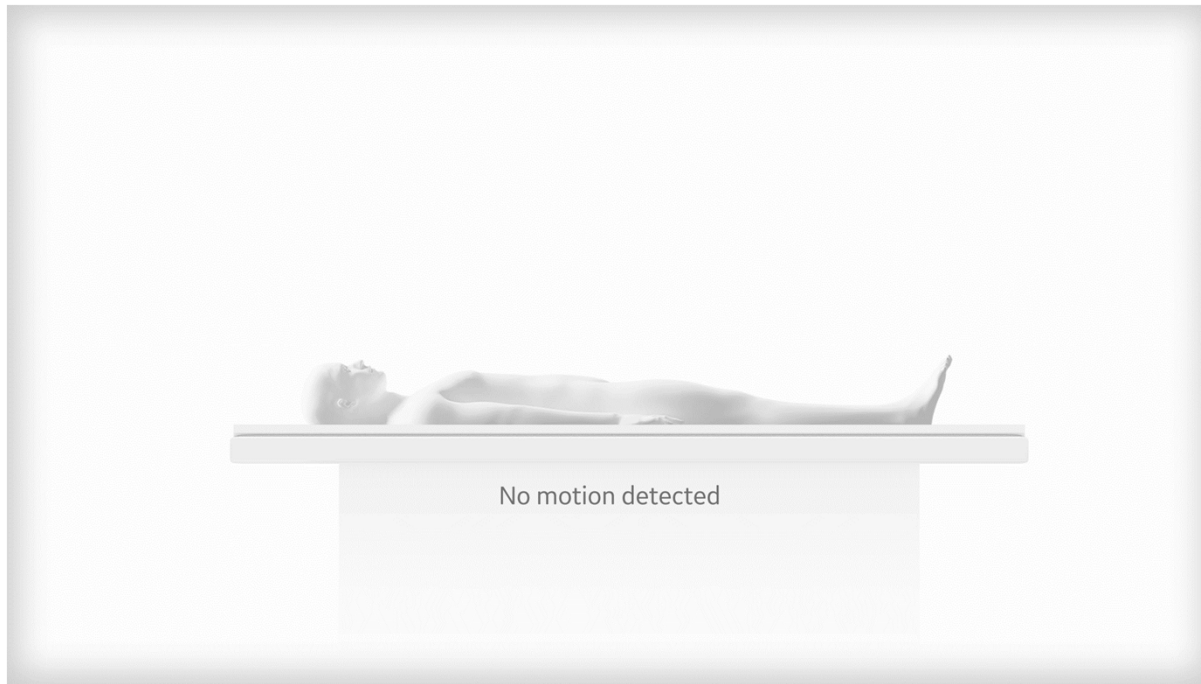
Autokorrektur nur dort, wo sie  
gebraucht wird

**Die erste “smarte” PET Scanning  
Lösung**



# MotionFree

## Automatische Detektion der Atembewegung



Detektion der Atembewegung  
aus PET-Daten

Physiologische Bewegungen  
werden automatisch erkannt  
und das Bild korrigiert

Entwickelt, um das individuelle  
Atemmuster jedes Patienten zu  
bestimmen



# MotionFree

Echtzeitinformationen zur Verlängerung der Scandauer

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Vewendung von PET-Daten  
um die Auswirkungen  
automatisch zu erkennen

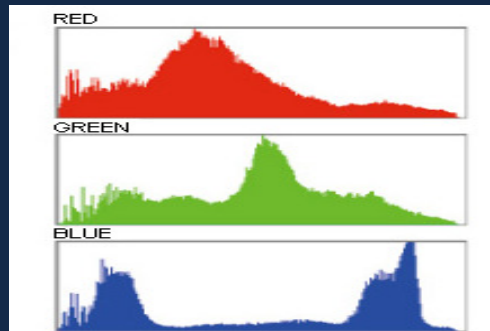
Echtzeit-Entscheidungen,  
wann die Scandauer verlängert  
werden soll

