

# TPS® with the system Neurolith® as a method in the treatment of the central nervous system of patients with Alzheimer's disease



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## Introduction

The Dementia syndrome is understood as being a disturbance of various cognitive functions, e.g. memory and orientation, over and above the average of those commonly experienced in old age. There are often pronounced deficits in social and employment everyday behaviour [1]. Primary and secondary dementia categories are recognized clinically: primary - the responsible alterations are to be found in the brain. Secondary - another illness of an organ apart from the brain is responsible [2]. Dementia is one of the most common psychiatric diseases in old age and dementia is very often first recognized at a late stage [1, 2].



Consequently it is highly relevant within the caring system that the onset of a dementia be recognized at the earliest possible opportunity and thus treated [3]. A psychiatric-psychosomatic clinic (Wahrendorff Clinic) in Germany (Lower Saxony) is focussing - in a new therapeutic centre - on the problem of treating patients with a mild to moderate form of Alzheimer's disease as early as possible on an outpatient basis. The means are supplied by the process termed „Transcranial Pulse Stimulation“ (TPS®) with the system Neurolith®. Externally generated audio impulses are introduced into the brain regions chosen for treatment. The aim being the release of growth factors and an improvement in the cerebral circulation, and consequently as a means of supporting and maintaining cognitive performance for as long as possible.

The poster contribution examines the cognitive performance of the chosen subjects in the course of treatment. In addition it contains the consideration of subjective reports of patients - having received TPS®-treatment - and their relatives.

## Method & Selection

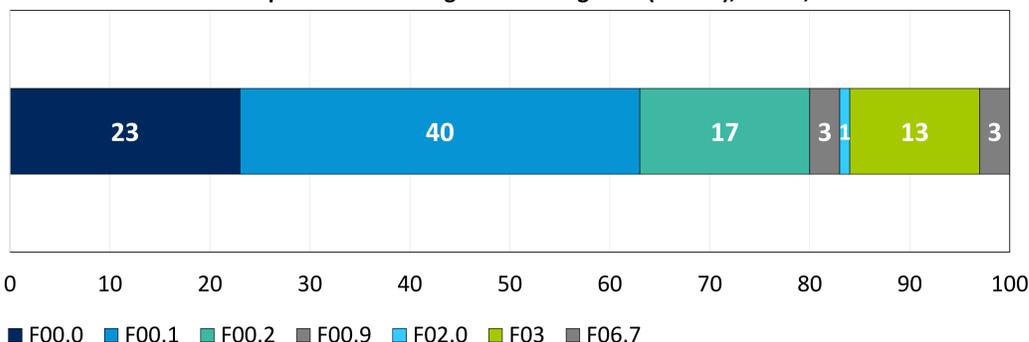
**Where?** Outpatient-Department of a psychiatric-psychosomatic clinic (Wahrendorff Clinic) in Germany (Lower Saxony).

**Who?** ♂ & ♀ with the diagnosis of a primary dementia who have undergone TPS®-treatment since 06/2021 with the system Neurolith®.

**What?** Assessment of the cognitive performance by means of the Montreal-Cognitive-Assessment (MoCA, cumulative result) & registration of the assessment of the TPS®-treatment by patients and relatives in a questionnaire.

**How?** MoCA at the beginning of the treatment (baseline-measurement, t1) & during the treatment (follow-up-measurements, at three-month intervals). Comparison of the averages of the MoCA-cumulative results with variance-analysis together with two follow-up measurements after three months (t2) & after six months (t3). The assessment concentrates on the comparison of the MoCA-cumulative result of t2 & t3 to t1.

