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Parkinson's Disease Current Awareness Bulletin

April 2018

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Title: Prediction of Falls in Subjects Suffering From Parkinson Disease, Multiple Sclerosis, and Stroke.

Citation: Archives of Physical Medicine & Rehabilitation; Apr 2018; vol. 99 (no. 4); p. 641-651

Author(s): Beghi, Ettore; Gervasoni, Elisa; Pupillo, Elisabetta; Bianchi, Elisa; Montesano, Angelo; Aprile, Irene; Agostini, Michela; Rovaris, Marco; Cattaneo, Davide

Objective: To compare the risk of falls and fall predictors in patients with Parkinson disease (PD), multiple sclerosis (MS), and stroke using the same study design.

Design: Multicenter prospective cohort study.

Setting: Institutions for physical therapy and rehabilitation. Participants Patients (N=299) with PD (n=94), MS (n=111), and stroke (n=94) seen for rehabilitation. Interventions Not applicable.

Main Outcome Measures: Functional scales were applied to investigate balance, disability, daily performance, self-confidence with balance, and social integration. Patients were followed for 6 months. Telephone interviews were organized at 2, 4, and 6 months to record falls and fall-related injuries. Incidence ratios, Kaplan-Meier survival curves, and Cox proportional hazards models were used.

Results: Of the 299 patients enrolled, 259 had complete follow-up. One hundred and twenty-two patients (47.1%) fell at least once; 82 (31.7%) were recurrent fallers and 44 (17.0%) suffered injuries; and 16%, 32%, and 40% fell at 2, 4, and 6 months. Risk of falls was associated with disease type (PD, MS, and stroke in decreasing order) and confidence with balance (Activities-specific Balance Confidence [ABC] scale). Recurrent fallers were 7%, 15%, and 24% at 2, 4, and 6 months. The risk of recurrent falls was associated with disease type, high educational level, and ABC score. Injured fallers were 3%, 8%, and 12% at 2, 4, and 6 months. The only predictor of falls with injuries was disease type (PD).

Conclusions: PD, MS, and stroke carry a high risk of falls. Other predictors include perceived balance confidence and high educational level.

Title: Navigating Interprofessional Spaces: Experiences of Clients Living with Parkinson's Disease, Students and Clinical Educators.

Citation: Journal of Interprofessional Care; May 2018; vol. 32 (no. 3); p. 304-312

Author(s): Friary, Philippa; Tolich, Janette; Morgan, Jane; Stewart, Jenny; Gaeta, Helen; Flood, Brenda; McNaughton, Susan

Abstract: When students in interprofessional education and practice programmes partner with clients living with a long-term condition, the potential for a better client and educational experience is enhanced when the focus is on client self-management and empowerment. This paper reports the findings from a phenomenological study into the experiences of five clients, six speech language therapy students, eight physiotherapy students, and two clinical educators participating in a university clinic-based interprofessional programme for clients living in the community with Parkinson's Disease. Collaborative hermeneutic analysis was conducted to interpret the texts from client interviews and student and clinical educator focus groups held immediately after the programme. The overarching narratives emerging from the texts were: "client-centredness"; "who am I/why am I here?"; "understanding interprofessional collaboration and development"; "personal and professional development, awareness of self and others"; "the environment - safety and support". These narratives and the meanings within them were drawn together to develop a tentative metaphor-based framework of "navigating interprofessional spaces" showing how the narratives and meanings are connected. The framework identifies a temporal journey toward

interprofessional collaboration impacted by diverse identities and understandings of self and others, varying expectations and interpretations of the programme, intra- and interpersonal, cultural and contextual spaces, and uncertainty. Shifts in being and doing and uncertainty appear to characterise client-driven, self-management focused interprofessional teamwork for all participants. These findings indicate that students need ongoing opportunities to share explicit understandings of interprofessional teamwork and dispel assumptions, since isolated interprofessional experiences may only begin to address these temporal processes.

Title: Implementation of a multidisciplinary psychoeducational intervention for Parkinson's disease patients and carers in the community: study protocol.

