

implementation initiatives, conference participation, mentoring, website development ([www.appde.eu](http://www.appde.eu)) and social media, like Twitter @euPhysioPD and FACEBOOK [www.facebook.com/euPhysioPD](http://www.facebook.com/euPhysioPD)

**Results:** The APPDE promotes optimal physiotherapy practice in Europe and internationally, including Guideline implementation, working closely with ParkinsonNet. It delivers courses developed in partnership with institutions and organisations. First course was in Edinburgh in 2007. It contributed to the MDS Allied Health Professional Summer School of physiotherapy (the Netherlands 2013 and Portugal 2014). Joining an international network group, APPDE members were speakers at the INPA Network Session (WCPT congress, Singapore 2015). The session promoted discussions on how networking between neurological therapists could improve practice and enhance CPD. The presentation utilised projects and networking undertaken by the APPDE.

**Conclusions:** Being an active part of the health professionals' international community creates bridges amongst multidisciplinary team members and promotes optimal physiotherapy practice for people with Parkinson's internationally.

## 514

### **Assessment of the quality of life of patients with Parkinson's disease**

*S. Lukmonov, D. Tolibov, A. Sobirov, F. Yunusov, K. Abdukhalimova, D. Jamilov, R. Agzamov, S. Tursunov (Tashkent, Uzbekistan)*

**Objective:** Purpose of investigation was to study the effect of motor disorders to quality of life of patients with Parkinson's disease.

**Background:** In recent years, developed various methods for study of quality of patient's life. However, the factors that influence its formation are associated with both the disease itself, and with the personality characteristics of the patient, remain poorly understood.

**Methods:** Examined 24 patients with Parkinson's disease (PD) at the age from 43 to 70 years (mean age  $63,1 \pm 7,2$  years) and 15 patients with essential tremor (ET) at the age from 45 to 72 years (mean age  $64,2 \pm 10,9$  years). Quality of life have conducted using scales of merit rating of life in PD (Boer et al., 1996).

**Results:** The main symptoms of the disease in patients with PD were hypokinesia and rigidity, which occurred in all patients, as well as resting tremor (observed in 87,5% of patients) and postural instability (8,3%). The results of merit rating of life correlated with data of evidence of hypokinesia ( $p < 0,05$ ), but not correlated with age, duration of disease and evidence of the tremor. In 33,3% of patients with ET celebrated isolated tremor of the hands, in 40% of patients involved tremor hands and head, at 26,7% the process spread to the vocal cords, lips and jaw. Unlike, in patients with ET quality of life correlated with the age of patients, duration of the disease and evidence of tremor ( $p < 0,005$ ).

**Conclusions:** The quality of life of patients with PD depends primarily on the evidence of postural instability, rigidity and hypokinesia, but does not correlate with disease duration and age.

## 515

### **Group meetings for newly diagnosed Parkinson's disease patients and their spouses: A preliminary experience**

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**Objective:** To estimate the contribution of a group meeting for newly diagnosed PD patients and their spouses.

**Background:** Parkinson's disease (PD) is a common neurodegenerative disease that is highly stigmatized. The period following diagnosis is inevitably an emotional one for the patient and family which may lead to lack of motivation and poor compliance. Knowledge about various aspects of PD and sharing personal experiences related to PD were proposed to enable better quality of life and coping. In a single 3-hour group meeting, PD patients, all diagnosed within the past year, and their spouses were introduced to the clinical service of our movement disorders unit. The meetings were led by the service's multidisciplinary team, comprised of neurologists, a psychiatrist, a nurse, a speech therapist a social worker (SW) and included 3 parts. Initially, a question was referred to all the participants: "with whom did you share the diagnosis?" followed by an activity with interactive cards "Cope" that aimed to create an emotional bonding by sharing each participant's feeling with the rest of the group members. Finally, the patients and their spouses referred informative questions to the team members.

