

SUPPLEMENTAL TABLE 1. Summary of kinetic modeling parameters for [<sup>18</sup>F]MNI-659 for 2TCM, 1TCM, Logan and SRTM for acquisitions of 210 and 90 min (n=10, mean ± sd).

Model	Parameter	210 min				90 min			
		Caudate	Putamen	Globus Pallidus	Cerebellum	Caudate	Putamen	Globus Pallidus	Cerebellum
2TCM	V <sub>T</sub>	1.83 ± 0.55	2.89 ± 0.85	3.08 ± 0.97	0.76 ± 0.24	1.69 ± 0.52	2.69 ± 0.78	2.81 ± 0.84	0.48 ± 0.13
	V <sub>T</sub> %SE	1.9 ± 0.7	1.3 ± 0.4	1.8 ± 0.6	13.3 ± 7.5	3.5 ± 4.5	2.5 ± 1	5.7 ± 4.5	7.8 ± 7.4
	K <sub>1</sub>	0.060 ± 0.022	0.078 ± 0.024	0.056 ± 0.018	0.070 ± 0.022	0.062 ± 0.025	0.085 ± 0.033	0.054 ± 0.016	0.085 ± 0.049
	K <sub>1</sub> %SE	2.8 ± 2.3	2.6 ± 1.4	2.3 ± 0.8	3.5 ± 1.8	3.2 ± 0.8	5.8 ± 6.1	3.1 ± 0.8	4.5 ± 3.5
	AIC	24.9 ± 24.6	-0.6 ± 30	0.9 ± 13.3	85.4 ± 45.2	17.5 ± 19.5	2.6 ± 14.6	9.1 ± 8.4	54.7 ± 18.4
	MSC	4.8 ± 0.6	5.1 ± 0.6	4.7 ± 0.3	4.3 ± 0.9	4.6 ± 0.8	4.8 ± 0.4	4.3 ± 0.4	4.4 ± 0.6
	BP <sub>P</sub>	1.07 ± 0.46	2.13 ± 0.74	2.32 ± 0.82	---	1.21 ± 0.44	2.21 ± 0.68	2.33 ± 0.73	---
	BP <sub>ND</sub>	1.5 ± 0.67	2.97 ± 1.09	3.16 ± 0.99	---	2.55 ± 0.86	4.65 ± 1.24	4.87 ± 1.15	---
1TCM	V <sub>T</sub>	1.69 ± 0.54	2.71 ± 0.82	2.84 ± 0.91	0.36 ± 0.11	1.61 ± 0.51	2.51 ± 0.75	2.5 ± 0.79	0.36 ± 0.11
	V <sub>T</sub> %SE	2.3 ± 0.4	2.4 ± 0.4	2.4 ± 0.4	4.8 ± 0.9	2.6 ± 0.6	2.7 ± 0.6	2.9 ± 0.6	4.9 ± 1.1
	K <sub>1</sub>	0.050 ± 0.016	0.062 ± 0.018	0.046 ± 0.014	0.063 ± 0.02	0.051 ± 0.017	0.065 ± 0.019	0.049 ± 0.015	0.064 ± 0.02
	K <sub>1</sub> %SE	2.2 ± 0.4	2.3 ± 0.4	2.2 ± 0.4	5.4 ± 1.1	2.2 ± 0.5	2.4 ± 0.8	2.1 ± 0.5	5.6 ± 1.5
	AIC	80.6 ± 14.1	82.1 ± 15.8	75.4 ± 14.4	151.1 ± 17.5	49.2 ± 10.2	47.6 ± 15.5	37.4 ± 12	94.6 ± 14.8
	MSC	3.6 ± 0.4	3.3 ± 0.3	3.1 ± 0.3	2.9 ± 0.4	3.5 ± 0.4	3.2 ± 0.5	3.3 ± 0.3	3 ± 0.5
	BP <sub>P</sub>	1.33 ± 0.44	2.34 ± 0.72	2.47 ± 0.8	---	1.26 ± 0.42	2.15 ± 0.66	2.14 ± 0.69	---
	BP <sub>ND</sub>	3.69 ± 0.73	6.53 ± 1.1	6.84 ± 0.92	---	3.53 ± 0.68	6.07 ± 0.99	6.01 ± 0.79	---
Logan	V <sub>T</sub>	1.81 ± 0.53	2.84 ± 0.81	2.95 ± 0.90	0.71 ± 0.20	1.67 ± 0.51	2.64 ± 0.76	2.67 ± 0.82	0.55 ± 0.15
	V <sub>T</sub> %SE	0.5 ± 0.2	0.3 ± 0.1	0.6 ± 0.2	2.4 ± 0.7	0.7 ± 0.2	0.8 ± 0.1	1.6 ± 0.2	2.4 ± 1
	BP <sub>P</sub>	1.1 ± 0.4	2.13 ± 0.66	2.24 ± 0.73	---	1.12 ± 0.39	2.09 ± 0.64	2.12 ± 0.68	---
	BP <sub>ND</sub>	1.58 ± 0.49	3.04 ± 0.73	3.16 ± 0.63	---	2.05 ± 0.54	3.82 ± 0.78	3.85 ± 0.66	---
SRTM	BP <sub>ND</sub>	1.97 ± 0.5	3.51 ± 0.71	3.4 ± 0.59	---	2.13 ± 0.5	3.75 ± 0.68	3.53 ± 0.56	---
	BP <sub>ND</sub> %SE	3.2 ± 0.7	2.3 ± 0.5	1.8 ± 0.4	---	2 ± 0.5	1.5 ± 0.4	2.3 ± 0.5	---
	R <sub>1</sub>	0.79 ± 0.09	1.01 ± 0.08	0.79 ± 0.09	---	0.81 ± 0.09	1.04 ± 0.08	0.81 ± 0.09	---
	R <sub>1</sub> %SE	0.8 ± 0.1	1 ± 0.1	0.8 ± 0.1	---	0.8 ± 0.1	1 ± 0.1	0.8 ± 0.1	---
	AIC	72.9 ± 13.9	55.5 ± 18.9	29.7 ± 21.6	---	17.4 ± 11.4	3.5 ± 14.5	16.3 ± 10.8	---
	MSC	3.7 ± 0.3	3.9 ± 0.4	4 ± 0.4	---	4.5 ± 0.6	4.7 ± 0.6	4 ± 0.4	---

