

# Parkinson's Disease Current Awareness Bulletin

September 2018

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**Title: Being in control of Parkinson's disease: A qualitative study of community-dwelling patients' coping with changes in care.**

**Citation:** European Journal of General Practice; Dec 2018; vol. 24 (no. 1); p. 138-145

**Author(s):** Plouvier, Annette O A; Olde Hartman, Tim C; van Litsenburg, Anne; Bloem, Bastiaan R; van Weel, Chris; Lagro-Janssen, Antoine L M

**Background:** Chronically ill patients have to cope with transfers in the level or setting of care. Patients with prevalent disorders such as diabetes mellitus can be supported by their general practitioner (GP) when experiencing such care changes, as the GP already offers them disease-specific care. For community-dwelling patients with low-prevalent diseases such as Parkinson's disease (PD) - for which disease-specific care is provided by medical specialists - tailoring support to handle care changes requires more insight into patients' coping. Objectives: To explore PD patients' coping with care changes.

**Methods:** A qualitative interview study was performed in 2013-2015 with a purposive sample of 16 community-dwelling PD patients in the Netherlands. A research assistant visited patients every month to explore if they had experienced a care change. If so, patients were interviewed face-to-face. An inductive approach to comparative content analysis was used.

**Results:** Patients encountered a variety of care changes such as changes in the level of unpaid care, the purchase of tools, modification of pharmacotherapy or admission to hospital. Being able to anticipate, initiate and independently handle care changes contributes to patients' sense of control and acceptance of the post-change situation. Patients, who commenced care changes themselves, had more realistic expectations of it.

**Conclusion:** Community-dwelling PD patients seem to be able to cope with the care changes they face. Offering education to facilitate their anticipation and initiation of changes in care and their ability to act independently, can contribute to patients' wellbeing. GPs can play a role in this.

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**Title: Crossing Virtual Doors: A New Method to Study Gait Impairments and Freezing of Gait in Parkinson's Disease.**

**Citation:** Parkinson's Disease (20420080); Aug 2018 ; p. 1-8

**Author(s):** Gómez-Jordana, Luis I.; Stafford, James; Peper, C. (Lieke) E.; Craig, Cathy M.

**Abstract:** Studying freezing of gait (FOG) in the lab has proven problematic. This has primarily been due to the difficulty in designing experimental setups that maintain high levels of ecological validity whilst also permitting sufficient levels of experimental control. To help overcome these challenges, we have developed a virtual reality (VR) environment with virtual doorways, a situation known to illicit FOG in real life. To examine the validity of this VR environment, an experiment was conducted, and the results were compared to a previous "real-world" experiment. A group of healthy controls (N = 10) and a group of idiopathic Parkinson disease (PD) patients without any FOG episodes (N = 6) and with a history of freezing (PD-f, N = 4) walked under three different virtual conditions (no door, narrow doorway (100% of shoulder width) and standard doorway (125% of shoulder width)). The results were similar to those obtained in the real-world setting. Virtual doorways reduced step length and velocity while increasing general gait variability. The PD-f group always walked slower, with a smaller step length, and showed the largest increases in gait variability. The narrow doorway induced FOG in 66% of the trials, while the standard doorway caused FOG in 29% of the trials. Our results closely mirrored those obtained with

real doors. In short, this methodology provides a safe, personalized yet adequately controlled means to examine FOG in Parkinson's patients, along with possible interventions.

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**Title: Gait alterations on irregular surface in people with Parkinson's disease.**

**Citation:** Clinical Biomechanics; Aug 2018; vol. 57 ; p. 93-98

**Author(s):** Xu, Hang; Hunt, MaryEllen; Bo Foreman, K.; Zhao, Jie; Merryweather, Andrew

**Background:** Persons with Parkinson's disease are at high risk for fall-related injuries with a large proportion of falls occurring while walking, especially when the walking environments are complex. The aim of this study was to characterize gait parameters on irregular surface for persons with Parkinson's disease.

**Methods:** Three-dimensional gait analysis was conducted for nine persons with Parkinson's disease and nine healthy age-matched adults on both regular and irregular surfaces. Repeated ANOVA and paired t -test were performed to determine the effect of surface and group for spatiotemporal, kinematic and stability variables.

**Findings:** Individuals with Parkinson's disease showed a larger ratio of reduction for speed, cadence and step length than controls when the surface changed from regular to irregular. The ankle transverse range of motion and root mean square of trunk acceleration increased on irregular surface for both groups. Additionally, individuals with Parkinson's disease demonstrated a decreased knee sagittal range of motion and trunk frontal and transverse range of motion compared with controls, especially on the irregular surface. Interpretation The irregular surface posed a greater challenge to maintain balance and stability for individuals with Parkinson's disease. A relatively small knee range of motion in the sagittal plane and large root mean square of trunk acceleration increased the potential fall risk for individuals with Parkinson's disease. This information improves the understanding of parkinsonian gait adaptations on irregular surfaces and may guide gait training and rehabilitation interventions for this high fall-risk population.

