

SUPPLEMENT REFERENCES

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2. Derdeyn CP, Videen TO, Simmons NR, et al. **Count-based PET method for predicting ischemic stroke in patients with symptomatic carotid arterial occlusion.** *Radiology* 1999;212:499–506
3. Derdeyn CP, Videen TO, Grubb RL Jr, et al. **Comparison of PET oxygen extraction fraction methods for the prediction of stroke risk.** *J Nucl Med* 2001;42:1195–7
4. Derdeyn CP, Videen TO, Yundt KD, et al. **Variability of cerebral blood volume and oxygen extraction: Stages of cerebral haemodynamic impairment revisited.** *Brain* 2002;125:595–607
5. Powers WJ. **Letter by powers regarding article, “failure of cerebral hemodynamic selection in general or of specific positron emission tomography methodology? carotid occlusion surgery study (COSS)”.** *Stroke* 2012;43:e43; author reply e44
6. Yamauchi H, Fukuyama H, Nagahama Y, et al. **Significance of increased oxygen extraction fraction in five-year prognosis of major cerebral arterial occlusive diseases.** *J Nucl Med* 1999;40:1992–8
7. Yamauchi H, Higashi T, Kagawa S, et al. **Is misery perfusion still a predictor of stroke in symptomatic major cerebral artery disease?** *Brain* 2012;135:2515–26

On-line Table 1: Overview of patient characteristics in studies evaluating the risk of stroke in patients with OEF testing

Study No.	First Author (Reference No.), ^b Year, and Journal	Study Design	No. of Medically Treated Subjects	Mean Age (SD)	Male %	Disease Site	Disease Severity	Contralateral Disease Severity	Mean Time since Last Symptoms, Days	Hemodynamic Inclusion Criteria (eg, Reduced CBF)?	Mean Follow-Up, Months
1	Powers (15), 1989, <i>Ann Neurol</i>	Retrospective cohort	30	60.8	66.7	ICA or MCA	Occlusion or >75% stenosis	N/A	24 subjects <30 d, 6 subjects <90 d	None	12
2	Grubb (4), 1998, <i>JAMA</i>	Prospective cohort	81	65 (9)	71.6	ICA or CCA	Occlusion	7 of 64 patients with available contralateral data had ≥50% stenosis	267.4	None	31.5
3	Yamauchi (16), 1999, <i>J Nucl Med</i>	Prospective cohort	40	62 (8)	75	ICA or MCA	Occlusion or >70% stenosis	8 of 40 patients with available contralateral data had ≥50% stenosis	257.3	None	60
4	Powers (17), 2000, <i>Neurology</i>	Prospective cohort	30	66 (9)	77	ICA or CCA	Occlusion	7 of 22 patient with available contralateral data had ≥50% stenosis	N/A; all patients never previously symptomatic	None	32
5	Hokari (18), 2009, <i>Surg Neurol</i>	Prospective cohort	20	64.3 (7)	75	ICA or MCA	Occlusion or >90% stenosis	N/A	>28 days (exact mean not provided)	Reduced CBF and CVR on prior ¹⁵ O-IMP SPECT	45.6
6	Powers (5), 2011, <i>JAMA</i>	Observational data from a randomized, controlled trial	99 (on-treatment analysis)	58 (9)	62	ICA	Occlusion	18 of 96 patients with available contralateral data had ≥50% stenosis	75	Abnormal elevated OEF	24 (71% of subjects completed 2-y follow-up before early trial termination)
7	Yamauchi (9), 2012, <i>Brain</i>	Prospective cohort	130	63 (8) ^a	76 ^a	ICA or MCA	Extracranial ICA occlusion or >50% intracranial ICA/MCA stenosis	42 of 165 patients with contralateral >50% stenosis	243 ^a	None	24

Note:—N/A indicates data not available; CVR = cerebrovascular reserve; IMP = isopropyl iodo-amphetamine; OEF = oxygen extraction fraction.