Citation: BMC Family Practice; Apr 2018; vol. 19 ; p. 1-1

Author(s): Navarta-Sánchez, M. V.; Ursua, M. E.; Riverol Fernández, M.; Ambrosio, L.; Medina, M.; Díaz de Cerio, S.; Álvarez, M. J.; Senosiain, J. M.; Gorraiz, A.; Caparrós, N.; Anaut, S.; Martín-Lanas, R.; Recio, M.; Portillo, M. C.

Background: Parkinson's disease progressively limits patients at different levels and as a result family members play a key role in their care. However, studies show lack of an integrative approach in Primary Care to respond to the difficulties and psychosocial changes experienced by them. The aim of this study is to evaluate the effects of a multidisciplinary psychoeducational intervention focusing on improving coping skills, the psychosocial adjustment to Parkinson's disease and the quality of life in patients and family carers in a Primary Care setting.

Methods: This quasi-experimental study with control group and mixed methods was designed to evaluate a multidisciplinary psychoeducational intervention. Based on the study power calculations, 100 people with Parkinson's disease and 100 family carers will be recruited and assigned to two groups. The intervention group will receive the ReNACE psychoeducational intervention. The control group will be given a general educational programme. The study will be carried out in six community-based health centres. The results obtained from the two groups will be collected for evaluation at three time points: at baseline, immediately after the intervention and at 6 months post-intervention. The results will be measured with these instruments: the Quality of Life Scale PDQ-39 for patients and the Scale of Quality of Life of Care-givers SQLC for family carers, and for all participants the Psychosocial Adjustment to Illness scale and the Brief COPE Inventory. Focus groups will be organised with some patients and family carers who will have received the ReNACE psychoeducational intervention and also with the healthcare professionals involved in its development.

Discussion: An important gap exists in the knowledge and application of interventions with a psychosocial approach for people with PD and family carers as a whole. This study will promote this comprehensive approach in Primary Care, which will clearly contribute in the existing knowledge and could reduce the burden of PD for patients and family carers, and also in other long-term conditions.

Trial registration: NCT03129425 (ClinicalTrials.gov). Retrospectively registered on April 26, 2017.

Title: Low-intensity, goal-directed occupational therapy and physiotherapy did not produce clinically meaningful differences in activities for people with mild to moderate Parkinson's Disease...

Citation: Australian Occupational Therapy Journal; Apr 2018; vol. 65 (no. 2); p. 163-164

Author(s): Swanton, Ruth; Cooke, Deirdre

Abstract: A review of the article "Physiotherapy and occupational therapy vs no therapy in mild to moderate Parkinson disease. A randomized clinical trial" by C. Clarke is presented.

Title: Effects of Fatigue on Balance in Individuals With Parkinson Disease: Influence of Medication and Brain-Derived Neurotrophic Factor Genotype.

Citation: Journal of Neurologic Physical Therapy; Apr 2018; vol. 42 (no. 2); p. 61-71

Author(s): Baer, Michael; Klemetson, Bradley; Scott, Diana; Murtishaw, Andrew S.; Navalta, James W.; Kinney, Jefferson W.; Landers, Merrill R.

Background and Purpose: Because falls can have deleterious consequences, it is important to understand the influence of fatigue and medications on balance in persons with Parkinson disease (PD). Thus, the purpose of this study was to investigate the effects of fatigue on balance in individuals with PD. Because brain-derived neurotrophic factor (BDNF) has been shown to be related to motor performance, we also explored its role.

Methods: A total of 27 individuals (age = 65.4 ± 8.1 years; males = 14, females = 13) with neurologist-diagnosed PD with 13 genotyped for BDNF as Val66Val, 11 as Val66Met, 2 as Met66Met (1 refused). Participants were tested both on and off medication, 1 week apart. On both days, they completed a pre- and posttest separated by a fatiguing condition. Factorial analyses of variancewere performed for the following balance domains: (1) anticipatory postural responses; (2) adaptive postural responses; (3) dynamic balance; (4) sensory orientation; and (5) gait kinematics. For BDNF, t-tests were conducted comparing genotype for the pre-post difference scores in both the on and off medication states. Results: There were no interactions between time (pre- and postintervention) and medication for any of the domains (Ps ≥ 0.187). Participants with BDNF Met alleles were not significantly different from Val66Val participants in balance (Ps ≥ 0.111) and response to a fatiguing condition (Ps ≥ 0.070).

