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Parkinson's Disease: The Effect of Treatment on Depression

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Parkinson's Disease (PD) is a degenerative disorder thought to be caused by a decrease in dopamine that affects motor function and is becoming increasingly more common around the world. PD patients often suffer from quality of life issues such as falls and dementia, as well as depression (Lang & Lozano, 1998). Depression in patients with PD is estimated to be as high as 40% (Brown & Jahanshahi, 1995; Cummings & Masterman, 1999). Previous researchers (Mindham, Marsden, & Parkes, 1976; Patten & Love, 1993) have identified medication as a possible influence on the high rate of depression, but none were able to conclusively determine that it affects depression. In this study, I propose to compare scores on the Hamilton Rating Scale for Depression shortly after diagnosis and a year after diagnosed for three groups: patients using Levodopa (a common PD medication), patients who have received Deep Brain Stimulation (a surgery performed to stimulate dopamine release), and patients who participate in dance therapy. This comparison allows us to begin to tease apart whether treatment can affect depression, or if depression is a symptom that comes with PD.

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Parkinson's Disease (PD) is a gradually disabling neurodegenerative disorder that is manifested clinically by bradykinesia, tremor, rigidity, flexed posture, postural instability, and freezing of gait (The Parkinson Study Group, 2004). PD affects approximately to 1.5 million people in the U.S. (Olanow & Schapira, 2012) and 4 million people in the world (Massano & Garrett, 2012) and is fairly evenly divided between male and female patients (Simon, Greenberg & Aminoff, 2009). No treatment is currently available to stop the progression of PD; all medications are primarily for symptomatic relief. PD is characterized pathologically by the loss of dopamine-producing neurons in the substantia nigra (Riederer & Wuketich, 1976). Neurodegeneration during PD occurs in the nigrostriatal dopaminergic neurons, the ventral tegmental area projecting into the nucleus accumbens, amygdala, Parkinson's hippocampus, orbitofrontal, anterior cingulate and prefrontal cortices (the mesocortical dopaminergic

pathways) (Javoy-Agid & Agid, 1980; Ouchi, Yoshikawa, Okada, Futatsubashi, Sekine, Iyo & Sakamoto, 1999). The dying neurons in the substantia nigra produce dopamine, which sends messages to the part of the brain that controls movement and coordination. As PD progresses, the amount of dopamine produced decreases which leaves a person unable to control movement normally (Parkinson's Disease Foundation, 2013). Non-motor features of Parkinson's disease occur both early and later in the disease and include autonomic and cognitive disturbances (Sellback & Sillburn, 2012), sleep disorders, fatigue, hallucinations and depression (Chaudhuri & Quinn, 2006). The etiology of PD is mostly unknown but it is widely thought that toxic environmental factors and genetic predisposition are factors in developing the disease.

The U.S. Food and Drug Administration has approved several drugs for the treatment of PD (Rao, Hofmann & Shakil, 2006). Table 1 describes the type of medications, the recommended use, and comments concerning these medications.

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Table 1. FDA-Approved medications for PD (Rao, Hofmann & Shakil, 2006).

Medication	Uses and Comments
Anticholinergics Benztropine (Cogentin), trihexyphenidyl (Artane)	Useful for symptomatic control of Parkinson's disease, benefits are mild to moderate; associated with more adverse effects than other drugs.
Carbidopa/levodopa Immediate- and sustained release carbidopa/ levodopa (Sinemet)	Levodopa is the most effective medication and remains the primary treatment for symptomatic Parkinson's disease; no added benefit for motor complications with sustained-release versus immediate-release preparations.
COMT inhibitors Entacapone (Comtan) Tolcapone (Tasmar)	Useful for managing motor fluctuations ("wearing-off" effect) in patients taking levodopa; levodopa dose may need to be reduced if dyskinesia appears.
Dopamine agonists Bromocriptine (Parlodel) Pergolide (Permax) Pramipexole (Mirapex), Ropinirole (Requip)	Useful for early and advanced disease. Useful for the initial treatment of parkinsonism and as adjunct therapy in patients taking levodopa. Useful for early disease and in patients with Parkinson's disease and motor fluctuations.
MAO-B inhibitors Selegiline (Eldepryl) (Azilect)	Useful for symptomatic control of Parkinson's disease (benefits are mild to moderate) and as adjuvant therapy for patients with Parkinson's disease and motor fluctuations
NMDA receptor inhibitor Amantadine (Symmetrel)	Useful for treating akinesia, rigidity, tremor and dyskinesia.