^a For Yamauchi et al. 2012, the age, sex, and days since last symptomatic were provided for the overall cohort of 165 patients, 35 of whom were surgically treated patients.

^b References cited are from the print article reference list.

On-line Table 2: Overview of OEF testing characteristics and risk of ipsilateral stroke

Study No.	First Author (Reference Number), Year, and Journal ^c	OEF Testing: Arterial Sampling-Dependent Quantitative OEF?	OEF Testing: Non-Arterial-Dependent Count-Based OEF?	OEF Testing: Absolute or Hemispheric-Ratio?	OEF Testing: Definition of Abnormal Test Result	OEF Testing: Repeated Analysis of Original OEF Test Data?	No. of Subjects with Normal OEF	No. of Subjects with Elevated OEF	Ipsilateral Ischemic Strokes in Normal OEF Group	Ipsilateral Ischemic Strokes in Abnormal OEF Group
1	Powers (15), 1989, <i>Ann Neurol</i>	Yes (n = 28 of 30)	No	Ratio	>1.143 (quantitative ratio) ^a	No	25	5	1	0
2	Grubb (4), 1998, <i>JAMA</i>	Yes (n = 68 of 81)	Yes (n = 13 of 81)	Ratio	>1.082 (quantitative ratio) and >1.062 (count-based ratio)	Yes, see On-line Table 3	42	39	2	11
3	Yamauchi (16), 1999, <i>J Nucl Med</i>	Yes	No	Both	>53.3% (absolute)	Yes, see On-line Table 4	33	7	5	4
4	Powers (17), 2000, <i>Neurology</i>	Yes (n = 26 of 30)	Yes (n = 4 of 30)	Ratio	>1.082 (quantitative ratio) and >1.062 (count-based ratio)	No	26	4	0	0
5	Hokari (18), 2009, <i>Surg Neurol</i>	Yes	No	Absolute	>50% (absolute)	No	11	9	0	3
6	Powers (5), 2011, <i>JAMA</i>	No	Yes	Ratio	>1.130 (count-based ratio)	No	0	99	6	20
7	Yamauchi (9), 2012, <i>Brain</i>	Yes	No	Absolute	>52.9% (absolute)	Yes, see On-line Table 5	98	32	3	4

Note:—OEF indicates oxygen extraction fraction.

^a For Powers et al, 1989, the 2 patients without quantitative data were classified as abnormal on the basis of PET map asymmetry.

^b For Powers et al, 2011, only patients with increased OEF were included for the randomized Carotid Occlusion Surgery Study Trial. On-line Tables 3 through 5 available at <http://stroke.ahajournals.org>.

^c References cited are from the print article reference list.

On-line Table 3: Repeat analyses of patient cohort originally presented in Grubb et al, 1998 *JAMA* (Index Study)

