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Parkinson's Disease

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December 2025

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1. **Non-Motor Symptoms in Parkinson's Disease and Their Impact on Quality of Life: A Cross-Sectional Study.**

Authors: Ahsan S.;Mehta S.;Chakravarti K.;Ray S.;Grover S.;Saharan R. and Lal, V.

Publication Date: 2025

Journal: Neurology India 73(6), pp. 1219–1225

Abstract: Background: Non-motor symptoms have a more significant impact on the quality of life in Parkinson's disease than motor symptoms. Objective(s): To evaluate the frequency of non-motor symptoms in Parkinson's disease and study their impact on quality of life. Method(s): A cross-sectional study was conducted on 100 patients with idiopathic Parkinson's disease. All patients underwent a detailed history and neurological examination, Hoehn and Yahr staging, MDS UPDRS scoring, NMSS scoring, and PDQ-39 scoring to assess their quality of life. Result(s): All patients presented with at least one non-motor symptom. The most frequently affected non-motor symptom was sleep/fatigue (95%), followed by urinary (79%) and gastrointestinal dysfunction (76%). The total NMSS score significantly correlated with disease severity and quality of life. Conclusion(s): Non-motor symptoms are quite prevalent in patients with Parkinson's disease and significantly impact their quality of life.

2. **Neuro-functional correlates of personality dimensions in Parkinson's disease.**

Authors: Boussac M.;Harroch E.;Joineau K.;Descamps E. and BrefelCourbon, C.

Publication Date: 2025

Journal: Frontiers in Pharmacology 16(pagination), pp. Article Number: 1705937. Date of Publication: 2025

Abstract: Introduction: According to the original model of the Temperament and Character Inventory (TCI), personality dimensions would be related to different neurotransmitters' systems such as the dopaminergic and the serotoninergic ones. Method(s): Our objective was to study associations between functional connectivity and personality in Parkinson's disease (PD). The data of 29 PD patients were collected (NCT04705207). It included personality evaluation using the TCI, functional connectivity from resting-state functional MRI, and anxio-depressive state from the Hospital Anxiety and Depression scale (HAD). Seed-to-voxels and ROI-to-ROI analyses were done in the CONN toolbox. Result(s): Significant association was found between Novelty Seeking scores and functional connectivity within the nucleus accumbens and one cluster formed of the orbitofrontal cortex. Significant associations were also found between Harm Avoidance scores and functional connectivity within the temporal pole and seven clusters (mainly formed of the post- and pre-central gyri, thalami, parietal lobule, putamen and temporal gyrus). These functional connectivities also correlated with HAD scores. Conclusion(s): In accordance with the TCI model, Novelty Seeking seems to be related to the dopaminergic system within the nucleus accumbens and orbitofrontal cortex connectivity, implicated in impulsivity. Moreover, Harm Avoidance would be related to the serotoninergic system within the temporal and fronto-thalamo-parietal network connectivity, involved in depressive disorders. Clinical trial registration: clinicaltrials.gov: NCT04705207 (https://clinicaltrials.gov/study/NCT04705207).

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3. **Temporal relationship between severe mental illness and neurological conditions in a UK primary care cohort.**

Authors: Burchill E.;Rogers J.P.;Osborn D.P.J.;Lewis G.;David A.S.;Hayes J.F. and Launders, N.

Publication Date: 2025

Journal: BMJ Mental Health 28(1) (pagination), pp. Date of Publication: 04 Nov 2025

Abstract: BACKGROUND: A higher prevalence of neurological conditions has been found in schizophrenia, bipolar disorder and other psychotic illnesses compared to the general population. We aimed to understand the cumulative prevalence of 15 neurological conditions in people with severe mental illness (SMI) from 5 years before to 5 years after their SMI diagnosis. METHOD(S): We identified patients with SMI, aged 18-100 years from 1 Jan 2000 to 31 Dec 2018, from the UK Clinical Practice Research Datalink. Each SMI patient was matched 1:4 to individuals without SMI. The cumulative prevalence of 15 neurological conditions was recorded at 5, 3 and 1 years prior to SMI diagnosis; at SMI diagnosis; and 1, 3

and 5 years after SMI diagnosis. Prevalences were compared with logistic regression. RESULT(S): We identified 68 789 patients with SMI and 274 827 comparators. Of 15 neurological conditions, 13 (multiple sclerosis, cerebrovascular disease, dementia, ataxic disorders, epilepsy, Parkinson's disease, other parkinsonism, paralysis, other movement disorders, cerebrospinal fluid disorders, cerebral palsy, disorders of nerve root, plexus or peripheral nerves and autonomic disorders) were more prevalent in SMI compared with comparators at the time of SMI diagnosis. Dementia (OR: 4.22; 95% CI 3.88 to 4.58), epilepsy (OR: 3.01; 95% CI 2.83 to 3.19) and Parkinson's disease (OR: 3.97; 95% CI 3.45 to 4.57) were particularly elevated at 5 years post-SMI diagnosis. CONCLUSION(S): Many neurological conditions have higher prevalence in the SMI cohort compared with those without SMI. The different prevalence patterns observed in our study highlight the need to establish the causal pathways between specific SMI and neurological disease diagnoses.

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4. **Improving recognition and management of inpatient delirium in Parkinson's disease: evidence review and implications for clinical care.**

Authors: Coleman C.;Smiley A.;Rosenfeld S. and Brooks, A.

Publication Date: 2025

Journal: Frontiers in Aging Neuroscience 17(pagination), pp. Article Number: 1693827. Date of Publication: 2025

Abstract: Delirium is an acute disturbance of attention, arousal, and cognition that fluctuates in severity and is a common yet under recognized complication in hospitalized patients with Parkinson's disease. In Parkinson's disease, symptoms such as rigidity, bradykinesia, hallucinations, and slowed thinking overlap with the clinical features of delirium, which can obscure its onset in hospitalized patients. Variability in diagnostic criteria further complicates accurate recognition and prevalence estimates. This mini review summarizes current evidence on the prevalence, risk factors, and consequences of delirium in Parkinson's disease (PD) and its associations with mortality and institutionalization. A total of 61 reports published between 1990 and 2025 were included across five domains: delirium diagnosis and prevalence, delirium subtypes, PD-specific delirium rates, risk factors and prevention, and treatment considerations. Foundational evidence reviews and official diagnostic documents (e.g., ICD-10, ICD-11, DSM criteria) were also incorporated as they remain internationally recognized standards for delirium diagnosis. Scholarly studies were appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists, with overall evidence quality judged to be moderate to high, while official diagnostic and guideline documents were considered high-quality based on their authoritative, consensus-driven development. Standardized clinical strategies for hospital management remain limited, but the available evidence supports the use of tailored approaches. We present evidence-based implications for clinical care aligned with the Parkinson's Foundation Hospital Care Standards to improve recognition, prevention, and treatment. We emphasize the need for critical evaluation, methodological consistency, and acknowledgment of the dynamic care challenges posed by delirium in Parkinson's disease.

5. **'Breaking the stigma': a qualitative study on how public perceptions affect individuals with Parkinson's disease - a nurse specialist perspective.**

Authors: Crooks S.;Mitchell G.;Wynne L. and Carter, G.

Publication Date: 2025

Journal: BMC Geriatrics 25(1), pp. 910

Abstract: BACKGROUND: Parkinson's disease (PD) is a chronic neurological disorder that affects around 24,000 people in Ireland. Despite being relatively common, awareness and understanding of the condition remain limited, often leading to misconceptions, stigma, and social isolation for those diagnosed. This study aimed to investigate how these challenges impact individuals with PD, drawing on the experiences and insights of Parkinson's disease nurse specialists (PDNS). By exploring the perspectives of PDNS, this research seeks to highlight the effects of stigma and public misunderstanding on the quality of life of those living with PD. METHOD(S): Semi-structured interviews and focus groups were conducted with 10 PDNs working in Northern Ireland and the Republic of Ireland between May and June 2024. The study employed an interpretivist approach and reflexive thematic analysis following Braun and Clarke's six-step framework. Ethical approval was obtained prior to data collection. RESULT(S): Five main themes were developed from the analysis: (1) Public knowledge of PD and Stigma, (2) Lived Experiences, (3) Support Systems and Services, (4) Increasing awareness of Parkinson's Disease, and (5) The Role of the PD Nurse. PDNS noted that limited public awareness of PD leads to misconceptions and stigma, negatively impacting the quality of life for those affected. PDNS also emphasised that raising awareness through education, campaigns, and their own role can help improve outcomes for individuals living with PD. DISCUSSION(S): The study highlights the complex relationship between public understanding, perceptions, and the quality of life for individuals with PD, as viewed through the lens of Parkinson's disease nurse specialists. Findings suggest that stigma and a lack of awareness contribute to emotional and social challenges, while strong support networks and public education can significantly enhance the experiences of those living with PD. The results underscore the need for widespread education, not only among the public but also within the healthcare sector, to better support individuals with PD in Ireland. Future research and targeted interventions should focus on increasing societal awareness to improve the lived experiences and well-being of those affected by the condition.