**Methods:** A retrospective study, based on a structured telephone survey performed by the SW.

difficulty (PIGD) group. Resting-state functional magnetic resonance imaging data was obtained from each subject. The bilateral STN was chosen as the region of interest to calculate the functional connectivity in a voxel-wise manner. ANOVA and post hoc analyses were performed to examine the difference in STN functional connectivity among TD, PIGD and HC groups. Correlation analysis between the tremor/PIGD scores and STN functional connectivity was carried out in all PD patients.

**Results:** Compared with the controls and PIGD patients, the TD patients had higher functional connectivity between the bilateral STN and the left cerebellar lobe. However, the PIGD patients showed higher functional connectivity between the bilateral STN and the bilateral middle occipital lobes when compared to the HC and TD groups. There was positive correlation between the STN functional connectivity with bilateral cerebellar lobes and the tremor score in all PD patients. And the STN functional connectivity with bilateral occipital lobes showed positive correlation with the PIGD score.

**Conclusions:** PD subtypes have distinguished STN functional connectivity, which may explain different DBS response in PD phenotypes. Increased coupling between the STN and cerebellum may underlie neural substrate of PD tremor while impaired coupling between the STN and putamen may be related with gait and posture disturbance of PD.

## 1207

### **Pronounced beta oscillations are a characteristic of the cortico-basal ganglia loop of subacute and chronic animal models of Parkinson's disease**

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**Objective:** To compare the power spectral densities of local field potentials recorded from the cortico-basal ganglia loop of a subacute (reserpine) and a chronic (6-OHDA) animal model of Parkinson's disease.

**Background:** Pathologically enhanced beta-oscillations have been found in deep brain recordings from human DBS-patients and in chronic animal models of PD. Recent correlative evidence suggests that beta-oscillations may play a pivotal role in the generation of the disease symptoms akinesia and rigidity. It is not known so far, if beta oscillations can also be found in the subacute reserpine model of Parkinson's disease.

**Methods:** Two animal models of PD, the reserpine and the 6-OHDA model, were compared with controls. In the 6-OHDA group we injected 8 µg of the neurotoxin unilaterally into the medial forebrain bundle of n=10 wistar rats. Recordings were made 20-30 days following the lesion. Reserpine (3mg/kg i. p.) was given 18 hours before the start of the experiment in n=9 rats. As healthy controls we used n=9 rats. We performed simultaneous recordings of LFPs from the primary motor cortex (M1), subthalamic nucleus (STN) and substantia nigra pars reticulata (SNr) under urethane anaesthesia. We calculated power spectral densities and coherences using custom written Spike 2 scripts.

**Results:** Significantly enhanced beta synchronization could be detected in the power spectral densities of the STN and the SNr of both animal models compared to healthy controls. However, the peak frequency differed substantially between the two groups (6-OHDA: STN-17Hz, SNR-15Hz; reserpine: STN-27Hz, SNR-28Hz). In the 6-OHDA group a beta peak was also found in M1 at 18Hz, which was not detected in the cortex of rats treated with reserpine. Beta coherences between the M1 and the STN/Snr were also elevated in both models, again with peaks at 18Hz for the 6-OHDA group and 28Hz for the reserpine group.

**Conclusions:** Our data show that enhanced beta-oscillations are a prominent feature of the pathophysiology in the cortico-basal ganglia of the reserpine and the 6-OHDA model of PD. The role of the different beta peak frequencies has to be further investigated.

## 1208

### **Comparative analysis of clinical and neuroimaging features of Parkinsonism and dementia of Alzheimer's type**

*D. Tolibov, G. Rakhimbaeva (Tashkent, Uzbekistan)*

**Objective:** Explore the features of cognitive disorders and neuroimaging features of Parkinson's disease (PD) and Alzheimer's disease (AD) in the comparative aspect.

**Methods:** Study 64 patients with cognitive impairment, including 32 patients with PD (mean age 62,8±9,6 years) and 32 patients with AD (mean age 64,1±8,2 years). Assessment of cognitive function carried out using the MMSE and Frontal Assessment Battery (FAB). Study of the patients also applied neuroimaging (MRI) study.

