Supplemental Information for

Intraoperative Cerebral Hemodynamic Monitoring during Carotid Endarterectomy via Diffuse Correlation Spectroscopy and Near-Infrared Spectroscopy

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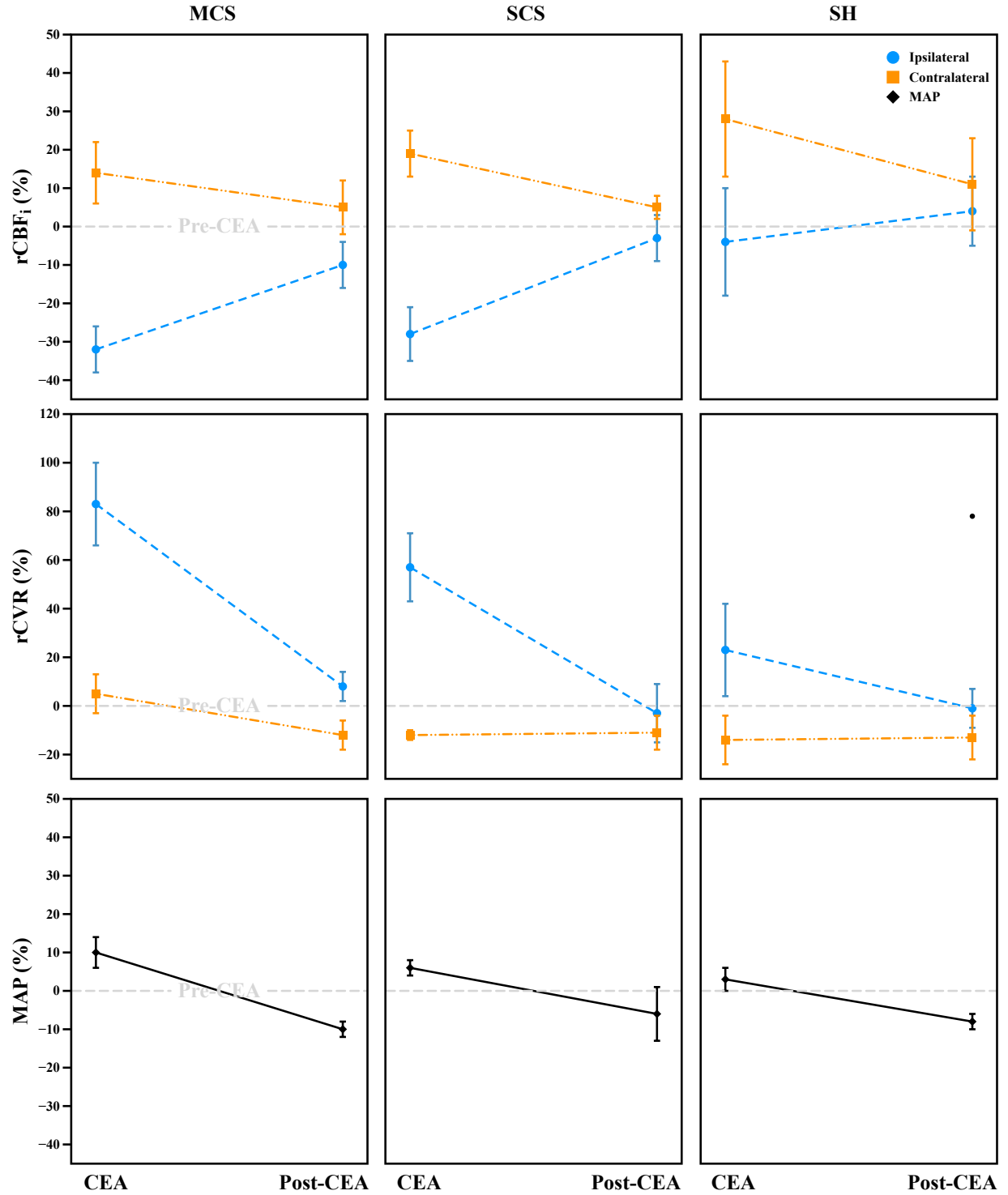
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Supplementary Table S1. Calculated μa, μs′, and DPF values in each wavelength for the right and left forehead probe.

