

Parkinson's Disease Current Awareness Bulletin

November 2018

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Title: Development of a community-based golf and exercise program for people with Parkinson's disease.

Citation: Complementary Therapies in Clinical Practice; Nov 2018; vol. 33 ; p. 149-155

Author(s): Cash, Megan F.; Ulanowski, Elizabeth; Danzl, Megan

Abstract: Individuals with Parkinson's disease (PD) typically display symptoms of rigidity, bradykinesia, and postural instability that can limit participation in recreational activities. The purpose of this clinical report is to describe the development, implementation, and outcomes of a novel and innovative community-based golf and exercise program for individuals with PD. In response to community interest, the program was developed through a unique partnership that blended the expertise of physical therapists and golf professionals. The 6-week program consisted of golf instruction and task-specific exercises. Improvements were noted in seven of eight participants for golf performance (driving distance and club head speed) and quality of life (PD Questionnaire-39) outcome measures. This report describes the design and implementation of a golf and exercise program for people with PD based on community need, evidence, and clinical expertise. Considerations and recommendations for future programs are discussed, such as program length, staffing, volunteers, funding, location, and resources.

Title: Role of physical activity in Parkinson's disease.

Citation: Annals of Indian Academy of Neurology; Oct 2018; vol. 21 (no. 4); p. 242-249

Author(s): Bhalsing, Ketaki; Abbas, Masoom; S. Tan, Louis

Abstract: Parkinson's disease (PD) is common, age-dependent neurodegenerative disorder caused by a severe loss of the nigrostriatal dopaminergic neurons. Given the projected increase in the number of people with PD over the coming decades, interventions aimed at minimizing morbidity and improve quality of life are crucial. There is currently no fully proven pharmacological therapy that can modify or slow the disease progression. Physical activity (PA) can complement pharmacological therapy to manage the inherent decline associated with the disease. The evidence indicates that upregulation of neurotrophins and nerve growth factors are potentially critical mediators of the beneficial effects associated with PA. Accumulating evidence suggests that patients with PD might benefit from PA in a number of ways, from general improvements in health to disease-specific effects and potentially, disease-modifying effects. Various forms of PA that have shown beneficial effects in PD include – aerobic exercises, treadmill training, dancing, traditional Chinese exercise, yoga, and resistance training. In this review, we explored available research that addresses the impact of exercise and PA on PD. The original articles with randomized control trials, prospective cohort studies, longitudinal studies, meta-analysis, and relevant review articles from 2005 to 2017 were selected for the present review. Many gaps remain in our understanding of the most effective exercise intervention for PD symptoms, the mechanisms underlying exercise-induced changes and the best way to monitor response to therapy. However, available research suggests that exercise is a promising, cost-effective, and low-risk intervention to improve both motor and nonmotor symptoms in patients with PD. Thus, PA should be prescribed and encouraged in all PD patients.

Title: A comparative study of early and late onset freezing of gait in Parkinson's disease.

Citation: Annals of Indian Academy of Neurology; Oct 2018; vol. 21 (no. 4); p. 256-262

Author(s): Prasad, Shweta; Lenka, Abhishek; Stezin, Albert; Naduthota, Rajini; Jha, Menka; Yadav, Ravi; Pal, Pramod

Background: Freezing of gait (FOG) is a common and debilitating symptom in Parkinson's disease (PD); the pathogenesis and natural course of which has not been fully understood. Objectives: This study was performed to evaluate patients with FOG in PD and ascertain factors contributing to an early onset of FOG in patients with PD.

Methodology: A chart review of 100 patients with PD (FOG [+] 50, FOG [-]: 50) was performed. FOG (+) patients were subdivided by a median split of time from motor onset to development of FOG (median: 6 years) into early onset FOG (EOFOG [n = 24]) and late onset FOG (n = 26).

Results: The FOG (+) group had a significantly longer duration of motor symptoms, a higher Hoehn and Yahr stage, and greater severity of disease. Festination, falls, and wearing off were more prevalent in the FOG (+) group. Several nonmotor symptoms (NMS) such as constipation, psychosis, fatigue, weight loss, drooling, excessive sweating, depression, and postural giddiness were significantly higher in the FOG (+) group. The EOFOG group had a later age at onset of motor symptoms. There were no significant differences observed in the NMS, with the exception of fatigue in EOFOG.

Conclusions: FOG is associated with longer disease duration and higher severity of disease. FOG (+) patients have distinct NMS which are contributory to disease morbidity. EOFOG might be associated with an accelerated disease progression and is linked with older patients and shorter disease duration.

Title: Gait evaluation using inertial measurement units in subjects with Parkinson's disease.

Citation: Journal of Electromyography & Kinesiology; Oct 2018; vol. 42 ; p. 44-48

Author(s): Zago, Matteo; Sforza, Chiarella; Pacifici, Ilaria; Cimolin, Veronica; Camerota, Filippo; Celletti, Claudia; Condoluci, Claudia; De Pandis, Maria Francesca; Galli, Manuela

Abstract: We investigated whether a wearable system based on a commercial Inertial Measurement Unit (IMU) can reliably provide the main spatiotemporal gait parameters in subjects with Parkinson's disease (PD), compared to a gold-standard optoelectronic motion capture system. The gait of 22 subjects with PD (Age: 69.4 (6.1) years; UPDRS-III: 28.0 (9.2)) was recorded simultaneously with an optoelectronic system and a commercial IMU-based wearable system. Eight spatiotemporal parameters describing the step cycle (cadence, velocity, stride length, stride duration, step length, stance, swing and double support duration) were compared between the two systems. The IMU and the optical system reported comparable gait parameters, with the exception of walking velocity (optical system, 0.72 (0.27) m·s⁻¹ vs. IMU: 0.86 (0.26) m·s⁻¹, p < 0.05). Although most parameters detected by the two systems were not statistically different, some of them like stride length, double support and step duration showed notable root mean square and mean absolute errors. In conclusion, the algorithm embedded in the current release of the commercial IMU requires further improvements to be properly used with subjects with PD. Overall, the IMU system was sufficiently accurate in the assessment of fundamental gait spatiotemporal parameters. The fast and simplified data recording process allowed by wearables makes this technology

appealing and represents a possible solution for the quantification of gait in the clinical context, especially when using a traditional 3D optoelectronic gait analysis is not possible, and when subjects are not fully cooperative.

