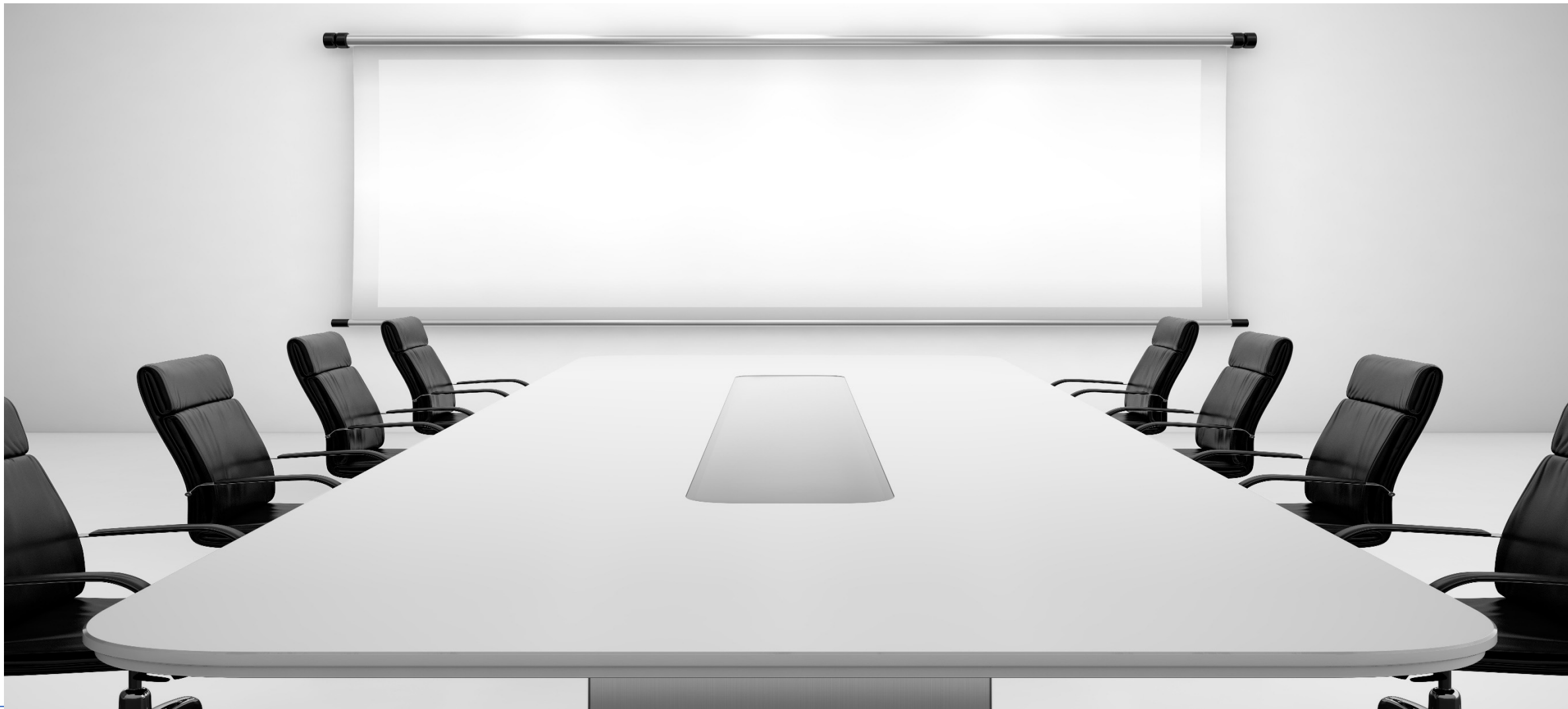




Bc. Janis Lukáš Cert. MDT
Parkinson's Disease, Rehabilitation and Physiotherapy
Based on European Guidelines

16.05.2024

At first..



BIO



TEAM

MUDr Vlasta Bernášková

Bc. Janis Lukáš Cert. MDT

Bc. Jiřína Frohlichová Cert. MDT

Bc. Vendula Haberová

Bc. Anežka Klaubrová

Bc. Kristýna Musilová

Mgr. Ján Dzvóník

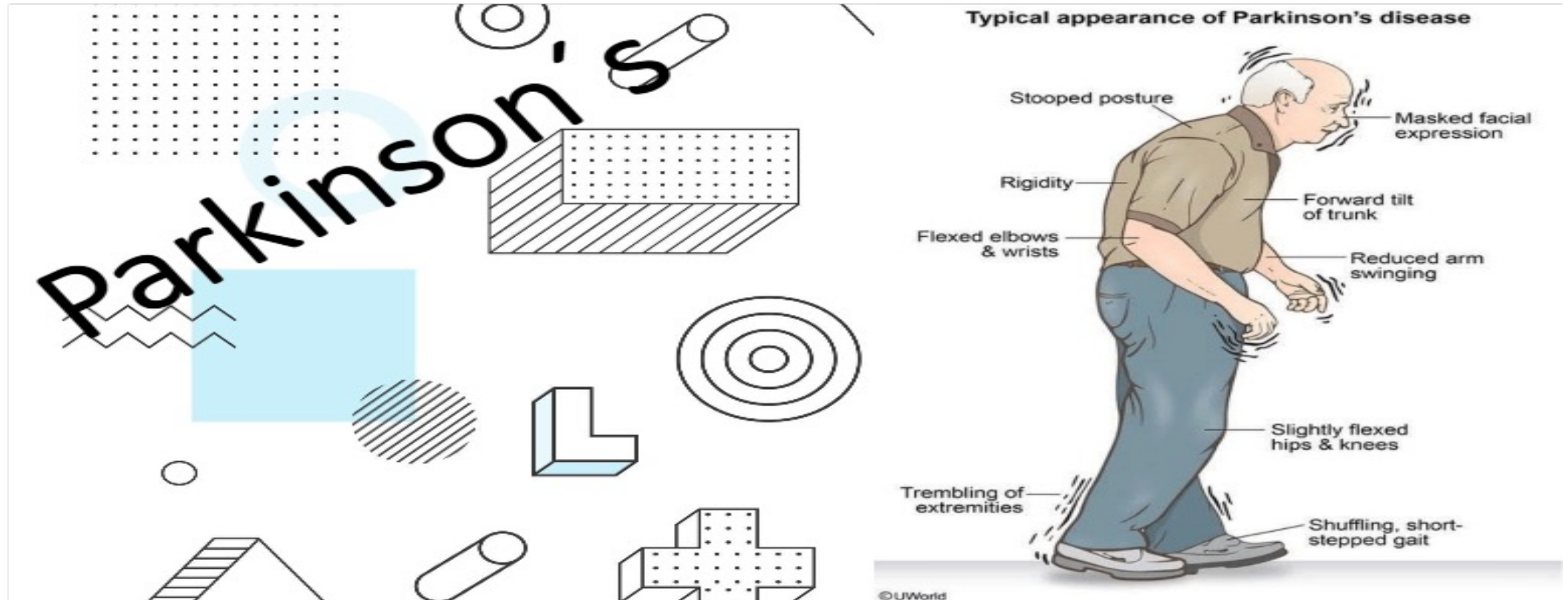
Occupational therapy team

Speech therapist, Neuropsychologists

Rehabilitační nemocnice Beroun



Introduction



”

neurotorium

Parkinson's disease is a disease with growing prevalence and negative effects on quality of life

Boland & Stacy. Am J Manag Care 2012;18(7 Suppl):S168–175

Prevalence

PD in Czech Republic = 30–50.000 with their numbers increasing.

Not only due to population ageing.

PD increased about **22%**.

According to one study PD is the fastest growing neurological disorder leading to, disability and death. We started talking about

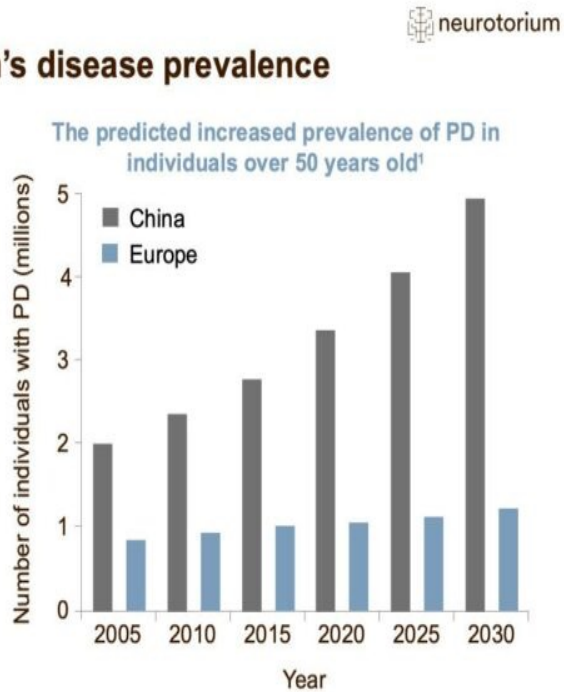
parkinson's pandemic.

Demographics/Statistics/Prevalence

Parkinson's disease

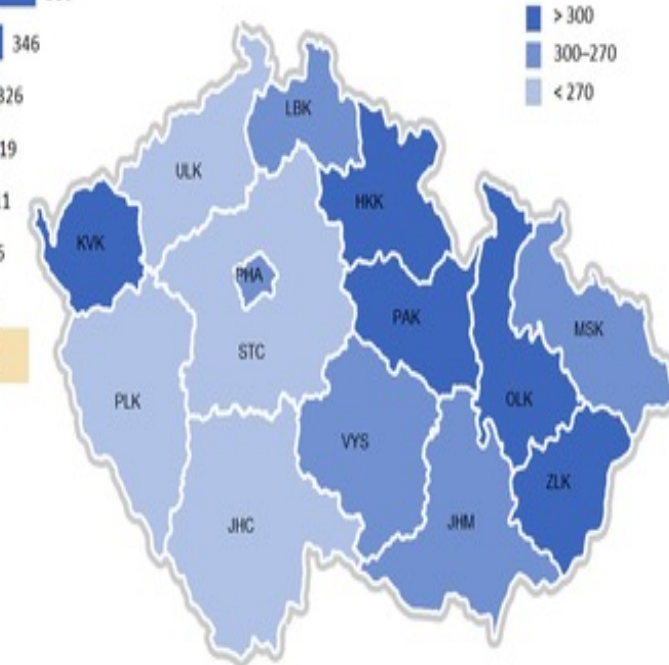
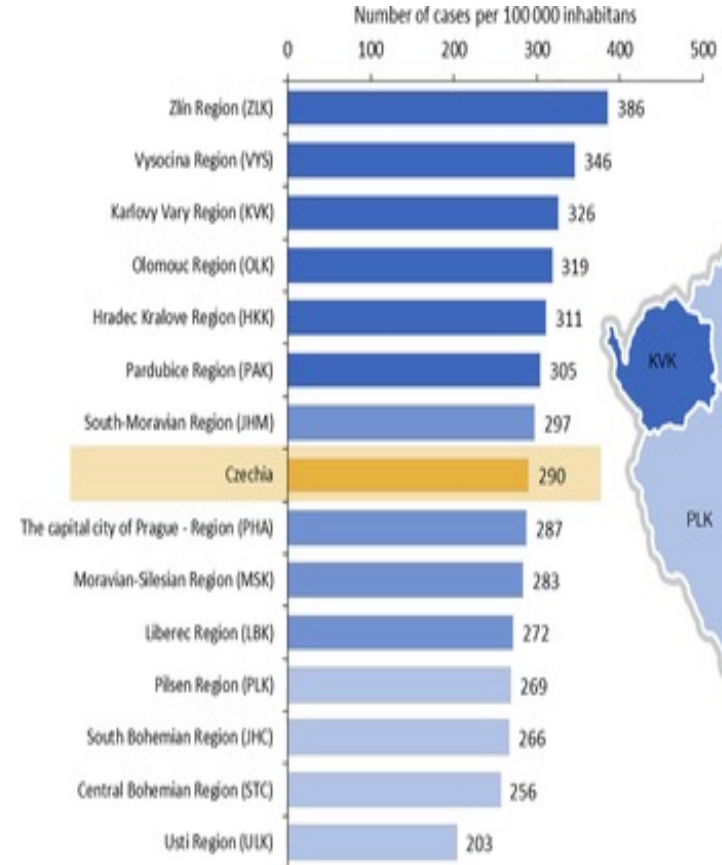
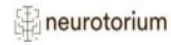
Predictions of the increase in Parkinson's disease prevalence

- Based on an analysis of epidemiological data in Western Europe's 5 most and the world's 10 most populous nations,^a it was estimated that the prevalence of PD in individuals over 50 years of age would rise from 4.1 million people in 2005, to 8.7 million people by 2030¹
- The burden of PD is expected to grow substantially, and to become increasingly concentrated outside the Western world¹



^aEurope: Germany, France, UK, Italy and Spain
The world: China, India, USA, Indonesia, Brazil, Pakistan, Bangladesh, Russia, Nigeria, Japan

1. Dorsey et al. Neurology 2007;68(5):384-386



exposure to excessive levels of manganese may trigger Parkinson's-like neurological symptoms.