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**Title: Quantitative assessment of upper limb functional impairments in people with Parkinson's disease.**

**Citation:** Clinical Biomechanics; Aug 2018; vol. 57 ; p. 137-143

**Author(s):** Corona, Federica; Pilloni, Giuseppina; Arippa, Federico; Porta, Micaela; Casula, Carlo; Cossu, Giovanni; Pau, Massimiliano

**Background:** In clinical routine, upper limb motor disorders of people with Parkinson's disease are commonly assessed using scale- or timed tests, but such tools are not fully suitable for providing detailed information about their type and magnitude. To partly overcome these limitations, the present study aims to quantitatively investigate upper limb functional impairments through quantitative analysis of the "hand-to-mouth" task.

**Methods:** Twenty-five individuals with Parkinson's disease and 20 age-matched healthy individuals underwent a kinematic analysis of the hand-to-mouth task from which spatio-temporal and kinematic measures, including summary measures (Arm Variable Score and Arm Profile Score), were calculated and correlated with clinical scores (Hoehn & Yahr, H&Y and the Unified Parkinson Disease Rating Scale, UPDRS).

**Findings:** The "hand-to-mouth" movement is significantly altered in individuals with Parkinson's disease, especially in terms of reduced velocity, reduced range of motion of elbow flexion-extension and deviation from a physiologic pattern (Arm Profile Score 12.8° vs.

10.1° of unaffected,  $P = 0.002$ ). Significant moderate correlations were found between movement duration and UPDRS-III ( $\rho = 0.478$ ,  $P = 0.001$ ) and between the Arm Profile Score and H&Y ( $\rho = 0.481$ ,  $P = 0.024$ ) and UPDRS-III ( $\rho = 0.326$ ,  $P = 0.001$ ).

**Interpretation:** On the basis of such findings, we can state that the kinematic analysis of "hand-to-mouth" movement, and in particular the summary indexes, are suitable for easily representing upper limb movement alterations in people with Parkinson's disease, thus allowing the monitoring either of disease progression or effectiveness of pharmacologic and rehabilitative treatments.

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**Title: Estimating the Evolution of Disease in the Parkinson's Progression Markers Initiative.**

**Citation:** Neuro-degenerative diseases; Aug 2018; vol. 18 (no. 4); p. 173-190

**Author(s):** Iddi, Samuel; Li, Dan; Aisen, Paul S; Rafii, Michael S; Litvan, Irene; Thompson, Wesley K; Donohue, Michael C

**Abstract:** Parkinson's disease is the second most common neurological disease and affects about 1% of persons over the age of 60 years. Due to the lack of approved surrogate markers, confirmation of the disease still requires postmortem examination. Identifying and validating biomarkers are essential steps toward improving clinical diagnosis and accelerating the search for therapeutic drugs to ameliorate disease symptoms. Until recently, statistical analysis of multicohort longitudinal studies of neurodegenerative diseases has usually been restricted to a single analysis per outcome with simple comparisons between diagnostic groups. However, an important methodological consideration is to allow the modeling framework to handle multiple outcomes simultaneously and consider the transitions between diagnostic groups. This enables researchers to monitor multiple trajectories, correctly account for the correlation among biomarkers, and assess how these associations may jointly change over the long-term course of disease. In this study, we apply a latent time joint mixed-effects model to study biomarker progression and disease dynamics in the Parkinson's Progression Markers Initiative (PPMI) and examine which markers might be most informative in the earliest phases of disease. The results reveal that, even though diagnostic category was not included in the model, it seems to accurately reflect the temporal ordering of the disease state consistent with diagnosis categorization at baseline. In addition, results indicated that the specific binding ratio on striatum and the total Unified Parkinson's Disease Rating Scale (UPDRS) show high discriminability between disease stages. An extended latent time joint mixed-effects model with heterogeneous latent time variance also showed improvement in model fit in a simulation study and when applied to real data.

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**Title: Deep brain stimulation improves restless legs syndrome in patients with Parkinson disease.**

**Citation:** Neurology; Aug 2018

**Author(s):** Klepitskaya, Olga; Liu, Ying; Sharma, Saloni; Sillau, Stefan H; Tsai, Jean; Walters, Arthur S

**Objective:** To study the effect of subthalamic nucleus (STN) deep brain stimulation (DBS) in patients with Parkinson disease (PD) and moderate to severe restless legs syndrome (RLS) on their RLS symptoms.

