UT Southwestern
O'Donnell Brain Institute

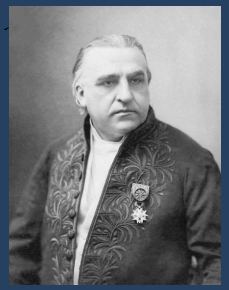
Taking Care of Parkinson's Disease

Shilpa Chitnis, M.D., Ph.D., FAAN, FANA.
Professor of Neurology & Neurotherapeutics

Parkinson's Disease History

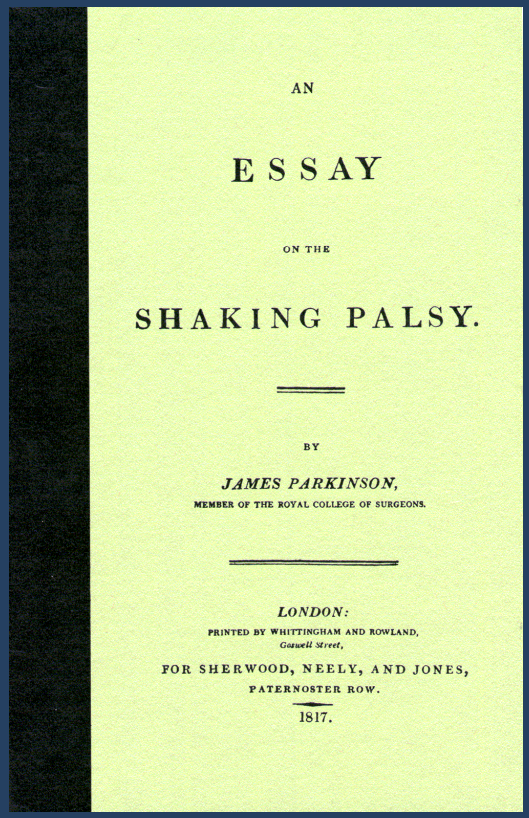
- 1817: first description of Parkinsonism

- James Parkinson



- Jean-Martin Charcot -1861: named Parkinson's disease

- George Cotzias-1967-68: conducted studies with Levo-dopa


AN

ESSAY

ON THE

SHAKING PALSY.

BY

JAMES PARKINSON,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS.

LONDON:

PRINTED BY WHITTINGHAM AND ROWLAND,
Goswell Street,

FOR SHERWOOD, NEELY, AND JONES,
PATERNOSTER ROW.

1817.

Epidemiology

- The disease affects 1-2% of the population above 60 years (*de Lau and Breteler 2006*)

- PD is relatively rare before age of 50 years and reaches a prevalence of 4% in the highest age groups (*de Rijk et al. 1995)*

- Lifetime risk:

- 2% for  1.3% for 

Risks: causal and protective factors

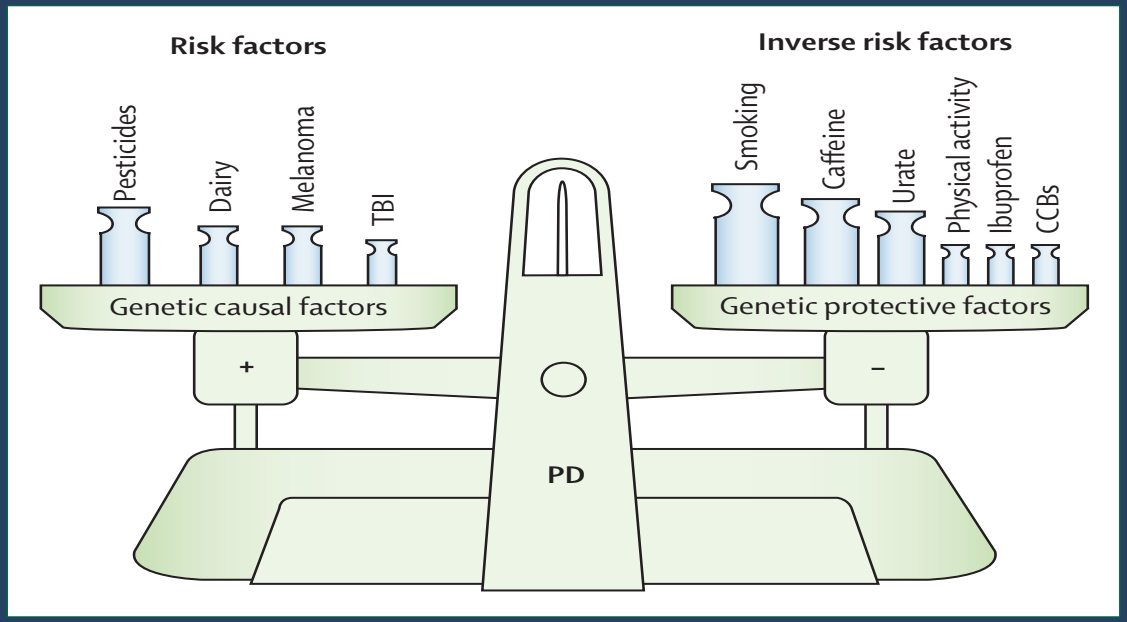
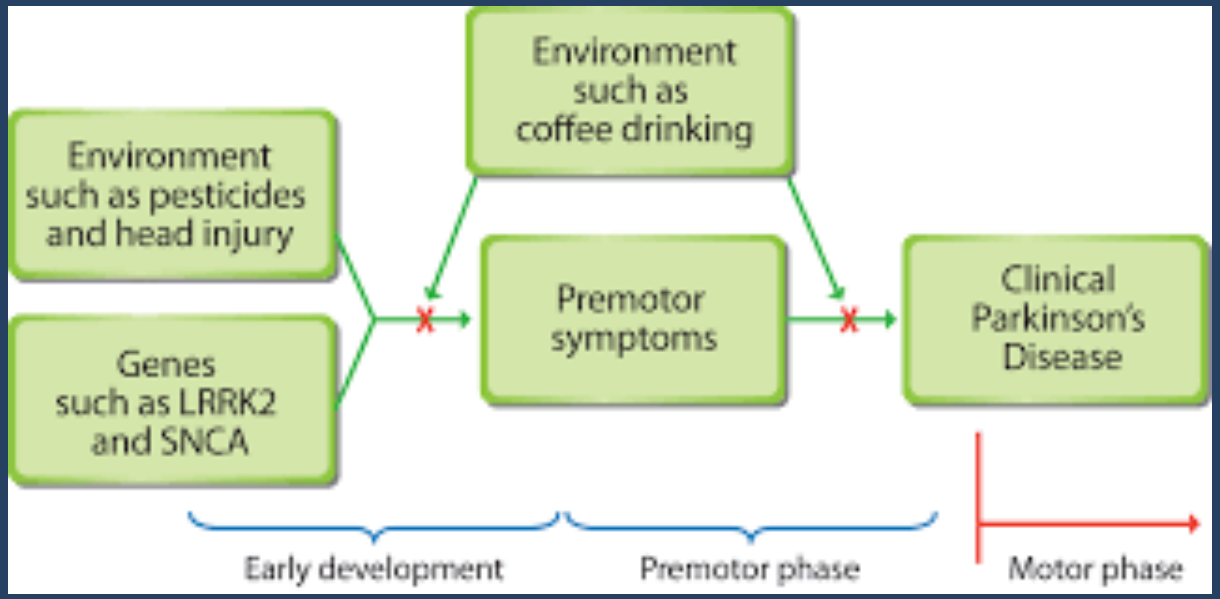


Figure 4: **The balance of genetic and environmental factors that underlie Parkinson's disease occurrence**
Larger weights have been used for those factors with stronger epidemiological evidence. We have included only factors supported by multiple prospective studies, but the presentation is not exhaustive and it is meant only for illustrative purposes. Factors included might or might not be causal. TBI=traumatic brain injury. PD=Parkinson's disease. CCBs=calcium channel blockers.

Ascherio A, Schwarzschild MA. The epidemiology of Parkinson's disease: risk factors and prevention. The Lancet Neurology. 2016 Nov 1;15(12):1257-72.