Discussion and Conclusions: Fatigue does not appear to have a detrimental effect on balance, and there was not a differential effect of medication in individuals with PD. These results also indicate that participants with a BDNF Met allele did not have a greater decay in function after a fatiguing condition. Video Abstract available for more insights from the authors (see Video, Supplemental Digital Content 1, available at: http://links.lww. com/JNPT/A196).

Title: NICE Guidance on Parkinson's disease.

Citation: GM: Midlife & Beyond; Mar 2018; vol. 48 (no. 3); p. 23-25

Author(s): Bloomer, Alison

Abstract: NICE recently published its quality standard on Parkinson's with the aim of setting out priority areas for improvement in health and social care in England and Wales. Professor Richard Walker, member of the NICE Guidelines Development Committee and the Quality Standard Advisory Committee, discusses the rationale behind the quality statements.

Title: Delusional misidentification in Parkinson's disease: report of two cases and a review.

Citation: Postgraduate Medicine; Mar 2018; vol. 130 (no. 2); p. 280-283

Author(s): Hermanowicz, Neal

Abstract: Syndromes of delusional misidentification consist of disordered familiarity and have been reported in diverse diagnoses, including Parkinson's disease. Although the most common delusional misidentification is Capgras syndrome, in which the sufferer believes a familiar person has been replaced by an identical imposter, other forms have been also described. The pathogenesis of delusions of misidentification appears to require dysfunction of or connection to a left cerebral cortical area involved in recognition of familiarity, and also right frontal cortex serving belief evaluation. Two cases of Parkinson's disease with an unusual delusional misidentification, intermetamorphosis, are presented, along with their improvement with pimavanserin, a novel atypical antipsychotic medication.

Title: Does Pisa syndrome affect upper limb function in patients with Parkinson's disease? An observational cross-sectional study.

Citation: NeuroRehabilitation; Feb 2018; vol. 42 (no. 2); p. 143-148

Author(s): Alwardat, Mohammad; Di Lazzaro, Giulia; Schirinzi, Tommaso; Sinibaldi Salime, Paola; Mercuri, Nicola Biagio; Pisani, Antonio

Background: Trunk alignment is thought to contribute to upper limb (UL) function. However, this common assumption is not clear in patients with Parkinson's Disease (PD) suffering from Pisa syndrome (PS). PS is a postural abnormality, characterized by revisable lateral trunk flexion more than 10 degrees.

Objective: To investigate the UL functioning and activities of daily living in PD patients with PS.

Methods: Forty-five participants distributed equally in three groups PD patients with PS, PD patients without PS and age/sex matched healthy controls (HC). The function and disability of UL was assessed by Arm Shoulder and Hand (DASH) questionnaire for all groups. PD groups then completed clinical assessments by the Unified Parkinson's Disease Rating Scale (UPDRS) part II-III, Modified Hoenh & Yahr (mH&Y) staging and the Levodopa Equivalent Daily Dose (LEDD).

Results: Three groups showed significant differences in DASH questionnaire ($p < 0.001$) with higher scores for PS group, intermediate for PD group and lower for HC group. PS group also showed higher score in UPDRS-II and mH&Y ($p = 0.019$), while no differences emerged between PD and PS in UPDRS-III score and LEDD.

Conclusion: Our results demonstrated that PS is associated with major impairment of both UL functioning and activities of daily living in PD patients.

Title: Treadmill training in Parkinson's patients after deep brain stimulation: Effects on gait kinematic.

Citation: NeuroRehabilitation; Feb 2018; vol. 42 (no. 2); p. 149-158

Author(s): Luna, N.M.S.; Lucareli, P.R.G.; Sales, V.C.; Speciali, D.; Alonso, A.C.; Peterson, M.D.; Rodrigues, R.B.M.; Fonoffc, E.T.; Barbosac, E.R.; Teixeira, M.J.; Greve, J.M.D.A.