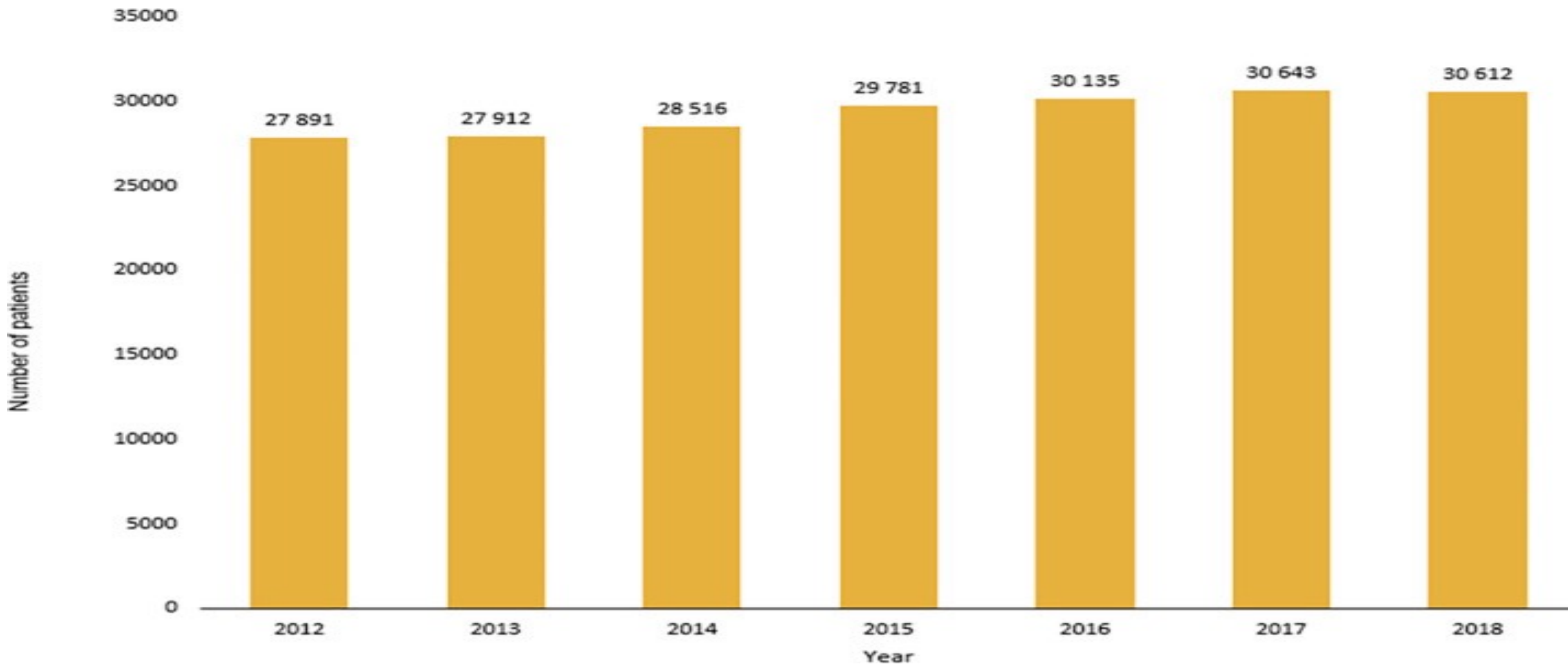


Tanner CM, Goldman SM. Epidemiology of Parkinson's disease. *Neurol Clin* 1996; 14 (2): 317-335.
Hirtz D, Thurman DJ, Gwinn-Hardy K, et al. How common are the "common" neurologic disorders? *Neurology* 2007; 68 (5): 326-337.
European Parkinson's Disease Association website.
<https://www.epda.eu.com>. Accessed February 2017.
Dorsey ER, Constantinescu R, Thompson JP, et al. Projected number of people with Parkinson disease in the most populous nations, 2005 through 2030. *Neurology* 2007; 68 (5): 384-386.

Kwakyé GF, Paoliello MM, Mukhopadhyay S, Bowman AB, Aschner M. Manganese-Induced Parkinsonism and Parkinson's Disease: Shared and Distinguishable Features. *Int J Environ Res Public Health*. 2015 Jul 6;12(7):7519-40. doi: 10.3390/ijerph120707519. PMID: 26154659; PMCID: PMC4515672.

Bůřil J, Bůřilová P, Pokorná A, Kováčková I, Baláž M. Representation of Parkinson's disease and atypical Parkinson's syndromes in the Czech Republic-A nationwide retrospective study. *PLoS One*. 2021 Feb 2;16(2):e0246342. doi: 10.1371/journal.pone.0246342. PMID: 33529251; PMCID: PMC7853522.

Demographics/Statistics/Prevalence



Bůřil J, Bůřilová P, Pokorná A, Kováčová I, Baláž M. Representation of Parkinson's disease and atypical Parkinson's syndromes in the Czech Republic-A nationwide retrospective study. PLoS One. 2021 Feb 2;16(2):e0246342. doi: 10.1371/journal.pone.0246342. PMID: 33529251; PMCID: PMC7853522.

Parkinson's Disease (PD)

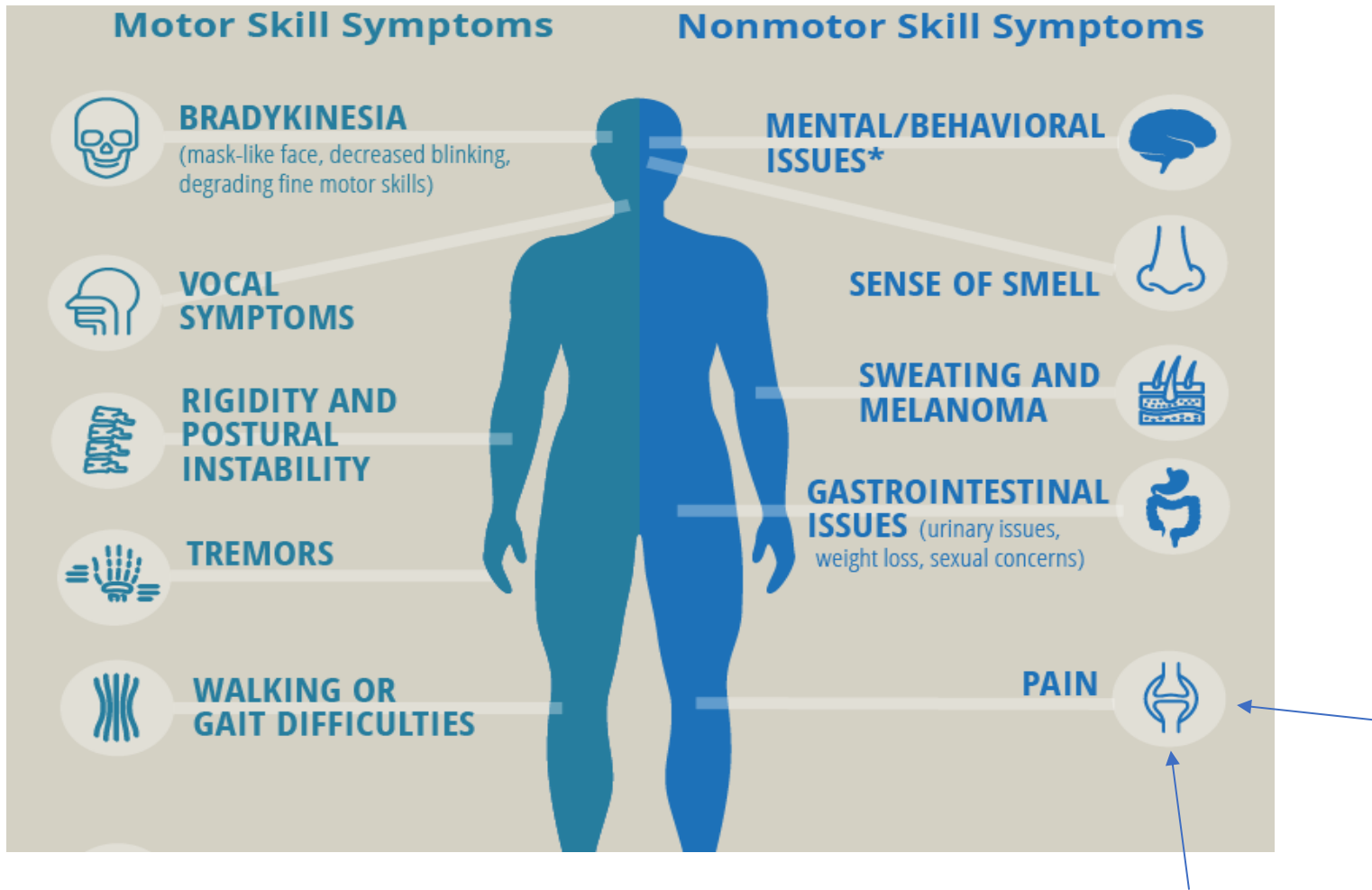
Chronic-progressive disease of the nervous system - neural degeneration of *substantia nigra* and ↓ in **dopamine** production in **basal ganglia**

Cause of PD is unknown, assuming genetical, exo- and endotoxic reasons

Prevalence **PD** is **100-150** cases among **100 000** population, age group over 60 years up to 1%.



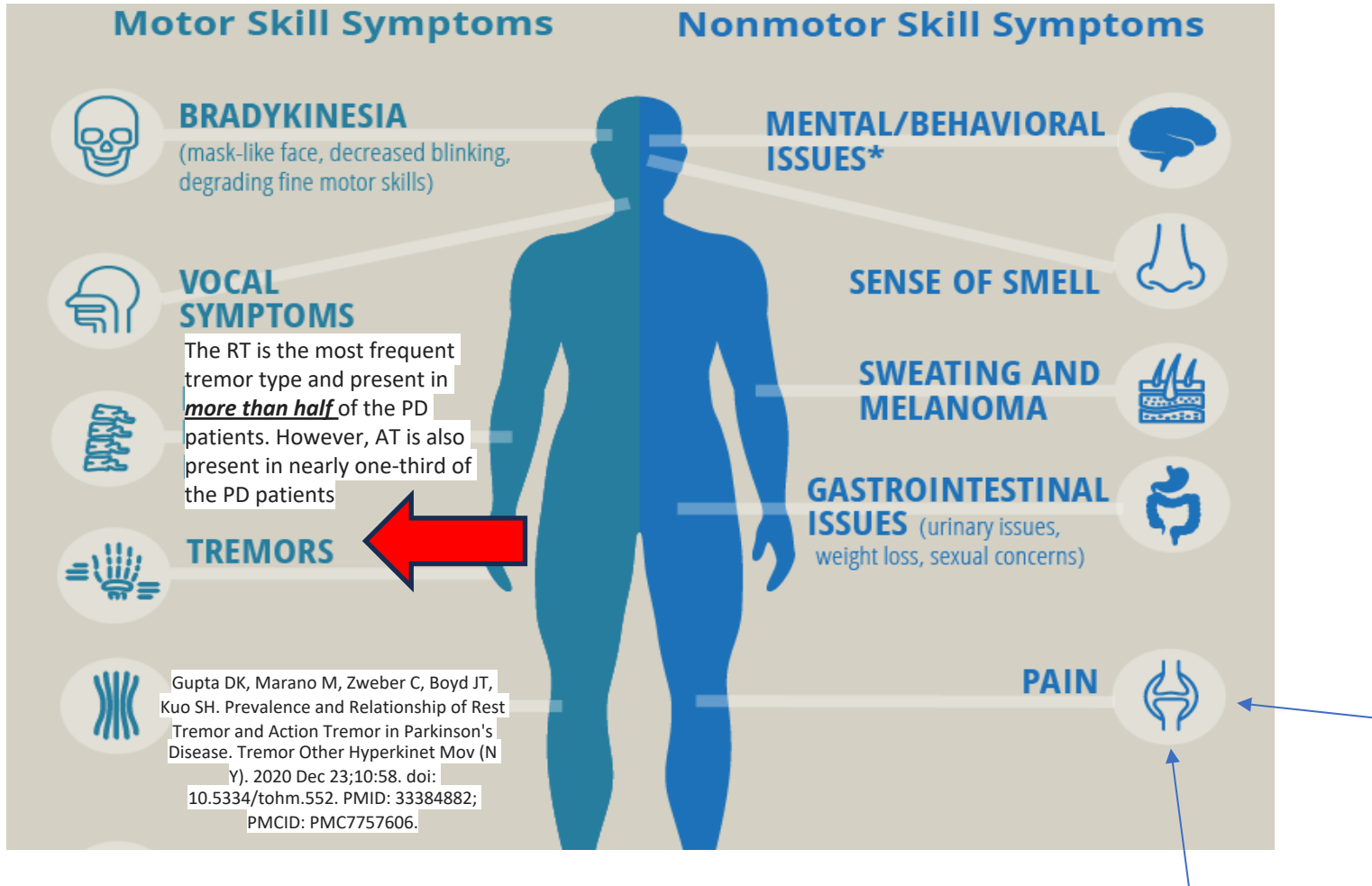
Symptoms



Motor symptoms – Movement disorders (***hypokinesia***, tremor, rigidity). gait, posture (**camptocormia**) and balance disorder