**Results:** In 11 patients with PD and in all patients with AD diagnosed dementia. The most prominent cognitive deficits observed in patients with AD - an average score of MMSE  $19,8 \pm 2,3$ , according to FAB  $13,8 \pm 1,6$ ; in the group with PD - an average score of MMSE  $25,2 \pm 2,6$ , according to FAB  $10,2 \pm 1,9$ . Dementia of PD accompanied by an increase of neural disorders, however, come to the fore violation praxis, gnosis, and worsening dysfunction frontal regions. In the group with AD patients with more severe dementia were significantly more severe violations of praxis and gnosis, and neuropsychological symptoms of dysfunction of the temporal divisions and diffuse cortical lesion. PD noted a positive correlation between the aggravation of cognitive disorders and severity of internal cerebral atrophy, and representation leukoaraiosis on imaging studies. There were no significant differences between patients with relatively mild and more severe dementia in Alzheimer's disease and neuroimaging parameters.

**Conclusions:** Changes of the symptoms correlated with cognitive and neuroimaging features in PD and AD.

## 1209

### **Resting state functional connectivity in olfactory network in de novo Parkinson's disease**

*S. Marino, L. Bonanno, F. Caminiti, F. Corallo, V. Lo Buono, S. De Salvo, G. Di Lorenzo, P. Bramanti (Messina, Italy)*

**Objective:** To assess the pattern of RS functional connectivity in PD patients, related to olfactory psychometric test, to elucidate olfactory-dependent cortical-subcortical functional networks.

**Background:** Olfactory dysfunction is a salient non-motor feature of PD. It manifests years before the development of Parkinsonian motor symptoms. Using resting state fMRI in PD patients, previous studies showed altered neuronal activity in the amygdaloid complex and hippocampal formation during olfactory stimulation. In this study, we argue that olfactory performances could influence the functional connectivity within key brain areas of PD patients.

**Methods:** We enrolled 12 de novo drug-naïve PD patients (6 males and 6 females, mean age:  $58.4 \pm 4.2$  years, H&Y 1.5, UPDRS median motor subscore 26, MMSE 27, BDI 15) and 10 age-matched normal controls (NC) None of the patients took anti-Parkinsonian drugs, as Levo-Dopa or dopaminoagonists, and antidepressive treatments. Olfactory function was studied by using the Sniffin Sticks Test. MRI study was performed with a 3T MRI scanner. Standard image data preparation, normalization and preprocessing and statistical analysis and visualization were performed with the Brain Voyager QX software.

**Results:** PD patients were hyposmic as indicated by mean scores of TDI (20.2). NC were normosmic (mean score: 37.3) ( $P < 0.05$ ). At MRI examination, all subjects did not present structural abnormalities, also in olfactory areas. Caudate was defined, as ROI, to study olfactory-dependent RS functional networks in PD patients. The PD patients showed increased positive striato-cortical connectivity in the left frontal areas and decreased connectivity in the right occipital area. The cortical functional connectivity with the caudate was negatively correlated with the TDI scores in the bilateral frontal areas, left occipital area and precuneus. There were no significant clusters were the TDI scores positively correlated with cortical functional connectivity with the caudate.

**Conclusions:** This study showed that the patterns of RS functional connectivity differ according to olfactory performance in de novo and drug-naïve PD patients and NC. A correlation analysis revealed that olfactory performance was negatively associated with cortical connectivity with the caudate. These data suggest that RS functional connectivity should be closely correlated with the level of olfactory performance in de novo PD patients.

## 1210

### **A cognitive fMRI study of non-manifesting LRRK2 and GBA carriers**

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**Objective:** To assess the cognitive profile of non-manifesting carriers of GBA and LRRK2 mutations using two fMRI tasks: a Stroop interference and N-Back working memory task.

**Background:** Mutations in the GBA and LRRK2 genes account for 1/3 of the prevalence of Parkinson's disease (PD) in Ashkenazi Jews. Non-manifesting carriers (NMC) of these mutations represent a population at risk for future development of PD. High rates of cognitive impairment have been documented in PD patients with up to a quarter of patients demonstrating cognitive impairments at diagnosis. While

**Objective:** With this study we aimed to prospectively evaluate the development of cognitive performance in individuals with persistent Mild Parkinsonian Signs (MPS) compared to neurologically healthy controls.

