The Parkinson's Disease Educational Course for Industry Professionals
Honolulu, Hawaii, USA | October 4, 2025

International Parkinson and Movement Disorder Society

Motor and non motor effects of clinically available infusion therapies in Parkinson's disease

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Disclosures

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Device-aided therapy options – what can we offer patients?

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Intestinal gel

Levodopa/carbidopa intestinal gel (LCIG)

Continuous administration of levodopa/carbidopa by infusion into the jejunum

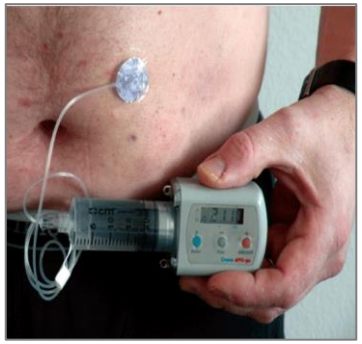
Levodopa/carbidopa/ entacapone intestinal gel (LECIGON)

Continuous administration of levodopa/carbidopa/entacapone gel by infusion into the jejunum

Subcutaneous

Subcutaneous apomorphine infusion

Does not require surgery; reversible.

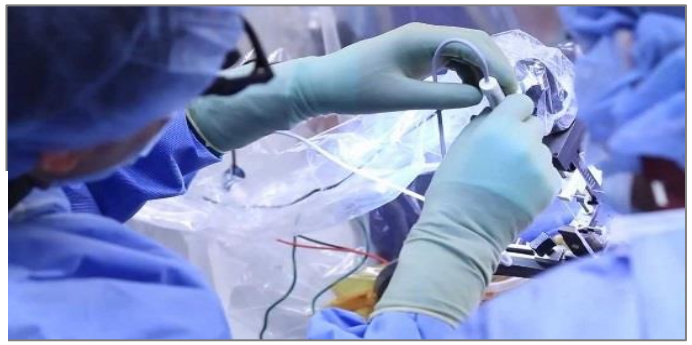


Abbvie Foslevodopa/Foscarbidopa subcutaneous infusion

Neurosurgery

Deep brain stimulation (DBS)

Requires stereotactic brain surgery



Subcutaneous foslevodopa/ foscarbidopa: A novel 24 h delivery option for levodopa

Karolina Poplawska-Domaszewicz[a,b,*] **and K. Ray Chaudhuri**[b,c]
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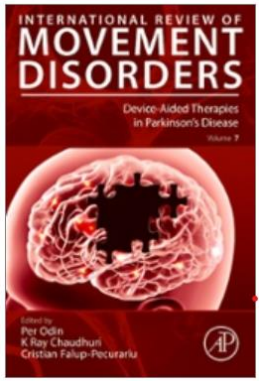
[c]Basic and Clinical Neuroscience Department, The Maurice Wohl Clinical Neuroscience Institute, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, United Kingdom
[*]Corresponding author: e-mail address: karolina.poplawska@usk.poznan.pl



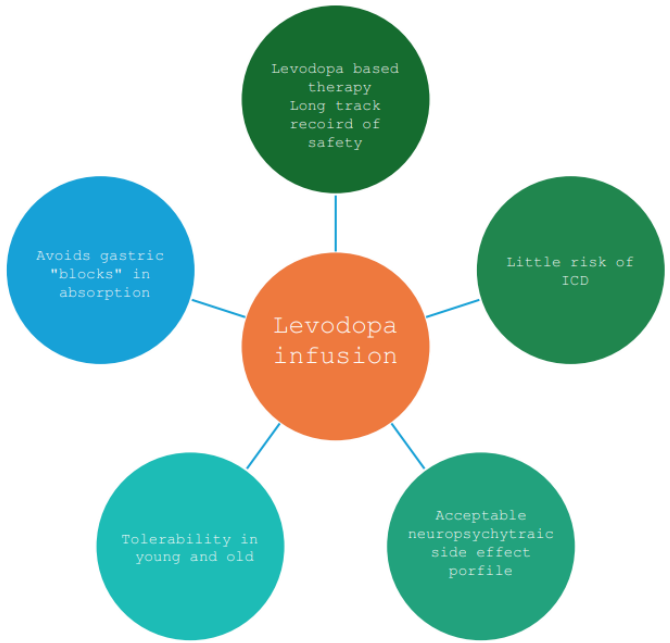
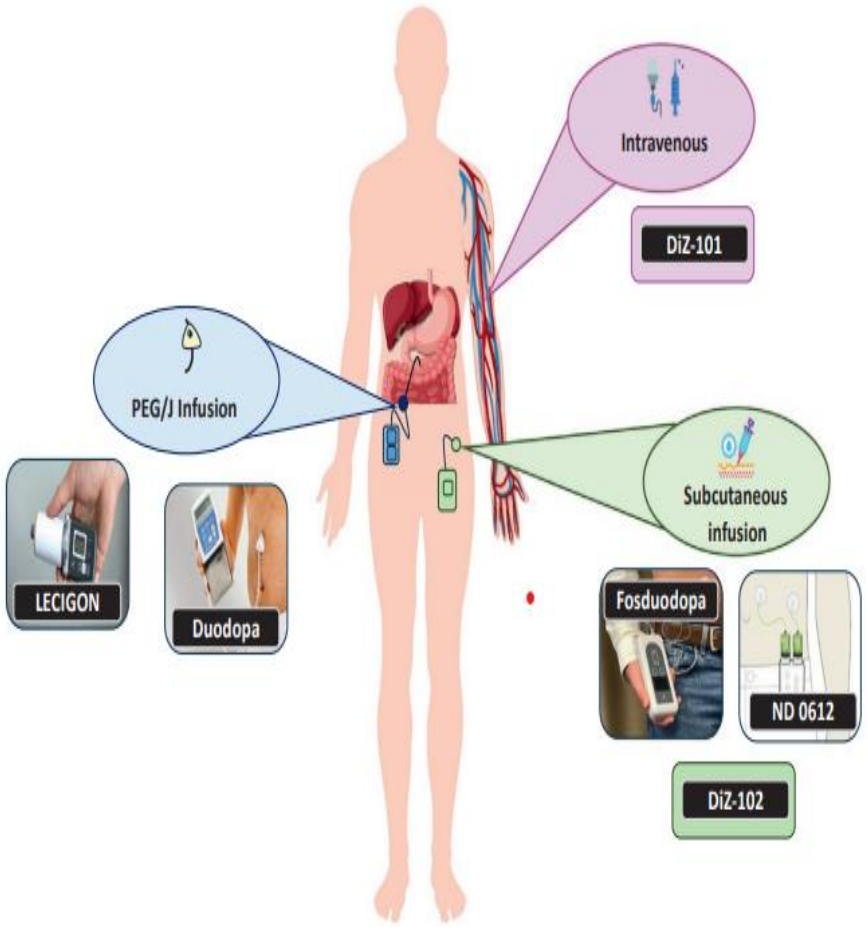


Fig. 1 Potential advantages of levodopa infusion in Parkinson's disease. ICD, impulse control disorder.



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Levodopa infusions story

1970 Oral levodopa is introduced into clinical practice, becoming the gold standard for Parkinson's treatment[1]

2000 Continuous delivery of Duodopa® via infusion pump is approved for advanced Parkinson's[3]

2000 The unmet need for those with advanced Parkinson's[2]

2010 The need for a minimally invasive, levodopa-based infusion treatment remains[4]

2020 The innovation of Produodopa®[5]

2024 The innovation and launch of LECIGON®

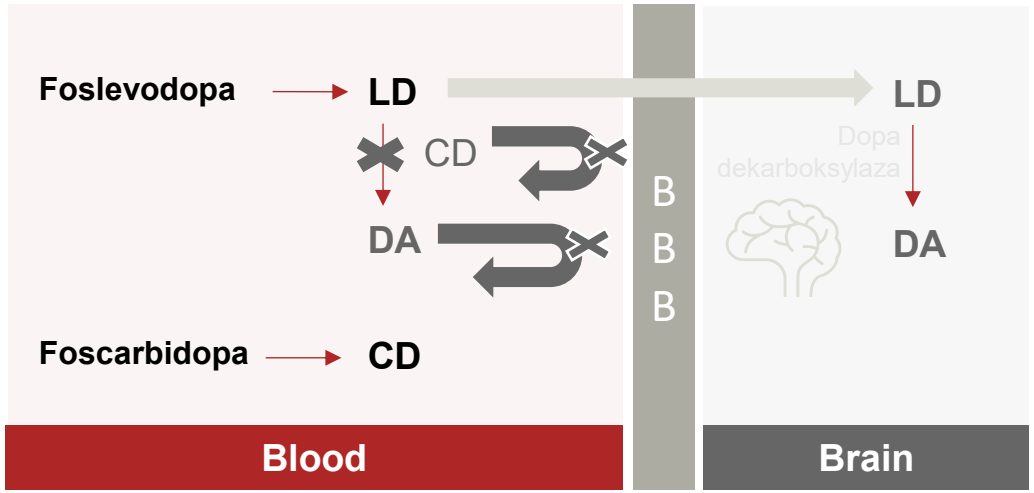
2024 The launch of Produodopa®[6]

LCIG, levodopa/carbidopa intestinal gel.

1. Abbott A. *Nature*. 2010;466:S6–7; 2. Koller WC and Tse W. *Neurology*. 2004;13;62:S1–8; 3. EMA. EU/3/01/035: Orphan designation for the treatment of advanced idiopathic Parkinson's disease with severe motor fluctuations. Available at: https://www.ema.europa.eu/en/medicines/human/orphan-designations/eu301035. Accessed: April 2024; 4. Antonini A. *J Mov Disord*. 2009;2:4–9; 5. Rosebraugh M, et al. *Ann Neurol*. 2021;90:52–61; 6. NICE. First NICE-recommended treatment for Parkinson's set to benefit hundreds. Available at: https://www.nice.org.uk/news/article/first-nice-recommended-treatment-for-parkinson-s-set-to-benefit-hundreds. Accessed: April 2024.

FOSLEVODOPA/FOSCARBIDOPA

Foslevodopa and foscarbidopa (20:1) convert in vivo into levodopa and carbidopa



LD may improve:

– Motor fluctuations
– ON time in patients responding to LD

CD does not cross the blood–brain barrier and inhibits peripheral decarboxylation of LD to DA

BBB: blood–brain barrier; CD: Carbidopa; DA: Dopamine; LD: Levodopa; PD: Parkinson's disease.
Based on: Rosebraugh M, Voight EA, Moussa EM, et al. Foslevodopa/Foscarbidopa: A New Subcutaneous Treatment for Parkinson's Disease [published online ahead of print, 2021 Mar 26]. Ann Neurol. 2021;10.1002/ana.26073

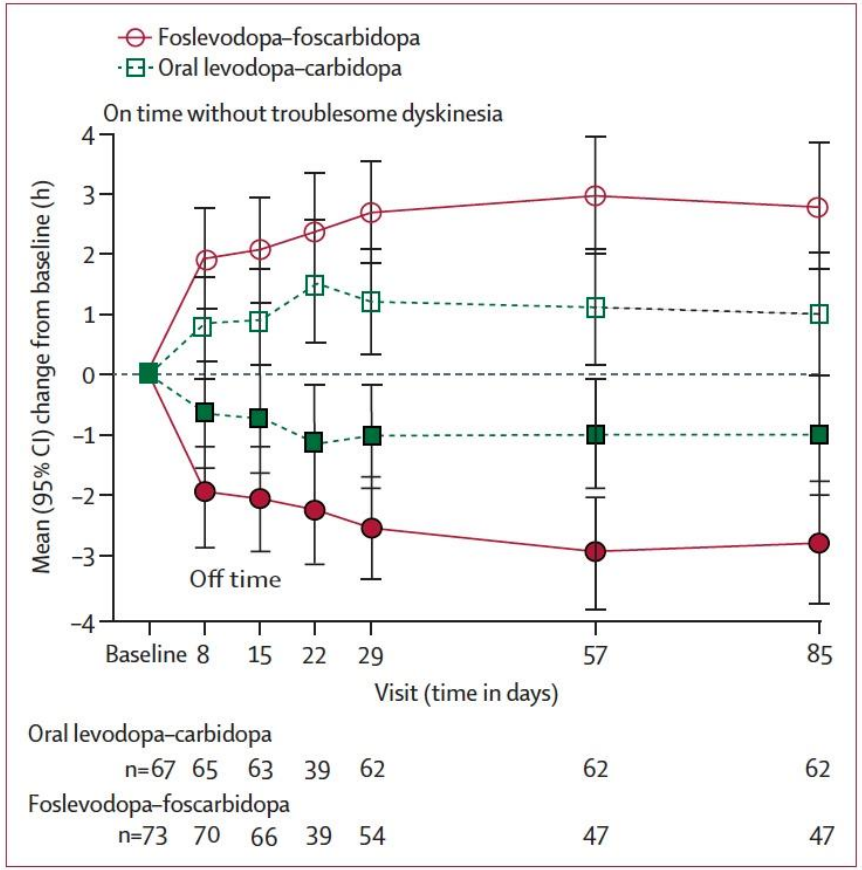
24-hour continuous subcutaneous infusion of foslevodopa/foscarbidopa

Pivotal Licensing Study

Safety and efficacy of continuous subcutaneous foslevodopa-foscarbidopa in patients with advanced Parkinson's disease: a randomised, double-blind, active-controlled, phase 3 trial

Michael J Soileau, Jason Aldred, Kumar Budur, Nahome Fisseha, Victor SC Fung, Anna Jeong, Thomas E Kimber, Kevin Klos, Irene Litvan, Daniel O'Neill, Weining Z Robieson, Meredith A Spindler, David G Standaert, Saritha Talapala, Eleni Okeanis Vaou, Hui Zheng, Maurizio F Facheris, Robert A Hauser

- A 12-week randomised, double-blind, double-dummy, active-controlled study
- 65 academic and community study centres in the USA and Australia.



Interpretation Foslevodopa-foscarbidopa improved motor fluctuations, with benefits in both on time without troublesome dyskinesia and off time. Foslevodopa-foscarbidopa has a favourable benefit-risk profile and represents a potential non-surgical alternative for patients with advanced Parkinson's disease.