Non motor symptoms - depression, anxiety, sleeping disorders in later stages cognitive decline, leading to dementia and autonomous dysfunctions (disorders of the gastrointestinal functions, incontinency , ortostatic hypotension, etc.).

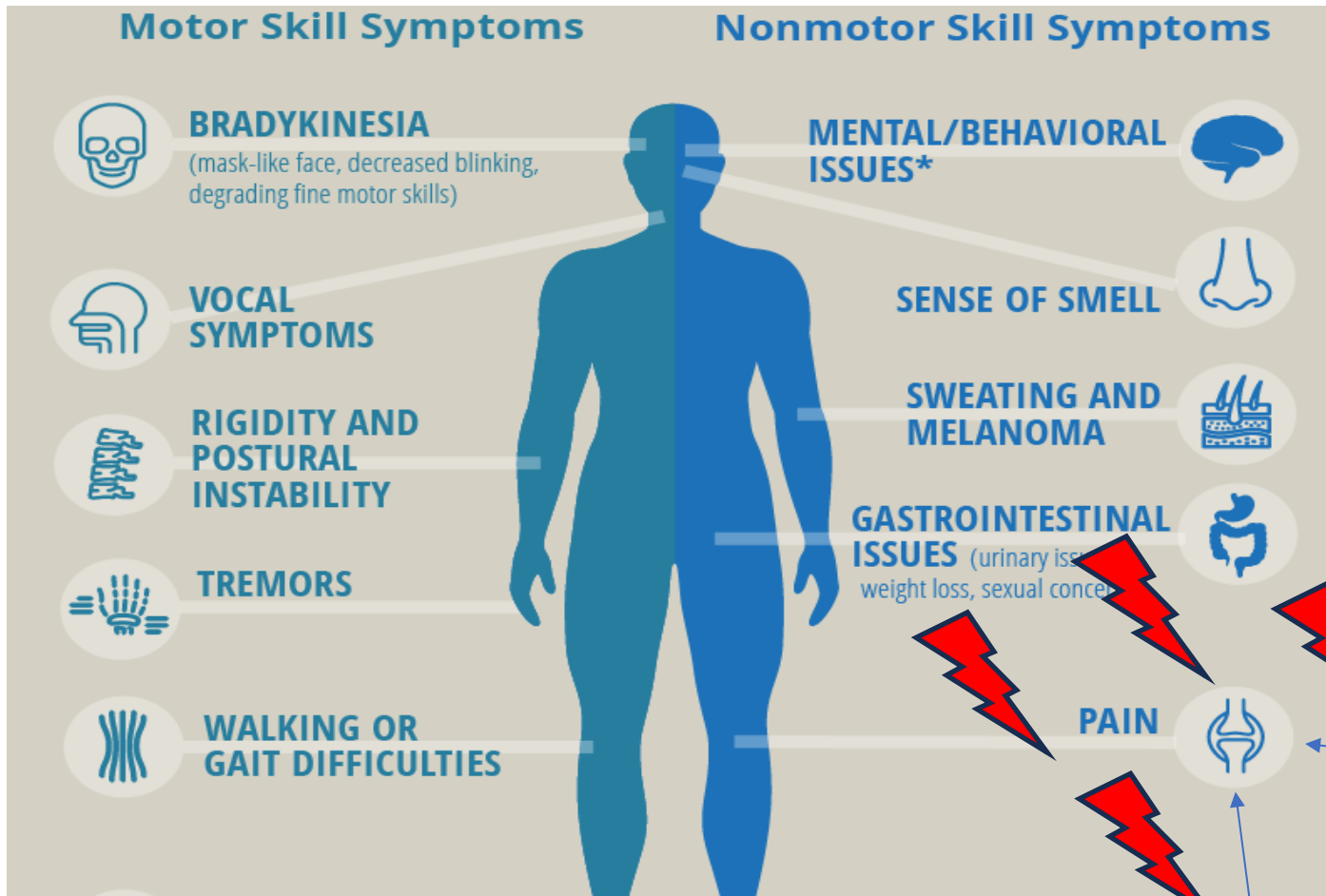
Symptoms



Motor symptoms – Movement disorders (hypokinesia, tremor, rigidity). gait, posture (**camptocormia**) and balance disorder

Non motor symptoms - depression, anxiety, sleeping disorders in later stages cognitive decline, leading to dementia and autonomous dysfunctions (disorders of the gastrointestinal functions, incontinency , ortostatic hypotension, etc.).

Symptoms

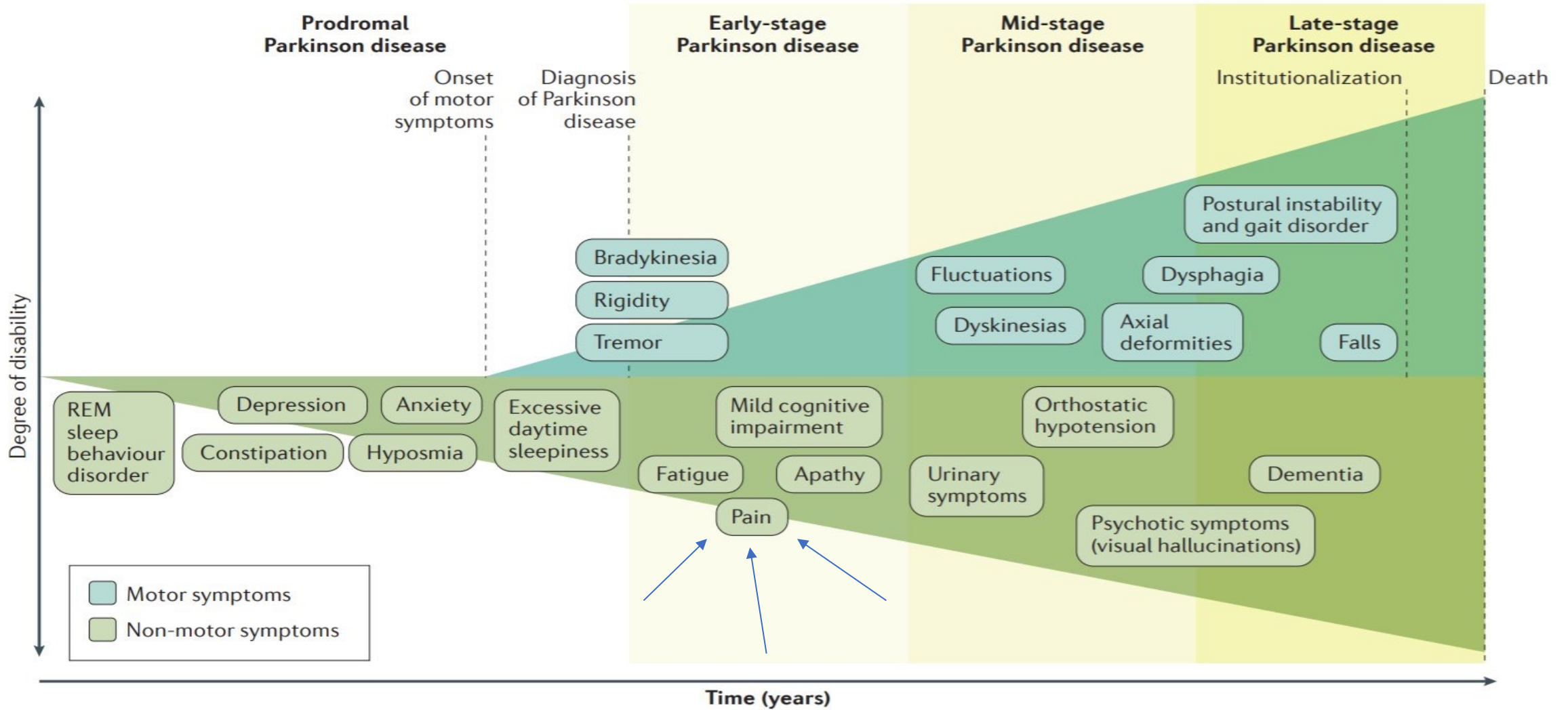


Motor symptoms – Movement disorders (hypokinesia, tremor, rigidity). gait, posture (**camptocormia**) and balance disorder

Non motor symptoms - depression, anxiety, sleeping disorders in later stages cognitive decline, leading to dementia and autonomous dysfunctions (disorders of the gastrointestinal functions, incontinency , ortostatic hypotension, etc.).

Overall, prevalence of **pain was high (95.4%); 91.1%** suffered from chronic pain, but **in only 22.3%** of them, pain disorder was diagnosed

Buhmann C, Wrobel N, Grashorn W, Fruendt O, Wesemann K, Diedrich S, Bingel U. Pain in Parkinson disease: a cross-sectional survey of its prevalence, specifics, and therapy. J Neurol. 2017 Apr;264(4):758-769. doi: 10.1007/s00415-017-8426-y. Epub 2017 Feb 27. PMID: 28243753.



SCOLIOSIS??