**Background:** MPS are common in elderly people and are associated with a wide range of severe health outcomes including dementia. So far, only two studies have demonstrated an association between the presence of MPS in non-demented elders and the development of incident dementia during follow-up.

**Methods:** Out of the TREND study, four hundred and eighty at baseline neurologically healthy elderly people, aged between 50 and 80 years, with complete follow-up data for 3 assessments in 43.8 months, were included in this analysis. Participants underwent a detailed cognitive test battery, evaluation of prodromal markers for neurodegeneration and history of vascular diseases at each study visit. In addition we analysed plasma levels of abeta40 and abeta42 longitudinally.

**Results:** Out of 480 participants 52 (11%) had persistent MPS. These individuals had reduced cognitive performance (test results) compared to controls at each timepoint of the study. Further, their cognitive test results deteriorated during the follow-up period. In addition, their levels of plasma Amyloid-beta1-42 were reduced and declined over time.

**Conclusions:** This study shows that there is an association of motor deficits, associated with basal ganglia dysfunction, and cognitive decline as a possible sign for a common neurodegenerative process.

### 1333

#### **Correlation between neuro-behavioral symptoms, cognition and gait in patients with dementia with Lewy bodies (DLB)**

*B. Tousi, L. Mourany (Cleveland, OH, USA)*

**Objective:** To determine the prevalence of neurobehavioral disturbances and their relationship to gait and cognitive impairment in DLB.

**Background:** The recent literature has conceptualized that anxiety has a direct negative effect on balance in the elderly. This cross sectional study is to ascertain whether there is a similar correlation between neurobehavioral symptoms and gait.

**Methods:** We studied 73 patients who came for initial evaluation at our memory clinic and had been diagnosed as probable DLB. We collected the data from the notes at the initial visit: visual hallucinations (77%), anti-depressant therapy (40%), anxiety (29%) and Gait disturbance or parkinsonism (85%), Tremor (50%), History of falls (47%), and orthostatic hypotension (22%). We assessed the correlation between these symptoms and also cognitive deficit.

**Results:** The mean age at initial visit was 73.2+/- 7.3 with the disease duration of 3.6+/-2.4. The mean MOCA score at initial visit was 15.5 +/- 5.7. The patients with anxiety symptoms reported more falls ( $\rho = .0330$ ,  $p=.005$ ). However, we did not find any correlation between falls and treatment with antidepressants. There was statistically significant association between gait disturbance and both visual hallucinations ( $\rho = .0402$ ,  $p=.000$ ) and orthostatic hypotension ( $\rho = - 0.0342$ ,  $p=.005$ ). There was no significant correlation between MoCA variables and non-motor symptoms. There was a weak correlation between current treatment with anti-depressant and better delayed free recall. There was a statistically significant but clinically weak inverse correlation between anxiety symptoms and delayed cued recall. There was no significant correlation between MOCA variables and falls.

**Conclusions:** Our findings emphasize that there is a direct correlation between anxiety and falls. That was similar to report from studies of cognitively intact elderly, which noted as people who are anxious, do less, and that leads to deconditioning and increased risk of falls. The direct correlation between visual hallucinations and gait disturbance suggests that visual hallucinations contributes to patients disability through its influences on locomotion. We also hypothesized that the presence of comorbid anxiety may, in part, account for the worse performance in delayed cued recall and overall contribute to the variability in memory performance among patients with DLB.

### 1334

#### **Depressive disorders in Parkinson's disease and Alzheimer's disease**

*D. Tolibov, G. Rakhimbaeva (Tashkent, Uzbekistan)*

**Objective:** Our primary aim was to study of the clinical characteristics of DD in patients with AD and PD.

**Background:** The problem of a combination of depression and dementia, in particular due to Alzheimer's disease (AD) and Parkinson's disease (PD), has attracted the attention of specialists in the field of neurology. Study of depressive disorders (DD) is great interest depressive disorder, both in terms of

influence on the development of dementia, depression, and in the aspect of interaction between the depression and over the neurodegenerative process.