Lancet Neurology 2022

Neurol Ther (2023) 12:1937–1958
https://doi.org/10.1007/s40120-023-00533-1

ORIGINAL RESEARCH

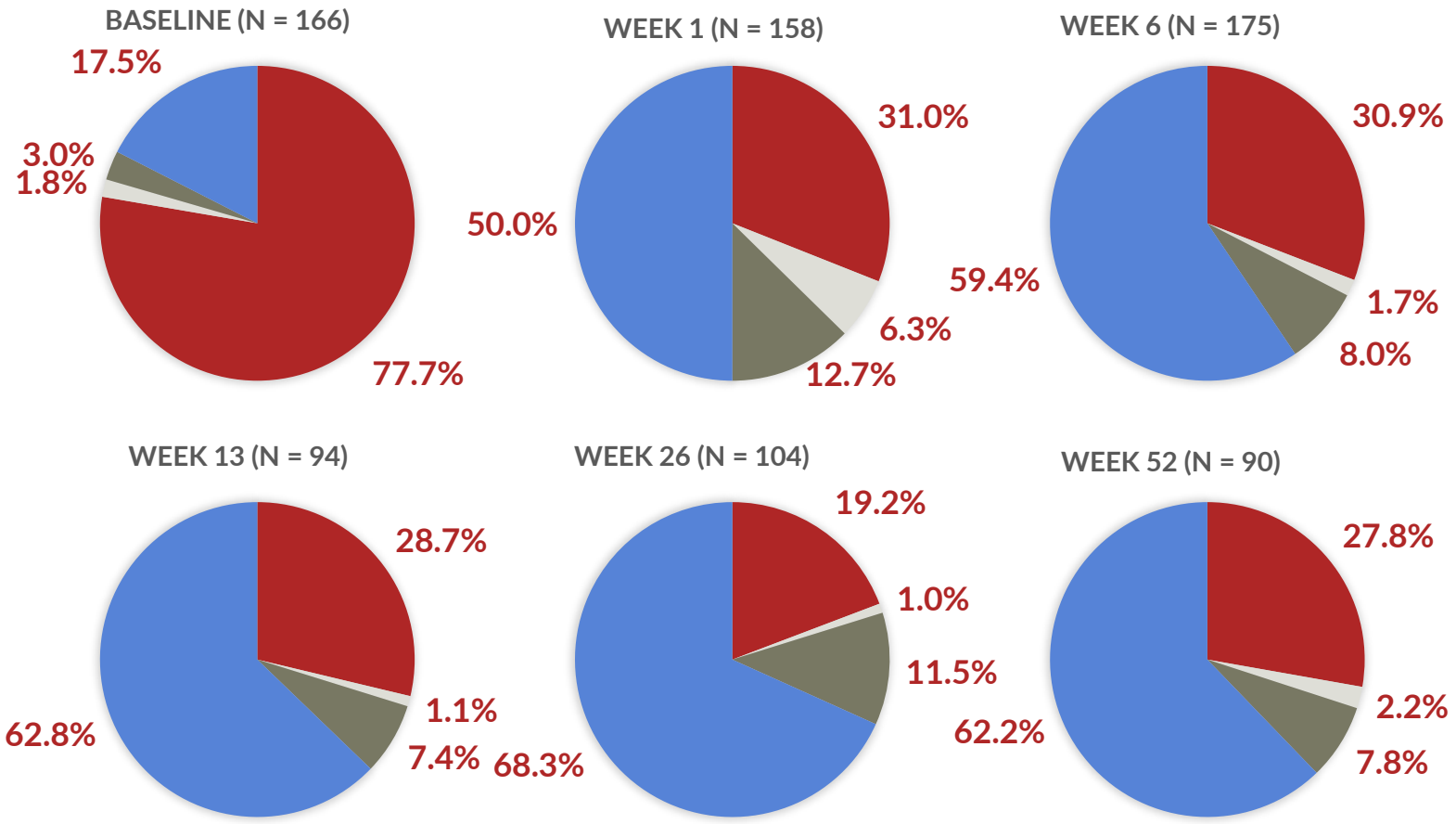
Continuous Subcutaneous Foslevodopa/Foscarbidopa in Parkinson's Disease: Safety and Efficacy Results From a 12-Month, Single-Arm, Open-Label, Phase 3 Study

Jason Aldred · Eric Freire-Alvarez · Alexander V. Amelin · Angelo Antonini · Bruno Bergmans · Filip Bergquist · Manon Bouchard · Kumar Budur · Camille Carroll · K. Ray Chaudhuri · Susan R. Criswell · Erik H. Danielsen · Florin Gandor · Jia Jia · Thomas E. Kimber · Hideki Mochizuki · Weining Z. Robieson · Amy M. Spiegel · David G. Standaert · Saritha Talapala · Maurizio F. Facheris · Victor S. C. Fung

- 52-week, phase 3, open-label, single-arm, multicenter study to assess the safety, tolerability, and efficacy of foslevodopa/foscarbidopa administered as a 24-hour/day CSCI in patients with aPD
- 60 sites across 13 countries (Australia, Belgium, Canada, Denmark, Germany, Italy, Japan, Netherlands, Russia, Spain, Sweden, United Kingdom, and United States)
- patient enrollment- June 2019- August 2021

Conclusion: Foslevodopa/foscarbidopa has the potential to provide a safe and efficacious, individualized, 24-hour/day, nonsurgical alternative for patients with PD.

Distribution of first morning state on awakening (assessed by 24-hour PD diary)



Daily 'Off' time[c], h	5.9 (2.2)[f]
Daily 'On' time without dyskinesia[c], h	6.5 (3.4)[f]
Daily 'On' time with non-troublesome dyskinesia[c], h	2.6 (2.6)[f]
Daily 'On' time with troublesome dyskinesia[c], h	1.0 (1.7)[f]
Daily 'On' time without troublesome dyskinesia[c], h	9.1 (2.5)

First morning non-sleep symptom:

- "Off" time
- "On" time without dyskinesia
- "On" time with troublesome dyskinesia
- "On" time with non-troublesome dyskinesia

- Permission granted from Neurology and Therapy to re-use images from Aldred J, *et al. Neurol Ther* 2023.
- Aldred J, *et al. Neurol Ther* 2023; doi: https://doi.org/10.1007/s40120-023-00533-1.

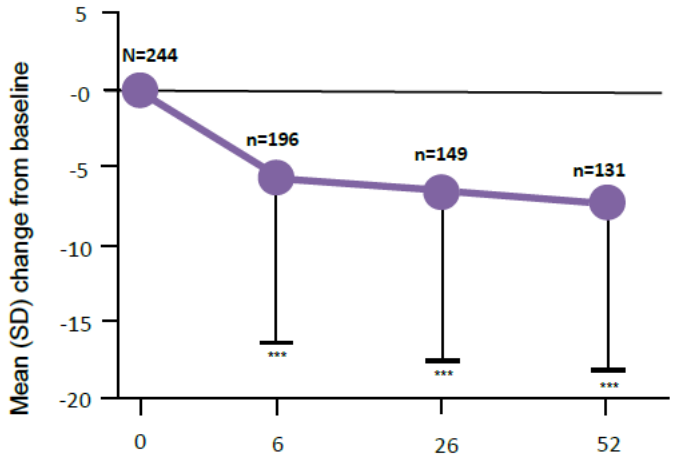
Movement Disorders
CLINICAL PRACTICE
BRIEF REPORT

Improved Sleep Correlates with Improved Quality of Life and Motor Symptoms with Foslevodopa/Foscarbidopa

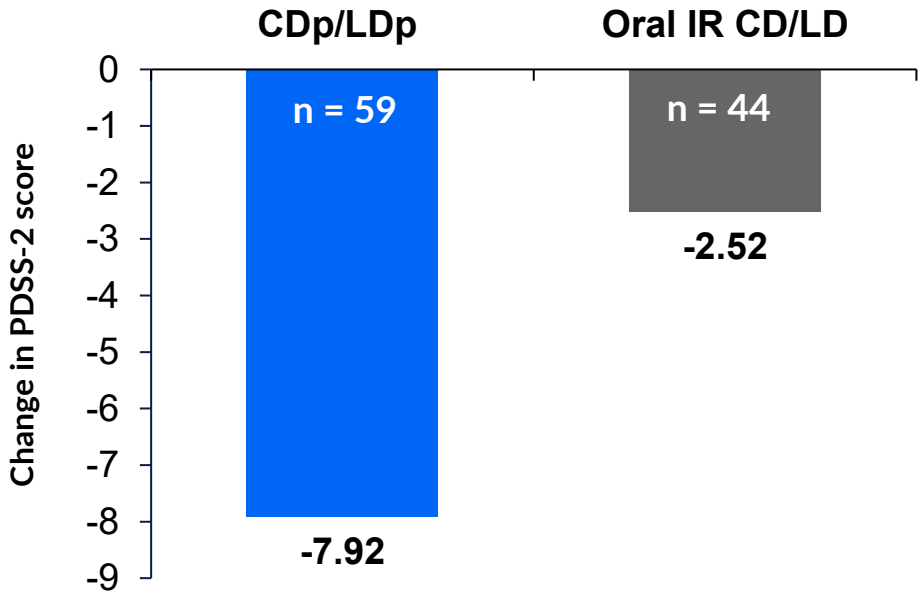
K. Ray Chaudhuri, MD, DSc, FRCP,[1,2,*] Maurizio F. Facheris, MD, MSC,[3] Bruno Bergmans, MD, PhD,[4,5] Filip Bergquist, MD, PhD,[6,7] Susan R. Criswell, MD, MSCI,[8] Jia Jia, PhD, MBA,[3] Pavnit Kukreja, PharmD,[3] Yohei Mukai, MD, PhD,[9] Amy M. Spiegel, PhD,[3] Resmi Gupta, PhD,[3] Lars Bergmann, MD,[3] and Rajesh Pahwa, MD[10]

Conclusions: Improved sleep with foslevodopa/foscarbidopa was associated with improved QoL and "Off" time.

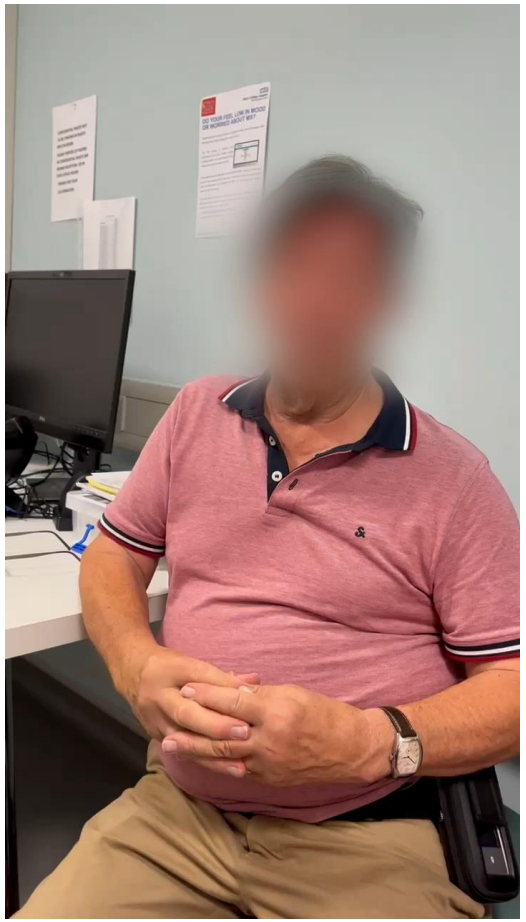
Fig: Sleep quality report using PDSS 2 scale in 244 subjects on Foslevodopa/foscarbidopa (Chaudhuri et al 2024) .



PDSS-2 total score: Change from baseline to week 12

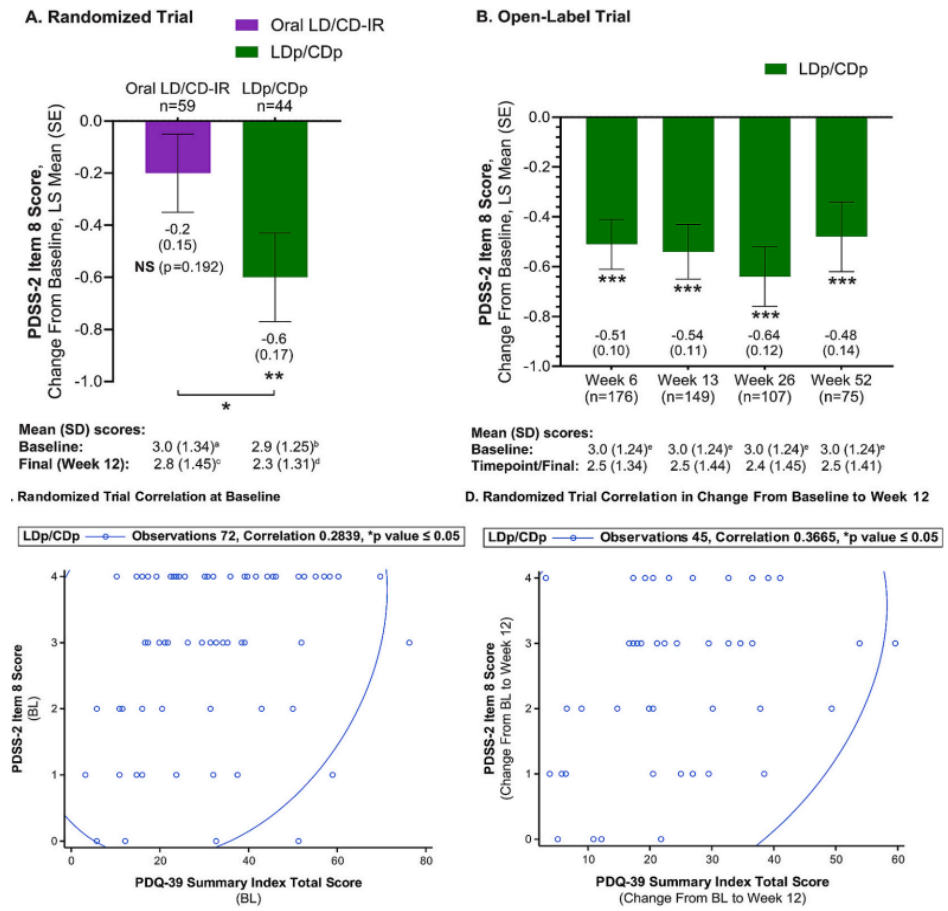


Soileau MJ, *et al. Lancet Neurol* 2022; **21**:1099–1109.



