Supplementary Table 1 Diagnostic criteria for neuroleptic malignant syndrome

Diagnostic criteria	Scoring	Scores in our patient
Exposure to a dopamine antagonist, or dopamine agonist withdrawal, within the past 72 hours	20	Onset of symptoms 3 days after the addition of quetiapine
Hyperthermia (> 100.4°F or > 38.0°C on at least 2 occasions, measured orally)	18	A temperature of 98°F at presentation
Rigidity	17	Patient had 'lead pipe' rigidity in all 4 limbs
Mental status alteration (reduced/ fluctuating level of consciousness)	13	Clear sensorium
Creatine kinase elevation (at least 4 times the upper limit of normal)	10	Normal levels
Sympathetic nervous system lability, defined as at least 2 of the following: 1. Blood pressure elevation (systolic or diastolic ≥ 25% above baseline) 2. Blood pressure fluctuation (≥ 20 mm Hg diastolic change or ≥ 25 mm Hg systolic change within 24 hours) 3. Diaphoresis 4. Urinary incontinence	10	Only one criterion, i.e., urinary incontinence, was present

Hypermetabolism, defined as heart-rate increase (≥25% above baseline) AND respiratory-rate increase (≥50% above baseline)	5	Normal
Negative work-up for infectious, toxic, metabolic, or neurologic causes	7	All were negative
A total score of ≥ 74 is required for the diagnosis of neuroleptic malignant syndrome	74	The score of 37 in our patient was well below the threshold, ruling out neuroleptic malignant syndrome

1. **Gurrera RJ**, Caroff SN, Cohen A, Carroll BT, DeRoos F, Francis A, Frucht S, Gupta S, Levenson JL, Mahmood A, Mann SC, Policastro MA, Rosebush PI, Rosenberg H, Sachdev PS, Trollor JN, Velamoor VR, Watson CB, Wilkinson JR. An international consensus study of neuroleptic malignant syndrome diagnostic criteria using the Delphi method. *J Clin Psychiatry* 2011; **72**: 1222-1228 [PMID: 21733489 DOI: 10.4088/JCP.10m06438]

Supplementary Table 2 Non-motor symptoms of Parkinson's disease

Symptom	Features	Rates	Onset	Course
Olfactory dysfunction	Anosmia/hyposmia	90%	Precedes motor symptoms Present at any stage of PD.	It may be associated with greater severity and rapid progression of PD. Risk factor for developing PD. May predict the onset of dementia in PD.
Visual disturbances	Impaired contrast sensitivity, colour discrimination, convergence, diplopia, dry eye syndrome	22% - 78%	Early-stage feature of PD.	Increase with disease progression.
Pain	Musculoskeletal/nociceptive, radicular/neuropathic, dystonia-related, primary/central PD,	30%-85%	Early-stage feature of PD.	-

	akathisia-related			
Sleep disturbances	Insomnia, sleep fragmentation, nocturnal awakening, periodic limb movements, restless leg syndrome, daytime hypersomnolence, sleep apnoea	20%-90%	Precedes motor symptoms. Mid-stage feature of PD.	Prevalence increases with increasing illness duration.
Rapid eye movement sleep behaviour disorder (REMBD)	Parasomnia is characterised by loss of muscle atonia and dream-enactment behaviours	25%-50%	Precedes motor symptoms by 12-14 years Early-stage feature of PD.	Patients with REMBD have an 33%- 90% risk of eventually developing PD. Associated with more severe PD.
Constipation	Constipation is often associated with a sensation of incomplete evacuation	28%-80%	Precedes motor symptoms by 20 years in about half of the patients.	Increases the risk of developing PD by 3 to 4.5-fold.

Gastrointestinal dysfunctions	Dysphagia, gastroparesis, small intestinal bacterial overgrowth, bowel dysfunction, hypersalivation	25%-67%	It can precede motor symptoms. Mid-stage feature of PD.	-
Hypotension	Orthostatic hypotension	30%-60%	Late-stage feature of PD. 80% patients are asymptomatic.	Related to the duration and severity of PD and the use of dopaminergic medications. More common in patients with dementia, such as those with Lewy Body dementia
	Post-prandial hypotension			
	Nocturnal/labile hypertension			
Urinary	Increased frequency,	25%-	Late-stage feature of	-

symptoms	urgency & urge incontinence, nocturia, incomplete bladder emptying, retention	50%	PD	
Sexual dysfunction	Men - erectile dysfunction, difficulty reaching orgasm, premature ejaculation Women - low sexual desire, arousal & orgasmic difficulties	53%-68%	Can precede motor symptoms Late-stage feature of PD	-
Diaphoresis	Paroxysmal drenching sweats	-	-	-
Fatigue	Feelings of tiredness or exhaustion, independent of depression or sleep disturbances	33%-80%%	It can precede motor symptoms. Early-stage feature of PD.	Not associated with duration or severity of PD & anti-parkinsonian medications.
Psychiatric symptoms	Anxiety, depression, psychosis, apathy, impulse control disorders	50%-90%	It can precede motor symptoms. It can be present at	More than one disorder in 45% of the patients. Prevalence increases with

			any stage of PD.	increasing illness duration. Depression increases the risk of developing PD.
Cognitive impairment	Subjective cognitive decline, mild cognitive impairment, dementia	30%-80%	It can precede motor symptoms. It can be present at any stage of PD.	Prevalence increases with increasing illness duration.

