

**Supplemental Table S1** Data on PET model and reconstruction used for FDG-PET/CT

Hospital	PET manufacturer	PET model	Reconstruction method	Beta, or iterations and subsets	Postreconstruction filter (FWHM)	No of patients
Bispebjerg Hospital	GE Medical Systems	Discovery 710	QCFX	$\beta=500$	-	4
		Discovery MI	QCFX	$\beta=500$	-	1
	Philips Medical Systems	GEMINI TF 64	BLOB-OS-TF	3i33s	$\lambda=1$	4
Herlev Hospital	Siemens	Biograph mCT 64	OSEM PSF+TOF	4i21s	2.5 mm	1
Rigshospitalet	Siemens	Biograph mCT 64	OSEM PSF+TOF	2i21s	2.0 mm	20
			OSEM PSF+TOF	2i21s	2.5 mm	1
			OSEM PSF	3i21s	2 mm	14
		Biograph TruePoint TrueV 40	OSEM PSF	3i21s	2.5 mm	1
		Biograph TruePoint TrueV 64	OSEM PSF	3i21s	2.0 mm	14
			OSEM PSF	3i21s	2.5 mm	1

FDG-PET/CT: 2-deoxy-2-[ $^{18}\text{F}$ ]fluoro-D-glucose-PET/CT; QCFX: QClear with PFS and filtering; BLOB-OS-TF: OSEM with blobs and TOF; OSEM: Ordered subset expectation maximization; PSF: point spread function; TOF: time of flight; I: iterations; S: subsets

**Supplemental Table S2** PET-parameters in intrapulmonary malignant lesions in patients with NSCLC

FDG-PET-parameters	All lesions median [IQ] ( <i>n</i> = 28)	Within HDV median [IQ] ( <i>n</i> = 15)	Outside of HDV median [IQ] ( <i>n</i> = 13)	<i>p</i> -value
SUV <sub>max</sub>	10.6 [5.1-16.1]	13.0 [6.8-16.3]	7.2 [4.1-14.5]	0.106
SUV <sub>peak</sub>	5.0 [3.2-9.1]	8.2 [4.3-10.0]	3.9 [2.3-6.2]	0.017*
MTV <sub>3.0</sub>	1.8 [0.6-11.8]	6.6 [1.6-52.2]	1.2 [0.2-2.2]	0.017*
MTV <sub>80%</sub>	0.1 [0.1-0.5]	0.2 [0.1-0.6]	0.1 [0.1-0.1]	0.112
MTV <sub>50%</sub>	1.2 [0.4-3.9]	2.5 [1.2-7.9]	0.6 [0.4-1.2]	0.014*
<b>FLT-PET-parameters</b>				
SUV <sub>max</sub>	3.8 [2.0-5.1]	3.9 [2.4-5.9]	3.6 [1.5-3.1]	0.235
SUV <sub>peak</sub>	2.4 [1.4-3.4]	2.6 [1.5-3.5]	2.2 [1.1-3.1]	0.194
PTV <sub>3.0</sub>	0.2 [0.0-2.0]	0.3 [0.0-4.5]	0.1 [0.0-0.5]	0.128
PTV <sub>80%</sub>	0.2 [0.1-0.3]	0.3 [0.1-0.5]	0.1 [0.1-0.2]	0.406
PTV <sub>50%</sub>	1.3 [0.8-4.3]	2.7 [0.8-10.1]	1.2 [0.6-1.7]	0.072

NSCLC: non-small cell lung cancer; HDV: high-dose irradiated volume (>50% of prescribed dose); IQ: interquartile range; SUV: standardized uptake value; MTV: metabolic tumour volume; PTV: proliferative tumour volume; \* Statistically significant.

**Supplemental Table S3** FDG-SUV<sub>max</sub> and FLT-SUV<sub>max</sub> in relapsed vs. non-relapsed HDV in patients with NSCLC

	HDV with relapse Mean ( <i>n</i> = 15)	HDV without relapse Mean ( <i>n</i> = 42)	Mean difference	<i>p</i> -value
FDG-SUV <sub>max</sub>	12.0	4.8	7.2 [4.1-10.4]	0.0001*
FLT-SUV <sub>max</sub>	4.4	2.3	2.1 [0.7-3.5]	0.006*

SUV: standardized uptake value; HDV: high-dose irradiated volume (>50% of prescribed dose); NSCLC: non-small cell lung cancer; \* Statistically significant.

