

SUPPLEMENTAL TEXT 1: Applied equations

Standardized Uptake Values were calculated as follows*:

$$\text{SUV} = \frac{\text{AC}_{\text{voi}} \text{ (kBq/ml)}}{\text{total tracer activity (MBq) / Body Weight (kg)}} \quad \begin{matrix} a \\ b \end{matrix}$$

^a AC, activity concentration; VOI, Volume-Of-Interest

^b Body Weight (*BW*) can be replaced by Lean Body Mass (LBM) or Body-Surface Area (BSA), for which the following formulas were used:

$$\begin{aligned} \text{LBM} &= 1.10 * \text{weight} - 128.0 * (\text{weight} / \text{height})^2 \\ \text{BSA} &= 0.007184 * \text{weight}^{0.425} * \text{height}^{0.725} \end{aligned}$$

* Boellaard R, Oyen WJ, Hoekstra CJ, et al. The Netherlands protocol for standardisation and quantification of FDG whole body PET studies in multi-centre trials. *Eur J Nucl Med Mol Imaging*. 2008;35:2320-2333.

SUPPLEMENTAL TABLE 1: Overview of the applied reconstruction parameters.

Center	PET/CT system	Tracer	Matrix Size	Reconstruction Algorithm	Time-of-Flight	Point-Spread-Functions	Filter	Voxel size (mm)	EARL calibrated
VUmc	Philips, Ingenuity / Gemini TF	¹⁸ F-FCH / ¹⁸ F-DCFPyL	144x144	BLOB-OS-TF (3 iterations, 33 subsets)	yes	no	none	4x4x4	yes
UMCU	Siemens, Biograph40	¹⁸ F-FCH / ⁶⁸ Ga-PSMA	200x200	PSF-TOF (4 iterations, 21 subsets)	yes	yes	Gaussian 7.50 mm	4.07x4.07 x3.00	yes
MSKCC	General Electric, Discovery 710	¹⁸ F-FDHT	128x128	VPFXS (2 iterations, 24 subsets)	yes	yes	n/a	5.47x5.47 x3.27	no
AMC	Philips, Gemini TF	¹⁸ F-FCH / ⁶⁸ Ga-PSMA	144x144	BLOB-OS-TF (3 iterations, 33 subsets)	yes	no	none	4x4x4	yes
St-Anton	Philips, Gemini TF	⁶⁸ Ga-PSMA	144x144	BLOB-OS-TF (3 iterations, 33 subsets)	yes	no	none	4x4x4	yes

n/a = not available

SUPPLEMENTAL TABLE 2: Healthy Tissue Uptake of PCa PET Tracers (complete results)