2. **Bonnet AM**, Jutras MF, Czernecki V, Corvol JC, Vidailhet M. Nonmotor symptoms in Parkinson's disease in 2012: relevant clinical aspects. *Parkinsons Dis* 2012; **2012**: 198316. [PMID: 22888466 DOI: 10.1155/2012/198316]

3. **Carroll V**, Rossiter R, Blanchard D. Non-motor symptoms of Parkinson's disease. *Aust J Gen Pract* 2021; **50**: 812–817. [PMID: 34713279 DOI: 10.31128/AJGP-07-21-6093]
4. **Cattaneo C**, Fabbrini A, Belvisi D, Aiello F, Marchet F, Fabbrini G. Non-Motor Symptoms: The Hidden Face of Parkinson's Disease. *Cells* 2026; **15**: 42. [DOI: 10.3390/cells15010042]
5. **Chahine LM**, Amara AW, Videnovic A. A systematic review of the literature on disorders of sleep and wakefulness in Parkinson's disease from 2005 to 2015. *Sleep Med Rev* 2017; **35**: 33–50. [PMID: 27863901 DOI: 10.1016/j.smrv.2016.08.001]

6. **Chaudhuri KR**, Schapira AHV. Non-motor symptoms of Parkinson's disease: dopaminergic pathophysiology and treatment. *Lancet Neurol* 2009; **8**: 464–474. [PMID: 19375664 DOI: 10.1016/S1474-4422(09)70068-7]
7. **Erro R**, Santangelo G, Barone P, Vitale C. Nonmotor symptoms in Parkinson's disease: classification and management. *JPRLS* 2015; **5**: 1–10. [DOI: 10.2147/JPRLS.S44382]
8. **Fernandes M**, Pierantozzi M, Stefani A, Cattaneo C, Bonizzoni EA, Cerroni R, Mercuri NB, Liguori C. Frequency of Non-motor Symptoms in Parkinson's Patients With Motor Fluctuations. Front Neurol 2021; **12**: 678373. [PMID: 34267721 DOI: 10.3389/fneur.2021.678373]
9. **Gupta S**, Shukla S. Non-motor symptoms in Parkinson's disease: Opening new avenues in treatment. *Current Research in Behavioral Sciences* 2021; **2**: 100049. [DOI: 10.1016/j.crbeha.2021.100049]
10. **Hermanowicz N**, Jones SA, Hauser RA. Impact of non-motor symptoms in Parkinson's disease: a PMD Alliance survey. *Neuropsychiatr Dis Treat* 2019; **15**: 2205–2212. [PMID: 31496703 DOI: 10.2147/NDT.S213917]
11. **Hou J-GG**, Lai EC. Non-motor Symptoms of Parkinson's Disease. *International Journal of Gerontology* 2007; **1**: 53–64. [DOI: 10.1016/S1873-9598(08)70024-3]
12. **Hussein A**, Guevara CA, Del Valle P, Gupta S, Benson DL, Huntley GW. Non-Motor Symptoms of Parkinson's Disease: The Neurobiology of Early Psychiatric and Cognitive Dysfunction. *Neuroscientist* 2023; **29**: 97–116. [PMID: 33966533 DOI: 10.1177/10738584211011979]
13. **Kadastik-Eerme L**, Muldmaa M, Lilles S, Rosenthal M, Taba N, Taba P. Nonmotor Features in Parkinson's Disease: What Are the Most Important Associated Factors? *Parkinsons Dis* 2016; **2016**: 4370674. [PMID: 27195172 DOI: 10.1155/2016/4370674]
14. **Lee HM**, Koh S-B. Many Faces of Parkinson's Disease: Non-Motor Symptoms of Parkinson's Disease. *J Mov Disord* 2015; **8**: 92–97. [PMID: 26090081 DOI: 10.14802/jmd.15003]