**Methods:** Patients undergoing STN DBS surgery for PD completed the International RLS Study Group Rating Scale (IRLS) and RLS Quality of Life (QoL) questionnaires preoperatively and postoperatively at 6 months, 1 year, and 2 years. The primary outcome measure was IRLS sum score and subscales (severity and impact) and the secondary measure was RLS QoL scores. Differences among the mean scores over time were analyzed using mixed model regression.

**Results:** Twenty-two patients were enrolled. The preoperative IRLS sum scores were  $19.59 \pm 6.95$ , severity subscale  $12.91 \pm 4.33$ , impact subscale  $4.45 \pm 2.72$ , and transformed RLS QoL score  $68.30 \pm 20.26$ . The differences between preoperative and averaged postoperative scores were IRLS sum score  $-7.80$ , severity subscale  $-5.50$ , impact subscale  $-1.20$ , and RLS QoL  $4.73$ . The overall F tests demonstrated differences among the times for the means of the IRLS sum and subscales:  $p < 0.05$ . There were no correlations between RLS symptoms improvement and PD motor symptoms improvement or reduction in PD medications. Half of the patients had at least 50% improvement and 27% had resolution of their RLS symptoms (IRLS = 0).

**Conclusions:** STN DBS significantly decreased RLS symptoms in patients with PD despite a decrease in dopaminergic treatment. This improvement was sustained over a 2-year period.

**Classification of Evidence:** This study provides Class IV evidence that for patients with PD and moderate to severe RLS, STN DBS improves RLS symptoms.

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**Title: Effectiveness of robot-assisted gait training on motor impairments in people with Parkinson's disease: a systematic review and meta-analysis.**

**Citation:** International journal of rehabilitation research. Internationale Zeitschrift fur Rehabilitationsforschung. Revue internationale de recherches de readaptation; Aug 2018

**Author(s):** Alwardat, Mohammad; Etoom, Mohammad; Al Dajah, Salameh; Schirinzi, Tommaso; Di Lazzaro, Giulia; Sinibaldi Salimei, Paola; Biagio Mercuri, Nicola; Pisani, Antonio

**Abstract:** The aim of this systematic review and meta-analysis was to evaluate the effectiveness of robot-assisted gait training (RAGT) on motor impairments in people with Parkinson's disease (PD). A computer-based systematic literature search was performed in six databases according to PRISMA guidelines. Randomized controlled trials (RCTs) that assessed the effects of RAGT on motor impairments in people with PD were included. GRADE approach and PEDro scale were used to determine the studies' quality of evidence. Meta-analyses were performed by calculating the weighted mean difference (WMD) at 95% confidence interval. Seven RCTs (PEDro: 5-8) met the inclusion criteria for systematic review and meta-analyses. The meta-analysis showed significant improvement on Unified Parkinson Disease Rating Scale Part III after intervention [WMD=3.292; 95% confidence interval (CI)=1.378-5.207;  $P=0.000$ ], and after 1-month follow-up (WMD=5.512; 95% CI=2.396-8.629;  $P=0.001$ ). Stride length (WMD=9.283; 95% CI=7.153-11.414;  $P=0.00$ ) and gait speed (WMD=0.166; 95% CI=-0.090 to 0.243;  $P=0.000$ ) showed significant improvements after RAGT. Balance as measured by Berg Balance Scale was improved significantly after intervention (WMD=3.87; 95% CI=0.374-6.735;  $P=0.029$ ) and at 1-month follow-up (WMD=3.87; 95% CI=1.324-6.413;  $P=0.002$ ). The pooled analysis did not detect any significant changes regarding stride time, cadence and functional balance scales. GRADE level of evidence ranged between high and low. The RAGT showed better outcomes than conventional interventions on some motor aspects in PD. However, RAGT did not seem superior to control interventions. Further RCTs that examine the effect of RAGT on more specific outcomes and at different medication statuses are required.

**Title: The impact of LSVT BIG therapy on postural control for individuals with Parkinson disease: A case series.**

**Citation:** Physiotherapy theory and practice; Aug 2018 ; p. 1-9

**Author(s):** Fishel, Sarah C; Hotchkiss, Megan E; Brown, Samantha A

**Background and Purpose:** LSVT BIG therapy may improve motor function and gait in those with early Parkinson disease (PD), but its impact on postural control for those with moderate PD has not been investigated. The purpose of this case series is to describe the impact of LSVT BIG therapy on postural control and gait in three individuals with moderate PD.