Schnelle und genaue  
Entscheidungsfindung

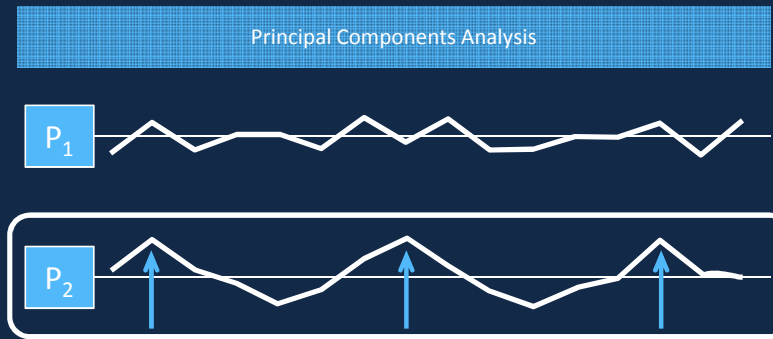
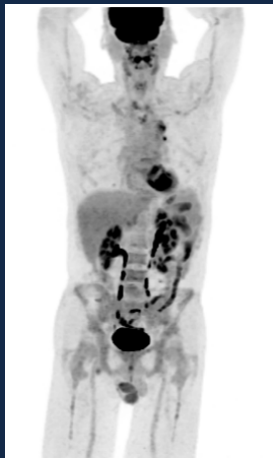




# MotionFree



Ein Bild besteht aus unterschiedlichen Komponenten.



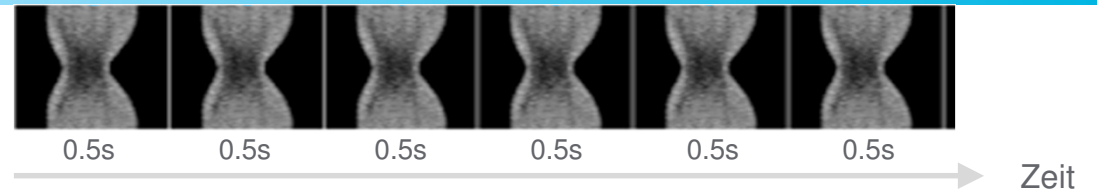
Ein PET Scan besteht auch aus unterschiedlichen Komponenten. Eine ist die Atembewegung.

Die Atembewegung wird durch eine Hauptkomponentenanalyse bestimmt.

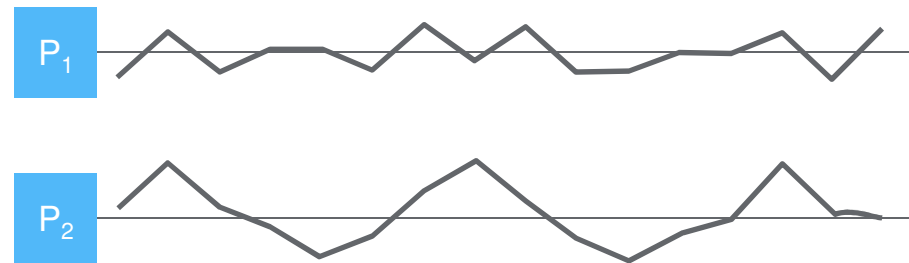


# MotionFree

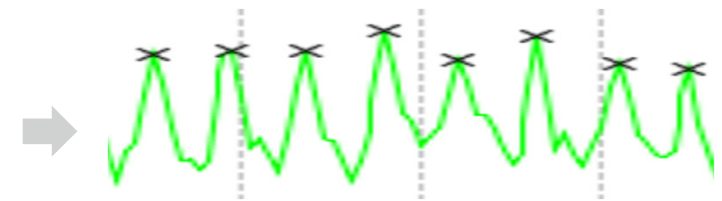
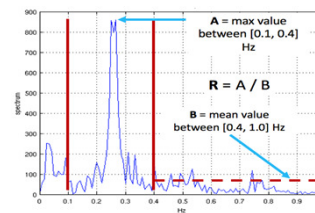
1. Die PET Daten werden in kurze dynamische Frames geteilt.



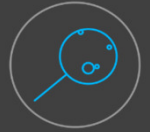
2. Die dynamischen Frames werden durch ein "unsupervised ML" in ihre Hauptkomponenten zerlegt.