15. **Lyons KE**, Pahwa R. The impact and management of nonmotor symptoms of Parkinson's disease. *Am J Manag Care* 2011; **17**: S308-314. [PMID: 22087551]
16. **Macías-García P**, Rashid-López R, Cruz-Gómez ÁJ, Lozano-Soto E, Sanmartino F, Espinosa-Rosso R, González-Rosa JJ. Neuropsychiatric Symptoms in Clinically Defined Parkinson's Disease: An Updated Review of Literature. *Behav Neurol* 2022; **2022**: 1213393. [PMID: 35586201 DOI: 10.1155/2022/1213393]
17. **Muzerengi S**, Contrafatto D, Chaudhuri KR. Non-motor symptoms: identification and management. *Parkinsonism Relat Disord* 2007; **13**: S450-456. [PMID: 18267282 DOI: 10.1016/S1353-8020(08)70048-8]
18. **Peña-Zelayeta L**, Delgado-Minjares KM, Villegas-Rojas MM, León-Arcia K, Santiago-Balmaseda A, Andrade-Guerrero J, Pérez-Segura I, Ortega-Robles E, Soto-Rojas LO, Arias-Carrión O. Redefining Non-Motor Symptoms in Parkinson's Disease. *Journal of Personalized Medicine* 2025; **15**: 172. [PMID: 40423044 DOI: 10.3390/jpm15050172]
19. **Pfeiffer RF**. Non-motor symptoms in Parkinson's disease. *Parkinsonism Relat Disord* 2016; **22**: S119-122. [PMID: 26372623 DOI: 10.1016/j.parkreldis.2015.09.004]
20. **Poewe W**. Non-motor symptoms in Parkinson's disease. *Eur J Neurol* 2008; **15**: 14–20. [PMID: 18353132 DOI: 10.1111/j.1468-1331.2008.02056.x]
21. **Radad K**, Moldzio R, Krewenka C, Kranner B, Rausch W-D. Pathophysiology of non-motor signs in Parkinsons disease: some recent updating with brief presentation. *Explor Neuroprot Ther* 2023; **3**: 24–46. [DOI: 10.37349/ent.2023.00036]
22. **Schapira AHV**, Chaudhuri KR, Jenner P. Non-motor features of Parkinson disease. *Nat Rev Neurosci* 2017; **18**: 435–450. [PMID: 28592904 DOI: 10.1038/nrn.2017.62]
23. **Stacy M**. Nonmotor symptoms in Parkinson's disease. *Int J Neurosci* 2011; **121**: 9–17. [PMID: 22035025 DOI: 10.3109/00207454.2011.620196]

24. **Tibar H**, El Bayad K, Bouhouche A, Ait Ben Haddou EH, Benomar A, Yahyaoui M, Benazzouz A, Regragui W. Non-Motor Symptoms of Parkinson's Disease and Their Impact on Quality of Life in a Cohort of Moroccan Patients. *Front Neurol* 2018; **9**: 170. [PMID: 29670566 DOI: 10.3389/fneur.2018.00170]
25. **Todorova A**, Jenner P, Ray Chaudhuri K. Non-motor Parkinson's: integral to motor Parkinson's, yet often neglected. *Pract Neurol* 2014; **14**: 310–322. [PMID: 24699931 DOI: 10.1136/practneurol-2013-000741]
26. **Zhang J**, Xu C-Y, Liu J. Meta-analysis on the prevalence of REM sleep behavior disorder symptoms in Parkinson's disease. *BMC Neurol* 2017; **17**: 23. [PMID: 28160778 DOI: 10.1186/s12883-017-0795-4]
27. **Zhang T-M**, Yu S-Y, Guo P, Du Y, Hu Y, Piao Y-S, Zuo L-J, Lian T-H, Wang R-D, Yu Q-J, Jin Z, Zhang W. Nonmotor symptoms in patients with Parkinson disease: A cross-sectional observational study. *Medicine (Baltimore)* 2016; **95**: e5400. [PMID: 27977578 DOI: 10.1097/MD.0000000000005400]
28. **Zis P**, Erro R, Walton CC, Sauerbier A, Chaudhuri KR. The range and nature of non-motor symptoms in drug-naive Parkinson's disease patients: a state-of-the-art systematic review. *npj Parkinson's Disease* 2015; **1**: 15013. [DOI: 10.1038/npjparkd.2015.13]

Supplementary Table 3 Psychiatric symptoms associated with Parkinson's disease

	Prevalence	Characteristics	Prodromal phase	Risk factor for PD	Course
Depression	Clinically significant symptoms: 30%-40% Minor depression: [1] 22% - 37% Dysthymia: 13% -22.5% Major depression: 17%-25%	The most common disorder. Two to threefold more than the general population Comorbid anxiety and depression are found in 50%-80% of patients with PD.	Precedes the onset of motor symptoms in up to 30% of patients with PD by 4-6 years	Increases the risk of developing PD by 2-3 times in the 2–5-year period before diagnosis	Early PD – 10% -27% patients have depression Late PD – 60% have depression
Cognitive impairment	Subjective cognitive decline: [2] 25% -40% Mild cognitive impairment: [3] 20%-30% Dementia: point prevalence 24% - 41%	Continuum from SCD to MCI and dementia The point prevalence of dementia is 4-6 times higher than in the general population Types include Alzheimer's, vascular, Lewy body, and Parkinson's disease dementia	Cognitive impairment can be present for decades before the manifestation of motor symptoms	Decline in executive dysfunction and working memory deficits has been reported as a risk factor for PD	Early PD – 10% -20% patients have cognitive deficits The mean time to dementia onset is 10 years. Prevalence at 10 years: 50%-75%; 20 years: 83%
Anxiety	Point prevalence: average 31% (range 25% - 43%)	Anxiety disorder, non-specific: 13% - 30% Generalised anxiety disorder: 11% -14% Panic disorder: 7%-30%	Precedes the onset of motor symptoms in	Anxiety, by itself or associated with depression,	Anxiety is often related to the withdrawal of