Risks: causal and protective factors

Environmental factors

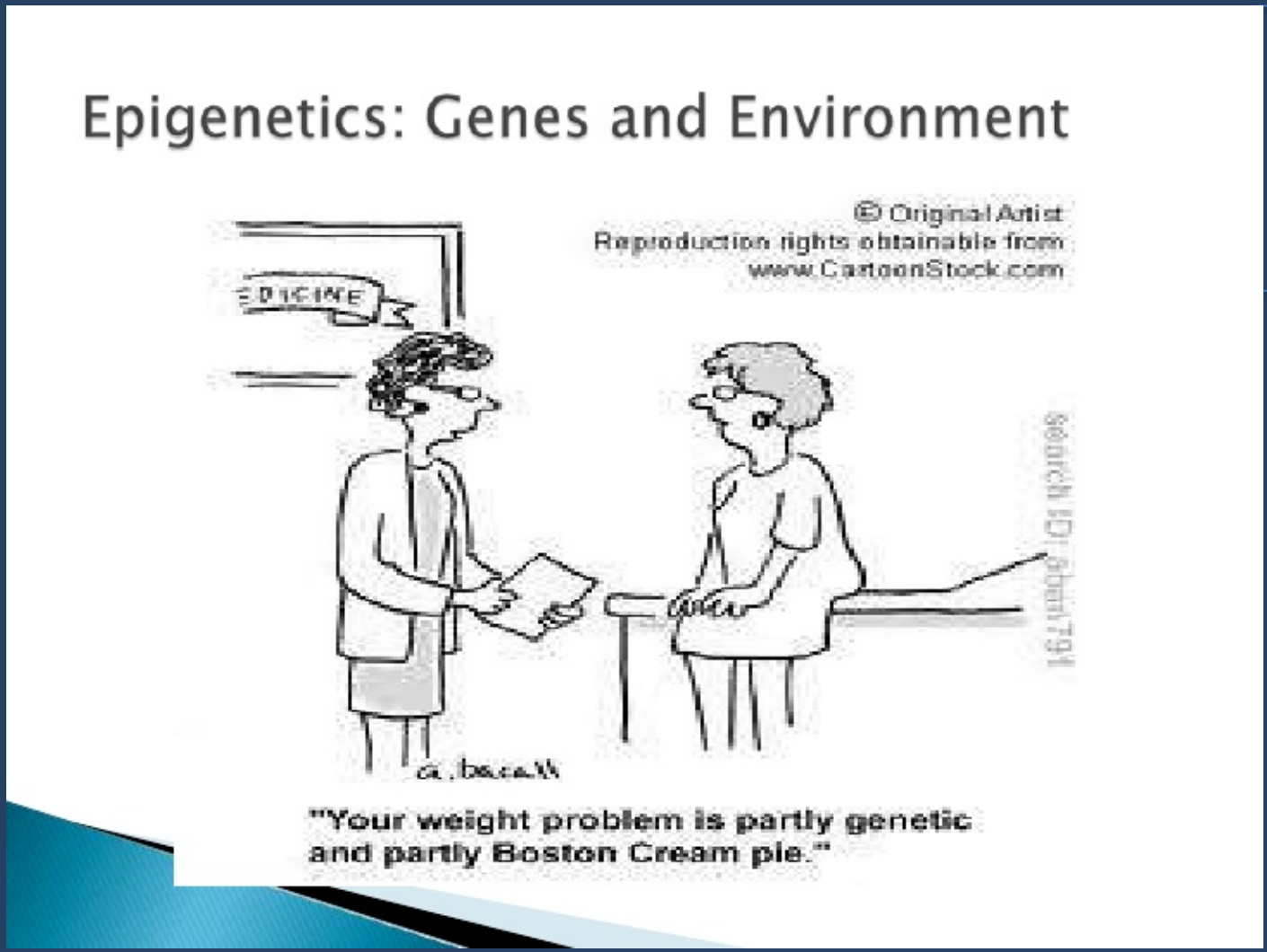


Avoid chemical pesticide exposure

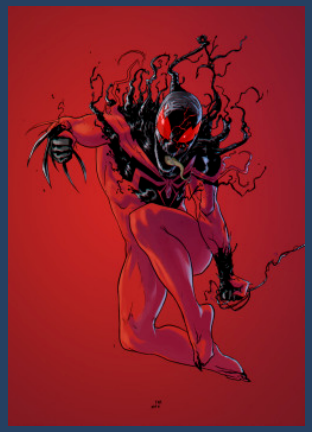
Choose your parents wisely

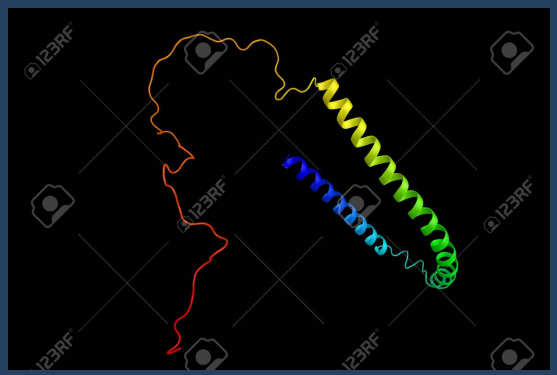
Genetics loads the "GUN", Environment pulls the Trigger!

