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Parkinson's Disease

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September 2025

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Book a session today at https://forms.office.com/e/HyiSXfDaYV (these sessions will be held on a monthly basis)

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1. **Use of Wearable Sensors to Assess Fall Risk in Neurological Disorders: Systematic Review**

Authors: Bonanno, Mirjam;Ielo, Augusto;De Pasquale, Paolo;Celesti, Antonio;De Nunzio, Alessandro Marco;Quartarone, Angelo and Calabro, Rocco Salvatore

Publication Date: Aug 18 ,2025

Journal: JMIR MHealth and UHealth 13, pp. e67265

Abstract: BACKGROUND: Assessing fall risk, especially in individuals with neurological disorders, is essential to prevent hospitalization, hypomobility, and reduced functional independence. Wearable sensors are increasingly used in neurorehabilitation, as they enable unsupervised fall risk assessment by providing continuous monitoring during daily functional tasks, thereby offering a reflection of the individual's real-world fall risk. OBJECTIVE: We systematically reviewed the literature on reliable biomechanical gait parameters detected with wearable sensors to assess fall risk in neurological disorders, focusing on patients with Parkinson disease, multiple sclerosis, stroke, or Alzheimer disease. In addition, we examined the latest advancements in wearable sensor technology, including best practices for device placement as well as data processing and analysis. METHODS: We conducted a comprehensive systematic search for relevant peer-reviewed articles published up to April 18, 2025, using PubMed, Web of Science, Embase, and IEEE Xplore, which are the most used databases in the fields of health and bioengineering. RESULTS: The 19 included studies

involved 2630 patients with neurological disorders, including 226 (8.59%) with multiple sclerosis (n=7, 37% studies), 2305 (87.64%) with Parkinson disease (n=8, 53% studies), 51 (1.94%) with stroke (n=3, 16% studies), and 48 (1.83%) with Alzheimer disease or cognitive impairment (n=1, 5% study). CONCLUSIONS: This review highlights the role of wearable technologies in assessing fall risk in patients with neurological disorders. Although the included studies showed variation in methods and a focus on technology over clinical context, the lack of standardization reflects ongoing advancements, which may be seen as a strength. TRIAL REGISTRATION: PROSPERO CRD42023463944; https://www.crd.york.ac.uk/PROSPERO/view/CRD42023463944.

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2. **Clinical predictors of speech changes after subthalamic neurostimulation in Parkinson's disease.**

Authors: Cavallieri F.;Bove F.;Zampogna A.;Castrioto A.;Meoni S.;Gessani A.;Schmitt E.;Pelissier P.;Valzania F.;Suppa A.;Pinto S.;Chabardes S.;Fraix V. and Moro, E.

Publication Date: 2025

Journal: Neurological Sciences (pagination), pp. Date of Publication: 2025

Abstract: Objective: To identify preoperative clinical predictive factors of postoperative speech changes in Parkinson's disease (PD) patients with bilateral subthalamic nucleus deep brain stimulation (STN-DBS). Method(s): Demographic variables, neuroimaging data, and clinical characteristics were retrospectively collected from consecutive PD patients, before, 1 and 10-years after bilateral STN-DBS at the Grenoble University Hospital (France) from 1993 to 2015. Predictors of postoperative speech changes (demographic, clinical and MRI variables) were assessed with univariate and multivariate logistic regression analyses. We considered as "event" a worsening of speech subscore (UPDRS item 18; MDS-UPDRS item 3.1) in the postoperative on-stimulation/off-medication (1-year follow-up) or under chronic treatment (10-years follow-up) conditions compared with the preoperative off-medication condition. Result(s): 324 PD patients (males: 196; disease duration at surgery: 11.10 [+/- 4.13] years; age at surgery: 56.25 [+/- 8.52] years) were included in the analysis. Overall, the speech item of the clinical rating did not change in 138 patients (42.6%), it improved in 113 patients (34.9%) and worsened in 73 patients (22.50%) 1-year after surgery. The preoperative off-medication speech item score and the degree of motor improvement after surgery in the med-off condition predicted the 1-year postoperative speech change. In the long-term subgroup (n=51) the preoperative percentage of daily time spent with fluctuations was associated with long-term speech worsening. Interpretation(s): Effects of STN-DBS on speech can substantially vary in PD patients. Predictors of short-term speech deterioration appears to be related to preoperative off-medication speech impairment and degree of motor improvement after surgery.Copyright © Fondazione Societa Italiana di Neurologia 2025.