	Lifetime prevalence: 49% Clinically significant symptoms: 26%	Social phobia: 14% Specific phobia: 13%	up to 30% of patients with PD by 20 years	doubles the risk of developing PD	dopaminergic medication or to the wearing off of medication effects
Psychosis	Psychosis: 25%-40% Complex visual hallucinations: 15% - 40% Minor visual hallucinations: 25% - 50% Non-visual hallucinations: 10% - 35% Delusions: 4%	Minor/ ill-formed hallucinations include passage (feeling like something is passing at the outer visual field), presence (feeling that someone is close by) hallucinations, and illusions (distorted perception of an actual stimulus). They are typically not disruptive. They occur early, insight is preserved, and there is no cognitive impairment Major/complex/ formed hallucinations are more commonly visual and impairing. They occur about 10 years after onset, insight is lost and cognitive impairment is common	Psychosis has been reported to occur even in untreated PD in the prodromal phase	-	Dopaminergic medication can cause psychosis in 20% - 35% patients with PD. Prevalence of psychosis increases to 60% - 70% after 12 years
Bipolar disorder	Prevalence: 11%	Patients with BD and PD have increased prevalence of catatonia, depression,	Some patients develop bipolar	BD increases the risk of PD by 2-6	Patients with BD and PD have a poorer

(BD)		delusions, cognitive deficits, impulse control disorders, and somatic symptom disorders.	disorder long before PD onset	times in the 3- 6-year period before diagnosis	course and outcome, and treatment response.
Apathy	Prevalence: average 40% (range 16% -70%)	Lack of motivation, initiative, and concern, diminished goal-directed activity, reduced interests and emotional display. Overlaps with depression and dementia.	-	-	Early-stage feature of PD. May predict dementia and cognitive decline over time.
Impulse control disorders	Prevalence: 14% -29% of patients with PD have one or more impulse control disorders	Pathological gambling, compulsive buying, pathological sexual behaviour, and compulsive eating.	-	-	Related to the use of dopaminergic medications. Prevalence increases with time.

[1] Dysthymic symptoms not present for 2 full years or more

[2] Subjective cognitive decline (SCD)- self-perceived decline in cognition with normal performance on tests

[3] Mild cognitive impairment (MCI) - decline in cognition associated with subtle deficits on tests and impairment of complex activities of daily living

29. **Aarsland D**, Pählhagen S, Ballard CG, Ehrt U, Svenningsson P. Depression in Parkinson disease: Epidemiology, mechanisms and management. *Nat Rev Neurol* 2012; **8**: 35-47 [PMID: 22124316 DOI: 10.1038/nrneurol.2011.189]

30. **Bell BD**. Depression and Parkinson's disease. *US Neurol* 2008; **4**: 67-68

31. **Brown RG**, Landau S, Hindle JV, Playfer J, Samuel M, Wilson KC, Hurt CS, Anderson RJ, Carnell J, Dickinson L, Gibson G, van Schaick R, Sellwood K, Thomas BA, Burn DJ. Depression and anxiety related subtypes in Parkinson's disease. *J Neurol Neurosurg Psychiatry* 2011; **82**: 803-809 [PMID: 21071500 DOI: 10.1136/jnnp.2010.213652]

32. **Broen MP**, Narayen NE, Kuijf ML, Dissanayaka NN, Leentjens AF. Prevalence of anxiety in Parkinson's disease. *Mov Disord* 2016; **31**: 1125-1133 [PMID: 27125963 DOI: 10.1002/mds.26643]

33. **Chakraborty A**, Diwan A. Depression and Parkinson's disease: A chicken-egg story. *AIMS Neurosci* 2022; **9**: 479-490 [PMID: 36660077 DOI: 10.3934/Neuroscience.2022027]

34. **Chen PH**, Cheng SJ. Depression in Parkinson disease: Current understanding and treatment. *Int J Gerontol* 2008; **2**: 172-182 [DOI: 10.1016/S1873-9598(09)70006-7]

35. **Chikatimalla R**, Dasaradhan T, Koneti J, Cherukuri SP, Kalluru R, Gadde S. Depression in Parkinson's disease: A narrative review. *Cureus* 2022; **14**: e27750 [PMID: 36106206 DOI: 10.7759/cureus.27750]

36. **Cong S**, Xiang C, Zhang S, Zhang T, Wang H, Cong S. Prevalence and clinical aspects of depression in Parkinson's disease: A systematic review and meta-analysis of 129 studies. *Neurosci Biobehav Rev* 2022; **141**: 104749 [PMID: 35750224 DOI: 10.1016/j.neubiorev.2022.104749]

37. **Cummings JL**. Depression and Parkinson's disease: A review. *Am J Psychiatry* 1992; **149**: 443-454 [PMID: 1372794 DOI: 10.1176/ajp.149.4.443]

38. **Dallé E**, Mabandla MV. Early life stress, depression and Parkinson's disease: A new approach. *Mol Brain* 2018; **11**: 18 [PMID: 29551090 DOI: 10.1186/s13041-018-0356-9]

39. **Dobkin RD**, Menza M, Bienfait KL, Gara M, Marin H, Mark MH, Dicke A, Friedman J. Depression in Parkinson's disease: Symptom improvement and residual symptoms after acute pharmacologic management. *Am J Geriatr Psychiatry* 2011; **19**: 222-229 [PMID: 20808132 DOI: 10.1097/JGP.0b013e3181e448f7]