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6. **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. Copyright © 2025 The Authors. Published by Elsevier Ltd.

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7. **Cerebral microbleeds aggravate severity of motor function, cognitive and emotional status in Parkinson's disease.**

Authors: Feng T.;Zuo H.;Du X.;Peng J. and Cheng, O.

Publication Date: 2025

Journal: Acta Neurologica Belgica (pagination), pp. Date of Publication: 2025

Abstract: Background: Cerebral microbleeds (CMBs) are highly prevalent in patients with Parkinson's disease (PD), but their impact on clinical symptom severity and genetic association remains unclear. This study investigates the relationship between CMBs and PD severity. Method(s): We recruited patients with PD from the outpatient clinic and inpatient wards of the First Affiliated Hospital of Chongqing Medical University. All participants had undergone susceptibility-weighted imaging (SWI) and had complete clinical assessments. Participants were categorized into groups based on their CMB count. We subsequently analyzed the risk factors for CMBs and examined the correlations between CMB burden and motor, cognitive, and emotional function, respectively. Furthermore, utilizing a genome-wide association study (GWAS) dataset, we investigated the association between genetic susceptibility to CMBs and PD severity preliminarily by Mendelian randomization (MR). Result(s): Among 158 patients with PD, 53 (33.5%) were found to have CMBs. Age, disease duration, and hypertension were independently associated with the presence of CMBs (p Result(s): Among 158 patients with PD, 53 (33.5%) were found to have CMBs. Age, disease duration, and hypertension were independently associated with the presence of CMBs (p Conclusion(s): The high prevalence of CMBs was associated with age, disease duration, and hypertension. Furthermore, our MR analysis provides preliminary evidence that a higher CMB

burden may exacerbate the severity of Parkinson's disease.

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8. **Investigation of gastrointestinal tumor symptoms and risk factors in eighty patients with Parkinson's disease.**

Authors: Fu, Zhong-Guo;Ren, Zhan-Xiu;Wang, Xin-Hong and Wang, Bai-Fang

Publication Date: Sep 15 ,2025

Journal: World Journal of Gastrointestinal Oncology 17(9), pp. 106912

Abstract: BACKGROUND: Parkinson's disease (PD) is often accompanied by gastrointestinal symptoms; however, the relationship between PD and gastrointestinal tumors remains unclear. AIM: To explore the symptom characteristics and risk factors of gastrointestinal tumors in patients with PD by integrating clinical, neurological, gastrointestinal, and laboratory assessments. METHODS: Eighty patients with PD who were admitted to our hospital between January 2023 and December 2024 were retrospectively analyzed. Clinical characteristics and neurological status were evaluated using standardized scales, including the Mini-Mental State Examination, Depression Anxiety Stress Scale-21, Pittsburgh Sleep Quality Index Barthel Index, Non-Motor Symptoms Scale, and the Intake, Feeling nauseated, Emesis, physical Exam, Duration of symptoms (I-FEED) gastrointestinal dysfunction score. Laboratory indicators including tumor markers [carcinoembryonic antigen (CEA), carbohydrate antigen 19-9 (CA19-9), carbohydrate antigen 72-4 (CA72-4)] were measured. Differences between PD patients with and without gastrointestinal tumors were compared, and logistic regression was used to identify associated factors. RESULTS: Among the 80 PD patients, 16 (20.00%) had gastrointestinal tumors. The most common symptoms in the tumor group were constipation (93.75%), urgency of defecation (75.00%), and abdominal tightness (75.00%). Patients with gastrointestinal tumors had significantly higher I-FEED, CEA, CA19-9, and CA72-4 levels (P CONCLUSION: This study uniquely combines neurological symptom scales and tumor markers to evaluate gastrointestinal tumor risk in patients with PD. The findings suggest that gastrointestinal dysfunction and tumor marker elevation are key clinical indicators, and highlight the importance of comprehensive assessment in identifying high-risk PD patients for timely intervention. Copyright ©The Author(s) 2025. Published by Baishideng Publishing Group Inc. All rights reserved.

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9. **Prevalence of living alone with dementia and other progressive neurological conditions: findings from primary care data in England.**

Authors: Gamble L.D.;Clare L.;Martyr A.;Caulfield M.;Charlwood C.;Hulme C.;Oyebode J.R. and Prina, M.

Publication Date: 2025

Journal: BMC Medicine 23(1) (pagination), pp. Article Number: 607. Date of Publication: 01 Dec 2025

Abstract: Background: Living alone with a neurodegenerative condition such as dementia

may result in inequalities in access to support and resources. However, estimates of the number of people living alone vary widely in research studies. We aimed to estimate the prevalence of living alone with dementia, Parkinson's disease, motor neurone disease (MND), and Huntington's disease in England using electronic healthcare records. Method(s): Individuals identified in the Clinical Practice Research Datalink (CPRD) database were categorised as living alone or living with others based on medical codes and the number of people registered at a given GP practice from a household. Excluding those in care facilities, the prevalence of living alone was estimated both overall and stratified by measures of inequality including age, sex, ethnicity, deprivation, urban/rural location, and region. Prevalence estimates of the population living alone, applied to age and sex structures of upper local authority areas, were mapped. Change in prevalence over 15 years was investigated using Joinpoint analysis. Result(s): In 2023, there were 205,507 people with dementia in the CPRD database, 40,244 with Parkinson's disease, 3515 with MND and 1672 with Huntington's disease. Of those with dementia, 40% lived alone, 33% lived alone with Parkinson's disease and MND and 38% lived alone with Huntington's disease. More area-level deprivation and an urban GP practice were associated with living alone for all conditions. For dementia, Parkinson's disease, and MND, there were differences by age, sex, ethnicity and region. The proportion of people living alone with dementia and MND has increased since 2009. Conclusion(s): A substantial number of people with neurodegenerative conditions are living alone, possibly exposing them to higher risks in some respect than carried by those who live with others. Changes to clinical policy are needed to enable improved support and targeted care for these individuals.

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10. **Mental Health and Well-Being of Residents with Parkinson's Disease in Care Homes: A Scoping Review.**

Authors: Gillis A.;Mitchell G. and Craig, S.

Publication Date: 2025

Journal: Healthcare (Switzerland) 13(21) (pagination), pp. Article Number: 2791. Date of Publication: 01 Nov 2025

Abstract: Introduction: As the prevalence of Parkinson's disease (PD) increases, care homes face growing challenges in managing residents' complex mental health needs. Residents may experience low mood, anxiety, and hallucinations. Method(s): A scoping review (ScR) was conducted following the methodological framework of Arksey and O'Malley and reported according to the PRISMA-ScR checklist. Four databases (CINAHL, Embase, PsycINFO, and Scopus) and grey literature sources were searched up to June 2025, alongside grey literature (European Public Health Association (EUPHA), the UK Department of Health and Social Care, the National Institute for Health and Care Excellence (NICE), and the World Health Organisation (WHO), with the aim of mapping the existing evidence on the mental health and well-being of people living with Parkinson's disease in care homes, in order to identify gaps in the literature. Screening and data extraction were conducted independently by two reviewers using Covidence software, with discrepancies resolved through discussion. Result(s): Eleven studies met the inclusion criteria, encompassing quantitative, qualitative, and mixed-methods designs. The findings indicate that mental health disorders are common and severe among care home residents with PD; 61% of individuals experienced at least one, contributing to

reduced quality of life, increased care dependency, emotional distress, and social isolation. Caregivers report significant burden associated with managing symptoms associated with mental health disorders and residents frequently experience a decline in psychosocial well-being. Conclusion(s): Although few studies evaluated interventions, the findings highlight the need for both pharmacological and non-pharmacological approaches. Specialised staff training and adherence to international care guidelines are needed to improve recognition and management of mental health needs in residents living with PD.