3. **Speech subtypes are associated with worsened tremor and axial symptoms in Parkinson's disease patients.**

Authors: Dos Santos, Vanessa Brzoskowski;Ravazio, Rafaela;Teixeira-Dos-Santos, Daniel;Schumacher Schuh, Artur Francisco;Mattjie, Christian;Pasquali, Joana M.;de Borba, Mauricia Denise;Barros, Rodrigo C. and Olchik, Maira Rozenfeld

Publication Date: 2025

Journal: Clinical Parkinsonism & Related Disorders 13, pp. 100373

Abstract: Background: Parkinson's disease (PD) is a heterogeneous disorder, suggesting the presence of distinct subtypes. Speech data, though easy to collect, remains underutilized in subtyping PD. Methods: Cross-sectional study with PD patients recruited from the Movement Disorders Outpatient Clinic of the Neurology Service at the University Hospital in Porto Alegre, Brazil. We included participants diagnosed with idiopathic PD and excluded participants with other disorders that could affect speech. Clinical and sociodemographic data were collected alongside MDS-UPDRS Parts II and III motor assessments. Tremor and gait-posture scores were derived from specific MDS-UPDRS items, with additional data on Deep Brain Stimulation (DBS) status and Levodopa Equivalent Daily Dose (LEDD). The tasks diadochokinesis (DDK) and monologue were recorded and acoustically analyzed using software. We compared our identified clusters using clinical data through an analysis of covariance adjusted for age, sex, and disease duration. Results: Ninety individuals with PD were included, with 61.2 (+/- 9.4) years old, 13.6 (+/- 6.6) disease duration, and 47.6 (+/- 10) age at onset. We identified three speech groups with strong separation between them, comprising 49 (mild), 13 (moderate), and 29 (severe) patients. Tremor and postural-gait stability scores differed significantly across the three clusters, with cluster 3 exhibiting higher tremor (13.42+/-10.66 vs. 7.09+/-6.62, p=0.020) and greater postural-gait instability (10.25+/-6.69 vs. 5.46+/-4.91, p=0.009) than cluster 1. These differences weren't explainable by distinct age, sex, or disease duration. Conclusion: Our speech-based clustering algorithm effectively differentiated Parkinson's disease subtypes in this sample, identifying distinct groups based on tremor and axial symptoms.

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4. **Short-term 30-day adverse events following awake versus asleep deep brain stimulation for movement disorders: a nationwide registry-based study.**

Authors: ElHajj V.G.;Nguyen R.;Ghaith A.K.;Staartjes V.E.;Mohrlen C.;ElmiTerander A. and Ali, R.

Publication Date: 2025

Journal: Brain and Spine 5(pagination), pp. Article Number: 104393. Date of Publication: 01 Jan 2025

Abstract: Introduction: Deep Brain Stimulation (DBS) is FDA-approved for the management of medically refractory movement disorders and epilepsy. We aim to assess potential differences in adverse eventsamong patients undergoing asleep versus awake DBS, to facilitate a patient centric decision-making process for the selection of ideal anesthesia modality for individuals

undergoing DBS procedures. Method(s): The ACS National Surgical Quality Improvement Program (NSQIP) database was queried for all patients undergoing DBS treatment between 2011 and 2020 in patients with a diagnosis of Parkinson's Disease, and Essential Tremor. Propensity score matching in a 2:1 ratio was performed. The primary endpoint was to quantify any short-term adverse events. Result(s): In total, 1778 patients undergoing asleep (75.7 %) and awake DBS procedures (24.3 %) were identified. The median age among included was 68.0 with most being males (65 %). After 2:1 propensity score matching there was no remaining baseline difference. 30-day complication rates were comparable between groups (2.3 % asleep vs. 0.7 % awake; p = 0.062). Similarly, there were no significant differences in 30-day readmission (3.5 % vs. 3.5 %; p = 0.96), reoperation (1.4 % vs. 0.9 %; p = 0.48), or non-home discharge (3.5 % vs. 3.0 %; p = 0.63). Median hospital length of stay did not differ significantly (0 vs. 0 days; p = 0.23). Conclusion(s): In this matched analysis using data from a prospective multicenter database of U.S. hospitals, asleep and awake DBS demonstrated comparable 30-day outcomes. No significant differences were observed in complication rates, readmissions, reoperations, discharge disposition, or length of hospital stay. These findings support clinical equipoise between the two approaches and underscore the importance of tailoring the choice of technique to individual patient characteristics and preferences.