Non-oral pharmaceutical therapies for PD included apomorphine, an injection of medication, and intestinal levodopa infusion, a gel that is pumped into the abdomen and is good for advanced Parkinson's (Sellbach & Silburn, 2012). Two types of neurosurgical operations are available for PD when standard drug therapy fails to effectively manage symptoms. Lesional surgery permanently ablates a specific region of the brain to

achieve either tremor control or lessen dyskinesia. The second option is deep brain stimulation surgery (DBS) (Sellbach & Silburn, 2012). DBS targets 1 of 2 areas of the brain, the subthalamic nucleus (STN) or the globus pallidus interna (GPI). DBS's safety and benefits have been well established through controlled trials and large clinical series (Krack et al., 2003; Deuschl et al., 2006; Kleiner-Fisman et al., 2006; Weaver et al., 2009; Follett et al., 2010; Moro et al., 2010; Smeding et al., 2011). Some alternative treatments used by patients with PD include Vitamin E, Riluzole and Coenzyme Q10, Vitamin C, folic acid and acupuncture; further research is needed to see if any of these are effective (Suchowersky, Gronseth, Perlmutter, Reich, Zesiewicz & Weiner, 2006). Non-pharmacological treatments include counseling, education, and maintaining good fitness (specifically core and balance fitness) (Sellbach & Silburn, 2012), and manual therapies including chiropractic, massage, osteopathic, and Trager therapy (Suchowersky et al., 2006). Physiotherapy can improve motor function and start hesitancy, freezing of gait, festination and falls, as well as voice quality (Sellbach & Silburn, 2012).

PD, especially in advanced stages, is often complicated by quality of life issues, such as treatment-related complications, falls, depression, and dementia (Lang & Lozano, 1998). The frequency of depression in Parkinson's disease is estimated to be around 40% (Brown & Jahanshahi, 1995; Cummings & Masterman, 1999) which is roughly twice that seen in other equivalently disabled patients without PD (Rodin & Voshart, 1986). 11 out of 42 patients with PD met the DSM criteria for a comorbid depressive disorder (Menza, 1993). Symptoms of depression in patients with PD are associated with reduced quality of life and increased disability (Schrag, Jahanshahi & Quinn, 2000). Some research suggests that depression in PD is associated with a loss of dopamine and noradrenaline innervation of cortical and subcortical components of the limbic system (Remy, Doder, Lees, Turjanski, & Brooks, 2005). Patients with PD and depression can be hard to treat due to drug interactions with the PD medication and how medications interact with PD itself. The three main complications concerning the comorbidity of depression and PD are: Can antidepressants increase Parkinson's symptoms? How safe are depression medications to use on patients with PD? What are the drug interactions between antidepressants and PD medications?

A possible association between levodopa and depression was originally suggested by case reports and the clinical observations of early clinical trials. One complication in the analysis of these observations is the fact that Parkinson's disease itself may cause depression. Depressive symptoms complicating Parkinson's disease have been related to the severity of the illness (Gotham, Brown, & Marsden, 1986; Mayeux, Stern, Rosen, & Leventhal, 1981) and to the severity of cognitive impairment (Mayeux, Stern, Rosen, & Leventhal, 1981; Starkstein, Preziosi, Bolduc, & Robinson, 1990), meaning

that the greater the severity of the illness and cognitive impairment, the more depression a patient may experience. One prospective study performed by Mindham, Marsden & Parkes (1976) found more depressive disorders in a group of patients treated with levodopa versus anticholinergic and/or amantidine. However, due to lack of evidence and no random assignment, they could not conclude that levodopa is a cause of depression (Patten & Love, 1993). Further research needs to be conducted to fully understand the relationship between PD and depression, and how to effectively treat depression in patients with PD.