**Intervention:** Three individuals with moderate PD, classified as stage 3 on the Hoehn and Yahr Scale, participated in the LSVT BIG therapy program. Intervention included 16-18 individual physical therapy sessions, provided within 4 weeks, focused on increasing amplitude of movement and a daily home exercise program. Outcomes, including balance, gait, dual-task performance, quality of life, and balance confidence, were examined after program completion, 1- and 4-months later.

**Outcomes:** Clinically meaningful improvements in balance and gait, including performance under dual-task conditions, were achieved by all patients and many of these improvements were maintained up to 4 months later. Changes in quality of life were not observed during the length of the intervention.

**Conclusion:** LSVT BIG therapy may improve postural control, gait, and dual-task performance, and therefore reduce fall risk for individuals with moderate PD.

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**Title: "Pure apathy" and cognitive dysfunctions in Parkinson's disease: A meta-analytic study.**

**Citation:** Neuroscience and biobehavioral reviews; Aug 2018

**Author(s):** D'Iorio, Alfonsina; Maggi, Gianpaolo; Vitale, Carmine; Trojano, Luigi; Santangelo, Gabriella

**Abstract:** Parkinson's Disease (PD) is characterized by motor and non-motor symptoms such as cognitive deficit and behavioural disturbances. Apathy seems to be related to cognitive impairment, but some studies failed to confirm the relationship due to different methodological procedures across studies. A meta-analysis on 8 studies was performed to explore the cognitive correlates of apathy without depression and dementia (pure apathy). Global cognitive function, memory, executive functions, processing speed/attention/working memory, visuospatial abilities and language were the outcomes. The effect size of the relationship between "pure apathy" and reduced global cognitive functioning, executive functions, processing speed/attention/working memory, visuospatial functions, long-term verbal memory was moderate, whereas apathy was strongly associated with inhibition dysfunctioning. Our results revealed a strong association between "pure apathy" and cognitive dysfunctions, particularly deficit of memory and executive functions related to altered prefronto-subcortical circuitries.



**Title: Association between olfactory loss and cognitive deficits in Parkinson's disease.**

**Citation:** Clinical neurology and neurosurgery; Aug 2018; vol. 173 ; p. 120-123

**Author(s):** Camargo, Carlos Henrique Ferreira; Jobbins, Vinícius Aguiar; Serpa, Rafael Arthur; Berbetz, Frederico Antônio; Sabatini, Jivago Szpoganicz; Teive, Hélio Afonso Ghizoni

**Objective:** The aim of this study was to compare the cognitive deficits and olfaction in PD patients.

**Patients and Methods:** In all, 42 PD patients and 38 controls were selected. All the individuals in both groups underwent cognitive assessment with the SCOPA-Cog neuropsychological battery and Mini-Mental State Examination (MMSE) and olfactory assessment with the Sniffin' Sticks Screening 12 Test. Parkinson's disease dementia (PDD) was diagnosed using the International Parkinson and Movement Disorder Society (MDS) criteria.

**Results:** The prevalence of olfactory dysfunction in PD patients was 95.24% (40/42). There was no statistically significant difference in olfaction when compared to patients with PDD and PD without cognitive deficits ( $5.12 \pm 3.25$  vs.  $6.71 \pm 2.63$ ,  $p = 0.115$ ). Attention [ $r = 0.35$ , 95% CI = (0.05-0.59),  $p = 0.01$ ] was the only cognitive domain correlated with olfactory loss in PD patients. There was a higher correlation among the scores of cognitive and olfactory assessments in controls,  $r=0.40$  (95% CI = [0.09-0.64],  $p = 0.007$ ), with MMSE.

**Conclusion:** The olfactory deficits prevalence in PD patients was significantly high. There may be a correlation between frontal lobe dysfunction and olfactory deficit

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**Title: Emerging and alternative therapies for Parkinson disease: an updated review.**

**Citation:** Current pharmaceutical design; Aug 2018

**Author(s):** Kabra, Atul; Sharma, Rohit; Kabra, Ruchika; Baghel, Uttam Singh

**Abstract:** Parkinson's disease (PD) is one of the most common neurodegenerative disorder with intricate progressive pathology. Currently, available conventional options for PD have certain limitations of their own, and as a result, patient compliance and satisfaction are low. Current contemporary treatment options provide only symptomatic relief with limited control to prevent disease progression, resulting in poor patient compliance and satisfaction. Several emerging pharmacotherapies for PD are in different stages of clinical development. These therapies include adenosine A2A receptor antagonists, glutamate receptor antagonists, monoamine oxidase inhibitors, anti-apoptotic agents, and antioxidants such as coenzyme Q10, N-acetyl cysteine, and edaravone. Other emerging nonpharmacotherapies include viral vector gene therapy, microRNAs, transglutaminases, RTP801, stem cells and glial-derived neurotrophic factor (GDNF). In addition, surgical procedures including deep brain stimulation, pallidotomy, thalamotomy and gamma knife surgery have emerged as alternative interventions for advanced PD patients who have completely utilized standard treatments and still suffer from persistent motor fluctuations. Complementary and Alternative medicine (CAM) modalities such as Yoga, acupuncture, Tai Chi, music therapies etc. are highly practiced in several countries, offer some of the safer and effective treatment modalities for PD. While several of these therapies hold much promise in delaying the onset of the disease and slowing its progression, more pharmacotherapies and surgical interventions need to be investigated in different stages of PD. It is hoped that these

emerging therapies and surgical procedures will strengthen our clinical armamentarium for improved treatment of PD.