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5. **Interventions for promoting physical activity in people with newly diagnosed Parkinson's disease: scoping review.**

Authors: Gilby J.;Kent B.;Lozano R.K. and Marsden, J.

Publication Date: 2025

Journal: Systematic Reviews 14(1) (pagination), pp. Article Number: 164. Date of Publication: 01 Dec 2025

Abstract: Background: There is increasing evidence to suggest that physical activity can slow Parkinson's progression. There is also increasing interest in non-pharmacological interventions to alleviate Parkinson's symptoms. This scoping review aimed to map and describe the evidence for interventions that promote physical activity in people with newly diagnosed Parkinson's. Method(s): Studies conducted since 2011, on adults with Parkinson's (>= 18 years), investigating the effects of non-pharmacological interventions to promote physical activity and/or exercise were considered. Interventions needed to be conducted in healthcare or healthcare-related settings for people within 5 years of Parkinson's diagnosis. Published or unpublished full-text articles since 2011 were searched in November 2023, using online focused, broad, and grey literature databases. JBI scoping review methodology was used and results presented in table format accompanied by a narrative review. Result(s): A total of 22 articles with a variety of research designs were included with 14 randomized trials, one single-site, prospective, single-arm study, two retrospective cohort studies, one case series, two case reports, and two qualitative reports. Many studies (n = 7) were conducted in outpatient clinics with the majority of interventions (n = 17) involving physiotherapists. Interventions varied widely, including aerobic exercise, balance exercise, dance, and yoga. The duration of intervention varied from 4 weeks to 8 years. Dosage of interventions varied widely from 30 to 90 min, and from twice weekly to seven times weekly. Several different outcome measures related to physical activity levels and/or physical fitness were used. The most frequent

clinician/researcher reported outcome measure was the 6-min walk test (in nine studies) and the most frequently used participant/patient reported outcome measure was the 39-item Parkinson's Disease Questionnaire (PDQ-39) (also in nine studies). The review showed limited research in identifiable cohorts with newly diagnosed Parkinson's. Sample sizes were predominantly small. In all but one study, authors interpreted their results as favoring interventions to promote physical activity for people with newly diagnosed Parkinson's. All authors recommended further studies. Conclusion(s): There is a need for more research with larger sample sizes and standardized reporting to inform the evidence base for interventions that promote physical activity in people with newly diagnosed Parkinson's. Systematic review registration: https://pearl.plymouth.ac.uk/ (http://hdl.handle.net/10026.1/20098)Copyright © The Author(s) 2025.

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6. **Effect of cognitive reserve on cognitive function and cognitive deterioration in Parkinson's disease: a longitudinal cohort study.**

Authors: Gu, Lihua;Zhang, Pengcheng;Zuo, Wenchao and Shu, Hao

Publication Date: Oct ,2025

Journal: Parkinsonism & Related Disorders 139, pp. 108001

Abstract: BACKGROUND: Previous cross-sectional work has suggested that higher cognitive reserve (CR) is associated with better cognitive performance and slower cognitive decline in Parkinson's disease (PD); however, these findings need confirmation in prospective longitudinal designs. The current study therefore examined how CR influences both cognitive function and the rate of cognitive deterioration in a longitudinal PD cohort. METHODS: This study utilized a prospective, longitudinal design and recruited participants from Tianjin Huanhu Hospital between September 2017-September 2019. PD patients were followed up for clinical assessment at an average of 2 +/- 0.6 years. RESULTS: Higher CR levels were associated with better cognitive performance and reduced cognitive decline over a 2-year follow-up period. Linear regression analysis revealed significant positive associations between CR and the 2-year change rate of Montreal cognitive assessment (MoCA) scores, with age and apolipoprotein E (APOE) genotype being significant predictors. Logistic regression indicated that CR Index (CRI) components (education, working activity, and leisure time) and intelligence quotient (IQ) were independently associated with cognitive decline risk. CONCLUSIONS: The study highlights the importance of CR in mitigating cognitive decline in PD and suggests that interventions to enhance CR could be beneficial for PD patients. Future research should focus on elucidating the underlying mechanisms and developing targeted interventions to support cognitive health in PD. Copyright © 2025 Elsevier Ltd. All rights reserved.

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7. **Is education a risk factor for Parkinson's disease?: A systematic review and meta-analysis.**

Authors: Lammer L.;Pflanz C.P.;Kirk M.;Shahabuddin A. and Bauermeister, S.