40. **Fritze S**, Brandt GA, Benedyk A, Moldavski A, Volkmer S, Daub J, Krayem M, Kukovic J, Schwarz E, Braun U, Wolf RC, Kubera KM, Northoff G, Meyer-Lindenberg A, Tost H, Hirjak D. Parkinsonism, psychomotor slowing, negative and depressive

symptoms in schizophrenia spectrum and mood disorders: Exploring their intricate nexus using a network analytic approach. *Schizophr Bull* 2025; **51**: 556-570 [PMID: 38665097 DOI: 10.1093/schbul/sbae055]

41. **Ishihara L**, Brayne C. A systematic review of depression and mental illness preceding Parkinson's disease. *Acta Neurol Scand* 2006; **113**: 211-220 [PMID: 16542159 DOI: 10.1111/j.1600-0404.2006.00579.x]

42. **Goodarzi Z**, Mrklas KJ, Roberts DJ, Jette N, Pringsheim T, Holroyd-Leduc J. Detecting depression in Parkinson disease: A systematic review and meta-analysis. *Neurology* 2016; **87**: 426-437 [PMID: 27358343 DOI: 10.1212/WNL.0000000000002898]

43. **Karceski S**. Early Parkinson disease and depression. *Neurology* 2007; **69**: E2-E3 [PMID: 17646622 DOI: 10.1212/01.WNL.0000277528.52407.C0]

44. **Leentjens AFG**. Depression in Parkinson's disease: Conceptual issues and clinical challenges. *J Geriatr Psychiatry Neurol* 2004; **17**: 120-126 [PMID: 15312277 DOI: 10.1177/0891988704267456]

45. **Lieberman A**. Depression in Parkinson's disease: A review. *Acta Neurol Scand* 2006; **113**: 1-8 [DOI: 10.1111/j.1600-0404.2006.00536.x]

46. **Marsh L**, McDonald WM, Cummings J, Ravina B; NINDS/NIMH Work Group on Depression and Parkinson's Disease. Provisional diagnostic criteria for depression in Parkinson's disease: Report of an NINDS/NIMH Work Group. *Mov Disord* 2006; **21**: 148-158 [PMID: 16211591 DOI: 10.1002/mds.20723]

47. **Marsh L**. Depression and Parkinson's disease: Current knowledge. *Curr Neurol Neurosci Rep* 2013; **13**: 409 [PMID: 24190780 DOI: 10.1007/s11910-013-0409-5]

48. **Pachana NA**, Egan SJ, Laidlaw K, Dissanayaka N, Byrne GJ, Brockman S, Marsh R, Starkstein S. Clinical issues in the treatment of anxiety and depression in older adults with Parkinson's disease. *Mov Disord* 2013; **28**: 1930-1934 [PMID: 24123116 DOI: 10.1002/mds.25689]

49. **Pontone GM**, Williams JR, Anderson KE, Chase G, Goldstein SA, Grill S, Hirsch ES, Lehmann S, Little JT, Margolis RL, Rabins PV, Weiss HD, Marsh L. Prevalence of anxiety disorders and anxiety subtypes in patients with Parkinson's disease. *Mov Disord* 2009; **24**: 1333-1338 [PMID: 19425086 DOI: 10.1002/mds.22611]

50. **Fernandez HH**, Merello M. Pramipexole for depression and motor symptoms in Parkinson's disease: Can we kill two birds with one stone? *Lancet Neurol* 2010; **9**: 556-557 [PMID: 20452824 DOI: 10.1016/S1474-4422(10)70114-9]

51. **Prange S**, Klinger H, Laurencin C, Danaila T, Thobois S. Depression in patients with Parkinson's disease: Current understanding of its neurobiology and implications for treatment. *Drugs Aging* 2022; **39**: 417-439 [PMID: 35616780 DOI: 10.1007/s40266-022-00942-1]

52. **Ravina B**, Camicioli R, Como PG, Marsh L, Jankovic J, Weintraub D, Elm J. The impact of depressive symptoms in early Parkinson disease. *Neurology* 2007; **69**: 342-347 [PMID: 17646631 DOI: 10.1212/01.WNL.0000268695.63392.10]

53. **Reijnders JS**, Ehrt U, Weber WE, Aarsland D, Leentjens AFG. A systematic review of prevalence studies of depression in Parkinson's disease. *Mov Disord* 2008; **23**: 183-189 [PMID: 17987654 DOI: 10.1002/mds.21803]

54. **Remy P**, Doder M, Lees A, Turjanski N, Brooks D. Depression in Parkinson's disease: Loss of dopamine and noradrenaline innervation in the limbic system. *Brain* 2005; **128**: 1314-1322 [PMID: 15716302 DOI: 10.1093/brain/awh445]

55. **Schrag A**, Barone P, Brown RG, Leentjens AFG, McDonald WM, Starkstein S, Weintraub D, Poewe W, Rascol O, Sampaio C, Stebbins GT, Goetz CG. Depression rating scales in Parkinson's disease: Critique and recommendations. *Mov Disord* 2007; **22**: 1077-1092 [PMID: 17394234 DOI: 10.1002/mds.21333]

56. **Slaughter JR**, Slaughter KA, Nichols D, Holmes SE, Martens MP. Prevalence, clinical manifestations, etiology, and treatment of depression in Parkinson's disease. *J Neuropsychiatry Clin Neurosci* 2001; **13**: 187-196 [PMID: 11449025 DOI: 10.1176/jnp.13.2.187]