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**Title: Cell-based therapy for Parkinson's disease: A journey through decades towards the light side of the Force.**

**Citation:** The European journal of neuroscience; Aug 2018

**Author(s):** Parmar, Malin; Torper, Olof; Drouin-Ouellet, Janelle

**Abstract:** This review describes the history, development and evolution of cell-based replacement therapy for Parkinson's disease (PD), from the first pioneering trials with fetal ventral midbrain progenitors to future trials using stem cells as well as reprogrammed cells. In the spirit of Tom Isaacs, the review takes parallels to the storyline of Star Wars, including the temptations from the dark side and the continuous fight for the light side of the Force. It is subdivided into headings based on the original movies, spanning from A New Hope to the Last Jedi. This article is protected by copyright. All rights reserved.

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**Title: The presence of cerebral microbleeds is associated with cognitive impairment in Parkinson's disease.**

**Citation:** Journal of the neurological sciences; Aug 2018; vol. 393 ; p. 39-44

**Author(s):** Daida, Kensuke; Tanaka, Ryota; Yamashiro, Kazuo; Ogawa, Takashi; Oyama, Genko; Nishioka, Kenya; Shimo, Yasushi; Umemura, Atsushi; Hattori, Nobutaka

**Background:** Cerebral microbleeds (CMBs) are often observed in Parkinson's disease (PD); however, their association with cognitive decline has been unclear. We performed a retrospective analysis of 124 cases of clinically diagnosed PD to determine the association between the presence of CMBs and cognitive decline.

**Results:** Of the 124 participants, 21 (16.9%) was diagnosed as PDD in this cohort. CMBs were observed significantly more frequently in the PDD than in the PD (47.6% vs 7.8%,  $P < .001$ ). The presence of both deep/infratentorial (40% vs 14.9%,  $P < .05$ ) and strictly lobar (75% vs 12.9%,  $P < .001$ ) CMBs were associated with PDD. The values of cognitive scales such as Mini-Mental State Examination and the Hasegawa Dementia Scale-revised, were also significantly lower in the presence of each type of CMB. A multivariable logistic regression analysis showed the presence of strictly lobar CMBs as well as a male gender, orthostatic hypotension, periventricular hyperintensity on magnetic resonance imaging were significantly associated with PDD in this cohort.

**Conclusions:** This study showed the presence of CMBs, especially strictly lobar type, was strongly associated with PDD. We suspect that the burden of small vessel disease and cerebral amyloid angiopathy may be related to the development of cognitive decline in PD, and a prospective study enrolling more cases is warranted.

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**Title: Importance of Balance-Gait Disorder as a Risk Factor for Cognitive Impairment, Dementia and Related Non-Motor Symptoms in Parkinson's Disease.**

**Citation:** Journal of Parkinson's disease; Aug 2018

**Author(s):** Lichter, David Gordon; Benedict, Ralph Holmes Boring; Hershey, Linda Ann



**Background:** In Parkinson's disease (PD), postural instability-gait disorder (PIGD) has been associated with more rapid cognitive decline, dementia, and greater non-motor symptom (NMS) burden.

**Objective:** To assess the importance of balance-gait disorder, relative to and in combination with other clinical measures, as a risk factor for cognitive impairment, dementia and NMS burden in PD.

**Methods:** 164 PD subjects were evaluated in a retrospective cross-sectional study using the MDS-UPDRS scale, MMSE and Clinical Dementia Rating Scale. Using univariate comparisons followed by multiple stepwise regression, we identified factors most closely associated with NMS burden and concurrent dementia. Nominal logistic regression and linear discriminant analysis was used to compute receiver operating characteristic curves and to measure sensitivity and specificity of predictors of dementia.