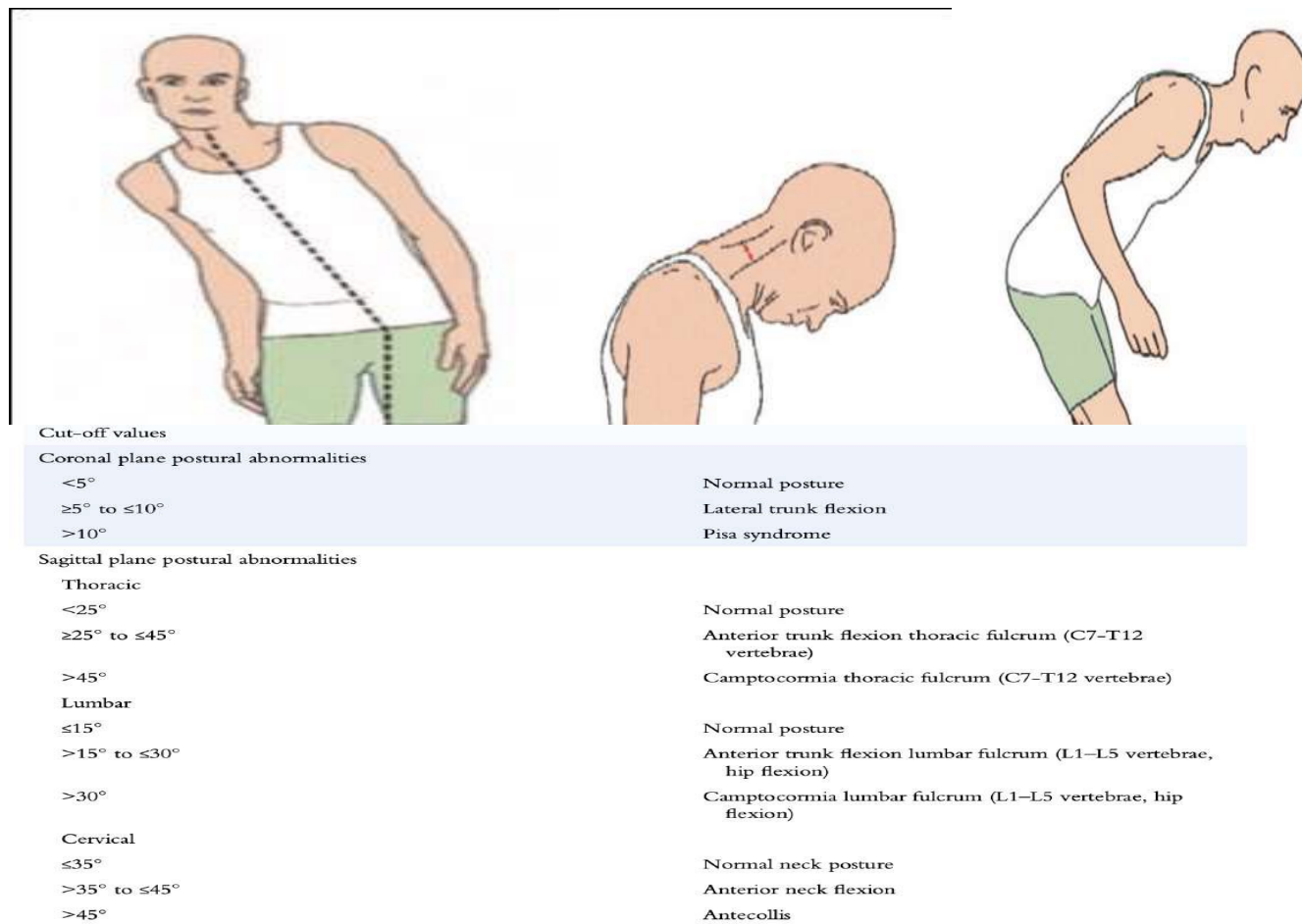
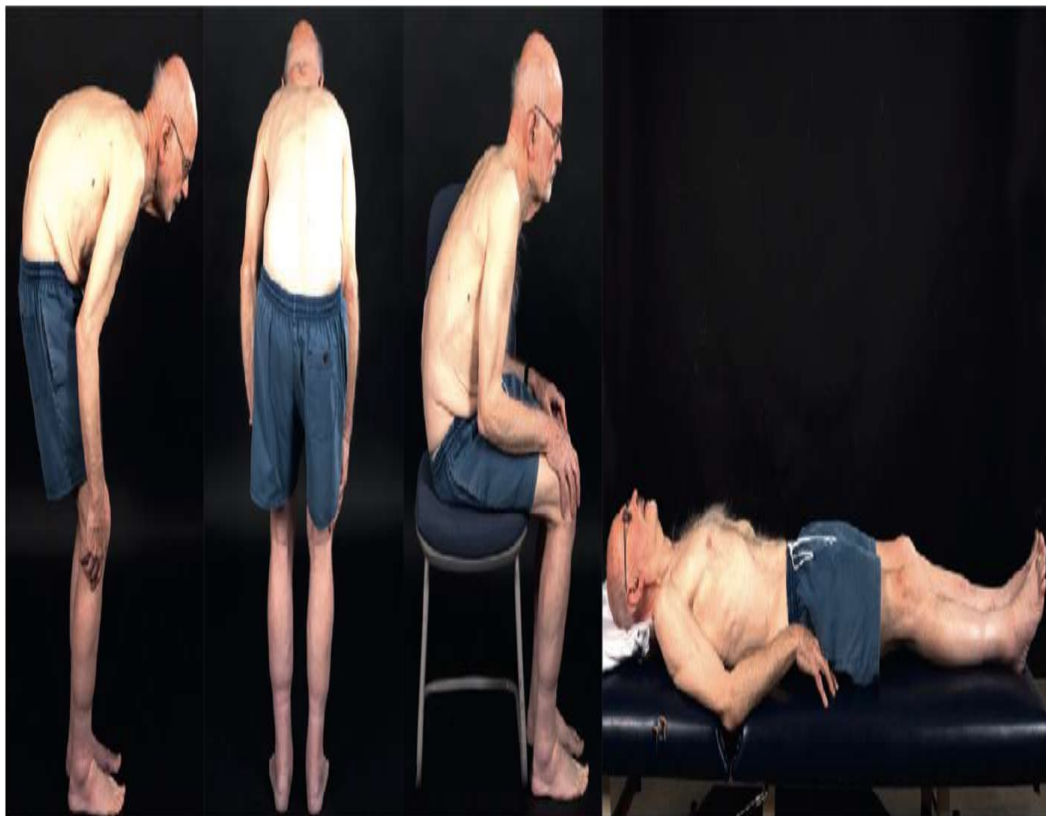


Figure 3: Camptocormia in the standing, seated, and supine positions

Diagnostical criteria

Presence of at least 2 out of 3 main symptoms

- **Tremor** (hands, legs)

- **HYPOKINESIA** [decrease in ROM, slower movements (bradykinesia), problems with initiating a movement (akinesia)]
- **rigidity** (increased muscle tone, resistance in active and passive movements)

Presence of at least 2 out of 4 side symptoms

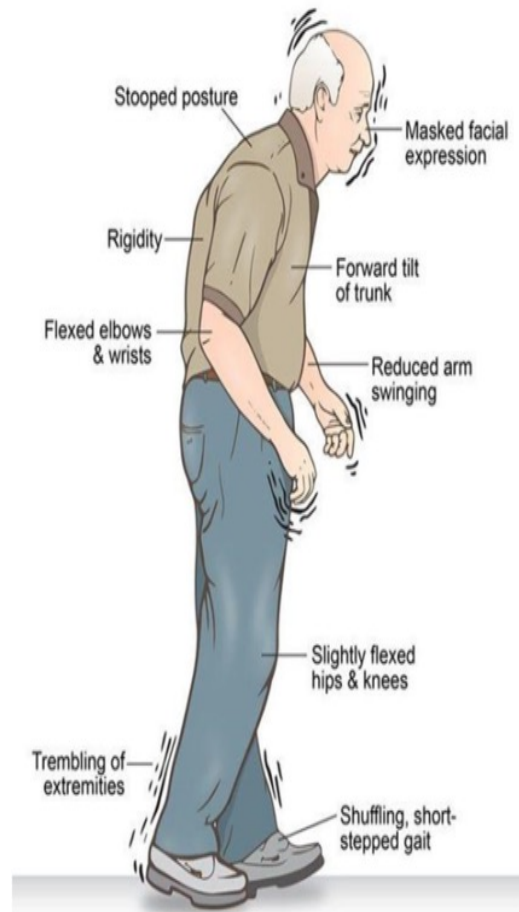
- Gradual progressive disease (sudden onset or faster worsening indicates other diagnosis , Parkinsonian syndromes)
- tremor as first sign
- asymmetrical symptoms at the beginning
- Obvious symptom alleviation after treatment with L-DOPA or agonists of dopamin [if ineffective after dosages of 1 g L-DOPA daily for at least 1 month most propably = **NOT PD**)



RED FLAGS

Presence of other symptoms might indicate another disease like:

- increased postural instability first 3 years
- hallucinations not drug-induced first 3 years
- dementia earlier than motor symptoms or during the first year
- supranuclear gaze palsy or slower vertical visual eye movements
- Unknown reasons / lack of findings (ex. Findings in the brain in specific locations, neuroleptics last 6 months)



T Tremor: shaking, usually starting on one side

R Rigidity: stiffness of the limbs, neck, or trunk

A Akinesia: loss or impairment in power of voluntary movement

P Posture and balance

Differential Diagnosis

Typical

PD - 80% all cases parkinson's

(hypokinetic-rigid) syndrome

Atypical- Parkinson Plus

10% symptomatic PS of other cause

- Vascular disease
- Metabolic
- toxic and drug-induced disorders
- PS hydrocephalus

10% other degenerative neurological disorders with PS

- Progressive Supranuclear Palsy (PSP)
- Multiple system atrophy (MSA)
- Alzheimer's disease
- Lewy body dementia
- Wilson's disease

GUIDELINES

European Physiotherapy Guideline for Parkinson's Disease

Developed with twenty European professional associations



Samyra Keus, Marten Munneke, Mariella Graziano, Jaana Paltamaa, Elisa Pelosin, Josefa Domingos, Susanne Brühlmann, Bhanu Ramaswamy, Jan Prins, Chris Struiksma, Lynn Rochester, Alice Nieuwboer, Bastiaan Bloem;
On behalf of the Guideline Development Group



Domingos J, Keus SHJ, Dean J, de Vries NM, Ferreira JJ, Bloem BR. The European Physiotherapy Guideline for Parkinson's Disease: Implications for Neurologists. *J Parkinsons Dis.* 2018;8(4):499-502. doi: 10.3233/JPD-181383. PMID: 30149464.

Radder DLM, Lígia Silva de Lima A, Domingos J, Keus SHJ, van Nimwegen M, Bloem BR, de Vries NM. Physiotherapy in Parkinson's Disease: A Meta-Analysis of Present Treatment Modalities. *Neurorehabil Neural Repair.* 2020 Oct;34(10):871-880. doi: 10.1177/1545968320952799. Epub 2020 Sep 11. PMID: 32917125; PMCID: PMC7564288.

WHAT DOES THE EVIDENCE SUGGEST?

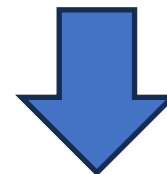
European Physiotherapy Guideline for Parkinson's Disease

Developed with twenty European professional associations



Samyra Keus, Marten Munneke, Mariella Graziano, Jaana Paltamaa, Elisa Pelosin, Josefa Domingos, Susanne Brühlmann, Bhanu Ramaswamy, Jan Prins, Chris Struiksma, Lynn Rochester, Alice Nieuwboer, Bastiaan Bloem;
On behalf of the Guideline Development Group

ACTIVE APPROACH!
RESISTANCE TRAINING

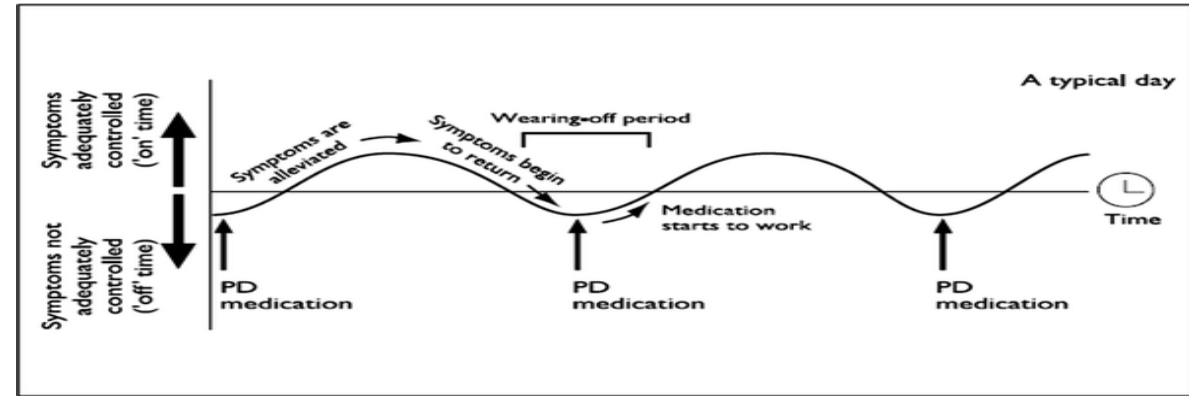


PREVENTION ! NEUROPROTECTION !