Title: The effect of medication on vastus lateralis muscle activation patterns in Parkinson's disease patients.

Citation: Journal of Electromyography & Kinesiology; Oct 2018; vol. 42 ; p. 66-73

Author(s): Nishikawa, Yuichi; Watanabe, Kohei; Takahashi, Tetsuya; Kimura, Hiroaki; Maruyama, Hirofumi

Abstract: The effect of levodopa on muscle activity patterns in Parkinson's disease (PD) patients is currently unclear. The aim of the present study was to compare the spatial distribution pattern of electromyographic activity during sustained isometric contraction in PD patients during on- and off-medication periods using multi-channel surface electromyography (SEMG). Ten female PD patients were recruited for the present study. All patients performed a sustained isometric knee extension at 10% maximum voluntary contraction task for 60 s. To evaluate alterations in the spatial SEMG potential distribution, the coefficient of variation (CV) of force, normalized root mean square (RMS), modified entropy, CV of the RMS, and correlation coefficients were calculated at during contraction task. The off-medication period exhibited more fluctuation during the contraction task than those in the on-medication period. The off-medication period exhibited less change in modified entropy, the CV of RMS, the correlation coefficient and patterns of spatial SEMG distribution. These data demonstrated that the heterogeneity and changes in the activation pattern are smaller in the off-medication period than in those in the on-medication period. These findings might indicate that levodopa enhanced the activation of muscle action potentials during force production.

Title: Can Postural Control Asymmetry Predict Falls in People With Parkinson's Disease?

Citation: Motor Control; Oct 2018; vol. 22 (no. 4); p. 449-461

Author(s): Beretta, Victor Spiandor; Barbieri, Fabio Augusto; Orcioli-Silva, Diego; Simieli, Lucas; Vitória, Rodrigo; Gobbi, Lilian Teresa Bucken; dos Santos, Paulo Cezar Rocha

Abstract: This study aimed to determine the relationship between postural asymmetry and falls in Parkinson's disease (PD). In total, 28 patients with PD were included. Postural control was analyzed in bipedal, tandem, and unipedal standing. Center of pressure (CoP) parameters were calculated for both limbs, and asymmetry was assessed using the asymmetry index. Logistic regression was used to predict/classify fallers through postural asymmetry. The Spearman correlation was performed to relate asymmetry and falls number. Poisson regression models were created to predict the number of falls in each condition. The results demonstrated that asymmetry can classify 75% of fallers and nonfallers. Asymmetry in anteroposterior-mean velocity of CoP in unipedal standing was related to the number of falls. Poisson regression showed that anteroposterior-mean velocity of CoP predicts falls in PD, indicating that increased asymmetry results in a greater number of falls. Anteroposterior-mean velocity of CoP seems to be a sensitive parameter to detect falls in PD, mainly during a postural challenging task.

Title: Sleep disorders and Parkinson disease; lessons from genetics.

Citation: Sleep Medicine Reviews; Oct 2018; vol. 41 ; p. 101-112

Author(s): Gan-Or, Ziv; Alcalay, Roy N.; Rouleau, Guy A.; Postuma, Ronald B.

Abstract: Parkinson disease is a common, age-related neurodegenerative disorder, projected to afflict millions of individuals in the near future. Understanding its etiology and identifying clinical, genetic or biological markers for Parkinson disease onset and progression is therefore of major importance. Various sleep-related disorders are the most common group of non-motor symptoms in advanced Parkinson disease, but they can also occur during its prodromal phase. However, with the exception of REM sleep behavior disorder, it is unclear whether they are part of the early pathological process of Parkinson disease, or if they develop as Parkinson disease advances because of treatments and neurodegeneration progression. The advancements in genetic studies in the past two decades have generated a wealth of information, and recent genetic studies offer new insight on the association of sleep-related disorders with Parkinson disease. More specifically, comparing genetic data between Parkinson disease and sleep-related disorders can clarify their association, which may assist in determining whether they can serve as clinical markers for Parkinson disease risk or progression. In this review, we discuss the current knowledge on the genetics of sleep-related disorders in Parkinson disease context, and the potential implications on research, diagnosis, counseling and treatment.

Title: Is there an order of loss of sounds in speakers with Parkinson's disease?

Citation: Clinical Linguistics & Phonetics; Nov 2018; vol. 32 (no. 11); p. 997-1011

Author(s): Read, Jennifer; Miller, Nick; Kitsou, Nikoletta

Abstract: Influential reports on speech changes in people with Parkinson's disease (PD; Logemann et al., 1978, 1981) reported a posterior to anterior pattern of loss of speech sound accuracy. These claims have never been examined. In a partial replication of Logemann et al.'s work, we examined whether posterior lingual sounds are most affected in people with Parkinson's disease, followed by anterior lingual sounds and then labial sounds. Ninety-nine people with PD (age: mean 70.7, SD 8.46; time since diagnosis: mean 6.97, SD 6.2) with mild to severe overall motor symptoms (Hoehn and Yahr stages 1-5, median 2.5) completed a diagnostic intelligibility test. This was scored by 60 listeners unfamiliar with PD and dysarthric speech. We calculated the proportion of posterior versus anterior lingual versus labial sounds misrecognized by the listeners. We compared profiles of misperceived sounds within and across Hoehn and Yahr stages of severity and in relation to Unified Parkinson's Disease Rating Scale (UPDRS) and speech intelligibility scores. Speech accuracy declined significantly in relation to overall motor impairment for labial and anterior lingual sounds but not for velar sounds. Speech sound accuracy was strongly associated with intelligibility outcomes ($p < 0.01$). Contrary to previous assertions, there was no evidence supporting the existence of a posterior to anterior order of 'loss' of oral speech sounds in people with PD, nor an interaction of anterior-posterior speech profile changes with Hoehn and Yahr stage. Findings support the notion that a common underlying impairment of movement downscaling affects all sounds similarly and simultaneously in PD from the start.