The current study poses two questions that need to be further researched: 1) Is depression more or less common in patients with PD who use levodopa, DBS, or dance therapy? and 2) is depression a symptom that comes with PD that is not associated with any particular PD medication? This study hypothesizes that depression rates will be higher for patients who use Levodopa as treatment for their PD. The answers to these questions will help develop the most effective treatment for depression in patients with PD.

PROPOSED METHOD

Participants

Patients who have been recently diagnosed with PD (within the last six months) will be recruited, through their doctors office, for this study (N=300).

Procedure

All participants will be tested using the Hamilton Rating Scale for Depression (see Appendix A), a seventeen question interview performed by a trained clinician, upon recruitment. One year later, all participants will be retested using the same depression scale. Patients will be divided into groups based on the type of treatment they have been receiving since diagnosis. The first group (N=100) will consist of patients who had been using Levodopa as a treatment for PD, the second group (N=100) will have received DBS surgery in the last six months and are currently using the apparatus, and the third group (N=100) will be participating in dance therapy twice a week, and no other treatments are used. All participants were given the Unified Parkinson's Disease Rating Scale (UPDRS) (see Appendix B) at the time of retest to determine the severity of their illness. The three groups will then be compared based on their UPDRS scores and for their levels of depression.

CONCLUSION

Limitations

The main limitation of this study is that it is merely a correlational study and it cannot be concluded

with certainty that any particular treatment can cause a higher rate of depression in patients. In addition no random assignment will be used when placing patients into treatment groups, they are grouped based on their own treatment decisions. We also only focus on patients who have been recently diagnosed with PD, and generally the severity of the illness and cognitive impairment, as well as depression, increase as the severity of PD increases.

Significance

PD is an increasingly growing illness that can affect the patient's daily living and be very debilitating. If the results suggest that a certain treatment or medication used for PD is associated with higher rate of depression in patients, not using that treatment might improve the quality of life for those with PD greatly. If depression is not found to be linked to treatment, it may be a symptom of PD. If depression is a side effect of medication, better methods to treat PD may need to be developed that don't effect depression, as current pharmaceutical methods don't account for drug interactions with PD medication.

APPENDIX A

To rate the severity of depression in patients who are already diagnosed as depressed, administer this questionnaire. The higher the score, the more severe the depression.

1. Depressed Mood

0 = Absent.

1 = These feeling states indicated only on questioning.

2 = These feeling states spontaneously reported verbally.

3 = Communicates feeling states non-verbally

- i.e., through facial expression, posture, voice, and tendency to weep.

4 = Patient reports virtually only these feeling states in his spontaneous verbal and non-verbal communication.

2. Work and Activities

0 = No difficulty.

1 = Thoughts and feelings of incapacity, fatigue or weakness related to activities; work or hobbies.

2 = Loss of interest in activities; hobbies or work - either directly reported by patient, or indirect in listlessness, indecision and vacillation (feels he has to push self to work or activities).

3 = Decrease in actual time spent in activities or decrease in productivity. In hospital rate 3 if patient does not spend at least three hours a day in activities (hospital job or hobbies) exclusive of ward chores.

4 = Stopped working because of present illness. In hospital, rate 4 if patient engages in no activities except ward chores, or if patient fails to perform ward chores unassisted.

3. Social Withdrawal

0 = Interacts with other people as usual.

1 = Less interested in socializing with others but continues to do so.

2 = Interacting less with other people in social (optional) situations.

3 = Interacting less with other people in work or family situations (i.e. where this is necessary).

4 = Marked withdrawal from others in family or work situations.

4. Genital Symptoms

0 = Absent.

1 = Mild.
2 = Severe.