Publication Date: 2025

Journal: medRxiv (pagination), pp. Date of Publication: 03 Jul 2025

Abstract: Parkinson's disease (PD), a prevalent neurodegenerative disease, has shown a twofold increase in global prevalence over the past 25 years, making research into its causes pivotal. Curiously, higher educational attainment has often been linked to a higher risk of PD. Yet, to our knowledge, these findings have not been validated in a systematic literature review and meta-analysis. Thus, we aimed to evaluate the cumulative evidence for such a link and explore potential sources of heterogeneity in effect size estimates. We systematically searched PubMed, Psychinfo, Web of Science and Embase and performed extensive citation and similar article searches. Eligible studies included reports of non-interventional quantitative studies that assessed the association between formal education and the risk of idiopathic PD in human adults. Furthermore, we included studies that evaluated the association between educational level and PD symptom severity as a predefined secondary outcome. For the primary outcome, we performed a random-effects meta-analysis to synthesise the effect of education on PD risk. The secondary outcome was synthesised qualitatively. We conducted multiple a priori subgroup analyses to investigate potential causes of heterogeneity. Risk of bias of included studies was assessed using the QUIPS tool. This study was prospectively registered on PROSPERO, (ID: CRD420250651033). Of 23,648 identified reports, 36 papers met inclusion criteria. The majority of these studies were assessed as having moderate or high overall risk of bias. Meta-analytic findings yielded a non-significant association between formal educational attainment and risk of PD, with a pooled odds ratio (OR) of 1.09 (k = 24; 95% CI: 0.92 - 1.28). Sensitivity analyses excluding outliers yielded similar results. Subgroup analyses did not explain observed heterogeneity in the results. There was no evidence of small study effects or p-hacking. Education appeared to be associated with reduced PD symptom severity but the number and quality of studies was limited. Education is unlikely to be an independent risk factor for PD. Study heterogeneity and methodological limitations preclude firm conclusions, though. Future research should investigate if healthcare access or literacy underly any associations of education and PD. The most plausible explanation for the apparent link between the two is lacking control for multiple comparisons and a distorted discussion of the results of analyses. Funding was provided by the UK Medical Research Council and the German Academic Scholarship Foundation.

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8. **Olfaction function improves in a specialised unit for Parkinson's disease.**

Authors: Muller T.;Ohm G.;Eilert K.;Haas T.;Lutge S.;Rothe H. and Mohr, J. D.

Publication Date: 2025

Journal: Journal of Neural Transmission (pagination), pp. Date of Publication: 2025

Abstract: In-patient treatment of patients with Parkinson's disease is common in specialized units. Reports on the efficacy of this hospitalisation often focus on rating scale outcomes. They measure motor and non motor symptoms, but did not include standardised evaluation of olfaction. Objectives were to determine the effects of this therapeutic setting on motor and non motor behaviour of in-patients with Parkinson's disease. We rated disease symptoms and assessed olfaction within standardised conditions at the beginning and at the end of their

hospital stay. Motor and non motor symptoms improved. Their extent of amelioration was associated to each other. Execution of the smelling test became better. The degree of olfaction enhancement was not related to the change of motor and non motor features. Results of this observational investigation reflect the benefits of in-patient treatment in Parkinson's disease. The increased olfactory function may result from better cognitive abilities and enhanced attention as consequence of modified drug treatment.

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9. **Robotic arm vs. stereotactic frame in deep brain stimulation surgery for movement disorders: a retrospective cohort study.**

Authors: Perera, Doriam;Ramos, Pedro Roldan;Valldeoriola, Francesc;Sanchez-Gomez, Almudena;Ferres, Abel;Perez-Baldioceda, Carlos;Cabrera, Gloria;Mosteiro, Alejandra;Gomez, Lorena;Codes, Marta;Manfrelloti, Roberto and Rumia, Jordi