[68Ga]PSMA

	SUVmax (BW)	SUVmax (LBM)	SUVmax (BSA)	SUVpeak (BW)	SUVpeak (LBM)	SUVpeak (BSA)	SUVmean (BW)	SUVmean (LBM)	SUVmean (BSA)
AORTA (5 slides 2x2)									
mean	1.38	1.04	0.03	1.23	0.92	0.03	1.09	0.82	0.03
SD	0.28	0.20	0.01	0.23	0.17	0.01	0.24	0.18	0.01
COV%	20.4	19.7	19.9	19.0	18.6	19.0	22.4	22.5	22.9
95% range	(0.83-1.94)	(0.64-1.44)	(0.02-0.05)	(0.77-1.68)	(0.58-1.26)	(0.02-0.04)	(0.61-1.57)	(0.46-1.18)	(0.01-0.04)
AORTA (2x2)									
mean	1.24	0.93	0.03	1.15	0.87	0.03	1.08	0.81	0.03
SD	0.29	0.22	0.01	0.24	0.18	0.01	0.26	0.20	0.01
COV%	23.4	24.0	24.4	20.6	21.1	21.6	24.3	25.0	25.5
95% range	(0.67-1.8)	(0.49-1.37)	(0.02-0.04)	(0.69-1.62)	(0.51-1.23)	(0.02-0.04)	(0.57-1.59)	(0.41-1.21)	(0.01-0.04)
AORTA (3x3)									
mean	1.33	1.00	0.03	1.20	0.90	0.03	1.08	0.81	0.03
SD	0.27	0.21	0.01	0.22	0.17	0.01	0.23	0.18	0.01
COV%	19.9	20.7	21.1	18.7	19.2	19.7	20.9	22.0	22.5
95% range	(0.81-1.85)	(0.59-1.41)	(0.02-0.04)	(0.76-1.64)	(0.56-1.24)	(0.02-0.04)	(0.64-1.52)	(0.46-1.16)	(0.01-0.04)
LIVER									
mean	6.41	4.80	0.15	5.66	4.24	0.13	4.78	3.58	0.11
SD	2.04	1.46	0.05	1.89	1.36	0.04	1.62	1.18	0.04
COV%	31.8	30.4	30.1	33.4	32.0	31.8	33.9	32.8	32.7
95% range	(2.41-10.4)	(1.94-7.66)	(0.06-0.24)	(1.96-9.37)	(1.58-6.9)	(0.05-0.22)	(1.61-7.96)	(1.28-5.89)	(0.04-0.19)
LUNG-APICALLY									
mean	1.05	0.79	0.02	0.84	0.63	0.02	0.56	0.42	0.01
SD	0.31	0.22	0.01	0.26	0.19	0.01	0.18	0.13	0.00
COV%	29.8	28.6	28.9	30.8	30.3	30.6	32.7	32.0	32.4
95% range	(0.44-1.66)	(0.34-1.23)	(0.01-0.04)	(0.33-1.35)	(0.26-1.01)	(0.01-0.03)	(0.2-0.91)	(0.16-0.68)	(0-0.02)
LUNG-BASALLY									
mean	1.36	1.02	0.03	1.20	0.90	0.03	0.73	0.55	0.02
SD	0.48	0.35	0.01	0.45	0.33	0.01	0.23	0.17	0.01
COV%	35.2	34.0	33.1	37.1	36.1	35.4	32.1	31.5	31.0
95% range	(0.42-2.3)	(0.34-1.7)	(0.01-0.05)	(0.33-2.08)	(0.26-1.54)	(0.01-0.05)	(0.27-1.19)	(0.21-0.88)	(0.01-0.03)

LUMBAR VERTEBRA

mean	1.24	0.93	0.03	0.99	0.74	0.02	0.67	0.50	0.02
SD	0.43	0.32	0.01	0.33	0.24	0.01	0.26	0.19	0.01
COV%	35.0	33.9	33.3	33.4	32.4	32.0	38.5	38.0	37.7
95% range	(0.39-2.09)	(0.31-1.55)	(0.01-0.05)	(0.34-1.63)	(0.27-1.21)	(0.01-0.04)	(0.16-1.17)	(0.13-0.87)	(0-0.03)

THORACIC VERTEBRA

mean	1.25	0.93	0.03	1.02	0.76	0.02	0.69	0.52	0.02
SD	0.41	0.29	0.01	0.30	0.22	0.01	0.23	0.17	0.01
COV%	33.0	31.2	30.7	29.4	28.3	28.2	32.5	31.8	31.8
95% range	(0.44-2.05)	(0.36-1.5)	(0.01-0.05)	(0.43-1.6)	(0.34-1.19)	(0.01-0.04)	(0.25-1.13)	(0.2-0.85)	(0.01-0.03)

MUSCLE

mean	0.94	0.71	0.02	0.76	0.57	0.02	0.50	0.38	0.01
SD	0.29	0.21	0.01	0.25	0.19	0.01	0.18	0.14	0.00
COV%	30.8	30.1	30.3	33.6	33.2	33.3	37.0	37.3	37.6
95% range	(0.37-1.51)	(0.29-1.13)	(0.01-0.04)	(0.26-1.26)	(0.2-0.94)	(0.01-0.03)	(0.14-0.86)	(0.1-0.65)	(0-0.02)

Average COV%			
	BW	LBM	BSA
<i>SUVmax</i>	30.1	29.2	29.1
<i>SUVpeak</i>	29.9	29.2	29.2
<i>SUVmean</i>	32.6	32.3	32.4
<i>total</i>	30.8	30.2	30.3