- **Significant improvement in nocturia symptoms** with foslevodopa/foscarbidopa compared to oral levodopa at week 12 ($p < 0.01$)
- In the open label study, there were significant reductions in nocturia scores at weeks 6, 13, 26, and 52 compared to baseline ($p < 0.001$ for all comparisons)

Bladder function in PD may involve dopamine D1 receptor activity, and the D1 effect of foslevodopa/foscarbidopa combined with sustained overnight stimulation may be the underlying mechanism, warranting further investigation.



Chaudhuri KR et al. Clin Park Relat Disord. 2025

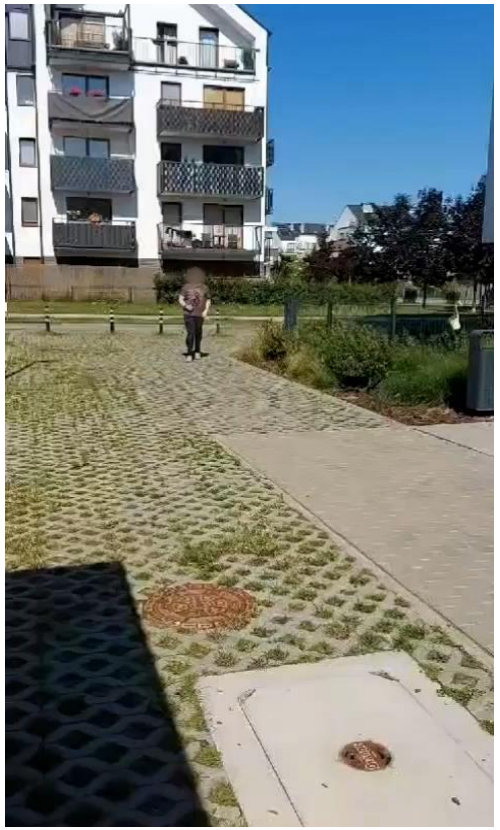
Case study 1: Right-sided bradykinesia and dystonic gait

Age: 39 years
Male

Diagnosed with EOPD with dystonia in 2016

Severe right-sided bradykinesia

Right-sided dystonic gait during best "On" state

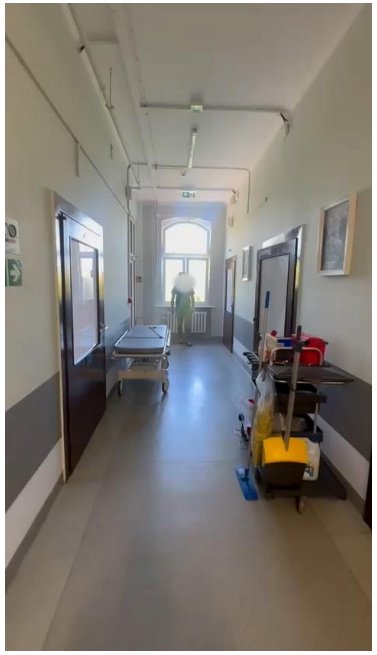


The patient provided consent for the use of these videos within this presentation.

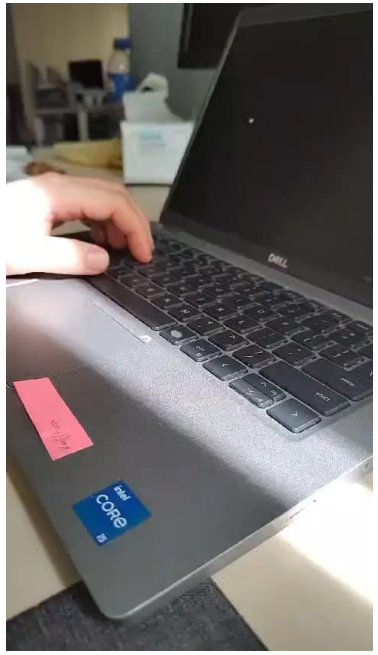
Decision on further treatment

Post LDp/CDp dose

Post LDp/CDp after a few hours



Improvement in writing



Post LDp/CDp after 1 month

LDp/CDp, foslevodopa/foscarbidopa.
The patient provided consent for the use of these videos within this presentation.

After 3 months

- Courtesy of Prof. R. Chaudhuri and Dr. K. Popławska-Domaszewicz.
- The patient provided consent for the use of these videos within this presentation.

After 1 year

The patient provided consent for the use of these videos within this presentation.

The special burden of EOPD and need for specific care

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Parkinsonism and Related Disorders
journal homepage: www.elsevier.com/locate/parkreldis

Recognition and characterising non-motor profile in early onset Parkin… disease (EOPD)

Karolina Poplawska-Domaszewicz [a,b,**], Mubasher A. Qamar [b,c], Cristian Falup Pecurari…
K Ray Chaudhuri [b,c,*]

High NMS burden
High risk of ICD
Higher genetic cases

Gene	Association described	Level of evidence
DRD2	Higher risk of ICD in Western population and Asian	+++
GRIN2B	Higher risk of ICD in Western population and Asian	++
DRD1	Higher risk of ICD	++
PRKAG2	Higher risk of ICD	+
MEFV	Higher risk of ICD	+
PRKCE	Higher risk of ICD	+
OPRK1	Higher risk of ICD	+
HTR2A	Higher risk of ICD	+
DDC	Higher risk of ICD	+
DRD3	Higher risk of ICD in Western population and Asian	+
DBH, ACE, BDNF	Higher risk of ICD in Russian population has been described	+
GBA and LRRK2	Higher risk described in PPMI analysis and an observational study	++
Parkin	specific patterns of ICD such as: compulsive shopping, binge eating, and punding/hobbyism	+
PINK1	specific patterns of ICD such as: hypersexuality, compulsive shopping and binge eating	++

EOPD genetic basis	Specific genetic mutation	Clinical association
AD pattern	SNCA	Cognitive decline
AR pattern	ATP13A2 (Kufor–Rakeb Syndrome)	Rapid cognitive decline, dementia, and optic atrophy
AR pattern	PRKN	Specific pattern of ICD: compulsive shopping, binge eating, punding, increased hobbyism, and sleep benefit
AR pattern	PINK1	Specific pattern of ICD: hypersexuality, compulsive shopping, and binge eating
AD pattern (GRIN2B)	GRIN2B, DRD1 and DRD2	Strong links with ICD. Racial variations noted
AD pattern (LRRK2) AR pattern (GBA1)	LRRK2 GBA1 (pathogenic mutations)	Increased rates of ICD
AR pattern	GBA1 (pathogenic mutations)	Cognitive decline, RBD, and dysautonomia
AR pattern	PLA2G6 (PLAN)	Rapid cognitive decline and optic atrophy
AR pattern (DJ-1) AR pattern (PINK1)	DJ-1 PINK1	Association with pain in PD. PINK1 lower back pain described in EOPD
NA	DRD2 rs2283265 polymorphism	Association with pain in EOPD

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Fosldopa and gait

Age: 59 years
Male
Self-employed businessman

Diagnosed with PD in 2007

Progress

Post initiation

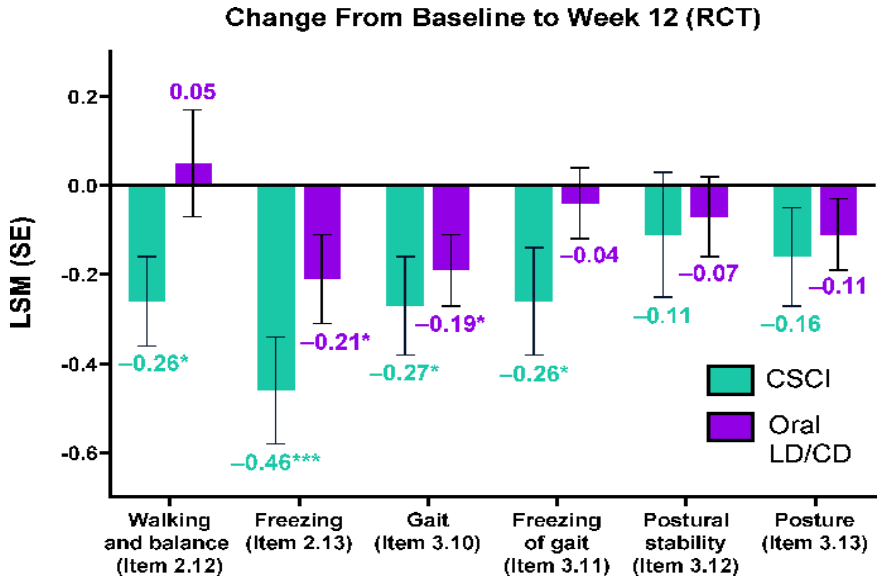
2-week follow-up

After 2 months

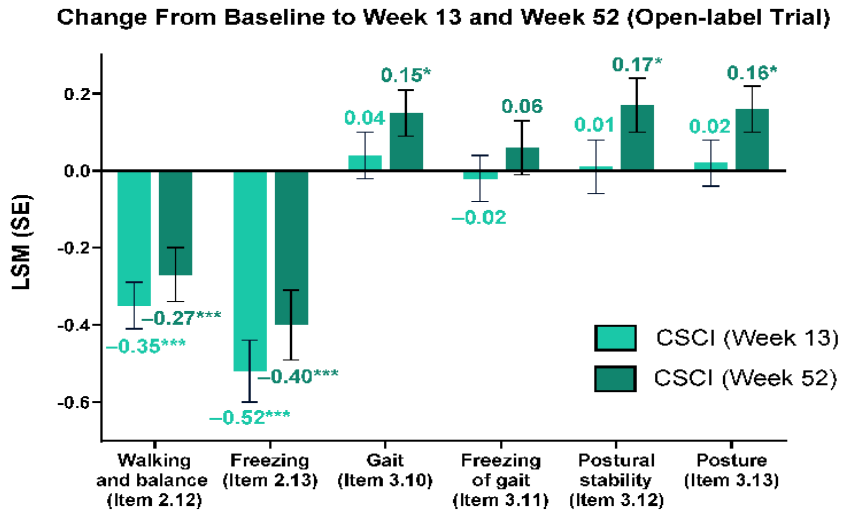
The patient provided consent for the use of these videos within this presentation.

Effect of continuous subcutaneous LDp/CDp treatment on falls, posture, and freezing of gait

***Post hoc* analysis of single items from LDp/CDp registration trials**



- Patients in the LDp/CDp arm achieved significant improvements from baseline to Week 12 in walking and balance, freezing, gait, and freezing of gait
- There were no significant between-arm differences in changes from baseline in postural stability or posture at Week 12.



- Significant improvements were observed from baseline in walking and balance and freezing at Weeks 13 and 52
- Gait, postural stability, and posture worsened vs baseline at Week 52

- *P<0.05; ***P<0.001 vs baseline.
- CSCI, continuous subcutaneous infusion; LD/CD, levodopa/carbidopa; LDp/CDp, foslevodopa/foscarbidopa; LSM, least squares mean; SE, standard error
- Odin P, *et al. EAN* 2023.

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Improvement of Troublesome Dyskinesia in People With Parkinson's Disease Treated With Foslevodopa/Foscarbidopa

Morten Blaabjerg,[1] Tsao-Wei Liang,[2] S Elizabeth Zauber,[3] Lars Bergmann,[4] Resmi Gupta,[4] Linda Harmer,[4] Megha Shah,[4] Filip Bergquist[5,6]

[1]Department of Neurology, Odense University Hospital, Odense, Denmark; [2]Department of Neurology, Thomas Jefferson University, Philadelphia, Pennsylvania, United States; [3]Department of Neurology, Indiana University School of Medicine, Indianapolis, Indiana, United States; [4]AbbVie Inc., North Chicago, Illinois, United States; [5]Department of Pharmacology, University of Gothenburg, Gothenburg, Sweden; [6]Sahlgrenska University Hospital, Gothenburg, Sweden

OBJECTIVE

To evaluate the effect of LDp/CDp on troublesome dyskinesia (TSD) in people with PD, stratified by baseline duration of TSD

CONCLUSIONS

- Continuous delivery of LDp/CDp treatment for 52-weeks was associated with significant improvements in time spent with TSD in those who experienced clinically-relevant levels of TSD at baseline[6]
- The majority of patients who experienced TSD at baseline reported no TSD after 52 weeks with continuous delivery of LDp/CDp
- This exploratory data suggests that continuous delivery with precise dosing of LDp/CDp may lead to shorter TSD duration and reduced impact on daily function for people with PD who experience TSD

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References

SAFETY PROFILE

LDp/CDp was generally well tolerated in patients with aPD

M15-741 study[1]

TEAE preferred terms, n[1] (%)	All subjects N = 244
Infusion site erythema	127 (52.0)
Infusion site nodule	70 (28.7)
Infusion site cellulitis	56 (23.0)
Infusion site edema	47 (19.3)
Hallucination	42 (17.2)
Fall	41 (16.8)
Infusion site pain	38 (15.6)
Infusion site reaction	30 (12.3)
Anxiety	29 (11.9)
Infusion site abscess	27 (11.1)
Dizziness	25 (10.2)

M15-736 study[2]

TEAE, n[2] (%)	Oral IR LD/CD N = 67	LDp/CDp N = 74
Infusion site erythema	1 (1)	20 (27)
Infusion site pain	1 (1)	19 (26)
Infusion site cellulitis	0	14 (19)
Infusion site edema	0	9 (12)
Dyskinesia	4 (6)	8 (11)
Fall	12 (18)	6 (8)
Infusion site bruising	2 (3)	6 (8)
Infusion site hemorrhage	0	6 (8)
Infusion site nodule	0	6 (8)
"On" and "Off" phenomenon	0	6 (8)
Hallucination	1 (1)	5 (7)
Balance disorder	0	4 (5)
Constipation	0	4 (5)
Hallucination, visual	0	4 (5)
Infusion site induration	0	4 (5)
Infusion site infection	0	4 (5)
Infusion site pruritus	0	4 (5)
Peripheral swelling	0	4 (5)

- The most common AEs of special interest were related to the **infusion site**[1,2]
- Majority of infusion site AEs were non-serious and **mild-to-moderate in severity**[1]

AE, adverse event; IR, immediate release; LD/CD, levodopa/carbidopa; LDp/CDp, foslevodopa/foscarbidopa; TEAE, treatment-emergent adverse event.