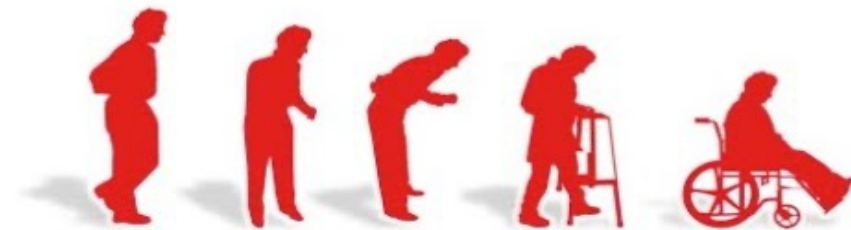


Well organized rehabilitation program

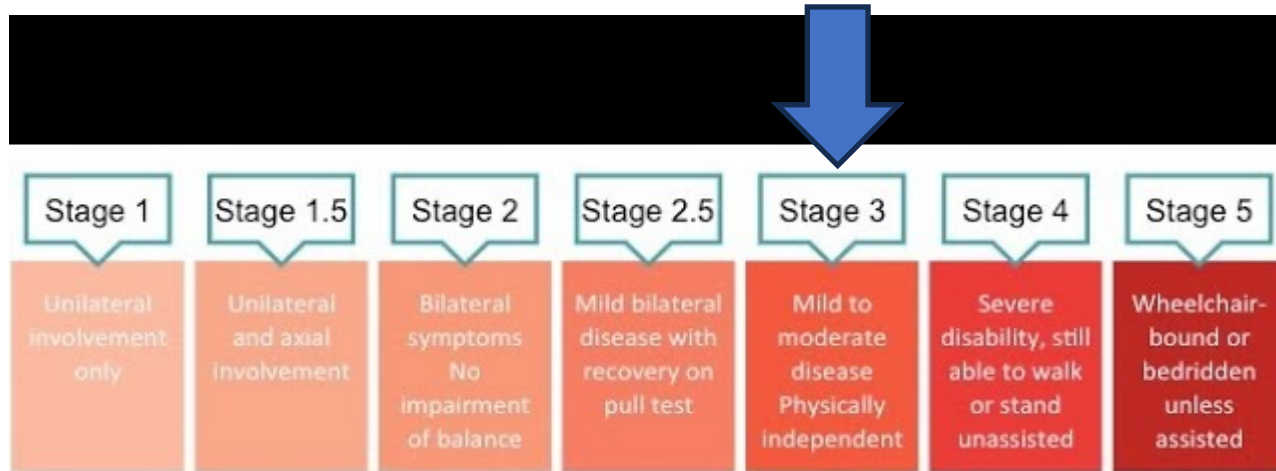
- Diagnosis (**Typical** VS **atypical** PD/PS)
- Complex assessment, Disease stages – early stage the sooner the better !! YH scale 3
- **MEDICATION!** (ON vs OFF)
- Goals – PIF questionnaire (Preassessment Information Form) „Should i visit a physio? formula
- Spiroergometry, individualised maximum patient loading during workout
- Cooperation with movement disorder clinics, speech therapist, Occupational Therapists, neuropsychologist - **multidisciplinary team**



Stage 1	Stage 1.5	Stage 2	Stage 2.5	Stage 3	Stage 4	Stage 5
Unilateral involvement only	Unilateral and axial involvement	Bilateral symptoms No impairment of balance	Mild bilateral disease with recovery on pull test	Mild to moderate disease Physically independent	Severe disability, still able to walk or stand unassisted	Wheelchair-bound or bedridden unless assisted



Why resistance training??



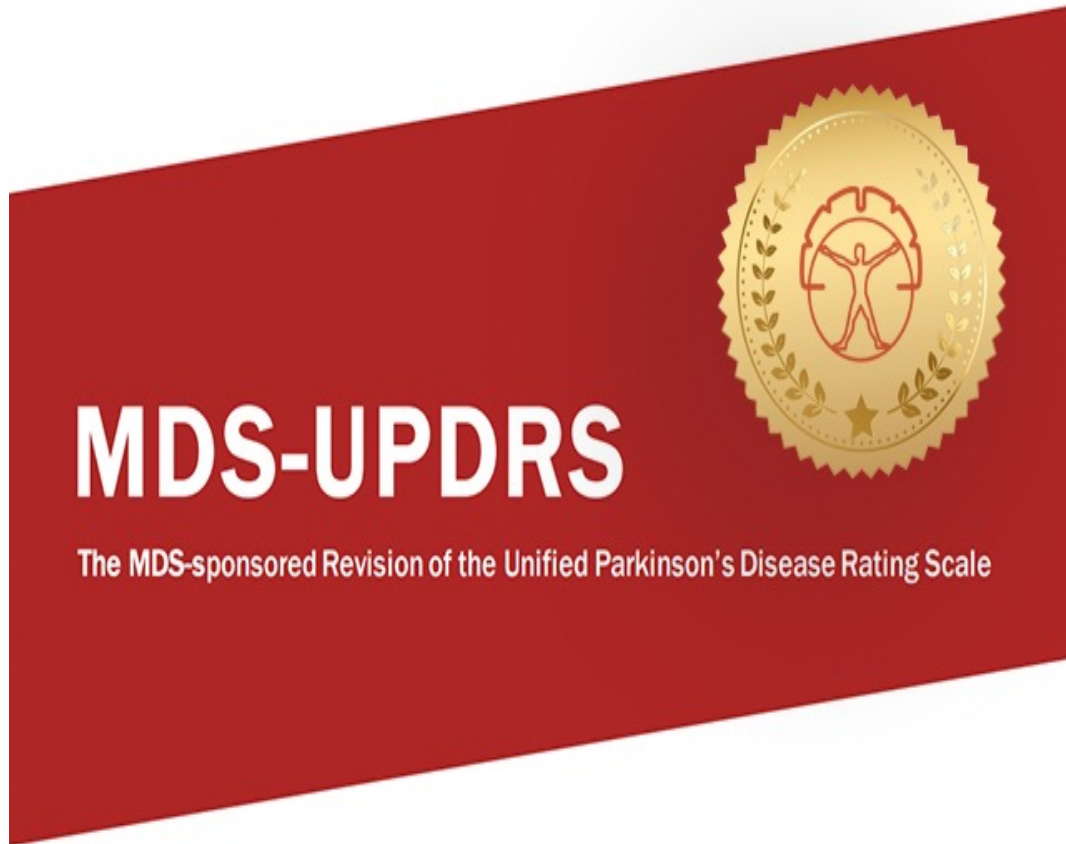
Neuroprotection!

Resistance training

The sooner the better!

HY scale to 3!

Assessment



Unified Parkinson's disease rating scale (UPDRS) - quantification of motor and non motor symptoms (Fahn et al., 1987).

MDS – UPDRS (Goetz et al., 2008)

- Part 1 - nonmotor aspects of ADL
- Part 2 - motor aspects of ADL
- Part 3 – movement assessment
- Part 4 – motor complications of PD
- Takes about 30 minutes (10 minutes Part1, 15 minutes Part III and 5 minutes Part 4). (MDS-UPDRS assesses 65 topics VS 55 previous version UPDRS)
- Rating - score 0-4 (normal, slight, mild, moderate, severe)

Questionnaires

Patient Name or Subject ID		Site ID	(mm-dd-yyyy) Assessment Date	Investigator's Initials
MDS UPDRS Score Sheet				
1.A	Source of information	<input type="checkbox"/> Patient <input type="checkbox"/> Caregiver <input type="checkbox"/> Patient + Caregiver	3.3b Rigidity- RUE 3.3c Rigidity- LUE 3.3d Rigidity- RLE 3.3e Rigidity- LLE 3.4a Finger tapping- Right hand 3.4b Finger tapping- Left hand 3.5a Hand movements- Right hand 3.5b Hand movements- Left hand 3.6a Pronation-supination movements- Right hand 3.6b Pronation-supination movements- Left hand 3.7a Toe tapping- Right foot 3.7b Toe tapping- Left foot 3.8a Leg agility- Right leg 3.8b Leg agility- Left leg 3.9 Arising from chair 3.10 Gait 3.11 Freezing of gait 3.12 Postural stability 3.13 Posture 3.14 Global spontaneity of movement 3.15a Postural tremor- Right hand 3.15b Postural tremor- Left hand 3.16a Kinetic tremor- Right hand 3.16b Kinetic tremor- Left hand 3.17a Rest tremor amplitude- RUE 3.17b Rest tremor amplitude- LUE 3.17c Rest tremor amplitude- RLE 3.17d Rest tremor amplitude- LLE 3.17e Rest tremor amplitude- Lip/jaw 3.18 Constancy of rest Were dyskinesias present? Did these movements interfere with ratings? Hoehn and Yahr Stage	
Part I				
1.1	Cognitive impairment			
1.2	Hallucinations and psychosis			
1.3	Depressed mood			
1.4	Anxious mood			
1.5	Apathy			
1.6	Features of DDS			
1.6a	Who is filling out questionnaire	<input type="checkbox"/> Patient <input type="checkbox"/> Caregiver <input type="checkbox"/> Patient + Caregiver		
1.7	Sleep problems			
1.8	Daytime sleepiness			
1.9	Pain and other sensations			
1.10	Urinary problems			
1.11	Constipation problems			
1.12	Light headedness on standing			
1.13	Fatigue			
Part II				
2.1	Speech			
2.2	Saliva and drooling			
2.3	Chewing and swallowing			
2.4	Eating tasks			
2.5	Dressing			
2.6	Hygiene			
2.7	Handwriting			
2.8	Doing hobbies and other activities			
2.9	Turning in bed			
2.10	Tremor			
2.11	Getting out of bed			
2.12	Walking and balance			
2.13	Freezing			
3a	Is the patient on medication?	<input type="checkbox"/> No <input type="checkbox"/> Yes		
3b	Patient's clinical state	<input type="checkbox"/> Off <input type="checkbox"/> On		
3c	Is the patient on Levodopa?	<input type="checkbox"/> No <input type="checkbox"/> Yes		
3.C1	If yes, minutes since last dose:			
Part III				
3.1	Speech			
3.2	Facial expression			
3.3a	Rigidity- Neck			
Part IV				
4.1	Time spent with dyskinesias			
4.2	Functional impact of dyskinesias			
4.3	Time spent in the OFF state			
4.4	Functional impact of fluctuations			
4.5	Complexity of motor fluctuations			
4.6	Painful OFF-state dystonia			

Copyright © 2008 International Parkinson and Movement Disorder Society. All rights reserved.
This scale may not be copied, distributed or otherwise used in whole or in part without prior written consent of the International Parkinson and Movement Disorder Society.



VŠEOBECNÁ FAKULTNÍ NEMOCNICE V PRAZE

Strana 1

MĚL/A BYCH CHODIT NA REHABILITACI, KDYŽ MÁM PARKINSONOVU NEMOC?

Odpovězte na následující otázky a předejte formulář svému neurologovi.

JMÉNO:		DATUM:	
VYPLŇUJE PACIENT		ANO	NE
Upadl/a nebo zakopnul/a jste v posledním roce, i když to třeba nedáváte do souvislosti s Parkinsonovou nemocí?		<input type="radio"/>	<input type="radio"/>
Stalo se Vám v posledním roce, že jste skoro upadl/a?		<input type="radio"/>	<input type="radio"/>
Máte strach z pádu?		<input type="radio"/>	<input type="radio"/>
Máte potíže s chůzí?		<input type="radio"/>	<input type="radio"/>
Máte potíže se vstáváním ze židle či sedáním na židli?		<input type="radio"/>	<input type="radio"/>
Máte potíže se vstáváním z postele, ulehnutím do postele či s otáčením na bok?		<input type="radio"/>	<input type="radio"/>
Máte kromě psaní také potíže s dalšími manuálními činnostmi, jako je např. uchopení hrnku či zapnutí knoflíků?		<input type="radio"/>	<input type="radio"/>
Alespoň půl hodinové cvičení (například chůze nebo cyklistika) pětkrát týdně je považováno za dostatečné. Dalo by se říci, že obvykle cvičíte méně?		<input type="radio"/>	<input type="radio"/>
Chtěli byste poradit s tím, jak být více fyzicky aktivní?		<input type="radio"/>	<input type="radio"/>
Když Vám „zaskočí“, máte problém si snadno a rychle „odkašlat“?		<input type="radio"/>	<input type="radio"/>
Platí pro Vás, že nedokážete na jeden nádech napočítat nahlas do třiceti? Pokud to nedokážete zaškrtněte „ANO“.		<input type="radio"/>	<input type="radio"/>
Máte pocit, že Vám paměť funguje hůř než dříve?		<input type="radio"/>	<input type="radio"/>
Soustředíte se hůř než dříve?		<input type="radio"/>	<input type="radio"/>
Pocítujete změny v náladě?		<input type="radio"/>	<input type="radio"/>
Máte potíže s vykonáváním běžných denních aktivit?		<input type="radio"/>	<input type="radio"/>
VYPLŇUJE NEUROLOG			
<input type="radio"/> Pacient motivován k rehabilitaci		<input type="radio"/> Rehabilitace indikována	
<input type="radio"/> Pacient schopen dojíždět na RHB		<input type="radio"/> PIF vydán	
Podpis indikujícího lékaře:			
Poznámky pro terapeuta:			

Evers LJW, Krijthe JH, Meinders MJ, Bloem BR, Heskes TM. Measuring Parkinson's disease over time: The real-world within-subject reliability of the MDS-UPDRS. *Mov Disord.* 2019 Oct;34(10):1480-1487. doi: 10.1002/mds.27790. Epub 2019 Jul 10. PMID: 31291488; PMCID: PMC6851993.