**Results:** Dementia was more frequent in those with the PiGD phenotype ( $\chi^2=11.49$ ,  $p=0.003$ ). The MDS-UPDRS balance-gait measure, excluding freezing of gait, was the single best predictor not only of concurrent cognitive impairment and dementia ( $F=37.16$ ,  $p<0.001$ ) but also of NMS burden, predicting 29% of the MDS-UPDRS total non-motor experiences of daily living score ( $F=67.14$ ,  $p<0.0001$ ). This measure, together with combined severity of hallucinations/psychosis, daytime sleepiness and urinary problems, a closely correlated symptom cluster ( $r=0.63$ ,  $p<0.0001$ ), accurately classified 84% of patients with dementia.

**Conclusions:** In PD, balance-gait impairment is closely associated with dementia and NMS burden, particularly the linked symptoms of cognitive impairment, psychosis, daytime sleepiness and urinary dysfunction. This phenotype identifies patients likely to require closer surveillance and more comprehensive care. Confirmation of these findings in prospective longitudinal studies might help refine predictive algorithms designed to identify PD patients more likely to progress from mild cognitive impairment to dementia.

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**Title: Everyday functioning of people with Parkinson's disease and impairments in executive function: a qualitative investigation.**

**Citation:** Disability & Rehabilitation; Oct 2018; vol. 40 (no. 20); p. 2351-2363

**Author(s):** Kudlicka, Aleksandra; Hindle, John V.; Spencer, Laura E.; Clare, Linda

**Purpose:** Executive function is the key area of cognitive impairment in Parkinson's disease. This study investigated how cognitive difficulties impact on everyday life of people with Parkinson's disease and their carers, and whether they explicitly mention executive-type difficulties.

**Methods:** Semistructured interviews with 11 people with Parkinson's disease and six carers were analyzed thematically. People with Parkinson's disease performed within the normal range on cognitive screening tests, but all had abnormal scores on tests of executive function.

**Results:** Despite relatively mild executive deficits and no global cognitive impairment, participants described executive-type difficulties as well as a range of problems in other cognitive domains, such as memory, processing speed and apathy. Cognitive difficulties had a far-reaching impact on everyday life and their significance depended on personal circumstances, such as the level of responsibilities of the person with Parkinson's disease and the extent of available support.

**Conclusions:** By presenting subjective accounts of living with Parkinson's disease and cognitive difficulties, this study improves our understanding of how the observed level of

cognitive impairment translates into everyday functioning. The study results have implications for recognizing cognitive difficulties and for planning support for people with Parkinson's disease and their families, and can help identify ways of promoting effective self-management. Implications for rehabilitation: Treatment of Parkinson's disease tends to focus on the movement disorder, meaning that cognitive difficulties and their impact can be overlooked. Participants in this study had only relatively mild executive deficits but described a range of cognitive problems, including executive-type difficulties. Cognitive difficulties have an emotional impact and can cause a range of challenges in everyday life, adding to the burden of physical symptoms of Parkinson's disease. Results of this study provide insights into how executive functions impairments translate into everyday difficulties in Parkinson's disease and have implications for planning support for people with Parkinson's disease and their families.

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**Title: Does Tai Chi improve balance and reduce falls incidence in neurological disorders? A systematic review and meta-analysis.**

**Citation:** Clinical Rehabilitation; Sep 2018; vol. 32 (no. 9); p. 1157-1168

**Author(s):** Winsler, Stanley John; Tsang, William W. N.; Krishnamurthy, Karthikeyan; Kannan, Priya

**Objective:** To evaluate the effect of Tai Chi on balance and reducing falls incidence in neurological disorders.

**Data sources:** AMED, Embase, Web of Science, SCOPUS, EBSCO and Medline from inception until February 2018.

**Review method:** Randomized controlled trials of Tai Chi compared with active or no treatment control, measuring balance with the Berg Balance Scale or the Timed Up and Go Test and number of falls in neurological disorders were included. Methodological quality was assessed using PEDro and quality of evidence using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) system.

**Results:** A total of 10 studies involving 720 participants were reviewed. Seven studies were in Parkinson's disease and three in stroke. Seven studies were of high methodological quality and three were low. Meta-analyses of balance measured with the Timed Up and Go Test in Parkinson's disease revealed a statistically significant effect of Tai Chi compared to no treatment (weighted mean difference (WMD), -2.13; 95% confidence interval (CI), -3.26 to -1.00;  $P < 0.001$ ) and was insignificant (WMD, -0.19; 95% CI, -1.74 to 1.35;  $P = 0.81$ ) when compared with active treatment. Tai Chi significantly reduced falls incidence in Parkinson's disease (odds ratio (OR), 0.47; 95% CI, 0.29 to 0.77;  $P = 0.003$ ) and stroke (OR, 0.21; 95% CI, 0.09 to 0.48;  $P < 0.001$ ). Balance measured with the Timed Up and Go Test comparing Tai Chi and active treatment was insignificant (WMD, 0.45; 95% CI, -3.43 to 2.54;  $P = 0.77$ ) in stroke. Conclusion: Tai Chi is effective in reducing falls incidence in Parkinson's disease and stroke. This systematic review did not find high-quality studies among other neurological disorders.