Objective: The purpose of this study was to evaluate the effect of treadmill training with body weight support on gait kinematics parameters in patients with PD using DBS.

Design: Twelve patients completed the protocols (age: 60.9±10.6 years; disease duration: 20±7 years; and time since DBS surgery: 20±4 months). The same set of patients underwent two trainings protocols and four gait analyses (before and after each training). They received eight weeks of treadmill training without body weight support (16 sessions) in conjunction with physiotherapy program followed by six weeks of wash out period, followed by eight weeks of body-weight-supported treadmill training in conjunction with a same physiotherapy program. The Gait

Kinematic Analysis involved eight infrared cameras that detected 19 reflective spherical markers attached in limb lower of patients. Statistical analysis used the Wilcoxon test ($p \leq 0.05$).

Results: Both the training no showed significant differences in linear variables. As the angular variables, only training with support showed significant increase of ranges of motion: pelvis tilt, obliquity and rotation amplitude; hip adduction-abduction and rotation amplitude; percentage of peak flexion in swing phase; foot progression amplitude.

Conclusion: The body weight supported treadmill training may promote increase of mobility of lower limbs during gait and it could be a targeted intervention for PD patients treated with DBS.

Title: The Impact of Dual-Tasking on Postural Stability in People With Parkinson's Disease With and Without Freezing of Gait.

Citation: Neurorehabilitation & Neural Repair; Feb 2018; vol. 32 (no. 2); p. 166-174

Author(s): Bekkers, Esther M. J.; Dockx, Kim; Devan, Surendar; Van Rossom, Sam; Verschueren, Sabine M. P.; Bloem, Bastiaan R.; Nieuwboer, Alice

Background: Postural instability and freezing of gait (FOG) are major problems in patients with Parkinson's disease (PD), and both contribute to falls. However, the interrelationship between these 2 deficits is still unclear. Objective. This study investigated whether dual-tasking influenced postural control differently in freezers (FOG+) and nonfreezers (FOG−).

Methods: Thirty-three patients with PD (19 FOG+, 14 FOG−, well-matched) and 28 healthy controls underwent 4 postural control tasks, consisting of standing on either stable or unstable surfaces with eyes open or closed. Each condition was performed with and without a cognitive dual-task (DT). Center of pressure and center of mass variables and cognitive DT performance outcomes were investigated.

Results: Postural stability decreased to a larger extent in FOG+ under DT conditions compared with the other groups, although overall most differences were found between FOG+ and controls. FOG+ exhibited worse postural control compared with FOG− under stable surface DT conditions, shown by higher medial-lateral sway measures (group × surface × task, $P < .05$). Also, postural DT cost (%) was higher in FOG+ than in FOG− in unstable surface conditions without vision. Controls performed better on the cognitive DT when balancing compared with sitting, whereas this improvement was absent in both PD subgroups and more so in FOG+.

Conclusions: Postural stability in FOG+ deteriorated more than in FOG− and controls upon cognitive load. Our results extend earlier findings on gait that the compensatory mechanisms to cope with DT stance are insufficient in FOG+. The findings highlight the need for adapted rehabilitation programs for this subgroup, comprising motor-cognitive balance training.

Title: Long-term safety and efficacy of levodopa-carbidopa intestinal gel in advanced Parkinson's disease.

Citation: Movement disorders : official journal of the Movement Disorder Society; Mar 2018

Author(s): Fernandez, Hubert H; Boyd, James T; Fung, Victor S C; Lew, Mark F; Rodriguez, Ramon L; Slevin, John T; Standaert, David G; Zadikoff, Cindy; Vanagunas, Arvydas D; Chatamra, Krai; Eaton, Susan; Facheris, Maurizio F; Hall, Coleen; Robieson, Weining Z; Benesh, Janet; Espay, Alberto J

Background: Levodopa-carbidopa intestinal gel (designated as carbidopa-levodopa enteral suspension in the United States) provides stable plasma levodopa concentrations and reduces motor fluctuations in advanced Parkinson's disease patients through continuous delivery of

levodopa via percutaneous endoscopic gastrojejunostomy. We report long-term safety and efficacy outcomes from an open-label phase 3 treatment program.

