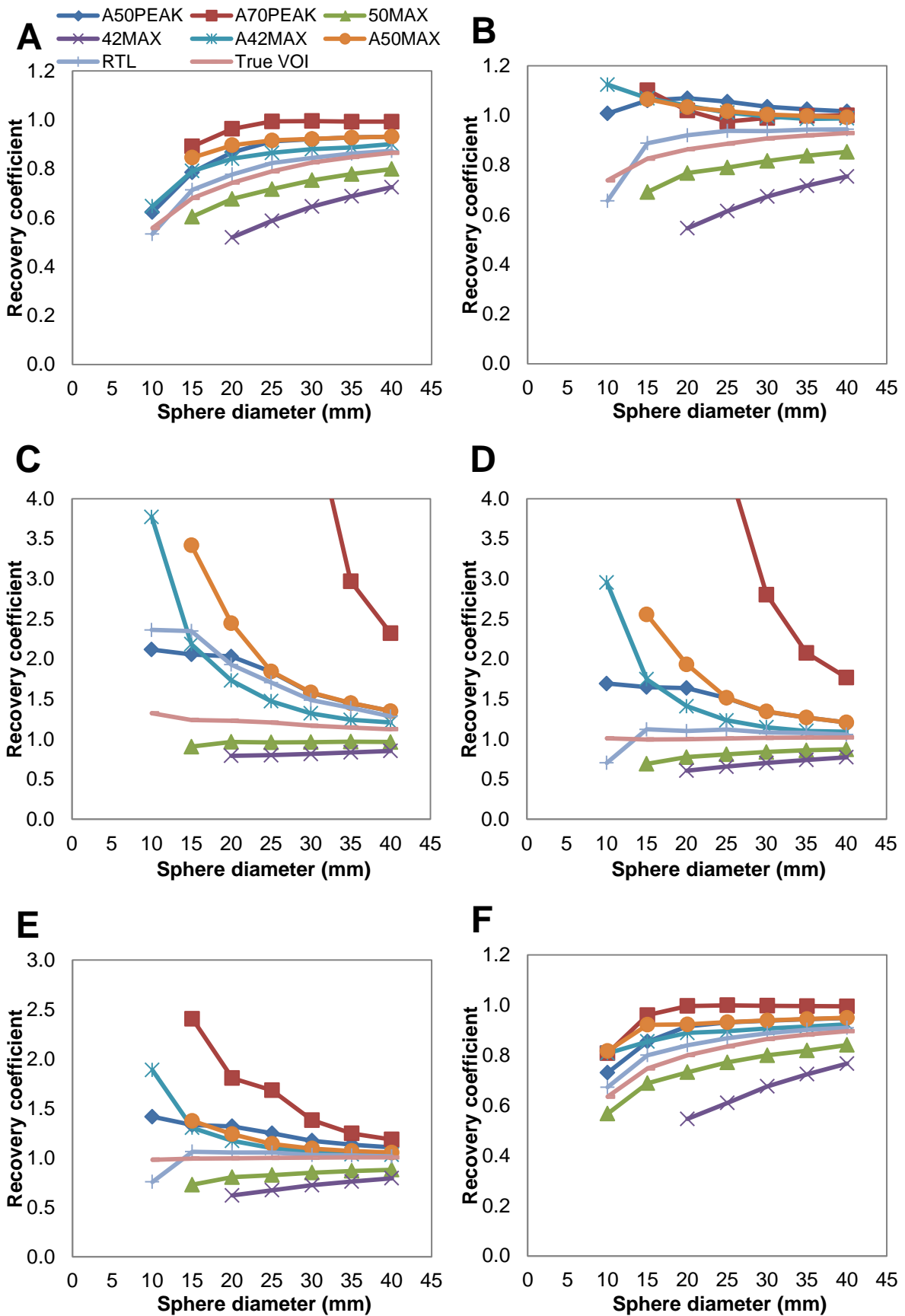
