Studies that have benefitted from the NoMoCo Pillow Support System

Following are just a few published studies of populations who have benefited from the comfort and stability the NoMoCo Pillow Support System provides. Our added support and pillow configuration helped to eliminate the challenges of imaging children and adolescents, older adults with kyphosis and physical challenges, and subjects in sleep deprivation studies. Subjects have consistently reported how pleasant and comfortable they had felt throughout the entire imaging session.

Striatopallidal regulation of affect in bipolar disorder

Caligiuri MP, Brown GG, Meloy MJ, Eberson S, Niculescu AB, Lohr JB.

Department of Psychiatry, University of California at San Diego, USA.
mcaligiuri@ucsd.edu

J Affect Disord. 2006 Apr;91(2-3):235-42.

BACKGROUND: Evidence from the neuroimaging literature suggests that the basal ganglia plays an important role in the regulation of affect. This conclusion stems almost exclusively from group comparisons and it remains unclear whether previous findings can be confirmed from a longitudinal study of mood change. The aim of this study was to increase our understanding of the functional role of the basal ganglia and thalamus in relation to change in affect in patients with bipolar disorder. METHODS: Ten bipolar disorder subjects participated in a functional MRI study. We used a simple motor reaction time task to probe subcortical regions bilaterally. Subjects were scanned twice, once when their self-reported mood ratings indicated hypomania or euthymia and then again when they were in depressed states. RESULTS: Subjects in their euthymic or hypomanic states exhibited increased caudate activity bilaterally and the globus pallidus of the left hemisphere. Longitudinal analyses revealed a significant association between an increase in severity of depression and a decrease in activity in the external segment of the right globus pallidus. CONCLUSIONS: Our findings suggest that the globus pallidus is less responsive during a simple motor task in the depressed compared to the normal or euthymic states in patients with bipolar disorder. These results are consistent with current physiologic models of basal ganglia circuitry in which an increase in caudate activity results in an increase in inhibitory GABAergic outflow to the external globus pallidus and subsequent decrease in thalamocortical excitation and may underlie the clinical manifestations of depression in bipolar disorder. LIMITATIONS: The findings of this study need to be interpreted with caution as correlation coefficients may be overestimated in this small study sample.

Patent No.: US 7,450,985 B2

Compensatory recruitment after sleep deprivation and the relationship with performance

Drummond SP, Meloy MJ, Yanagi MA, Orff HJ, Brown, GG.

Department of Psychiatry, University of California San Diego, San Diego, CA 92161, USA. drummond@ucsd.edu

Psychiatry Res. 2005 Dec 30;140(3):211-23.

This study examined the effects of total sleep deprivation (TSD) on cerebral responses to a verbal learning task with two levels of word difficulty. A total of 32 subjects were studied with functional magnetic resonance imaging (fMRI) after normal sleep and following 36 h of TSD. Cerebral responses to EASY words were identical on both nights, but several brain regions showed increased activation to HARD words following TSD compared with following a normal night of sleep (NORM). These regions included bilateral inferior frontal gyrus, bilateral dorsolateral prefrontal cortex, and bilateral inferior parietal lobe. Better free recall performance on the HARD words after TSD was related to increased cerebral responses within the left inferior and superior parietal lobes and left inferior frontal gyrus. Recall was negatively related to activation within the right inferior frontal gyrus. Overall, the findings support the predictions of the compensatory recruitment hypothesis that task demands influence both the likelihood and location of increased cerebral activation during task performance following TSD, and refine that hypothesis by identifying a specific task demand that plays a role. The performance relationships suggest increased activation may be both beneficial (compensatory) and interfere with task performance, depending on the brain regions involved.

Blood oxygen level dependent response and spatial working memory in adolescents with alcohol use disorders

Tapert SF, Schweinsburg AD, Barlett VC, Brown, SA, Frank LR, Brown GG, Meloy MJ.

VA San Diego Healthcare System, San Diego, California 92161, USA. stapert@ucsd.edu

Alcohol Clin Exp Res. 2004 Oct;28(10):1577-86.

BACKGROUND: Previous studies have suggested neural disruption and reorganization in young and older adults with alcohol use disorders (AUD). However, it remains unclear at

what age and when in the progression of AUD changes in brain functioning might occur. METHODS: Alcohol use disordered (n = 15) and nonabusing (n = 19) boys and girls aged 15 to 17 were recruited from local high schools. Functional magnetic resonance imaging data were collected after a minimum of 5 days' abstinence as participants performed spatial working memory and simple motor tasks. RESULTS: Adolescents with AUD showed greater brain response to the spatial working memory task in bilateral parietal cortices and diminished response in other regions, including the left precentral gyrus and bilateral cerebellar areas (clusters > or =943 microl; $p < 0.05$), although groups did not differ on behavioral measures of task performance. No brain response differences were observed during a simple finger-tapping task. The degree of abnormality was greater for teens who reported experiencing more withdrawal or hangover symptoms and who consumed more alcohol. CONCLUSIONS: Adolescents with AUD show abnormalities in brain response to a spatial working memory task, despite adequate performance, suggesting that subtle neuronal reorganization may occur early in the course of AUD.