Risks: causal and protective factors

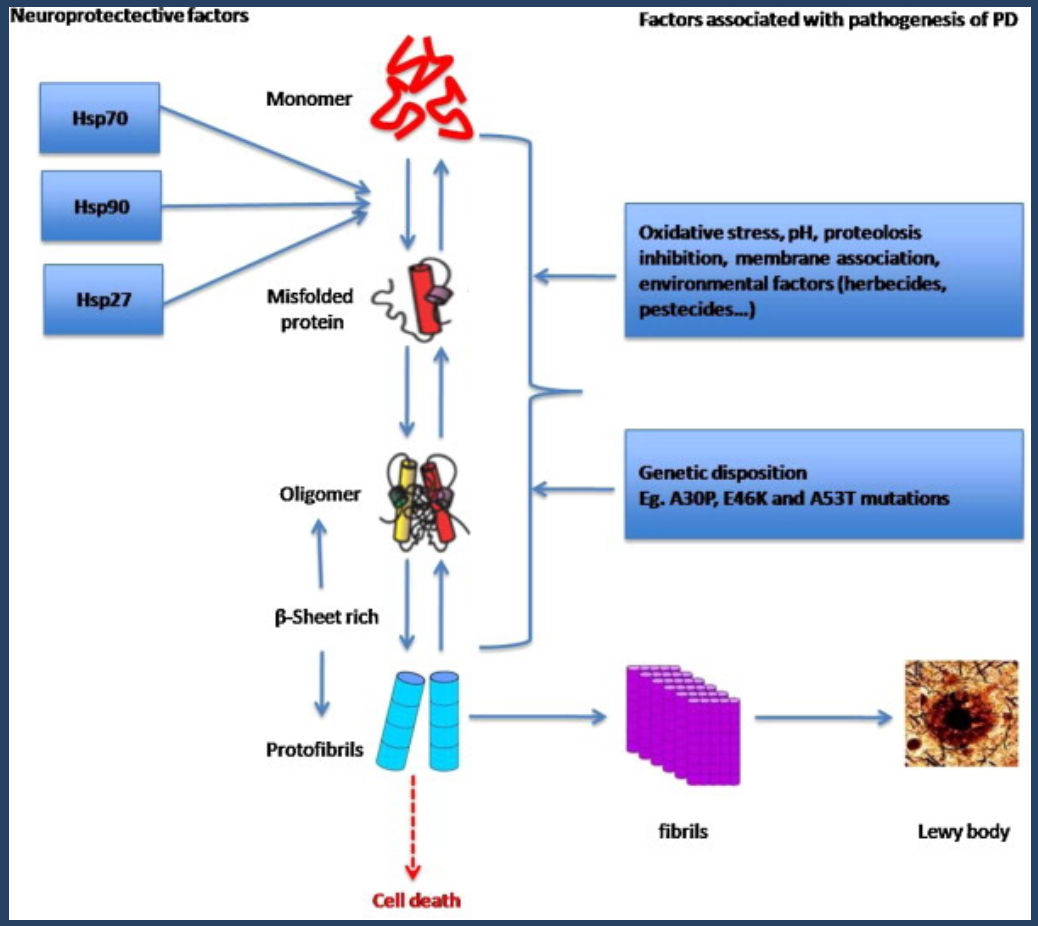


What happens in Parkinson's Disease

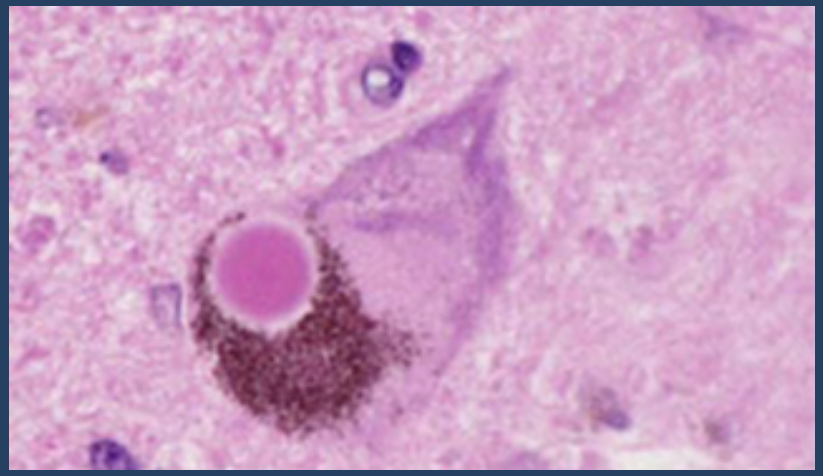




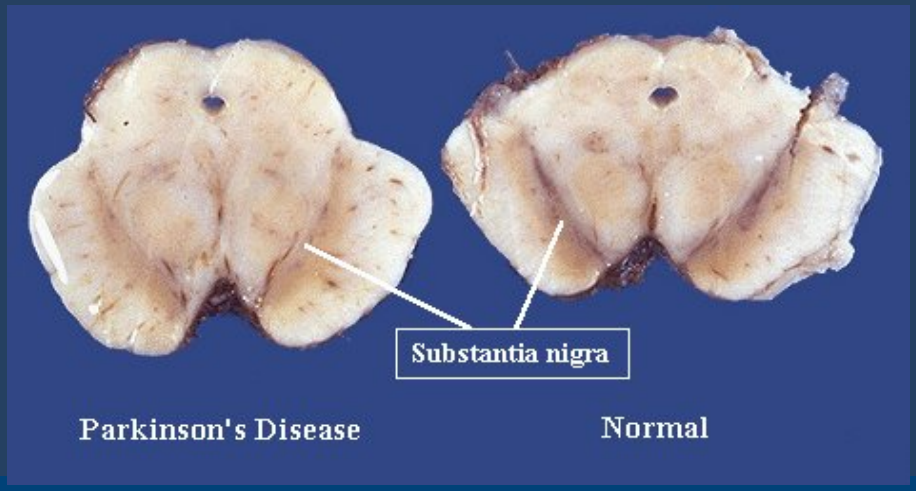
Alpha Synuclein



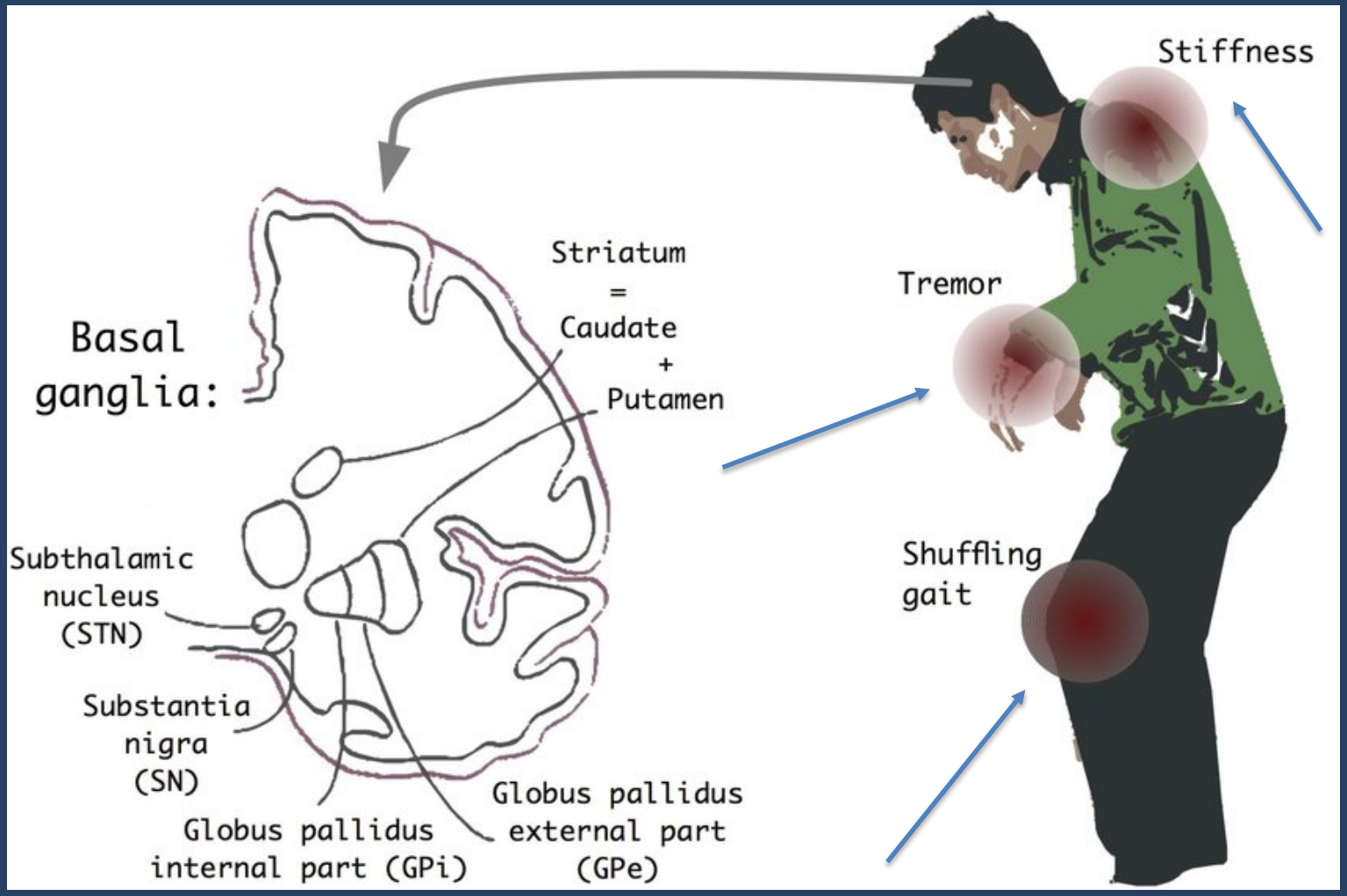
What happens in Parkinson's Disease



Neuromelanin containing dopaminergic neuron with Lewy body



Motor Symptoms



Preserving Dopaminergic Neurons

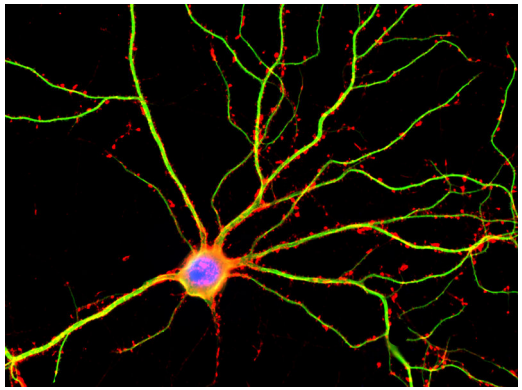
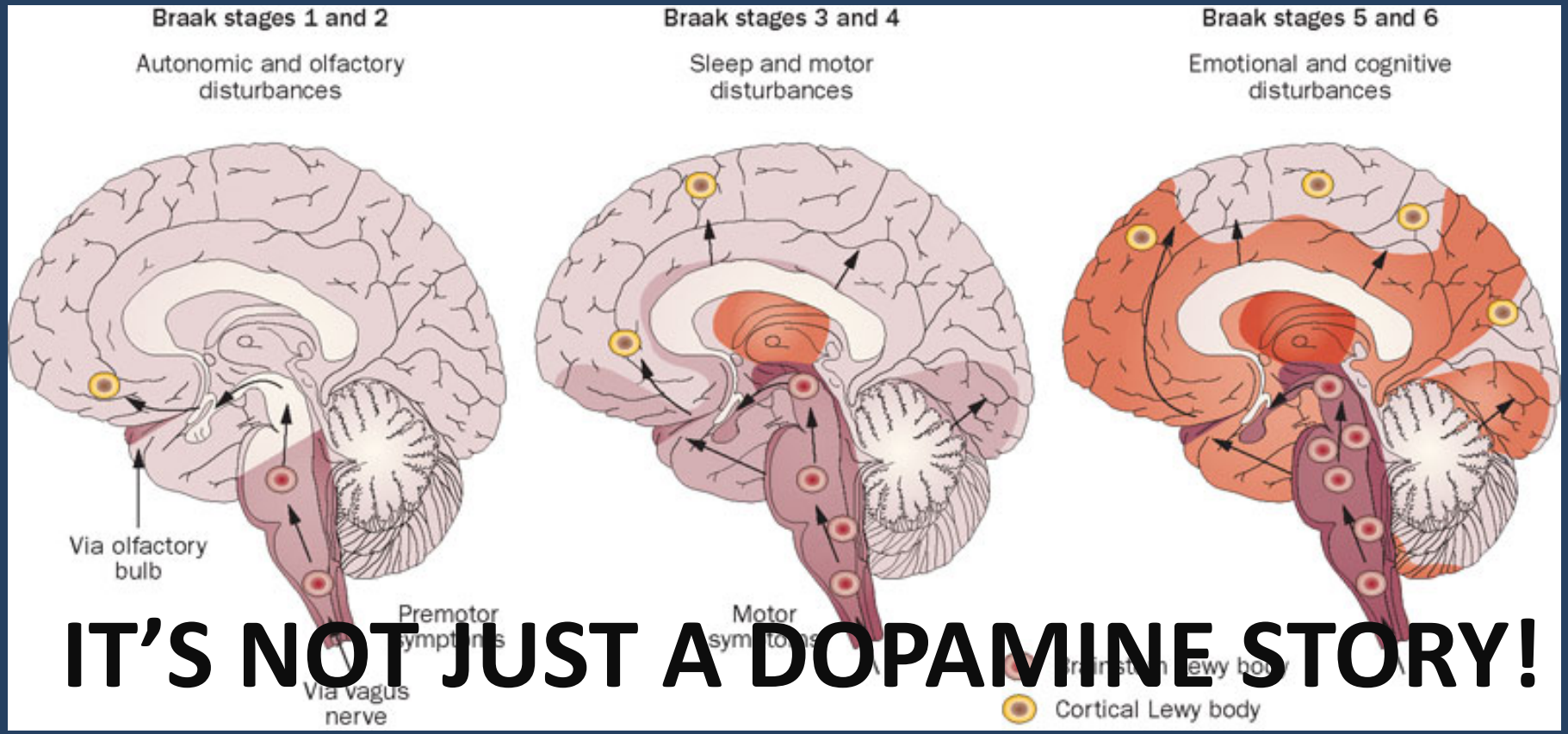


Table 1. Mechanism of Parkinson's disease (PD) pathogenesis and possible targets for therapy (adopted from Yacoubian TA *et al.*, 2009, [50]).

PD Pathogenic Mechanism	Targets for Neuroprotection
Oxidative stress and mitochondrial dysfunction	Inhibitors of dopamine metabolism (e.g., MAO inhibitors, dopamine receptor agonists)
	Electron transport enhancers (e.g., CoQ10)
	Other Oxidants (e.g., Vitamin E, Uric acid)
	Glutathione promoters (e.g., selenium)
	Inhibitors of a-synuclein aggregation
	Therapeutic agents that reduce α-synuclein protein levels
	Enhancers of parkin function
	Enhancers of UCH-L1 function
	Enhancers of proteosomal or lysosomal pathways
Protein aggregation and misfolding	Anti-inflammatory agents (e.g., NSAID, statins, minocycline)
	NMDA receptor antagonists, Calcium channel antagonists
	Anti-apoptotic agents
Neuroinflammation	Neurotrpohic factors (e.g., GDNF, neurturin)
Excitotoxicity	
Apoptosis and cell death pathways	
Loss of trophic factors	

Braak's Hypothesis

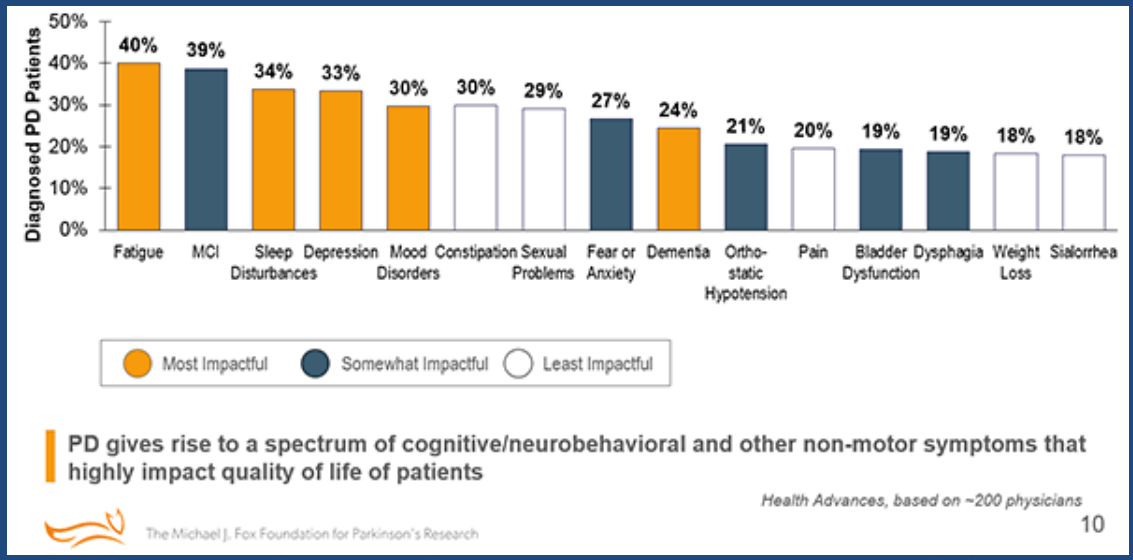


IT'S NOT JUST A DOPAMINE STORY!