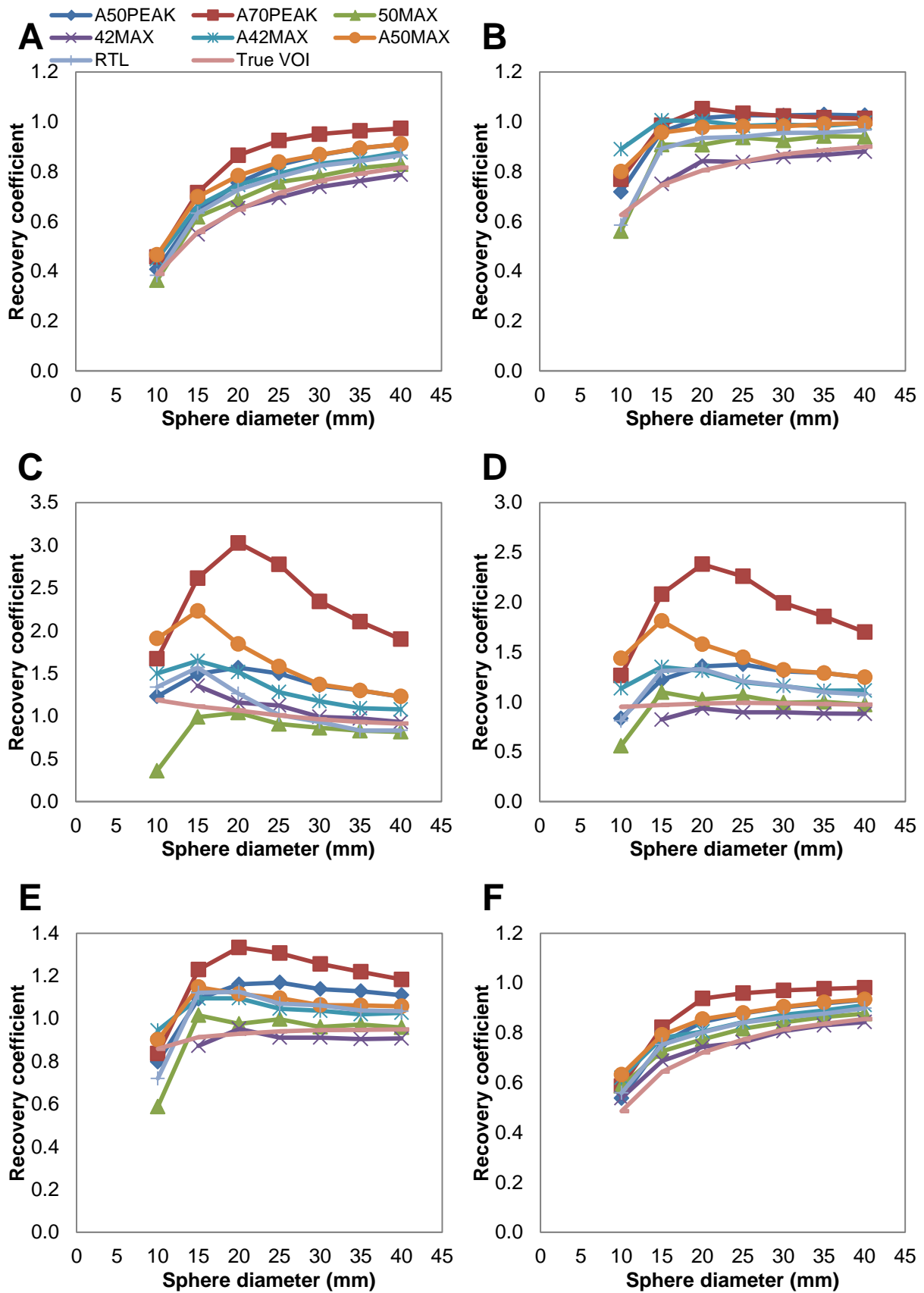