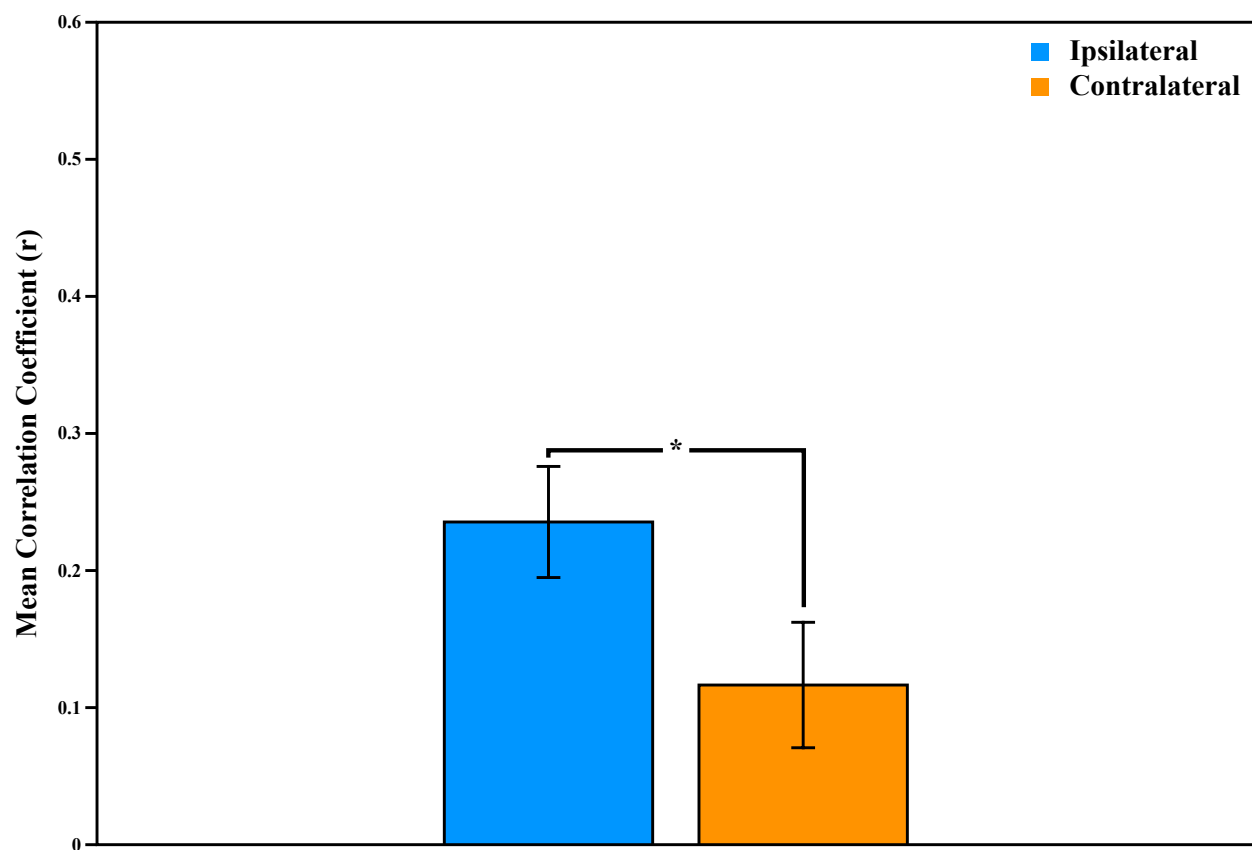| Forehead Probe	λ (nm)	μa (cm^{-1})	μs′ (cm^{-1})	DPF
Right	672	0.26	11.38	5.78
	706	0.17	10.57	6.77
	759	0.21	9.48	5.84
	830	0.19	8.29	5.60
Left	690	0.20	10.94	6.41
	726	0.16	10.13	6.87
	784	0.18	9.03	6.19
	813	0.18	8.55	6.01