Publication Date: Aug 12 ,2025

Journal: Acta Neurochirurgica 167(1), pp. 219

Abstract: BACKGROUND: Recently, robotic arms have been incorporated into the implantation of electrodes for deep brain stimulation (DBS). This study aimed to determine the accuracy of brain electrode placement, initial clinical efficacy, and safety profile of the robotic arm Neuromate (Renishaw) compared to a stereotactic frame in movement disorders. METHODS: This study involved two retrospective cohorts: one cohort was operated on using a stereotactic frame and the other with a robotic arm. This study was conducted at Barcelona Hospital Clinic. RESULTS: Seventy-seven patients were included, of whom 30 underwent surgery using the robot and 47 using a stereotactic frame. The postoperative improvement percentage of the Unified Parkinson's Disease Rating Scale at 3 months was similar in both groups (robot: 71.4 +/- 18 vs. frame: 72.6% +/- 17, P = 0.82). There were no significant differences in the perioperative complications (robot: 4% vs. frame: 4.3%, P = 0.93) or in the adverse reactions related to brain stimulation and medical treatment (robot: 18% vs. frame: 25%, P = 0.53). There was a slight improvement in the anatomical-radiological accuracy of brain electrode implantation assisted by the robotic arm, measured using radial error (robot: 1.01 +/- 0.5 mm vs. frame: 1.32 +/- 0.6 mm, P = 0.03). CONCLUSIONS: Both systems (robotic and stereotactic frame) exhibited similar initial clinical efficacies and safety profiles. The use of the robotic arm Neuromate slightly improved the anatomical-radiological accuracy in the placement of DBS electrodes for movement disorders compared with the stereotactic frame. Copyright © 2025. The Author(s).

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10. **Understanding the experience of prescription charges in people living with parkinson's disease: a focus group study.**

Authors: Readman, Megan Rose;Oluseye, Ayomide;Brighton, Lisa Jane;Polden, Megan;Fairman, Ian;Parkinson, Ian;Parkinson, Caroline and Giebel, Clarissa

Publication Date: Aug 22 ,2025

Journal: BMC Public Health 25(1), pp. 2879

Abstract: BACKGROUND: In England, people aged > 60 are typically required to pay for their prescriptions. Whilst exemption criteria enable people living with specified long-term health conditions to receive free prescriptions, Parkinson's disease is omitted from this list. People with Parkinson's are often reliant upon medications, and evidence suggests that medical fees can reduce quality of life and medicine adherence. We, therefore, aimed to explore the impact of prescription charges on people with Parkinson's and their family care partners (caregivers). METHODS: This is a qualitative focus group study with people with Parkinson's and caregivers. Focus groups were semi-structured and conducted online. Participants were recruited through opportunity sampling. Eligible participants were adults aged 18 and over living in England who either (1) had a diagnosis of Idiopathic Parkinson's Disease or (2) provided unpaid care for someone with Parkinson's, including parents, adult children, siblings, or close friends. Data was analysed using reflexive thematic analysis within a critical realist paradigm. RESULTS: Five focus groups were conducted with people with Parkinson's (n = 12) and caregivers (n = 12). All focus groups comprised both people with Parkinson's and caregivers. Thematic analysis identified three overarching themes: (1) The financial toll of medication and its ripple effects; (2) Lack of inclusion and support; and (3) Difficulties of seeking support. People affected by Parkinson's disagreed with current policy and suggestions of per-prescription charge re-evaluation were expressed. CONCLUSIONS: Prescription charges have multifaceted negative impacts on people affected by Parkinson's. Current prescription charge policies, including their exemption criteria, should be reviewed, alongside initiatives to raise awareness of existing financial support systems, such as pre-payment certificates. REGISTRATION: Study protocol and analysis strategy are pre-registered on Open Science Framework (https://osf.io/y8ve5/).

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11. **Impact of a perioperative protocol for Parkinson's disease patients on use of contraindicated drugs.**

Authors: SalgadoCamara P.;De la CasaFages B.;SanchezSoblechero A.;Mateo Sierra O.;MartinBarbero M.L. and Grandas, F.

Publication Date: 2025

Journal: Neurologia (pagination), pp. Date of Publication: 2025

Abstract: Introduction: During surgical admissions, the use of antidopaminergic drugs is associated with increased morbimortality and hospital stay in patients with Parkinson's disease (PD) and other parkinsonisms. We implemented a protocol to ensure adequate perioperative pharmacological management in our center, including educational sessions and complementary tools, such as an electronic Pharmacological Alert and a Patient Information Sheet. Objective(s): The objective of this study was to analyze the changes in the prescription of contraindicated medications to PD or parkinsonism patients admitted for surgery, in the three years following implementation of the protocol, and to establish the compliance with the protocol among the medical staff involved in their hospital care over the same period. Method(s): This is an observational, analytical, prospective study with a before-after design. Result(s): Prescription of contraindicated drugs decreased significantly over the study period (from 57.8% to 20.6%; p Result(s): Prescription of contraindicated drugs decreased significantly over the study period (from 57.8% to 20.6%; p Result(s): Prescription of contraindicated drugs decreased significantly over the study period (from 57.8% to 20.6%; p

Conclusion(s): The protocol reduced the prescription of contraindicated drugs to PD and parkinsonism patients during their surgical admissions in our center. The Pharmacological Alert and Neurology clinics played a crucial role.

