

# Parkinson's Disease Current Awareness Bulletin November 2021

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#### Title: A Systematic Review of Parkinson's Disease Cluster Analysis Research.

**Citation:** Aging and disease; Oct 2021; vol. 12 (no. 7); p. 1567-1586 **Author(s):** Hendricks, Renee M; Khasawneh, Mohammad T

Abstract: One way to understand the Parkinson's disease (PD) population is to investigate the similarities and differences among patients through cluster analysis, which may lead to defined, patient subgroups for diagnosis, progression tracking and treatment planning. This paper provides a systematic review of PD patient clustering research, evaluating the variables included in clustering, the cluster methods applied, the resulting patient subgroups, and evaluation metrics. A search was conducted from 1999 to 2021 on the PubMed database, using various search terms including: Parkinson's disease, cluster, and analysis. The majority of studies included a variety of clinical scale scores for clustering, of which many provide a numerical, but ordinal, categorical value. Even though the scale scores are ordinal, these were treated as numerical values with numerical and continuous values being the focus of the clustering, with limited attention to categorical variables, such as gender and family history, which may also provide useful insights into disease diagnosis, progression, and treatment. The results pointed to two to five patient clusters, with similarities among the age of onset and disease duration. The studies lacked the use of existing clustering evaluation metrics which points to a need for a thorough, analysis framework, and consensus on the appropriate variables to include in cluster analysis. Accurate cluster analysis may assist with determining if PD patients' symptoms can be treated based on a subgroup of features, if personalized care is required, or if a mix of individualized and groupbased care is the best approach.

#### Title: Association between Sleep, Alzheimer's, and Parkinson's Disease.

**Citation:** Biology; Nov 2021; vol. 10 (no. 11) **Author(s):** Matsumoto, Sumire; Tsunematsu, Tomomi

**Abstract:** The majority of neurodegenerative diseases are pathologically associated with protein misfolding and aggregation. Alzheimer's disease (AD) is a type of dementia that slowly affects memory and cognitive function, and is characterized by the aggregation of the  $\beta$ -amyloid protein and tau neurofibrillary tangles in the brain. Parkinson's disease (PD) is a movement disorder typically resulting in rigidity and tremor, which is pathologically linked to the aggregation of  $\alpha$ -synuclein, particularly in dopaminergic neurons in the midbrain. Sleep disorders commonly occur in AD and PD patients, and it can precede the onset of these diseases. For example, cognitively normal older individuals who have highly fragmented sleep had a 1.5-fold increased risk of subsequently developing AD. This suggests that sleep abnormalities may be a potential biomarker of these diseases. In this review, we describe the alterations of sleep in AD and PD, and discuss their potential in the early diagnosis of these diseases. We further discuss whether sleep disturbance could be a target for the treatment of these diseases.

# Title: Body Weight Support Gait Training for Patients With Parkinson Disease: A Systematic Review and Meta-analyses.

**Citation:** Archives of Physical Medicine & Rehabilitation; Oct 2021; vol. 102 (no. 10); p. 2012-2021

**Author(s):** Lorenzo-García ; Cavero-Redondo, Iván; Torres-Costoso, Ana Isabel; Guzmán-Pavón, María José; Núñez de Arenas-Arroyo, Sergio; Álvarez-Bueno, Celia

Abstract: To determine the effectiveness of body weight support (BWS) gait training to improve the clinical severity, gait, and balance in patients with Parkinson disease (PD). A literature search was conducted until July 2020 in MEDLINE, Physiotherapy Evidence Database, Cochrane Central Register of Controlled Trials, and Cumulative Index to Nursing and Allied Health Literature. Randomized controlled trials that aimed at determining the effectiveness of physical activity interventions with BWS during gait training in patients with PD. The methodological quality of randomized controlled trials was assessed using the Cochrane risk of bias tool (RoB 2.0). Effect size (ES) and 95% confidence intervals [CIs] were calculated for the Unified Parkinson Disease Rating Scale (UPDRS), the UPDRS section III, the 6-minute walk test (6MWT), gait parameters (ie, velocity, cadence, stride length), and the Berg Balance Scale (BBS). Twelve studies were included in the systematic review. The pooled ES for the effect of BWS on total UPDRS was -0.35 (95% CI, -0.57 to -0.12; I 2=1.9%, P =.418), whereas for UPDRS III it was -0.35 (95% CI, -0.68 to -0.01; I 2=66.4 %, P <.001). Furthermore, the pooled ES for 6MWT was 0.56 (95% CI, -0.07 to 1.18; I 2=77.1%, P =.002), for gait velocity was 0.37 (95% CI, -0.10 to 0.84); I 2=78.9%, P <.001), for cadence was 0.03 (95% CI, -0.25 to 0.30; I 2=0.0%, P =.930), for stride length was 1.00 (95% CI, 0.23 to 1.78; I 2=79.5%, P =.001), and for BBS was 0.65 (95% CI, 0.30, 0.99; I 2=51.8%, P =.042). Interventions with BWS could improve the general and motor clinical severity of patients with PD, as well as other parameters such as stride length and balance. However, the effect does not appear to be statistically significant in improving gait parameters such as velocity, cadence, and distance.

# Title: Cross-Sectional Profile of Most Bothersome Problems as Reported Directly by Individuals With Parkinson's Disease (2697).

Citation: Neurology; Oct 2021; vol. 97 (no. 16); p. 795-795

**Objective:** To examine the frequency and severity of verbatim Patient Report of Problems (PROPs) that individuals with Parkinson's Disease (PD) find most bothersome. **Background:** An understanding of the unfiltered patient experience in the form of their most common problems and by disease duration is critical for patient-focused drug development and care.

