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Evaluating the benefits of medical spa treatments for people with Parkinson's disease

Submission date	Recruitment status	[ ] Prospectively registered
14/11/2026	Recruiting	[ ] Protocol
Registration date	**Overall study status**	[ ] Statistical analysis plan
17/11/2026	Ongoing	[ ] Results
Last Edited	**Condition category**	[ ] Individual participant data
17/11/2026	Nervous System Diseases	[X] Record updated in last year

Plain English summary of protocol
Not provided at time of registration

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Study information

Scientific Title
Evaluation of the effectiveness of the hybrid-park center project’s spa treatment protocol as an adjunctive therapy for parkinson’s disease using questionnaires, digitally measured outcomes, and advanced omics methods

Study objectives
The objective of this study is to investigate the systemic molecular mechanisms underlying recovery and treatment response in patients with Parkinson’s disease by comparing four parallel study groups:
Group 1 – Parkinson Spa Recovery (PSR): Patients receiving the standard Parkinson Spa Recovery protocol.
Group 2 – PSR + Enhanced Reality: Patients receiving the Parkinson Spa Recovery protocol combined with enhanced reality-based therapy.
Group 3 – PSR + HYBRID-PARK Treatment: Patients receiving the Parkinson Spa Recovery protocol combined with the HYBRID-PARK treatment.
Group 4 – Control Group: Patients receiving no study intervention.

The study aims to evaluate and compare the clinical, functional, and molecular effects of these interventions using patient-reported outcomes, digitally measured parameters, and advanced omics technologies.

Ethics approval required
Ethics approval required

Ethics approval(s)

Approved 11/11/2026, Ethics Committee of Slovenske Liecebne Kupele Piestany, A.S (Slovenske Liecebne Kupele Piestany, A.S. Kupelny ostrov 29, Piestany, 92129, Slovakia; +421 (0)902963093; mkoumal@ensanahotels.com), ref: EK 11/2026

Primary study design
Interventional

Allocation
Non-randomized controlled trial

Masking
Blinded (masking used)

Control
Active

Assignment
Parallel

Purpose
Prevention, Supportive care, Treatment

Study type(s)

Health condition(s) or problem(s) studied
Parkinson’s disease

Interventions
Participants in Group 1 completed a 21-day inpatient multimodal PSR rehabilitation programme at the Slovak Health Spa Piešťany. The regimen totalled 63 therapeutic interventions (three sessions daily) across three specialised modules:
1. Balneotherapy, physiotherapy and physical treatments: daily balneological treatments utilised natural medicinal mineral water or hydrogen-sulphide-rich peloid therapy. Bespoke physiotherapy sessions (2×/week) addressed individual musculoskeletal imbalances, focusing on gait dynamics and postural stability. Structured group exercises (3×/week) incorporated aquatic therapy, hydro-cycling, neuro-specific gym training. Adjunctive therapies, including hydromassage, parafango (paraffin-peloid), magnetotherapy or phototherapy (biolamp), were administered according to individual clinical indications.
2. Sensory modulation: a multi-sensory stimulation protocol provided visual cues (high-contrast floor markers), auditory stimuli (rhythmic and meditative acoustics), and somatosensory inputs (aromatherapy) to facilitate motor planning and emotional regulation.
3. Nutraceutical intervention and hydropinic (mineral water) therapy: participants adhered to a controlled dietary regimen integrating principles of the Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet. The nutritional protocol was standardised to a mean daily energy intake of 2000 kcal, administered across three equal meals. The target macronutrient distribution was 20% protein (100 g), 60% carbohydrates (300 g), and 20% lipids (44.4 g), aligning with established Acceptable Macronutrient Distribution Ranges (AMDR, IOM 2002 /2005). This regimen emphasised neuroprotective food groups, including leafy greens, berries, and healthy fats, while restricting processed sugars and saturated lipids. Hydropinic therapy

consisted of drinking 100 ml natural medicinal water 1-3 times daily (titrated to individual tolerance). To optimize mineral absorption and metabolic influence, servings were administered 30 minutes pre-prandially.

Participants in Group 2 completed a 21-day inpatient PSR programme at the Slovak Health Spa Piešťany + ten therapeutic sessions per stay with Enhanced Reality, which will simulate an indoor garden environment for year-round therapy, incorporating the following stages: initial preparation and calibration, rhythmic walking, stopping and restarting gait, walking through narrow spaces, walking with turns in both directions and returning to the starting point, selective apple picking while walking, and completion of the session with final data recording.

Participants in Group 3 completed a 21-day inpatient PSR programme at the Slovak Health Spa Piešťany + ten therapeutic sessions per stay in a comprehensive multisensory garden equipped with therapeutic modules. The garden comprises six functional therapeutic areas: a walkable pond garden, a levitating stone garden, a dry Zen garden with meditation capsules (three sessions), an arid olfactory garden, a maze garden with navigation supported by interactive water features and small water installations, and a therapeutic activity garden.