BW, body weight; LBM, lean-body mass; BSA, body-surface area

[18F]DCFPyL

	SUVmax (BW)	SUVmax (LBM)	SUVmax (BSA)	SUVpeak (BW)	SUVpeak (LBM)	SUVpeak (BSA)	SUVmean (BW)	SUVmean (LBM)	SUVmean (BSA)
AORTA (5 slides 2x2)									
mean	1.16	0.88	0.03	1.09	0.83	0.03	1.01	0.78	0.02
SD	0.17	0.12	0.00	0.15	0.11	0.00	0.14	0.10	0.00
COV%	14.82	13.63	13.69	14.03	12.71	12.78	14.18	13.15	13.21
95% range	(0.82-1.49)	(0.65-1.12)	(0.02-0.04)	(0.79-1.39)	(0.62-1.04)	(0.02-0.03)	(0.73-1.3)	(0.58-0.98)	(0.02-0.03)
AORTA (2x2)									
mean	1.07	0.82	0.03	1.04	0.79	0.03	1.01	0.77	0.02
SD	0.17	0.12	0.00	0.15	0.10	0.00	0.15	0.10	0.00
COV%	15.78	14.12	13.92	14.60	12.81	12.65	14.62	13.43	13.27
95% range	(0.74-1.4)	(0.59-1.04)	(0.02-0.03)	(0.74-1.34)	(0.59-0.99)	(0.02-0.03)	(0.72-1.3)	(0.57-0.97)	(0.02-0.03)
AORTA (3x3)									
mean	1.12	0.86	0.03	1.06	0.81	0.03	1.01	0.77	0.02
SD	0.16	0.11	0.00	0.15	0.10	0.00	0.14	0.10	0.00
COV%	14.38	12.44	12.15	13.76	11.82	11.71	13.51	12.39	12.25
95% range	(0.81-1.44)	(0.65-1.07)	(0.02-0.03)	(0.78-1.35)	(0.62-1)	(0.02-0.03)	(0.74-1.27)	(0.58-0.96)	(0.02-0.03)
LIVER									
mean	6.84	5.23	0.17	6.48	4.96	0.16	5.92	4.53	0.14
SD	1.48	1.12	0.03	1.43	1.09	0.03	1.33	1.02	0.03
COV%	21.7	21.3	21.0	22.1	22.0	21.8	22.5	22.5	22.2
95% range	(3.93-9.75)	(3.05-7.42)	(0.1-0.23)	(3.67-9.29)	(2.82-7.1)	(0.09-0.22)	(3.31-8.53)	(2.54-6.53)	(0.08-0.21)
LUNG-APICALLY									
mean	0.64	0.48	0.02	0.58	0.44	0.01	0.44	0.33	0.01
SD	0.18	0.12	0.00	0.17	0.11	0.00	0.13	0.08	0.00
COV%	28.5	24.6	23.9	29.4	25.6	24.9	28.5	25.1	24.6
95% range	(0.28-1)	(0.25-0.72)	(0.01-0.02)	(0.25-0.91)	(0.22-0.66)	(0.01-0.02)	(0.19-0.68)	(0.17-0.5)	(0.01-0.02)
LUNG-BASALLY									
mean	0.78	0.59	0.02	0.73	0.56	0.02	0.50	0.38	0.01
SD	0.24	0.17	0.01	0.24	0.18	0.01	0.13	0.09	0.00
COV%	31.0	29.4	29.4	33.0	31.4	31.4	26.0	23.7	23.5
95% range	(0.31-1.25)	(0.25-0.93)	(0.01-0.03)	(0.26-1.21)	(0.21-0.9)	(0.01-0.03)	(0.25-0.76)	(0.21-0.56)	(0.01-0.02)

LUMBAR VERTEBRA

mean	1.07	0.81	0.03	0.96	0.73	0.02	0.77	0.58	0.02
SD	0.35	0.24	0.01	0.30	0.21	0.01	0.25	0.18	0.01
COV%	32.3	29.9	29.3	31.0	28.9	28.4	32.6	30.9	30.4
95% range	(0.39-1.75)	(0.34-1.29)	(0.01-0.04)	(0.38-1.54)	(0.32-1.14)	(0.01-0.04)	(0.28-1.26)	(0.23-0.94)	(0.01-0.03)