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11. **Prevalence, associated factors and impact of mild cognitive impairment in hospitalized older adults with Parkinson's disease: a cross-sectional study.**

Authors: Gong, Siyuan;Wang, Tianqi;Tang, Rongzhu;Hu, Wangjuan;Wang, Wenjing;Li, Jia;Liu, Jihong and Liao, Chunlian

Publication Date: 2025

Journal: Frontiers in Aging Neuroscience 17, pp. 1693417

Abstract: Background: Early identification of mild cognitive impairment (MCI) and timely interventions are essential to delay dementia in Parkinson's disease (PD). This study aims to examine the prevalence of MCI among hospitalized older adults with PD, preliminarily identify related factors, and explore its possible clinical impact, with the goal of providing evidence to inform more targeted screening and intervention strategies. Methods: A cross-sectional survey was conducted in China. From July 2022 to January 2025, a total of 339 hospitalized older adults with PD were recruited from a hospital using convenience sampling. Data were collected on demographic characteristics, biochemical markers, and clinical assessments. MCI was evaluated using the Mini-Mental State Examination. Univariate analysis was conducted to examine potential associations between MCI and the collected variables. Multivariate logistic regression was then used to identify independent factors and their impact associated with MCI in hospitalized older adults with PD. Results: The results showed that the prevalence of MCI in hospitalized older adults with PD was 45.4%. Multivariate logistic regression analysis revealed that MCI in hospitalized older adults with PD was significantly associated with education level of primary and below [OR=6.358, 95% CI (2.542, 15.902)] and junior [OR=4.782, 95% CI (1.965, 11.635)], higher MDS-UPDRS-III scores [OR=1.023, 95% CI (1.007, 1.039)], presence of anxiety [OR=2.045, 95% CI (1.080, 3.873)], lower hemoglobin levels [OR=0.983, 95% CI (0.968, 0.998)], and longer hospitalization duration [OR=1.833, 95% CI (1.113, 3.017)]. Conclusion: Our study observed a relatively high prevalence of MCI among hospitalized older adults with PD, and identified several associated factors, including lower educational level, greater severity of motor symptoms, anxiety, and reduced hemoglobin levels. These findings provide preliminary insights into factors that may warrant consideration when designing PD-MCI screening and intervention programs. Notably, we also found an association between PD-MCI and longer hospitalization duration, suggesting that early identification and management of MCI may help improve patient outcomes and reduce hospitalization burden. Copyright © 2025 Gong, Wang, Tang, Hu, Wang, Li, Liu and Liao.

12. **Peripheral inflammation's variable impact on cognitive and symptomatic outcomes in Parkinson's disease: a longitudinal and cross-sectional analysis.**

Authors: He, Peikun;Li, Yanyi;Huang, Zhiheng;Gao, Yuyuan;Duan, Qingrui;Qiu, Yihui;Feng, Shujun;Huang, Ruiyun;Gong, Liangxu;Ma, Guixian;Zhang, Yuhu;Shi, Lin;Wang, Lijuan and Nie, Kun

Publication Date: Jun 07 ,2025

Journal: Npj Parkinsons Disease 11(1), pp. 155

Abstract: Increasing evidence supported a link between peripheral inflammation and Parkinson's disease (PD). However, the role of peripheral inflammation in the progression of PD clinical symptoms remained unclear. This study evaluates peripheral inflammation using serum differential leukocyte counts and their derived ratios. A total of 170 PD patients were retrospectively enrolled from Guangdong Provincial People's Hospital (GDPH) and 68 from PPMI. Partial correlation analysis showed that neutrophil-to-lymphocyte ratio (NLR) negatively correlated with MoCA in GDPH but not in PPMI. Moreover, peripheral inflammation was shown to correlate with white matter integrity. The result of the longitudinal analysis showed that higher baseline NLR predicted worsening in letter number sequencing (LNS) score. Path analysis indicated that white matter integrity significantly mediated the relationship between NLR and cognitive change in the LNS score from Year 5 to baseline. Peripheral inflammation is associated with global cognition and white matter integrity in PD and predicts cognitive decline.

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13. **Medication Adherence in Parkinson's Disease: Longitudinal Changes and the Influence of Depressive Symptoms.**

Authors: Heimrich, Konstantin G.;Schonenberg, Aline;Franke, Gabriele Helga and Prell, Tino

Publication Date: 2025

Journal: Patient Preference & Adherence 19, pp. 2835–2845

Abstract: Purpose: Parkinson's disease (PD) is a progressive neurodegenerative disease. As the disease progresses, medication regimens become increasingly complex. The long-term success of PD pharmacotherapy is highly dependent on patient adherence to the prescribed medication regimen. The aim of this study is to investigate how intentional and unintentional non-adherence evolves over time and to identify PD-related factors that influence these longitudinal changes. These findings may be crucial in developing targeted interventions to improve adherence, particularly in patients who have difficulties with intentional or unintentional non-adherence. Patients and Methods: The sample consisted of 91 people with PD who were initially treated as part of the PD multimodal complex treatment at the Department of Neurology, Jena University Hospital, Germany. They were followed up three and six months after discharge. Medication adherence was assessed using the Stendal Adherence to Medication Score (SAMS) and its three subscores for forgetfulness, knowledge, and modification. Statistical analyses included Wilcoxon signed rank test, Friedman test, and generalized estimating equations to determine longitudinal changes in non-adherence and the

influence of PD-related variables. Results: Analysis of SAMS subscores showed improvement over time in modification and knowledge, whereas forgetfulness did not show significant change. Modification was significantly associated with depressive symptoms. Conclusion: Medication adherence in PD is a dynamic process and changes over time. The findings suggest that while educational interventions are effective in improving knowledge and reducing intentional non-adherence, addressing depressive symptoms and cognitive impairment is critical to improving overall adherence. Future research should continue to explore the factors that influence adherence behaviors and develop targeted strategies to help people with PD maintain adherence throughout the course of their disease.

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14. **Automated MRI-Based Classification of Parkinsonism: A Deep Learning Approach to Distinguish PD From PSP.**

Authors: Hu X.;Cao Z.;Song T.;Zhou Y.;Lu W.;Zhu Y.;Hua R.;Peng D.;Shi F. and Lu, J.

Publication Date: 2025

Journal: CNS Neuroscience and Therapeutics 31(11) (pagination), pp. Article Number: e70645. Date of Publication: 01 Nov 2025

Abstract: Objective: Differentiating Parkinson's disease (PD) from progressive supranuclear palsy (PSP) is crucial for appropriate treatment, as each disease has distinct therapeutic requirements. The Magnetic Resonance Parkinsonism Index (MRPI) has shown promise as a diagnostic biomarker, yet manual methods introduce variability and limit its applicability. In this study, we aim to develop a fully automated algorithm for MRPI 1.0 and 2.0 calculation, and assess its ability to distinguish PD from PSP in two cohorts from different regions of China. Method(s): A total of 75 PD patients and 29 PSP patients from two hospitals were enrolled. All participants underwent neurological examinations, including the MDS-UPDRS-III and H-Y scale, as well as brain MRI scans. Additionally, tissue-intensity images derived from 3D isotropic T1WI images from 2D thick slices using a deep learning (DL)-based super-resolution (SR) technique were aligned to a standard template followed by corresponding structural mask parcellation for measurement of MRPI 1.0 and MRPI 2.0. Subsequently, a logistic regression model was constructed to identify PD patients from PSP based on these indexes. Result(s): MRPI 2.0 demonstrated higher diagnostic accuracy than MRPI 1.0, with an AUC of 0.78. Additionally, the automated method showed strong linear correlations with manual assessments from an experienced radiologist, validating its reliability, and identification of PSP from PD with the average AUC of 0.85. Conclusion(s): The automated MRPI method improves diagnostic accuracy for differentiating PD from PSP, providing a reliable and clinically applicable tool. The integration of a super-resolution technique to convert 2D MRI data into high-resolution images expands the potential of MRPI as a neuroimaging biomarker.

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15. **Multidisciplinary inpatient care for Parkinson's disease: a single-centre cohort study on improvements in gait, overall motor function, and quality of life.**

Authors: Kleinholdermann, Urs;Mugge, Felicitas C. J.;Carapezza, Tiziano;Decher, Lukas;Timmermann, Lars and Pedrosa, David J.

Publication Date: Sep 02 ,2025

Journal: Neurological Research & Practice 7(1), pp. 62

Abstract: BACKGROUND: Parkinson's disease (PD) multimodal complex treatment (PD-MCT) is an inpatient therapeutic programme specifically designed for patients exhibiting parkinsonian symptoms. Established in Germany, this comprehensive approach addresses the multifaceted challenges associated with the management of PD, particularly in advanced stages or when complications such as motor fluctuations, dyskinesia, or non-motor symptoms become pronounced. The programme integrates pharmacological optimization, physiotherapy, occupational therapy, speech therapy, and psychological support, among other complementary therapies, to enhance patient outcomes holistically. Despite its availability for seventeen years, only seven studies evaluating the effectiveness of PD-MCT have been conducted. In this study we evaluated the effects of PD-MCT with a special focus on gait, hypothesizing an improvement after the treatment. METHODS: In this single-centre cohort study at a German university hospital we included patients with PD diagnosed by the Movement Disorder Society (MDS) criteria, aged 18-85 years, legal capacity to consent and admitted for treatment with PD-MCT. We assessed changes in motor and non-motor symptoms using Wilcoxon's signed rank test on pre/post measurements of part III of the motor part of the MDS Unified Parkinson's Disease Rating Scale (MDS-UPDRS), the Parkinson's Disease Questionnaire (PDQ-39) and the Timed Up and Go Test (TUG). As a particular emphasis was placed on gait analysis we objectively measured gait throughout the treatment period using advanced mobile sensor technology and analysed gait speed, stride length and lift height using linear mixed effects models. RESULTS: In our sample of 43 PD patients we found significant improvements in MDS-UPRDRS part III (V = 679, p = 0.001), PDQ-39 (V = 770, p : In our sample of 43 PD patients we found significant improvements in MDS-UPRDRS part III (V = 679, p = 0.001), PDQ-39 (V = 770, p : In our sample of 43 PD patients we found significant improvements in MDS-UPRDRS part III (V = 679, p = 0.001), PDQ-39 (V = 770, p : In our sample of 43 PD patients we found significant improvements in MDS-UPRDRS part III (V = 679, p = 0.001), PDQ-39 (V = 770, p : In our sample of 43 PD patients we found significant improvements in MDS-UPRDRS part III (V = 679, p = 0.001), PDQ-39 (V = 770, p : In our sample of 43 PD patients we found significant improvements in MDS-UPRDRS part III (V = 679, p = 0.001), PDQ-39 (V = 770, p CONCLUSIONS: Our results underscore the added value of a multimodal inpatient approach, thereby supporting its role as a justified investment in the management of complex PD cases. This work contributes to the expanding body of evidence advocating for integrated, multidisciplinary care models in the treatment of neurodegenerative disorders. TRIAL REGISTRATION: This study has not been registered.