**Design/Methods:** De-identified baseline data were analyzed from 23,629 participants in the Fox Insight online platform (March 2017 – February 2020), publicly accessible via the Michael J Fox Foundation Data-Exploration-Network (FoxDen). Individuals reported up to five most bothersome PD-related problems, including problem severity (score 0: none to 3: severe). Descriptive analyses examined baseline responses overall and by self-reported years since diagnosis (early:≤3 years, n=12,040; mid: >3 to ≤10 years, n=8,386; late: >10 years, n=3,203).

**Results:** Overall, the three most common bothersome symptom-domains were postural instability (59%), tremor (49%), and cognition (39%). Comparing % of patients reporting their most bothersome problems by early/mid/late years since diagnosis groups, reports were: tremor 56/46/31, postural instability 54/60/72, and cognition 36/39/46. Other bothersome problems included mood, pain, fatigue, and sleep (each reported by ~30%). The severity of PROPs was higher among participants with longer disease duration, compared to participants with early disease.

**Conclusions:** Among a large sample of PD patients who shared their symptoms online, both motor and non-motor bothersome problems were reported and varied in frequency by duration of PD. Reports of tremor as the most bothersome problem were highest for earlier

patients, whereas reports of postural instability or cognition were highest for patients with longer time since diagnosis. These findings provide a cross-sectional natural history of most bothersome PD symptoms that will be explored with additional longitudinal data in order to improve clinical care and inform patient-focused drug development.

**Study Supported by:** The Michael J Fox Foundation for Parkinson's Disease Research (New York, NY) and Biogen (Cambridge, MA)

#### Title: Dance Is an Accessible Physical Activity for People with Parkinson's Disease.

Citation: Parkinson's Disease (20420080); Oct 2021 ; p. 1-20

**Author(s):** Emmanouilidis ; Hackney, Madeleine E.; Slade, Susan C; Heng, Hazel; Jazayeri, Dana; Morris, Meg E.

**Objective:** To evaluate the outcomes of face-to-face, digital, and virtual modes of dancing for people living with Parkinson's disease (PD).

**Design:** Systematic review informed by Cochrane and PRIMSA guidelines. Data Sources. Seven electronic databases were searched: AMED, Cochrane, PEDro, CINHAL, PsycINFO, EMBASE, and MEDLINE.

**Methods:** Eligible studies were randomised controlled trials (RCT) and other trials with quantitative data. The PEDro scale evaluated risk of bias for RCTs. Joanna Briggs Institute instruments were used to critically appraise non-RCTs. The primary outcome was the feasibility of dance interventions, and the secondary outcomes included gait, balance, quality of life, and disability.

**Results:** The search yielded 8,327 articles after duplicates were removed and 38 met the inclusion criteria. Seven were at high risk of bias, 20 had moderate risk of bias, and 11 had low risk of bias. There was moderately strong evidence that dance therapy was beneficial for balance, gait, quality of life, and disability. There was good adherence to digital delivery of dance interventions and, for people with PD, online dance was easy to access.

**Conclusion:** Dancing is an accessible form of exercise that can benefit mobility and quality of life in people with PD. The COVID-19 pandemic and this review have drawn attention to the benefits of access to digital modes of physical activity for people living with chronic neurological conditions.

#### Title: Demoralization and Quality of Life of Patients with Parkinson Disease.

**Citation:** Psychotherapy & Psychosomatics; Nov 2021; vol. 90 (no. 6); p. 415-421 **Author(s):** Zhu ; Kohn, Robert; Patel, Amar; Koo, Brian B.; Louis, Elan D.; de Figueiredo, John M.; Koo, Brian B; Louis, Elan D; de Figueiredo, John M

**Introduction:** Demoralization is quite prevalent in patients with Parkinson disease (PD). Unrecognized or untreated, demoralization may progress, at times, to demands for euthanasia and the desire for suicide. Typically, patients with PD do not complain of being "demoralized"; rather, they report disruptions in the quality of their lives. Hence, early identification of disruptions in health-related quality of life (HRQoL) specifically associated with demoralization may prompt earlier recognition and treatment. Published data on such associations, however, could not be found. Alleviation of demoralization in PD is likely to improve treatment outcomes.

**Objective:** This research aimed at identifying the disruptions of HRQoL specifically associated with the demoralization of patients with PD.

**Methods:** Consecutive general hospital outpatients with PD (n = 95) were assessed for: demoralization, with the Diagnostic Criteria for Psychosomatic Research Demoralization Scale (DCPR-D) and the Demoralization Scale (DS); depression, with the Patient Health Questionnaire-9 (PHQ-9); HRQoL, with the Parkinson Disease Questionnaire-Short Form (PDQ-8); sociodemographic variables; medical comorbidities; PD severity; and types of treatment.

**Results:** The prevalence of demoralization was 19%. Regression analyses showed that demoralization was significantly more likely to be experienced by participants who had difficulty with mobility and felt embarrassed in public due to having PD. Demoralization explained HRQoL over and above depression.

**Conclusions:** Stigma and perceived difficulty with mobility are associated with demoralization of PD patients, and they may signal the need for psychotherapeutic and behavioral interventions to prevent the progression to helplessness, hopelessness, demands for euthanasia, and desire for suicide.

Title: Development of a Parkinson's disease specific falls questionnaire.

Citation: BMC Geriatrics; Oct 2021; vol. 21 (no. 1); p. 1-18

**Author(s):** Harris ; Duckham, Rachel L.; Daly, Robin M.; Abbott, Gavin; Johnson, Liam; Rantalainen, Timo; Teo, Wei-Peng

**Background:** Falls are a major health burden for older adults with Parkinson's disease (PD), but there is currently no reliable questionnaire to capture the circumstances and consequences of falls in older adults with PD. This study aimed to develop a PD-specific falls questionnaire and to evaluate its test-retest reliability in older adults with PD.