3. Fourier Transformation Algorithmus identifiziert die Atembewegung







# DETEKTION KLEINER LÄSIONEN

## Aufnahmeparameter

88.1 MBq FDG  
62 min p.i.  
20 min Aufnahmedauer

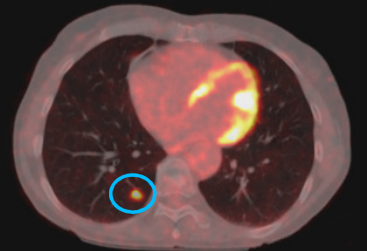
## Patienten BMI

18,9

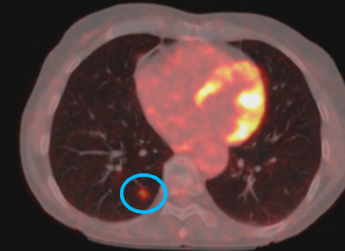
MotionFree



Konventionell Statisch



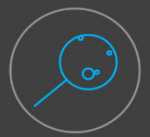
SUVmax 6.74  
Volume 0.50cm<sup>3</sup>



SUVmax 4.99  
Volume 0.84cm<sup>3</sup>

Courtesy Zurich University Hospital





# DETEKTION KLEINER LÄSIONEN

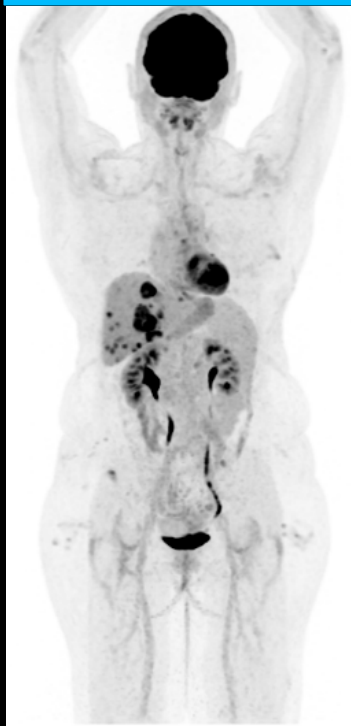
## Aufnahmeparameter

243,5 MBq FDG  
58 min p.i.  
20 min Aufnahmedauer

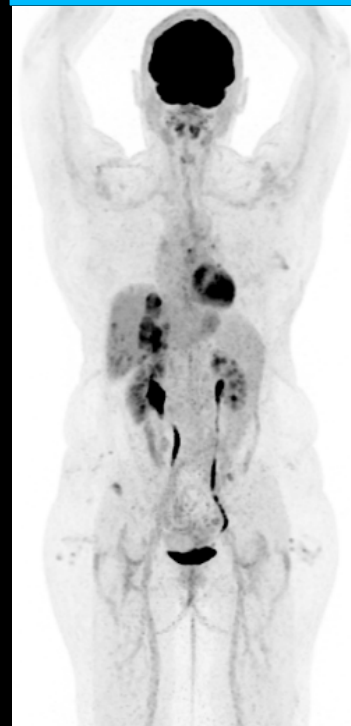
## Patienten BMI

26,8

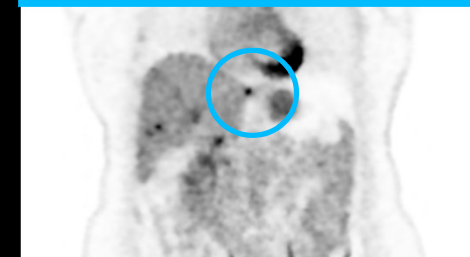
MotionFree



Konventionell Statisch

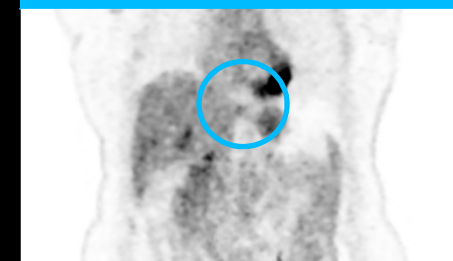