The Science of Parkinson's Disease

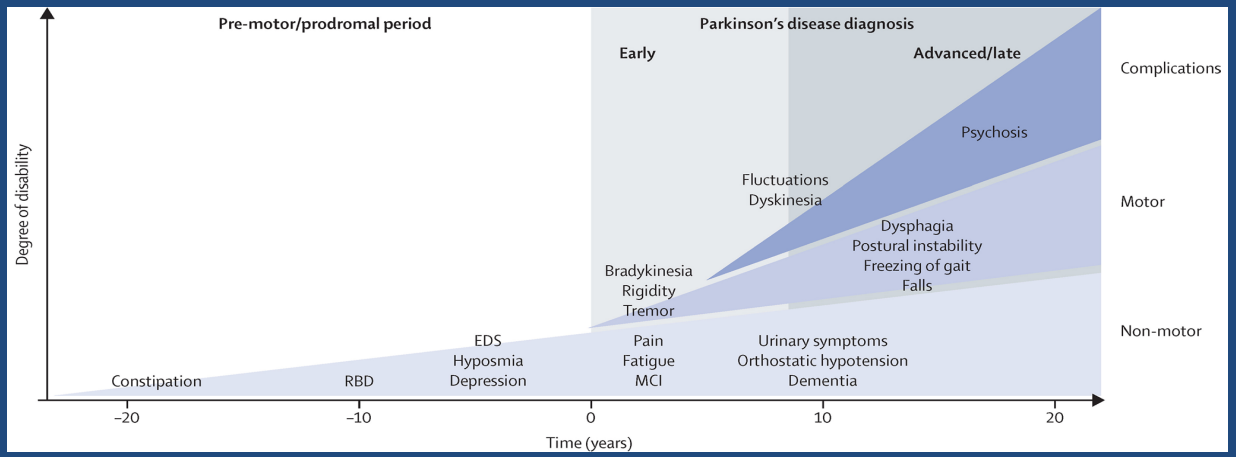
Question

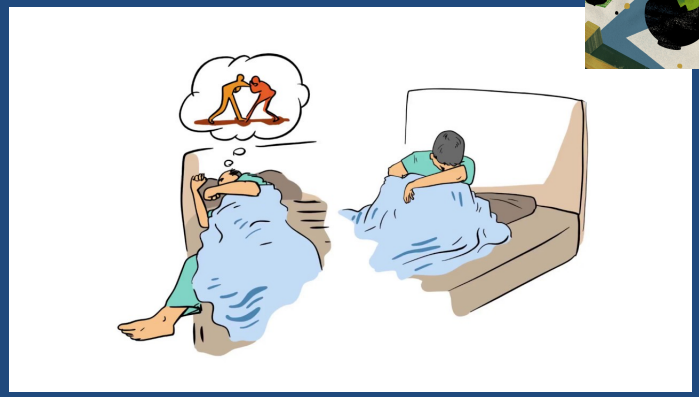
- Which of the symptoms of PD reduce quality of life?
- Lack of levodopa responsiveness
- Intractable tremor
- Wearing off
- Non-motor symptoms
- Dyskinesia



Pre-motor/Prodromal PD

The following symptoms of PD may start decades before the onset of motor Sx:





Seeing a Movement Disorders Specialist

- Neurologists with extra training in Parkinson's disease
- Knowledge and experience necessary to offer this holistic and individualized care.
- Not everyone with PD sees a movement disorder specialist because there aren't enough of them.
- Lack of funding for fellowship training and limited exposure to the specialty during residency hold doctors back from pursuing movement disorder careers.

Seeing a Movement Disorders Specialist



- https://parkinson.org/Living-with-Parkinsons/in-your-area

- https://mds.movementdisorders.org/directory/



UT Southwestern
O'Donnell Brain Institute

Preparing For Your MD Visit

1. Take along an extra set of ears
2. Write down your symptoms & a quick timeline of Sx
3. Bring medication bottles & any films on CD
4. Make a list of questions you want to ask and bring along
5. Be prepared for a somewhat long day with testing
6. Make sure you feel comfortable with the MD or else find another specialist in your area

Being Knowledgeable about PD

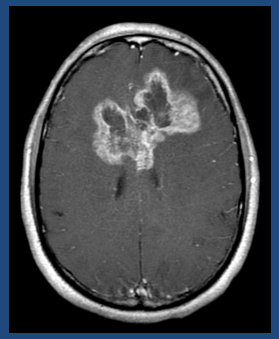
- https://www.parkinson.org
- https://www.michaeljfox.org
- https://www.davisphinneyfoundation.org
- https://www.parkinsonalliance.org
- Manage mis-perceptions about the disease

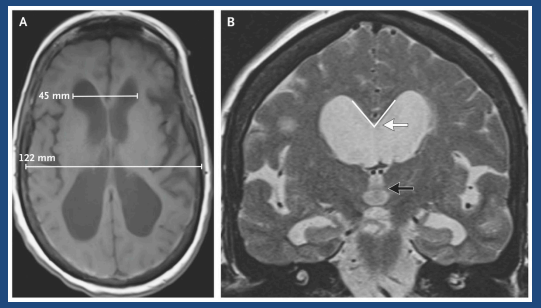
ASK YOUR DOCTOR!!

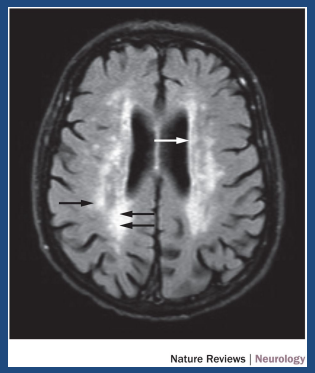
Diagnostic tests

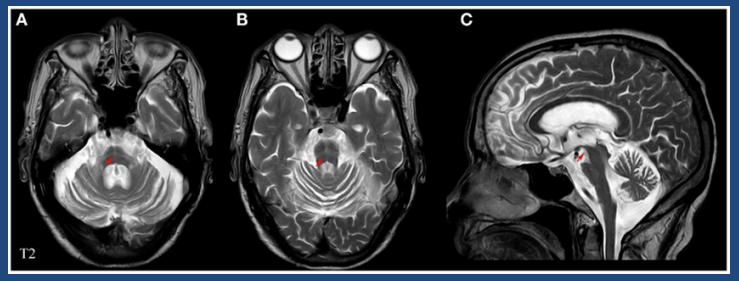
- MRI Brain

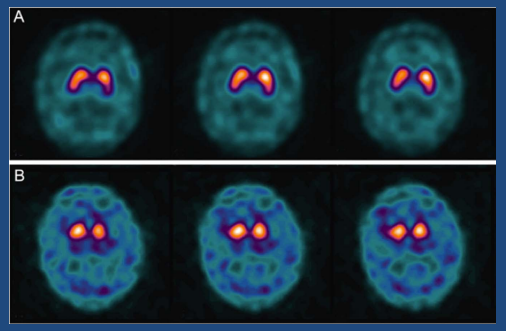
- Does not diagnose Parkinson's disease











- DAT Scan

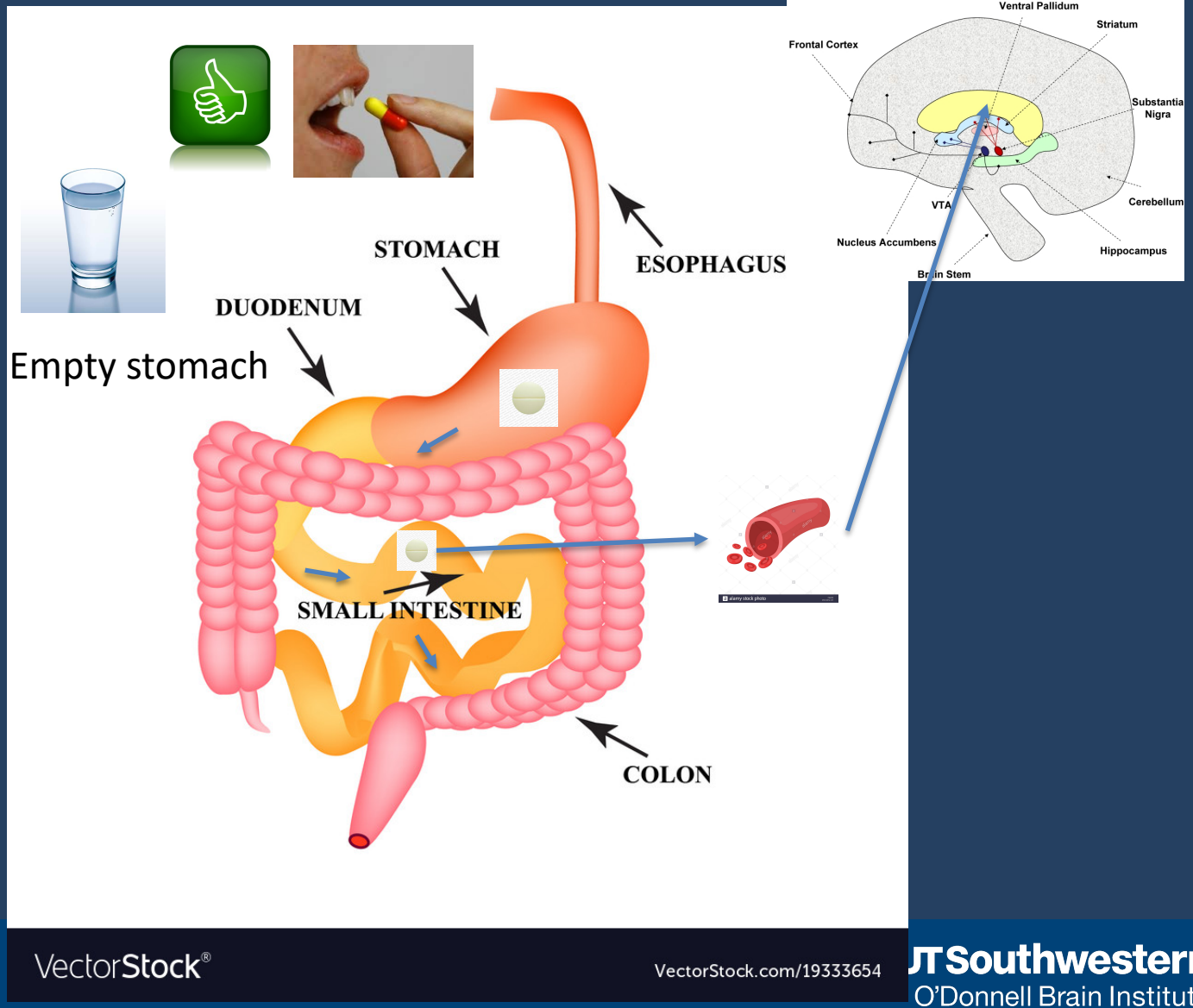
Know your Medications

- Make a detailed medication list
- Separate the PD medications from non-PD medications
- Know the generic and brand name for your medications
- Know the exact strength of the medication
- Write down the exact timings for each PD medication
- Write down any side effects