5. Somatic Symptoms - GI

0 = None.
1 = Loss of appetite but eating without staff encouragement. Heavy feelings in abdomen.
2 = Difficulty eating without staff urging. Requests or requires laxatives or medication for bowels or medication for G.I. symptoms.

6. Loss of Weight

0 = No weight loss.
1 = Probable weight loss associated with present illness.
2 = Definite (according to patient) weight loss.

7. Weight Gain

0 = No weight gain.
1 = Probable weight gain due to current depression.
2 = Definite (according to patient) weight gain due to depression.

8. Appetite Increase

0 = No increase in appetite.
1 = Wants to eat a little more than usual.
2 = Wants to eat somewhat more than normal.
3 = Wants to eat much more than usual.

9. Increased Eating

0 = Is not eating more than usual.
1 = Is eating a little more than usual.
2 = Is eating somewhat more than usual.
3 = Is eating much more than normal.

10. Carbohydrate Craving

0 = No change in food preference or consumption.
1 = Craving or eating more carbohydrates (starches or sugars) than before.
2 = Craving or eating much more carbohydrates than before.
3 = Irresistible craving or eating of sweets or starches.

11. Insomnia - Early

0 = No difficulty falling asleep.
1 = Complains or occasional difficulty falling asleep - i.e., more than 1/2 hour.
2 = Complains of nightly difficulty falling asleep.

12. Insomnia - Middle

0 = No difficulty.
1 = Patient complains of being restless and disturbed during the night.
2 = Waking during the night - any getting out of bed rates 2 (except for purposes of voiding).

13. Insomnia - late

0 = No difficulty.
1 = Waking in early hours of the morning but goes back to sleep.
2 = Unable to fall asleep again if he gets out of bed.

14. Hypersomnia

0 = No increase in sleep length.
1 = At least 1 hour increase in sleep length.
2 = 2+ hour increase.
3 = 3+ hour increase.
4 = 4+ hour increase.
2

15. Somatic Symptoms - General

0 = None.

1 = Heaviness in limbs, back or head. Backaches, headache, muscle aches. Loss of energy and fatigability.
2 = Any clear-cut symptom rates 2.

16. Fatigability

0 = Does not feel more fatigued than usual.
1 = Feels more fatigued than usual but this has not impaired function significantly; less frequent than in (2).
2 = More fatigued than usual; at least one hour a day; at least three days a week.
3 = Fatigued much of the time most days.
4 = Fatigued almost all the time.

17. Feelings of Guilt

0 = Absent.
1 = Self reproach, feels he has let people down.
2 = Ideas of guilt or rumination over past errors or sinful deeds.
3 = Present illness is a punishment. Delusions of guilt.
4 = Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations.

18. Suicide

0 = Absent.
1 = Feels life is not worth living.
2 = Wishes he were dead or any thoughts of possible death to self.
3 = Suicide ideas or gestures.
4 = Attempts at suicide (any serious attempt rates 4).

19. Anxiety - Psychic

0 = No difficulty.
1 = Subjective tension and irritability.
2 = Worrying about minor matters.
3 = Apprehensive attitude apparent in face or speech.
4 = Fears expressed without questioning.

20. Anxiety - Somatic

0 = Absent.
1 = Mild.
2 = Moderate.
3 = Severe.
4 = Incapacitating.

21. Hypochondriasis

0 = Not present
1 = Self-absorption (bodily).
2 = Preoccupation with health.
3 = Frequent complaints, requests for help, etc.
4 = Hypochondriacal delusions.

22. Insight

0 = Acknowledges being depressed and ill.
1 = Acknowledges illness but attributes cause to bad food, climate, over work, virus, need for rest, etc.
2 = Denies being ill at all.

23. Motor Retardation

0 = Normal speech and thought.
1 = Slight retardation at interview.
2 = Obvious retardation at interview.
3 = Interview difficult.
4 = Complete stupor.

24. Agitation

0 = None.
1 = Fidgetiness.
2 = Playing with hands, hair, etc.