**Methods:** Examined 44 patients with PD (mean age 67,2±2,4 years) and 38 patients with AD (mean age 69,3±2,6 years). The main methods of investigation were Mini Mental State Examination (MMSE) and Hamilton Psychiatry Rating Scale for Depression (HDRS-17).

**Results:** The study is shown data on the MMSE - 15,8±2,3 in AD and 23,1±2,6 in PD. The most commonly in patients with AD met anxiety depression (7,9%), apathetic depression (36,8%), and depression with delusions (10,6%),hypochondriacal depression (26,3%) and the dreary depression (18,4 %). In assessing the scale of the Hamilton found 9,2±1,4 at AD. The most commonly in patients with PD met anxiety depression (31,8%), apathetic depression (29,5%), and depression with delusions (18,2%),hypochondriacal depression (11,4%) and the dreary depression (9,1 %). In assessing the scale of the Hamilton found 20,8±1,1 in PD.

**Conclusions:** Patients with presenile AD were more characteristic of apathetic melancholy and depression, and patients with senile type AD - hypochondriacal depression and depression with delusions. The most pronounced rates of depression were observed in the group with PD. All patients with PD had a depressive disorder, mostly apathetic and hypochondriacal depression.

### 1335

#### **Presenting symptoms and cognitive profile in Lewy body dementia: A series of cases**

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**Objective:** The study aim is to outline the Lewy body dementia (DLB) phenotypes as presenting symptoms and its correlation with cognitive profiles and clinical evolution of disease.

**Background:** DLB is the second most common cause of dementia in the elderly. DLB is clinically and pathologically related to Parkinson's disease (PD) and PD dementia, and the three disorders can be viewed as existing on a spectrum of Lewy body disease. Sleep disturbances as REM and NREM parasomnia are mostly represented in early DLB as in advanced phases of disease. The pattern of neuropsychological deficits seen in DLB is different to those of Alzheimer disease, with less marked memory impairment and more severe impairments of visuo-spatial, attentional and frontal-executive functions.

**Methods:** Seventy- one out patients with DLB have been collected from 2011 since 2014 among patients referring to the Parkinson's disease and Movement Disorders Unit, Sleep Medicine Unit and Alzheimer Unit at the IRCCS C. Mondino National Institute of Neurology Foundation in Pavia, Italy. All the patients underwent to neurological and neuropsychological assessment.

**Results:** We divided the patients in three groups on the basis of presenting symptoms: twenty-four patients referred psychiatric/behavioural symptoms (that include REM behaviour disorders, confusional arousal, visual hallucinations, delirium and depression) as presenting symptom (group 1- G1); thirty-five patients referred Parkinsonism (group 2-G2); twelve patients referred cognitive impairment (group 3- G3). The three groups differed in impairment of amnesic domain : 40% of G1 patients show amnesic impairment, 41% in G2 and 66% in G3. The G3 patients show a shorter disease duration than G1 and G2 patients .

**Conclusions:** The presenting features of DLB can be broadly placed in three categories: psychiatric/behavioural symptoms, Parkinsonism and cognitive impairment. The presenting symptoms don't configure a different phenotype of disease. The patient that initially present cognitive impairment have earlier diagnosis and show, at the moment of diagnosis, more cognitive impairment in amnesic domain than the patients that initially present with non cognitive symptoms.

### 1336

**Withdrawn by Author**

### 1337

#### **Heart rate variability to differentiate dementia with Lewy bodies from Alzheimer's disease in patients with mild cognitive impairment**

*J. Yoon, S.M. Lee, J.M. Hong (Suwon, Korea)*

**Objective:** We aimed to determine whether heart rate variability (HRV) can aid in the differentiation of DLB from AD at the MCI stage.

impairment on at least one of the following subtests: Logical Memory, Verbal Learning, and Design Memory. Impairment of storage and a greater impairment of memory retrieval were observed. Nine had impairment of semantic fluency and twelve on cognitive flexibility. Three patients had impairment of planning, monitoring, self-regulation and problem-solving. Six patients had depression on HAM-D test. All patients had affectation of at least one domain of cognition or affect. There was relative sparing of abstract reasoning, confrontation naming and response inhibition. Associations between the severity of impairments and either a poor educational background, unemployment, or age were not observed.