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**Title: Can telerehabilitation games lead to functional improvement of upper extremities in individuals with Parkinson's disease?**

**Citation:** International Journal of Rehabilitation Research; Sep 2018; vol. 41 (no. 3); p. 230-238

**Author(s):** Cikajlo, Imre; Hukić, Alma; Dolinšek, Irena; Zajc, Dejana; Vesel, Mateja; Krizmanič, Tatjana; Blažica, Bojan; Biasizzo, Anton; Novak, Franc; Peterlin Potisk, Karmen

**Abstract:** Parkinson's disease (PD) is treated by medication, less with deep brain stimulation and physiotherapy. Different opinions on the clinical meaningfulness of the physiotherapy or recommended intensive physiotherapy were found. Our objectives were to design intensive target-based physiotherapy for upper extremities suitable for telerehabilitation services and examine the clinical meaningfulness of the exergaming at an unchanged medication plan. A telerehabilitation exergaming system using the Kinect sensor was developed; 28 patients with PD participated in the study. The system followed the participants' movements and adapted the difficulty level of the game in real time. The outcomes of the study showed that seven out of 26 participants could set up the equipment at home alone. Clinical outcomes of Box and Blocks Test (mean: 47 vs. 52,  $P = 0.002$ , Cohen's  $d = 0.40$ ), UPDRS III (mean: 27 vs. 29,  $P = 0.001$ ,  $d = 0.22$ ), and daily activity Jebsen's test; writing a letter (mean: 24.0 vs. 20.6,  $P = 0.003$ ,  $d = 0.23$ ); and moving light objects (mean: 4.4 vs. 3.9,  $P = 0.006$ ,  $d = 0.46$ ) were statistically significant ( $P < 0.05$ ) and considered clinically meaningful. The Nine-Hole Peg Test showed a statistically nonsignificant improvement (mean: 28.0 vs. 26.5,  $P = 0.089$ ,  $d = 0.22$ ). The participants claimed problems with mobility but less with activities of daily living and emotional well-being (PDQ-39). The findings lead to preliminary conclusions that exergaming is feasible, but may require technical assistance, whereas clinically meaningful results could be achieved according to validated instruments and an unchanged medication plan in individuals with PD.

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**Title: Historical and cross-cultural perspectives on Parkinson's disease.**

**Citation:** Journal of Complementary & Integrative Medicine; Sep 2018; vol. 15 (no. 3)

**Author(s):** Blonder, Lee Xenakis

**Abstract:** Parkinson's disease (PD) is a common neurodegenerative disorder, affecting up to 10 million people worldwide according to the Parkinson's Disease Foundation. Epidemiological and genetic studies show a preponderance of idiopathic cases and a subset linked to genetic polymorphisms of a familial nature. Traditional Chinese medicine and Ayurveda recognized and treated the illness that Western Medicine terms PD millennia ago, and descriptions of Parkinson's symptomatology by Europeans date back 2000 years to the ancient Greek physician Galen. However, the Western nosological classification now referred to in English as "Parkinson's disease" and the description of symptoms that define it, are accredited to British physician James Parkinson, who in 1817 authored The Shaking Palsy. Later in the nineteenth century, French neurologist Jean-Martin Charcot re-labeled paralysis agitans "Parkinson's disease" and over a century of scientific research ensued. This review discusses European, North American, and Asian contributions to the understanding and treatment of PD from ancient times through the twentieth century.

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**Title: The UK Parkinson's Audit 2017: Transforming care.**

**Citation:** British Journal of Neuroscience Nursing; Aug 2018; vol. 14 (no. 4); p. 195-196

**Author(s):** Cunnington, Anne-Louise

**Abstract:** The article discusses the results of the Parkinson's National Audit 2017 that addresses the concerns of professionals, patients and carers about the quality of care provided to people with Parkinson's Disease across Great Britain.

**Title: Driving impairment and crash risk in Parkinson disease: A systematic review and meta-analysis.**

**Citation:** Neurology; Sep 2018; vol. 91 (no. 10); p. e906

**Author(s):** Thompson, Trevor; Poulter, Damian; Miles, Clare; Solmi, Marco; Veronese, Nicola; Carvalho, André F; Stubbs, Brendon; Uc, Ergun Y

**Objectives:** To provide the best possible evidence base for guiding driving decisions in Parkinson disease (PD), we performed a meta-analysis comparing patients with PD to healthy controls (HCs) on naturalistic, on-the-road, and simulator driving outcomes.

