

and higher arm motor FM score at baseline, were predictive of greater improvements in arm motor FM score following therapy. On multivariate analysis, only two of these factors—baseline brain function and baseline motor status—remained predictive of behavioral gains from restorative therapy.

The authors conclude that, as well as guiding therapy choices, baseline measurement of brain function could serve as an entry criterion for trials examining restorative therapy.

**Original article** Cramer SC *et al.* (2007) Predicting functional gains in a stroke trial. *Stroke* **38**: 2108–2114

### Break recommended every 30 min during transcranial Doppler sonography

Transcranial Doppler sonography (TCD) is widely used for the monitoring of cerebral blood flow. Although no adverse effects have been reported with this technique, little attention has been given to the potential for extended sessions of TCD to cause thermal damage to the brain surface via the adsorption of ultrasound by tissue and skull bone. Now, researchers from the Jikei University School of Medicine, Tokyo, Japan, report the first *in vivo* animal study of local brain temperature changes during long-term TCD.

To monitor temperature change at the skull-brain interface (SBI), the researchers inserted thermocouples into 15 New Zealand White rabbits. Of these rabbits, 10 underwent 90 min of TCD (0.2 W; maximum output 2 MHz) via a probe placed on the parietal bone; the remaining five rabbits formed the control group and did not undergo TCD. SBI temperature and central brain tissue temperature (CBTT) were monitored throughout insonation. Mean CBTT peaked at 37.54 °C after 25 min of TCD (an increase of 1.86 °C from baseline), after which point it gradually decreased. SBI temperature showed a similar pattern of change, peaking after 20 min of TCD, with a maximum increase from baseline of 3.37 °C. The profiles of CBTT and SBI temperature measured in the TCD group were significantly different from those measured in the control group ( $P < 0.0001$  for both).

Although there are large differences in brain volume between rabbits and humans, cerebral blood flow per gram of brain weight is similar. On the basis of this similarity, the authors

recommend a break in TCD monitoring every 30 min to avoid thermal damage to the brain.

**Original article** Nakagawa K *et al.* (2007) Does long-term continuous transcranial Doppler monitoring require a pause for safer use? *Cerebrovasc Dis* **24**: 27–34

### Recommendations for treatment of nervous system Lyme disease

Patients with Lyme disease, a tick-borne infectious disorder, present with many symptoms including rash and flu-like symptoms, followed by musculoskeletal, arthritic, neuropsychiatric and cardiac manifestations. The Quality Standards Subcommittee (QSS) of the American Academy of Neurology has published evidence-based recommendations on the treatment of patients with the nervous-system-related forms of the disorder, nervous system Lyme disease and post-Lyme syndrome.

The systematic review incorporated 37 articles published from 1983 to 2003. Most studies used parenteral regimens, although several European studies reported a preference for oral treatment—especially with doxycycline—over parenteral treatment in patients without parenchymal CNS involvement (i.e. those with meningitis, cranial neuritis, or radiculitis).

The QSS reports that parenteral administration of penicillin, ceftriaxone or cefotaxime is probably safe and effective for the treatment of PNS Lyme disease, and CNS Lyme disease with or without parenchymal involvement (Level B recommendation). Oral doxycycline is probably safe and effective for PNS Lyme disease, and for CNS Lyme disease without parenchymal involvement; oral amoxicillin or cerufoxime axetil may offer similar efficacy to doxycycline, but require further investigation (Level B recommendation). Responses to oral treatment were comparable in adults and children, although the evidence was stronger in adults. By contrast, patients with post-Lyme syndrome did not respond to prolonged use of antibiotics and experienced serious adverse effects that could have been treatment-related, leading the QSS to recommend against prolonged antibiotic treatment in this group (Level A recommendation).

**Original article** Halperin JJ *et al.* (2007) Practice parameter: treatment of nervous system Lyme disease (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology* **69**: 91–102