Abbreviations and Their Definitions

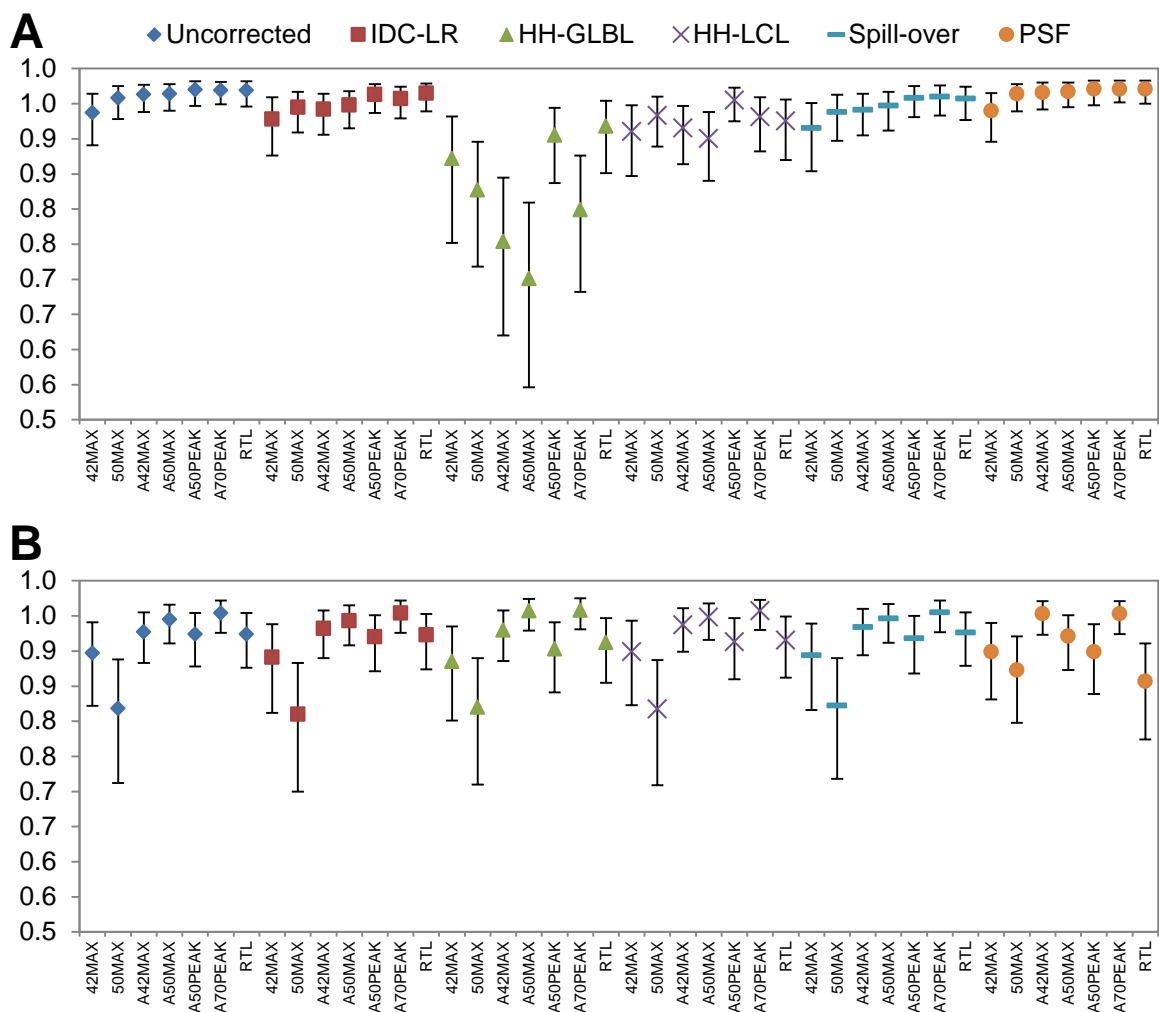
Abbreviation	Definition
¹⁸ F-FDG	¹⁸ F-fluorodeoxyglucose
¹⁸ F-FCH	¹⁸ F-fluoromethylcholine
PVE	Partial-volume effect
PVC	Partial-volume correction
PVC methods:	
IDC-LR	Iterative deconvolution Lucy–Richardson
HH-GLBL	Global background-adapted PVC
HH-LCL	Local background-adapted PVC
Spill-over	Mask-based spill-over PVC
PSF-reconstruction	Point spread function reconstruction
VOI	Volume of interest
VOI methods:	
42MAX	42% of maximal voxel
50MAX	50% of maximal voxel
A42MAX	42% of maximal voxel + background
A50MAX	50% of maximal voxel + background
A50PEAK	50% of peak voxel + background
A70PEAK	70% of peak voxel + background
RTL	Relative threshold level
RC	Recovery coefficient
AC	Activity concentration
SUVmean	Mean standardized uptake value
TLG	Total lesion glycolysis
ICC	Intraclass correlation coefficient
FWHM	Full width at half maximum
BLOB-OS-TF	Iterative time-of-flight reconstruction
NSCLC	Non–small cell lung cancer
mPC	Metastatic prostate cancer



Supplemental Fig. 1) Recovery coefficients as a function of sphere diameter: uncorrected (A), IDC-LR (B), HH-GLBL (C), HH-LCL (D), spill-over (E), and PSF-reconstruction (F) of spheres in mediastinum, on noise-less images. Please note: RCs of A70PEAK exceed the y-axis maximum, up to 11.8 and 8.2 in graphs C and D, respectively. Missing values are due to failure of VOI delineation.