Title: Parkinson's disease, temporomandibular disorders and bruxism: A pilot study.

Citation: Journal of Oral Rehabilitation; Nov 2018; vol. 45 (no. 11); p. 854-863

Author(s): Verhoeff, Merel C.; Lobbezoo, Frank; Wetselaar, Peter; Aarab, Ghizlane; Koutris, Michail

Background: Even though bruxism and Parkinson's disease (PD) share common characteristics, their relation is still not clear. Both bruxism and PD are movement disorders in addition, patients with bruxism as well as those with PD complain about musculoskeletal pain, including temporomandibular disorders (TMD) pain.

Objectives: Therefore, the aim of this pilot study was to gain more insight into the possible relation between bruxism and TMD on one hand and PD on the other.

Methods: In total, 801 persons gave their written informed consent and agreed to participate in the study filling in a questionnaire. Complete data were collected from 708 persons (368 with PD or Parkinsonism [PR] and 340 controls) and were included in the analysis. The questionnaire included the graded chronic pain scale, the DC/TMD oral behaviour checklist, the DC/TMD symptom questionnaire and the TMD pain screener. In addition, a question about self-reported tooth wear was included. The chi-square test and independent samples t test were used for the data analysis.

Results: Patients with PD/PR reported significantly more often bruxism during sleep and wakefulness than controls. Also, patients with PD/PR had more often possible TMD and reported a significantly higher mean pain intensity in the orofacial region than controls. There was no significant difference in complaints of jaw locking between the patient group and the control group. A tendency towards a significant association was found between PD/PR and tooth wear.

Conclusion: There is a relation between PD/PR and bruxism. Furthermore, a relation of PD/PR with TMD pain is suggested to be present.

Title: Parkinson's disease: symptoms, treatment options and nursing care.

Citation: Nursing Standard; Oct 2018; vol. 33 (no. 7); p. 53-58

Author(s): Cotterell, Phil

Abstract: Idiopathic Parkinson's disease (IPD) is a progressive neurodegenerative condition that causes various motor and non-motor symptoms and will often have life-changing effects for those with the condition, as well as for their family and carers. Nurses can make a significant difference to the lives of those affected by Parkinson's disease, whether in the acute setting, community setting or in care homes. This article explores the causes and progressive clinical pathway of IPD using an evidence-based approach. It emphasises the valuable role of the multidisciplinary team and of the nurse, in particular, in monitoring and improving the quality of life of those with the condition and their family and carers.

Title: Long-term effects of highly challenging balance training in Parkinson's disease—a randomized controlled trial.

Citation: Clinical Rehabilitation; Nov 2018; vol. 32 (no. 11); p. 1520-1529

Author(s): Wallén, Martin Benka; Hagströmer, Maria; Conradsson, David; Sorjonen, Kimmo; Franzén, Erika

Objectives: To determine long-term effects of a highly challenging training program in people with Parkinson's disease, as well as describe how initially observed improvements of the program deteriorated over time.

Design: Long-term follow-up of previously reported outcomes at 10 weeks of a randomized controlled trial. Setting: University hospital setting.

Participants: One-hundred elderly with mild-to-moderate (Hoehn and Yahr 2–3) Parkinson's disease.

Interventions: Participants in the training group (n = 51) received 10 weeks (three times/week) of balance and gait exercises, incorporating dual-tasks, while the control group (n = 49) received care as usual.

Main Outcome Measures: Balance control (Mini-Balance Evaluation System Test (Mini-BESTest)) and gait velocity. Mixed-design analyses of variance were used to determine potential training effects at 6- and 12-month follow-up, and piecewise regression models predicted the rate of deterioration.

Results: Seventy-six participants were included at final follow-up. No significant ($P > .05$) between-group differences remained at either 6 or 12 months following the intervention. The mean Mini-BESTest scores of the training and control group were 19.9 (SD 4.4) and 18.6 (SD 4.3), respectively, at the 12-month follow-up. Gait speed was 1.2 (SD 0.2) m/s in both groups at 12 months. The training group showed a larger deterioration rate per month in balance performance (0.21 point) and gait velocity (0.65 cm/s) than controls ($P < .05$).

Conclusion: These results suggest that training effects diminish within 6 months after balance training, implying that the program may need to be repeated regularly.

Title: Stress Management Training (SMT) Improves Coping of Tremor-Boosting Psychosocial Stressors and Depression in Patients with Parkinson's Disease: A Controlled Prospective Study.

Citation: Parkinson's Disease (20420080); Oct 2018 ; p. 1-12

Author(s): Buhmann, C.; Jungnickel, D.; Lehmann, E.

Background: Stress reduction and relaxation exercises are therapeutically suggested to patients with Parkinson's disease (PD) and tremor, but data regarding efficacy or preferential methods are missing.

Objective: To investigate the effect of a standardized stress management training (SMT) according to Kaluza on coping with tremor-boosting psychosocial stress factors.

Methods: 8-week SMT was applied to 82 PD patients with tremor and 30 controls. Changes in stress-associated factors were measured applying four scales: Kaluza's "warning signs for stress" and "stress-amplifying thoughts" and Beck Depression Inventory (BDI) and quality of life (PDQ-8). Short-term outcome (8 weeks) was evaluated in both groups, and long-term outcome (3–6 months) was evaluated only in PD patients.