**Methods:** A novel PD-specific falls questionnaire (PDF-Q) was developed in two modes (online and paper-based version) and used to assess falls and near-falls events over the past 12-months. Questions were agreed upon by an expert group, with the domains based on previous falls-related questionnaires. The questions included the number and circumstances (activities, location and direction) of falls and near-falls, and consequences (injuries and medical treatment) of falls. The PDF-Q was distributed to 46 older adults with PD (online n = 30, paper n = 16), who completed the questionnaire twice, 4 weeks apart. Kappa ( $\kappa$ ) statistics were used to establish test-retest reliability of the questionnaire items.

**Results:** Pooled results from both questionnaires for all participants were used to assess the overall test-retest reliability of the questionnaire. Questions assessing the number of falls ( $\kappa = 0.41$ ) and the number of near-falls ( $\kappa = 0.51$ ) in the previous 12-months demonstrated weak agreement, while questions on the location of falls ( $\kappa = 0.89$ ) and near-falls ( $\kappa = 1.0$ ) demonstrated strong to almost perfect agreement. Questions on the number of indoor ( $\kappa = 0.86$ ) and outdoor ( $\kappa = 0.75$ ) falls demonstrated moderate to strong agreement, though questions related to the number of indoor ( $\kappa = 0.47$ ) and outdoor ( $\kappa = 0.56$ ) near-falls demonstrated weak agreement. Moderate to strong agreement scores were observed for the most recent fall and near-fall in terms of the direction (indoor fall  $\kappa = 0.80$ ; outdoor fall  $\kappa = 0.81$ ; near-fall  $\kappa = 0.54$ ), activity (indoor fall  $\kappa = 0.70$ ; outdoor fall  $\kappa = 0.82$ ; near-fall  $\kappa = 0.56$ ).

**Conclusions:** The new PDF-Q developed in this study was found to be reliable for capturing the circumstances and consequences of recent falls and near-falls in older adults with PD.

#### Title: Digital assessment at home - mPower against Parkinson disease.

**Citation:** Nature Reviews Neurology; Nov 2021; vol. 17 (no. 11); p. 661-662 **Author(s):** Maetzler ; Pilotto, Andrea

**Abstract:** Results of a new study have shown the enormous potential of smartphonecollected, real-world data for the differentiation of patients with Parkinson disease from controls. This study spearheads a new phase for the evaluation of symptoms associated with Parkinson disease that is patient-centred, digital, objective, continuous and relevant to everyday life.

#### Title: Drooling rating scales in Parkinson's disease: A systematic review.

**Citation:** Parkinsonism & Related Disorders; Oct 2021; vol. 91 ; p. 173-180 **Author(s):** Nascimento ; Carmona, Jaqueline; Mestre, Tiago; Ferreira, Joaquim J.; Guimarães, Isabel

**Background:** Drooling is a clinically relevant non-motor symptom of people with Parkinson's disease (PwP). Several drooling rating scales are available. Nevertheless, the compelling scientific evidence supporting their validity is limited. This study aims to evaluate clinical rating scales for drooling, assessing their characteristics, clinimetric properties, and clinical utility classification.

**Methods:** A systematic review was undertaken. Two reviewers performed independent literature searches using the CENTRAL®, CINAHL®, Embase®, MEDLINE®, SciElo®, and SPEECH BITE® databases. We used consensus-based standards for the selection of health measurement instruments (COSMIN) and the International Parkinson's disease and the Movement Disorders (MDS) criteria to evaluate the included rating scales.

**Results:** The following six rating scales were identified: Drooling Impact Scale (DIS), Sialorrhea Scoring Scale (SSS), Drooling Severity and Frequency Scale (DSFS), Drooling Rating Scale (DRS), Sialorrhea Clinical Scale for Parkinson Disease (SCS-PD), and the Radboud Oral Motor inventory for Parkinson's disease - Saliva (ROMP-saliva). The scales had heterogeneous characteristics: (i) not all were created/adapted for PwP; (ii) different dimensions associated with drooling are assessed; (iii) cross-cultural adaptations are limited to some languages. The clinimetric properties showed: (i) target population size limitations; (ii) incomplete reliability analysis; (iii) lack of robust validity; (iv) sensitivity to change not fully explored. Following the MDS criteria, only one tool was classified as "recommended", the ROMP-saliva.

**Conclusions:** This review provides information for an adequate selection of a drooling rating scale for clinical and/or research purposes. To date, ROMP-saliva is the only scale with substantial evidence of its clinimetric properties adequacy and data in PwP.

# Title: Effect of Foot Orthoses and Shoes in Parkinson's Disease Patients: A PRISMA Systematic Review.

Citation: Journal of personalized medicine; Nov 2021; vol. 11 (no. 11)

**Author(s):** Reina-Bueno, María; Calvo-Lobo, César; López-López, Daniel; Palomo-López, Patricia; Becerro-de-Bengoa-Vallejo, Ricardo; Losa-Iglesias, Marta Elena; Romero-Morales, Carlos; Navarro-Flores, Emmanuel

**Abstract:** Reduced plantar foot sensation, postural instability, and gait difficulties are characteristic of Parkinson's disease patients. A systematic review was carried out to determine the effect of the different types of insoles and shoes in these patients. Several databases were used to search for relevant articles reporting Parkinson's disease patients undergoing treatment with any type of insole and footwear. All titles and abstracts were reviewed independently by two reviewers and the available data were extracted. The study eligibility criteria were any type of experimental study that included Parkinson's disease patients treated with any type of insole or footwear. Eight studies were selected. Interventions used were textured insoles, footwear modifications, and habitual footwear. Three different outcomes were evaluated in each study: gait parameters, balance, and plantar sensation. According to the data available from this systematic review, the most important conclusion is that more controlled studies are needed in this research field. There are indications to suggest that textured insoles have positive effects on gait parameters, balance, and plantar sensation in Parkinson's disease patients.

### Title: Effect of Resistance Exercise on Body Structure and Function, Activity, and Participation in Individuals With Parkinson Disease: A Systematic Review.