Supplemental Fig. 2) Recovery coefficients as a function of sphere diameter: uncorrected (A), IDC-LR (B), HH-GLBL (C), HH-LCL (D), spill-over (E), and PSF reconstruction (F) of spheres in *lung*, on noise-less images. Missing values are due to failure of VOI delineation.



Supplemental Fig. 3 ICCs of SUVmean (A) and TLG (B) of all combinations of VOI and PVC method. Shown are the results of the ^{18}F -FCH-PET cohort. Error-bars represent 95% confidence intervals.

Analysis	Sub-analysis	Data
Resolution kernel calibration	-	Phantom experiment
Volumetric accuracy non-PSF- vs. PSF-reconstruction	-	Phantom experiment
Accuracy of PVC methods	Effect of: <ul style="list-style-type: none"> - VOI method - Volumetric accuracy - True VOI misalignment - Noise-level 	Simulations
Precision of PVC and VOI methods	-	Simulation experiment and clinical data

Supplementary Table 1) Summary of performed analyses and the respective datasets used.

		Scan 1			Scan 2		
VOI	PVC	feasibility (% of 70)	Median SUVmean*	Median TLG*	feasibility (% of 70)	Median SUVmean*	Median TLG*
42MAX	Uncorrected	81.4	6.2 (3.5)	41.8 (211.2)	81.4	5.9 (3.9)	42.1 (234.2)
	IDC-LR		8.2 (6.2)	57.6 (245.8)		7.7 (5.9)	54.6 (264.9)
	HH-GLBL		9.1 (8)	65.3 (304.5)		9.4 (7.2)	73.6 (310.6)
	HH-LCL		8.8 (6)	63.8 (264)		8.5 (6.6)	61.6 (277.6)
	Spill-over		9.2 (7)	67.1 (269.2)		9.3 (7.2)	64.8 (282.8)
	PSF	92.9	7.4 (3.9)	36.4 (225.1)	88.6	7.3 (4.6)	37.9 (215)
50MAX	Uncorrected	94.3	6.8 (3.5)	28.4 (165.8)	84.3	6.3 (4.4)	27.8 (156.4)
	IDC-LR		9.5 (7)	44 (194.7)		8.7 (6.7)	38.6 (193.6)
	HH-GLBL		11.2 (9.6)	60.5 (242.6)		12.2 (11.4)	60.8 (254.7)
	HH-LCL		10.5 (7.8)	50.5 (224.8)		10.5 (8.2)	47 (217.2)
	Spill-over		10.1 (7.1)	46.9 (210.8)		9.9 (7.5)	42.1 (214.7)
	PSF	97.1	8.1 (4.6)	21.4 (145.6)	91.4	7.9 (5.4)	18.6 (112.7)
A42MAX	Uncorrected	94.3	6.7 (3.5)	18.9 (131.2)	91.4	6.4 (4.1)	18.9 (77.5)
	IDC-LR		9.9 (6.4)	30.4 (161.8)		9.1 (5.4)	29.5 (93.7)
	HH-GLBL		13.4 (8.1)	54.5 (206.5)		13.1 (6.7)	43.4 (185.8)
	HH-LCL		11 (6.9)	35.9 (181.9)		11.3 (6.2)	34 (118.1)
	Spill-over		10.1 (6.3)	29.9 (175.1)		9.5 (5.6)	29.1 (99.6)
	PSF	97.1	8.1 (4.3)	17.7 (109)	95.7	7.8 (5)	19.5 (54.3)
A50MAX	Uncorrected	97.1	7.4 (3.8)	13.4 (59.8)	91.4	7 (4.4)	13.9 (37.8)
	IDC-LR		10.3 (6.1)	19.9 (71)		9.4 (5.3)	19 (43.7)
	HH-GLBL		17.6 (10.7)	41 (164.5)		19.5 (12.7)	40.5 (124.5)
	HH-LCL		14 (8.9)	30.1 (100.6)		15.2 (8.1)	30.2 (71.9)
	Spill-over		10.1 (5.7)	19.3 (75.1)		10.3 (5.7)	19.7 (47.9)
	PSF	100.0	9 (4.7)	12.4 (34.2)	94.3	8.8 (5.3)	13.7 (31.6)
A50PEAK	Uncorrected	90.0	6.3 (3.8)	24.8 (131.3)	88.6	6 (4.1)	24.8 (116.7)
	IDC-LR		9 (5.3)	36.8 (162)		8.1 (5)	37.4 (129.5)
	HH-GLBL		11.1 (6.4)	50.1 (202.6)		11.1 (6.5)	50.5 (201.4)
	HH-LCL		9.4 (6.6)	43.1 (188.3)		9.3 (6)	38.9 (173.8)
	Spill-over		8.9 (5.6)	38.7 (181.8)		8.8 (5.5)	38.9 (161.6)
	PSF	97.1	7.3 (4.1)	28.3 (166.1)	95.7	7.1 (4.7)	27.3 (120)
A70PEAK	Uncorrected	97.1	7.3 (4.2)	14.8 (34.9)	91.4	7.1 (4.6)	13.2 (25.4)
	IDC-LR		9.9 (5.8)	21.5 (42.4)		9.5 (5.4)	17.8 (29.3)
	HH-GLBL		20.5 (12.9)	37.5 (113.6)		21.3 (13.2)	40.6 (84.8)
	HH-LCL		14.6 (8.8)	30.8 (78.7)		14.7 (8.7)	26.8 (51)
	Spill-over		10 (5.6)	21.3 (48.8)		9.8 (5.8)	18.1 (33.6)
	PSF	100.0	8.2 (5.2)	17.2 (38.7)	95.7	8.2 (5.6)	13.1 (25.4)
RTL	Uncorrected	88.6	6 (3.6)	36.1 (180.8)	90.0	5.7 (4.2)	35.4 (189.2)
	IDC-LR		8.4 (6)	53 (206.3)		7.8 (5.3)	50.8 (206.8)
	HH-GLBL		8.9 (6.3)	63.7 (248)		8.8 (6.9)	64.7 (265.9)
	HH-LCL		8.9 (6.3)	61.5 (243.7)		8.1 (7.2)	61.2 (240.2)
	Spill-over		9.6 (6.4)	60.8 (234.1)		8.6 (6.2)	60.3 (250.8)
	PSF	97.1	7.7 (4.1)	31.2 (160.7)	94.3	7.4 (4.7)	25.3 (142.4)