3 = Moving about can't sit still.
4 = Hand wringing, nail biting, hair pulling, biting of lips.

(HDR maximum score = 15)

0 - 4 normal, depending on age, education, complaints
5 - 8 mild
8 - 11 moderate
12 - 15 severe

1 = Periods of sadness or guilt greater than normal, never sustained for days or weeks.

2 = Sustained depression (1 week or more).

3 = Sustained depression with vegetative symptoms (insomnia, anorexia, weight loss, loss of interest).

4 = Sustained depression with vegetative symptoms and suicidal thoughts or intent.

4. Motivation/Initiative

0 = Normal.

1 = Less assertive than usual; more passive.

2 = Loss of initiative or disinterest in elective (nonroutine) activities.

3 = Loss of initiative or disinterest in day to day (routine) activities.

4 = Withdrawn, complete loss of motivation.

APPENDIX B

UNIFIED PARKINSON'S DISEASE RATING SCALE (UPDRS)

I. MENTATION, BEHAVIOR AND MOOD

1. Intellectual Impairment

0 = None.

1 = Mild. Consistent forgetfulness with partial recollection of events and no other difficulties.

2 = Moderate memory loss, with disorientation and moderate difficulty handling complex problems.

Mild but definite impairment of function at home with need of occasional prompting.

3 = Severe memory loss with disorientation for time and often to place.

Severe impairment in handling problems.

4 = Severe memory loss with orientation preserved to person only. Unable to make judgements

or solve problems. Requires much help with personal care. Cannot be left alone at all.

2. Thought Disorder (Due to dementia or drug intoxication)

0 = None.

1 = Vivid dreaming.

2 = "Benign" hallucinations with insight retained.

3 = Occasional to frequent hallucinations or delusions; without insight;

could interfere with daily activities.

4 = Persistent hallucinations, delusions, or florid psychosis. Not able to care for self.

3. Depression

0 = None.

II. ACTIVITIES OF DAILY LIVING (for both "on" and "off")

5. Speech

0 = Normal.

1 = Mildly affected. No difficulty being understood.

2 = Moderately affected. Sometimes asked to repeat statements.

3 = Severely affected. Frequently asked to repeat statements.

4 = Unintelligible most of the time.

6. Salivation

0 = Normal.

1 = Slight but definite excess of saliva in mouth; may have nighttime drooling.

2 = Moderately excessive saliva; may have minimal drooling.

3 = Marked excess of saliva with some drooling.

4 = Marked drooling, requires constant tissue or handkerchief.

7. Swallowing

0 = Normal.

1 = Rare choking.

2 = Occasional choking.

3 = Requires soft food.

4 = Requires NG tube or gastrostomy feeding.8. Handwriting

0 = Normal.

1 = Slightly slow or small.

2 = Moderately slow or small; all words are legible.

3 = Severely affected; not all words are legible.

4 = The majority of words are not legible.

9. Cutting food and handling utensils

0 = Normal.

1 = Somewhat slow and clumsy, but no help needed.

2 = Can cut most foods, although clumsy and slow; some help needed.

3 = Food must be cut by someone, but can still feed slowly.

4 = Needs to be fed.

10. Dressing

0 = Normal.

1 = Somewhat slow, but no help needed.

2 = Occasional assistance with buttoning, getting arms in sleeves.

3 = Considerable help required, but can do some things alone.

4 = Helpless.

11. Hygiene

0 = Normal.

1 = Somewhat slow, but no help needed.

2 = Needs help to shower or bathe; or very slow in hygienic care.

3 = Requires assistance for washing, brushing teeth, combing hair, going to bathroom.

4 = Foley catheter or other mechanical aids.

12. Turning in bed and adjusting bed clothes

0 = Normal.

1 = Somewhat slow and clumsy, but no help needed.

2 = Can turn alone or adjust sheets, but with great difficulty.

3 = Can initiate, but not turn or adjust sheets alone.

4 = Helpless.

13. Falling (unrelated to freezing)

0 = None.