Know your Medications

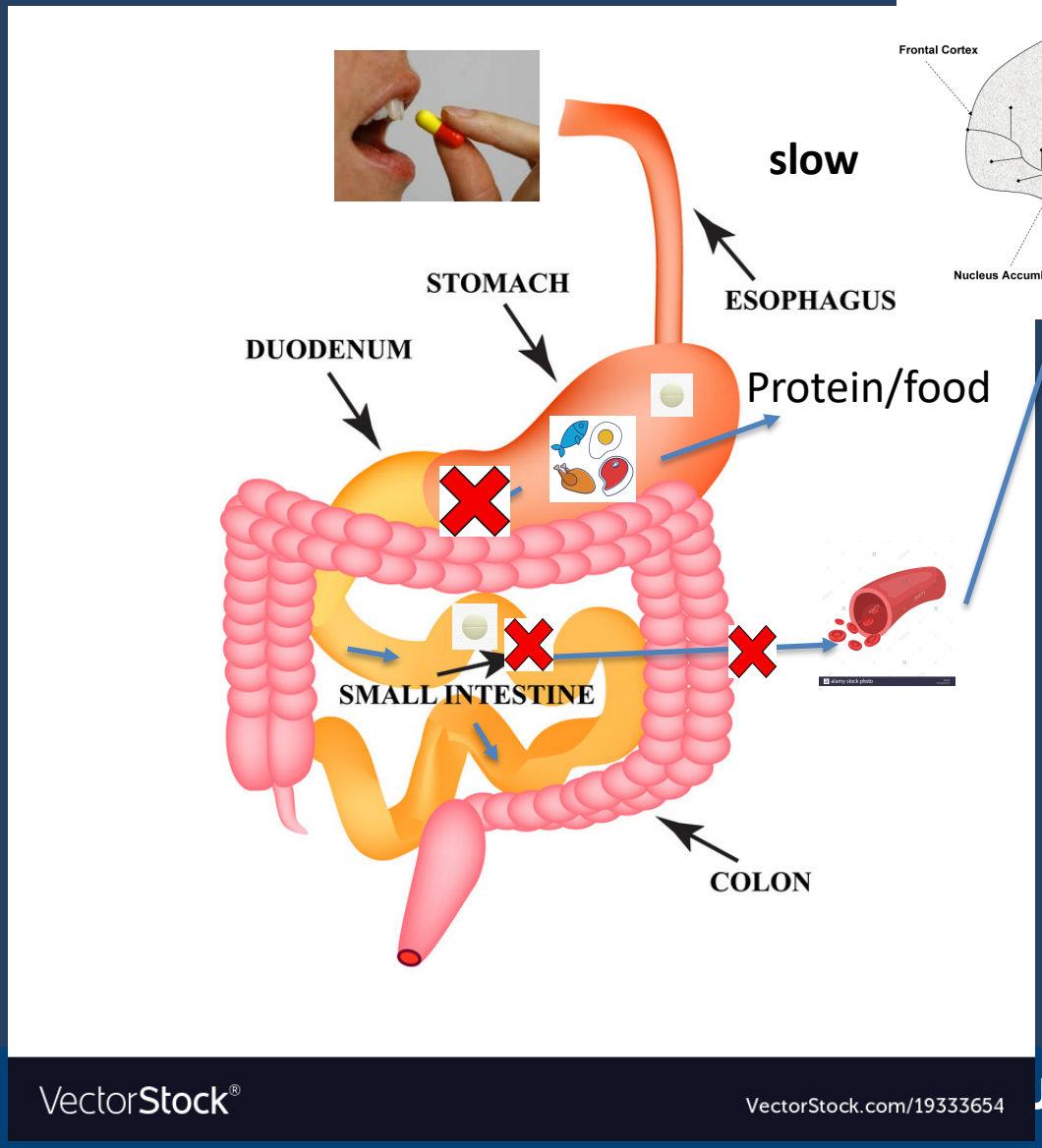
Know your Medications

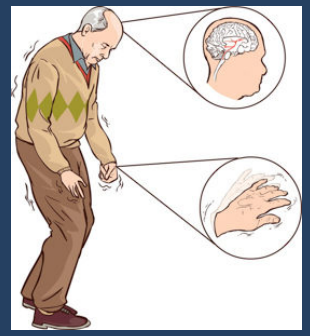
Understanding how Levodopa Works



UT Southwestern
O'Donnell Brain Institute

When Levodopa Does Not Work





Know your Medications (Agonists)

- Pramipexole (Mirapex)
- Ropinirole (Requip)
- Rotigotine (Neupro Patch)

Movement Disorders
Vol. 18, No. 6, 2003, pp. 659–667
© 2003 Movement Disorder Society

Sleep Attacks, Daytime Sleepiness, and Dopamine Agonists in Parkinson's Disease

Sebastian Paus, MD,[1] Hans Michael Brecht, MD,[2] Jürgen Köster, PhD,[2] Gert Seeger, MD,[3] Thomas Klockgether, MD,[1] and Ullrich Wüllner, MD[1]*

[1]*Department of Neurology, University of Bonn, Bonn, Germany*
[2]*Boehringer Ingelheim Pharma KG, Ingelheim, Germany*
[3]*Central Institute of Mental Health, Mannheim, Germany*

Know your Medications (Agonists)

ARTICLE

Longitudinal analysis of impulse control disorders in Parkinson disease

Jean-Christophe Corvol, MD, Fanny Artaud, PhD, Florence Cormier-Dequaire, MD, Olivier Rascol, MD, Franck Durif, MD, Pascal Derkinderen, MD, Ana-Raquel Marques, MD, Frédéric Bourdain, MD, Jean-Philippe Brandel, MD, Fernando Pico, MD, Lucette Lacomblez, MD, Cecilia Bonnet, MD, Christine Brefel-Courbon, MD, Fabienne Ory-Magne, MD, David Grabli, MD, Stephan Klebe, MD, Graziella Mangone, MD, Hana You, MD, Valérie Mesnage, MD, Pei-Chen Lee, PhD, Alexis Brice, MD, Marie Vidailhet, MD, and Alexis Elbaz, MD, For the DIGPD Study Group

Correspondence
Dr. Corvol
jean-christophe.corvc
aphp.fr

Neurology® 2018;91:e189-e201. doi:10.1212/WNL.0000000000005816

Abstract

Objective
To investigate the longitudinal dose-effect relationship between dopamine replacement therapy and impulse control disorders (ICDs) in Parkinson disease (PD).

Methods
We used data from a multicenter longitudinal cohort of consecutive patients with PD with ≤5 years' disease duration at baseline followed up annually up to 5 years. ICDs were evaluated during face-to-face semistructured interviews with movement disorder specialists. Generalized estimating equations and Poisson models with robust variance were used to study the association between several time-dependent definitions of dopamine agonist (DA) use, taking dose and duration of treatment into account, and ICDs at each visit. Other antiparkinsonian drugs were also examined.

Results
Among 411 patients (40.6% women, mean age 62.3 years, average follow-up 3.3 years, SD 1.7 years), 356 (86.6%) took a DA at least once since disease onset. In 306 patients without ICDs at baseline, the 5-year cumulative incidence of ICDs was 46.1% (95% confidence interval [CI] 37.4–55.7, DA ever users 51.5% [95% CI 41.8–62.1], DA never users 12.4% [95% CI 4.8–30.0]). ICD prevalence increased from 19.7% at baseline to 32.8% after 5 years. ICDs were associated with ever DA use (prevalence ratio 4.23, 95% CI 1.78–10.09). Lifetime average daily dose and duration of treatment were independently associated with ICDs with significant dose-effect relationships. Similar analyses for levodopa were not in favor of a strong association. ICDs progressively resolved after DA discontinuation.

Conclusion
In this longitudinal study of patients with PD characterized by a high prevalence of DA treatment, the 5-year cumulative incidence of ICDs was ≈46%. ICDs were strongly associated with DA use with a dose-effect relationship; both increasing duration and dose were associated with ICDs. ICDs progressively resolved after DA discontinuation.

RELATED ARTICLE

Editorial
Don't ask, don't tel
Impulse control dis
in PD
Page 107

MORE ONLINE

Podcast
Dr. Jason Crowell interviews Dr. Alex about his paper on control disorders ir Parkinson disease.
NPub.org/9mi9i9

ORIGINAL CONTRIBUTION

Dopamine Agonist Withdrawal Syndrome in Parkinson Disease

Christina A. Rabinak, BSE; Melissa J. Nirenberg, MD, PhD

Objectives: To report and characterize a dopamine agonist (DA) withdrawal syndrome (DAWS) in Parkinson disease.

Design: Retrospective cohort study.

Setting: Outpatient tertiary movement disorders clinic.

Patients: A cohort of 93 nondemented patients with Parkinson disease enrolled in a prospective study of non-motor and motor disease manifestations.

Main Outcome Measure: The presence of DAWS, defined as a severe, stereotyped cluster of physical and psychological symptoms that correlate with DA withdrawal in a dose-dependent manner, cause clinically significant distress or social/occupational dysfunction, are refractory to levodopa and other Parkinson disease medications, and cannot be accounted for by other clinical factors.