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16. **Factors Associated With the Response to Exercise in Patients With Parkinson's Disease.**

Authors: Lee, Myung Jun;Park, Jinse;Ryu, Dong-Woo;Yoo, Dallah and Cheon, Sang-Myung

Publication Date: Oct ,2025

Journal: Journal of Movement Disorders 18(4), pp. 308–316

Abstract: OBJECTIVE: Exercises have been proposed as adjuvants for the treatment of Parkinson's disease (PD); however, responses to exercise interventions have shown inconsistent results. We investigated the clinical factors associated with improvements in motor deficits after exercise. METHODS: A total of 85 patients with PD were enrolled from five tertiary hospitals and classified into four exercise groups: home exercise, strength training, Tai Chi, and yoga groups. Clinical measurements of the motor and nonmotor features of patients with PD were performed at baseline and 12 weeks after the exercise intervention. We employed principal component analysis (PCA) to reduce variables into ten factors and then examined associations of baseline characteristics with percentage improvement in the Movement Disorder Society sponsored Unified Parkinson's Disease Rating Scale Part III (MDS-UPDRS III) score via a Bayesian regression model. RESULTS: In the multivariate Bayesian regression model including ten PCA-derived factors, the percentage improvement in the MDS-UPDRS III score was associated with factors including prominent motor deficits (posterior interval [mean+/-standard deviation]: 2.5+/-1.5) and nonmotor symptoms such as depression, anxiety, and subjective memory impairment (3.3+/-1.7). Another factor related to functional impairments in gait and postural control was associated with less improvement after the exercise intervention (-3.9+/-1.7). According to the subgroup analyses, motor features were associated with improvements in the home exercise and strength training groups, whereas mood disturbance, fatigue, and subjective cognitive impairment were related to changes in the home exercise and Tai Chi groups. CONCLUSION: Our results suggest that the individual phenotypes of patients with PD may be associated with clinical improvement following exercise.

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17. **When Parkinson's disease encounters high fever: two case reports and literature review.**

Authors: Lei, Yi-Hui;Zhang, Xiao-Ping;Zhou, Hong-Yan;Liu, Xiao-Dong;Long, Jian;Liu, Hai-Jun;Xu, Zu-Cai and Xu, Ping

Publication Date: 2025

Journal: American Journal of Translational Research 17(10), pp. 8143–8156

Abstract: Parkinson's disease (PD) is a chronic progressive neurodegenerative disorder. Acute hyperthermia syndrome (AHS) associated with PD is a critical neurological condition requiring immediate intervention. This article presents two cases of patients with PD with hyperthermia and provides a comprehensive comparative analysis across multiple dimensions, including etiology, pathogenesis, clinical features, diagnostic approaches, therapeutic strategies, and outcomes. The first patient exhibited motor dysfunction followed by hyperthermia, which was alleviated by adjusting the dosage of dopaminergic medication. In contrast, the second patient was initially misdiagnosed with sepsis, and his condition significantly improved with dopaminergic therapy. This report aimed to enhance clinicians' understanding of this syndrome, improve diagnostic precision, and facilitate the development of more effective treatment protocols for optimizing patient outcomes. AJTR Copyright © 2025.

18. **Delirium, genetic susceptibility and Parkinson's disease progression: a community- and UK biobank-based matched cohort study.**

Authors: Li M.;Duan W.;Feng Y.;Wang Z.;Hao X.;Li S.;Sun S. and Shi, C.

Publication Date: 2025

Journal: Aging & Mental Health , pp. 1–9

Abstract: OBJECTIVES: While various psychological factors increase Parkinson's disease (PD) risk, delirium's role remains unexplored. This study examined whether delirium is associated with PD incidence and identified potential modifying factors. METHOD(S): We conducted a matched cohort study using UK Biobank data, including 6,254 patients with first-time delirium and 31,270 matched unexposed individuals. Cox proportional hazards models assessed PD risk following delirium, evaluating effect modification by age, sex, education, BMI, depression, frailty, and polygenic risk scores. RESULT(S): During follow-up (median: 1,011 days for exposed vs 1,678 days for unexposed), 2% of delirium patients developed PD vs 1% of controls. Delirium was associated with significantly increased PD risk (HR: 3.97; 95% CI: 2.97-5.33). Education level significantly modified this association, with higher education linked to greater risk (College: HR 6.57; Non-college: HR 3.70). Age, sex, BMI, frailty, and polygenic risk scores did not significantly alter the association. CONCLUSION(S): Delirium is a significant and potentially modifiable risk factor for PD, highlighting the clinical importance of its prevention and management, particularly in highly educated individuals.

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19. **Identification of the efficacy and safety of apomorphine in the treatment of Parkinson's disease via meta-analysis.**

Authors: Li, Haidong;Zhang, Liwen;Jiang, Baona and Jing, Lu

Publication Date: Nov 27 ,2025

Journal: BMC Neurology 25(1), pp. 490

Abstract: BACKGROUND: The majority of Parkinson's disease (PD) patients experience motor fluctuations and dyskinesias as the disease progresses. Apomorphine has been used as an acute treatment for off episodes in PD in recent years. However, conclusions from clinical studies regarding the efficacy and safety of apomorphine have been inconsistent, particularly prior to the publication of larger pivotal trials. OBJECTIVES: To systematically evaluate the efficacy and safety of apomorphine in PD patients, a meta-analysis of randomized controlled trials (RCTs) and single-armed studies were performed. METHODS: PubMed, Web of Science, Embase, and Cochrane databases were searched to identify all related studies. Outcomes of interest were changes in Parkinson's Disease Rating Scale Part III (UPDRS-III) scores, ON and OFF time, and adverse events (AES). RESULTS: In this meta-analysis, 20 clinical studies were included (n = 1262 patients): seventeen RCTs, and three single-armed studies. The pooled results from RCTs indicate that apomorphine treatment significantly improved patients' motor function compared to placebo. Specifically, there was a mean difference (MD) of -12.28 (95% CI: [-17.98, -6.59]) in UPDRS-III scores. Patients treated with apomorphine experienced a reduced off time (MD = -10.70, 95% CI: [-20.33, -1.06]), indicating

a shorter duration of the "off" state. Furthermore, the combined results indicated a conversion rate from off to on state in PD patients treated with apomorphine of 0.79 (95% CI 0.67-0.89). In terms of safety analyses from single-armed studies, apomorphine treatment was associated with several AES, including nausea, drowsiness, vomiting, dizziness, and excessive sweating. However, the findings suggest that the incidence of AES was relatively low during treatment with apomorphine. CONCLUSION: The meta-analysis results indicate that apomorphine effectively improves dyskinesia and motor fluctuations in patients with PD. Furthermore, the incidence of AES was relatively low during treatment with apomorphine.

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20. **Effects of oral levodopa on motor symptoms and gait impairments in Parkinson's disease: a systematic review and meta-analysis.**

Authors: Lillebaek, Birk S.;Tran, Janni;Dalgas, Ulrik and Langeskov-Christensen, Martin

Publication Date: Dec ,2025

Journal: Expert Review of Neurotherapeutics 25(12), pp. 1435–1449

Abstract: INTRODUCTION: Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by motor and gait impairments. Levodopa remains the cornerstone of pharmacological treatment. This review examined the acute effects of oral levodopa on motor symptoms and gait parameters in people with PD. METHODS: PubMed and Embase were searched up to February 17th 2025. Included studies presented within-subject comparisons between ON- and OFF-medication states, assessing outcomes such as UPDRS motor scores, clinical walking tests, and spatiotemporal gait metrics. Study quality was assessed using the NIH quality assessment tool for before-after studies without control groups. Standardized mean changes (SMC) were calculated to quantify treatment effects. Studies with incomplete data were qualitatively reviewed. RESULTS: Thirty-nine papers (38 studies; 1425 participants) were included. Levodopa significantly improved the (MDS)-UPDRS motor score (SMC = -1.49 [-1.77, -1.22]), corresponding to a mean decrease of -14.0 points [-16.7, -11.48]. Stride/step length (0.76 [0.44, 1.08]), gait velocity (0.75 [0.48, 1.01]), and clinical walking tests (-0.50 [-0.78, -0.21]) also improved. Effects on other gait characteristics (i.e., step width, stance/swing/step time, gait cycle duration, and swing/stance phase) were limited. CONCLUSIONS: Oral levodopa induces substantial acute improvements in motor symptoms and key gait parameters but has limited effects on other gait characteristics, emphasizing the need for complementary and individualized interventions.