1 = Rare falling.

2 = Occasionally falls, less than once per day.

3 = Falls an average of once daily.

4 = Falls more than once daily.

14. Freezing when walking

0 = None.

1 = Rare freezing when walking; may have start hesitation.

2 = Occasional freezing when walking.

3 = Frequent freezing. Occasionally falls from freezing.

4 = Frequent falls from freezing.

15. Walking

0 = Normal.

1 = Mild difficulty. May not swing arms or may tend to drag leg.

2 = Moderate difficulty, but requires little or no assistance.

3 = Severe disturbance of walking, requiring assistance.

4 = Cannot walk at all, even with assistance.

16. Tremor (Symptomatic complaint of tremor in any part of body.)

0 = Absent.

1 = Slight and infrequently present.

2 = Moderate; bothersome to patient.

3 = Severe; interferes with many activities.

4 = Marked; interferes with most activities.17. Sensory complaints related to parkinsonism

0 = None.

- 1 = Occasionally has numbness, tingling, or mild aching.
- 2 = Frequently has numbness, tingling, or aching; not distressing.
- 3 = Frequent painful sensations.
- 4 = Excruciating pain.

III. MOTOR EXAMINATION

18. Speech

- 0 = Normal.
- 1 = Slight loss of expression, diction and/or volume.
- 2 = Monotone, slurred but understandable; moderately impaired.
- 3 = Marked impairment, difficult to understand.
- 4 = Unintelligible.

19. Facial Expression

- 0 = Normal.
- 1 = Minimal hypomimia, could be normal "Poker Face".
- 2 = Slight but definitely abnormal diminution of facial expression.
- 3 = Moderate hypomimia; lips parted some of the time.
- 4 = Masked or fixed facies with severe or complete loss of facial expression;

lips parted 1/4 inch or more.

20. Tremor at rest (head, upper and lower extremities)

- 0 = Absent.
- 1 = Slight and infrequently present.
- 2 = Mild in amplitude and persistent. Or moderate in amplitude, but only intermittently present.
- 3 = Moderate in amplitude and present most of the time.
- 4 = Marked in amplitude and present most of the time.

21. Action or Postural Tremor of hands

- 0 = Absent.
- 1 = Slight; present with action.
- 2 = Moderate in amplitude, present with action.

- 3 = Moderate in amplitude with posture holding as well as action.
- 4 = Marked in amplitude; interferes with feeding.
- 22. Rigidity (Judged on passive movement of major joints with patient relaxed in sitting position.

Cogwheeling to be ignored.)

- 0 = Absent.
- 1 = Slight or detectable only when activated by mirror or other movements.
- 2 = Mild to moderate.
- 3 = Marked, but full range of motion easily achieved.
- 4 = Severe, range of motion achieved with difficulty.

23. Finger Taps (Patient taps thumb with index finger in rapid succession.)

- 0 = Normal.
- 1 = Mild slowing and/or reduction in amplitude.
- 2 = Moderately impaired. Definite and early fatiguing. May have occasional arrests in movement.
- 3 = Severely impaired. Frequent hesitation in initiating movements or arrests in ongoing movement.
- 4 = Can barely perform the task.

24. Hand Movements (Patient opens and closes hands in rapid succession.)

- 0 = Normal.
- 1 = Mild slowing and/or reduction in amplitude.
- 2 = Moderately impaired. Definite and early fatiguing. May have occasional arrests in movement.
- 3 = Severely impaired. Frequent hesitation in initiating movements or arrests in ongoing movement.

4 = Can barely perform the task. 25. Rapid Alternating Movements of Hands (Pronation-supination movements of hands, vertically and

horizontally, with as large an amplitude as possible, both hands simultaneously.)

- 0 = Normal.
- 1 = Mild slowing and/or reduction in amplitude.

2 = Moderately impaired. Definite and early fatiguing. May have occasional arrests in movement.

3 = Severely impaired. Frequent hesitation in initiating movements or arrests in ongoing movement.

4 = Can barely perform the task.