**Citation:** Archives of Physical Medicine & Rehabilitation; Oct 2021; vol. 102 (no. 10); p. 1998-2011

Author(s): Braz de Oliveira ; Maria dos Reis, Luciana; Pereira, Natalia Duarte

Abstract: To investigate the effects of resistance exercise (RE) on body structure and function, activity, and participation in individuals with Parkinson Disease (PD) in the mild to moderate stages. Medline, Embase, Web of Science, The Cochrane Library, Lilacs, and PEDro were searched from inception until June 2020 using the terms "Parkinson Disease," "Exercise," "Resistance Training," "Muscle Strength," "Cardiorespiratory Fitness," "Postural Balance," "Gait," and "Quality of Life." We included studies conducted in individuals with PD involving RE compared with a control group. Two independent reviewers performed the selection process based on titles, abstracts, and full-text reading. In total, 270 individuals with PD were included from 10 selected studies. Two reviewers independently extracted characteristics related to participants, intervention and control types, and results. The PEDro scale was used to assess the methodological quality, and the level of evidence was analyzed and synthesized using the Grading of Recommendation, Assessment, Development, and Evaluations approach. The level of evidence for body structure and function was low and without effect for lower limb muscle strength; very low and with effect for upper limb muscle strength, cardiorespiratory fitness, and postural balance; and very low and without effect for flexibility after RE training. For activity, the evidence was very low and with effect for gait and very low and without effect for mobility. For participation (ie, guality of life) the evidence was very low and without effect. Although the level of evidence was low to very low, RE was shown to promote improvements in body structure and function (upper limb muscle strength, cardiovascular function, postural balance) and activity (gait). In contrast, RE did not significantly improve participation (quality of life). However, based on the present findings, the practice of RE can be recommended for individuals with PD in the mild to moderate stages.

#### Title: Effects of Diabetes Mellitus on the Risk of Parkinson Disease: An Updated Meta-Analysis with Cohort Studies.

Citation: Korean Journal of Adult Nursing; Oct 2021; vol. 33 (no. 5); p. 448-457

**Author(s):** Graduate Student, College of Nursing, Jeonbuk National University, Jeonju, Korea; Youngran Yang; Jeong Hee Kang

**Purpose:** This meta-analysis was conducted to analyze the effect of Diabetes Mellitus (DM) on the risk of Parkinson Disease (PD).

**Methods:** Original prospective observational studies were searched through PubMed, Cumulative Index of Nursing and Allied Health Literature (CINAHL), ProQuest, Web of Science, Science Direct, Koreanstudies Information Service System (KISS), and DBpia published up to March 2020. The Relative Risks (RRs) were calculated using the randomeffects model.

**Results:** An integrated analysis of ten large population-based cohort studies, involving 10,730,117 participants, showed that patients with DM had a 30% higher risk of PD than those without DM (pooled RR=1.30, 95% Confidence Interval [CI]=1.14~1.48). Subgroup analyses based on the characteristics of the studies were conducted, and the association between DM and PD was significant in studies conducted in Asia (RR=1.30, 95% CM.01~1.69) and Europe (RR=1.45, 95% CM.09~1.94), and for patients with DM durations less than ten years (RR=1.31, 95% CI=1.27~1.37) and stroke (RR=1.16, 95% CM.03~1.31). Each study included in the analysis had methodologically good quality and showed no evidence of publication bias.

**Conclusion:** DM resulted in a significantly increased risk of PD; therefore, prevention and early detection of PD in patients with DM should be encouraged.

Title: Effects of the Coronavirus Disease 2019 Pandemic on Motor Symptoms in Parkinson's Disease: An Observational Study.

**Citation:** Movement Disorders; Nov 2021; vol. 36 (no. 11); p. 2461-2463 **Author(s):** Kainaga ; Shirota, Yuichiro; Kodama, Satoshi; Toda, Tatsushi; Hamada, Masashi

# Title: How much time is needed in clinical practice to reach a diagnosis of clinically established Parkinson's disease?

**Citation:** Parkinsonism & Related Disorders; Nov 2021; vol. 92 ; p. 53-58 **Author(s):** Rossi ; Perez-Lloret, Santiago; Merello, Marcelo

**Introduction:** The implementation of accepted clinical diagnostic criteria has improved the accuracy of a clinical diagnosis of Parkinson's disease (PD). Time frames of 3-10 years have been empirically proposed to reach a diagnosis of clinically established PD.

**Methods:** We explored the time to a Final Clinical Diagnosis (FCD) and the factors that predict faster diagnoses in patients presenting with parkinsonism and/or tremor between 2009 and 2015 at our tertiary center. All patients underwent a standardized workout process to reach a FCD, which included an acute levodopa challenge (LDC) after the first visit.

**Results:** Among the 326 patients included, 215 (66%) received a FCD within the first six months after the LDC. A FCD was reached in 95% and 100% of patients in 33 and 108 months, respectively. PD was the FCD in 196 patients (60.1%). The FCD was reached faster in patients with a positive response to levodopa and when the FCD was PD.

**Conclusion:** The time needed to reach a final diagnosis in the clinical setting was 2.75 years in 95% of patients presenting initially with parkinsonism and/or tremor. Patients with positive responses to levodopa at the LDC, benefited from shorter delays until the FCD.

#### Title In-Home Falls Risk Assessment in Parkinson Disease: A Guide for Clinicians.

**Citation:** Archives of Physical Medicine & Rehabilitation; Oct 2021; vol. 102 (no. 10); p. 2051-2054

#### Title: Integration of palliative care in Parkinson's disease management.

**Citation:** Current Medical Research & Opinion; Oct 2021; vol. 37 (no. 10); p. 1745-1759 **Author(s):** Senderovich ; Jimenez Lopez, Briam

# Title: International Multicenter Analysis of Brain Structure Across Clinical Stages of Parkinson's Disease.

**Citation:** Movement Disorders; Nov 2021; vol. 36 (no. 11); p. 2583-2594 **Author(s):** Laansma ; Bright, Joanna K.; Al-Bachari, Sarah; Anderson, Tim J.; Ard, Tyler; Assogna, Francesca; Baquero, Katherine A.; Berendse, Henk W.; Blair, Jamie; Cendes, Fernando; Dalrymple-Alford, John C.; de Bie, Rob M.A.; Debove, Ines; Dirkx, Michiel F.; Druzgal, Jason; Emsley, Hedley C.A.; Garraux, Gäetan; Guimarães, Rachel P.; Gutman, Boris A.; Helmich, Rick C.