Results: Of 40 subjects treated with a DA, 26 underwent subsequent DA taper. Of these 26 subjects, 5 (19%) developed DAWS and 21 (81%) did not. All subjects with DAWS had baseline DA-related impulse control disorders. Symptoms of DAWS resembled those of other drug withdrawal syndromes and included anxiety, panic attacks, agoraphobia, depression, dysphoria, diaphoresis, fatigue, pain, orthostatic hypotension, and drug cravings. Subjects with DAWS as compared with those without DAWS had higher baseline DA use (mean [SD], 420 [170] vs 230 [180] DA levodopa equivalent daily doses [DA-LEDD], respectively; $P = .04$) and higher cumulative DA exposure (mean [SD], 1800 [1200] vs 700 [900] DA-LEDD-years, respectively; $P = .03$). Subjects with DAWS also had considerably lower Unified Parkinson's Disease Rating Scale motor scores than those without DAWS (mean [SD], 21 [5] vs 31 [10], respectively; $P = .007$), despite comparable disease duration (mean [SD], 7.3 [7] vs 6.3 [4] years, respectively; $P = .77$) and similar total dopaminergic medication use (mean [SD], 830 [450] vs 640 [610] total LEDD, respectively; $P = .52$) in the 2 groups.

Conclusions: Dopamine agonists have a stereotyped withdrawal syndrome that can lead to profound disability in a subset of patients. Physicians should monitor patients closely when tapering these medications.

Arch Neurol. 2010;67(1):58-63

UT Southwestern
O'Donnell Brain Institute

Building your Multi-disciplinary Team

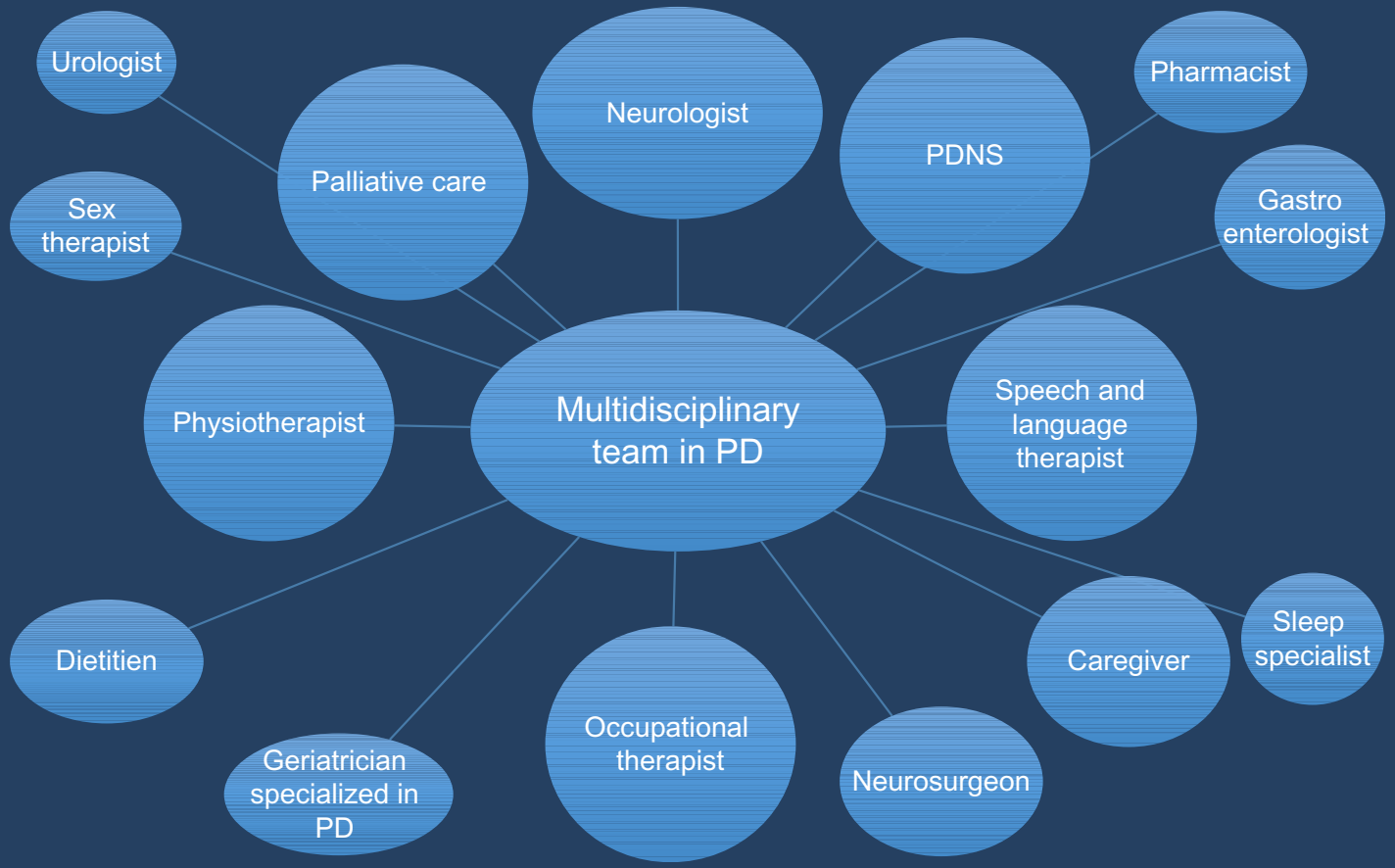


Fig. 1 Multidisciplinary team disciplines. *PD*, Parkinson's disease; *PDNS*, Parkinson's disease nurse specialist.

Understanding what each team member does

Table 1 The Ideal Composition of a Multidisciplinary Team Members in Parkinson's Disease

Specialist	Role	References
Neurologist	Patient diagnosis, prognosis, and treatment; lead of the MDT	Giladi et al. (2014)
Parkinson's disease nurse (PDNS)	Provide information, education, and support on PD and related issues; a center point for communication between the patient and other MDT members	Trend et al. (2002)
Psychologist and neuropsychiatrist	Evaluate the mental status of the patient (anxiety, depression, psychosis, etc.); provide psychosocial support, cognitive behavior therapy, and psychotherapy medications if necessary	Chaudhuri, Healy, et al. (2006) and Giladi et al. (2014)
Speech and language therapist	Assist patients in communication, speech, and swallowing management using a variety of exercise therapies	Giladi et al. (2014) and Trend et al. (2002)

Understanding what each team member does

Physiotherapist	Help patients stay mobile with exercise therapies; develop physical ability and skills to perform functional daily activities of living	Giladi et al. (2014)
Occupational therapist	Promote health and well-being through occupation; enable patients to complete daily activities of living	Parkinsons.org.uk (2015)
Sleep specialist	Evaluate sleep disturbances associated with PD	Chaudhuri (2009)
Caregiver	Communicate and work with the MDT in patient management and treatment plans Provide a good level of social care for the patient and self	Schrag et al. (2006) and Tod et al. (2016)
Urologist	Evaluate and address issues with urinary retention and bladder stability	Jost (2013)
Gastroenterologists	Evaluate and treat issues that arise with entire gastric tract and gastric functioning	Chaudhuri, Healy, et al. (2006)

Understanding what each team member does

Table 1 The Ideal Composition of a Multidisciplinary Team Members in Parkinson's Disease—cont'd

Specialist	Role	References
Dietitian	Mediate nutrition, alleviate swallowing difficulties and constipation, and support the maintenance of a healthy weight for the patient	Parkinsons.org.uk (2016)
Pharmacist	Manage pharmacotherapy treatment	
Psychosexual therapist	Promote sexual health with counseling in sexual function and dysfunction	Giladi et al. (2014)
Neurosurgeon	Assess patients for neurosurgical treatment to potentially alleviate and control motor symptoms	Perlmutter and Mink (2006)

PD, Parkinson's disease; MDT, multidisciplinary team.

Exercise

Bhalsing, *et al*.: Physical activity in Parkinson's disease

Table 2: Summary of reviews and meta-analysis on the effects of physical activity on motor features in Parkinson's disease

Review	Number of studies included	Inclusion criteria	Outcome/conclusion
		Any form of physical activity	
Lauzé *et al*.[8]	106 studies (R or M)	All studies with idiopathic PD patients who participated in PA as a mean of intervention	PA seems most effective in improving physical capacities (57.2% improvement of all reported outcomes) and physical and cognitive functional capacities (55.3% improvement of all reported outcome measures)
Kwakkel *et al*.[24]	23 studies (R or M)	RCTs that assessed physical therapy interventions in patients with PD were eligible for inclusion	Effects of PA in PD patients are task specific 1. Improvement in postural control and balance reported by (9 studies) 2. Improvement in gait and gait-related activities reported by (3 studies) 3. Improvement in physical condition reported by (5 studies) and 4. Improvement in transfer reported by (1 study)
Keus *et al*.[25]	29 studies	All studies with sufficient data on the effectiveness of PA in PD were included	Four specific recommendations 1. Cueing strategies to improve gait 2. Cognitive strategies to improve transfer 3. Exercises to improve balance; and 4. Training of joint mobility and muscle power to improve physical capacity
Crizzle and Newhouse[26]	7 studies	Studies with idiopathic PD patients participated in any form of PA were eligible for the review	Exercise training is beneficial to patients with PD, especially those in the early stages of the disease

Exercise

Aerobic exercise			
Shu *et al*.[27]	18 studies	Article comparing effect of aerobic exercise intervention with any comparator, including other forms of exercise or PA in patients with PD	Aerobic exercise showed beneficial effects in improving Motor action (SMD-0.57, *P*=0.003), balance (SMD-2.02 , *P*=0.01), and gait (SMD-0.33, *P*<0.0001) in patients with PD
Tambosco *et al*.[28]	36 studies	Literature studying aerobic training and strength training exercise interventions in patients with PD	Aerobic and strength training improve physical abilities of patients suffering from PD
Treadmill training exercise			
Mehrholz *et al*.[29]	18 studies	RCTs comparing treadmill training with no treadmill training in patients with PD	Use of treadmill training in patients with PD may improve clinically relevant gait parameters such as gait speed (95% CI 0.03-0.14; *P*=0.001) and stride length (95% CI 0.01-0.09; *P*=0.01), but walking distance and cadence did not improve
Herman *et al*.[30]	14 studies	Studies evaluating the effects of treadmill training on patients with PD	Treadmill training could play an important role in improving gait and mobility in patients with PD
Dance therapy			
Aguiar *et al*.[31]	18 studies	RCTs comparing dance therapy with any other form of PA training in patients with PD	Therapeutic dance can be safe and feasible for people with mild-to-moderately severe PD, with beneficial effects on walking, freezing of gait, and health-related QOL
Shanahan *et al*.[32]	13 studies	Studies evaluating dance interventions for individuals with PD	The evidence evaluated suggests that two 1-h dance classes per week over 10-13 weeks may have beneficial effects on endurance, motor impairment, and balance
Traditional Chinese exercise			
Song *et al*.[33]	21 studies	Studies evaluating the effect of Tai Chi/Qigong for individuals with PD	Fixed-effect models showed that Tai Chi/Qigong was associated with significant improvement in most motor outcomes UPDRS III (*P*<0.001) Balance (*P*<0.001) Timed Up and Go (*P*=0.005) Falls (*P*=0.004)

Exercise

Table 2: Contd...