Results: At baseline, PDQ-8 was worse in PD patients compared to controls. PD patients improved significantly regarding short- and long-term outcome scores of "warning signs for stress," "stress-amplifying thoughts," and BDI scores, independently of disease severity or duration. Younger and male PD patients showed the best benefit. Controls improved comparably to PD patients but significantly only with respect to "stress-amplifying thoughts." Retrospectively, 88% (29/33) of PD patients were rated SMT as helpful 12–18 months later. Self-practicing SMT exercises correlated significantly with subjectively better coping with tremor-related daily impairment and subjective short-term and long-term tremor reduction.

Conclusion: SMT should be a part of therapy of PD patients with tremor.

Title: Manifestations and Outcomes of Patients with Parkinson's Disease and Serious Infection in the Emergency Department.

Citation: BioMed Research International; Oct 2018 ; p. 1-8

Author(s): Su, Chih-Min; Kung, Chia-Te; Chen, Fu-Cheng; Cheng, Hsien-Hung; Hsiao, Sheng-Yuan; Lai, Yun-Ru; Huang, Chin-Cheng; Tsai, Nai-Wen; Lu, Cheng-Hsien

Background: Several comorbidities contribute to an increased risk of infections in Parkinson's disease (PD) as the disease progresses. However, few studies have examined the correlation between sepsis and PD. Aim. The aim of this study is to disclose the presentation and outcome of serious infection in patients with PD in the emergency department.

Methods: This retrospective cohort study enrolled patients with PD who had serious infection and were admitted to the emergency department between January 2007 and December 2013. For clinical comparison, we compared the clinical features, laboratory data, and outcomes with those of age- and sex-matched patients who had serious infection but not PD.

Results: There were a total of 1,200 episodes of infected PD patients and 2,400 age- and sex-matched infected patients without PD as disease controls. PD patients had fewer comorbidities and lower severity of infectious disease but longer hospital stays than control group patients. The incidences of respiratory tract and urinary tract infections were higher in PD patients. The levels of inflammatory and organ dysfunction biomarkers in PD were lower and compatible with the severity of infectious disease. A total of 86 (7.2%) infected PD patients died during the 28-day admission compared to 339 (14.1%) in non-PD patients. Serum C-reactive protein, bandemia, and lactate could be used to predict mortality in infected PD patients.

Conclusions: In infected patients with PD, respiratory and urinary tract infections were the two most common infectious sources. Empiric therapy based on experience could treat both respiratory and urinary tract infections. Early diagnosis and treatment are essential for survival.

Title: Exercise Guidelines for Gait Function in Parkinson's Disease: A Systematic Review and Meta-analysis.

Citation: Neurorehabilitation & Neural Repair; Oct 2018; vol. 32 (no. 10); p. 872-886

Author(s): Ni, Meng; Hazzard, Joseph B.; Signorile, Joseph F.; Luca, Corneliu

Abstract: This systematic review and meta-analysis is to provide comprehensive evidence-based exercise recommendations targeting walking function for adults with Parkinson's disease.

Methods: Fixed- or random-effect meta-analyses estimated standardized effect sizes (Hedge's g), comparing treatment effects from exercise with nonexercise and another form of exercise (non-EXE control and EXE control). Cuing and exercise duration were used as moderators for subanalyses.

Results: The 40 included randomized controlled trials comprised 1656 patients. The exercise group showed significantly superior performance in timed up-and-go ($g = -0.458$; $g = -0.390$) compared with non-EXE control and EXE control; significantly greater improvement in comfortable walking speed ($g = 0.449$), fast walking speed ($g = 0.430$), and stride or step length ($g = 0.379$) compared with non-EXE control; and significantly greater

cadence ($g = 0.282$) compared with EXE controls. No significant differences between intervention and control groups were observed for double-leg support time (DLST), dynamic gait index (DGI), 6-minute walk test, or freezing of gait questionnaire (FOG-Q). Notably, treatment effect from the exercise of interest compared with a standard exercise was greater than for nonexercise for cadence and FOG-Q. Moreover, EXE control was favored for DLST and DGI. Cuing had a significantly positive effect on stride length alone. Exercise duration significantly, but negatively, influenced the treatment effect on comfortable walking speed.

Conclusion: Gait-specific training, rather than a general exercise program, should be emphasized if gait is the outcome of interest. Further investigation is needed on exercise dosage and its selective effect on more challenging walking tasks, endurance, and freezing of gait.

Title: Relating Anticipatory Postural Adjustments to Step Outcomes During Loss of Balance in People With Parkinson's Disease.

Citation: Neurorehabilitation & Neural Repair; Oct 2018; vol. 32 (no. 10); p. 887-898

Author(s): Peterson, Daniel S.; Lohse, Keith R.; Mancini, Martina

Background: Effective protective steps are critical for fall prevention, and anticipatory postural adjustments (APAs) after a perturbation but prior to protective steps affect step performance. Although APAs prior to protective steps are altered in people with Parkinson's disease (PD), whether these changes affect subsequent step performance is poorly understood.

Objective: Characterize the relationship between mediolateral APA size and protective step outcomes in response to anteroposterior balance perturbations in people with PD.

Methods: Twenty-eight individuals with PD completed 25 forward and 25 backward protective steps in response to support surface translations. Multilevel linear models related mediolateral APA size to protective step outcomes.

Results: During forward protective stepping, larger mediolateral APAs were associated with delayed ($P < .001$) and larger ($P = .004$) steps. Larger APAs were also associated with smaller mediolateral ($P < .001$) but larger anterior-posterior center of mass movement at foot off ($P < .001$). During backward stepping, larger APAs were associated with later steps ($P < .001$) and smaller anterior-posterior margin of stability at first foot contact ($P < .001$). During backward stepping, larger APAs were also associated with worse clinical (ie, UPDRS [Unified Parkinson's Disease Rating Scale]; $P = .005$) and balance (ie, MiniBEST [Mini-Balance Evaluation Systems Test]; $P = .021$) outcomes.

Conclusions: During forward protective stepping, larger APAs were associated with larger and later steps, suggesting APA size may have mixed effects on the subsequent step. During backward stepping, larger APAs were associated with worse stepping outcomes (ie, later steps, smaller anterior-posterior margin of stability, worse clinical outcomes). Interventions aimed at improving APAs in PD should monitor spatial and temporal protective step outcomes to ensure treatment does not negatively affect protective steps, particularly for forward stepping.