**Objective:** Using a multicenter approach and harmonized analysis methods, we aimed to shed light on Parkinson's disease stage-specific profiles of pathology, as suggested by in vivo neuroimaging.

**Methods:** Individual brain MRI and clinical data from 2357 Parkinson's disease patients and 1182 healthy controls were collected from 19 sources. We analyzed regional cortical thickness, cortical surface area, and subcortical volume using mixed-effects models. Patients grouped according to Hoehn and Yahr stage were compared with age- and sexmatched controls. Within the patient sample, we investigated associations with Montreal Cognitive Assessment score.

**Results:** Overall, patients showed a thinner cortex in 38 of 68 regions compared with controls ( $d_{max} = -0.20$ ,  $d_{min} = -0.09$ ). The bilateral putamen ( $d_{left} = -0.14$ ,  $d_{right} = -0.14$ ) and left amygdala (d = -0.13) were smaller in patients, whereas the left thalamus was larger (d = 0.13). Analysis of staging demonstrated an initial presentation of thinner occipital, parietal, and temporal cortices, extending toward rostrally located cortical regions with increased disease severity. From stage 2 and onward, the bilateral putamen and amygdala were consistently smaller with larger differences denoting each increment. Poorer cognition was associated with widespread cortical thinning and lower volumes of core limbic structures.

**Conclusions:** Our findings offer robust and novel imaging signatures that are generally incremental across but in certain regions specific to disease stages. Our findings highlight the importance of adequately powered multicenter collaborations. © 2021 The Authors. *Movement Disorders* published by Wiley Periodicals LLC on behalf of International Parkinson and Movement Disorder Society

#### Title: Lower urinary tract dysfunction in Parkinsonian syndromes.

**Citation:** Neurological Sciences; Oct 2021; vol. 42 (no. 10); p. 4045-4054 **Author(s):** Vichayanrat ; Hentzen, Claire; Batla, Amit; Simeoni, Sara; Iodice, Valeria; Panicker, Jalesh N. **Purpose of Review:** The aim of this review is to outline the clinical presentation, pathophysiology and evaluation of lower urinary tract (LUT) dysfunction in Parkinson's disease and other parkinsonian syndromes including multiple system atrophy, dementia with Lewy bodies, progressive supranuclear palsy and corticobasal degeneration.

**Recent Findings:** LUT dysfunction commonly occurs in neurological disorders, including patients with parkinsonian syndromes. The pattern of LUT dysfunction and its severity are variable, depending upon the site of lesion within the neural pathways. Parkinsonian syndromes are broadly divided into Parkinson's disease (PD) and a typical parkinsonian syndromes such as multiple system atrophy (MSA), dementia with Lewy bodies (DLB), progressive supranuclear palsy (PSP) and corticobasal degeneration (CBD). Different parkinsonian syndromes have distinct clinical features (e.g. dysautonomia, early dementia, supranuclear gaze palsy, higher cortical signs), and the pattern of LUT dysfunction and its severity can differ.

**Conclusions:** LUT dysfunction is a common feature in patients with parkinsonian syndromes. Recognising the pattern of LUT dysfunction during the assessment of these patients can help management and possibly facilitate an earlier diagnosis.

# Title: Mild Parkinsonian Signs: A Systematic Review of Clinical, Imaging, and Pathological Associations.

**Citation:** Movement Disorders; Nov 2021; vol. 36 (no. 11); p. 2481-2493 **Author(s):** Buchanan ; Richards, Marcus; Schott, Jonathan M.; Schrag, Anette

Abstract: Mild parkinsonian signs (MPS) have been widely studied during the past 3 decades and proposed as a risk marker for neurodegenerative disease. This systematic review explores the epidemiology, clinical and prognostic associations, radiological features, and pathological findings associated with MPS in older adults free from neurodegenerative disease. We find that MPS as currently defined are strongly associated with increasing age and increased risk of development of Parkinson's disease (PD), all-cause dementia, disability, and death. Positive associations with later PD are found mainly in younger populations and those with other features of prodromal PD. There are currently no consistent radiological findings for MPS, and pathological studies have shown that MPS, at least in the oldest old, are often underpinned by mixed neuropathologies, including those associated with Alzheimer's disease, cerebrovascular disease, nigral neuronal loss, and Lewy bodies. Different subcategories of MPS appear to convey varying risk and specificity for PD and other outcomes. MPS overall are not specific for parkinsonian disorders and, although associated with increased risk of PD, can reflect multiple pathologies, particularly in older individuals. "Mild motor signs" appears a more appropriate term to avoid prognostic and pathological implications, and larger future studies to prospectively examine outcomes and associations of specific MPS subcategories are required. © 2021 The Authors, Movement Disorders published by Wiley Periodicals LLC on behalf of International Parkinson and Movement Disorder Society

#### Title: Musculoskeletal pain in Parkinson's disease: a narrative review.

**Citation:** Neurodegenerative Disease Management; Oct 2021; vol. 11 (no. 5); p. 373-385 **Author(s):** Tueth ; Duncan, Ryan P **Abstract:** The prevalence of musculoskeletal (MSK) pain in people with Parkinson's disease (PD) is higher than that of age-matched controls. In this review, we outline what is known about MSK pain in PD, focusing on the neck, shoulder, knee, hip and low back. We also compare what is known about MSK pain in PD to what is known in older adults without PD. Finally, we outline areas of for future research related to MSK pain in people with PD. Joint pain in people with Parkinson's disease (PD) is more common than other healthy older adults. In this paper, we describe what is known about joint pain in PD, focusing on the neck, shoulder, knee, hip and low back. We also compare how much is known about pain in PD versus how much is known about pain in older adults without PD. Finally, we suggest ways future researchers can help the world better understand pain in PD. Musculoskeletal pain in Parkinson's disease. What do we know about it and how might we study it going forward?