SUPPLEMENTAL TABLE 2. [<sup>18</sup>F]MNI-659 V<sub>T</sub> test-retest for 2TCM, 1TCM and Logan for 210 min acquisitions (n=5, mean ± sd).

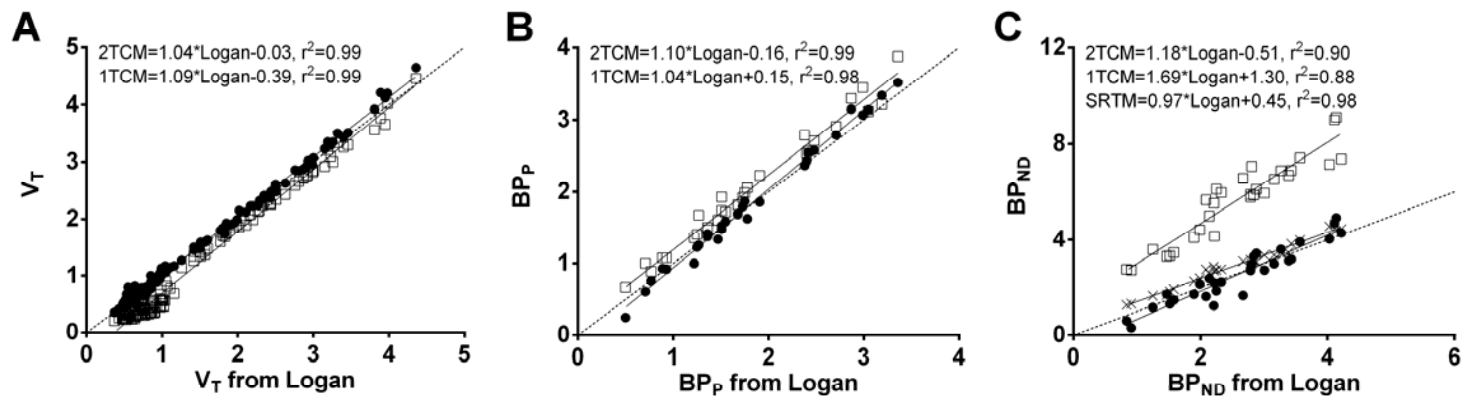
Model	Parameter	Caudate		Putamen		Globus Pallidus		Cerebellum	
		Scan 1	Scan 2	Scan 1	Scan 2	Scan 1	Scan 2	Scan 1	Scan 2
2TCM	V <sub>T</sub>	1.83 ± 0.61	1.82 ± 0.54	2.96 ± 0.94	2.82 ± 0.84	3.11 ± 0.98	3.05 ± 1.08	0.74 ± 0.25	0.78 ± 0.26
	VAR	29 ± 15 %		30 ± 11 %		27 ± 12 %		21 ± 15 %	
	ICC	0.50		0.46		0.67		0.77	
1TCM	V <sub>T</sub>	1.73 ± 0.62	1.65 ± 0.51	2.80 ± 0.94	2.61 ± 0.77	2.92 ± 0.99	2.75 ± 0.93	0.37 ± 0.13	0.36 ± 0.10
	VAR	30 ± 13 %		31 ± 11 %		29 ± 10 %		33 ± 10 %	
	ICC	0.56		0.49		0.64		0.42	
Logan	V <sub>T</sub>	1.83 ± 0.58	1.80 ± 0.53	2.91 ± 0.88	2.77 ± 0.82	2.99 ± 0.90	2.90 ± 0.99	0.70 ± 0.18	0.72 ± 0.23
	VAR	28 ± 15 %		30 ± 13 %		28 ± 12 %		27 ± 17 %	
	ICC	0.51		0.47		0.61		0.50	

SUPPLEMENTAL TABLE 3. [<sup>18</sup>F]MNI-659 BP<sub>p</sub> test-retest for 2TCM, 1TCM and Logan for 210 min acquisitions (n=5, mean ± sd).