Title: 113Evaluating Outcomes after Hip Fracture in Patients with Parkinson's Syndromes...66th Annual & Scientific Meeting of the Irish Gerontological Society Transforming Ageing Across Borders at Slieve Russell Hotel, Co., Cavan, Ireland, 27-29 September 2018.

Citation: Age & Ageing; Sep 2018; vol. 47

Author(s): Jonsson, Agnes; Fallon, Aoife; Hughes, Graham; Doyle, Rachael

Title: 116Medication Management in Acutely Hospitalised Patients with Parkinson's Disease: A Single Centre Audit...66th Annual & Scientific Meeting of the Irish Gerontological Society Transforming Ageing Across Borders at Slieve Russell Hotel, Co., Cavan, Ireland, 27-29 September 2018.

Citation: Age & Ageing; Sep 2018; vol. 47

Author(s): Murphy, Claire; Ali, Saied; Traynor, Bryan; McKeown, Ross; Basit, Mian; Mulroy, Martin; Bhuachalla, Blaithe Ni; Lynch, Olwyn

Title: Use of deep brain stimulation to reduce Parkinson's disease symptoms.

Citation Nursing Times; Sep 2018; vol. 114 (no. 9); p. 5-5

Author(s): Wild, Deidre; Norris, Caroline

Abstract: Deep brain stimulation is a neurosurgical intervention that aims to improve motor performance and quality of life in people with Parkinson's disease, while enabling the reduction of levodopa medication. Although not a cure, it gives respite from the adverse motor symptoms of Parkinson's disease for most suitable patients, thereby releasing the potential for a new lease of life. This article explains the procedure, the process for selecting patients for surgery, and the role of the specialist in supporting patients before and after surgery. It includes the perspectives of a retired nurse in the later stages of Parkinson's disease and her deep brain stimulation specialist nurse.

Title: Wearables for gait and balance assessment in the neurological ward - study design and first results of a prospective cross-sectional feasibility study with 384 inpatients.

Citation: BMC Neurology; Aug 2018; vol. 18 (no. 1)

Author(s): Bernhard, Felix P.; Sartor, Jennifer; Bettecken, Kristina; Hobert, Markus A.; Arnold, Carina; Weber, Yvonne G.; Poli, Sven; Margraf, Nils G.; Schlenstedt, Christian; Hansen, Clint; Maetzler, Walter

Background: Deficits in gait and balance are common among neurological inpatients. Currently, assessment of these patients is mainly subjective. New assessment options using wearables may provide complementary and more objective information.

Methods: In this prospective cross-sectional feasibility study performed over a four-month period, all patients referred to a normal neurology ward of a university hospital and aged between 40 and 89 years were asked to participate. Gait and balance deficits were assessed with wearables at the ankles and the lower back. Frailty, sarcopenia, Parkinsonism, depression, quality of life, fall history, fear of falling, physical activity, and cognition were evaluated with questionnaires and surveys.

Results: Eighty-two percent (n = 384) of all eligible patients participated. Of those, 39% (n = 151) had no gait and balance deficit, 21% (n = 79) had gait deficits, 11% (n = 44) had balance deficits and 29% (n = 110) had gait and balance deficits. Parkinson's disease, stroke, epilepsy, pain syndromes, and multiple sclerosis were the most common diseases. The assessment was well accepted.

Conclusions: Our study suggests that the use of wearables for the assessment of gait and balance features in a clinical setting is feasible. Moreover, preliminary results confirm previous epidemiological data about gait and balance deficits among neurological inpatients. Evaluation of neurological inpatients with novel wearable technology opens new opportunities for the assessment of predictive, progression and treatment response markers.

Title: Treating Speech Movement Hypokinesia in Parkinson's Disease: Does Movement Size Matter?

Citation: Journal of speech, language, and hearing research : JSLHR; Nov 2018; vol. 61 (no. 11); p. 2703-2721

Author(s): Kearney, Elaine; Haworth, Brandon; Scholl, Jordan; Faloutsos, Petros; Baljko, Melanie; Yunusova, Yana

Purpose: This study evaluates the effects of a novel speech therapy program that uses a verbal cue and gamified augmented visual feedback regarding tongue movements to address articulatory hypokinesia during speech in individuals with Parkinson's disease (PD).

Method: Five participants with PD participated in an ABA single-subject design study. The treatment aimed to increase tongue movement size using a combination of a verbal cue and augmented visual feedback and was conducted in 10 45-min sessions over 5 weeks. The presence of visual feedback was manipulated during treatment. Articulatory working space of the tongue was the primary outcome measure and was examined during treatment and in cued and uncued sentences pre- and posttreatment. Changes in speech intelligibility in response to a verbal cue pre- and posttreatment were also examined.

Results: During treatment, 4/5 participants showed a beneficial effect of visual feedback on tongue articulatory working space. At the end of the treatment, they used larger tongue movements when cued, relative to their pretreatment performance. None of the participants, however, generalized the effect to the uncued sentences. Speech intelligibility of cued sentences was judged as superior posttreatment only in a single participant.

Conclusions: This study demonstrated that using an augmented visual feedback approach is beneficial, beyond a verbal cue alone, in addressing articulatory hypokinesia in individuals with PD. An optimal degree of articulatory expansion might, however, be required to elicit a speech intelligibility benefit.

Title: Assessment of Health-Related Quality of Life between People with Parkinson's Disease and Non-Parkinson's: Using Data Drawn from the '100 for Parkinson's' Smartphone-Based Prospective Study.

Citation: International journal of environmental research and public health; Nov 2018; vol. 15 (no. 11)

Author(s): Fan, Xiaojing; Wang, Duolao; Hellman, Bruce; Janssen, Mathieu F; Bakker, Gerben; Coghlan, Rupert; Hursey, Amelia; Matthews, Helen; Whetstone, Ian

Background: This study aims to assess the specific difference of the health-related quality of life between people with Parkinson's and non-Parkinson's.