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12. **Examining Loneliness in People With Parkinson Disease Participating in Community-based Exercise.**

Authors: Swink L.A.;Diprinzio D.;Brown J.;Novak D.;Christiansen C.L. and Manago, M. M.

Publication Date: 2025

Journal: Journal of Neurologic Physical Therapy : JNPT (pagination), pp. Date of Publication: 22 Jul 2025

Abstract: BACKGROUND AND PURPOSE: This study determined the prevalence of loneliness in a regional community-based exercise class program for people with Parkinson disease (PwPD) and examined relationships with demographic characteristics, functional independence, functional mobility, and quality of life (QOL). METHOD(S): This study was a cross-sectional analysis of 231 PwPD, all of whom were participating in community-based exercise class programs. Participants completed questionnaires on loneliness (UCLA 3-Item Loneliness Scale [UTILS]), functional independence (Schwab & England Scale), performance-based measures of functional mobility (Timed Up & Go, 10 Meter Walk Test, 30 Second Sit-to-Stand), and QOL (Parkinson's Disease Questionnaire-8). UTILS scores of 4 were classified as "lonely." RESULTS: Participants were, on average, 71.9 (+/-7.5) years old, 5.4 (+/-5.4) years since their Parkinson disease diagnosis, had been participating in group exercise classes for 2.3 (+/-2.4) years, and almost one-third of participants (n = 76/231, 32.9%) scored in the "lonely" range on the UTILS. There were significant differences between the lonely and non-lonely groups in sex distribution, functional independence, Timed Up & Go, and QOL. Age, functional independence, and loneliness scores accounted for 55.8% of the variance in QOL scores. DISCUSSION AND CONCLUSION(S): In this study, loneliness was present even in PwPD actively engaged with an exercise community. Loneliness among PwPD was also related to functional independence, functional mobility, and QOL. While further study is needed, having rehabilitation clinicians and exercise class instructors screen for loneliness in PwPD may help inform plans of care and recommendations to address loneliness.

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13. **An Exploration of the High Prevalence of Parkinson's Disease in a Rural Area of North West England.**

Authors: Varden R.;O'Callaghan A. and Walker, R.

Publication Date: 2025

Journal: Movement Disorders Clinical Practice (pagination), pp. Date of Publication: 2025

Abstract: Background: Globally the prevalence of Idiopathic Parkinson's Disease (IPD) is rising. Increasing recognition is being given to the influence of environmental factors on this

rise, although the precise impact of such factors remains poorly understood. We need accurate ways of measuring prevalence to understand regional and global trends. Objective(s): To use case finding methodology to measure the crude, and age adjusted, prevalence of IPD in a rural area of North West England, and to describe the difference in results with those obtained using electronic record searching alone to understand the accuracy of such methods. To compare prevalence between subgroups to build hypotheses that could guide further research. Method(s): Local Parkinson's service records from several sources were searched electronically and manually reviewed against validated diagnostic criteria. Figures were age adjusted according to the national denominator population. Result(s): The age adjusted prevalence of IPD was 201/100,000 (95% CI 186-217), higher than in any other published UK study using similar case finding methods. Numbers were higher using electronic diagnostic code searching alone, which may over estimate prevalence. No significant difference was seen between rural and urban areas, relative risk 0.92 (95% CI 0.80-1.06), although there was a trend to higher prevalence in historically industrial coastal areas. Conclusion(s): This study highlights some of the pitfalls in using large healthcare datasets to measure IPD prevalence. Overall, the prevalence of IPD is high in this predominantly rural area, and exhibits prevalence trends that warrant further investigation in relation to genetic and environmental factors.

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14. **A Systematic Review of the Parkinson's Foundation Hospital Care Recommendations.**

Authors: Veilleux Carpentier A.;Malaty I.A.;LeWitt P.A.;Azmi H.;Brooks A.;Pollak E.;Air E.L.;Simpson H.;Thomas J.;Thomas F.P.;Cocoziello L.;Rosenfeld S. and Okun, M. S.