MotionFree



SUVmax 6.08  
Volumen 5.63 cm<sup>3</sup>

Konventionell Statisch



SUVmax 4.25  
Volume 35.51cm<sup>3</sup>

Courtesy Zurich University Hospital





# MOTIONFREE MIT GA-68

## Aufnahmeparameter

139,4 MBq  $^{68}\text{Ga}$ -Dotatate  
64 min p.i.  
20 min Aufnahmedauer

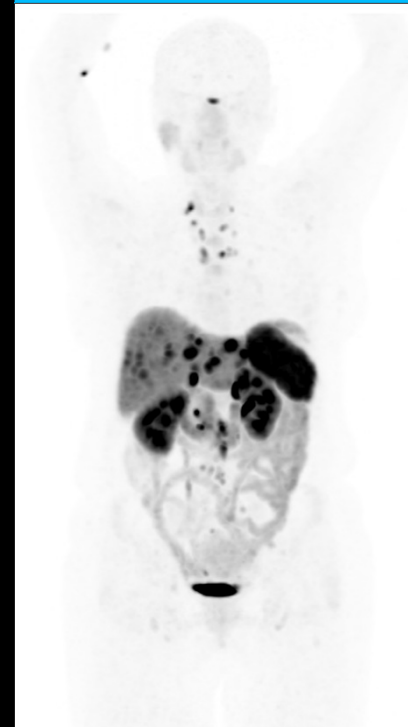
## Patienten BMI

26,5

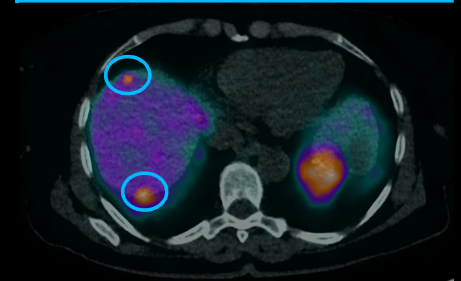
MotionFree



Konventionell Statisch

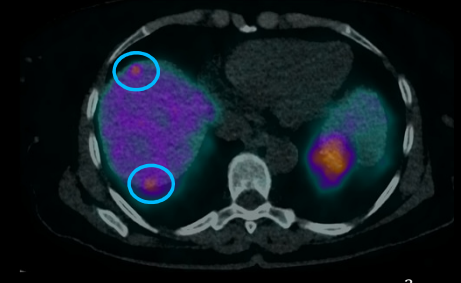


MotionFree



SUVmax 19.16, Volumen  $3.62\text{cm}^3$   
SUVmax 18.53, Volumen  $19.22\text{cm}^3$

Konventionell statisch



SUVmax 13.25, Volumen  $6.51\text{cm}^3$   
SUVmax 13.87, Volumen  $19.47\text{cm}^3$

Courtesy Zurich University Hospital



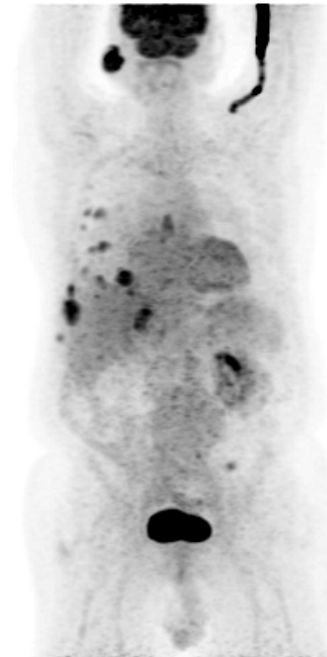
# MotionFree

Eine Sorge weniger!