Methods: A total of 1710 people were drawn from a prospective study with a smartphone-based survey named '100 for Parkinson's' to assess health-related quality of life. The EQ-5D-5L descriptive system and the EQ visual analogue scale were used to measure health-related quality of life and a linear mixed model was used to analyze the difference.

Results: The mean difference of EQ-5D-5L index values between people with Parkinson's and non-Parkinson's was 0.15 (95%CI: 0.12, 0.18) at baseline; it changed to 0.17 (95%CI: 0.14, 0.20) at the end of study. The mean difference of EQ visual analogue scale scores between them increased from 10.18 (95%CI: 7.40, 12.96) to 12.19 (95%CI: 9.41, 14.97) from baseline to the end of study.

Conclusion: Data can be captured from the participants' own smart devices and support the notion that health-related quality of life for people with Parkinson's is lower than non-Parkinson's. This analysis provides useful evidence for the EQ-5D instrument and is helpful for public health specialists and epidemiologists to assess the health needs of people with Parkinson's and indirectly improve their health status.

Title: Management of neurogenic bladder in patients with Parkinson's disease: A systematic review.

Citation: Neurourology and urodynamics; Nov 2018

Author(s): Hajebrahimi, Sakineh; Chapple, Christopher R; Pashazadeh, Fariba; Salehi-Pourmehr, Hanieh

Aims: To assess the different treatment methods in management of neurogenic bladder (NGB) in patients with Parkinson's disease (PD).

Methods: A systematic search was performed in Cochrane library, EMBASE, Proquest, Clinicaltrial.gov, WHO, Google Scholar, MEDLINE via PubMed, Ovid, ongoing trials registers, and conference proceedings in November 11, 2017. All randomized controlled trials (RCTs) or quasi-RCTs comparing any treatment method for management of NGB in patients with PD were included. The titles and abstracts of all identified studies were evaluated independently by two investigators. Once all of the potential related articles were retrieved, each author separately evaluated the full text of each article and the quality of the methodology of the selected studies using the Cochrane appraisal risk of bias checklist and then the data about the patient's outcomes was extracted. We registered the title in Joanna Briggs Institute (JBI) that is available in http://joannabriggs.org/research/registered_titles.aspx.

Results: We included 41 RCTs or quasi-RCTs or three observational study with a total of 1063 patients that evaluated pharmacological, neurosurgical, botulinum toxin, electrical neuromodulation, and behavioral therapy effects on NGB. Among the included studies only solifenacin succinate double-blind, randomized, placebo-controlled study was assessed as low risk of bias, and treatment led to an improvement in urinary incontinence.

Conclusions: Although several interventions are available for treatment NGB in patients with PD, at present there is little or no evidence that treatment improves patient outcomes in this population. Additional large, well designed, randomized studies with improved methodology and reporting focused on patient-centered outcomes are needed.

Title: Management of visual hallucinations in dementia and Parkinson's disease.

Source: International psychogeriatrics; Nov 2018 ; p. 1-22

Author(s): Swann, Peter; O'Brien, John T

Objectives: Visual hallucinations are a common symptom in dementia and Parkinson's disease and have been associated with greater cognitive and functional decline, but optimal management strategies are unclear. We review the frequency and pathogenesis of visual

hallucinations in dementia and Parkinson's disease and examine the evidence base for their management.

Design: We undertook a systematic review of the visual hallucinations in dementia, searching studies published between January 1980 and July 2017 using PubMed with the search terms visual hallucinations AND review AND (dementia OR parkinson*).

Results: We found 645 articles and screened them for relevance, finally including 89 papers (11 meta-analyses, 34 randomized controlled trials, six other trials and a number of relevant review articles). Only six of the trials reported visual hallucination outcomes separately from other neuropsychiatric symptoms.

Conclusions: Atypical antipsychotics were frequently studied, but with the exception of clozapine in Parkinson's disease dementia, results were equivocal. There was some evidence that acetylcholinesterase inhibitors may help visual hallucinations. Overall, effect sizes for most treatments were small and there were few studies with long term follow up. Treatments need to be carefully weighed up with the risks and reviewed often, and many patients improved without treatment. There is a lack of data regarding visual hallucinations due to the grouping of psychotic symptoms together in commonly used rating scales. The lack of a specific rating scales, or analyzable items within other scales, for visual hallucinations, limited efficacy of current and small evidence base with short follow up are important areas for future studies to address.

Title: Is the aquatic thermal environment a suitable place for providing rehabilitative treatment for person with Parkinson's disease? A retrospective study.

Citation: International journal of biometeorology; Nov 2018

Author(s): Masiero, Stefano; Maghini, Irene; Mantovani, Maria Eleonora; Bakdounes, Leila; Koutsikos, Kostas; Del Felice, Alessandra; Sale, Patrizio

Abstract: Many authors showed that aquatic physiotherapy could improve quality of life and reduce postural instability and risk of falling in elderly subjects. The aim of this research was to explore if the thermal aquatic environment is a suitable place for rehabilitative training in person with Parkinson disease (PwP) with results comparable to the standard physiotherapy. A retrospective study was conducted on a database of 14 persons with Parkinson who were admitted to a thermal aquatic rehabilitation to undergo treatments made to improve gait and balance impairments. The rehabilitation training consisted of 45-min sessions conducted twice a week, on non-consecutive days, over 4 weeks of functional re-education and kinesitherapy in the thermal pool. Educational and prevention instructions were also given to the patients during each session. Additionally, nutrition (diet), health education, and cognitive behavioral advice were given to our patients by therapists. The clinical characteristics of the sample were age 66 ± 9 , disease duration 7 ± 5 , and Hoehn and Yahr 1.5 ± 0.5 . The statistical analysis showed a statistically significant improvement for the UPDRS $p = 0.0005$, for The Berg Balance Scale $p = 0.0078$, for the PDQ8 $p = 0.0039$, Tinetti $p = 0.0068$, and for Mini BESTest $p = 0.0002$. Our data suggest that this intervention could become a useful strategy in the rehabilitation program of PwP. The simplicity of treatment and the lack of side effects endorse the use of thermal aquatic environment for the gait and balance recovery in PwP.