1. Aldred J, *et al. Neurol Ther* 2023; **12**:1937–1958 (incl. suppl.); 2. Soileau MJ, *et al. Lancet Neurol* 2022; **21**:1099–1109 (incl. suppl.).

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Poster 006

Sustained Long-Term Safety and Tolerability of Foslevodopa/ Foscarbidopa in Parkinson's Disease: 96-Week Primary Treatment Period Results from an Ongoing Open-Label Extension Study

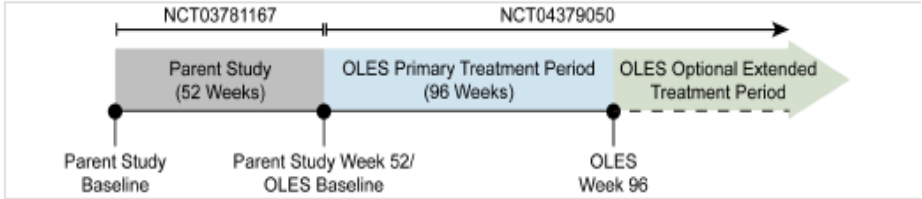
Filip Bergquist,[1,2] Jason Aldred,[3] Erik H. Danielsen,[4] Camille Carroll,[5] Cheney Matthews,[6] Jia Jia,[6] Megha Shah,[6] Amy Spiegel,[6] Victor SC Fung[7,8]

[1]Department of Pharmacology, Institute of Neuroscience and Physiology, University of Gothenburg, Gothenburg, Sweden; [2]Department of Neurology, Sahlgrenska University Hospital, Gothenburg, Sweden; [3]Selkirk Neurology & Inland Northwest Research, Spokane, WA, USA; [4]Department of Neurology, Aarhus University, Aarhus, Denmark; [5]Newcastle University, Translational and Clinical Research Institute, Newcastle, UK; [6]AbbVie Inc., North Chicago, IL, USA; [7]Sydney Medical School, Sydney, New South Wales, Australia; [8]Department of Neurology, Westmead Hospital, Sydney, New South Wales,

OBJECTIVE

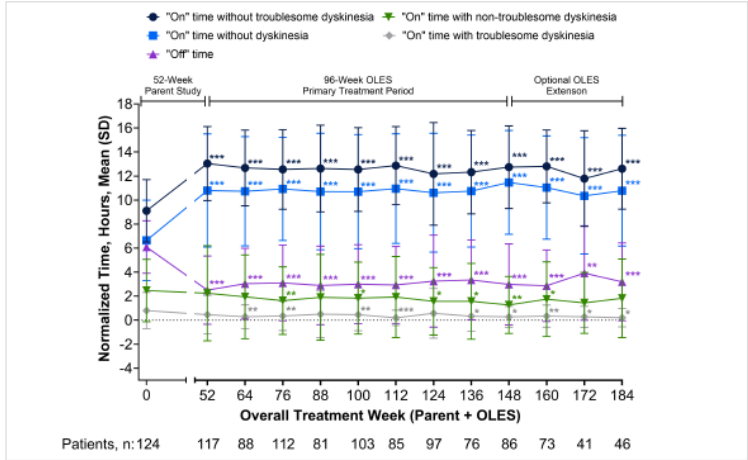
Evaluate the long-term safety, tolerability, and efficacy of foslevodopa/ foscarbidopa (LDp/CDp) in people with advanced Parkinson's disease (PD) treated through week 96 of an open-label extension study (OLES)

Study Design



- The OLES consists of a 96-week primary treatment period and optional extended treatment period that is open-ended and ongoing

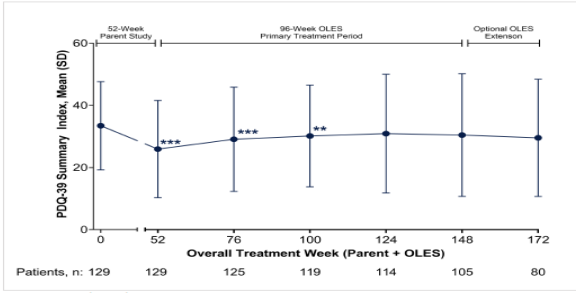
Improvements in "Off" and "On" Time Were Sustained from the Parent Study



OLES, Open-label extension study. Treatment weeks are defined relative to treatment initiation in the parent study. Week 52 corresponds to the OLES baseline, and week 148 corresponds to the end of the primary treatment period. Patient n at each time point corresponds to the number of patients in the OLES with valid PD diary recording days. p-values indicate comparisons to parent study baseline values for patients in the OLES. *p < 0.05, **p < 0.01, ***p ≤ 0.001.

- Improvements in "Off" time and "On" time without dyskinesia were sustained throughout the OLES, up to 184 weeks of total treatment

Improvements in PDQ-39 Summary Index Were Maintained through 100 Total Weeks of Treatment



OLES, Open-label extension study.
Treatment weeks are defined relative to treatment initiation in the parent study. Week 52 corresponds to the OLES baseline, and week 148 corresponds to the end of the primary treatment period. Patient n at each time point corresponds to the number of patients in the OLES with valid PDQ-39 assessments at each visit. *p = 0.05, **p = 0.01, ***p ≤ 0.001; indicate comparisons to parent study baseline values for patients in the OLES.

Poster 006

Sustained Long-Term Safety and Tolerability of Foslevodopa/ Foscarbidopa in Parkinson's Disease: 96-Week Primary Treatment Period Results from an Ongoing Open-Label Extension Study

Filip Bergquist,[1,2] Jason Aldred,[3] Erik H. Danielsen,[4] Camille Carroll,[5] Cheney Matthews,[6] Jia Jia,[6] Megha Shah,[6] Amy Spiegel,[6] Victor SC Fung[7,8]

[1]Department of Pharmacology, Institute of Neuroscience and Physiology, University of Gothenburg, Gothenburg, Sweden; [2]Department of Neurology, Sahlgrenska University Hospital, Gothenburg, Sweden; [3]Selkirk Neurology & Inland Northwest Research, Spokane, WA, USA; [4]Department of Neurology, Aarhus University, Aarhus, Denmark; [5]Newcastle University, Translational and Clinical Research Institute, Newcastle, UK; [6]AbbVie Inc., North Chicago, IL, USA; [7]Sydney Medical School, Sydney, New South Wales, Australia; [8]Department of Neurology, Westmead Hospital, Sydney, New South Wales,

OBJECTIVE

Evaluate the long-term safety, tolerability, and efficacy of foslevodopa/ foscarbidopa (LDp/CDp) in people with advanced Parkinson's disease (PD) treated through week 96 of an open-label extension study (OLES)

Adverse Events During the OLES

	Total, n (%), N=129
Any AE	119 (92.2)
Any AE considered associated with LDp/CDp	96 (74.4)
Any serious AE	48 (37.2)
Any severe AE	42 (32.6)
Any AE leading to discontinuation of LDp/CDp	17 (13.2)
Any AE leading to death	7 (5.4)
Most common AEs (≥15% of patients)	
Fall	42 (32.6)
Infusion site erythema	29 (22.5)
Infusion site cellulitis	24 (18.6)
Hallucination	22 (17.1)

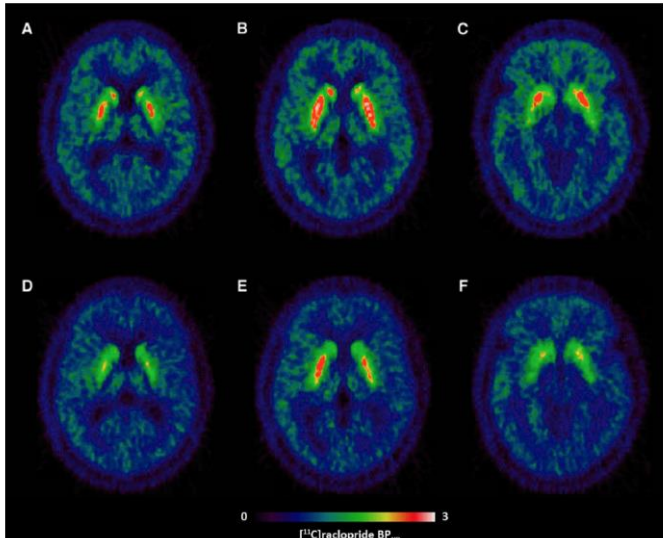
AE, adverse event; LDp/CDp, foslevodopa/foscarbidopa.
AEs were evaluated in from OLES baseline until the data cutoff in the safety analysis set, defined as any patients who received any LDp/CDp in this period. All AEs are treatment-emergent and do not imply relationship to study drug unless indicated.

- Overall, 92.2% of patients experienced ≥1 AE in the OLES
- AEs were the primary reason for discontinuation in n=13 (10.1%) patients
- The LDp/CDp safety profile was generally similar to that reported in the parent study[1] but showed notable shifts
  - Falls were more frequent in the OLES than in the parent study (32.6% vs 16.8%[1])
  - The OLES had lower rates for infusion-site erythema (22.5% vs 52.0%[1]) and cellulitis (18.6% vs 23.0%[1])
  - Hallucinations were similar in frequency in both studies. In the OLES, majority were mild (n/N=8/22) or moderate (n/N=12/22)

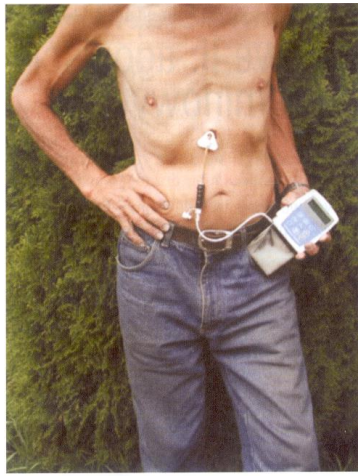
Levodopa-Carbidopa Intestinal Gel (LCIG)

Levodopa/carbiodopa intestinal gel

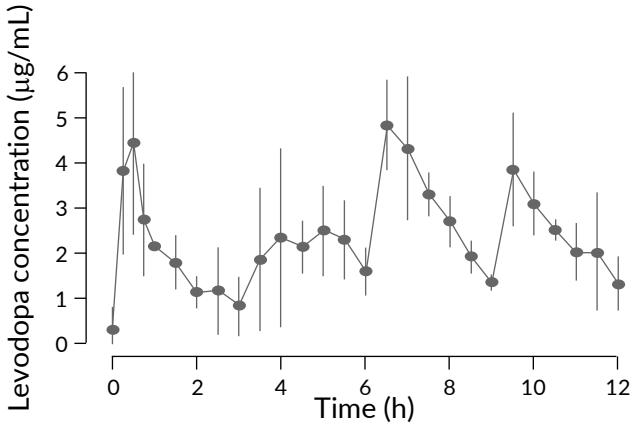
Duodopa infusion provides stable striatal dopamine levels

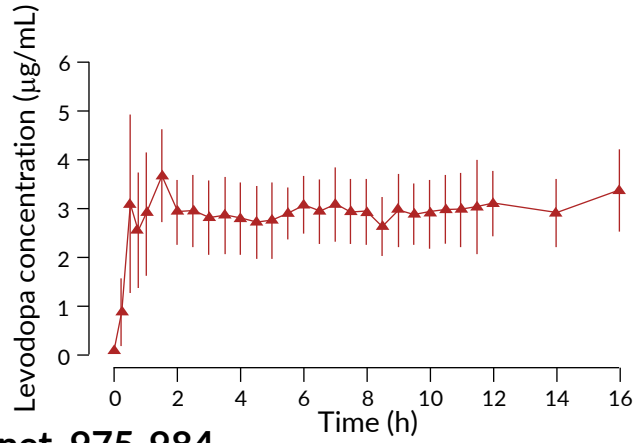


Decreases in [^{11}C]raclopride binding potential before (A-C) and after (D-F) LCIG infusions (PET).

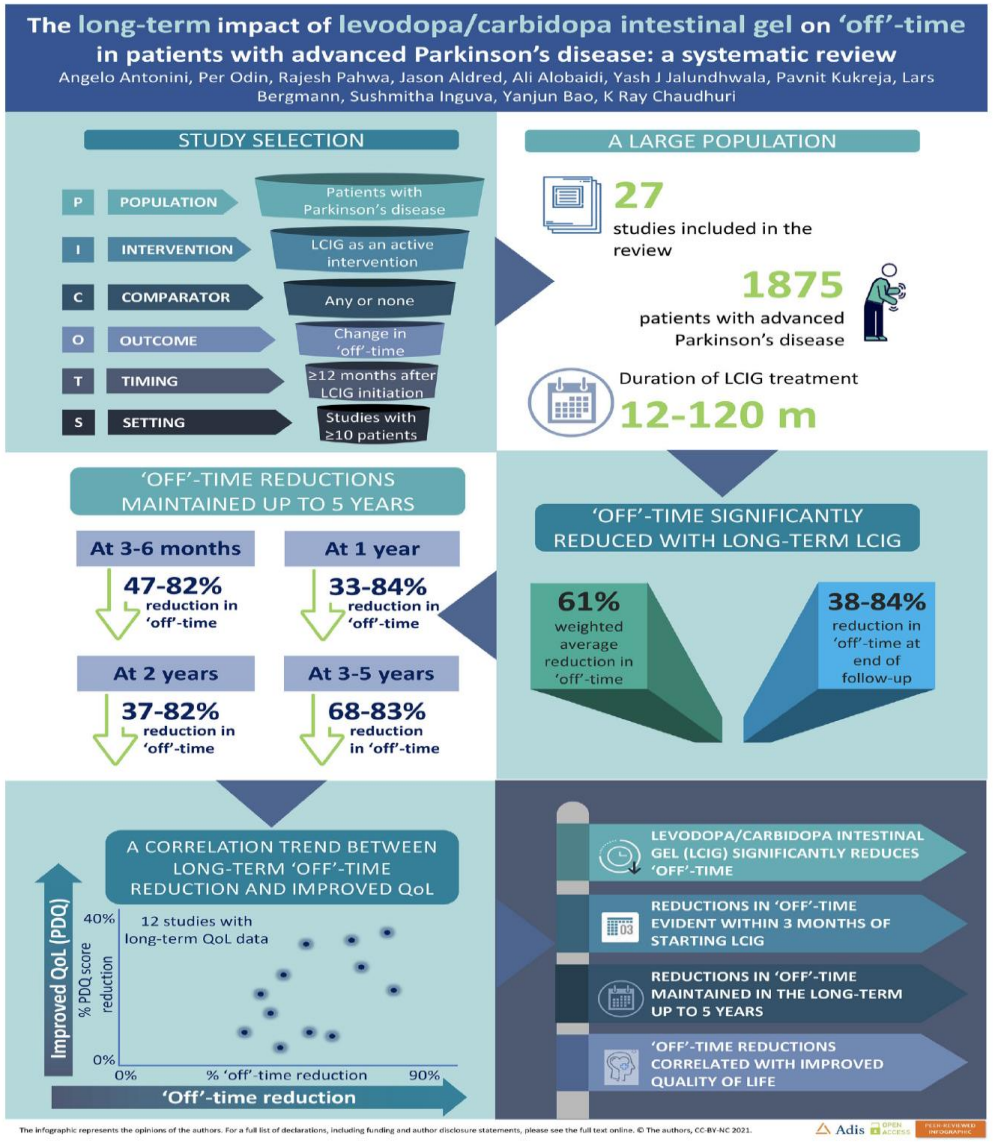


Plasma concentrations of levodopa with oral tablets vs LCIG[2]





