

Abstract for Society for Neuroscience 2004.

The stability of auditory activation in fMRI across sessions and sites: Initial Calibrations.  
J. Turner, S. Morris, H. Lee, C. Wible, G. Brown, S. Potkin, FIRST BIRN.

**Purpose.** The FIRST BIRN is a multi-site project funded by NCRR and NIH ([www.nbirn.net](http://www.nbirn.net)) with an initial goal of developing standardized calibration methods for fMRI equipment and imaging activation paradigms. A first study is the reliability of an activation finding over time, both within a single subject across time at a single site, and across sites with different scanners. **Methods.** Two right-handed males ages 18-35 traveled to ten scanning sites and participated in the same experiment at all sites. During the fMRI scan, subjects performed a visual task, while blocks of auditory stimuli were heard. Subjects performed this task twice each day, on two separate days at each site. Each site's images were analyzed separately, and the extent of activation in the superior temporal gyrus (STG) at a consistent significance value was compared across days and sites. The results are compared before and after an initial, proportional calibration factor was applied on a site-by-site basis. **Results.** The extent of activation in the STG varied dramatically in the pre-calibration analysis. The 1.5T scanners showed a non-significant tendency toward smaller areas of activation than the higher-field scanners. The extent of activation in the L and R hemispheres were strongly correlated, with the L hemisphere significantly larger than on the R. After calibration, the inter-site differences within a uniform field-strength are decreased. **Conclusions.** The extent of activation within a single area, even with the same subject and methods, are highly variable from day to day and site to site. Site sensitivity differences must be accounted for prior to meaningful interpretation of multi-site data. Initial site-specific calibration methods are being developed and refined.

Funded by NCRR (NIH), 5 MOI RR 000827.