Supplemental table 2) VOI method feasibility (% of 70 lesions successfully delineated) and median SUVmean and TLG for all combinations of VOI and PVC method of the ¹⁸F-FDG-PET cohort. *numbers in parentheses represent IQR.

		Scan 1			Scan 2		
VOI	PVC	feasibility (% of 67)	Median SUVmean*	Median TLG*	feasibility (% of 67)	Median SUVmean*	Median TLG*
42MAX	Uncorrected	74.6	6.4 (3.4)	52.6 (92.7)	79.1	6.6 (3.9)	54.2 (90)
	IDC-LR		8.5 (4.8)	70.9 (109.5)		9.2 (5.5)	73.2 (108.7)
	HH-GLBL		10.4 (4.6)	71.6 (127.5)		11.2 (5.9)	92.5 (150.9)
	HH-LCL		9 (5.4)	76.8 (124.9)		9.7 (5.6)	86.7 (131.5)
	Spill-over		9.3 (5.1)	78 (120.8)		9.8 (6)	83.2 (126.8)
	PSF	84.3	7.7 (4.6)	55.7 (87.7)	80.6	7.4 (4.5)	50.1 (70.7)
50MAX	Uncorrected	92.5	6.4 (4)	43.6 (73.6)	89.6	6.4 (3.7)	45.2 (56.6)
	IDC-LR		9.1 (5.9)	62.5 (95.8)		9.3 (6)	60.1 (71.7)
	HH-GLBL		13.8 (8.3)	77.3 (135.3)		14.2 (10.3)	82 (134.1)
	HH-LCL		10.7 (7)	73.6 (113.8)		11.1 (8.3)	77.1 (95.3)
	Spill-over		9.8 (6)	66.3 (106.7)		9.8 (7)	65.4 (82.4)
	PSF	94.3	7.7 (4.6)	40 (66.6)	92.5	7.6 (5.9)	39.6 (51.1)
A42MAX	Uncorrected	95.5	6.5 (4)	25.8 (51.4)	95.5	6.3 (4.2)	27.5 (51.4)
	IDC-LR		9.3 (5.5)	33.6 (66)		9.2 (6.2)	35.4 (66.9)
	HH-GLBL		13.5 (7.1)	60.7 (104.6)		14.3 (9.4)	67.4 (107)
	HH-LCL		11.2 (6.8)	43 (83.5)		11.2 (7.2)	47.9 (81.2)
	Spill-over		9.3 (5.9)	35.6 (70.6)		9.2 (6)	38.2 (68.3)
	PSF	95.7	7.9 (4.8)	27.1 (59.9)	95.5	7.6 (5.5)	28.2 (48.5)
A50MAX	Uncorrected	95.5	7.2 (4.4)	17.7 (35.5)	97.0	6.8 (4.6)	19.3 (31.3)
	IDC-LR		9.2 (5.5)	21.4 (42.8)		9.3 (6.4)	25.5 (39.5)
	HH-GLBL		18.6 (10.4)	49.6 (74.7)		20.6 (11.1)	45.5 (71.2)
	HH-LCL		14.2 (7.2)	32.2 (63.4)		14.4 (8.4)	37.2 (62.9)
	Spill-over		9.3 (5.4)	22.5 (46.5)		9.3 (6.4)	25.4 (40.9)
	PSF	95.7	8.9 (5.1)	19 (30.4)	97.0	8.2 (6)	19.5 (33.1)