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21. **Not all Parkinsons patients with thoracolumbar spinal fusion are created equal: Highlighting the difference between long and short fusions.**

Authors: Lindsey M.;Levy H.;Allen T.;Pumford A.;Hamouda A.;Kelley B.;Goh B.;Freedman B.;Sebastian A. and Nassr, A.

Publication Date: 2025

Journal: North American Spine Society Journal 24(pagination), pp. Article Number: 100808. Date of Publication: 01 Dec 2025

Abstract: Background Parkinsons disease (PD) is a devastating neuromuscular disease that has several distinct spinal syndromes in addition to common degenerative spinal disorders. Multiple studies have concluded that patients with Parkinson's disease are at increased risk for perioperative medical complications and poor surgical outcomes such as failure of hardware and reoperation. PD patients exist in a spectrum of spinal disease with presentations, indications and surgical paradigms varying widely, yet the literature tends to treat them as a homogenous group. A more nuanced investigation and comparison of PD patients undergoing TL fusion will yield important differences in presentation, indication and outcomes. There is scant evidence on the most appropriate fusion paradigm for treating Parkinson's patients. We set out to compare patients who had short or long (>3 levels) thoracolumbar fusions to contrast the rate of surgical failure, and complications between each surgical approach and identify any patient, surgical, or disease risk factors for poor outcomes. Methods This retrospective cohort study of a single center experience with spinal fusion patients with concomitant Parkinson's disease at the time of spinal surgery. We included adult patients who underwent thoracolumbar spinal fusion and had a concomitant diagnosis of PD at an academic center between 2017 and 2022. Revision, oncologic and infection cases were excluded. Primary outcome measures were radiographic (stenosis, listhesis, hardware, fracture) evidence of failure, and morbidity. Secondarily, a multivariate regression was performed to identify patient risk factors for failure. We extracted and analyzed demographic information, Parkinson's specific metrics, in and out of hospital complications, surgical data, and radiologic outcomes and compared patients who underwent either short or long fusion constructs. Results 92 patients were identified after inclusion and exclusion. 63 (68%) underwent short fusion and 29 (32%) had long fusion constructs. Short fusion constructs were more strongly indicated for radiculopathy 51% vs. 21% p=.01) while extended fusions had a higher indication of spinal deformity (41%vs. 10% p=.001) or fracture (34%vs. 8% p=.004) and were more likely to have decreased mobility prior to surgery (79.7%vs. 53.9%; PCopyright © 2025 .

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22. **Air pollution and Parkinson's disease: A prospective cohort study with sex-stratified analysis in the UK biobank.**

Authors: Liu, Jianghong;Pan, Michael;Shi, Haoer;Sun, McKenna;Chen, Aimin and Feng, Rui

Publication Date: Dec ,2025

Journal: Neurotoxicology 111, pp. 103353

Abstract: Air pollution has been suggested as a potential environmental risk factor for Parkinson's disease (PD), but findings remain inconsistent, and sex-specific effects are understudied. This study examined associations between exposure to nitrogen dioxide (NO2) and particulate matter) and particulate matter 10) and incident PD, using data from the UK Biobank. Annual levels of NO2 (2005-2007) and PM10 (2007) were estimated based on residential addresses. Logistic regression models assessed the associations between air pollution exposure and PD onset, adjusting for age, sex, smoking status, and family history of PD. Competing risk models and inverse probability weighting were applied to address survivorship bias and missing data. Sex-stratified analyses explored potential differences by sex. Among 210,417 participants (mean follow-up = 9.17 years), 2592 developed PD. Higher exposure to both NO2 and PM10 was associated with increased PD risk. In sex-specific models, the associations remained significant in males but not in females. Competing risk

models confirmed elevated PD risk with NO2 (HR = 1.05; 95% CI: 1.01-1.09) and PM10 (HR = 1.08; 95% CI: 1.03-1.13) in the overall cohort, with similar or stronger associations in males (NO2: HR = 1.07; 95% CI: 1.02-1.13; PM10: HR = 1.07; 95% CI: 1.02-1.14). In conclusion, long-term exposure to NO2 and PM10 was linked to increased PD risk, particularly in males. These findings highlight the importance of incorporating sex-specific analyses in environmental research on PD.

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23. **Postural instability in Parkinson's disease assessed by instrumented pull-test: Clinical-pharmacological implications.**

Authors: Mostile, Giovanni;Contrafatto, Federico;Cultraro, Marco;Caruso, Dario;Manenti, Mattia;Ando, Bruno and Zappia, Mario

Publication Date: Dec ,2025

Journal: Parkinsonism & Related Disorders 141, pp. 108103

Abstract: INTRODUCTION: Postural Instability (PI) in Parkinson's Disease (PD) and its responsiveness to Levodopa (LD) have been poorly investigated quantitatively. Primary outcomes of the study were to quantify postural instability in a cohort of LD-treated PD patients in order to reliably discriminate stable from unstable PD subjects and to detect acute response to LD on PI. METHODS: We enrolled N = 28 patients diagnosed with "clinically definite" PD. Two groups were identified according to the score of the "postural instability" MDS-UPDRS item: 15 PD with Postural Stability (PD-PS) and 13 PD with PI. Each patient performed an "instrumented pull-test" five times both in OFF and in ON state, wearing a passive marker on the sternum. Marker positions were recorded by an optokinetic system. "Total Time" (TT) was estimated for all patients, indicating time from the onset of postural change until recovery. Healthy Controls (HC) data were used as reference. RESULTS: TT values were significantly different when comparing HC to PD and PD-PS to PD-PI. Significant differences were also found when comparing TT values among "stable" vs "unstable" trials, as well as when comparing TT values before and after LD administration. TT threshold equal to 3.64s discriminated between stable and unstable trials with an accuracy of 83.2 %. CONCLUSIONS: TT may represent a reliable biomarker of PI in PD, resulting modified by LD. Study results highlight dopaminergic mechanisms underlying PI in PD.

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24. **Fractures in Parkinson's Disease: Pathophysiology, Prevention, and Orthopedic Outcomes**

Authors: Osman, Ali;Maya, Tala;Bhutta, Rayyan;Doshi, Natasha;Khan, Maryam;Shah, Sara;Periceles, Paslene and Rasmussen, Janae

Publication Date: Sep ,2025

Journal: Cureus 17(9), pp. e92946

Abstract: Fractures are an important comorbidity in Parkinson's disease (PD), which can result in disability, mortality, and high healthcare costs. Impaired mobility, postural instability,

bradykinesia, muscle rigidity, and decreased bone mineral density (BMD) contribute to the increased risk of falls, which often result in hip and upper extremity fractures. Hip fractures in patients with PD are associated with an increased hospital length of stay and a decline in functional independence. Multimodal fall prevention in PD is well established, but prevention of fractures is often underutilized, despite evidence-based interventions. Information on fall-related fracture outcomes after exercise interventions is an area warranting further investigation. Several new strategies, such as home-based telerehabilitation (TR) and pharmacologic agents, show promise but are not yet widely implemented in care. While screening tools and risk stratification methods are available, most patients with PD are not screened for skeletal fragility or entered into a structured prevention program. This review proposes a reframing of skeletal fragility in PD from a problem of secondary complications, amenable to treatment only after the fact, to a primary and expected consequence of neuromotor dysfunction in this disease. When fracture risk is considered a core and predictable outcome of PD progression, the integration of new models of care may be accelerated that combine movement therapy, bone-protective interventions, and proactive surgical planning to improve long-term outcomes.

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25. **Investigating the association of pan-immune-inflammation value, systemic immune-inflammation index, and neutrophil-to-lymphocyte ratio with pain in Parkinson's disease.**

Authors: Pan H.;Wang X.;Zhang X.;Shi X.;Sun T.;Xu J. and Wang, S.