Externes Gerät



MotionFree



**Fehlfunktion externer Geräte**





Vielen Dank für  
Ihre  
Aufmerksamkeit



# MOTIONFREE

## Aufnahmeparameter

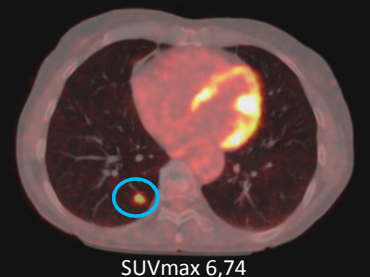
88,1 MBq FDG  
Start 62 min p.i.  
20 min Aufnahmedauer

## Patienten BMI

18,9

Courtesy Zurich University Hospital

MotionFree



SUVmax 6,74  
Volumen 0,50cm<sup>3</sup>

Konventionell Statisch



SUVmax 4,99  
Volumen 0,84cm<sup>3</sup>





# IMPROVED LESION DETECTABILITY AND FLEXIBLE WORKFLOW

## Acquisition

148.5MBq / 4.01mCi FDG  
74 minute uptake  
17.5 minute acquisition

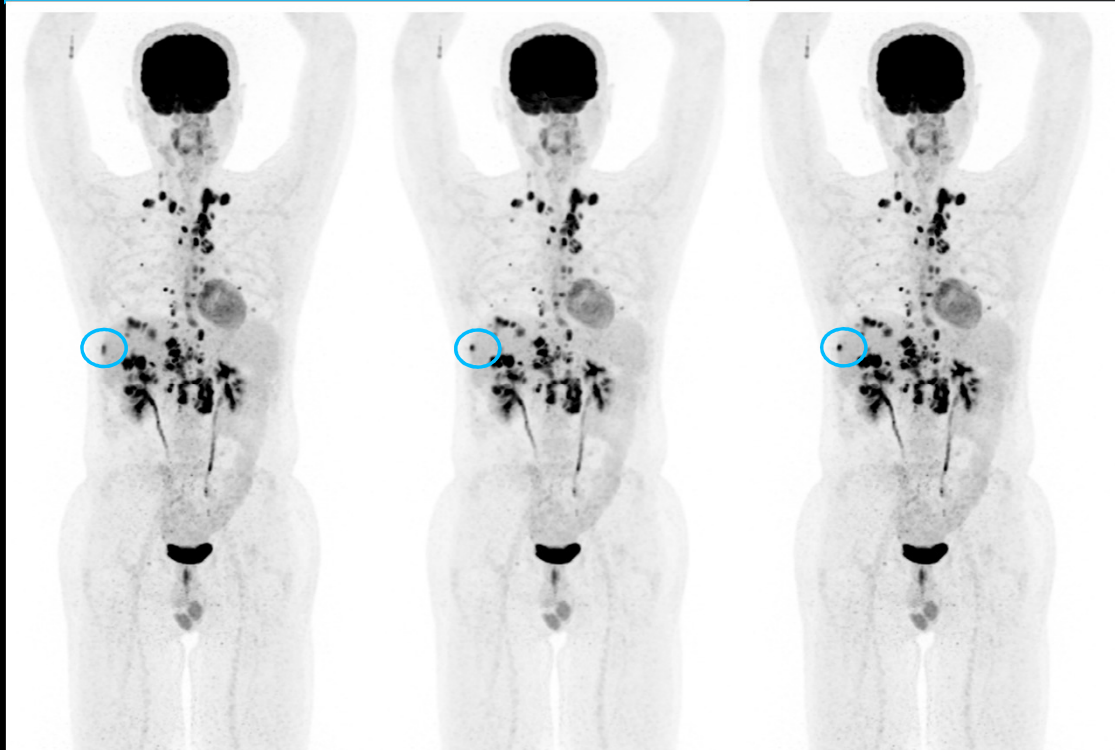
## Patient BMI

23.36

Conventional Static  
2:30

MotionFree  
3:30

MotionFree  
5:00



Courtesy Zurich University Hospital