**Conclusions:** The observed impairment of executive functions, memory storage and retrieval, learning and affect suggest the involvement of the frontal lobes, frontal subcortical areas and limbic lobe, consistent with the postulated corticostriatolimbic dysfunction. There is a need to screen XDP patients for cognitive impairments with a tool that can easily be used bedside or in the clinic.

### 1353

#### **Modeling dementia with Lewy bodies using patient-derived neurons**

*D.H. Adamowicz, J. Mertens, D.P. Salmon, D.R. Galasko, S. Roy, F.H. Gage (La Jolla, CA, USA)*

**Objective:** To model Dementia with Lewy bodies (DLB) using neurons derived from patients clinically diagnosed with the disease.

**Background:** A major challenge in neurodegenerative disease research has been the unavailability of living, diseased neurons. This barrier was recently overcome by using fibroblasts from living patients and reprogramming them into neurons via induced pluripotent stem cells (iPSCs) that can be directed towards a neural fate, or directly as induced neurons (iNs), bypassing the stem cell stage. Direct reprogramming is both time-advantageous and has been shown to preserve epigenetic marks resulting from aging, a particularly useful feature in terms of modeling age-related diseases. While the related Parkinson's and Alzheimer's diseases have been studied using this methodology, DLB has received less attention.

**Methods:** We have obtained fibroblasts from five clinically diagnosed DLB patients through the UCSD Shiley-Marcos Alzheimer's Disease Research Center (ADRC). We also have fibroblasts from two unaffected first-degree relatives to use as genetic controls, and three unrelated, non-demented age-matched controls. The reprogramming procedures were conducted based on existing methods, and derived neurons were matured for several weeks, some in co-culture with astrocytes.

**Results:** We have successfully reprogrammed DLB patient fibroblasts to iPSCs and iNs. The neurons we generated display many neuronal features, including the expression of neuronal markers, as verified by immunohistochemistry. We have done RNA-sequencing to examine differential gene expression between patient lines and controls, and are now optimizing functional assays based on these findings.

**Conclusions:** As evidenced by our preliminary results, we suspect the iPSC/iN approach to be promising in the context of DLB, in order to further our understanding of the mechanisms underlying the disease.

### 1354

#### **Analysis of cognitive disorders of Parkinson's disease (PD) in the comparative aspect**

*S. Lukmonov, D. Tolibov, A. Sobirov, F. Yunusov, D. Jalilov, K. Abdukhalimova, A. Kalendarev (Tashkent, Uzbekistan)*

**Objective:** Purpose of investigation was to conduct a comparative assessment of cognitive impairment in Parkinson's disease.

**Background:** According to modern concepts, Parkinsonism - is not only a movement disorders. This symptoms also always accompanied by pathological changes by the higher brain functions, emotional sphere, other neurological systems.

**Methods:** Examined 31 patients with Parkinson's disease (mean age  $67,2 \pm 1,1$  years) and 15 healthy persons (mean age  $63,9 \pm 2,4$  years). For assess of cognitive sphere used MMSE scale. In all patients with PD were conducted neuroimaging studies of the brain, which showed no changes indicative of vascular genesis of Parkinson's syndrome.

**Results:** Examination of PD patients with MMSE cognitive disorders revealed in 87,1% of patients, 45,2% of them - mild cognitive impairment, 41,9% of them - dementia. Assistance correlation analysis had conducted to study the factors affecting the development of cognitive impairment in patients with Parkinson's disease. It had shown that the severity of cognitive impairment irrespective of age and gender of patients with PD. The dependence of the value of total score on the MMSE form PD: tremor-rigid ( $23,2 \pm 0,8$ ), rigidly - tremor ( $26,7 \pm 0,5$ ) and akinetic form ( $13,0 \pm 5,4$ ). Found an inverse correlation between

the duration of disease and the value of the total score on a scale MMSE. The higher level of education in patients with PD was associated with less severe cognitive impairment by MMSE.