1. Politis M, *et al.* (2017) Mov Disord, 235-240; 2. Othman AA, *et al.* (2015) Clin Pharmacokinet, 975-984.



Adv Ther (2021) 38:2854–2890
https://doi.org/10.1007/s12325-021-01747-1

REVIEW

The Long-Term Impact of Levodopa/Carbidopa Intestinal Gel on 'Off'-time in Patients with Advanced Parkinson's Disease: A Systematic Review

Angelo Antonini · Per Odin · Rajesh Pahwa · Jason Aldred · Ali Alobaidi · Yash J. Jalundhwala · Pavnit Kukreja · Lars Bergmann · Sushmitha Inguva · Yanjun Bao · K. Ray Chaudhuri

Continuous dopaminergic stimulation provided by LCIG reduces OFF time and improves other motor complications that are not well controlled with oral levodopa. These improvements are sustained for more than 12 months and up to 5 years.

Antonini et al., 2021

Journal of Parkinson's Disease 13 (2023) 769–783
DOI 10.3233/JPD-225105
IOS Press

Clinical Research

Levodopa Carbidopa Intestinal Gel in Advanced Parkinson's Disease: DUOGLOBE Final 3-Year Results

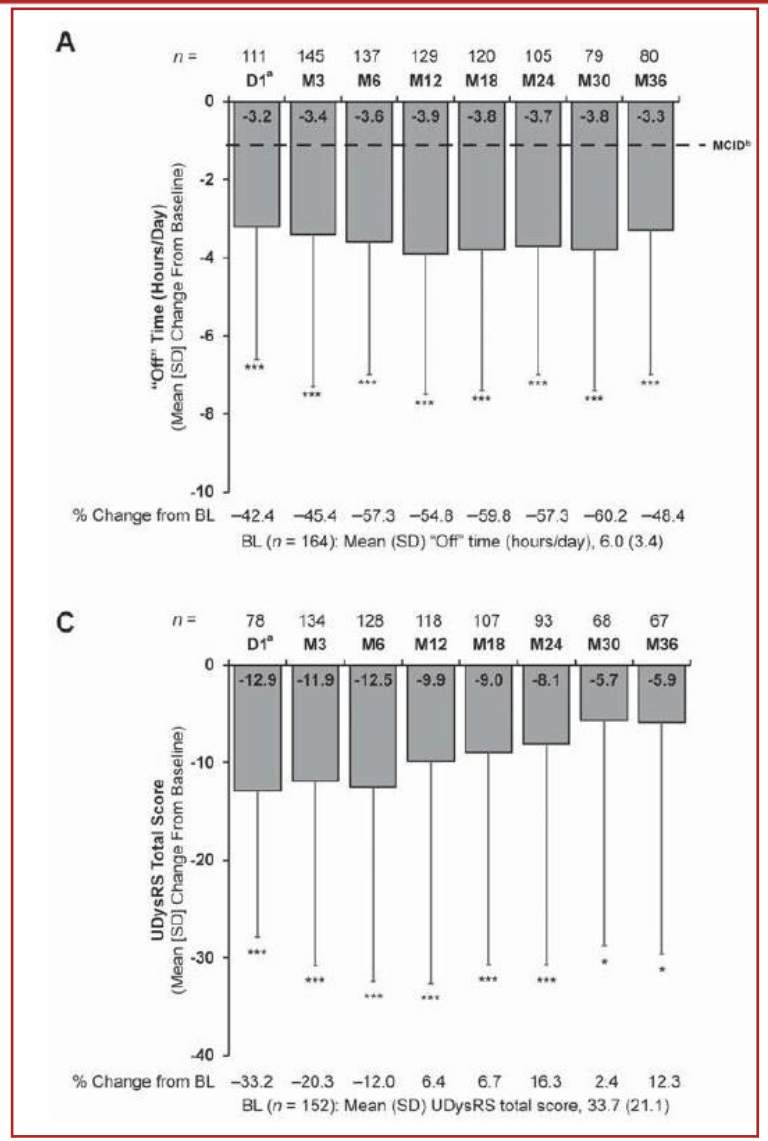
K. Ray Chaudhuri[a,*], Norbert Kovács[b], Francesco E. Pontieri[c,d], Jason Aldred[e], Paul Bourgeois[f], Thomas L. Davis[g], Esther Cubo[h], Marieta Anca-Herschkovitsch[i], Robert Iansek[j], Mustafa S. Siddiqui[k], Mihaela Simu[l], Lars Bergmann[m], Mayra Ballina[m], Pavnit Kukreja[m], Omar Ladhani[m], Jia Jia[m] and David G. Standaert[n]

- global multicenter, single arm, non-interventional, post-marketing, observational study
- 55 sites across 10 countries (Australia, Belgium, Hungary, Israel, Italy, Romania, Slovenia, Spain, United Kingdom, and the United States)
- 195 patients

Baseline demographics and clinical characteristics

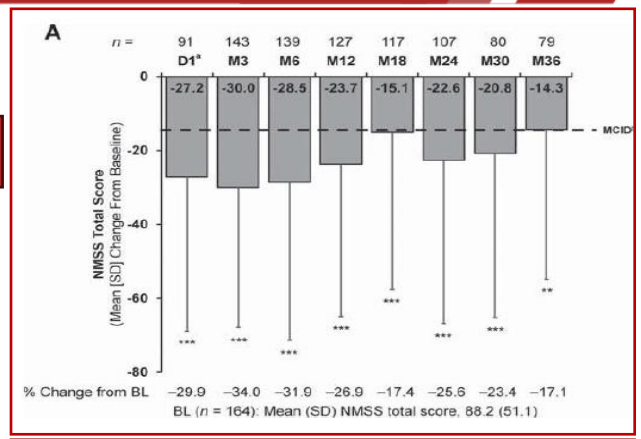
Characteristic	Total $N = 195$
Sex, *n* (%)	
Male	120 (61.5)
Female	75 (38.5)
Age (y); mean ± SD	70.2 ± 8.2
<65 y, *n* (%)	44 (22.6)
65–75 y, *n* (%)	95 (48.7)
>75 y, *n* (%)	56 (28.7)
BMI; mean ± SD BMI, kg/m^2	25.9 ± 4.1[a]
PD duration, y: mean ± SD	11.2 ± 4.8
<10 y, *n* (%)	94 (48.5)
≥10 y, *n* (%)	100 (51.5)
Time to LCIG initiation, y; mean ± SD from:	
PD symptoms	12.2 ± 5.0
Start of motor fluctuations	5.6 ± 4.7

Off period

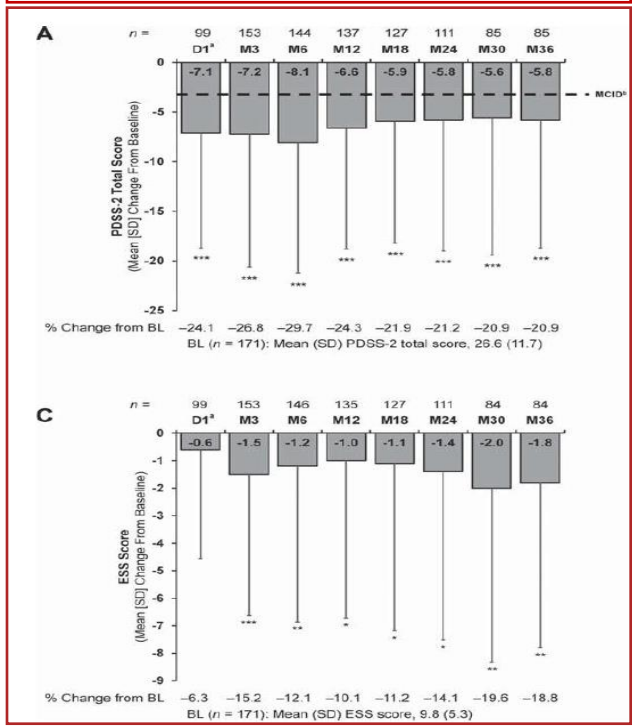


Dyskinesia

NMSS



PDSS



Chaudhuri et al.
JPD 2023

Movement Disorders
Vol. 24, No. 10, 2009, pp. 1468–1474

Intrajejunal Levodopa Infusion in Parkinson's Disease: A Pilot Multicenter Study of Effects on Nonmotor Symptoms and Quality of Life

Holger Honig, MD,[1] Angelo Antonini, MD,[2] Pablo Martinez-Martin, MD,[3] Ian Forgacs, FRCP,[4] Guy C. Faye, FRCP,[4] Thomas Fox, MD,[1] Karen Fox, MD,[1] Francesca Mancini, MD,[2] Margherita Canesi, MD,[2] Per Odin, MD, PhD,[1] and K. Ray Chaudhuri, MD, FRCP, DSc[4]*

TABLE 2. *Importance of the change induced by duodenal levodopa/carbidopa treatment*

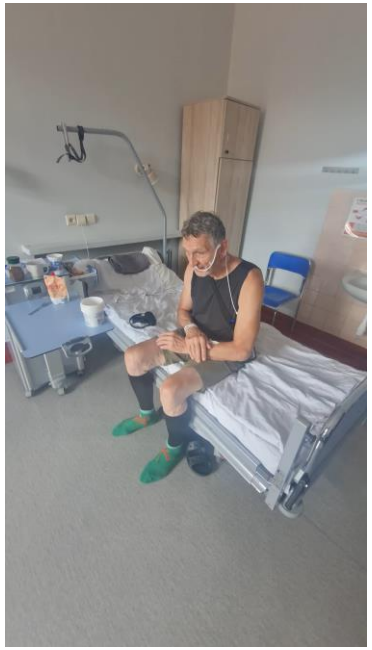
	Patients worsened (%)	Patients stable (%)	Patients improved (%)	Effect size	SRM	Range of potential MIC: Baseline ½ SD	Range of potential MIC: Baseline ¼ SD	Range of potential MIC: 10% of maximum possible score	Mean difference in score
UPDRS 3-Motor examination	13.6	18.2	68.2	0.54	0.79	7.0	**3.5**	**10.8**	−7.54[a]
UPDRS 4-Complications	0	0	100	2.03	1.76	1.5	**0.7**	**2.3**	−5.91
UPDRS-Dyskinesia score[b]	0	13.6	86.4	1.61	1.50	1.3	**0.6**	**1.6**	−3.77
PD Sleep Scale[c]	0	0	100	2.16	1.51	6.6	**3.3**	**15.0**	28.51
PDQ-8	9.1	13.6	77.3	1.28	1.09	9.2	**4.6**	**10.0**	−23.4
NMSS-Total score	4.5	0	95.5	0.89	1.23	28.2	**14.1**	**36.0**	−50.55
Cardiovascular	0	40.9	59.1	0.67	0.81	1.8	**0.9**	**2.4**	−2.41
Sleep/Fatigue	0	13.6	86.4	0.72	1.02	**7.9**	**3.9**	4.8	−11.32
Mood/Cognition	18.2	22.7	59.1	0.49	0.58	**7.6**	**3.8**	7.2	−7.50[a]
Perception/Hallucinations	9.1	63.6	27.3	0.30	0.44	2.6	**1.3**	**3.6**	−1.54[a]
Attention/Memory	0	54.5	45.5	0.40	0.67	**4.0**	**2.0**	3.6	−3.27[a]
Gastrointestinal	4.5	27.3	68.2	0.67	0.89	**4.6**	**2.3**	3.6	−6.23
Urinary	9.1	22.7	68.2	0.62	0.81	**5.3**	**2.7**	3.6	−6.64
Sexual	13.6	40.9	45.5	0.48	0.50	**4.1**	**2.0**	2.4	−3.91[a]
Miscellaneous	9.1	13.6	77.3	0.97	1.02	4.0	**2.0**	**4.8**	−7.73

LCIG

- LCIG, levodopa/carbidopa intestinal gel.
- Courtesy of Prof. R. Chaudhuri and Dr. K. Popławska-Domaszewicz.
- The patient provided consent for the use of these videos within this presentation.