THORACIC VERTEBRA

mean	1.06	0.81	0.03	0.95	0.73	0.02	0.75	0.57	0.02
SD	0.29	0.19	0.01	0.23	0.16	0.01	0.21	0.15	0.00
COV%	27.2	24.0	23.1	24.7	22.4	21.8	28.4	26.5	26.0
95% range	(0.49-1.62)	(0.43-1.19)	(0.01-0.04)	(0.49-1.41)	(0.41-1.04)	(0.01-0.03)	(0.33-1.16)	(0.27-0.87)	(0.01-0.03)

MUSCLE

mean	0.79	0.61	0.02	0.71	0.55	0.02	0.55	0.42	0.01
SD	0.27	0.21	0.01	0.26	0.20	0.01	0.21	0.16	0.01
COV%	34.5	34.2	34.4	35.9	35.8	35.9	37.8	38.1	38.4
95% range	(0.26-1.33)	(0.2-1.01)	(0.01-0.03)	(0.21-1.21)	(0.16-0.93)	(0.01-0.03)	(0.14-0.97)	(0.11-0.74)	(0-0.02)

Average COV%			
	BW	LBM	BSA
<i>SUVmax</i>	27.1	25.1	24.8
<i>SUVpeak</i>	27.1	25.4	25.1
<i>SUVmean</i>	27.1	25.6	25.3
<i>total</i>	27.1	25.4	25.1

BW, body weight; LBM, lean-body mass; BSA, body-surface area

[18F]FCH

	SUVmax (BW)	SUVmax (LBM)	SUVmax (BSA)	SUVpeak (BW)	SUVpeak (LBM)	SUVpeak (BSA)	SUVmean (BW)	SUVmean (LBM)	SUVmean (BSA)
AORTA (5 slides 2x2)									
mean	0.78	0.59	0.02	0.73	0.55	0.02	0.63	0.48	0.02
SD	0.15	0.11	0.00	0.14	0.11	0.00	0.14	0.10	0.00
COV%	19.6	19.4	20.0	19.7	19.1	19.7	22.7	21.7	22.1
95% range	(0.48-1.07)	(0.37-0.81)	(0.01-0.03)	(0.45-1.01)	(0.34-0.76)	(0.01-0.02)	(0.35-0.91)	(0.27-0.68)	(0.01-0.02)
AORTA (2x2)									
mean	0.69	0.53	0.02	0.68	0.51	0.02	0.62	0.47	0.01
SD	0.16	0.12	0.00	0.14	0.10	0.00	0.14	0.10	0.00
COV%	22.6	22.0	22.5	20.9	20.0	20.5	23.2	21.9	22.4
95% range	(0.39-1)	(0.3-0.75)	(0.01-0.02)	(0.4-0.96)	(0.31-0.71)	(0.01-0.02)	(0.34-0.9)	(0.27-0.67)	(0.01-0.02)
AORTA (3x3)									
mean	0.75	0.57	0.02	0.71	0.54	0.02	0.63	0.47	0.01
SD	0.17	0.13	0.00	0.15	0.11	0.00	0.14	0.10	0.00
COV%	22.5	22.0	22.4	20.7	19.9	20.2	23.1	22.1	22.4
95% range	(0.42-1.08)	(0.32-0.82)	(0.01-0.03)	(0.42-1)	(0.33-0.75)	(0.01-0.02)	(0.34-0.91)	(0.27-0.68)	(0.01-0.02)
LIVER									
mean	10.84	8.19	0.26	10.21	7.71	0.25	9.17	6.93	0.22
SD	1.82	1.39	0.05	1.72	1.36	0.04	1.56	1.25	0.04
COV%	16.8	17.0	17.6	16.8	17.6	18.3	17.0	18.0	18.7
95% range	(7.27-14.42)	(5.45-10.92)	(0.17-0.35)	(6.84-13.58)	(5.05-10.38)	(0.16-0.33)	(6.11-12.23)	(4.48-9.38)	(0.14-0.3)
LUNG-APICALLY									
mean	1.03	0.77	0.02	0.95	0.71	0.02	0.64	0.48	0.02
SD	0.29	0.20	0.01	0.26	0.18	0.01	0.21	0.15	0.00
COV%	28.2	26.2	26.2	27.4	25.6	25.6	32.8	30.5	30.4
95% range	(0.46-1.6)	(0.38-1.17)	(0.01-0.04)	(0.44-1.46)	(0.36-1.07)	(0.01-0.03)	(0.23-1.05)	(0.19-0.76)	(0.01-0.02)
LUNG-BASALLY									
mean	1.48	1.12	0.04	1.43	1.08	0.03	0.95	0.72	0.02
SD	0.47	0.36	0.01	0.47	0.36	0.01	0.28	0.20	0.01
COV%	31.6	32.0	32.0	33.0	33.8	33.9	29.3	28.6	28.6
95% range	(0.56-2.4)	(0.42-1.82)	(0.01-0.06)	(0.51-2.35)	(0.36-1.79)	(0.01-0.06)	(0.4-1.5)	(0.31-1.12)	(0.01-0.04)