57. **Stefanova E**. Depression in Parkinson's disease. *Ann Gen Hosp Psychiatry* 2003; **2**: S12 [DOI: 10.1186/1475-2832-2-S1-S12]

58. **Sawabini KA**, Watts RL. Treatment of depression in Parkinson's disease. *Parkinsonism Relat Disord* 2004; **10 Suppl 1**: S37-S41 [PMID: 15109585 DOI: 10.1016/j.parkreldis.2004.02.002]

59. **van der Velden RMJ**, Broen MPG, Kuijf ML, Leentjens AFG. Frequency of mood and anxiety fluctuations in Parkinson's disease patients with motor fluctuations: A systematic review. *Mov Disord* 2018; **33**: 1521-1527 [PMID: 30225905 DOI: 10.1002/mds.27465]

60. **Veazey C**, Aki SO, Cook KF, Lai EC, Kunik ME. Prevalence and treatment of depression in Parkinson's disease. *J Neuropsychiatry Clin Neurosci* 2005; **17**: 310-323 [PMID: 16179652 DOI: 10.1176/jnp.17.3.310]

61. **Wei WX**, Meng L, Mao ZF, Mo ZH, Yang L, Qin Y, Huang JY. The association between the incident risk of Parkinson's disease and depression in middle-aged and older adults, and the moderating role of lifestyle: Evidence from the CHARLS. *Front Psychol* 2025; **16**: 1590931 [PMID: 40606884 DOI: 10.3389/fpsyg.2025.1590931]

62. **Yoon SY**, Heo SJ, Kim YW, Lee SC, Shin J, Lee JW. Depressive symptoms and the subsequent risk of Parkinson's disease: A nationwide cohort study. *Am J Geriatr Psychiatry* 2024; **32**: 339-348 [PMID: 37953133 DOI: 10.1016/j.jagp.2023.10.006]

63. **Aarsland D**, Larsen JP, Lim NG, Janvin C, Karlsen K, Tandberg E, Cummings JL. Range of neuropsychiatric disturbances in patients with Parkinson's disease. *J Neurol Neurosurg Psychiatry* **1999**; **67**: 492-496 [PMID: 10486397 DOI: 10.1136/jnnp.67.4.492]

64. **Aarsland D**, Batzu L, Halliday GM, Geurtsen GJ, Ballard C, Chaudhuri KR, Weintraub D. Parkinson disease-associated cognitive impairment. *Nat Rev Dis Primers* 2021; **7**: 47 [PMID: 34210995 DOI: 10.1038/s41572-021-00280-3]

65. **Weil RS**, Costantini AA, Schrag AE. Mild cognitive impairment in Parkinson's disease. *Curr Neurol Neurosci Rep* 2018; **18**: 17 [PMID: 29525906 DOI: 10.1007/s11910-018-0823-9]

66. **Cummings JL**. Intellectual impairment in Parkinson's disease. *J Geriatr Psychiatry Neurol* 1988; **1**: 24-36 [PMID: 2908099 DOI: 10.1177/089198878800100106]

67. **Aarsland D**, Zaccai J, Brayne C. Dementia in Parkinson disease. *Mov Disord* 2005; **20**: 1255-1263 [PMID: 16041803 DOI: 10.1002/mds.20527]

68. **Aarsland D**, Brønnick K, Ehrt U, De Deyn PP, Tekin S, Emre M, Cummings JL. Neuropsychiatric symptoms in patients with Parkinson's disease and dementia: Frequency, profile and associated caregiver stress. *J Neurol Neurosurg Psychiatry* 2007; **78**: 36-42 [PMID: 16820421 DOI: 10.1136/jnnp.2005.083113]

69. **Aarsland D**, Brønnick K, Alves G, Tysnes OB, Pedersen KF, Ehrt U, Larsen JP. The spectrum of neuropsychiatric symptoms in patients with early, untreated Parkinson's disease. *J Neurol Neurosurg Psychiatry* 2009; **80**: 928-930 [PMID: 19608786 DOI: 10.1136/jnnp.2008.166959]

70. **Aarsland D**, Kurz MW. The epidemiology of dementia associated with Parkinson's disease. *Brain Pathol* 2010; **20**: 633-639 [PMID: 20522088 DOI: 10.1111/j.1750-3639.2009.00369.x]

71. **Gibson LL**, Weintraub D, Lemmen R, Perera G, Chaudhuri KR, Svenningsson P, Aarsland D. Risk of dementia in Parkinson's disease: A systematic review and meta-analysis. *Mov Disord* 2024; **39**: 1697-1709 [PMID: 39036849 DOI: 10.1002/mds.29918]

72. **Jellinger KA**. Mild cognitive impairment in Parkinson's disease: Current view. *Front Cognit* 2024; **3**: 1369538 [DOI: 10.3389/fcogn.2024.1369538]