Model	Parameter	Caudate		Putamen		Globus Pallidus	
		Scan 1	Scan 2	Scan 1	Scan 2	Scan 1	Scan 2
2TCM	BP <sub>p</sub>	1.09 ± 0.52	1.05 ± 0.44	2.22 ± 0.83	2.04 ± 0.72	2.37 ± 0.82	2.27 ± 0.90
	VAR	30 ± 15 %		35 ± 12 %		29 ± 13 %	
	ICC	0.64		0.52		0.70	
1TCM	BP <sub>p</sub>	1.36 ± 0.51	1.29 ± 0.42	2.43 ± 0.82	2.26 ± 0.68	2.55 ± 0.86	2.40 ± 0.83
	VAR	29 ± 14 %		31 ± 12 %		29 ± 11 %	
	ICC	0.61		0.51		0.67	
Logan	BP <sub>p</sub>	1.13 ± 0.43	1.07 ± 0.40	2.21 ± 0.73	2.05 ± 0.67	2.29 ± 0.74	2.18 ± 0.81
	VAR	29 ± 14 %		31 ± 11 %		28 ± 11 %	
	ICC	0.62		0.51		0.65	

SUPPLEMENTAL TABLE 4. [<sup>18</sup>F]MNI-659 BP<sub>ND</sub> test-retest for 2TCM, 1TCM, Logan and SRTM for 210 min acquisitions (n=5, mean ± sd).

Model	Parameter	Caudate		Putamen		Globus Pallidus	
		Scan 1	Scan 2	Scan 1	Scan 2	Scan 1	Scan 2
2TCM	BP <sub>ND</sub>	1.57 ± 0.81	1.44 ± 0.59	3.17 ± 1.31	2.76 ± 0.92	3.35 ± 1.16	2.98 ± 0.87
	VAR	14 ± 6 %		20 ± 4 %		14 ± 6 %	
	ICC	0.93		0.87		0.89	
1TCM	BP <sub>ND</sub>	3.76 ± 0.93	3.61 ± 0.57	6.76 ± 1.45	6.30 ± 0.68	7.08 ± 1.18	6.60 ± 0.63
	VAR	8 ± 6 %		7 ± 9 %		9 ± 7 %	
	ICC	0.84		0.71		0.61	
Logan	BP <sub>ND</sub>	1.61 ± 0.49	1.56 ± 0.54	3.15 ± 0.72	2.93 ± 0.80	3.27 ± 0.57	3.04 ± 0.73
	VAR	9 ± 6 %		8 ± 10 %		9 ± 8 %	
	ICC	0.96		0.91		0.88	
SRTM	BP <sub>ND</sub>	1.97 ± 0.51	1.97 ± 0.55	3.60 ± 0.72	3.42 ± 0.78	3.50 ± 0.53	3.29 ± 0.69
	VAR	7 ± 4 %		6 ± 8 %		8 ± 6 %	
	ICC	0.96		0.93		0.89	



SUPPLEMENTAL FIGURE 1. (A) Correlation of  $^{18}\text{F}$ -MNI-659 2TCM and 1TCM 210 min  $V_T$  estimates against Logan  $V_T$  estimates (all regions). (B) Correlation of  $^{18}\text{F}$ -MNI-659 2TCM and 1TCM 210 min  $\text{BP}_P$  estimates against Logan  $\text{BP}_P$  estimates (caudate, putamen and globus pallidus). (C) Correlation of  $^{18}\text{F}$ -MNI-659 2TCM, 1TCM and SRTM 210 min  $\text{BP}_{\text{ND}}$  estimates against Logan  $\text{BP}_{\text{ND}}$  estimates (caudate, putamen and globus pallidus). Closed circle = 2TCM; open square = 1TCM; cross = SRTM; solid line = linear regression fit; dashed line = line of identity. For  $V_T$ , 2TCM and 1TCM correlated well with Logan, close to the line of identity. Regions with low  $V_T$  (cerebellum) were however underestimated for 1TCM compared to Logan (-50%). For  $\text{BP}_P$ , there was again a good agreement with  $r^2 > 0.99$  and a slope close to 1.0. 1TCM overestimated  $\text{BP}_P$  by 10-20%, due to the underestimation of  $V_T$ . For  $\text{BP}_{\text{ND}}$ , SRTM correlated well with Logan estimates with  $r^2 > 0.98$ , with an overestimation of 10-20%. 2TCM agreed with Logan but 1TCM clearly overestimated  $\text{BP}_{\text{ND}}$  compared to Logan due to the bias of  $V_T$  in the cerebellum.