λ, wavelength; *μa*, absorption coefficient; *μ*s′, reduced scattering coefficient; *DPF*, differential pathlength factor.
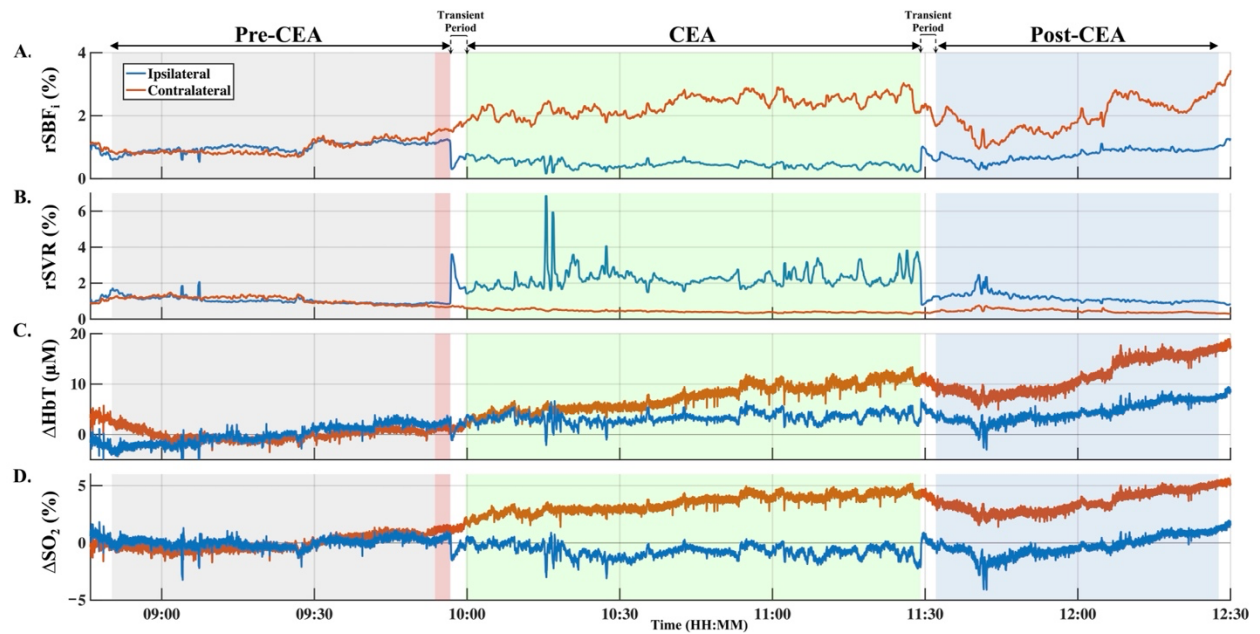
Supplementary Figure S1. Hemodynamic changes in rCBF$_i$, rCVR, and MAP in each group during the CEA and post-CEA phases. All changes were normalized with respect to the pre-CEA phase (long baseline, grey dashed line). All data are represented in mean ± standard error of the mean. One patient was defined as an outlier in the SH

group, indicated as a black-filled circle. MCS, normal-to-mild contralateral stenosis group; SCS, moderate-to-substantial contralateral stenosis group; SH, shunt utilization group; CEA, carotid endarterectomy; $rCBF_i$, relative cerebral blood flow index; rCVR, relative cerebrovascular resistance; MAP, mean arterial pressure.

Supplementary Figure S2. Mean correlation coefficients (r) between hemispheres during the pre-CEA phase. When all patients are considered, CBF_i was more autoregulated in the contralateral hemisphere than the ipsilateral hemisphere during the pre-CEA phase. * $p < 0.05$. CBF_i, cerebral blood flow index; MCS, normal-to-mild contralateral stenosis group; SCS, moderate-to-substantial contralateral stenosis group; SH, shunt utilization group.

Supplementary Figure S3. A typical measurement on a patient (#21, MCS group) at 5 mm during CEA. All data are normalized with respect to the pre-CEA phase (long baseline), represented in grey and red shaded areas. Ipsilateral and contralateral hemodynamic changes at 5 mm are shown in blue and orange, respectively, for $rSBF_i$ (A), rSVR (B), ΔHbT (C), and ΔSO_2 (D). All data are normalized with respect to the pre-CEA phase (long baseline), represented in grey and red shaded areas. A three-minute short baseline is represented in the red shaded area. CEA and post-CEA phases are represented in shaded light green and blue areas, respectively. CEA, carotid endarterectomy; $rSBF_i$, relative superficial blood flow index; rSVR, relative superficial vascular resistance; ΔHbT, changes in total hemoglobin concentration; ΔSO_2, changes in oxygen saturation.