# NO ADDITIONAL TIME WITHOUT COMPROMISE

## Acquisition Details

536MBq / 14.5mCi FDG  
58 minute uptake  
12.5 minute acquisition

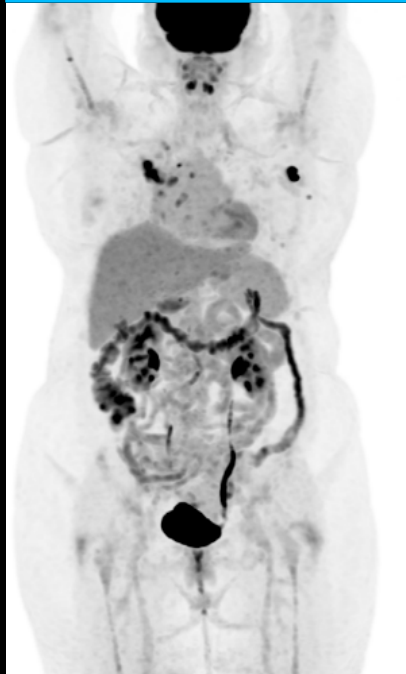
## Patient History

Subsequent Breast Ca

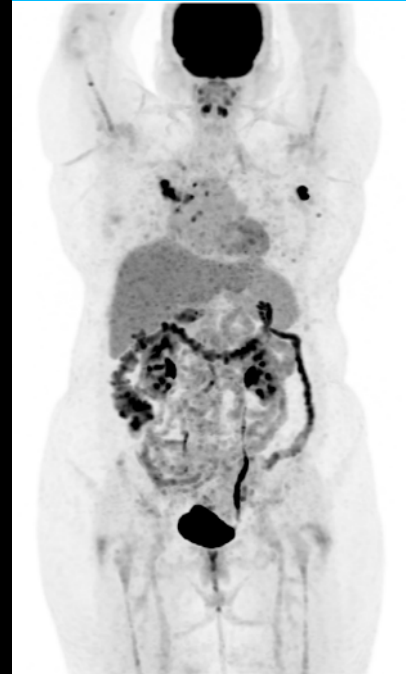
## Patient BMI

41.6

Conventional Static

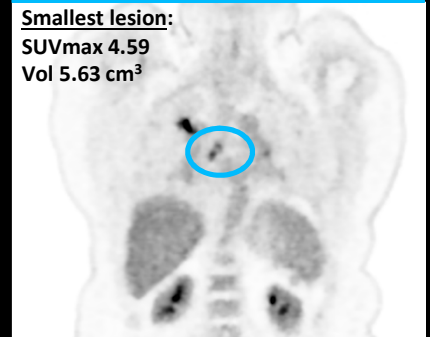


MotionFree  
1/2 time



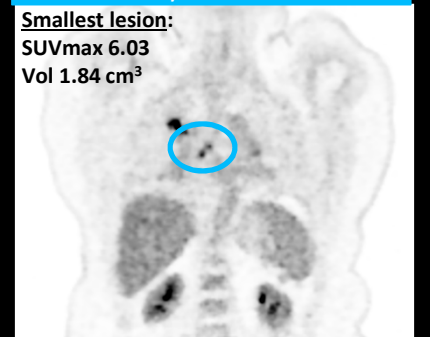
Conventional Static

**Smallest lesion:**  
SUVmax 4.59  
Vol 5.63 cm<sup>3</sup>

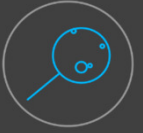


MotionFree  
1/2 time

**Smallest lesion:**  
SUVmax 6.03  
Vol 1.84 cm<sup>3</sup>



Courtesy Seattle Cancer Care Alliance



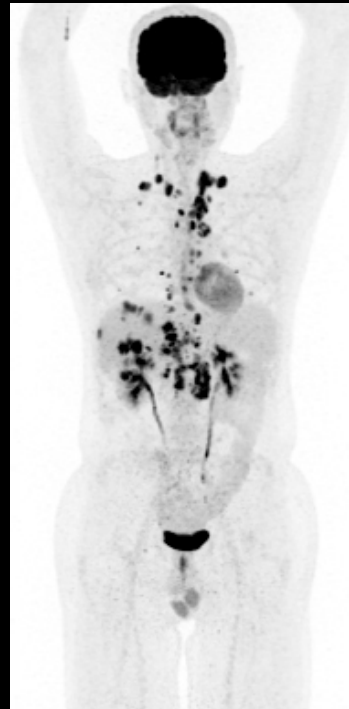
# IMPROVED LESION DETECTABILITY



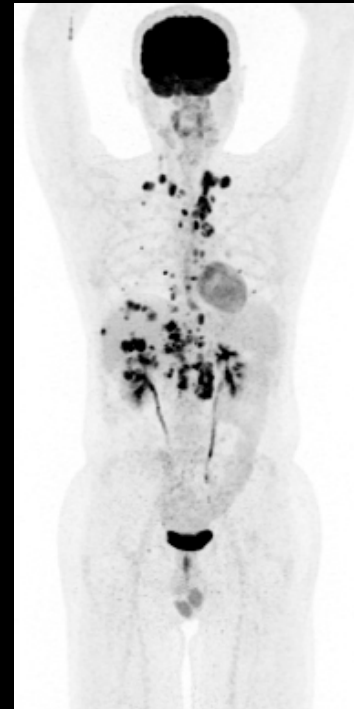