Publication Date: 2025

Journal: Movement Disorders Clinical Practice (pagination), pp. Date of Publication: 2025

Abstract: Background: People with Parkinson's disease (PwP) face increased risks of complications and longer hospital stays compared to the general population. Four major factors contribute to increased morbidity and mortality during hospitalization: medication timing errors, administration of harmful medications, restricted mobility, and dysphagia. Objective(s): To systematically review the literature on medication timing, contraindicated medications, mobility, and dysphagia in hospitalized PwP, and to evaluate the strength of evidence supporting the Parkinson's Foundation's consensus recommendations for inpatient care. Method(s): A systematic review was conducted by searching MEDLINE and EMBASE databases up to February 1, 2024. Original research articles involving hospitalized PwP were included. The level of evidence for each Parkinson's Foundation recommendations was assessed. Result(s): The review included 33 studies. Multiple studies showed that medication errors were associated with longer hospital stays, motor deterioration, and increased mortality in PwP. Interventions such as electronic medical record alerts, staff education, and specialized PD units reduced medication errors. Limited evidence was found on the impact of immobility and dysphagia during hospitalization. Conclusion(s): The evidence base supporting the Parkinson's Foundation's hospital care recommendations varies in strength. Recommendations regarding medication timing and avoiding harmful medications are

supported by multiple observational studies, while those for mobility and dysphagia are primarily based on expert opinion. Implementing these recommendations through multidisciplinary interventions may improve hospital care quality for PD. However, more high-quality research, including randomized controlled trials, is needed to evaluate intervention impacts and address identified knowledge gaps.

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15. **Opportunities and Limitations of Wrist-Worn Devices for Dyskinesia Detection in Parkinson's Disease.**

Authors: Wiederhold A.J.;Zhu Q.R.;Spiegel S.;Dadkhah A.;PotterNerger M.;Langebrake C.;Uckert F. and Gundler, C.

Publication Date: 2025

Journal: Sensors (Basel, Switzerland) 25(14) (pagination), pp. Date of Publication: 21 Jul 2025

Abstract: During the in-hospital optimization of dopaminergic dosage for Parkinson's disease, drug-induced dyskinesias emerge as a common side effect. Wrist-worn devices present a substantial opportunity for continuous movement recording and the supportive identification of these dyskinesias. To bridge the gap between dyskinesia assessment and machine learning-enabled detection, the recorded information requires meaningful data representations. This study evaluates and compares two distinct representations of sensor data: a task-dependent, semantically grounded approach and automatically extracted large-scale time-series features. Each representation was assessed on public datasets to identify the best-performing machine learning model and subsequently applied to our own collected dataset to assess generalizability. Data representations incorporating semantic knowledge demonstrated comparable or superior performance to reported works, with peak F1 scores of 0.68. Generalization to our own dataset from clinical practice resulted in an observed F1 score of 0.53 using both setups. These results highlight the potential of semantic movement data analysis for dyskinesia detection. Dimensionality reduction in accelerometer-based movement data positively impacts performance, and models trained with semantically obtained features avoid overfitting. Expanding cohorts with standardized neurological assessments labeled by medical experts is essential for further improvements.

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16. **'It Would've Been Nice to Know About Allied Health Earlier': Insights From People With Parkinson's Disease.**

Authors: Wong, Cassandra M.;Dennis, Sarah M.;Allen, Natalie E. and Paul, Serene S.

Publication Date: Aug ,2025

Journal: Health Expectations 28(4), pp. e70391

Abstract: INTRODUCTION: Allied health interventions can improve impairments and quality of life for people with Parkinson's disease (PwPD). However, allied health services are

underutilised, and PwPD encounter barriers when accessing allied health. This study examined the allied health referral patterns of PwPD in New South Wales, Australia, from their perspective. METHODS: Community-dwelling PwPD and their care-partners (CPs) were recruited. Participants completed a questionnaire, two-stage semi-structured interviews and a structured retrospective chart to track their PD journey. RESULTS: Eighteen PwPD and five CPs participated, including six from culturally and linguistically diverse (CALD) backgrounds, two of whom required an interpreter. The Levesque model of healthcare access was utilised to describe this study's themes. The approachability and appropriateness of allied health services varied, as did participants' ability to perceive the need for services. CALD participants' fluency in English further impacted their perceptions, and they often found traditional medicine more acceptable. Health service availability was limited, particularly when accessing multidisciplinary care and in regional areas. Participants who lived alone or did not drive had limited ability to reach services. A lack of affordable services and limited ability to pay contributed to difficulties accessing allied health interventions; this could be somewhat relieved by funding packages. The ability to seek and engage in healthcare was present in all participants. CONCLUSIONS: PwPD recognise the need for allied health but experience barriers when accessing care, resulting in them not receiving the recommended early, regular and ongoing allied healthcare. Funding arrangements should be reviewed to enable this. PATIENT OR PUBLIC CONTRIBUTION: People with Parkinson's disease and their care-partners generated the findings of this study through their interviews and retrospective charts. They provided feedback on results via member checking of their transcripts. CLINICAL TRIAL REGISTRATION: Not applicable.