Yamamoto T, Yamanaka Y, Hirano S, Higuchi Y, Kuwabara S. Utility of movement disorder society-unified Parkinson's disease rating scale for evaluating effect of subthalamic nucleus deep brain stimulation. *Front Neurol.* 2023 Jan 6;13:1042033. doi: 10.3389/fneur.2022.1042033. PMID: 36686507; PMCID: PMC9852822.



Pre-Assessment Information Form (PIF)

Příloha 2 Formulář PIF

Vypíšte prosím následující formulář PIF (Pre-assessment Information Form, Informační formulář vyplněný pacientem před vyšetřením) před první návštěvou fyzioterapie. Pomůže Vám (případně tomu, kdo o Vás pečuje) se zamyslet nad tím, kterým problémům se chcete s fyzioterapeutem věnovat. Váš fyzioterapeut si díky tomu udělá obrázek o tom, co považujete za hlavní problém(y), a také o Vaší fyzické kondici.

Datum:

Jméno:

Cíl ve fyzioterapii

1. Jaký problém/problémy byste nejraději začal/a řešit na prvním místě?

2. Jakým způsobem jste se snažil/a řešit tento problém/problémy dosud?

3. Jak moc toto Vaše řešení fungovalo?

4. Co byste chtěl/a, aby pro Vás fyzioterapeut udělal?

© ParkinsonNet | KNGF 2014

10. Došlo u vás za poslední měsíc k zamrznutí (freezingu)?

- Ne
- Ano

Fyzická aktivita

11. U každé aktivity, kterou jste za poslední týden provozovali, napište, jak dlouho jste ji dělal/a. Uveďte prosím součet za celý týden.

Aktivita	Celkový čas strávený při aktivitě za poslední týden
Chůze po rovině (doma, venku nebo na běžeckém pásu)	Minuty:
Chůze do kopce, do schodů nebo běh	Minuty:
Jízda na kole po rovině (venku nebo na rotopedu)	Minuty:
Jízda na kole do kopce nebo rychlá jízda (venku nebo na rotopedu)	Minuty:
Tanec, rekreační plavání, gymnastika, skupinové cvičení, jóga, tenisová čtyřhra nebo golf	Minuty:
Vytrvalostní plavání v klidném tempu, tenisová dvouhra nebo veslování	Minuty:
Zametání, mytí oken nebo hrabání listů na zahradě či na dvoře	Minuty:
Práce na zahradě či na dvoře, náročné stavební práce, zvedání těžkých břemen, sekání dřeva nebo odhazování sněhu	Minuty:
Jiné aktivity, prosím uveďte jaké:	Minuty:

12. Jak aktivní jste byl/a v porovnání s ostatními týdny?

- Tento týden aktivnější
- Stejně aktivní
- Tento týden méně aktivní

13. Přestal/a jste v posledních 12 měsících provozovat nějaké pravidelné aktivity?

14. Pokud ano, proč?

© ParkinsonNet | KNGF 2014

10. Došlo u vás za poslední měsíc k zamrznutí (freezingu)?

- Ne
- Ano

Fyzická aktivita

11. U každé aktivity, kterou jste za poslední týden provozovali, napište, jak dlouho jste ji dělal/a. Uveďte prosím součet za celý týden.

Aktivita	Celkový čas strávený při aktivitě za poslední týden
Chůze po rovině (doma, venku nebo na běžeckém pásu)	Minuty:
Chůze do kopce, do schodů nebo běh	Minuty:
Jízda na kole po rovině (venku nebo na rotopedu)	Minuty:
Jízda na kole do kopce nebo rychlá jízda (venku nebo na rotopedu)	Minuty:
Tanec, rekreační plavání, gymnastika, skupinové cvičení, jóga, tenisová čtyřhra nebo golf	Minuty:
Vytrvalostní plavání v klidném tempu, tenisová dvouhra nebo veslování	Minuty:
Zametání, mytí oken nebo hrabání listů na zahradě či na dvoře	Minuty:
Práce na zahradě či na dvoře, náročné stavební práce, zvedání těžkých břemen, sekání dřeva nebo odhazování sněhu	Minuty:
Jiné aktivity, prosím uveďte jaké:	Minuty:

12. Jak aktivní jste byl/a v porovnání s ostatními týdny?

- Tento týden aktivnější
- Stejně aktivní
- Tento týden méně aktivní

13. Přestal/a jste v posledních 12 měsících provozovat nějaké pravidelné aktivity?

14. Pokud ano, proč?

© ParkinsonNet | KNGF 2014

© ParkinsonNet | KNGF 2014

15. Zatrhňte prosím, zda tyto aktivity považujete za obtížné nebo zda při nich máte potíže jako je zamrznutí (freezing), nestabilita nebo bolest:

Doména	Aktivita	Obtížné	Snadné
Chůze	Chůze v interiéru		
	Chůze v exteriéru		
	Otačení		
	Začátek chůze		
	Chůze do schodů a ze schodů		
	Chůze spolu se současným prováděním druhé aktivity		
Transfery	Chůze v úzkém prostoru		
	Zastavení		
	Otačení na lůžku		
	Vstávání z postele nebo si lehnout si		
	Nastupování do auta nebo vystupování z auta		
	Posazování ze židle nebo postavování na židli		
Manuální aktivity	Posazování na toaletu nebo zvednutí se z toalety		
	Zvedání předmětů ze země		
	Vstávání ze země		
	Nasedání na kolo nebo sesedání z kola		
	Vstup do vany nebo výstup z vany		
	Běžné manuální aktivity jako je příprava pokrmů nebo domácí práce		
	Sebeobsluha jako najíst se, umýt se nebo obléknout se		

16. Prosím zaškrtněte, zda míváte tyto pocity:

Doména	Aktivita	Ano	Ne
Tělesné funkce	Snadno se zadýchám		
	Svalová slabost		
	Zluchlost		
Bolest	Bolest		

Zvažte, zda k fyzioterapeutovi nechtete přijít s tím, kdo o Vás pečuje, nebo s kamarádem či kamarádkou: Víc hlav víc ví!



Jenkinson C, Fitzpatrick R, Peto V, Greenhall R, Hyman N. The Parkinson's Disease Questionnaire (PDQ-39): development and validation of a Parkinson's disease summary index score. Age Ageing. 1997 Sep;26(5):353-7. doi: 10.1093/ageing/26.5.353. PMID: 9351479.

Opara J, Małecki A, Małecka E, Socha T. Motor assessment in Parkinson's disease. Ann Agric Environ Med. 2017 Sep 21;24(3):411-415. doi: 10.5604/12321966.1232774. Epub

2017 May 11. PMID: 28954481.

5. Je něco dalšího, co by o Vás měl fyzioterapeut vědět (např. jiné zdravotní obtíže mimo Parkinsonovu nemoc)?

6. Je něco, na co byste se chtěl/a fyzioterapeuta zeptat?

Pády

7. Upadl/a jste za poslední rok, ať už z jakéhokoliv důvodu, kvůli zakopnutí nebo uklouznutí, byť by to pravděpodobně nemuselo souviset s Parkinsonovou nemocí?

- Ne
- Ano

8. Stalo se Vám za poslední rok, že byste málem upadl/a, ale nakonec se Vám podařilo pádu předejít?

- Ne
- Ano

9. Jak velký máte strach z pádů?

- Vůbec ne
- Trochu
- Poměrně dost
- Velmi

Zamrznutí (freezing)

Zamrznutí (freezing) označuje pocit jako byste měl/a nohy přilepené k podlaze. Někdy ho doprovází třes dolních končetin a krátké, šouravé krůčky. Objevuje se při rozejití, v otočkách, při procházení zúženými prostory nebo při chůzi v přelidněných prostorech. Pokud si nejste jisti, zda u vás k zamrznutí (freezing) dochází, podívejte se na video zamrznutí (freezingu) na webové stránce www.parkinsonnet.info/euguideline

SETTING GOALS!

Stability and falls

Walking

Transfers

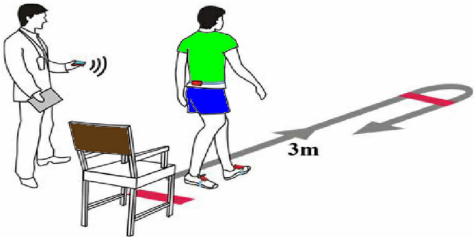
Manual dexterity

Physical capacity

Respiratory function



Clinical Assessment and baselines



- **5 Times Sit To Stand Test (5TSTS)**

- **Timed Up and GO (TUG)**

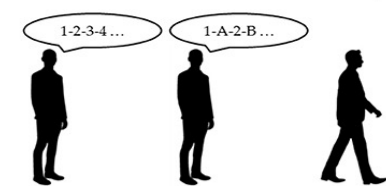
- **Dual Task (DTUG or D5TSTS)**

- **Freezing**

- **Stability**

- **6 minute walking test (6MWT)**

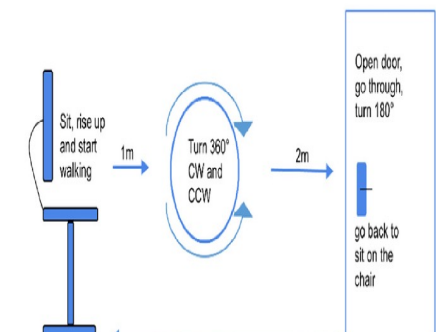
Oral TMT – A Oral TMT – B Walking



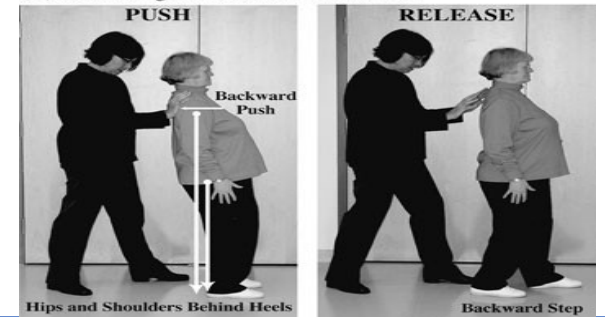
Oral TMT – A + Walking Oral TMT – B + Walking



Freezing



(A) Performing the Push and Release Test



Kanellos FS, Tsamis KI, Rigas G, Simos YV, Katsenos AP, Kartsakalis G, Fotiadis DI, Vezyraki P, Peschos D, Konitsiotis S. Clinical Evaluation in Parkinson's Disease: Is the Golden Standard Shiny Enough? Sensors (Basel). 2023 Apr 7;23(8):3807. doi: 10.3390/s23083807. PMID: 37112154; PMCID: PMC10145765.

Falvo MJ, Earhart GM. Reference equation for 6-minute walk in individuals with Parkinson disease. J Rehabil Res Dev. 2009;46(9):1121-6. doi: 10.1682/jrrd.2009.04.0046. PMID: 20437318; PMCID: PMC2867249.