**Illustration 1:** Number of patients according to main diagnosis (ICD-10), n = 70, distribution in %



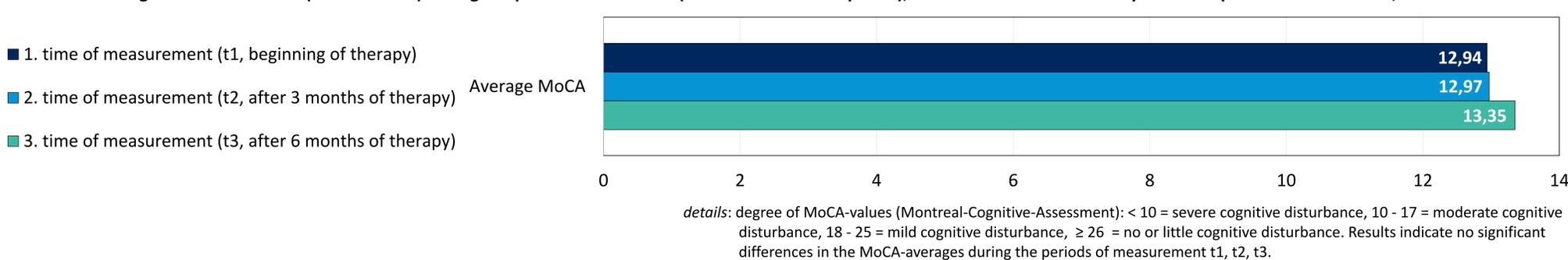
**Table 1:** Number of patients according to age, n = 77

| Feature    | ♂ & ♀<br>n = 77 (100 %)                | ♂<br>n = 31 (40 %) | ♀<br>n = 46 (60 %) | p                 |
|------------|--|--------------------|--------------------|-------------------|
| Age M (SD) | 72,38 (1,11)<br>Min. = 48<br>Max. = 88 | 72,16 (1,51)       | 72,52 (1,58)       | n.s. <sup>a</sup> |

details: M = average; SD = standard deviation; <sup>a</sup> t-test; n.s. = not significant

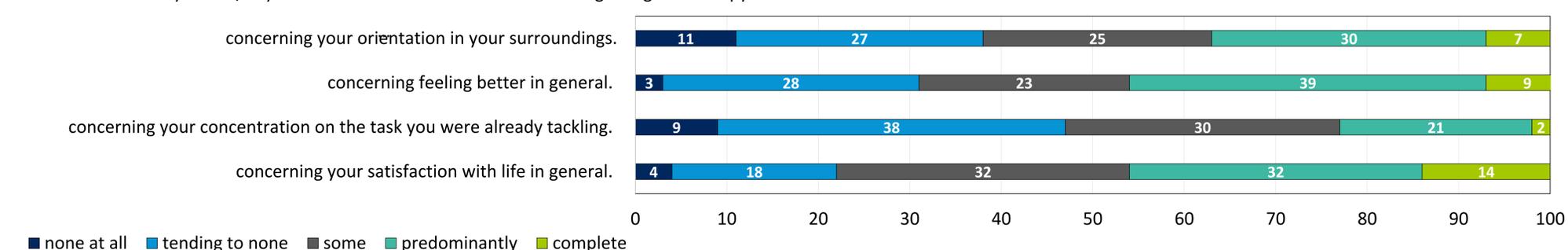
## Results

**Illustration 2:** Cognitive Performance (MoCA-values) during the period of treatment (three measurement points), results of the variance-analysis with repeated measurement, n = 31



**Illustration 3:** Evaluation of patients following TPS®-treatment, n = 44, distribution in %

To what extent have you and/or your relatives noticed differences since beginning the therapy?



## Conclusion

The TPS®-treatment can lead to maintaining cognitive performance: the results indicate a minimal alteration of the cognitive performance during the three periods of measurement (Illus. 2), without statistical significance. Regarding the classification of the MoCA-values the patients averagely show a moderate cognitive disturbance (Illus. 2). Thus this way of treatment succeeds in reaching patients at an early stage. According to the evaluation of patients and/or relatives, some improvement was experienced after TPS®-treatment concerning orientation in surroundings, concentration, feeling better in general and satisfaction (Illus. 3). Furthermore after TPS®-treatment 84 % of questioned patients estimated their mental health as moderate to good. The results obtained must be evaluated under consideration of the fact that the various aspects - including cognitive performance - can also be influenced by other factors. Furthermore, the study is being continued, it is not yet concluded.

### literatur:

[1] Kastner UH, Schraut V, Löbach, R. Handbuch Demenz. Fachwesen für Pflege und Betreuung. 5. Auflage München: Elsevier GmbH, 2022. [2] Kitwood T. Demenz. Der personen-zentrierte Ansatz im Umgang mit verwirrten Menschen. 7., überarbeitete und ergänzte Auflage Bern: Hogrefe, 2016. [3] Pinkert C, Holle B. Menschen mit Demenz im Akutkrankenhaus. Z Gerontol Geriat. 2012; 45:728-734. DOI: <https://doi.org/10.1007/s00391-012-0319-1>