A50PEAK	Uncorrected	94.0	6 (3.8)	35.4 (61.4)	94.0	5.9 (3.8)	35.5 (58.7)
	IDC-LR		8.4 (5.1)	47.9 (83.6)		8.3 (5.3)	48 (76.7)
	HH-GLBL		11.3 (6.3)	68 (116.5)		12.7 (6)	73.3 (110.2)
	HH-LCL		9.7 (5.4)	59.7 (92.9)		9.6 (6.3)	60.1 (85.2)
	Spill-over		8.8 (5.3)	52.3 (85.1)		8.8 (5.5)	52.2 (80.7)
	PSF	95.7	7.2 (4.7)	41.6 (69.9)	95.5	7.1 (4.6)	33 (60)
A70PEAK	Uncorrected	97.0	7.4 (4.2)	15.1 (26)	98.5	7.3 (4.7)	14.4 (26.5)
	IDC-LR		9.6 (5.1)	20 (33.8)		9.3 (5.7)	19.8 (35.8)
	HH-GLBL		21.9 (10.9)	47 (75)		24.5 (11.1)	41.2 (62.9)
	HH-LCL		14.9 (8.6)	33.4 (51.6)		14.7 (9.4)	32.3 (58.9)
	Spill-over		10.3 (5.8)	20.9 (34.6)		9.5 (6.6)	19.9 (37.4)
	PSF	97.1	8.9 (5.1)	5.4 (30.8)	98.5	8.5 (5.4)	17.4 (28.5)
RTL	Uncorrected	91.0	6.1 (3.5)	43.6 (67.4)	94.0	6 (3.6)	44.8 (64.2)
	IDC-LR		8.4 (5)	58.1 (84.7)		8.3 (5.4)	60.9 (81.1)
	HH-GLBL		11.1 (7.4)	74.4 (123.3)		12 (7.8)	79.1 (110.4)
	HH-LCL		11.3 (6.4)	72.7 (127.9)		11 (7.5)	79.6 (110.4)
	Spill-over		9.4 (5.1)	68.3 (94)		9.5 (5.9)	70.4 (93.2)
	PSF	94.3	7.3 (4.5)	46.3 (73.9)	95.5	7.1 (5)	45.3 (62.6)

Supplemental Table 3) VOI method feasibility (% of 67 lesions successfully delineated) and median SUVmean and TLG for all combinations of VOI and PVC method of the ¹⁸F-FCH-PET cohort. *numbers in parentheses represent IQR.

	42MAX	50MAX	A42MAX	A50MAX	A50PEAK	A70PEAK	RTL
Non-PSF	0.98 (0.97-0.99)	0.96 (0.93-0.97)	0.92 (0.87-0.95)	0.96 (0.94-0.98)	0.94 (0.90-0.96)	0.95 (0.92-0.97)	0.96 (0.94-0.98)
PSF	0.97 (0.94-0.98)	0.95 (0.92-0.97)	0.95 (0.91-0.97)	0.97 (0.95-0.98)	0.88 (0.81-0.93)	0.89 (0.82-0.93)	0.93 (0.88-0.95)

Supplementary Table 4) ICCs of VOI volumes generated on non-PSF- and PSF-reconstructed images in the ¹⁸F-FDG-PET cohort. 95%-CI in parentheses.