### Title: Non-Immersive Virtual Reality to Improve Balance and Reduce Risk of Falls in People Diagnosed with Parkinson's Disease: A Systematic Review.

Citation: Brain sciences; Oct 2021; vol. 11 (no. 11)

**Author(s):** García-López, Héctor; Obrero-Gaitán, Esteban; Castro-Sánchez, Adelaida María; Lara-Palomo, Inmaculada Carmen; Nieto-Escamez, Francisco Antonio; Cortés-Pérez, Irene

**Objective:** To evaluate the effectiveness of non-immersive virtual reality in reducing falls and improving balance in patients diagnosed with Parkinson's disease.

**Methods:** The following databases were searched: PUBMED, PEDro, Scielo, CINAHL, Web of Science, Dialnet, Scopus and MEDLINE. These databases were searched for randomized controlled trials published using relevant keywords in various combinations. The methodological quality of the articles was evaluated using the PEDro scale.

**Results:** A total of 10 studies with a total of 537 subjects, 58.7% of which (n = 315) were men, have been included in the review. The age of the participants in these studies ranged between 55 and 80 years. Each session lasted between 30 and 75 min, and the interventions lasted between 5 and 12 weeks. These studies showed that non-immersive virtual reality is effective in reducing the number of falls and improving both static and dynamic balance in patients diagnosed with Parkinson's disease. Results after non-immersive virtual reality intervention showed an improvement in balance and a decrease in the number and the risk of falls. However, no significant differences were found between the intervention groups and the control groups for all the included studies regarding balance.

**Conclusions:** There is evidence that non-immersive virtual reality can improve balance and reduce the risk and number of falls, being therefore beneficial for people diagnosed with Parkinson's disease.

Title: Pharmacotherapeutic management of Parkinson's disease inpatients: how about asking hospital pharmacists?

Citation: European Journal of Hospital Pharmacy; Nov 2021; vol. 28

**Author(s):** Etxebarria ; Palacios-Zabalza, Itziar; Ibarrondo, Itziar; Domingo-Echaburu, Saioa; Hernandez, Rafael; Isla, Arantxa; Solinis, Marian

**Introduction:** Parkinson's disease (PD) is considered to be the fastest growing neurological disorder in the world. Patients with PD are hospitalised more frequently, have longer admissions and experience more complications during hospitalisation than age-matched

control groups. The incorrect timing of levodopa administration and prescription of contraindicated antidopaminergic drugs are the most important risk factors for motor function deterioration during hospital admission, and have been associated with longer hospital stays and even increased mortality. Despite their crucial role in pharmacotherapy, little attention has been paid to the perspective of hospital pharmacists. The objective of this study was to identify key issues in the pharmacotherapeutic management of inpatients with PD by the implementation of a national Spanish survey specifically designed to analyse the perspective of hospital pharmacists.

**Methods:** An internet-based questionnaire covering the following areas was designed: hospital and participant characteristics, drug formulary, medication compliance and reconciliation, protocols and contraindicated drugs and areas for improvement.

**Results:** A total of 76 pharmacists from 59 hospitals answered the survey. Some weaknesses were identified in the availability of drugs: (1) pharmacy services closed at certain times (86.4%); (2) low variety of antiparkinsonian drugs (18.4% store >21 different drugs); (3) delay in antiparkinsonian drug administration if unavailable (>12 hours in 39.5% of cases); (4) lack of flexibility in administration times; (5) low availability of transdermal rotigotine and subcutaneous apomorphine (<50%). The participants ranked highly the designing of specific protocols for patients with PD and implementation of concrete actions to optimise PD inpatient pharmacotherapy.

**Conclusions:** The participants detected some improvement opportunities and proposed realistic and applicable recommendations and strategies aiming to enhance the safety of patients with PD. Protocols for antiparkinsonian drug interchange, administration timing and nil by mouth status, medication reconciliation, and handling nausea/vomiting or psychotic symptoms are considered the main improvement areas.

# Title: Physical Activity in De Novo Parkinson Disease: Daily Step Recommendation and Effects of Treadmill Exercise on Physical Activity.

Citation: Physical Therapy; Oct 2021; vol. 101 (no. 10); p. 1-11

**Author(s):** Handlery ; Stewart, Jill Campbell; Pellegrini, Christine; Monroe, Courtney; Hainline, Garrett; Flach, Alicia; Handlery, Kaci; Fritz, Stacy

**Objective:** People with Parkinson disease (PD) have low physical activity (PA) levels and are at risk for cardiovascular events. The 3 purposes of this study were to determine a step threshold that corresponds to meeting aerobic PA guidelines, determine effects of treadmill exercise on PA, and quantify the relationship between changes in daily steps and fitness.

**Methods:** This was a secondary analysis of the Study in Parkinson's Disease of Exercise trial, which randomized participants to high-intensity treadmill exercise, moderate-intensity treadmill exercise, or usual care for 6 months. Daily steps and moderate- to vigorousintensity PA (MVPA) were assessed at baseline and once each month using an activity monitor. Fitness was assessed via graded exercise test at baseline and at 6 months. A step threshold that corresponds to meeting PA guidelines was determined by receiver operating characteristic curves. The effect of treadmill exercise on PA was examined in those below the step threshold (ie, the least active participants). Pearson r correlations determined the relationship between daily steps and fitness.

