Response to Letter Regarding Article, “Near Infrared Spectroscopy for the Detection of Desaturations in Vulnerable Ischemic Brain Tissue: A Pilot Study at the Stroke Unit Bedside”

Response:
We thank Freeman and Taussky for their comments on our study. We agree that near infrared spectroscopy (NIRS) has several practical advantages over established cerebral blood flow measurement methods like positron emission tomography or CT perfusion. Mainly because of its noninvasiveness, easy bedside application and excellent temporal resolution NIRS is suitable for long-term continuous monitoring on stroke units. The recent finding of Freeman of a strong correlation between bilateral frontal NIRS measurements and corresponding regional cerebral blood flow on CT perfusion imaging is interesting, especially because both techniques were not applied simultaneously (minutes to hours apart). This would indicate that not only relative changes, but also absolute (mean) regional saturation of oxygen values might be of clinical use. This information might have limited usefulness because no clear differences between the (severely) affected and unaffected hemispheres in the 8 neurological patients were detected. In our study with several hours of bifrontal NIRS recording in patients with stroke, significantly more cerebral desaturations were found in the affected hemisphere as time progressed. Several factors may explain these different findings. For instance, the vulnerability of the affected hemisphere may become more apparent with long-term continuous recordings. NIRS seems more sensitive to transient episodes of desaturation because of its ability to monitor over many hours, as opposed to (CT) perfusion imaging techniques. A next step would be to elucidate the mechanisms of local arteriovenous desaturations. Coregistration of different physiological parameters such as peripheral arterial oxygenation, CO2, blood pressure, (if possible) intracranial pressure, cerebral blood flow (velocity), and taking into account (permanently or temporarily disturbed) autoregulatory mechanisms and electroencephalographic data would improve the interpretation of the complex NIRS signal.

Sources of Funding
M.J.H.A. is supported by the Netherlands Organisation for Health Research and Development.

Disclosures
None.

Marcel J.H. Aries, MD
Jan Willem J. Elting, PhD
Patrick C.A.J. Vroomen, PhD
Department of Neurology
University Medical Centre Groningen
Groningen, The Netherlands

Response to Letter Regarding Article, "Near Infrared Spectroscopy for the Detection of Desaturations in Vulnerable Ischemic Brain Tissue: A Pilot Study at the Stroke Unit Bedside"

Marcel J.H. Aries, Jan Willem J. Elting and Patrick C.A.J. Vroomen

Stroke. 2012;43:e62; originally published online April 26, 2012; doi: 10.1161/STROKEAHA.112.658047

The online version of this article, along with updated information and services, is located on the World Wide Web at:

http://stroke.ahajournals.org/content/43/7/e62

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org/subscriptions/