PD-FOG

Before Duodopa



Duodopa therapy

Study reference	Participants	Study design	Treatment	Main findings	FOG subtype
Levodopa-carbidopa intestinal gel (LCIG)					
[60]	65 advanced PD	Observational, retrospective, a review of medical records	Mean duration of LCIG therapy was 3.7 years	FOG improved (FOG present only in 22% of patients at 1 year follow-up compared to 46% at baseline).	Unknown
[61]	91 advanced PD	Observational, retrospective, a review of medical records	Mean time of follow up of 18 ± 8.4 months	Gait disorders (freezing, festination, postural instability) improved in 61.4% of patients (three point scale).	Unknown
[62]	32 advanced PD with FOG	Observational, retrospective, a review of medical records	Mean duration of LCIG therapy was 2.59 ± 1.12 years	FOG that present in OFF condition and improved but did not disappear completely in ON condition can be further improved by LCIG (UPDRS freezing score).	31 patients with responsive FOG and one with resistant-FOG
[63]	177 advanced PD, in which 122 patients with FOG	Observational, retrospective, multi-center, cross-sectional, uncontrolled	Mean duration of LCIG therapy was 34.7 months, 80.8% of patients ≥12 months	FOG improved in 76.2% of patients (subjective assessment by clinicians).	Unknown
[64]	28 PD	Prospective, open label, uncontrolled	17/28 patients reached the 24-month follow-up	FOG improved (FOGQ)	Unknown
[65]	25 PD	Prospective, open label, uncontrolled	20 patients continued on treatment to 6 months.	FOG improved (FOGQ)	Unknown
[66]	5 PD with FOG	Prospective, open label, uncontrolled	24 h LCIG therapy, 6 months	360° turn time reduced, FOG improved (FOGQ) and fall frequency reduced	Resistant
[56]	7 PD with FOG	Prospective, open label controlled, unrandomized	Evaluations were performed in "On" state (60–90 min after taking the morning oral levodopa or LCIG).	FOG improved on LCIG (FOGQ and UPDRS freezing score)	Resistant

Gao *et al. Translational Neurodegeneration* (2020) 9:12

Journal of Parkinson's Disease 13 (2023) 769–783
DOI 10.3233/JPD-225105
IOS Press

Clinical Research

Levodopa Carbidopa Intestinal Gel in Advanced Parkinson's Disease: DUOGLOBE Final 3-Year Results

K. Ray Chaudhuri[a,*], Norbert Kovács[b], Francesco E. Pontieri[c,d], Jason Aldred[e], Paul Bourgeois[f], Thomas L. Davis[g], Esther Cubo[h], Marieta Anca-Herschkovitsch[i], Robert Iansek[j], Mustafa S. Siddiqui[k], Mihaela Simu[l], Lars Bergmann[m], Mayra Ballina[m], Pavnit Kukreja[m], Omar Ladhani[m], Jia Jia[m] and David G. Standaert[n]

SAFETY PROFILE

Parameters	*n* (% of *N* = 195)
Any SAE	107 (54.9)
Any SAE with reasonable possibility of causal relationship to LCIG	31 (15.9)
Any SAE leading to drug withdrawal	53 (27.2)
Any severe AE	69 (35.4)
Patients remaining on LCIG despite study discontinuation	32 of 106 discontinued patients (30.2%)
Deaths	34 (17.4)
Deaths considered possibly related to LCIG[a]	1 (0.5)

	Common SAEs (≥4 patients)	Treatment-emergent SAEs (reasonable possibility)
MedDRA v23.1 Preferred Term	*n* (% of *N* = 195)	*n* (% of *N* = 195)
Fall	8 (4.1)	2 (1.0)
PD	8 (4.1)	3 (1.5)
Urinary tract infection	7 (3.6)	1 (0.5)
Hip fracture	6 (3.1)	0
Pneumonia	6 (3.1)	0
Abdominal pain	6 (3.1)	4 (2.1)
Device dislocation	5 (2.6)	2 (1.0)
Femoral neck fracture	4 (2.1)	0
Hyponatremia	4 (2.1)	1 (0.5)
Sepsis	4 (2.1)	0

K.R. Chaudhuri et al. / Final 3-year Results from the DUOGLOBE Study

Movement Disorders
CLINICAL PRACTICE
RESEARCH ARTICLE

Levodopa–Entacapone–Carbidopa Intrajejunal Infusion in Advanced Parkinson's Disease – Interim Analysis of the ELEGANCE Study

Daniel Weiss, MD,[1,*] Wolfgang H. Jost, MD,[2] József Attila Szász, MD,[3] Zvezdan Pirtošek, MD,[4] Ivan Milanov, MD,[5] Volker Tomantschger, MD,[6] Norbert Kovács, MD,[7] Harry Staines, PhD, CSTAT,[8] Bharat Amlani, MPharm,[9] Niall Smith, BSc,[9] and Teus van Laar, MD[10]

Conclusions: Routine use of LECIG for up to 12 months provided sustained control of motor symptoms, and was well tolerated with a positive impact on QoL and high patient satisfaction.

Lecigon infusion shows strong effect on all aspects of sleep dysfunction in PD

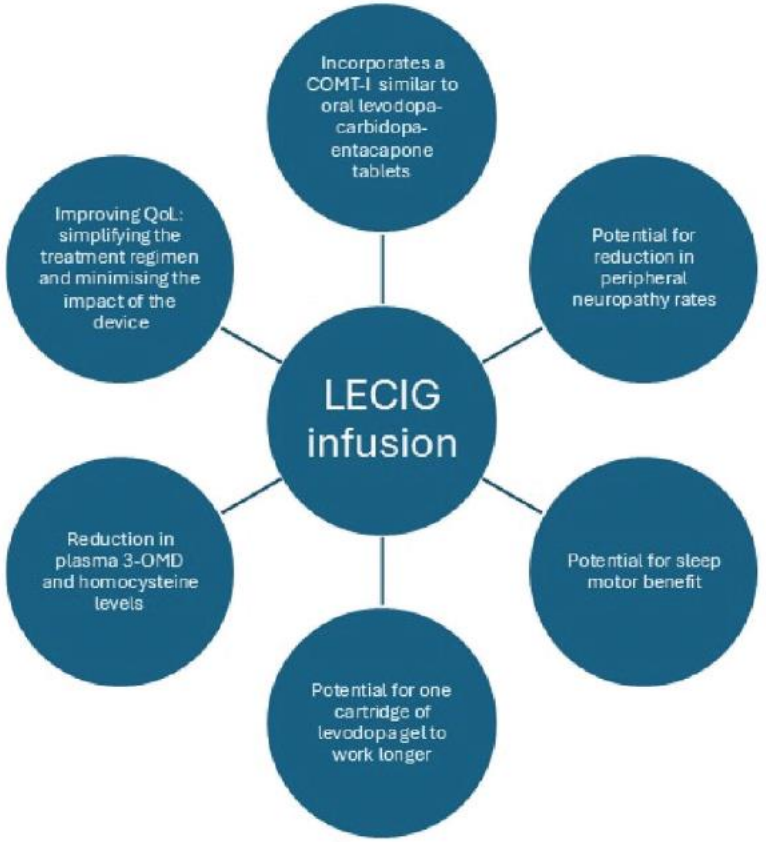
MOVEMENT DISORDERS CLINICAL PRACTICE 2025. doi: 10.1002/mdc3.70046

Expert Review of Medical Devices

The device-aided intrajejunal delivery of levodopa–entacapone–carbidopa intestinal gel the treatment of Parkinson's disease: overview of efficacy and safety

Karolina Popławska-Domaszewicz, Vinod Metta, Per Odin & K Ray Chaudhuri

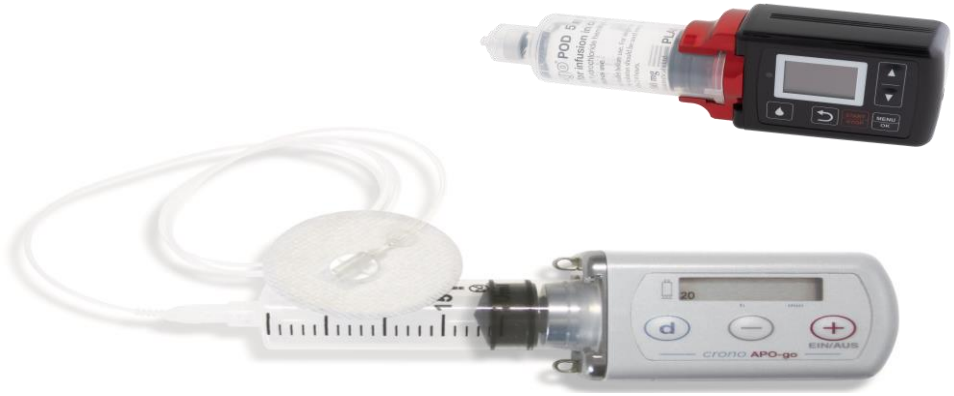
Published online: 08 May 2025.



Apomorphine is the only dopamine agonist with equivalent efficacy to levodopa

- Apomorphine Pen

Apomorphine Pump



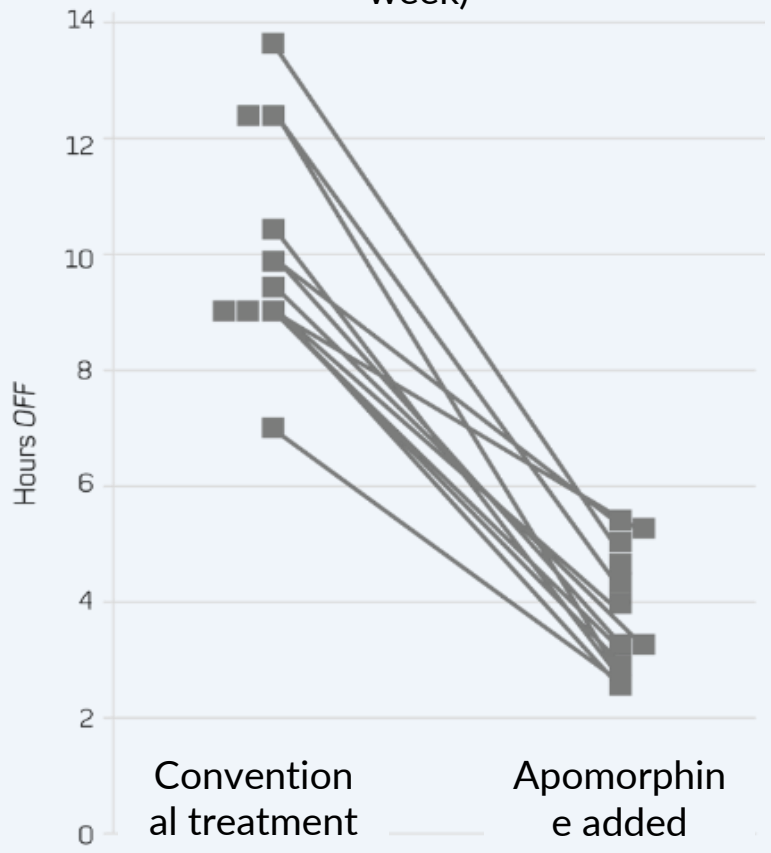
- Broad spectrum dopamine agonist activating all dopamine D1-like (D1, D5) and D2-like (D2, D3, D4) receptors with a rapid and reliable effect[1]
- Supported by clinical evidence and experience of efficacy and safety over 30 years[1]
- Despite advances in therapy apomorphine remains the only dopamine agonist with equivalent efficacy to levodopa[2]
- Subcutaneous apomorphine infusion provide continuous dopaminergic stimulation via continuous drug delivery [3]

1. Jenner P, Katzenschlager R. Parkinsonism Relat Disord. 2016;33 Suppl 1:S13-21.
2. Stibe CM, et al. Lancet. 1988;1(8582):403-6.
3. APO-go® POD 5 mg/ml solution for infusion in cartridge. Summary of Product Characteristics. 2022.

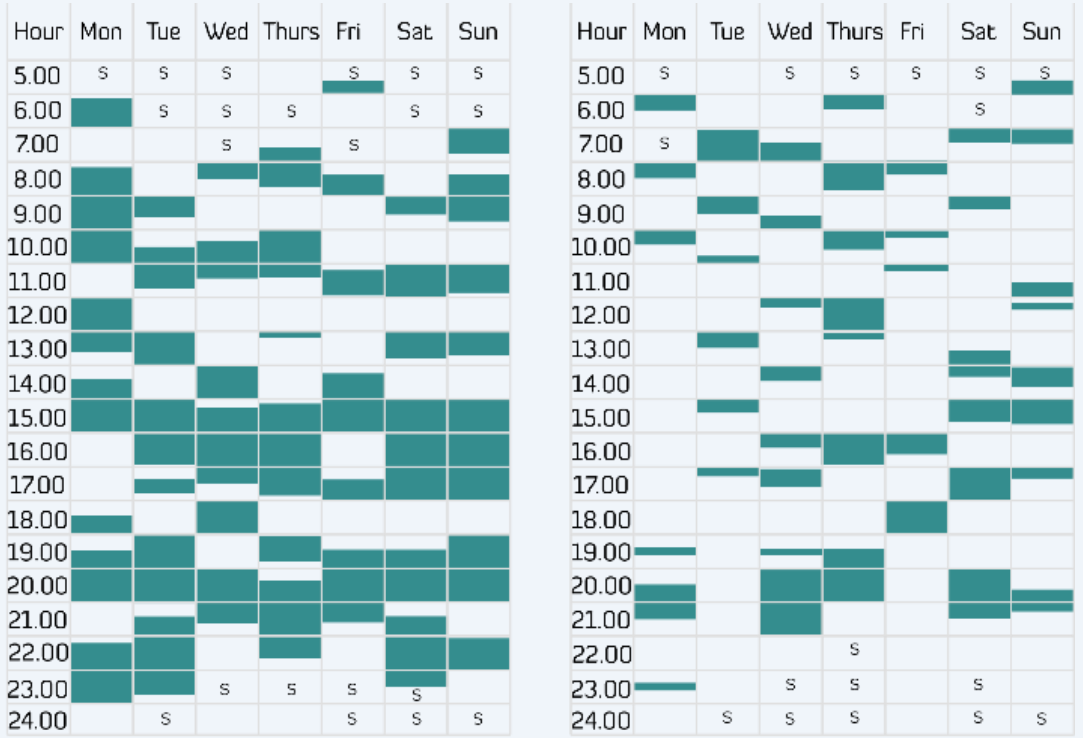
Apomorphine equipotent to levodopa

Subcutaneous apomorphine effective for the management of ON–OFF oscillations in 19 PD patients

Mean hours OFF per day (averaged over 1 week)



Diary recording OFF periods before and after apomorphine. Shade=OFF



Stibe CM et al. Lancet 1988;1(8582):403-6

APOMORPHINE

- intermittent apomorphine injection (penject)

- continuous subcutaneous apomorphine infusion (pump)

Trenkwalder, Chaudhuri et al. Expert Consensus Group report on the use of apomorphine in the treatment of Parkinson's disease e Clinical practice recommendations. Parkinsonism and Related Disorders, 2015.

So why APOMORPHINE PEN?