Review	Number of studies included	Inclusion criteria	Outcome/conclusion
Yang *et al*. (2014)[34]	15 studies	Studies evaluating the effect of Tai Chi/Qigong (traditional Chinese medical exercise) for individuals with PD	Tai Chi plus medication showed greater improvements in Motor function (SMD-0.57; 95% CI-1.11-−0.04) Berg balance scale (SMD-1.22; 95% CI-1.65-−0.80) However, Tai Chi plus medication did not show better improvements in gait or QOL
Zhou *et al*.[35]	9 studies	RCTs comparing Tai Chi with any comparator without Tai Chi relevant exercises in patients with PD	The aggregated results are in favor of Tai Chi on improving motor function (P=0.002) and balance (P<0.00001) in patients with PD. However, there is no sufficient evidence to support or refute the value of Tai Chi on improving gait velocity, stride length, or QOL
Resistance training exercise			
Saltychev *et al*.[36]	12 studies	Literature studying progressive resistance training versus no treatment, placebo, or other treatment in patients with PD	The effect of progressive resistance training on 1. Comfortable walking speed-(95% CI 0.01-0.05) in favor of intervention but below the minimal detectable change 2. Timed Up and Go test - not significant (95% CI−1.47-0.06) 3. 6-min walk test-(95% CI 7.86-25.48) are in favor of intervention, but below the minimal detectable change There is so far no evidence on the superiority of progressive resistance training compared with other treatments to support the use of this technique in rehabilitation of idiopathic PD
Uhrbrand *et al*.[37]	15 studies	Articles in which the effect of intensive exercise therapy in patients affected by PD was evaluated	There is strong evidence that resistance training can improve muscle strength in PD, which is underlined by the meta-analysis (95% CI 0.22-0.86)
Brienesse and Emerson[38]	5 studies	Studies evaluating resistance exercise programs in PD population	Resistance training was shown to have a positive effect in both muscle strength outcomes as well as functional outcomes related to mobility in PD population
Lima *et al*.[39]	4 studies	Studies evaluating progressive resistance exercise programs in PD population	Progressive resistance exercise increased strength, with an SMD-0.50 (95% CI 0.05-0.95) and had a clinically worthwhile effect on walking capacity, with a mean difference of 96 m (95% CI 40-152) among people with mild-to-moderate PD

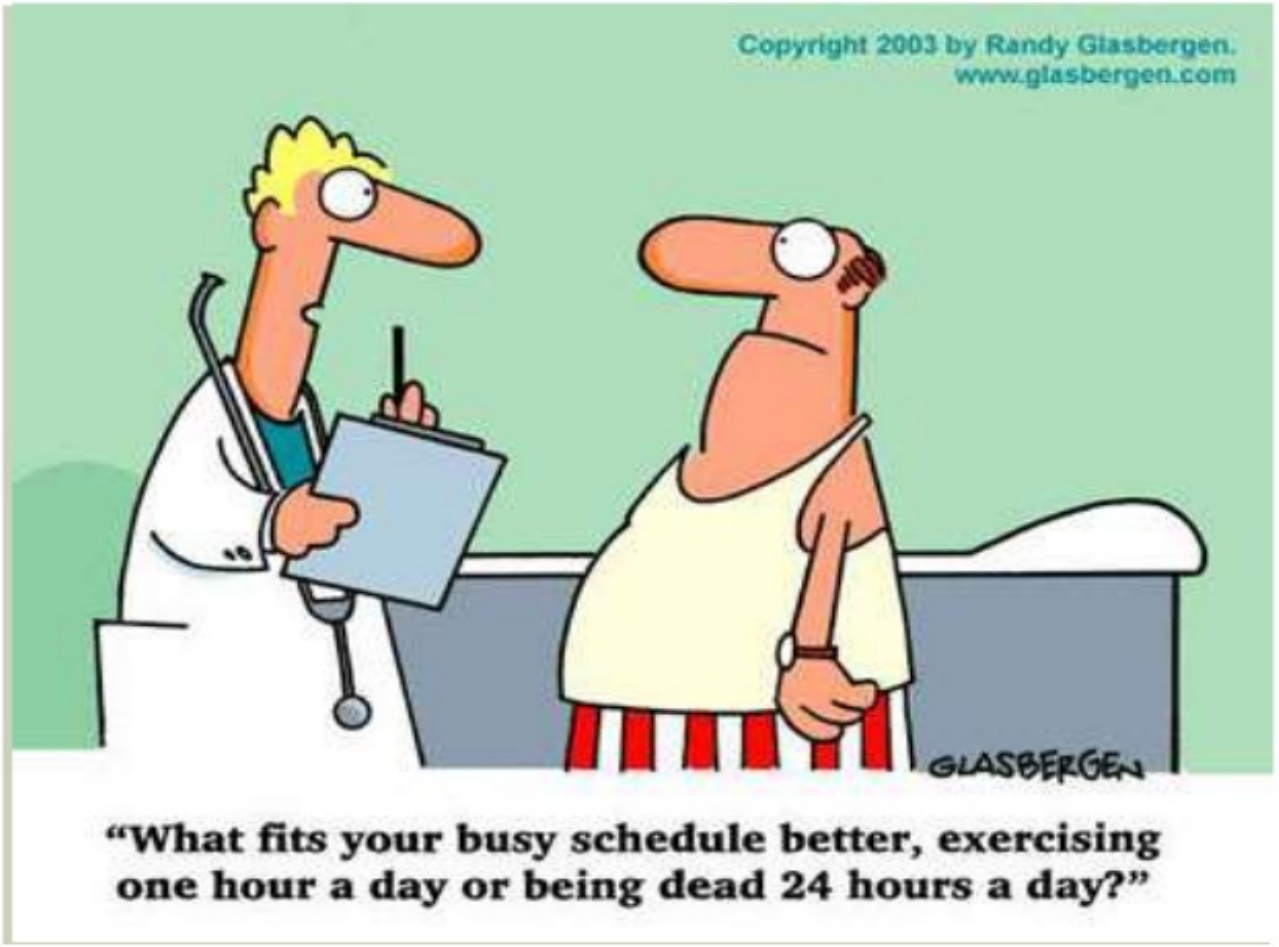
Exercise

Table 3: Role of physical activity in nonmotor features in Parkinson's disease

Study	Intervention	Outcome/conclusion
		Autonomic dysfunction
Kanegusuku *et al*.[43]	Resistance training	Progressive resistance training improved cardiovascular autonomic dysfunction in PD training group 1. Decrease in low-frequency component of heart rate variability after 12 weeks ($P<0.05$) 2. Reduction in systolic blood pressure fall during orthostatic stress after 12 weeks ($P<0.05$)
		Sleep dysfunction
Silva-Batista *et.al*.[44]	Resistance training	After resistance training, patients with PD showed improved sleep scores than the healthy control ($P\leq0.05$). Resistance training is recommended as an adjunct therapeutic method for improving sleep quality of subjects with moderate PD
Wassom *et al*.[45]	Qigong exercise	Improved sleep quality in Qigong exercise group
Frazzitta *et al*.[46]	Multidisciplinary exercise program	On average, in intervention group, sleep scores improved ($P<0.0001$), suggesting multidisciplinary intensive rehabilitation treatment may have a positive impact on many aspects of sleep in PD
Nascimento *et al*.[47]	Multimodal exercise program	Mild-to-moderate intensity of multimodal physical exercises can contribute to attenuating sleep disturbances
		Cognitive impairment
David *et al*.[48]	Resistance exercise	At 24 months, relative to baseline, modified fitness counts improved on the digit span ($P<0.01$) and stroop ($P=0.03$), whereas progressive resistance exercise training improved on the digit span ($P<0.01$), Stroop ($P=0.048$) providing evidence that 24 months of PA may improve attention and working memory in patients with PD
Uc *et al*.[49]	Aerobic exercise	Improved performance on flanker task-response inhibition test ($P<0.05$ to $P<0.001$) after exercise program
Nocera *et al*.[50]	Tai Chi exercise	Large, but nonstatistically significant improvement, was found for the digits backward test ($P=0.08$) suggesting Tai Chi training may help improve executive functioning
McKee and Hackney[51]	Tango dance therapy	Tango participants improved on spatial cognition ($P=0.021$) and executive function ($P=0.012$) compared with education participants. Gains were maintained 10-12 weeks postintervention
Ridgel *et al*.[52]	Passive leg cycling	Improved executive function after passive cycling
Cruise *et al*.[53]	Exercise intervention program	Improvement in frontal lobe-based executive function in exercising group
Tanaka *et al*.[54]	Multimodal physical exercise program	Improvement in executive function in exercising group
		Mood disorders
Dashtipour *et al*.[55]	Combined aerobic and resistance exercise	Sustained improvement in depression (Beck depression inventory postintervention evaluation showed improvement in scores 4-week postintervention ($P=0.001$) 3-month postintervention ($P=0.002$) and 6-month postintervention ($P=0.006$) in combined intervention group
Teixeira-Machado et al.[56]	Exercise program based on the Feldenkrais method	Treated group showed reduction in the level of depression ($P=0.05$)
Park *et al*.[57]	Combined aerobic and resistance exercise	Greater reduction in depression in early-start group (Beck Depression Index mean change from baseline values decreased more in the early-start group, this was statistically significant ($P=0.04$) compared with late-start group
Burini *et al*.[58]	Combined aerobic training and Qigong exercise	No significant improvement in mood (P value not significant) in intervention group