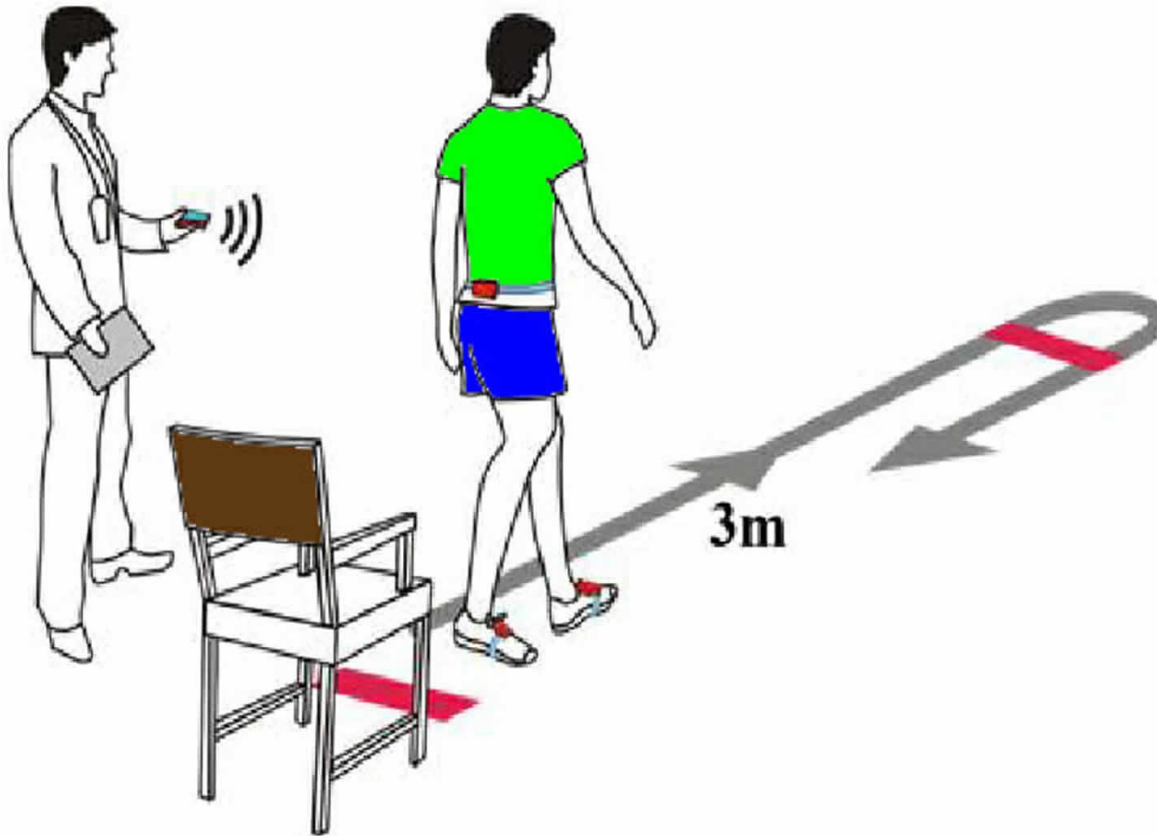
Brusse KJ, Zimdars S, Zalewski KR, Steffen TM. Testing functional performance in people with Parkinson disease. Phys Ther. 2005 Feb;85(2):134-41. PMID: 15679464.

Baselines



- **5 Times Sit To Stand Test (5TSTS)**
- Balance, Risk of Falling, Lower Limb strength
- score :
 - 50-59 (20) $7,7 \pm 2,6$ sec
 - 60-69 (25) $7,8 \pm 2,4$ sec
 - 70-79 (24) $9,3 \pm 2,1$ sec
 - 80-85 (14) $10,8 \pm 2,6$ sec
 - 50-85 (83) $8,7 \pm 2,6$ sec
- PD patients (Hoehn & Yahr 1-4) cut off score 16s, whereas **> 16s indicates Risk of falling**

Baselines



- **Timed Up and GO (TUG)**

- Information regarding patient's mobility, posture during walking

Interpretation (general population, regardless of age)

≤10s normal

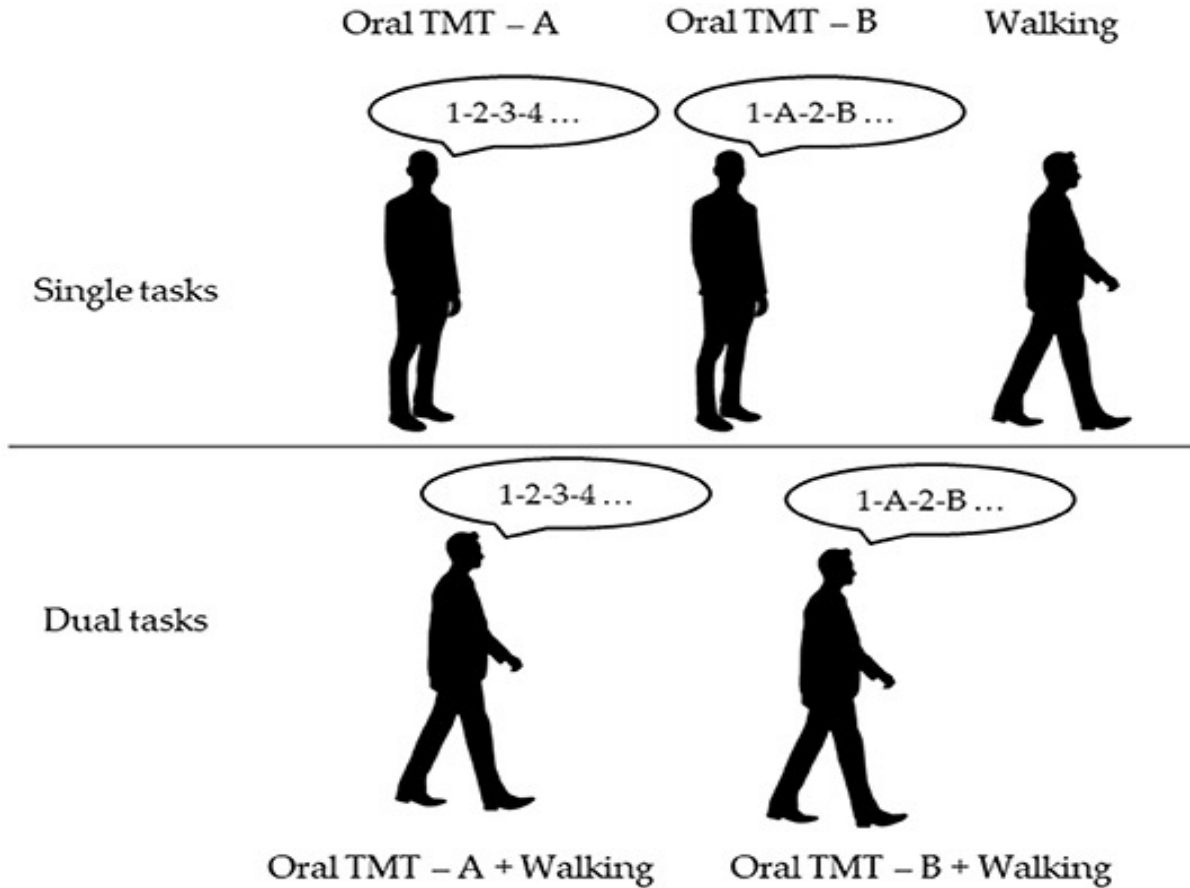
≤20s good mobility, independent, without the need of support from another person

≤30s mobility problems, unable to walk alone, needs support

Score ≤14 – **Risk of falling**

Finally, of clinical significance, a proposed **cut score of 11.5 seconds** was identified as representing the highest specificity and sensitivity to discriminate fallers from nonfallers

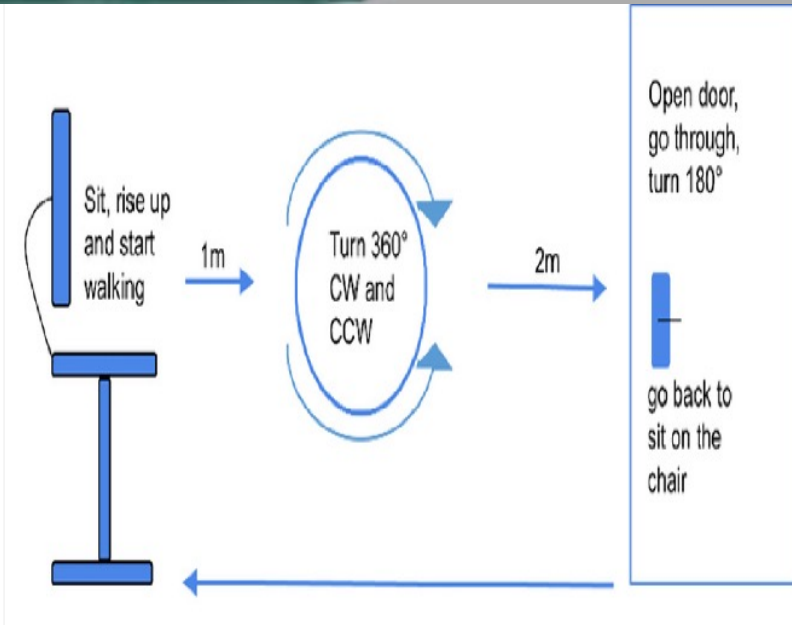
Baselines



- Dual Task (DTUG or D5TSTS)

- 2 modifications TUG test
- Cognitive and Manual/Motor
- Dual task = doing two things simultaneously. Dual Task can significantly change walking, especially the speed or cognition

Baselines



Baselines

Stability (Proactive, Static, Reactive)