Fills gaps in the control of motor functioning with usual medication

- Rapid onset of action (4-12 minutes)
- Reliability for recovering the ON state
- Short half life (lasts about an hour) – no interference with basal drug regimen

1. Pfeiffer RF, et al. Parkinsonism Relat Disord. 2007;13(2):93-100.

intermittent apomorphine injection (penject)

- „Rescue therapy" for motor and non-motor "off" periods inadequately controlled by oral/transdermal treatments
- patients with unpredictable and predictable 'off' periods
- off symptoms that may improve include: off-related dystonia, freezing, non-motor symptoms, including pain, early morning 'off' states (early morning dystonia, akinesia, nonmotor fluctuations)
- when absorption of oral levodopa is impaired or the patient has gastric emptying problems (gastroparesis) to treat delayed "on"

Trenkwalder, Chaudhuri et al. Expert Consensus Group report on the use of apomorphine in the treatment of Parkinson's disease e Clinical practice recommendations. Parkinsonism and Related Disorders, 2015.

Apomorphine Injection: Other actions

Apomorphine can have tremorolytic action

Thanks Courtesy Prof Chaudhuri/Dr V Metta

Apomorhine can be useful for dystonic pain

Thanks Courtesy Prof Chaudhuri/Dr V Metta

continuous subcutaneous apomorphine infusion (pump)

- „off" periods not adequately controlled by oral treatment
- when rescue doses of apomorphine injection are effective but too frequent (for example, more than 4-6 times per day)
- dyskinesias limit further therapy optimalization
- simplify complex PD dosing regimens to improve convenience

Trenkwalder, Chaudhuri et al. Expert Consensus Group report on the use of apomorphine in the treatment of Parkinson's disease e Clinical practice recommendations. Parkinsonism and Related Disorders, 2015.

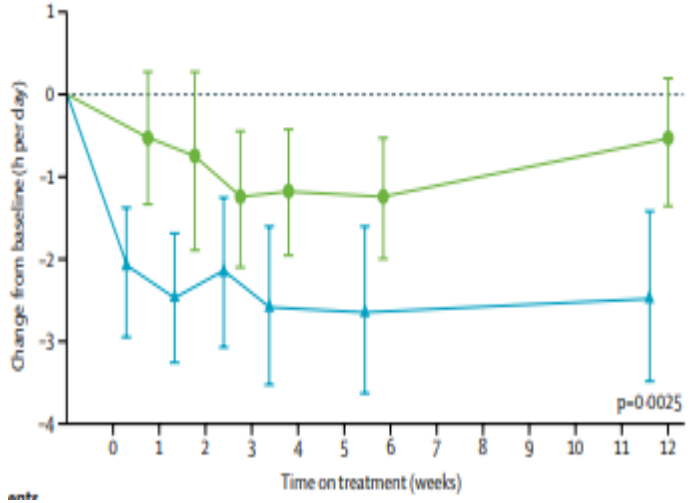
Apomorphine subcutaneous infusion in patients with Parkinson's disease with persistent motor fluctuations (TOLEDO): a multicentre, double-blind, randomised, placebo-controlled trial

Lancet Neurol 2018; 17: 749–59

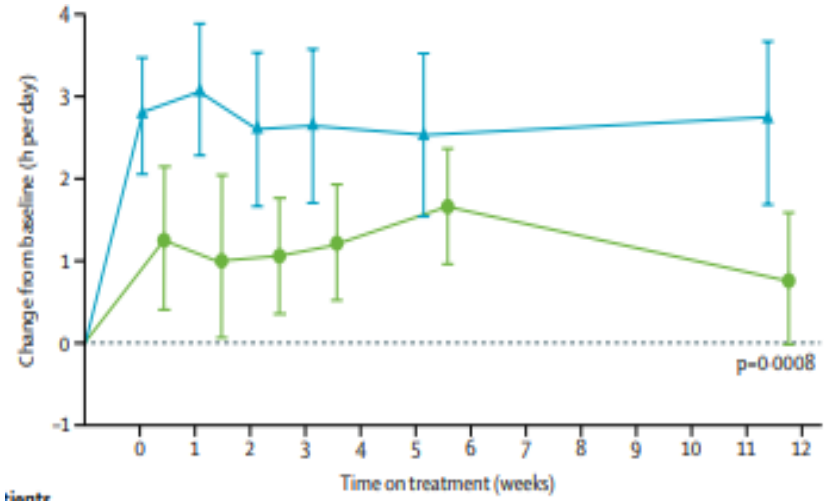
Regina Katzenschlager, Werner Poewe, Olivier Rascol, Claudia Trenkwalder, Günther Deuschl, K Ray Chaudhuri, Tove Henriksen, Teus van Laar, Kevin Spivey, Senthil Vel, Harry Staines, Andrew Lees

a significant decrease in off-time hours per day in the 12 week of treatment

62% of patients in the apomorphine arm experienced more than two hours of reduction of off time from baseline compared to 29% for placebo



the on-time troublesome dyskinesia free period was higher in the apomorphine group (2·77 ± 3·26 hours) as compared to the placebo group (0·80 ± 2·93 hours)



TOLEDO 52-week OLP results: key efficacy outcomes confirmed those of the DBP

Methods:

All patients completing the 12-week DBP

- The primary objective →evaluation of long-term safety of APO.

Results:

84 patients entered the OLP (40 previously on APO, 44 on placebo) and 59 patients (70.2%) completed the study.

Reduction in daily OFF time and improvement in ON time without troublesome dyskinesia were sustained for up to 64 weeks.

Mean (±SD) daily levodopa-equivalent dose decreased from DBP baseline to week 64 by 543 mg (±674) and levodopa dose by 273 mg (±515).

Conclusions:

The safety and efficacy of APO infusion were demonstrated with long-term use for persistent motor fluctuations, allowing substantial reductions in oral PD medication.

Pooled data for week 64 (n=55)

Mean (±SD) change from DBP baseline in daily OFF time -3.66 (2.72) hours

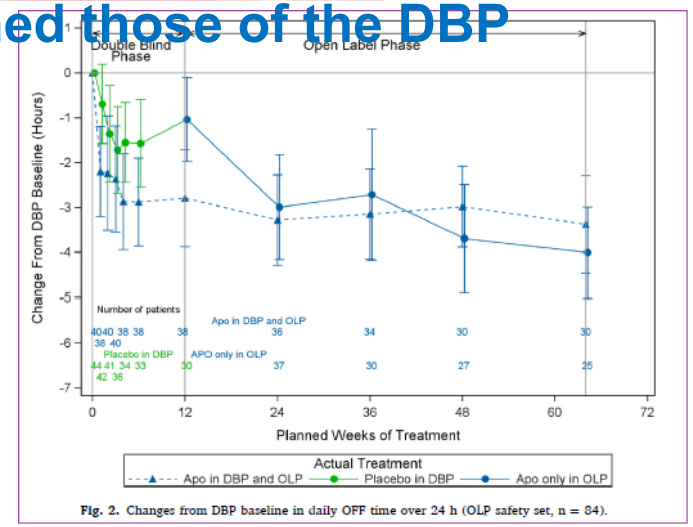


Fig. 2. Changes from DBP baseline in daily OFF time over 24 h (OLP safety set, n = 84).

Pooled data for week 64 (n=55)

Mean (±SD) change from DBP baseline in daily ON time without troublesome dyskinesia 3.31 (3.12) hours

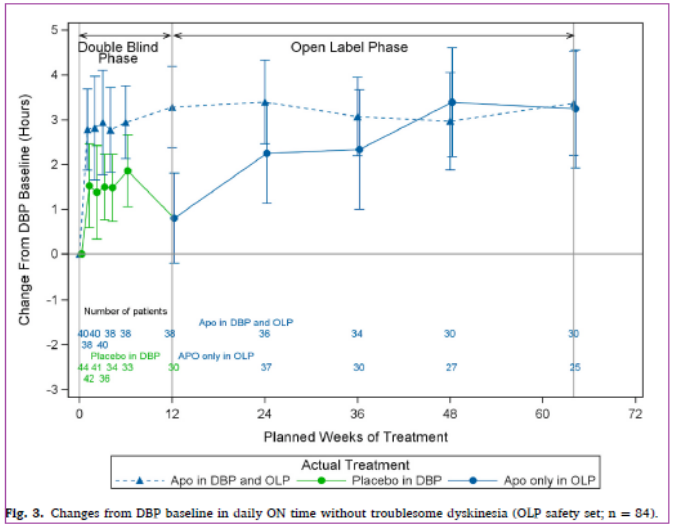


Fig. 3. Changes from DBP baseline in daily ON time without troublesome dyskinesia (OLP safety set; n = 84).

Katzenschlager R, et al. Parkinsonism Rel Dis. 2021;83:79-85.

APO, apomorphine infusion; DBP, double-blind phase; OLP, open-label phase.

Research article

Continuous, subcutaneous apomorphine infusion for Parkinson disease motor fluctuations: Results from the phase 3, long-term, open-label United States InfusON study

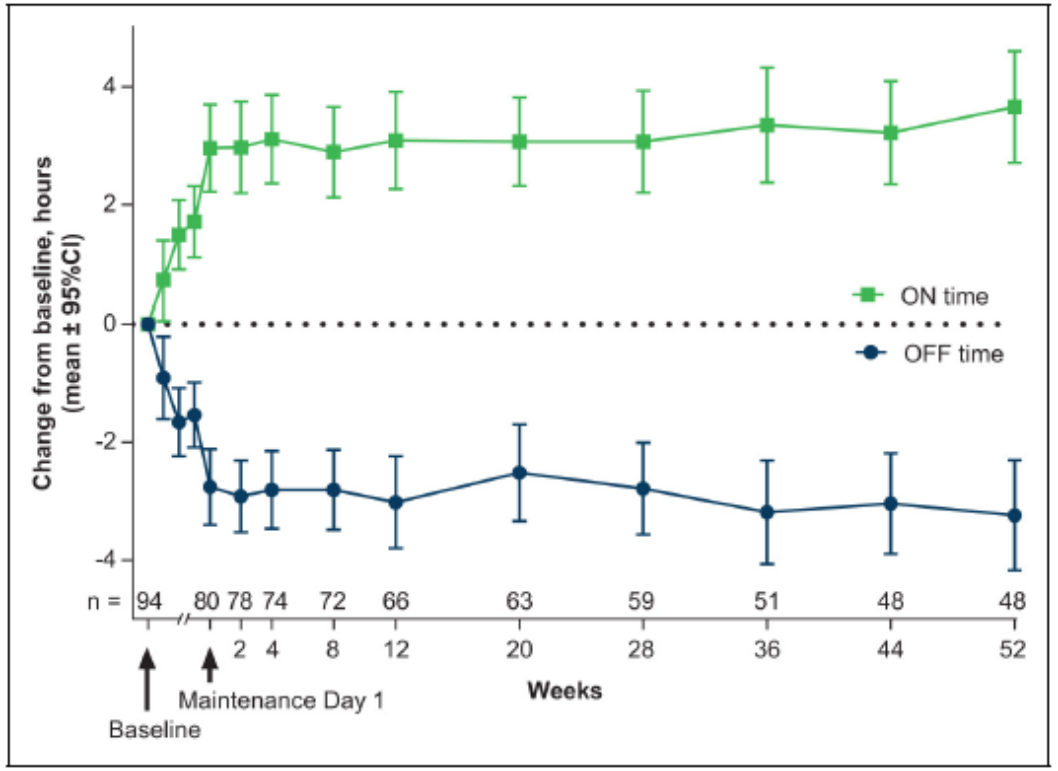
Journal of Parkinson's Disease
1–13

DOI: 10.1177/1877718X241310727
journals.sagepub.com/home/pkn
Sage | IOS Press

InfusON: A US-based post-hoc analysis of open-label, long-term outpatient use of apomorphine infusion

- Phase III study: confirmed long-term (1 year) safety profile and tolerability[1]
- **Aligned with the results of the TOLEDO study[2,3]**

Mean changes from baseline in daily OFF time (blue) and daily ON time without troublesome dyskinesia (green)



1. Isaacson SH, et al. J Parkinsons Dis. 2025;15(2):361-373.
2. Katzenschlager R, et al. Lancet Neurol. 2018;17(9):749-59.
3. Katzenschlager R, et al. Parkinsonism Relat Disord. 2021;83:79-85.

Journal of Parkinson's Disease 1 (2011) 197–203
DOI 10.3233/JPD-2011-11037
IOS Press

Chronic Subcutaneous Infusion Therapy with Apomorphine in Advanced Parkinson's Disease Compared to Conventional Therapy: A Real Life Study of Non Motor Effect

Pablo Martinez-Martin[a], Prashanth Reddy[f], Angelo Antonini[b], Tove Henriksen[c], Regina Katzenschlager[d], Per Odin[e], Antonia Todorova[f], Yogini Naidu[g], Susanne Tluk[g], Chandni Chandiramani[f], Anne Martin[f] and Kallol Ray Chaudhuri[f,g,*]

Changes following apomorphine infusion in motor and QOL indices

	Control			Apomorphine		
	Baseline (SD)	Follow-Up (SD)	p	Baseline (SD)	Follow-Up (SD)	p
UPDRS–Motor Examination	20.06 (9.68)	19.35 (12.80)	0.69	36.94 (11.42)	15.35 (8.21)	0.0003
UPDRS–Complications	7.93 (5.43)	7.00 (4.46)	0.48	10.00 (6.43)	3.53 (3.52)	0.0003
PDQ-8	35.84 (23.10)	44.85 (17.57) ↓	0.02	55.70 (19.80)	32.35 (21.54) ↑	0.001

PDQ, Parkinson's Disease Questionnaire; QOL, quality of life;
SD, standard deviation; UPDRS, Unified Parkinson's disease Rating Scale

Table 1
Changes following Apomorphine infusion and continuing conventional therapy (comparator) in motor, non-motor, and quality of life dimensions

	Control			Apomorphine		
	Baseline	Follow-up	*p*	Baseline	Follow-up	*p*
UPDRS-Motor exam	20.06 (9.68)	19.35 (12.80)	0.69	36.94 (11.42)	15.35 (8.21)	0.0003
UPDRS-Complications	7.93 (5.43)	7.00 (4.46)	0.48	10.00 (6.43)	3.53 (3.52)	0.0003
NMSS-Cardiovascular	1.29 (2.97)	1.18 (2.90)	0.45	4.65 (5.63)	2.76 (3.51)	0.03
Sleep	12.29 (9.58)	12.06 (9.32)	0.90	22.06 (11.47)	10.71 (9.63)	0.0003
Mood/apathy	8.35 (10.33)	8.06 (8.78)	0.79	22.76 (19.85)	11.29 (13.04)	0.0005
Perceptual	2.23 (5.03)	2.59 (6.26)	0.90	4.59 (6.92)	1.88 (3.35)	0.04
Attention	6.00 (8.40)	7.18 (7.76)	0.16	12.82 (9.62)	8.71 (7.75)	0.006
Gastrointestinal	5.94 (5.97)	7.12 (6.49)	0.24	7.35 (7.35)	4.41 (5.11)	0.002
Urinary	4.29 (3.57)	6.23 (4.26)	0.06	10.70 (8.93)	5.71 (6.72)	0.001
Sexual	3.12 (6.58)	3.29 (6.12)	0.97	2.53 (5.96)	2.00 (3.94)	0.42
Miscellany	4.12 (5.67)	4.29 (5.55)	0.61	18.47 (14.54)	9.47 (9.70)	0.0003
NMSS-Total score	47.65 (43.40)	52.00 (37.65)	0.22	105.94 (65.43)	56.94 (45.39)	0.0003
PDQ-8	35.84 (23.10)	44.85 (17.57)	0.02	55.70 (19.80)	32.35 (21.54)	0.001

Benjamini-Hochberg correction: $p < 0.027$; UPDRS: Unified Parkinson's Disease Rating Scale; NMSS: Non-Motor Symptoms Scale; PDQ-8: Parkinson's Disease Questionnaire-8 items.