Publication Date: 2025

Journal: Frontiers in Neurology 16(pagination), pp. Article Number: 1682964. Date of Publication: 2025

Abstract: Objective: To explore the relationship between novel composite inflammatory markers-pan-immune-inflammation value (PIV), systemic immune-inflammation index (SII), and neutrophil-to-lymphocyte ratio (NLR)-and the presence of pain in patients with Parkinson's disease (PD). Method(s): A total of 150 PD patients who attended the outpatient or inpatient departments of the Second Clinical College of Xuzhou Medical University (Huai'an Third People's Hospital) between September 2020 and December 2023 were enrolled as the PD group. An additional 150 age- and sex-matched healthy individuals undergoing routine physical examinations were selected as the healthy control (HC) group. The King's Parkinson's Disease Pain Scale (KPPS), Hoehn-Yahr (H-Y) staging, Unified Parkinson's Disease Rating Scale part III (UPDRS-III), Hamilton Depression Rating Scale-24 (HAMD-24), and Hamilton Anxiety Rating Scale (HAMA) were used to assess pain, disease severity, motor symptoms, depression, and anxiety in PD patients. Demographic and laboratory data were collected for all participants. Based on KPPS scores, PD patients were subdivided into those with pain (PDP group) and those without pain (nPDP group). Intergroup differences were compared, and the associations of PIV, SII, and NLR with pain in PD were analyzed. Result(s): Among the 150 PD patients, 79 (52.7%) reported pain, with a mean KPPS score of 10.81+/-8.67. Compared to the HC group, PD patients exhibited significantly elevated levels of PIV, SII/100, and NLR, and significantly lower platelet and lymphocyte counts (pResult(s): Among the 150 PD patients, 79 (52.7%) reported pain, with a mean KPPS score of 10.81+/-8.67. Compared to the HC group, PD patients exhibited significantly elevated levels of PIV, SII/100, and NLR, and significantly

lower platelet and lymphocyte counts (pResult(s): Among the 150 PD patients, 79 (52.7%) reported pain, with a mean KPPS score of 10.81+/-8.67. Compared to the HC group, PD patients exhibited significantly elevated levels of PIV, SII/100, and NLR, and significantly lower platelet and lymphocyte counts (pConclusion(s): Inflammatory dysregulation is present in PD patients. Compared with the nPDP group, patients in the PDP group showed significantly higher levels of PIV and SII/100, as well as greater disease severity (H-Y stage, UPDRS-III) and more pronounced depressive symptoms (HAMD-24) (pConclusion(s): Inflammatory dysregulation is present in PD patients. Compared with the nPDP group, patients in the PDP group showed significantly higher levels of PIV and SII/100, as well as greater disease severity (H-Y stage, UPDRS-III) and more pronounced depressive symptoms (HAMD-24) (pCopyright

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26. **A modified Delphi study of post-operative management for subthalamic deep brain stimulation in Parkinson's disease.**

Authors: Pedrosa A.J.;Molter J.N.;Brito de Almeida L.;Kimura K.;Mestre T.;Okun M.S.;Capetian P. and Pedrosa, D. J.

Publication Date: 2025

Journal: Journal of Parkinson's Disease , pp. 1877718X251394354

Abstract: BackgroundDespite the widespread adoption of deep brain stimulation (DBS) for treating Parkinson's disease (PD) over the last few decades, standardized post-operative care protocols remain lacking.ObjectiveThis study aimed to establish expert consensus on managing post-operative subthalamic nucleus (STN-DBS).MethodsA three-round online Delphi study was conducted involving an international panel of DBS experts actively engaged in all facets of post-operative care. In the initial round, the panel generated ideas regarding essential components of a post-operative care protocol. In rounds two and three, numerical ratings and rankings were employed to achieve consensus on the formulated statements. This iterative process culminated in a refined STN-DBS care protocol.ResultsThe study included 76 international participants who, over three survey rounds, reached consensus on 129 components of a care protocol for managing post-operative STN-DBS. The final protocol encompassed eleven essential domains: hospital discharge, rehabilitation referral, imaging and lead review, monopolar testing, local field potential sensing, troubleshooting, medication management, multiprofessional care, follow-up, empowerment of patients and caregivers, and quality control of management procedures.ConclusionsThis Delphi-based, expert-driven process resulted in a comprehensive care protocol for patients undergoing STN-DBS. The findings offer a valuable resource for healthcare professionals, providing a structured, consensus-based framework aimed at optimizing post-operative outcomes. In addition to supporting clinical practice, these recommendations may help inform policy development and drive systematic improvements in care delivery. Further research and validation in diverse clinical settings will be essential to assess the generalizability and real-world impact of the proposed procedures.

27. **Participation of ethnic minorities in Parkinson's research: challenges and needs. A qualitative study.**

Authors: Ramadhan M.;Schrag A.;Tufail M. and Stott, J.

Publication Date: 2025

Journal: Age and Ageing 54(10) (pagination), pp. Article Number: afaf296. Date of Publication: 01 Oct 2025

Abstract: Objective: To explore barriers to participation in Parkinson's disease (PD) research trials amongst ethnic minority (EM) individuals in the UK and to identify potential strategies to improve inclusivity. Design(s): A qualitative study using semi-structured interviews and thematic analysis. Setting(s): Participants were recruited primarily through community outreach in the UK. Participant(s): Twenty-one individuals diagnosed with PD, self-identifying as belonging to EM groups, participated in the study. The sample included individuals from South Asian, Black African and Middle Eastern backgrounds. Result(s): Five themes were identified: (i) Lack of Awareness of Research Opportunities; (ii) Mistrust and Misconceptions about Research, where fears and misunderstandings about research processes contributed to hesitancy; (iii) Understanding the importance and scope of research, some participants viewed research only as a means to find a cure, while others emphasised the need for studies on non-motor symptoms; (iv) Practical and Parkinson's-related barriers, including fatigue, travel difficulties, financial constraints and language barriers; and (v) Facilitators to Participation many preferring flexible and remote participation options. Conclusion(s): This study found addressing barriers to participation requires tailored engagement strategies, transparent communication, diverse representation in research teams and practical support measures. Emphasising the importance of research and its potential to improve treatments and outcomes is essential to improving inclusivity and accessibility in PD research.

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28. **Real-world evidence of pimavanserin utilization among patients with Parkinson's disease psychosis: a review of real-world data that augments data from randomized controlled trials.**

Authors: Rashid N.;Yunusa I.;Doshi D.;Yakkala V.;Gopal D.;Abler V. and Rajagopalan, K.

Publication Date: 2025

Journal: Journal of Comparative Effectiveness Research 14(12), pp. e250129

Abstract: Aim: Pimavanserin (PIM) is the only US FDA-approved atypical antipsychotics (AAPs) for the treatment for hallucinations and delusions associated with Parkinson's disease psychosis (PDP). In addition to demonstrating symptom improvements in clinical trials, PIM appears to consistently show favorable outcomes among published real-world evidence (RWE) studies compared with off-label AAPs (e.g., quetiapine [QUE]). A comprehensive review of these RWE studies was conducted to summarize the overall benefits of PIM among PDP patients residing in community or nursing home/long-term care (NH/LTC) settings. Material(s) and Method(s): A literature review of published comparative RWE studies of PIM

among PDP patients from 1 January 2017 to 1 April 2025 was conducted. Eligible studies examined the following outcomes in community and NH/LTC settings: clinical (e.g., falls, fractures), adherence (e.g., discontinuations), all-cause and psychiatric (psych)-related healthcare resource use (e.g., hospitalizations, emergency room (ER) visits, office visits, etc.), and mortality. Result(s): Sixteen RWE studies of PIM versus other-AAPs or QUE and PIM nonusers were included for review. In these studies, PIM had 20-37% lower all-cause and psych-related hospitalizations, 7-15% lower ER visits, significant delays to LTC admissions, lower rates of falls or fractures in NH/LTC settings and lower observed rates of mortality versus other-AAPs. Similar results were found for PIM versus QUE. Conclusion(s): PDP patients initiating PIM versus other-AAPs or QUE were associated with lower all-cause and psychiatric healthcare resource use burden, longer community-stays and delayed NH/LTC admissions. Additionally, PIM was associated with higher treatment compliance, fewer falls or fractures and lower overall mortality risk versus other-AAPs or QUE. PIM's favorable real-world profile versus other-AAPs or QUE across community and NH/LTC settings complement the favorable clinical trial findings.

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29. **Prevalence and predictors of freezing of gait in people with Parkinson's disease.**

Authors: Shalash A.;Bahbah E.;Sadik E.;Essam M.;George P.;Afify H.E.;Hamid E. and Helmy, A.

Publication Date: 2025

Journal: Egyptian Journal of Neurology, Psychiatry and Neurosurgery 61(1) (pagination), pp. Article Number: 109. Date of Publication: 01 Dec 2025

Abstract: Background: Identifying the risk factors of freezing of gait (FOG) is essential in the management of Parkinson's disease (PD). This study aimed to identify the clinical and radiological predictors of FOG in Egyptian people with PD (PwPD). The gait of 91 PwPD was evaluated using new freezing of gait questionnaire (NFOG-Q), Berg balance scale (BBS), ten-meter walking test and time up and go test. Also, patients were assessed by total and sub-scores of MDS-UPDRS, Schwab and England (S&E-ADL), Hoehn and Yahr (H&Y), Beck depression inventory (BDI), non-motor symptoms scale (NMSS), and PD questionnaire 39 (PDQ-39). White matter hyperintensities in the MRI brain were evaluated using the Fazekas and Scheltens scales. Result(s): The prevalence of FOG was 63.7%. Compared to non-FOG patients, patients with FOG had significantly higher disease duration, MDS-UPDRS total, sub-scores and H&Y (p Result(s): The prevalence of FOG was 63.7%. Compared to non-FOG patients, patients with FOG had significantly higher disease duration, MDS-UPDRS total, sub-scores and H&Y (p Result(s): The prevalence of FOG was 63.7%. Compared to non-FOG patients, patients with FOG had significantly higher disease duration, MDS-UPDRS total, sub-scores and H&Y (p Result(s): The prevalence of FOG was 63.7%. Compared to non-FOG patients, patients with FOG had significantly higher disease duration, MDS-UPDRS total, sub-scores and H&Y (p Conclusion(s): Factors associated with FOG include disease duration, LEDD, motor symptom severity, gait characteristics, and cognitive impairment,-while white matter load does not appear to be a contributing factor. These findings highlight the importance of a comprehensive, multidisciplinary approach to FOG management.