+use of balance tester

(A) Performing the Push and Release Test

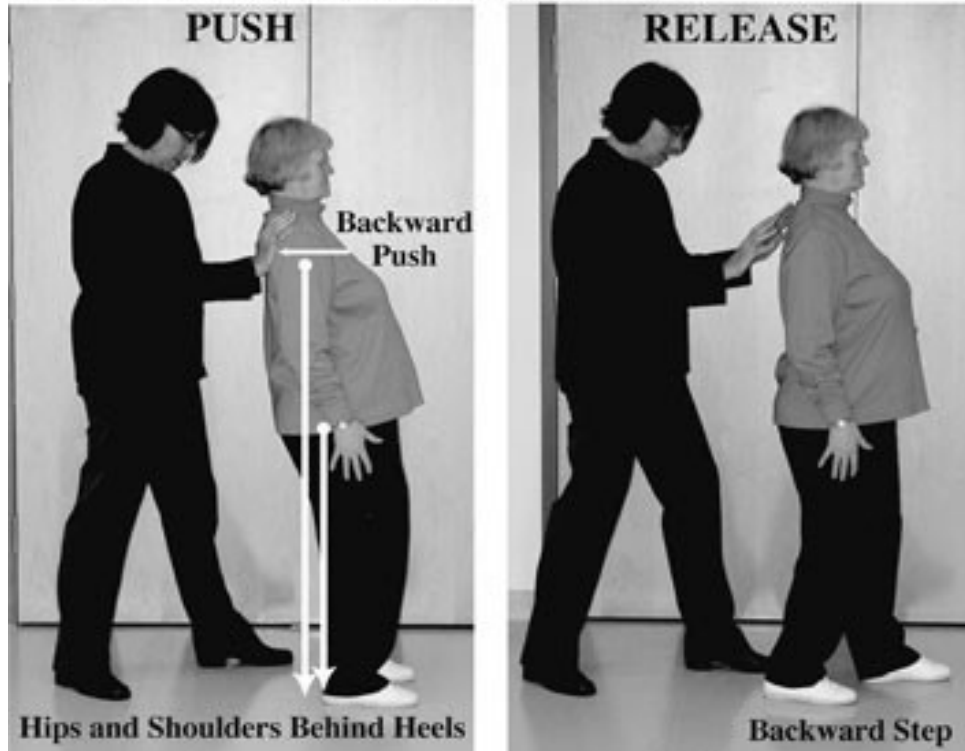


Table 3

Proposed scoring of the push and release test

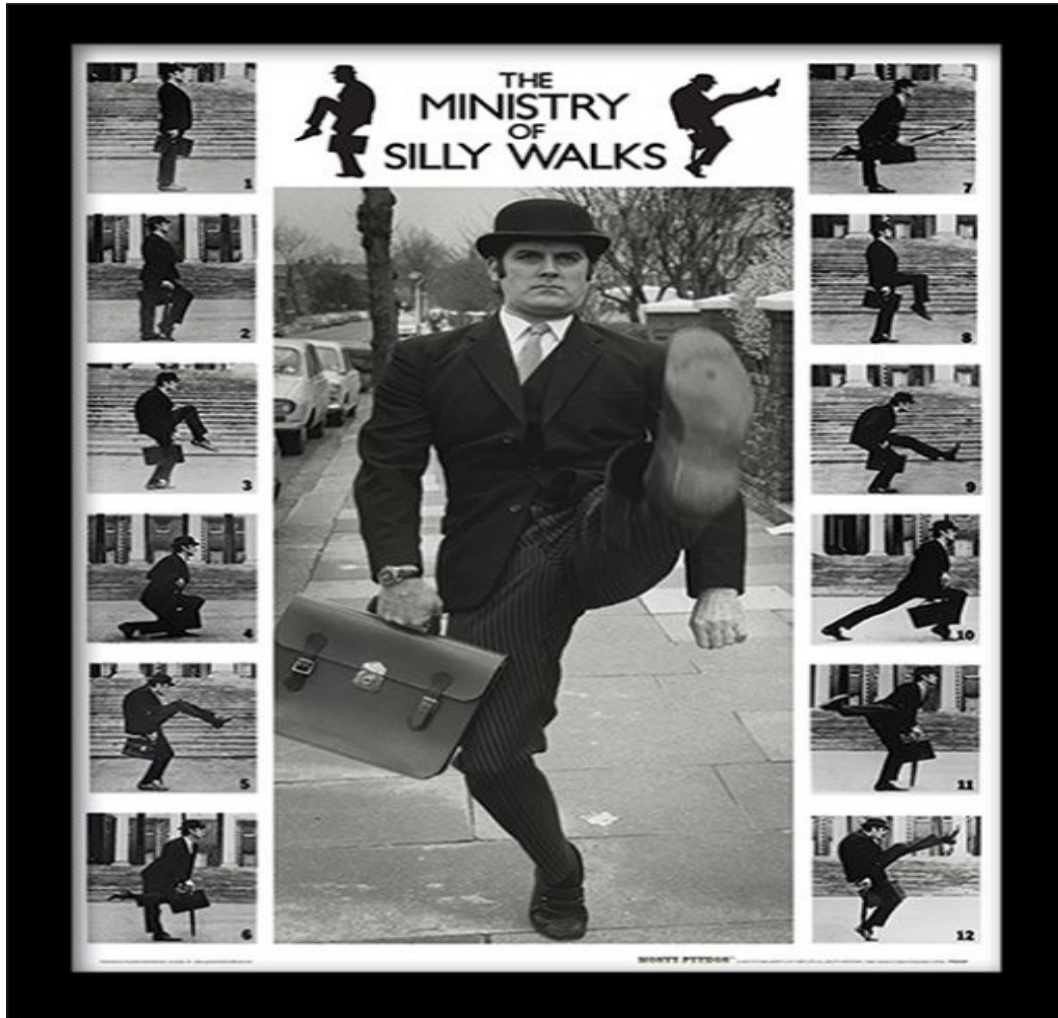
0	Recovers independently with one step of normal length and width
1	Two to three small steps backward, but recovers independently
2	Four or more steps backward, but recovers independently
3	Steps, but need to be assisted to prevent a fall
4	Falls without attempting a step or unable to stand without assistance

Baselines



- **6 minute walking test (6MWT)**
- Assessing the **distance** patient is able to cover as fast as he can during 6 minutes
- Not only about distance but also level of physical activity, capacity and function of the cardiorespiratory system thanks to Borg scale, saturation and blood pressure levels.
- (Borg Scale 0-10 0= no fatigue 10=extreme fatigue)

Sometimes it looks like this



Ergospirometry



Therapy is focused on aerobic resistance based on each individual's maximum loading capacity

Ergospirometry ideally before hospitalisation or prior to initiating outpatient circuit training

Monitoring during training



From theory to practice

- ✓ Outpatients and inpatients
- ✓ Individual or group sessions
- ✓ Double filter
- ✓ Doctor appointments twice a month
- ✓ Using same battery of tests to communicate better



Training

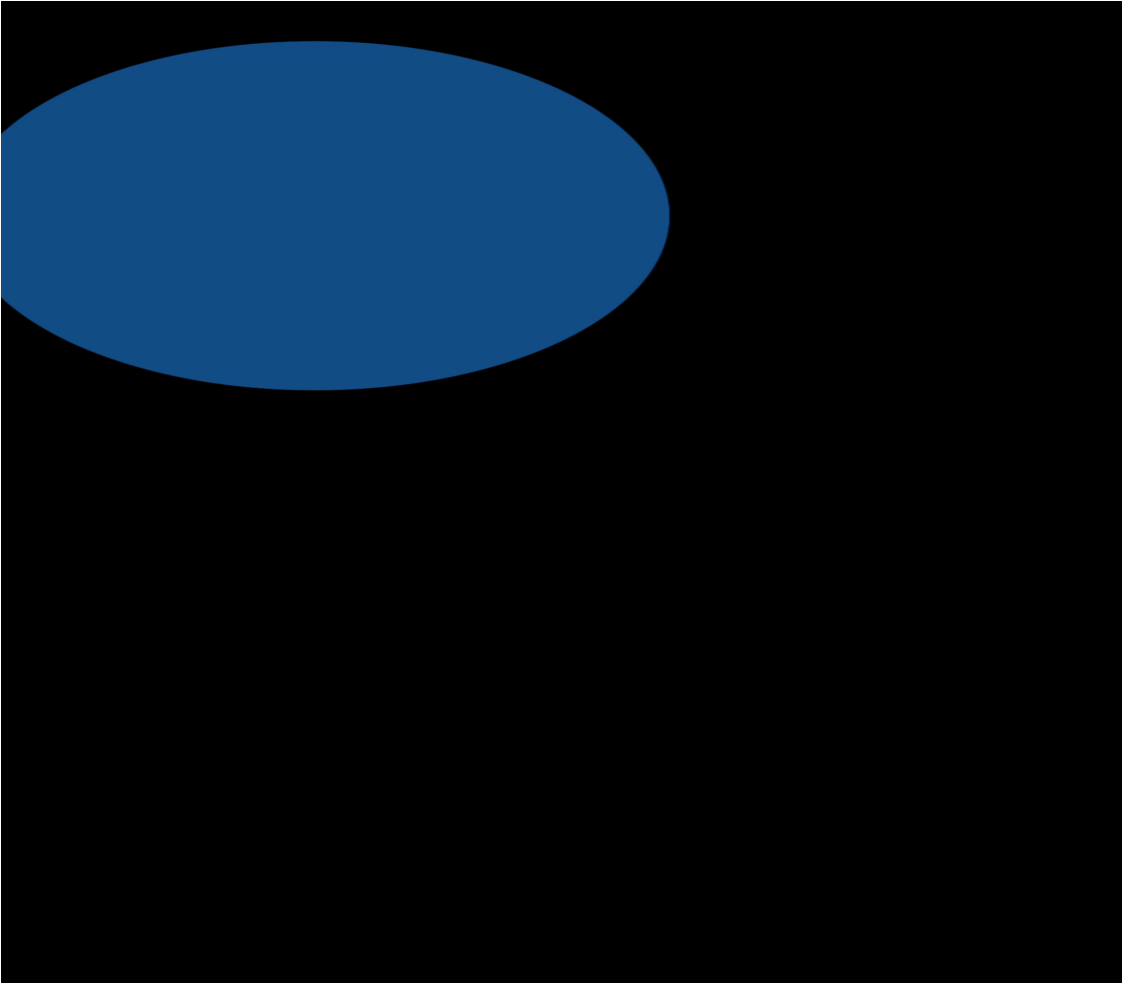


Training balance individually



Freezing strategies





- Proactive stability
- Stride length
- Getting up from sitting position
- BIG movements

Groups



Circuit training



Circuit training **2-3** times a **week**

Up to 10 people (usually 5-8)

60 minutes (6 rounds, **40 secs** exercise
20sec break , **1minute pause** after **1 round**)

At first 5 exercises gradually 7-8

Upper extremities, Lower extremities (PD
specific , BIG)

Newly crossfit! 60minute sessions x2 a week

(10-15minutes workout, various exercises
from deadlift to squat , kettlebell swings etc.)

Crossfit



Circuit training videos



Eldemir S, Guclu-Gunduz A, Eldemir K, Saygili F, Yilmaz R, Akbostanci MC. The effect of task-oriented circuit training-based telerehabilitation on upper extremity motor functions in patients with Parkinson's disease: A randomized controlled trial. *Parkinsonism Relat Disord.* 2023 Apr;109:105334. doi: 10.1016/j.parkreldis.2023.105334. Epub 2023 Feb 28. PMID: 36917914.

Soke F, Guclu-Gunduz A, Kocer B, Fidan I, Keskinoglu P. Task-oriented circuit training combined with aerobic training improves motor performance and balance in people with Parkinson's Disease. *Acta Neurol Belg.* 2021 Apr;121(2):535-543. doi: 10.1007/s13760-019-01247-8. Epub 2019 Nov 18. PMID: 31741209.

Sum it Up

Typical PD HY scale to 3 = resistance training (supported by studies)
NEUROPROTECTION- Prevention



Future studies??

Dif. Diagn. **Atypical** PD , worse prognosis not enough data , neuroprotection?



Patients sent from movement disorder centres + Neurological clinics assessed by our Psychiatrist



Based on assessment :

- hospitalisation (individual/group/both) 4 groups up to 6 people last year
- Outpatient (group/individual)



Physical Therapy assessment (double filter)



Lau YS, Patki G, Das-Panja K, Le WD, Ahmad SO. Neuroprotective effects and mechanisms of exercise in a chronic mouse model of Parkinson's disease with moderate neurodegeneration. *Eur J Neurosci.* 2011 Apr;33(7):1264-74. doi: 10.1111/j.1460-9568.2011.07626.x. Epub 2011 Mar 7. PMID: 21375602; PMCID: PMC3079264.

Tsai WL, Chen HY, Huang YZ, Chen YH, Kuo CW, Chen KY, Hsieh TH. Long-Term Voluntary Physical Exercise Exerts Neuroprotective Effects and Motor Disturbance Alleviation in a Rat Model of Parkinson's Disease. *Behav Neurol.* 2019 Dec 5;2019:4829572. doi: 10.1155/2019/4829572. PMID: 31885725; PMCID: PMC6915149.

Palasz E, Niewiadomski W, Gasiorowska A, Wysocka A, Stepniewska A, Niewiadomska G. Exercise-Induced Neuroprotection and Recovery of Motor Function in Animal Models of Parkinson's Disease. *Front Neurol.* 2019 Nov 1;10:1143. doi: 10.3389/fneur.2019.01143. PMID: 31736859; PMCID: PMC6838750

IN A NUTSHELL

PD able to = Training groups



PD not able to = Lighter training groups
or individually according to their symptoms and stage



Prevent falling/freezing/worsening etc



EFFORT

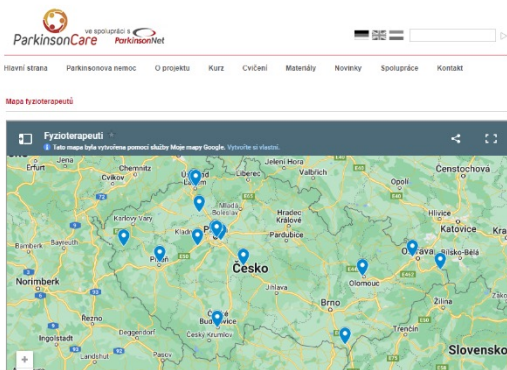
- **Hard to start**(sending emails,informing)
- **Motivation** (sometimes hard to convince)
- **Resilience** (only few case at first)
- **Not so hard to mantain**(logistics,workload)
- **Teamwork**
- **Only few clinics** with small capacity



Spread the word!



Najděte fyzioterapeuta
ve svém okolí



	2022 <u>1.3%</u> of all patients	2023 <u>2%</u> of all patients	2024 <u>2.7%</u> of all patients	?	?
Hospitalised	30	60	31+		
Outpatient	15	40	20+		
Overall	45	100	??		

Minimum=10 PD patients a year!

The reason we do this



Hi there, I would like to share options of outpatient rehabilitation training for people with Parkinson's Disease,





Thank you for your attention

Bc. Janis Lukáš Cert. MDT

janisloukas@seznam.cz

www.nemocnice-beroun.cz