**Results:** Individuals with de novo PD (n = 110) were included. Those with  $\geq$ 4200 steps were 23 times more likely (95% CI = 7.72 to 68) to meet PA guidelines than those with <4200 steps. For those with <4200 steps at baseline (n = 33), only those in the high-intensity exercise group increased daily steps (median of differences = 1250 steps, z = -2.35) and MVPA (median of differences = 12.5 minutes, z = -2.67) at 6 months. For those with <4200 steps, changes in daily steps were not associated with changes in fitness (r = .183).

**Conclusion:** In people with PD and <4200 daily steps at baseline, high-intensity treadmill exercise increased daily steps and MVPA, but these changes were not associated with changes in fitness. Impact People with PD should be encouraged to take ≥4200 daily steps to meet PA guidelines through walking.

Title: Psychotherapy for the Treatment of Anxiety and Depression in Patients with Parkinson Disease: A Meta-Analysis of Randomized Controlled Trials.

**Citation:** Journal of the American Medical Directors Association; Nov 2021; vol. 22 (no. 11); p. 2289-2289

Author(s): Hong ; Tan, Shennie; Huang, Tsai-Wei

Abstract: Anxiety and depression are major psychiatric nonmotor symptoms (NMSs) of Parkinson disease (PD). Although several studies have investigated the effects of psychotherapeutic interventions, particularly cognitive-behavioral therapy (CBT), for alleviating anxiety and depression in patients with PD, the findings have been inconclusive because of the small sample size and the lack of a unified protocol for such treatments. Thus, the present meta-analysis of randomized controlled trials (RCTs) was conducted to assess the effect of psychotherapy on PD-related anxiety and depression. Systematic review and meta-analysis. Relevant RCTs were extracted from PubMed, Embase, Cumulative Index to Nursing and Allied Health Literature, and Cochrane Library databases. This study was registered in PROSPERO under the number CRD 42020165052. The primary and secondary outcomes were changes in the anxiety score and depressive symptoms, respectively. Fourteen RCTs including 507 patients with PD were analyzed. The interventions were classified as CBT and non-CBT. CBT significantly reduced anxiety at the end of the study (standardized mean difference = -0.85, 95% confidence interval = -1.12 to -0.58, P <.001, I 2 = 0%), whereas non-CBT did not. Greater heterogeneity in the effects of non-CBT treatment was observed. CBT was significantly beneficial for depression (standardized mean difference = -0.83, 95% confidence interval = -1.26 to -0.40, P < .001, I 2 = 55%). Despite the greater heterogeneity in the effects, non-CBT interventions were also effective in alleviating depressive symptoms. CBT is effective for the management of anxiety and depression in patients with PD. Routine treatment for patients with this condition is strongly recommended.

#### Title: Sleep apnea syndrome and subthalamic stimulation in Parkinson's disease.

Citation: Sleep Medicine; Oct 2021; vol. 86 ; p. 106-112

**Author(s):** Bargiotas ; Bargiotas, Ioannis; Debove, Ines; Lachenmayer, M. Lenard; Vayatis, Nicolas; Schuepbach, W.M. Michael; Bassetti, Claudio L.A.

**Objectives:** The association between Parkinson's disease (PD) and sleep apnea syndrome (SAS) is not fully elucidated and very few studies reported on SAS outcome after deep brain stimulation (DBS). Here, we compare the clinical profile of PD patients with and without SAS and assess, for the first time, the value of pre-DBS SAS as predictor of post-DBS outcome in PD.

**Methods:** Fifty patients were grouped into PD with SAS (PD-SAS+,n = 22) and without (PD-SAS-,n = 28), based on the Apnea-Hypopnea-Index (AHI≥5) in polysomnography. We used novel multivariate statistical models to compare pre-DBS profiles and assess post-DBS motor, non-motor and quality of life (QoL) changes in both groups.

**Results:** In the entire cohort, 44% of patients had at least mild SAS (AHI≥5), while 22% had at least moderate (AHI≥15). Mean AHI was 11/h (NREM-AHI = 10.2/h and REM-AHI = 13.5/h). The two groups had equal demographics and PD characteristics, and did not differ in respect to unified Parkinson's disease rating scale (UPDRS)-IIOFF, Body-Mass-Index, polysomnographic features, RBD, depression, sleepiness and QoL scores. The PD-SAS+ group had significantly higher scores in UPDRS-IIIOFF (41.1 ± 17.7 vs.  $30.9 \pm 11.7$ ,p < 0.05) compared to PD-SAS- group. The groups did not differ in respect to post-DBS change in UPDRS-II, UPDRS-III, Epworth sleepiness scale, Hamilton depression rating scale and PDQ39 scores. Positive airway pressure therapy had no impact on post-DBS outcome.

**Conclusions:** In patients with PD and candidates for DBS, the presence of SAS is associated with increased motor signs, but not with a specific non-motor, QoL or sleep-wake profile. The presence of SAS prior to STN-DBS is not associated with worse outcome after surgery.

## Title: Social and psychological impact of the COVID-19 pandemic on people with Parkinson's disease: a scoping review

**Citation:** Public Health; Oct 2021; vol. 199 ; p. 77 **Author(s):** Brooks, SK; Weston, D; Greenberg, N

**Objectives:** The COVID-19 pandemic caused countries across the globe to impose restrictions to slow the spread of the virus, with people instructed to stay at home and reduce contact with others. This reduction in social contact has the potential to negatively impact mental health and well-being. The restrictions are particularly concerning for people with existing chronic illnesses such as Parkinson's disease, who may be especially affected by concerns about the pandemic and associated reduction of social contact. The aim of this review was to synthesise published literature on the impact of the COVID-19 pandemic on the social and psychological well-being of people with Parkinson's disease.

Study Design: The design of this study is a scoping review.