Conventional Static  
VPFXS



MotionFree  
VPFXS



Conventional Static  
Q.Clear



MotionFree  
Q.Clear



Imagination at work

# DISCOVERY MI 3-RING

CLINICAL EXCELLENCE – FAST SCANS FOR ALL PATIENTS

## Acquisition

8 minutes – 1 min / bed  
212 MBq / 5.74 mCi FDG at scan  
160 minute uptake

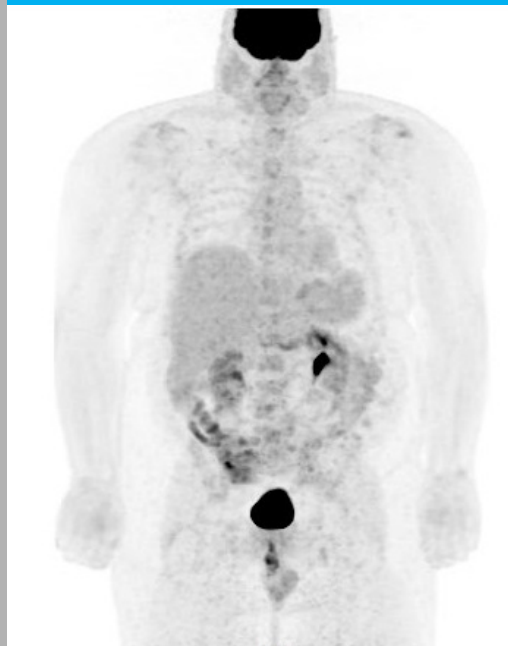
## Patient History

Patient with history of lymphoma referred to PET for follow-up

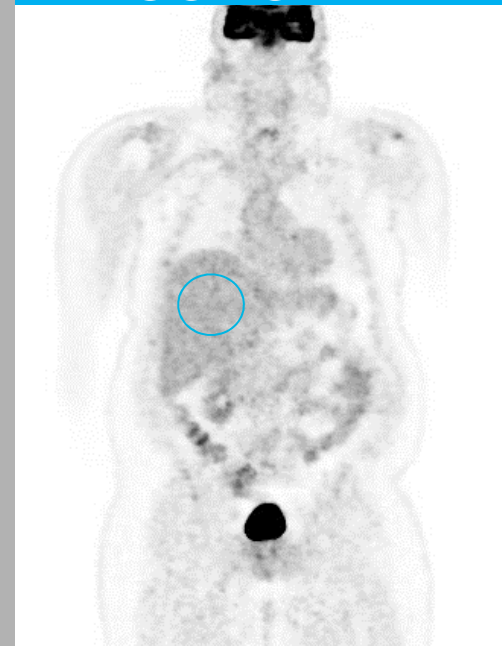
## Patient BMI

45.8

MIP



CORONAL



SUVmean: 2.19 g/ml  
SUV std: 0.23 g/ml



TRUE  
DISCOVERY

DISCOVERY MI

LIGHTBURST DIGITAL

Q.SUV

REVOLUTION EVO

DIGITAL INDUSTRIAL

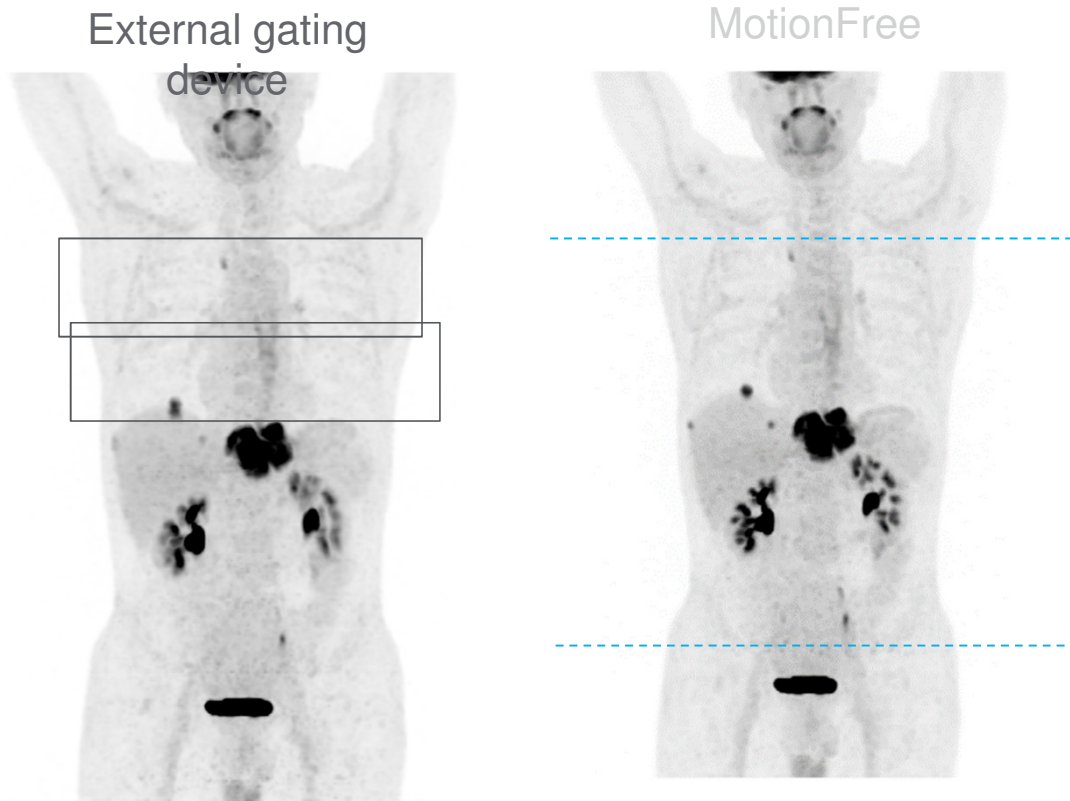
CLINICAL  
IMAGES