Study Number	Study First Author and Year	Study Design	Number of Medically Managed Subjects	OEF Testing: Arterial-Sampling Dependent Quantitative OEF?	OEF Testing: Non-Arterial-Dependent Count-Based OEF?	OEF Testing: Absolute or Hemispheric-Ratio?	OEF Testing: Definition of Abnormal Test Result	Number of Subjects with Normal OEF	Number of Subjects with Elevated OEF	Ipsilateral Ischemic Strokes in Normal OEF Group	Ipsilateral Ischemic Strokes in Abnormal OEF Group	Odds Ratio (95% CI)
Index Study	Grubb 1998 <i>JAMA</i> ¹	Prospective Cohort	81	Yes (n = 68)	Yes (n = 13)	Ratio	>1.082 (quantitative ratio) and >1.062 (count-based ratio)	42	39	2	11	7.86 (1.61 to 38.23)
2A	Derdeyn 1999 Radiology ²	Retrospective Review of Prospective Cohort	68	Yes	No	Ratio	>1.084	37	31	2	7	5.10 (0.98 to 26.71)
2B	Derdeyn 1999 Radiology ²	Retrospective Review of Prospective Cohort	81	No	Yes	Ratio	>1.062	31	50	0	13	22.68 (1.30 to 396.88)
2C	Derdeyn 2001 <i>J Nucl Med</i> ³	Retrospective Review of Prospective Cohort	68	Yes	No	Absolute	>0.44	35	33	1	8	10.88 (1.28 to 92.66)
2D	Derdeyn 2002 <i>Brain</i> ⁴	Retrospective Review of Prospective Cohort	81	No	Yes	Ratio	>1.067 OEF (quantitative) or 1.068 OEF (count based) and CBV ratio >1.114	62 (non-elevated CBV and OEF)	19 (elevated CBV and OEF)	3	10	21.85 (5.03 to 94.90)
2E	Derdeyn 2002 <i>Brain</i> ⁴	Retrospective Review of Prospective Cohort	68	Yes	No	Absolute	>0.44 OEF and CBV >2.81 ml/100g	48 (non-elevated CBV and OEF)	20	2	7	12.38 (2.29 to 66.97)
2F	Powers 2012 <i>Stroke</i> ⁵	Retrospective Review of Prospective Cohort (COSS eligible patients)	36	Yes	No	Absolute	>0.50	26	10	5	4	2.80 (0.57 to 13.83)
2G	Powers 2012 <i>Stroke</i> ⁵	Retrospective Review of Prospective Cohort (COSS eligible patients)	36	No	Yes	Ratio	>1.13	18	18	2	7	5.09 (0.89 to 29.27)

CBV, cerebral blood volume; COSS, Carotid Occlusion Surgery Study; OEF, oxygen extraction fraction; OR, odds ratio.

On-line Table 4: Repeated analysis of OEF testing data in Yamauchi et al. 1999 J Nucl Med (Index Study)

Study Number	Study First Author and Year	Study Design	Number of Medically Managed Subjects	OEF Testing: Arterial-Sampling Dependent Quantitative OEF?	OEF Testing: Non-Arterial Dependent Count-Based OEF?	OEF Testing: Absolute or Hemispheric-Ratio?	OEF Testing: Definition of Abnormal Test Result	Number of Subjects with Normal OEF	Number of Subjects with Elevated OEF	Ipsilateral Ischemic Strokes in Normal OEF Group	Ipsilateral Ischemic Strokes in Abnormal OEF Group	Odds Ratio (95% CI)
Index Study 3A	Yamauchi 1999 J Nucl Med ⁶	Prospective Cohort	40	Yes	No	Absolute	>0.533	33	7	5	4	7.47 (1.27 to 44.00)
				Yes	No	Ratio	>1.091	26	14	4	5	3.06 (0.66 to 14.06)

OEF, oxygen extraction fraction; OR, odds ratio.

On-line Table 5: Repeated analysis of OEF testing data in Yamauchi et al. 2012 Brain (Index Study)

Study Number	Study First Author and Year	Study Design	Number of Medically Managed Subjects	OEF Testing: Arterial-Sampling Dependent Quantitative OEF?	OEF Testing: Non-Arterial Dependent Count-Based OEF?	OEF Testing: Absolute or Hemispheric-Ratio?	OEF Testing: Definition of Abnormal Test Result	Number of Subjects with Normal OEF	Number of Subjects with Elevated OEF	Ipsilateral Ischemic Strokes in Normal OEF Group	Ipsilateral Ischemic Strokes in Abnormal OEF Group	Odds Ratio (95% CI)
Index Study 7A	Yamauchi 2012 Brain ⁷	Prospective Cohort	130	Yes	No	Absolute	>0.529	98	32	3	4	4.52 (0.96 to 21.42)
				Yes	No	Absolute	Misery perfusion, defined as OEF >0.529, and CBF <35ml/100g/min and CBF/CBV <7.6/min	T14 (did not meet all hemodynamic parameters of misery perfusion)	16 (with misery perfusion)	3	4	12.23 (2.46 to 61.77)

OEF, oxygen extraction fraction; OR, odds ratio.