73. **Stefanova E**, Žiropadja L, Stojković T, Stanković I, Tomić A, Ječmenica-Lukić M, Petrović I, Kostić VS. Mild cognitive impairment in early Parkinson's disease using the Movement Disorder Society Task Force criteria: Cross-sectional study in Hoehn and Yahr stage 1. *Dement Geriatr Cogn Disord* 2015; **40**: 199-209 [PMID: 26278639 DOI: 10.1159/000433421]

74. **Vardy ERLC**, Teodorczuk A, Yarnall AJ. Review of delirium in patients with Parkinson's disease. *J Neurol* 2015; **262**: 2401-2410 [PMID: 25957635 DOI: 10.1007/s00415-015-7760-1]

75. **Yarnall AJ**, Rochester L, Burn DJ. Mild cognitive impairment in Parkinson's disease. *Age Ageing* 2013; **42**: 567-576 [PMID: 23801744 DOI: 10.1093/ageing/aft085]

76. **Bazo-Alvarez JC**, Nimmons D, Walters K, Petersen I, Schrag A. Anxiety and Parkinson's disease risk. *Br J Gen Pract* 2024; **74**: e482-e488 [PMID: 38514045 DOI: 10.3399/BJGP.2023.0423]

77. **Lin CH**, Lin JW, Liu YC, Chang CH, Wu RM. Risk of Parkinson's disease following anxiety disorders. *Eur J Neurol* 2015; **22**: 1280-1287 [PMID: 26031920 DOI: 10.1111/ene.12740]

78. **Dissanayaka NN**, White E, O'Sullivan JD, Marsh R, Pachana NA, Byrne GJ. The clinical spectrum of anxiety in Parkinson's disease. *Mov Disord* 2014; **29**: 967-975 [PMID: 25043800 DOI: 10.1002/mds.25937]

79. **Vertes AC**, Beato MR, Sonne J, Khan Suheb MZ. Parkinson-Plus Syndrome. *StatPearls* 2026 [PMID: 585113]

80. **Barnes J**, David AS. Visual hallucinations in Parkinson's disease: a review and phenomenological survey. *J Neurol Neurosurg Psychiatry* 2001; **70**: 727–733. [PMID: 11385004 DOI: 10.1136/jnnp.70.6.727]

81. **Fénelon G**, Mahieux F, Huon R, Ziégler M. Hallucinations in Parkinson's disease: prevalence, phenomenology and risk factors. *Brain* 2000; **123**: 733–745. [PMID: 10734005 DOI: 10.1093/brain/123.4.733]

82. **Fénelon G**, Soulas T, Zenasni F, De Langavant LC. The changing face of Parkinson's disease-associated psychosis: a cross-sectional study based on the new NINDS-NIMH criteria. *Mov Disord* 2010; **25**: 755–759. [PMID: 20437542 DOI: 10.1002/mds.22839]

83. **Ffytche DH**, Creese B, Politis M, Chaudhuri KR, Weintraub D, Ballard C, Aarsland D. The psychosis spectrum in Parkinson disease. *Nat Rev Neurol* 2017; **13**: 81–95. [PMID: 28106066 DOI: 10.1038/nrneurol.2016.200]

84. **Levin J**, Hasan A, Höglinger GU. Psychosis in Parkinson's disease: identification, prevention and treatment. *J Neural Transm (Vienna)* 2016; **123**: 45–50. [PMID: 25894288 DOI: 10.1007/s00702-015-1400-x]

85. **Marsh L**. Psychosis in Parkinson's Disease. *Curr Treat Options Neurol* 2004; **6**: 181–189. [PMID: 15043801 DOI: 10.1007/s11940-004-0010-y]

86. **Pahwa R,** Kremens DE. Effective Management Approaches for Psychosis in Patients with Parkinson Disease. *J Clin Psychiatry* 2018; 79: 1-4. [DOI: 10.4088/JCP.ad18017su1c]

87. **Ravina B**, Marder K, Fernandez HH, Friedman JH, McDonald W, Murphy D, Aarsland D, Babcock D, Cummings J, Endicott J, Factor S, Galpern W, Lees A, Marsh L, Stacy M, Gwinn-Hardy K, Voon V, Goetz C. Diagnostic criteria for psychosis in Parkinson's disease: report of an NINDS, NIMH work group. *Mov Disord* 2007; **22**: 1061–1068. [PMID: 17266092 DOI: 10.1002/mds.21382]

88. **Samudra N**, Patel N, Womack KB, Khemani P, Chitnis S. Psychosis in Parkinson Disease: A Review of Etiology, Phenomenology, and Management. *Drugs Aging* 2016; **33**: 855–863. [PMID: 27830568 DOI: 10.1007/s40266-016-0416-8]

89. **Schneider RB**, Iourinets J, Richard IH. Parkinson's disease psychosis: presentation, diagnosis and management. *Neurodegener Dis Manag* 2017; **7**: 365–376. [PMID: 29160144 DOI: 10.2217/nmt-2017-0028]

90. **Taddei RN**, Cankaya S, Dhaliwal S, Chaudhuri KR. Management of Psychosis in Parkinson's Disease: Emphasizing Clinical Subtypes and Pathophysiological Mechanisms of the Condition. *Parkinsons Dis* 2017; **2017**: 3256542. [PMID: 29104810 DOI: 10.1155/2017/3256542]