**Supplemental Table S4** Prognostic value of PET-parameters and clinical variables in patients with intrapulmonary relapse of irradiated NSCLC. Univariate survival analysis (*n* = 28)

FDG-PET parameters in recurrent lesions, continuous variable	Hazard ratio [95% CI]	<i>p</i> -value
SUV <sub>max</sub> (pr unit)	1.00 [0.93-1.08]	0.962
SUV <sub>peak</sub> (pr unit)	1.05 [0.92-1.19]	0.508
MTV <sub>3.0</sub> (pr cm <sup>3</sup> )	1.01 [0.99-1.02]	0.560
MTV <sub>80%</sub> (pr cm <sup>3</sup> )	3.51 [0.93-13.20]	0.064
MTV <sub>50%</sub> (pr cm <sup>3</sup> )	1.12 [0.99-1.26]	0.067
FDG-PET parameters in recurrent lesions, dichotomized variable		
SUV <sub>max</sub> (> 10.6)	1.01 [0.40-2.56]	0.979
SUV <sub>peak</sub> (> 4.9)	1.01 [0.40-2.56]	0.979
MTV <sub>3.0</sub> (> 1.7 cm <sup>3</sup> )	0.75 [0.29-1.91]	0.547
MTV <sub>80%</sub> (> 0.1 cm <sup>3</sup> )	1.58 [0.62-4.01]	0.340
MTV <sub>50%</sub> (> 1.2 cm <sup>3</sup> )	1.45 [0.57-3.70]	0.436
FLT-PET parameters in recurrent lesions, continuous variable		
SUV <sub>max</sub> (pr unit)	0.90 [0.73-1.12]	0.340
SUV <sub>peak</sub> (pr unit)	0.88 [0.62-1.26]	0.489
PTV <sub>3.0</sub> (pr cm <sup>3</sup> )	1.04 [0.92-1.17]	0.519
PTV <sub>80%</sub> (pr cm <sup>3</sup> )	3.72 [0.73-18.87]	0.113
PTV <sub>50%</sub> (pr cm <sup>3</sup> )	1.07 [1.01-1.13]	0.018*
FLT-PET parameters in recurrent lesions, dichotomized variable		
SUV <sub>max</sub> (> 3.7)	0.69 [0.27-1.76]	0.435
SUV <sub>peak</sub> (> 2.4)	0.82 [0.32-2.10]	0.684
PTV <sub>3.0</sub> (> 0.2 cm <sup>3</sup> )	0.68 [0.26-1.80]	0.438
PTV <sub>80%</sub> (> 0.2 cm <sup>3</sup> )	1.57 [0.62-4.02]	0.350
PTV <sub>50%</sub> (> 1.3 cm <sup>3</sup> )	1.31 [0.51-3.35]	0.570
Clinical parameters		
Age (at suspicion) (pr year)	1.03 [0.96-1.10]	0.453
Sex (male)	2.80 [1.00-7.84]	0.050
Stadium (III vs I-II)	1.15 [0.43-3.05]	0.779
(IV vs I-II)	0.54 [0.07-4.43]	0.567
Radiotherapy (Conventionally fractionated radiotherapy vs. SBRT)	1.28 [0.48-3.42]	0.625
Histology (Squamous cell carcinoma vs. adenocarcinoma)	1.24 [0.48-3.20]	0.659

Time since end of radiotherapy (pr month)	0.98 [0.90-1.08]	0.726
Site of relapse (within HDV vs. outside HDV)	1.54. [0.60-3.98]	0.373
Intention for relapse treatment (palliation vs. curative)	1.30 [0.50-3.39]	0.593
Extra-pulmonary metastases (present)	1.96 [0.63-6.11]	0.245

SUV: standardized uptake value; MTV: metabolic tumour volume; PTV: proliferative tumour volume; SBRT: stereotactic body radiotherapy; HDV: high-dose irradiated volume (>50% of prescribed dose); \* Statistically significant.

**Supplemental Table S5** Multivariate survival analysis in patients with relapsed NSCLC ( $n = 28$ )

Covariate	Hazard ratio [95% CI]	<i>p</i> -value
MTV <sub>50%</sub> (pr cm <sup>3</sup> )	1.19 [0.98-1.44]	0.072
PTV <sub>50%</sub> (pr cm <sup>3</sup> )	1.02 [0.95-1.09]	0.638
Sex (male)	4.17 [1.28-13.56]	0.018*
Age (at suspicion) (pr year)	1.08 [1.00-1.17]	0.065
Time since end of radiotherapy (pr month)	0.96 [0.88-1.05]	0.355

MTV: metabolic tumour volume; PTV: proliferative tumour volume; \* Statistically significant.