Participants in Group 4 receiving no study intervention (control group).

Intervention Type
Mixed

Primary outcome(s)
1. Patient-reported quality of life measured using the Parkinson's Disease Questionnaire (PDQ-39) at before treatment (T0), after treatment (21 days) (T1), 3 months post treatment (T2), 6 months post treatment (T3)

2. Objective motor performance measured using the Modified Parkinson Activity Scale (mPAS) at before treatment (T0), after treatment (21 days) (T1)

3. Functional autonomy in activities of daily living measured using the Schwab and England Activities of Daily Living Scale (S&E ADL) at before treatment (T0), after treatment (21 days) (T1)

4. Basic clinical biochemical and hematological parameters measured using various clinically certified methods: Absolute Basophil Count (109/L), Absolute Eosinophil Count (109/L), Absolute Lymphocyte Count (109/L), Absolute Monocyte Count (109/L), Absolute Neutrophil Count (109/L), Atherogenic Index Basophils (%), C-Reactive Protein (mg/L), Eosinophils (%), Hematocrit Hemoglobin (g/L), Interleukin 1-alpha (pg/mL), Interleukin 1-beta (pg/mL), Interleukin 6 (pg/mL), Lymphocytes (%), Mean Corpuscular Hemoglobin (pg), Mean Corpuscular Hemoglobin Concentration (g/L), Mean, Corpuscular Volume (fL), Monocytes (%), Neutrophils (%), Platelet Distribution Width (fL), Platelets (109/L), Red Blood Cells (1012/L), S-Uric Acid (µmol /L), S-Alanine Aminotransferase (µkat/L), S-Aspartate Aminotransferase (µkat/L), S-Calcium (mmol/L), S-Creatine Kinase (µkat/L), S-Creatinine (µmol/L), S-Glucose (mmol/L), S-High-Density Lipoprotein (mmol/L), S-Cholesterol (mmol/L), S-Potassium (mmol/L), S-Low Density Lipoprotein Cholesterol (mmol/L), S-Magnesium (mmol/L), S-Sodium (mmol/L), S-non-High Density Lipoprotein Cholesterol (mmol/L), S-Phosphate (mmol/L), S-Triglycerides (mmol/L), S-Urea (mmol /L), White Blood Cells (109/L) at before treatment (T0), after treatment (21 days) (T1)

5. Qualitative and quantitative features of plasma proteome measured using deep aptamer proteomics profiling, fold change, false discovery rate at before treatment (T0), after treatment (21 days) (T1)

6. Digitally measured outcomes (TUG test - average of three measured times [s], 10 meter walk test - average time [s] and walking speed [m/s], step length [cm], step cadence [steps/min], upper limb movements during walking [arm swing] [cm], reaction time and percentage of correctly selected target objects [s]) measured using sensors placed on the head, wrists, and ankles at before treatment (T0), after treatment (21 days) (T1)

Key secondary outcome(s)

Completion date
30/11/2027

Eligibility

Key inclusion criteria
Parkinson's disease patients with mild-to-moderate impairment, classified as Hoehn and Yahr stages 2-3

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
40 Years

Upper age limit
80 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Infectious diseases: infectious diseases transmissible to humans and being a carrier of pathogens; all diseases in the acute stage
2. Cardiovascular conditions: clinical signs of circulatory failure, post-deep vein thrombosis conditions within 3 months of recovery, post-superficial thrombophlebitis conditions within 6 weeks of recovery, hypertension with diastolic pressure above 16 kPa (120 mmHg)
3. Metabolic conditions: diabetes mellitus, frequently recurring profuse bleeding of any kind, cachexia (wasting syndrome) of any kind, malignant tumors during and after treatment with clinically confirmed signs of disease progression
4. Neurological and psychiatric conditions: epilepsy (except for cases where no seizures have occurred in the last year),
active attacks or phases of psychosis and mental disorders with antisocial behavior or impaired

communication, alcohol or drug dependency, dementia
5. General and physiological conditions: stage III urinary and fecal incontinence, enuresis nocturna (bedwetting), pregnancy, non-healing skin defects of any origin

Date of first enrolment
16/11/2026

Date of final enrolment
31/08/2027

Locations

Countries of recruitment
Slovakia

Sponsor information

Organisation
Slovenske Liecebne Kupele Piestany, A.S.

Funder(s)

Funder type

Funder Name
Office of the Deputy Prime Minister of the Slovak Republic for the Recovery and Resilience Plan and the Knowledge Economy, grant for industrial research and experimental development projects in the field of biotechnology, Call PK 1/2025, pursuant to Grant Agreement No. CEZ UPPVL SR: 249/2025

Funder Name
Slovenske Liecebne Kupele Piestany, A.S.

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available