**Methods:** Seven major databases were systematically searched (to January 2018) for studies comparing patients with PD to HCs on overall driving performance, with data analyzed using random-effects meta-analysis.

**Results:** Fifty studies comprising 5,410 participants (PD = 1,955, HC = 3,455) met eligibility criteria. Analysis found the odds of on-the-road test failure were 6.16 (95% confidence interval [CI] 3.79-10.03) times higher and the odds of simulator crashes 2.63 (95% CI 1.64-4.22) times higher for people with PD, with poorer overall driving ratings also observed (standardized mean differences from 0.50 to 0.67). However, self-reported real-life crash involvement did not differ between people with PD and HCs (odds ratio = 0.84, 95% CI 0.57-1.23,  $p = 0.38$ ). Findings remained unchanged after accounting for any differences in age, sex, and driving exposure, and no moderating influence of disease severity was found.

**Conclusions:** Our findings provide persuasive evidence for substantive driving impairment in PD, but offer little support for mandated PD-specific relicensure based on self-reported crash data alone, and highlight the need for objective measures of crash involvement.

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**Title: Alcohol consumption and risk for Parkinson's disease: a systematic review and meta-analysis.**

**Citation:** Journal of neurology; Aug 2018

**Author(s):** Jiménez-Jiménez, Félix Javier; Alonso-Navarro, Hortensia; García-Martín, Elena; Agúndez, José A G

**Abstract:** The possibility that alcohol consumption should be considered as a "protective factor" for Parkinson's disease (PD) has been suggested by several case-control studies. However, other case-control studies and data from prospective longitudinal cohort studies have been inconclusive. We carried out a systematic review which included all the eligible studies published on PD risk related with alcohol consumption, and conducted a meta-analysis according to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines. The systematic review was performed using two databases, and the meta-analysis of the eligible studies with the software Meta-Disc1.1.1. Heterogeneity between studies was tested with the Q-statistic. The meta-analysis included 26 eligible retrospective case-control studies (8798 PD patients, 15,699 controls) and 5 prospective longitudinal cohort studies (2404 PD patients, 600,592 controls) on alcohol consumption and PD. In retrospective case-control studies the frequency of PD patients never drinkers was higher and the frequency of heavy + moderate drinkers was lower [diagnostic OR (95% CI) 1.33(1.20-1.48) and 0.74(0.64-0.85)], respectively, when compared to healthy controls. In contrast, in prospective studies, the differences were not significant with the exception of a trend towards a higher frequency of non-drinkers in PD women and a significantly lower frequency of moderate + heavy drinkers in PD men in those studies which stratified data by gender. The present meta-analysis suggests an inverse association between alcohol

consumption and PD, which is supported by the results of case-control studies but not clearly by prospective ones.

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**Title: Fallers with Parkinson's disease exhibit restrictive trunk control during walking.**

**Citation:** Gait & posture; Sep 2018; vol. 65 ; p. 246-250

**Author(s):** Jehu, Deborah; Nantel, Julie

**Background:** The relationship between falls and static and dynamic postural control has not been established in Parkinson's disease (PD). The purpose was to compare the compensatory postural strategies among fallers and non-fallers with PD as well as older adults during static and dynamic movements.

**Methods:** Twenty-five individuals with PD (11 fallers) and 17 older adults were outfitted with 6 accelerometers on the wrists, ankles, lumbar spine, and sternum, stood quietly for 30 s on a force platform, and walked back and forth for 30 s along a 15 m walkway. Root-mean-square displacement amplitude of the center of pressure (COP), COP velocity, gait spatial-temporal characteristics, trunk range of motion (ROM), and peak trunk velocities were obtained.

**Results:** COP velocity in anterior-posterior was larger in older adults than those with PD ( $p < 0.05$ ). Trunk frontal ROM and velocity were smaller in fallers and non-fallers with PD compared to older adults ( $p < 0.05$ ). Trunk anterior-posterior ROM and velocity were smaller in fallers than non-fallers with PD and older adults ( $p < 0.05$ ). In fallers with PD, negative correlations were shown between the sagittal trunk velocity and the COP velocity in the anterior-posterior direction as well as between trunk frontal velocity and COP velocity in both directions ( $p < 0.05$ ). In non-fallers with PD, horizontal trunk ROM and velocity were positively correlated with COP ROM and velocity in the medial-lateral direction ( $p < 0.01$ ).

**Significance:** Dynamic postural control revealed better discrimination between groups than static. Fallers and non-fallers with PD and older adults adopted different compensatory strategies during static and dynamic movements; thereby providing important information for falls-risk assessment.

### **Sources Used**

The following databases are searched on a regular basis in the development of this bulletin: Amed, British Nursing Index, Cinahl, Medline

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