30. **Characterization of the Epidemiological Profile of Patients With Parkinson's Disease Who Were Hospitalized due to SARS-CoV-2 Infection: A Portrait of 4 Years of the Pandemic in Brazil.**

Authors: Silva A.E.F.;Costa P.T.;Mello L.S.;Marques L.F.A. and Marson, F. A. L.

Publication Date: 2025

Journal: Journal of Medical Virology 97(11) (pagination), pp. Article Number: e70670. Date of Publication: 01 Nov 2025

Abstract: Individuals with Parkinson's disease may be more susceptible to severe coronavirus disease (COVID)-19 outcomes due to advanced age and neurological and systemic impairments. However, the evidence on this association remains inconclusive. This study investigates the impact of severe acute respiratory syndrome coronavirus 2 infection in hospitalized patients with Parkinson's disease. Secondary data from the Influenza Epidemiological Surveillance Information System were obtained from the OpenData-SUS platform of the Brazilian Ministry of Health, covering March 2020 to March 2024. Variables included demographics, comorbidities, clinical signs and symptoms, ventilatory and intensive care unit (ICU) support, hospital stay, and outcomes. Missing data were imputed, and descriptive, bivariate, and multivariable analyses were conducted using 5% significance level. Among 1 725 690 hospitalized COVID-19 patients in Brazil, 4907 (0.3%) had Parkinson's disease. Overall mortality was 37.2%, while mortality among Parkinson's patients reached 53.1% (OR = 1.920; 95% CI = 1.815-2.031), indicating a significantly higher risk. Death was independently associated with advanced age, male sex, low vaccination coverage, and cardiovascular or chronic respiratory diseases. Age strongly predicted both Parkinson's diagnosis and mortality. Parkinson's patients had higher ICU admission rates and more frequent need for invasive ventilation. Multivariable analysis confirmed Parkinson's disease as an independent mortality risk factor (OR = 1.277; 95% CI = 1.198-1.360). The logistic regression model for mortality demonstrated good discrimination, with an area under the receiver operating characteristic curve of 0.810 (95% CI = 0.809-0.811), indicating reliable performance in distinguishing patients who experienced the outcome. Parkinson's disease is associated with higher mortality and greater ICU needs in hospitalized COVID-19 patients. These findings underscore the need for targeted prevention, close monitoring, and tailored clinical management for this vulnerable group, especially considering their age and comorbid conditions.

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31. **VReeze: an open-source virtual reality for the examination of freezing of gait in Parkinson's disease - a study design of a crossover repeated measures study for validation.**

Authors: Siragy T.;Russo Y.;Hirschbichler S.;Nantel J.;Wegscheider P.;Schweiger H.;Simonlehner M.;Kisiel M. and Horsak, B.

Publication Date: 2025

Journal: BMJ Open 15(11) (pagination), pp. Article Number: e106489. Date of Publication: 09

Nov 2025

Abstract: Introduction Parkinson's disease is the second most prevalent neurodegenerative disease worldwide, with up to 70% of patients exhibiting freezing of gait (FOG). FOG is defined as transient episodes when one is unable to effectively engage in the stepping process (despite the intention to walk), which decreases or completely ceases forward movement. Although several FOG triggers have been identified, eliciting FOG remains challenging in research, hindering progress in research and therapy. Virtual reality (VR) offers a promising approach to evoke FOG during overground walking by combining environmental and neuropsychological triggers. This project aims to validate an existing open-source VR-FOG toolbox that integrates multiple triggers. Methods A within-subject repeated measures crossover study design with a 1-hour washout period will be used for this project to validate the VR-FOG toolbox. This will consist of three blocks (baseline non-VR, VR non-FOG and VR-FOG). All participants will first complete a baseline walking trial without VR, then be randomised to either the VR non-FOG environment-a virtual replica of the laboratory-or the VR-FOG environment containing multiple virtual FOG triggers. After a 1-hour washout period, they will complete the remaining VR condition. A crossover design will minimise ordering effects of VR conditions on FOG frequency and duration. Twenty participants with Parkinson's disease with FOG will be tested at St. Polten University of Applied Sciences (Austria) and 20 at the University of Exeter (UK) and will be recruited from local communities. Multisite testing will verify that the VR-FOG environment triggers FOG regardless of testing location. Ethics and dissemination Ethical approval was obtained from the Lower Austrian Ethics Commission and the University of Exeter review boards. All data will be anonymised, used solely for this project and securely stored in General Data Protection Regulation-compliant repositories. Study results will be presented at scientific conferences and published in peer-reviewed journals.

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32. **Living Alone Is Associated with Discontinuation of Levodopa-Entacapone-Carbidopa Intestinal Gel Treatment in Advanced Parkinson's Disease.**

Authors: Viljaharju, Vili;Mertsalmi, Tuomas;Pauls, K. Amande M.;Koivu, Maija;Eerola-Rautio, Johanna;Udd, Marianne and Pekkonen, Eero

Publication Date: 2025

Journal: European Neurology 88(5-6), pp. 159–166

Abstract: INTRODUCTION: Levodopa-entacapone-carbidopa intestinal gel (LECIG) is a recently introduced device-aided treatment option for advanced Parkinson's disease. Data on long-term outcomes remain limited, with only two published studies to date. This study aimed to report long-term outcomes of LECIG treatment, focusing on safety, adverse events, and treatment adherence. METHODS: In this retrospective longitudinal observational single-center study, the medical records of 27 consecutive patients treated with LECIG at Helsinki University Hospital between 2020 and 2024 were analyzed. Adverse events, treatment discontinuations, and medication changes were assessed during the first 2 years of treatment. Clinically significant weight loss was defined as weight loss of >5% over 12 months. Fisher's exact test was used to assess the association between living situation and treatment discontinuation.

RESULTS: In total, 10 patients (37%) discontinued the treatment, with 6 (60%) within the first year. Living alone was significantly associated with discontinuation (p = 0.033) compared to living with a spouse or in an institution. Three patients died during follow-up from causes unrelated to LECIG treatment. Adverse events were frequent, including inner tube complications requiring 41 inner tube replacements. Clinically significant weight loss was observed in 29% of patients. CONCLUSIONS: In long-term treatment, adverse events with LECIG appear similar to those observed with levodopa-carbidopa intestinal gel (LCIG). However, weight loss and the discontinuation rate appear higher with LECIG. Yet, no direct comparison to LCIG was made in this study. Similar to LCIG, the discontinuation rate is particularly high among patients living alone. Copyright © 2025 S. Karger AG, Basel.

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33. **Correlation analysis of Hand flexibility and balance function in patients with Parkinson's Disease.**

Authors: Wang W.;Li C.;Zeng B.;Wang C.;Sun Y.;Wang J. and Zhu, Y.

Publication Date: 2025

Journal: Gerontology , pp. 1–20

Abstract: INTRODUCTION: Parkinson's Disease (PD) is a progressive neurological disorder caused by a reduction in dopamine in the substantia nigra and striatum of the basal ganglia. Patients with mild to moderate PD have poor hand dexterity, reduced grip strength, and lower self-perceived hand function ability. To explore the correlation between hand function and balance function in patients with Parkinson's disease. METHOD(S): 196 Patients with Parkinson's disease who visited the Department of Rehabilitation Medicine and the Department of Neurology of Huashan Hospital Affiliated to Fudan University from June 2022 to December 2024 were selected, with Hohn-Yarr stages II-III. The hand function and balance function of the patients were evaluated. The correlation between the hand function and balance function of the patients was observed through the scales STEF, Berg Balance Scale and TUGT. RESULT(S): The hand function of the patients was positively correlated with the balance function. The STEF balance was positively correlated with the total Berg score at the opening period (r=0.563, P RESULT(S): The hand function of the patients was positively correlated with the balance function. The STEF balance was positively correlated with the total Berg score at the opening period (r=0.563, P RESULT(S): The hand function of the patients was positively correlated with the balance function. The STEF balance was positively correlated with the total Berg score at the opening period (r=0.563, P CONCLUSION(S): The patients with hand function and balance function has a positive correlation, and negatively correlated with TUGT when using, can be predicted by hand function assessment in patients with balance function, the future research needs to determine a function will not affect another function.Copyright S. Karger AG, Basel.

