outcome was quality of life, and the severity of psychiatric symptoms, including eating disorder, obsessive-compulsive, depressive, and anxiety symptoms. The systematic review and meta-analysis protocol was registered in PROSPERO under study's registration number: CRD42022295712.

**Results:** Four studies were included for meta-analysis, with a total of 56 patients with treatment-refractory AN. Follow-up ranged from 6-24 months. Random effects meta-analysis showed a significant increase in BMI following DBS, with a large effect size (Hedge’s g = 1.13; 95% CI = 0.80 to 1.46; Z-value = 6.75; P < 0.001), without heterogeneity (I^2 = 0.00; P = 0.901). Random effects meta-analysis also showed a significant increase in quality of life (Hedge’s g = 0.86; 95% CI = 0.44 to 1.28; Z-value = 4.01; P < 0.001). Furthermore, DBS decreased the severity of psychiatric symptoms (Hedge’s g = 0.89; 95% CI = 0.57 to 1.21; Z-value = 4.7; P > 0.001, I^2 = 4.29, P = 0.371).

**Conclusions:** In this first meta-analysis, DBS showed statistically large beneficial effects on weight restoration, quality of life, and reduction of psychiatric symptoms in patients with treatment-refractory AN. These outcomes call for more extensive naturalistic studies to determine the clinical relevance for functional recovery.

**Research Category and Technology and Methods**

**Translational Research:** 1. Deep Brain Stimulation (DBS)

**Keywords:** Deep brain stimulation, treatment-refractory, Anorexia Nervosa, meta-analysis

[http://dx.doi.org/10.1016/j.brs.2023.01.328](http://dx.doi.org/10.1016/j.brs.2023.01.328)

**Abstract key:** Pl- Plenary talks; S- Regular symposia oral; FS- Fast-Track symposia oral; OS- On-demand symposia oral; P- Posters

**P1.026**

**PRESERVATION OF CEREBELLAR AFFERENT PATHWAY MAY BE RELATED TO GOOD HAND FUNCTION IN PATIENTS WITH STROKE**

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**Abstract**

Many chronic stroke patients suffer from worsened hand function, and functional recovery of the hand does not occur well after 6 months. Therefore, predicting final hand function through acute phase imaging would be important in counseling with the patients. Thus, we investigated the relationship between remaining white matter integrity in corticospinal tract (CST), cortico-ponto-cerebellar tract (CPCT) at acute stage and chronic hand function. And we presented the cut-off value of fractional anisotropy (FA) of CPCT at the acute stage for predicting final hand function. This retrospective case-control study included 18 stroke patients who were classified into poor hand function (n = 11) and good hand function group (n = 7). Diffusion tensor image (DTI) was done within 2 months ± 15 days after onset, and the Jebsen’s Hand Function test was conducted 6-12 months after onset. The investigation of white matter focused on the values of fiber number (FN) and FA for CST and CPCT.

The normalized (affected/non-affected) FA and FN values in the CPCT in the good hand function group were higher than those in the poor hand function group. The normalized FN and FA values in the CST were not significantly different between two groups. The normalized cut-off value distinguishing the good hand function group from the poor hand function group was 0.8889 for FA in CPCT. In conclusion, the integrity of the CPCT in the acute stage was associated with hand function in the chronic stage. The integrity of the CPCT in the acute stage can be used to predict chronic hand function. Based on these results, cerebellar afferent fiber measurements may be a useful addition to predict hand function and to plan specific rehabilitation strategies.

This study was already published as ‘Shin BK et al. Life 2022; 12, 959. [https://doi.org/10.3390/life12070959](https://doi.org/10.3390/life12070959).

**Research Category and Technology and Methods**

**Clinical Research:** 24. Structural Brain Imaging

**Keywords:** Stroke, Recovery, Hand function, diffusion tensor imaging; DTI

[http://dx.doi.org/10.1016/j.brs.2023.01.329](http://dx.doi.org/10.1016/j.brs.2023.01.329)

### P1.027

**RAPID MODULATION OF GABA LEVELS IN THE ANTERIOR TEMPORAL LOBE DURING SEMANTIC PROCESSING: A COMBINED MRS, FMRI AND CTBS STUDY**

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**Abstract**

Semantic memory is defined as the collective knowledge of words including words, pictures, objects, people, and emotion. Converging evidence from neuropsychological and neuroscientific studies indicates that the anterior temporal lobe (ATL) is a representational hub in semantic memory. Previously, we demonstrated that the regional GABA concentration in the ATL predicted human semantic processing and GABAergic action is crucial to the neurobiological contribution of the ATL semantic function. Moreover, continuous theta-burst stimulation (cTBS) over the ATL modulated the task-induced regional activity led to disrupt the semantic performance (slower reaction time) in healthy participants. Here, we investigated the underlying neurochemical mechanisms of semantic neuroplasticity in the ATL using the combined magnetic resonance spectroscopy (MRS), functional magnetic resonance imaging (fMRI) and cTBS. Participants (N = 18) had resting MRS and fMRI before and after cTBS outside of the scanner. MRS volume of interests (VOIs) were placed in the left ATL and vertex as a control VOL. cTBS was delivered over the ATL or the vertex as a control site with a week gap between the stimulations. During fMRI, participants performed a semantic association task and a pattern matching task as a control task. cTBS over the ATL reduced the semantic task induced activity and increased the regional GABA in the ATL. We explored the relationship between GABA level changes and task-induced regional activity changes in the ATL caused by cTBS. Importantly, individuals with more increased GABA after cTBS over the ATL showed more decreased semantic task induced regional activity in the ATL. Our results suggested that GABAAergic action in the ATL is crucial to semantic processing and its short-term neuroplasticity. Furthermore, individual TMS-responsiveness on semantic processing can be modulated by GABA changes in the ATL. Our findings may imply a clinical use of non-invasive brain stimulation – predicting positive tRMS intervention treatment outcomes.

**Research Category and Technology and Methods**

**Basic Research:** 22. Neuroplasticity

**Keywords:** Semantic memory, Neuroplasticity, GABA, MR Spectroscopy

[http://dx.doi.org/10.1016/j.brs.2023.01.330](http://dx.doi.org/10.1016/j.brs.2023.01.330)

**Abstract key:** Pl- Plenary talks; S- Regular symposia oral; FS- Fast-Track symposia oral; OS- On-demand symposia oral; P- Posters

### P1.028

**TPS® WITH THE NEUROLITH® SYSTEM AS A METHOD FOR TREATING THE CENTRAL NERVOUS SYSTEM OF PATIENTS WITH ALZHEIMER’S DISEASE**

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**Abstract**

**Introduction:** Dementia – one of the most common diseases in old age – is often only diagnosed at a late stage. Therefore patients with dementia have often a 1.4 to 3.6 times greater risk of treatment as an inpatient. Consequently it is highly relevant within the caring system to identify and treat the onset of dementia at the earliest possible opportunity.

Part of a new treatment center, a psychiatric clinic in the Hanover area (Wahrenhoff) has concentrated on treating patients with a mild or moderate form of Alzheimer’s disease as early as possible on an outpatient basis. The method of transcranial pulse stimulation (TPS®) with the...