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17. **Metabolic Syndrome and Incidence of Parkinson Disease A Community-Based Longitudinal Study and Meta-Analysis.**

Authors: Zhang X.;Wang J.;Dove A.;Yu T.;Li Q.;Gottesman R.F. and Xu, W.

Publication Date: 2025

Journal: Neurology 105(6) (pagination), pp. Article Number: e214033. Date of Publication: 23 Se 2025

Abstract: Background and Objectives The association between metabolic syndrome (MetS) and incident Parkinson disease (PD) remains equivocal. We aimed to investigate the association of MetS and its components with the risk of PD and to explore the role of genetic background in the MetS-PD association. Methods This prospective cohort study included PD-free adults aged 37-73 years from the UK Biobank. MetS was defined as presence of 3 or more of the following: elevated waist circumference (>=102 cm for men; >=88 cm for women), hypertension (systolic blood pressure >=130 mm Hg, diastolic blood pressure >=85 mm Hg, or use of antihypertensive medication), dyslipidemia (high-density lipoprotein cholesterol =1.70 mmol/L or use of lipid-lowering medication), and hyperglycemia (HbA1c >= 5.7%). PD was diagnosed based on information from medical records. PD-related polygenic risk score (PRSPD) was calculated based on the presence of 26 PD-related alleles and categorized as low, moderate, or high. Data were analyzed using Cox regression. In addition, a meta-analysis was conducted by integrating the present UK Biobank data with findings from 8 other observational studies. Results The study included 467,200 participants (mean age 56.53 +/-

8.09 years; 54.26% female), 177,407 (37.97%) of whom had MetS. Over the follow-up (6,605.9 x 1,000 person-years), 3,222 participants developed PD (5.01 [95% CI 4.84-5.18] per 10,000 person-years, age-specified and sex-specified). The hazard ratio of PD was 1.39 (1.11-1.74) for participants with MetS compared with those who were MetS-free. Furthermore, having a higher number of MetS components was dose-dependently associated with higher PD risk (HR: 1.14 [1.05-1.24]; p for trend = 0.001). In addition, PD risk was highest among participants with MetS and high PRSPD (HR: 2.58 [2.12-3.14]; p for interaction = 0.002). In a meta-analysis of 24,789,538 participants with 98,582 incident cases of PD, the pooled relative risk of PD was 1.29 (1.15-1.44) for participants with MetS. Discussion Supported by evidence from meta-analysis, MetS was associated with higher risk of incident PD, especially in people with a high genetic predisposition for PD.

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18. **Artificial intelligence in neurodegenerative diseases research: a bibliometric analysis since 2000**

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Abstract: This bibliometric review examines the evolving landscape of artificial intelligence (AI) in neurodegenerative diseases research from 2000 to March 16, 2025, utilizing data from 1,402 publications (1,159 articles, 243 reviews) indexed in the Web of Science Core Collection. Through advanced tools - VOSviewer, CiteSpace, and Bibliometrix R - the study maps collaboration networks, keyword trends, and knowledge trajectories. Results reveal exponential growth post-2017, driven by advancements in deep learning and multimodal data integration. The United States (25.96%) and China (24.11%) dominate publication volume, while the UK exhibits the highest collaboration centrality (0.24) and average citations per publication (31.68). Core journals like Scientific Reports and Frontiers in Aging Neuroscience published the most articles in this field. Highly cited publications and burst references highlight important milestones in the development history. High-frequency keywords include "alzheimer's disease," "parkinson's disease," "magnetic resonance imaging," "convolutional neural network," "biomarkers," "dementia," "classification," "mild cognitive impairment," "neuroimaging," and "feature extraction." Key hotspots include intelligent neuroimaging analysis, machine learning methodological iterations, molecular mechanisms and drug discovery, and clinical decision support systems for early diagnosis. Future priorities encompass advanced deep learning architectures, multi-omics integration, explainable AI systems, digital biomarker-based early detection, and transformative technologies including transformers and telemedicine. This analysis delineates AI's transformative role in optimizing diagnostics and accelerating therapeutic innovation, while advocating for enhanced interdisciplinary collaboration to bridge computational advances with clinical translation.

Sources Used:

The following databases are used in the creation of this bulletin: EMBASE and Medline.

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