LUMBAR VERTEBRA

mean	3.13	2.36	0.07	2.69	2.03	0.06	2.33	1.76	0.06
SD	0.76	0.54	0.02	0.66	0.48	0.02	0.61	0.45	0.01
COV%	24.2	22.9	22.7	24.6	23.7	23.6	26.4	25.8	25.7
95% range	(1.65-4.62)	(1.3-3.42)	(0.04-0.11)	(1.4-3.99)	(1.09-2.97)	(0.03-0.09)	(1.13-3.53)	(0.87-2.65)	(0.03-0.08)

THORACIC VERTEBRA

mean	1.72	1.30	0.04	1.50	1.13	0.04	1.25	0.94	0.03
SD	0.54	0.40	0.01	0.51	0.38	0.01	0.47	0.35	0.01
COV%	31.4	30.8	30.7	34.3	33.9	33.8	37.3	37.1	37.1
95% range	(0.66-2.78)	(0.51-2.08)	(0.02-0.07)	(0.49-2.51)	(0.38-1.88)	(0.01-0.06)	(0.33-2.16)	(0.26-1.63)	(0.01-0.05)

MUSCLE

mean	3.68	2.78	0.09	3.17	2.40	0.08	2.78	2.11	0.07
SD	0.74	0.55	0.02	0.66	0.48	0.02	0.58	0.42	0.01
COV%	20.2	19.6	19.5	21.0	20.1	20.0	20.9	20.1	20.0
95% range	(2.22-5.13)	(1.71-3.85)	(0.05-0.12)	(1.87-4.48)	(1.45-3.35)	(0.05-0.11)	(1.64-3.93)	(1.28-2.94)	(0.04-0.09)

Average COV%			
	BW	LBM	BSA
<i>SUVmax</i>	25.0	24.4	24.5
<i>SUVpeak</i>	25.4	25.0	25.1
<i>SUVmean</i>	26.7	26.0	26.1
<i>total</i>	25.7	25.1	25.2