26. Leg Agility (Patient taps heel on the ground in rapid succession picking up entire leg. Amplitude

should be at least 3 inches.)

0 = Normal.

1 = Mild slowing and/or reduction in amplitude.

2 = Moderately impaired. Definite and early fatiguing. May have occasional arrests in movement.

3 = Severely impaired. Frequent hesitation in initiating movements or arrests in ongoing movement.

4 = Can barely perform the task.

27. Arising from Chair

(Patient attempts to rise from a straightbacked chair, with arms folded across chest.)

0 = Normal.

1 = Slow; or may need more than one attempt.

2 = Pushes self up from arms of seat.

3 = Tends to fall back and may have to try more than one time, but can get up without help.

4 = Unable to arise without help.

28. Posture

0 = Normal erect.

1 = Not quite erect, slightly stooped posture; could be normal for older person.

2 = Moderately stooped posture, definitely abnormal; can be slightly leaning to one side.

3 = Severely stooped posture with kyphosis; can be moderately leaning to one side.

4 = Marked flexion with extreme abnormality of posture.

29. Gait

0 = Normal.

1 = Walks slowly, may shuffle with short steps, but no festination (hastening steps) or propulsion.

2 = Walks with difficulty, but requires little or no assistance; may have some festination, short steps,

or propulsion.

3 = Severe disturbance of gait, requiring assistance.

4 = Cannot walk at all, even with assistance.

30. Postural Stability (Response to sudden, strong posterior displacement produced by pull on shoulders

while patient erect with eyes open and feet slightly apart. Patient is prepared.)

0 = Normal.

1 = Retropulsion, but recovers unaided.

2 = Absence of postural response; would fall if not caught by examiner.

3 = Very unstable, tends to lose balance spontaneously.

4 = Unable to stand without assistance.

31. Body Bradykinesia and Hypokinesia (Combining slowness, hesitancy, decreased armswing, small

amplitude, and poverty of movement in general.)

0 = None.

1 = Minimal slowness, giving movement a deliberate character; could be normal for some persons.

Possibly reduced amplitude.

2 = Mild degree of slowness and poverty of movement which is definitely abnormal.

Alternatively, some reduced amplitude.

3 = Moderate slowness, poverty or small amplitude of movement.

4 = Marked slowness, poverty or small amplitude of movement.IV.
COMPLICATIONS OF THERAPY (In the past week)

A. DYSKINESIAS

32. Duration: What proportion of the waking day are dyskinesias present?

(Historical information.)

0 = None

1 = 1-25% of day.

2 = 26-50% of day.

3 = 51-75% of day.

4 = 76-100% of day.

33. Disability: How disabling are the dyskinesias?

(Historical information; may be modified by office examination.)

0 = Not disabling.

1 = Mildly disabling.

2 = Moderately disabling.

3 = Severely disabling.

4 = Completely disabled.

34. Painful Dyskinesias: How painful are the dyskinesias?

0 = No painful dyskinesias.

1 = Slight.

2 = Moderate.

3 = Severe.

4 = Marked.

35. Presence of Early Morning Dystonia (Historical information.)

0 = No

1 = Yes

B. CLINICAL FLUCTUATIONS

36. Are "off" periods predictable?

0 = No

1 = Yes

37. Are "off" periods unpredictable?

0 = No

1 = Yes

38. Do "off" periods come on suddenly, within a few seconds?

0 = No

1 = Yes

39. What proportion of the waking day is the patient "off" on average?

0 = None

1 = 1-25% of day.

2 = 26-50% of day.

3 = 51-75% of day.

4 = 76-100% of day.

C. OTHER COMPLICATIONS

40. Does the patient have anorexia, nausea, or vomiting?

0 = No

1 = Yes

41. Any sleep disturbances, such as insomnia or hypersomnolence?

0 = No

1 = Yes

42. Does the patient have symptomatic orthostasis?
(Record the patient's blood pressure, height and weight on the scoring form)

0 = No

1 = Yes

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