Title: The association between restless legs syndrome and premotor symptoms of Parkinson's disease.

Citation: Journal of the neurological sciences; Nov 2018; vol. 394 ; p. 41-44

Author(s): Iwaki, Hirotaka; Hughes, Katherine C; Gao, Xiang; Schwarzschild, Michael A; Ascherio, Alberto

Background: Previous studies regarding the association between restless legs syndrome (RLS) and Parkinson's disease (PD) have produced contradictory results. However, the time frame between them has varied across these studies, and also, the longitudinal trajectory of RLS symptoms has not been considered.

Objective: To investigate if transient or continuous/recurrent RLS identified by questionnaire are associated with the premotor symptoms of PD.

Methods: The study population comprised 16,636 men in the Health Professional Follow-Up Study, who answered questions regarding RLS symptoms in both 2002 and 2008, and were not diagnosed with PD. Outcomes were self-reported constipation, possible REM sleep behavior disorder (pRBD) in 2012 and smell identification test score in 2014.

Results: RLS was associated with increased odds of constipation, but only continuous/recurrent RLS status was associated with higher odds of having pRBD. RLS was not significantly associated with olfactory scores.

Conclusion: In this large-scale longitudinal study, we found moderate associations between the presence of RLS and increased odds of having constipation and pRBD.

Title: Management of Sleep Disturbances in Parkinson's Disease Patients, Carers and the Patient and Carer Dyadic Relationship: A Scoping Review.

Citation: Clinical gerontologist; Nov 2018 ; p. 1-9

Author(s): Wade, Rachael; Pachana, Nancy A; Dissanayaka, Nadeeka

Objectives: Sleep disturbances are a debilitating non-motor symptom in Parkinson's disease (PD) and negatively impact patients, their carers and the patient-carer dyadic relationship. This review outlines the phenomenology, as well as factors associated with and treatment of sleep disturbances, in PD patients and their informal carers.

Methods: The following terms were used in four databases: Parkinson*, sleep* disturbance*, carer*, dyad*, intervention* and treatment*.

Results: Across the articles reviewed, the frequency of reported sleep disturbances in PD ranged between 60% and 98%. Common sleep problems in PD included insomnia, excessive day time sleepiness, REM sleep behavior disorder (RBD), sleep apnoea, periodic limb movements and sleep attacks. Within dyads, significant correlations were found with depression, anxiety and carer burden relating to night time care in particular. Despite the negative impact of sleep disturbance in PD, the evidence-base for treatment remains limited.

Conclusions: While addressing individual factors associated with sleep disturbances, it is also important to emphasize the needs arising from the patient-carer dyadic relationship. While a number of non-pharmacological interventions were suggested in the literature, further well-controlled trials are still required.

Clinical Implications: Multiple approaches are required to reduce sleep disturbances and associated burden in PD.

Title: Physical Activity in Older Adults With Mild Parkinsonian Signs: A Cohort Study.

Citation: The journals of gerontology. Series A, Biological sciences and medical sciences; Nov 2018; vol. 73 (no. 12); p. 1682-1687

Author(s): Santos, Daniel; Mahoney, Jeannette R; Allali, Gilles; Verghese, Joe

Background: Physical activity regimens are beneficial for older adults with Parkinson's disease; however, their beneficial effect on individuals with mild parkinsonian signs (MPS) who do not meet criteria for Parkinson's disease is not established. The current observational study aims to determine the cognitive and motor impact of physical activity in older adults with MPS over a 1-year period.

Methods: Three hundred and forty-one individuals underwent medical and neurologic assessment of MPS at baseline. MPS was diagnosed using the motor portion of the Unified Parkinson Disease Rating Scale. Physical activity frequency (days/month) were recorded at baseline and 1-year follow-up along with Repeatable Battery for Assessment of Neuropsychological Status (RBANS) score and gait velocity during normal walking (NW) and walking while talking (WWT) conditions. Associations over the 1-year period were assessed using linear regressions controlling for key covariates.

Results: One hundred and thirty (38.1%) participants met criteria for MPS. These participants demonstrated significant associations between physical activity and gait velocity at baseline (NW: $p < .01$; WWT: $p = .03$) and follow-up (NW: $p < .01$; WWT: $p = .02$). Physical activity was also associated with RBANS total score ($p < .01$) at follow-up. Increases in physical activity frequency over 1 year were associated with increases in NW velocity ($p = .02$), WWT velocity ($p < .01$), and RBANS total score ($p < .01$).

Conclusions: Among older adults with MPS, increased frequency of physical activity is associated with decreased risk of cognitive and motor decline. Our results highlight the importance of participation in physical activities on maintaining motor and cognitive functioning in older adults with MPS.

Title: Mental health in Parkinson's disease after receiving aquatic therapy: a clinical trial.

Citation: Acta neurologica Belgica; Nov 2018

Author(s): Pérez-de la Cruz, Sagrario

Abstract: Depression is a major determinant of quality of life in individuals with Parkinson's disease. The aim of this study was to evaluate the effects of a program of Ai Chi aquatic therapy on pain, depression and quality of life in people with Parkinson's disease. Participants were randomized to receive dry land physiotherapy treatment (control group) or aquatic Ai Chi sessions in the pool (experimental group). The outcome measures used included the VAS pain scale, the Geriatric Depression Scale and the SF-36 quality of life scale. In the experimental group treated with aquatic therapy, significant differences were found in the pain, depression and quality of life variables post-treatment ($p < 0.001$). In the control group, improvements were only observed in the VAS pain scale, and these were less significant than the changes found in the experimental group ($p = 0.006$). The significant changes registered in the experimental group at the post-treatment assessment were maintained 1 month after completing the experimental intervention program. In conclusion, these findings indicate that physical exercise performed in water has positive effects on some of the factors that influence mood and quality of life in people with Parkinson's disease.