BW, body weight; LBM, lean-body mass; BSA, body-surface area

[18F]FDHT

	SUVmax (BW)	SUVmax (LBM)	SUVmax (BSA)	SUVpeak (BW)	SUVpeak (LBM)	SUVpeak (BSA)	SUVmean (BW)	SUVmean (LBM)	SUVmean (BSA)
AORTA (5 slides 2x2)									
mean	5.20	3.88	0.12	4.84	3.61	0.12	4.73	3.53	0.11
SD	1.06	0.73	0.02	0.95	0.67	0.02	1.02	0.72	0.02
COV%	20.4	18.8	19.4	19.5	18.5	19.2	21.6	20.3	21.0
95% range	(3.12-7.16)	(2.45-5.84)	(0.08-2.08)	(2.98-6.8)	(2.3-5.57)	(0.07-2.08)	(2.73-6.69)	(2.12-5.49)	(0.07-2.07)
AORTA (2x2)									
mean	5.10	3.80	0.12	4.87	3.62	0.12	4.86	3.62	0.12
SD	1.13	0.78	0.03	1.04	0.72	0.02	1.07	0.75	0.02
COV%	22.2	20.5	20.9	21.3	19.9	20.4	22.1	20.8	21.3
95% range	(2.88-7.32)	(2.27-5.32)	(0.07-0.17)	(2.83-6.91)	(2.21-5.04)	(0.07-0.16)	(2.75-6.96)	(2.14-5.09)	(0.07-0.16)
AORTA (3x3)									
mean	5.24	3.90	0.12	4.88	3.63	0.12	4.71	3.50	0.11
SD	1.11	0.76	0.02	1.05	0.73	0.02	1.15	0.82	0.03
COV%	21.2	19.4	19.9	21.6	20.2	20.6	24.5	23.3	23.7
95% range	(3.06-7.2)	(2.42-5.86)	(0.08-2.08)	(2.81-6.84)	(2.2-5.59)	(0.07-2.08)	(2.45-6.67)	(1.9-5.46)	(0.06-2.07)
LIVER									
mean	5.12	3.83	0.12	4.59	3.44	0.11	4.10	3.08	0.10
SD	0.75	0.62	0.02	0.64	0.56	0.02	0.65	0.58	0.02
COV%	14.6	16.1	16.2	14.0	16.3	16.7	15.9	19.0	19.6
95% range	(3.65-7.08)	(2.62-5.79)	(0.08-2.08)	(3.33-6.55)	(2.34-5.4)	(0.07-2.07)	(2.83-6.06)	(1.93-5.04)	(0.06-2.06)
LUNG-APICALLY									
mean	1.36	0.99	0.03	1.19	0.87	0.03	0.90	0.66	0.02
SD	0.53	0.32	0.01	0.44	0.27	0.01	0.33	0.20	0.01
COV%	39.3	32.3	31.4	37.4	31.0	30.3	36.5	30.5	29.9
95% range	(0.31-3.32)	(0.36-2.95)	(0.01-1.99)	(0.32-3.15)	(0.34-2.83)	(0.01-1.99)	(0.26-2.86)	(0.26-2.62)	(0.01-1.98)
LUNG-BASALLY									
mean	1.61	1.19	0.04	1.48	1.10	0.04	1.00	0.74	0.02
SD	0.46	0.29	0.01	0.44	0.28	0.01	0.25	0.16	0.01
COV%	28.6	24.2	24.0	29.4	25.8	25.6	25.3	21.1	21.1
95% range	(0.71-3.57)	(0.63-3.15)	(0.02-2)	(0.63-3.44)	(0.54-3.06)	(0.02-2)	(0.51-2.96)	(0.44-2.7)	(0.01-1.98)

LUMBAR VERTEBRA

mean	2.18	1.60	0.05	1.93	1.42	0.05	1.60	1.18	0.04
SD	0.52	0.30	0.01	0.44	0.28	0.01	0.36	0.23	0.01
COV%	23.6	18.6	18.0	22.7	19.5	19.3	22.6	19.4	19.3
95% range	(1.17-4.14)	(1.01-3.56)	(0.03-2.01)	(1.07-3.89)	(0.88-3.38)	(0.03-2.01)	(0.89-3.56)	(0.73-3.14)	(0.02-2)

THORACIC VERTEBRA

mean	1.95	1.43	0.05	1.72	1.27	0.04	1.36	1.00	0.03
SD	0.42	0.28	0.01	0.33	0.23	0.01	0.25	0.19	0.01
COV%	21.6	19.4	19.2	19.4	18.3	18.4	18.8	18.5	18.8
95% range	(1.12-3.91)	(0.89-3.39)	(0.03-2.01)	(1.06-3.68)	(0.81-3.23)	(0.03-2)	(0.86-3.32)	(0.64-2.96)	(0.02-1.99)

MUSCLE

mean	1.14	0.84	0.03	0.96	0.71	0.02	0.76	0.57	0.02
SD	0.26	0.17	0.01	0.18	0.12	0.00	0.15	0.11	0.00
COV%	23.1	20.4	19.9	18.7	17.2	17.4	19.9	19.2	19.4
95% range	(0.62-3.1)	(0.5-2.8)	(0.02-1.99)	(0.61-2.92)	(0.47-2.67)	(0.01-1.98)	(0.47-2.72)	(0.35-2.53)	(0.01-1.98)

Average COV%			
	BW	LBM	BSA
<i>SUVmax</i>	24.6	21.5	21.2
<i>SUVpeak</i>	23.3	21.2	21.2
<i>SUVmean</i>	23.3	21.6	21.7
<i>total</i>	23.7	21.4	21.4

BW, body weight; LBM, lean-body mass; BSA, body-surface area