**Conclusions:** The value of the total score from the MMSE, which characterizes cognitive function, depends on the duration, form of the disease, the level of education of patients.

### 1355

#### **Memory compensation strategies in patients with Parkinson's disease**

*C.C. Walton, J.Y.Y. Szeto, L. Mowszowski, S.J.G. Lewis, S.L. Naismith (Sydney, Australia)*

**Objective:** To investigate the use of memory compensation strategies in Parkinson's disease.

**Background:** Difficulty with memory is a particular cause of complaint in patients with Parkinson's disease (PD) and is a predictor of subsequent cognitive decline. Cognitive training is now a more commonly investigated nonpharmacological technique for alleviating cognitive deficits in PD. However, little is known about how patients independently recruit memory compensation strategies (MCS) in their daily lives. The current study aimed to investigate how commonly strategies are employed, and what predicts their use.

**Methods:** Patients were recruited through the PD Research Clinic at the University of Sydney. The Memory Compensations Questionnaire (MCQ) was used to measure strategy use. The 45-item questionnaire leads to scores in five scales representing strategy use: 'Internal' (use of internal strategies), 'External' (use of external strategies), 'Recruitment' (reliance on other people), 'Effort' (investment of effort into memory tasks) and 'Time' (investment of time into memory tasks). There are an additional two scales assessing compensation beliefs: 'Change' (observation of memory change in last 5-10 years) and 'Success' (commitment to high level of memory performance). Other typical clinical measures were obtained during the clinic assessment. We built three multiple regression models to predict external and internal strategy use, along with recruitment. All clinical variables which were significantly correlated with these MCS were entered at once into the respective model.

**Results:** Data for 81 patients was obtained. The sample was relatively high functioning. Patients prioritized external strategies above internal, and relied on friends and family least. Time, effort, change, and gender significantly accounted for 22.6% of the variance in external strategy use ( $F_{76,4} = 5.547, p < .001$ ). Time, effort, success, change and depression scores significantly accounted for 54.6% of the variance in internal strategy use ( $F_{72,5} = 5.547, p < .001$ ). Time, effort, success, change, gender, depression and memory scores accounted for 36.6% of the variance in external strategy use ( $F_{69,8} = 4.983, p < .001$ ).

**Conclusions:** Preliminary data suggests MCS are used by non-demented patients with PD, although guidance may be needed in remediation programs, to increase internal strategy use. Future research is needed to investigate MCS in a more impaired sample.

### 1356

#### **Levodopa impairs learning in healthy young adults: Implications for Parkinson's disease**

*P.A. MacDonald, A. Vo, K.N. Seergobin (London, ON, Canada)*

**Objective:** The objective was to investigate the effect of dopaminergic therapy on healthy young adults to test the dopamine overdose hypothesis.

**Background:** Dopaminergic therapy improves some cognitive functions and worsens others in patients with Parkinson's disease. These paradoxical effects are explained by the dopamine overdose hypothesis, which proposes that effects of dopaminergic therapy on cognitive functions is determined by the baseline dopamine levels in brain regions mediating these functions. We directly tested this hypothesis, evaluating the effects of levodopa on stimulus-reward and stimulus-response learning in healthy young adults, who have optimal baseline dopamine levels and dopamine regulation.

**Methods:** In each experiment, half of the participants were tested on 100/25 mg of levocarb whereas the other half were tested on placebo in a randomized, double-blind design. In Experiment 1, healthy participants ( $n = 26$ ) completed a probabilistic reversal learning task in which they acquired stimulus-reward relations and re-learned new associations via unexpected punishment until a total of nine reversals were achieved. Error rates provided a measure of learning efficiency. Greater errors suggested poorer learning. In Experiment 2, healthy adults ( $n = 40$ ) performed a stimulus-response learning task. Participants learned to associate different abstract stimuli to specific key-press responses through trial-and-error via feedback. Blocks of stimulus-response trials were performed until participants reached at 75% criterion to ensure sufficient learning. Mean improvement scores describing the rate at which stimulus-response