PA=Physical activity, PD=Parkinson's disease

Exercise


Copyright 2003 by Randy Glasbergen.
www.glasbergen.com
GLASBERGEN
"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"

Falls

1. **Create a space you're familiar with** by avoiding new routines and changes at home. Familiarize yourself with furniture and places you can grab on to so everywhere is easily accessible

2. **Remove rugs, arrange power cords and add night lights** to make it easier to get around

3. **Avoid multi-tasking while walking**

4. **Make the bathtub safer by adding mats with a grip or a grab bar**

5. **Take your time standing up**

Nutrition

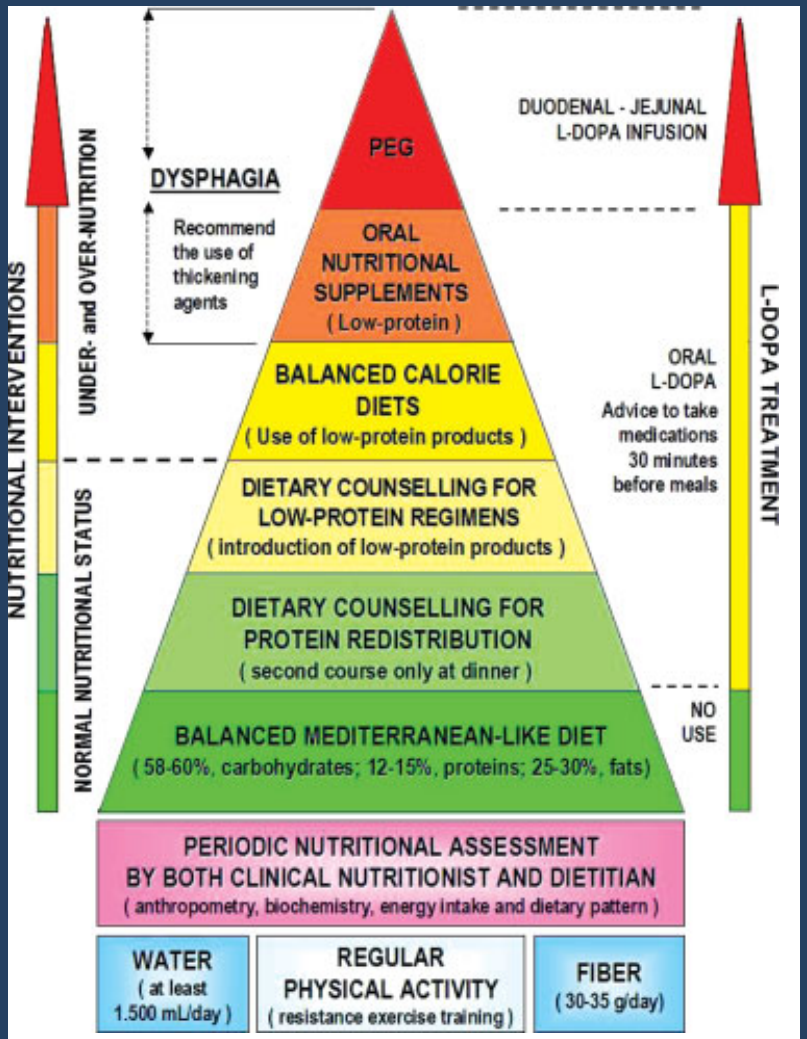


FIG. 3. A potential nutritional treatment pyramid for patients with PD in relation to stage of disease.

- There is no one diet that is proven best for people with PD
- There is no evidence that a gluten-free diet is necessary
- More data is needed before a ketogenic diet for PD can be recommended

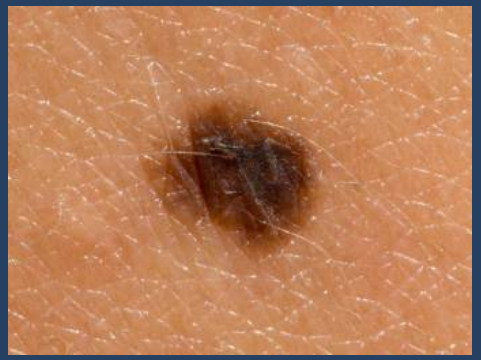
Barichella M, Cereda E, Pezzoli G. Major nutritional issues in the management of Parkinson's disease. Movement disorders. 2009 Oct 15;24(13):1881-92.

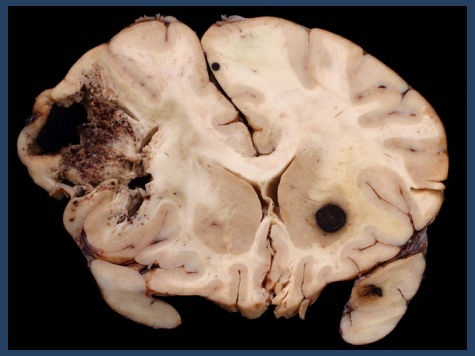
Nutrition

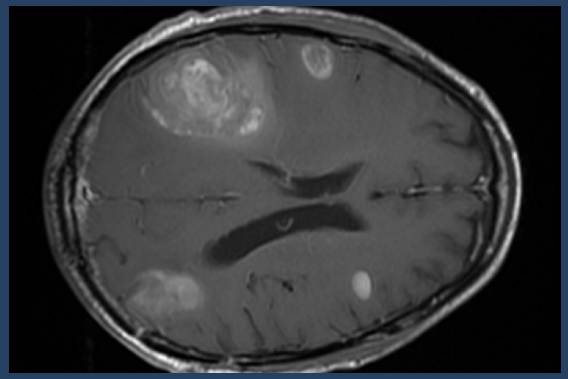
- The Mediterranean diet, which is rich in plant-based foods and olive oil has shown both heart and brain health benefits and is associated with lower rates of PD
- The MIND diet is also a reasonable diet for someone with PD to follow
- Talk to your healthcare team about your nutrition concerns and work together with them to ensure you are following a dietary plan that is best suited for you and your particular needs

Dermatology Screening

- Melanoma occurs frequently in PD patients and vice versa
- Increased risk not dependent on dopaminergic therapy
- *Bose A, Petsko GA, Eliezer D. Parkinson's Disease and Melanoma: Co-Occurrence and Mechanisms. Journal of Parkinson's disease. 2018 Jan 1;8(3):385-98.*







- Screen at least once a year, more if you have a history

Hospital Visit Challenges for PD patients

- Not getting medications on time
- Find out if you can bring all your own bottles, Pharmacy may check them first
- There are multiple explanations for worsening of PD while in the hospital, Infections should be sought and treated
- Medication list should be updated and checked for contraindicated medications

Hospital Visit Challenges for PD patients

- Infection and medications are common causes of confusion during hospitalization, When the underlying cause is addressed, the confusion usually improves dramatically

- Chest PT, speech pathology, and physical therapy should all be useful in the recovery process.

- Be aware of what procedures can be done safely with DBS, and be ready to assume primary responsibility for turning it on and off for procedures

Hospital Visit Challenges for PD patients

	Trade Name	Generic Name
Antipsychotic (used for agitated confusion)	Haldol	Haloperidol
	Loxitane	Loxapine HCL
	Mellaril (high dosage)	Thioridazine
	Moban	Molindone
	Navane	Thiothixene
	Orap	Pimozide
	Prolixin, Permitil	Fluphenazine
	Serentil	Mesoridazine Besylate
	Stelazine	Trifluoperazine
	Taractan	Chlorprothixene
	Thorazine	Chlorpromazine
	Trilafon	Perphenazine
	Zyprexa	Olanzapine
Antidepressant	Ascendin	Amoxapine
	Marplan	Isocarboxazid
	Nardil	Phenelzine
	Parnate	Tranylcypromine
	Triavil	Combination of Perphenazine & Amitriptyline
Antivomiting	Compazine	Prochlorperazine
	Inapsine	Droperidol
	Phenergan	Promethazine
	Reglan	Metoclopramide
	Torecan	Thiethylperazine
Miscellaneous, Blood Pressure, Post-op Medication	Moderil	Rescinnamine
	Rauverid	None
	Rauwiloid	None
	Serpasil	Reserpine
	Wolfina	None
Avoid Unless Benefit Outweighs Risk	Abilify	Aripiprazole
	Aldomet	Alpha-methyldopa
	Buspar	Buspirone
	Depakote	Divalproex Sodium
	Dilantin	Phenytoin
	Eskalith, Lithobid	Lithium
	Geodon	Ziprasidone
	Pavabid	Papaverine
	Risperdal	Risperidone
Narcotic Analgesic	Demerol*	Meperidine

*Cannot be used with Azilect (Rasagiline) or Eldepryl (Selegiline) treatment

Planning for Surgery

- Try to connect your surgeon with your movement MD
- Choosing anesthetic agent carefully
- Anesthetic medications have been identified as a potential cause of morbidity in this population because of their interaction with the drugs used to manage PD
- The commonly used anesthetic drug propofol has been reported to demonstrate dyskinetic effects in individuals with and without movement disorders, including PD

Planning for Surgery

- For short-term treatment of sialorrhea caused by impaired swallowing, which may worsen during anesthesia, glycopyrrolate by mouth and ipratropium spray have been shown to be effective

- to avoid symptom exacerbation and other adverse effects, it is recommended that the usual drug regimen continue until just before the induction of anesthesia. This is especially critical in patients taking levodopa because of the drug's short half-life. During procedures requiring extended anesthesia, levodopa can be administered by means of a nasogastric tube

Living well with PD

- **So you have been diagnosed with Parkinson's disease:**
- Be an effective partner with your Doctor
- Assemble your multi-disciplinary team
- Exercise, exercise, exercise and exercise
- There is no agreement on any special diet or supplements for PD, but most experts agree that a healthy diet with plenty of water is important

Living well with PD

- Importance of good sleep
- Sign up for clinical trials
- Become a strong advocate for self and others with PD
- Join a support group
- Plan for the future
- Empower self with the best knowledge about PD

Together we can fight Parkinson Disease!

Thank you for listening!