**Methods:** We searched five electronic databases for English language articles containing primary data on this topic.

**Results:** Thirty-one relevant studies were found and included in the review. Six main themes were identified: impact of the pandemic on physical and mental health; COVID-19 concerns; access to health care; impact on daily and social activities; impact on physical activity and impact on caregivers. Levels of perceived risk of COVID-19 differed across studies, but most participants had adopted preventive measures such as staying at home and reducing social contacts. Participants in many studies reported a discontinuation of regular healthcare appointments and physiotherapy, as well as concerns about being able to obtain medication. Loss of daily activities and social support was noted by many participants. There was mixed evidence on the impact of the pandemic on physical exercise, with some studies finding no change in physical activity had poorer mental health and greater worsening of symptoms. Caregivers of people with Parkinson's disease were more likely to be negatively affected by the pandemic if they cared for people with complex needs such as additional mental health problems.

**Conclusions:** The COVID-19 pandemic has had negative effects on the physical and mental health of people with Parkinson's disease, perhaps due to disruption of healthcare services, loss of usual activities and supports and reduction in physical activity. We make recommendations for policy, practice and future research.

## Title: Telerehabilitation for Individuals with Parkinson's Disease and a History of Falls: A Pilot Study.

**Citation:** Physiotherapy Canada; Oct 2021; vol. 73 (no. 4); p. 343-350 **Author(s):** Lavoie ; Bouchard, Manon; Turcotte, Stéphane; Tousignant, Michel

**Purpose:** Falls among persons with Parkinson's disease (PD) decrease health-related quality of life (HRQOL) and are a risk factor for hospitalization. Although physiotherapy can decrease falls and improve functional capacity, people living in remote areas have limited access to such services. This pilot study aimed to document the feasibility of a physiotherapy telerehabilitation intervention for patients with PD and to estimate the change over time in functional capacity, HRQOL, and the rate of falls.

**Methods:** Eleven persons with PD participated in an 8-week physiotherapy telerehabilitation intervention. We assessed feasibility by computing retention rate and assiduity, number of undesirable health events, and technical problems. We assessed functional capacity, HRQOL, and falls at baseline, after the intervention, and at the 3-month follow-up.

**Results:** Retention rate and assiduity were 91% and 100%. We resolved all technical problems (21.9% of sessions). No undesirable health events occurred. Point estimates suggest an improvement in functional capacity (Mini-BESTest) and HRQOL. Forty percent of participants fell during the intervention phase.

**Conclusion:** Physiotherapy telerehabilitation is feasible and safe for persons with PD. Improvements in functional capacity and HRQOL must be confirmed with an appropriate design.

#### Title: Trends in Mortality From Parkinson Disease in the United States, 1999-2019.

Citation: Neurology; Nov 2021; vol. 97 (no. 20)

**Author(s):** Rong ; Xu, Guifeng; Liu, Buyun; Sun, Yangbo; Snetselaar, Linda G.; Wallace, Robert B.; Li, Benchao; Liao, Jingling; Bao, Wei

**Background and Objectives:** The mortality from Parkinson disease (PD) and its long-term trends in the United States in recent decades remains unknown. This study aimed to describe the trends in PD mortality in the United States from 1999 to 2019.

**Methods:** We used data from the National Vital Statistics System, a nationwide, populationbased death registry, to determine national trends in PD mortality, overall and by age, sex, race/ethnicity, urban-rural classification, and geographic location. Analyses focused on the data from 479,059 deaths due to PD from 1999 to 2019. Joinpoint regression was performed to examine temporal trends in age-adjusted death rates.

**Results:** The age-adjusted mortality from PD increased from 5.4 (95% confidence interval [CI] 5.3-5.5) per 100,000 population in 1999 to 8.8 (95% CI, 8.7-8.9) per 100,000 population in 2019, with an average annual percent change of 2.4% (95% CI, 1.8%-3.0%). From 1999 to 2019, PD mortality increased significantly across all age groups, both sexes, various racial/ethnic groups, and different urban-rural classifications. The US states and District of Columbia with reported death rates all experienced an increase in PD mortality. Significant differences by sex and race/ethnicity were noted. Age-adjusted PD mortality rates were twice as high in men as in women and were greater in White individuals than those from other racial/ethnic groups.

**Discussion:** From 1999 to 2019, the mortality from PD in the United States has increased significantly. The increase was regardless of age, sex, race/ethnicity, urban-rural

classification, and geographic location. A comprehensive evaluation of long-term trends in PD mortality is important for health care priority setting.

Title: Wearable sensors in the diagnosis and study of Parkinson's disease symptoms: a systematic review.

**Citation:** Journal of Medical Engineering & Technology; Oct 2021; vol. 45 (no. 7); p. 532-545

**Author(s):** Albán-Cadena ; Villalba-Meneses, Fernando; Pila-Varela, Kevin O.; Moreno-Calvo, Alejandro; Villalba-Meneses, Carlos P.; Almeida-Galárraga, Diego A.

**Abstract:** Nowadays, there are several diseases which affect different systems of the body, producing changes in the correct functioning of the organism and the people lifestyles. One of them is Parkinson's disease (PD), which is defined as a neurodegenerative disorder provoked by the destruction of dopaminergic neurons in the brain, resulting in a set of motor and non-motor symptoms. As this disease affects principally to ancient people, several researchers have studied different treatments and therapies for stopping neurodegeneration and diminishing symptoms, to improve the quality patients' lives. The most common therapies created for PD are based on pharmacological treatment for controlling the degeneration advance and the physical ones which do not reveal the progress of patients. For this reason, this review paper opens the possibility for using wearable motion capture systems as an option for the control and study of PD. Therefore, it aims to (1) study the different wearable systems used for capture the movements of PD patients and (2) determine which of them bring better results for monitoring and assess PD people. For the analysis, it uses papers based on experiments that prove the functioning of several motion systems in different aspects as monitoring, treatment and diagnose of the disease. As a result, it works with 30 papers which describe the factors mentioned before. Additionally, the paper uses journals and literature review about the pathology, its characteristics and the function of wearable sensors for the correct understanding of the topic.

#### Sources Used:

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

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