SHAPING THE FUTURE

DISCLAIMER  
S

# MotionFree

A seamless digital setup



Real Time and true physiologic respiratory motion correction

Automated and integrated workflow for all scans and all patients

No need to “guess” at where respiratory motion impact will occur.



# MotionFree

It's already there when you need it



Flexibility to choose which bed positions receive motion correction

Always collecting and correcting respiratory motion data in the background

Any patient, any clinical situation

# MotionFree - PET Digital Gating

Vergleich zum Varian RPM

Keine Bewegungskorrektur MIP



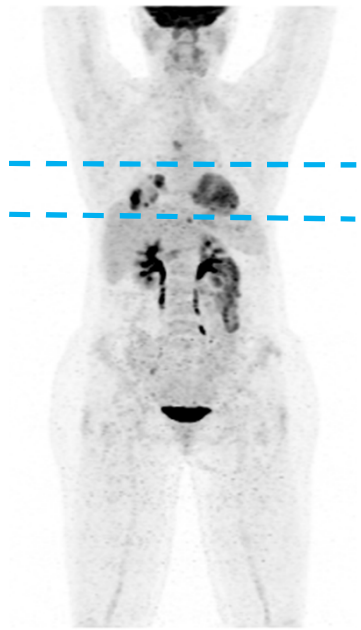
RPM Gating mit Q.Static MIP



PET Digital Gating mit Q.Static MIP



4D PET Digital Gating MIP



# MotionFree