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34. **The Importance of Medication Reconciliation in a Patient with Parkinson's Disease.**

Authors: Wright, Sarah Steely and Wright, Charlie

Publication Date: Nov 01 ,2025

Journal: The Senior Care Pharmacist 40(11), pp. 443–449

Abstract: In this case, a 67-year-old male experienced a progression of his Parkinson's disease symptoms following an inpatient hospitalization for pneumonia. He presents to the neurology clinic for follow-up, where the neurology ambulatory care pharmacist was consulted to assist with his case. The pharmacist identified a medication reconciliation discrepancy that resulted in an unintentional change in the dosing frequency of his carbidopa/levodopa. This, combined with the initiation of metoclopramide, a dopamine-receptor antagonist, led to a worsening of his Parkinson's symptoms. His carbidopa/levodopa dose was titrated back to the previous regimen, metoclopramide was discontinued, and his symptoms significantly improved. This case highlights the importance of best practices in medication reconciliation for patients with Parkinson's disease, the impact of drug-disease interactions, and emphasizes the critical role of ambulatory care pharmacists in geriatric patient care.

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35. **Stage-specific efficacy of pharmacological interventions on gait impairments in Parkinson's disease.**

Authors: Zhang J.;Chen L. and Li, J.

Publication Date: 2025

Journal: Frontiers in Neurology 16(pagination), pp. Article Number: 1657884. Date of Publication: 2025

Abstract: Objective: This study aims to clarify the variations and the therapeutic effects of medicine on gait by analyzing the gait characteristics before and after medication in various stages of Parkinson's disease (PD). Method(s): This prospective study included 60 patients with PD [Hoehn-Yahr (H-Y) stage 1-4] at the department of Neurology of Beijing Tsinghua Changgung Hospital, and 30 gender and age - matched healthy controls. The ReadyGo system was used to record gait parameters. The levodopa challenge test was applied to assess the therapeutic effect of medicine on gait. Result(s): We observed a shorter stride length and stride height, a longer stride time and turn-around time, and a reduction of stride speed in the PD group compared with the healthy control group significantly. No significant changes were noted in the variability of stride parameters (stride frequency variability and stride length variability). The radar chart demonstrated a gradual decline in gait parameters as the disease progressed. Compared to healthy control group, significant differences in stride speed and stride time were observed from H-Y stage 1 (pResult(s): We observed a shorter stride length and stride height, a longer stride time and turn-around time, and a reduction of stride speed in the PD group compared with the healthy control group significantly. No significant changes were noted in the variability of stride parameters (stride frequency variability and stride length variability). The radar chart demonstrated a gradual decline in gait parameters as the disease progressed. Compared to healthy control group, significant differences in stride speed and stride time were observed from H-Y stage 1 (pResult(s): We observed a shorter stride length and stride height, a longer stride time and turn-around time, and a reduction of stride speed in the PD group compared with the healthy control group significantly. No significant changes were noted in the variability of stride parameters (stride frequency variability and stride length variability). The radar chart demonstrated a gradual decline in gait parameters as the disease progressed. Compared to healthy control group,

significant differences in stride speed and stride time were observed from H-Y stage 1 (pResult(s): We observed a shorter stride length and stride height, a longer stride time and turn-around time, and a reduction of stride speed in the PD group compared with the healthy control group significantly. No significant changes were noted in the variability of stride parameters (stride frequency variability and stride length variability). The radar chart demonstrated a gradual decline in gait parameters as the disease progressed. Compared to healthy control group, significant differences in stride speed and stride time were observed from H-Y stage 1 (pConclusion(s): Gait changes can serve as a new early diagnosis marker for PD because of the early significant change in gait parameters especially on stride speed and stride time. As the disease advances, various gait parameters gradually deteriorate, suggesting that objective gait monitoring can provide a reference method to dynamically observe PD progression. Unlike the previous view that medicine has limited effect on gait, this study found that although the effect of medicine on gait is not as remarkable as that on tremor and rigidity, medicine can still effectively improve gait, especially in the patients with advanced PD.

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36. **The mediating role of biological age in the impact of mood instability symptoms on neurodegenerative disease and mortality.**

Authors: Zhang J.;Liu K.;Wang J.;Wang Y.;Ma X.;Li Z.;He S.;Liu X.;Chen P. and Li, J.

Publication Date: 2025

Journal: BMC Medicine 23(1) (pagination), pp. Article Number: 596. Date of Publication: 01 Dec 2025

Abstract: Background: Accumulating evidence links mood instability to an increased risk of adverse outcomes, yet its relationship with neurodegenerative diseases remains underexplored. This study examines the associations between mood instability symptoms and the risk of neurodegenerative diseases, exploring the mediating role of biological aging. Method(s): The participants in the UK Biobank without a diagnosed neurological condition at baseline were included. Mood instability symptoms were assessed at two time points: baseline (2006-2010, T1) and the third visit (2014 +, T2), using 13 items of mental symptoms (e.g., "mood goes up and down," "miserable for no reason"). Biological aging was generated by two previously described measures of biological age based on 14 routinely measured clinical biomarkers (PhenoAge, Klemera-Doubal method age). Latent class analysis (LCA) was employed to classify individuals into different psychological clusters. Cox proportional hazard models and mediation analyses were used to examine the associations between mood instability symptoms, biological aging, and adverse health outcomes. The latent transition analysis (LTA) identified latent classes of transition, and multifactor logistic regression was used to examine the sex difference in the probability of transitioning between these latent classes. Result(s): Of 185,818 included participants, 51.86% were female. During a median follow-up of 14.6 years, we identified three clusters with distinct mood patterns. Compared to individuals with a pattern of "stable," individuals with severe mood instability symptoms at baseline was significantly associated with an increased risk of all-cause dementia (hazard ratio [HR] = 1.17, 95% CI: 1.02-1.35), Parkinson's disease (HR = 1.47, 95% CI: 1.21-1.77), and all-cause mortality (HR = 1.07, 95% CI: 1.01-1.14). Accelerated biological aging was also linked to a higher risk of both dementia and Parkinson's disease. Mediation analyses revealed that

biological aging partially mediated the association between severe mood instability symptoms and neurodegenerative diseases, as well as mortality (ranging from 0.78% to 13.6%). Notably, females had a higher risk of transitioning to more severe groups over time. Conclusion(s): These findings underscore the critical need to focus on severe mood instability symptoms in early intervention strategies to reduce neurodegenerative disease risk, particularly by focusing on emotional well-being in females.

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37. **Prevalence, risk factors, and outcomes of malnutrition in older adults hospitalized with community-acquired pneumonia: a retrospective study.**

Authors: Zheng, Xiao-Lu;Zhang, Xing;Yuan, Jia-Hui and Yi, Lu-Tian

Publication Date: 2025

Journal: Frontiers in Medicine 12, pp. 1522261

Abstract: Purpose: Community-acquired pneumonia (CAP) is a common health problem in older adults. Malnutrition is also prevalent in the elderly population. This study aimed to investigate the prevalence, risk factors, and outcomes of malnutrition in hospitalized older adults diagnosed with CAP. Methods: From April 2023 to October 2023, clinical data of older adults hospitalized with CAP were retrospectively analyzed. Based on their malnutrition status at the time of admission, patients were classified into the malnutrition and non-malnutrition groups. The demographic and clinical characteristics as well as outcomes were compared between the two groups. Univariate and multivariate logistic regression analyses were used for variables of interest. The receiver operating characteristic curve was applied to evaluate the risk factors. Results: A total of 511 eligible patients were included in this study. There were 90 and 421 patients in the malnutrition and non-malnutrition groups, respectively. Univariate analysis showed a significant difference in six factors: age, living alone, past cerebral stroke, Parkinson's disease, serum albumin, and hemoglobin (P P = 0.025), past cerebral stroke (OR = 2.643, P = 0.014), Parkinson's disease (OR = 2.998, P = 0.028), low serum albumin level (OR = 6.407, P P Conclusion: The prevalence of malnutrition was high in older adults hospitalized with CAP. Malnutrition was associated with worse outcomes, including prolonged hospital stay, higher in-hospital mortality, and increased readmission. Old age (> 74 years), past cerebral stroke, Parkinson's disease, low serum albumin level (: The prevalence of malnutrition was high in older adults hospitalized with CAP. Malnutrition was associated with worse outcomes, including prolonged hospital stay, higher in-hospital mortality, and increased readmission. Old age (> 74 years), past cerebral stroke, Parkinson's disease, low serum albumin level (: The prevalence of malnutrition was high in older adults hospitalized with CAP. Malnutrition was associated with worse outcomes, including prolonged hospital stay, higher in-hospital mortality, and increased readmission. Old age (> 74 years), past cerebral stroke, Parkinson's disease, low serum albumin level (Copyright © 2025 Zheng, Zhang, Yuan and Yi.

Sources Used:

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