Title: Levodopa-induced dyskinesia in Parkinson disease: A population-based cohort study.

Citation: Neurology; Nov 2018

Author(s): Turcano, Pierpaolo; Mielke, Michelle M; Bower, James H; Parisi, Joseph E; Cutsforth-Gregory, Jeremy K; Ahlskog, J Eric; Savica, Rodolfo

Objective: To assess dyskinesia frequency in a population-based cohort of patients with Parkinson disease (PD). Dyskinesia complicates levodopa treatment and affects quality of life.

Methods: Utilizing the 1991-2010 population-based, parkinsonism-incident cohort of Olmsted County, MN (n = 669), accessed via the Rochester Epidemiology Project, we identified patients with PD and abstracted levodopa-related dyskinesia information.

Results: Of 309 patients with PD (46.2% with parkinsonisms), 279 (90.3%) received levodopa. Most (230/279; 82.4%) had been treated by a Mayo Clinic neurologist. Median age of the 309 patients with PD at the time of diagnosis was 74.1 years (range 33.1-97.8 years). Median-age levodopa initiation in this cohort was 75 years (range 37-98 years), and median-duration levodopa treatment was 6 years (range 2 months to 19.8 years). Dyskinesia was documented in 84 of 279 patients (30.1%). Median time from levodopa initiation to dyskinesia onset was 4 years (range 2 months to 20 years); those with dyskinesia (65.5%; 55/84) developed it within 5 years of levodopa initiation (9 within the first year). Dyskinesia was mild in 57/84 (67.9%), moderate in 16/84 (19.1%), and severe in 9/84 (10.7%); severity was not reported in 2 cases. Dyskinesia severity led to levodopa adjustments or amantadine initiation in 60.7% (51/84 of those with dyskinesia), with improvement in 23/51 (45.1%). Thirteen patients with dyskinesia underwent deep brain stimulation, reporting marked improvement. Postmortem examination confirmed Lewy body disease in 7 autopsied cases.

Conclusions: Levodopa-induced dyskinesia affected 30% of the patients with PD in our cohort. Mayo neurologists favoring levodopa dosage optimization treated most patients. Dyskinesia was severe in 3.2% of all levodopa-treated patients with PD (10.7% of all patients with dyskinesia) with marked improvement among those treated with deep brain stimulation.

Title: Cellular and Molecular Aspects of Parkinson Treatment: Future Therapeutic Perspectives.

Citation: Molecular neurobiology; Nov 2018

Author(s): Jamebozorgi, Khosro; Taghizadeh, Eskandar; Rostami, Daryoush; Pormasoumi, Hosein; Barreto, George E; Hayat, Seyed Mohammad Gheibi; Sahebkar, Amirhossein

Abstract: Parkinson's disease is a neurodegenerative disorder accompanied by depletion of dopamine and loss of dopaminergic neurons in the brain that is believed to be responsible for the motor and non-motor symptoms in this disease. The main drug prescribed for Parkinsonian patients is L-dopa, which can be converted to dopamine by passing through the blood-brain barrier. Although L-dopa is able to improve motor function and improve the quality of life in the patients, there is inter-individual variability and some patients do not achieve the therapeutic effect. Variations in treatment response and side effects of current drugs have convinced scientists to think of treating Parkinson's disease at the cellular and molecular level. Molecular and cellular therapy for Parkinson's disease include (i) cell transplantation therapy with human embryonic stem (ES) cells, human induced pluripotent

stem (iPS) cells and human fetal mesencephalic tissue, (ii) immunological and inflammatory therapy which is done using antibodies, and (iii) gene therapy with AADC-TH-GCH gene therapy, viral vector-mediated gene delivery, RNA interference-based therapy, CRISPR-Cas9 gene editing system, and alternative methods such as optogenetics and chemogenetics. Although these methods currently have a series of challenges, they seem to be promising techniques for Parkinson's treatment in future. In this study, these prospective therapeutic approaches are reviewed.

Cognitive rehabilitation, self-management, psychotherapeutic and caregiver support interventions in progressive neurodegenerative conditions: a scoping review.

Citation: NeuroRehabilitation; Nov 2018

Author(s): Clare, Linda; Teale, Julia C; Toms, Gill; Kudlicka, Aleksandra; Evans, Isobel; Abrahams, Sharon; Goldstein, Laura H; Hindle, John V; Ho, Aileen K; Jahanshahi, Marjan; Langdon, Dawn; Morris, Robin; Snowden, Julie S; Davies, Rhys; Markova, Ivana; Busse, Monica; Thompson-Coon, Jo

Background: Despite their potentially significant impact, cognitive disability may be overlooked in a number of progressive neurodegenerative conditions, as other difficulties dominate the clinical picture.

Objective: We examined the extent, nature and range of the research evidence relating to cognitive rehabilitation, self-management, psychotherapeutic and caregiver support interventions in Parkinsonian disorders, multiple sclerosis (MS), frontotemporal dementias (FTD), motor neuron disease and Huntington's disease.

Methods: Scoping review based on searches of MEDLINE and CINAHL up to 15 March 2016. RESULTS We included 140 eligible papers. Over half of the studies, and almost all the randomised controlled trials, related to MS, while a number of single case studies described interventions for people with FTD. CR interventions addressed functional ability, communication and interaction, behaviour or memory. The majority of psychotherapy interventions involved cognitive behavioural therapy for depression or anxiety. Self-management interventions were mainly available for people with MS. There were few reports of interventions specific to caregivers. Numerous methodological challenges were identified.

Conclusions: The limited range of studies for all conditions except MS suggests a need firstly to synthesise systematically the available evidence across conditions and secondly to develop well-designed studies to provide evidence about the effectiveness of CR and other psychological interventions.

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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