91. **Weintraub D**, Hurtig HI. Presentation and Management of Psychosis in Parkinson's Disease and Dementia With Lewy Bodies. *Am J Psychiatry* 2007; **164**: 1491–1498. [PMID: 17898337 DOI: 10.1176/appi.ajp.2007.07040715]

92. **Dols A**, Lemstra AW. Parkinsonism and bipolar disorder. *Bipolar Disord* 2020; **22**: 413-415 [PMID: 31954093 PMCID: PMC7317540 DOI: 10.1111/bdi.12888]

93. **Faustino PR**, Duarte GS, Chendo I, Castro Caldas A, Reimão S, Fernandes RM, Vale J, Tinazzi M, Bhatia K, Ferreira JJ. Risk of developing Parkinson disease in bipolar disorder: A systematic review and meta-analysis. *JAMA Neurol* 2020; **77**: 192-198 [PMID: 31609378 PMCID: PMC6802493 DOI: 10.1001/jamaneurol.2019.3446]

94. **Willis AW**, Thibault DP, Schmidt PN, Dorsey ER, Weintraub D. Hospital care for mental health and substance abuse conditions in Parkinson's disease. *Mov Disord* 2016; **31**: 1810-1819 [PMID: 27943472 DOI: 10.1002/mds.26832]

95. **Onofrj M**, Di Iorio A, Carrarini C, Russo M, Franciotti R, Espay AJ, Boylan LS, Taylor JP, Di Giannantonio M, Martinotti G, Valente EM, Thomas A, Bonanni L, Delli Pizzi S, Dono F, Sensi S. Preexisting bipolar disorder influences the subsequent phenotype of Parkinson's disease. *Mov Disord* 2021; **36**: 2840-2852 [PMID: 34427338 DOI: 10.1002/mds.28745]

96. **Huang MH**, Cheng CM, Huang KL, Hsu JW, Bai YM, Su TP, Li CT, Tsai SJ, Lin WC, Chen TJ, Chen MH. Bipolar disorder and risk of Parkinson disease: A nationwide longitudinal study. *Neurology* 2019; **92**: e2735-e2742 [PMID: 31118242 DOI: 10.1212/WNL.0000000000007649]

97. **Nilsson FM**, Kessing LV, Bolwig TG. Increased risk of developing Parkinson's disease for patients with major affective disorder: A register study. *Acta Psychiatr Scand* 2001; **104**: 380-386 [PMID: 11722320 DOI: 10.1034/j.1600-0447.2001.00372.x]

98. **Li X**, Sundquist J, Hwang H, Sundquist K. Impact of psychiatric disorders on Parkinson's disease: A nationwide follow-up study from Sweden. *J Neurol* 2008; **255**: 31-36 [PMID: 18080857 DOI: 10.1007/s00415-007-0655-z]

99. **Lin HL**, Lin HC, Chen YH. Psychiatric diseases predated the occurrence of Parkinson disease: A retrospective cohort study. *Ann Epidemiol* 2014; **24**: 206-213 [PMID: 24462274 DOI: 10.1016/j.annepidem.2013.12.010]

100. **Pontone GM**, Koch G. An association between bipolar disorder and Parkinson disease: When mood makes you move. *Neurology* 2019; **92**: 1125-1126 [PMID: 31118246 DOI: 10.1212/WNL.0000000000007641]

101. **Shiba M**, Bower JH, Maraganore DM, McDonnell SK, Peterson BJ, Ahlskog JE, Schaid DJ, Rocca WA. Anxiety disorders and depressive disorders preceding Parkinson's disease: A case-control study. *Mov Disord* 2000; **15**: 669-677 [PMID: 10928577 DOI: 10.1002/1531-8257(200007)15:4<669::AID-MDS1011>3.0.CO;2-5]

102. **den Brok MG**, van Dalen JW, van Gool WA, Moll van Charante EP, de Bie RM, Richard E. Apathy in Parkinson's disease: A systematic review and meta-analysis. *Mov Disord* 2015; **30**: 759-769 [PMID: 25787145 DOI: 10.1002/mds.26208]

103. **Pagonabarraga J**, Kulisevsky J, Strafella AP, Krack P. Apathy in Parkinson's disease: clinical features, neural substrates, diagnosis, and treatment. *Lancet Neurol* 2015; **14**: 518-531 [PMID: 25895932 DOI: 10.1016/S1474-4422(15)00019-8]

104. **Dujardin K**, Sgambato V. Neuropsychiatric disorders in Parkinson's disease. *Front Neurosci* 2020; **14**: 25 [PMID: 32063833 DOI: 10.3389/fnins.2020.00025]

105. **Weintraub D**, Aarsland D, Chaudhuri KR, Dobkin RD, Leentjens AF, Rodriguez-Violante M, Schrag A. Neuropsychiatry of Parkinson's disease: advances and challenges. *Lancet Neurol* 2022; **21**: 89-102 [PMID: 34942142 DOI: 10.1016/S1474-4422(21)00330-6]

106. **Jones S**, Torsney KM, Scourfield L, Berryman K, Henderson EJ. Neuropsychiatric symptoms in Parkinson's disease. *BJPsych Advances* 2020; **26**: 333-342 [DOI: 10.1192/bja.2019.79]