Martinez-Martin P, Reddy P, Antonini A, Henriksen T, Katzenschlager R, Odin P, Todorova A, Naidu Y, Tluk S, Chandiramani C, Martin A, Chaudhuri KR. (2011) J Parkinsons Dis, 197-203.

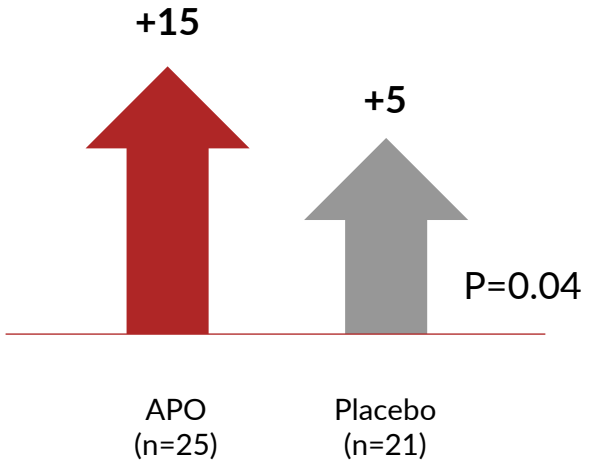
APOMORPHEE: night-time only apomorphine study

APOMORPHEE is the first randomised, double-blind, placebo-controlled trial to assess safety, tolerability and efficacy of a night-time only apomorphine infusion

- 46 patients (advanced PD and moderate-severe insomnia)enrolled
- Sleep disturbances were improved according to difference in PDSS
- Acceptable safety profile
- Positive effects observed on motor symptoms on morning awakening

subcutaneous night-time only apomorphine infusion might be useful to manage sleep disturbances in patients with advanced Parkinson's disease and moderate to severe insomnia

Mean change in PDSS score (N=46)



Cochen de Cock V, et al. Lancet Neurol. 2022;21:428-37.

APO, apomorphine; PDSS, Parkinson's disease sleep scale.

SAFETY PROFILE

OLP safety set (n=84)	n (%)
Patients with at least one AE	83 (98.8)
AEs related to the study medication	77 (91.7)
Serious treatment-related AEs	8 (9.5)
AEs leading to study discontinuation:	14 (16.7)
• Infusion site reactions	4 (4.8)
• Fatigue	2 (2.4)
• Autoimmune haemolytic anaemia	1 (1.2)
• Delirium	1 (1.2)
• Dementia	1 (1.2)
• Disturbance in attention	1 (1.2)
• Lymphoma	1 (1.2)
• Nausea	1 (1.2)
• Panic attack	1 (1.2)
• Somnolence	1 (1.2)

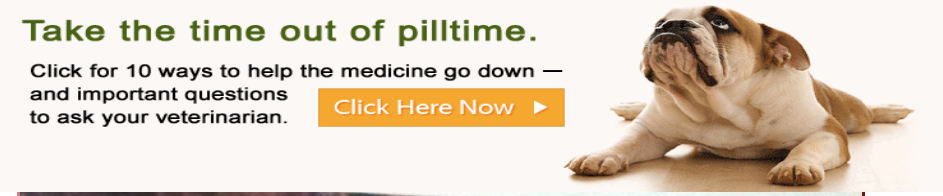
OLP safety set (n=84)	n (%)
AEs with a local intolerability (skin changes at injection site)	60 (71.4)
Most common AEs (≥10% frequency)	
• Infusion site nodules	46 (54.8)
• Nausea	19 (22.6)
• Somnolence	19 (22.6)
• Dyskinesia	14 (16.7)
• Fall	14 (16.7)
• Insomnia	13 (15.5)
• Constipation	12 (14.3)
• Dizziness	11 (13.1)
• Infusion site erythema	11 (13.1)
• Headache	9 (10.7)

- **Safety profile of APO was consistent with extensive clinical experience**
- **Common treatment-related adverse events:**
  - Mild or moderate infusion site nodules
  - Somnolence
  - Nausea

Katzenschlager R, et al. Parkinsonism Relat Disord. 2021;83:79-85.

AE, adverse event; DBP, double-blind phase; OLP, open-label phase

Apomorphine is the emetic of choice in dogs



Preferably use Domperidone 10mg TID

The Parkinson's Disease Educational Course for Industry Professionals

Honolulu, Hawaii, USA | October 4, 2025

International Parkinson and Movement Disorder Society

Review › Expert Opin Drug Deliv. 2025 Aug 1:1-18. doi: 10.1080/17425247.2025.2539962.
Online ahead of print.

Navigating the therapeutic landscape in advanced Parkinson's disease: a comprehensive review from infusion therapies to stem cells

Carmelo Fogliano [1], Leonardo Rigon [1 2], K Ray Chaudhuri [3 4], Karolina Popławska-Domaszewicz [3 5], Cristian Falup-Pecurariu [6 7], Iulia Murasan [7], Andrea Guerra [1], Michela Garon [1], Per Odin [8 9], Nobutaka Hattori [10], Angelo Antonini [1 2]

DAT selection

Individualized approach based on patient's characteristics and preferences

Patient's characteristics	DBS	SCLI	CSAI	LCIG	LECIG
Younger age (<65 years)	+ +	+	+	-	-
Dementia	- -	-	- -	=	=
MCI	-	+	=	+ +	+ +
Psychosis/hallucination	- -	-	- -	+	+
High-dose levodopa requirement	+ +	=	-	+ +	+ +
ICDs	+ +	+	+	+ +	+ +
DDS and Punding	+ +	-	-	+ +	+ +
Limited caregiving	=	-	-	=	=
Sleep disturbances	+	+ +	+ +	+	+
Apathy	=	+	+	=	=
Levodopa-resistant tremor	+ +	-	-	-	-
Entacapone intolerance	+ +	+ +	+ +	+ +	- -
Severe orthostatic hypotension	+ +	+	-	+	+
Daytime sleepiness	+ +	+	-	+	+
Levodopa-resistant dysphagia	=	=	=	+ +	+ +
Morning akinesia	+ +	+ +	+	+	+
Carry-on device intolerant	+ +	=	=	-	=
Genetic data	Based on mutation-specific clinical phenotype				

COLOR LEGENDA	
- -	avoid
-	should avoid
=	consider offering
+	should offer
+ +	offer
Bold	core assessments

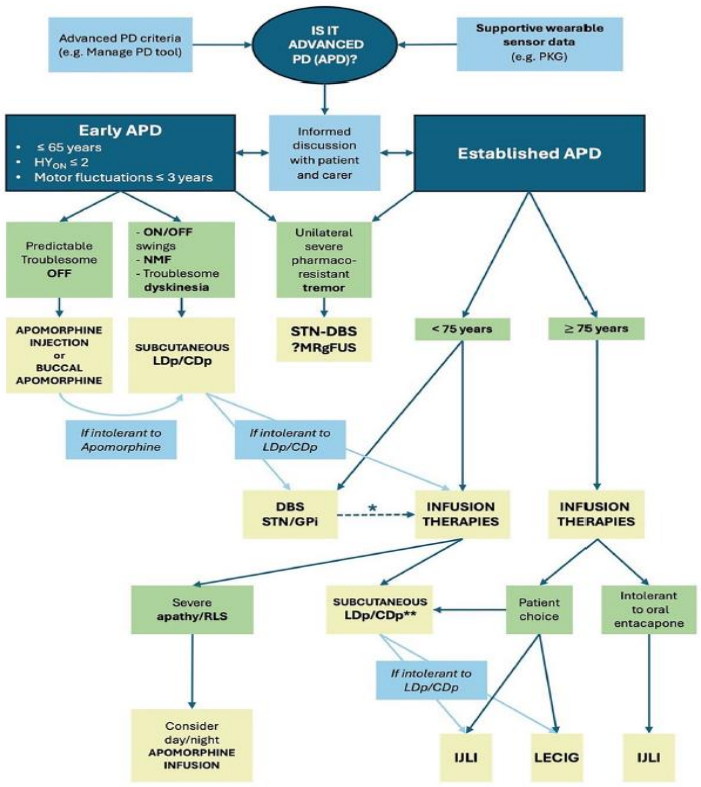
ABBREVIATIONS	
DBS	deep brain stimulation
SCLI	subcutaneous continuous levodopa infusion
CSAI	continuous subcutaneous apomorphine infusion
LCIG	levodopa carbidopa intestinal gel
LECIG	levodopa entacapone carbidopa intestinal gel
ICDs	impulse control behavior disorders
DDS	dopamine dysregulation syndrome
MCI	mild cognitive impairment

Neurol Ther
https://doi.org/10.1007/s40120-024-00635-4

REVIEW

Subcutaneous Levodopa: A New Engine for the Vintage Molecule

Karolina Poplawska-Domaszewicz · Lucia Batzu · Cristian Falup-Pecurariu · K. Ray Chaudhuri



* To be considered as subsequent step, if needed.
** Home nursing option to consider for elderly patients.

Fig. 3 Potential algorithm for clinical use of available advanced therapies treatment options. *PD* Parkinson's disease, *APD* advanced PD, *PKG* Personal KinetiGraph, *HY* Hohen & Yahr, *NMF* non-motor fluctuations, *MRgFUS* MRI-guided focused ultrasound, *DBS* deep brain stimulation, *STN* subthalamic nucleus, *GPi* globus pallidus internus, *RLS* restless legs syndrome, *IJLI* intrajejunal levodopa infusion, *LECIG* levodopa–entacapone–carbidopa intestinal gel, *?* indicates possible consideration of the technique if locally available

DAT combinations & switches

Before- APO

1 mont after DBS+APO

3 months after DBS+APO

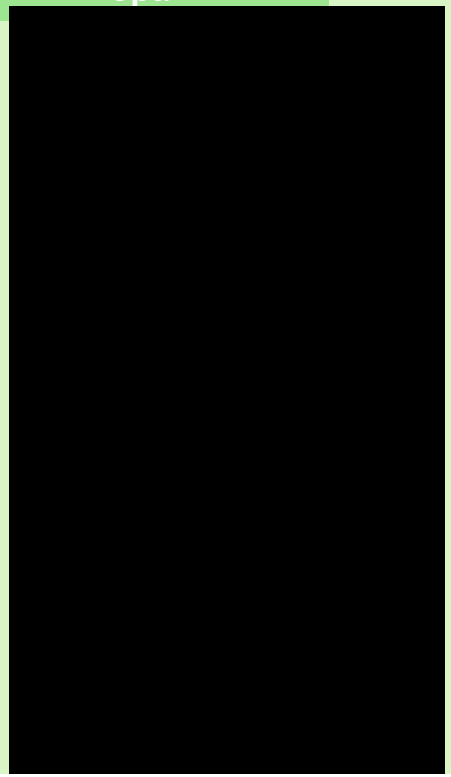
International Parkinson and Movement Disorder Society

Case study : Apomorphine → Foslevodopa/Foscarbidopa

Age: 65 years
PD-2009
2019-2024- CSAI
2025- fosldopa/foskarbiodopa

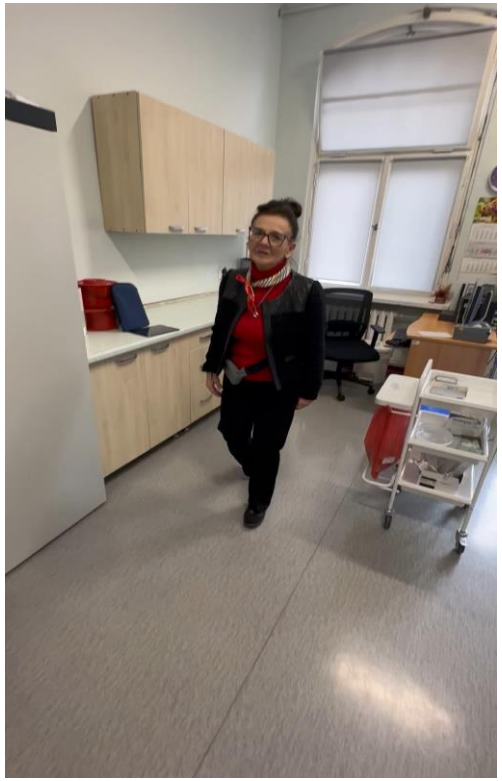
Progress

Before



Titration process

After 3 months



After 1 year

The patient provided consent for the use of these videos within this presentation.

The Parkinson's Disease Educational Course for Industry Professionals

Honolulu, Hawaii, USA | October 4, 2025

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Thank you for your attention

PARKINSON'S DISEASE NON-MOTOR GROUP

Parkinson's Foundation CENTER OF EXCELLENCE

KING'S College LONDON University of London

EUROPAR

Uniwersytecki Szpital Kliniczny w Poznaniu