Methods: PD patients (n = 262) who completed a 12-week double-blind study and its 52-week open-label extension or a separate 54-week open-label study were enrolled in this ongoing phase 3 open-label, multinational study (NCT00660673). Safety and efficacy assessments were collected every 6 months.

Results: Mean total duration of exposure to levodopa-carbidopa intestinal gel was 4.1 years (range, 1.2 to 6.9 years). The overall discontinuation rate was 34% (average annual discontinuation rate, 10%). Although most patients (94%) reported an adverse event, the rate of adverse events decreased over time; 53% experienced a serious adverse event. Of patients in this extension study, 54% required jejunal tube replacement during the study, and 37% required percutaneous endoscopic gastrostomy tube replacement. Most patients were on levodopa monotherapy. Patients maintained reductions in "off" time and increases in mean "on" time without dyskinesia from initial levodopa-carbidopa intestinal gel infusion to he study end point ($P < 0.001$; n = 81). Activities of daily living and quality-of-life assessments demonstrated significant improvements that persisted through the study.

Conclusions: This long-term study demonstrates sustained and clinically meaningful benefits from levodopa-carbidopa intestinal gel in advanced PD patients. Although adverse event rates decreased over time, vigilance is required for device-related complications and adverse events.

Title: Relationships between dysphagia and tongue pressure during swallowing in Parkinson's disease patients.

Citation: Journal of oral rehabilitation; Mar 2018

Author(s): Minagi, Yoshitomo; Ono, Takahiro; Hori, Kazuhiro; Fujiwara, Shigehiro; Tokuda, Yoshitsugu; Murakami, Kazuhiro; Maeda, Yoshinobu; Sakoda, Saburo; Yokoe, Masaru; Mihara, Masahito; Mochizuki, Hideki

Abstract: Although dysphagia is a life-threatening problem in patients with Parkinson's disease (PD), the pathophysiology of oropharyngeal dysphagia is yet to be understood. The present study investigated the tongue motor function during swallowing in relation with dysphagia and the severity of PD. Thirty PD patients (14 males and 16 females; average age, 69.4 years), Hoehn and Yahr stage II-IV, in Osaka University Hospital are participated in this study. During swallowing 5 ml of water, tongue pressure on the hard palate was measured using a sensor sheet with 5 measuring points. The maximal tongue pressure at each measuring point during swallowing was compared between PD patients and healthy controls. Subjective assessment of oropharyngeal dysphagia was performed using Swallowing Disturbance Questionnaire -Japanese. The maximal tongue pressure at each measuring point was significantly lower in PD patients than in healthy controls (8 males and 12 females; average age, 71.6 years). Furthermore, the maximal tongue pressure was significantly lower in dysphagic PD patients than non-dysphagic PD patients. Loss of tongue pressure production at the anterior part of the hard palate was strongly related to dysphagia in the oral phase as well as in the pharyngeal phase. An abnormal pattern of tongue pressure production was more frequently observed in dysphagic PD patients than in non-dysphagic PD patients. The results suggest that tongue pressure measurement might be useful for early and quantitative detection of tongue motor disability during swallowing in PD patients. This article is protected by copyright. All rights reserved.

Title: Cardiac sympathetic denervation can predict the wearing-off phenomenon in patients with Parkinson's disease.

Citation: Journal of nuclear medicine : official publication, Society of Nuclear Medicine; Mar 2018

Author(s): Lee, Jee-Eun; Kim, Joong-Seok; Ryu, Dong-Woo; Oh, Yoon-Sang; Yoo, Ie Ryung; Lee, Kwang-Soo

Abstract: Recent studies have suggested that preserved cardiac sympathetic denervation may be associated with a small motor burden in Parkinson's disease (PD), and serve as a "good" marker which is not associated with other non-motor symptoms. We sought to investigate whether cardiac sympathetic denervation increases the risk of the early wearing-off phenomenon in PD. Methods: This hospital-based prospective study enrolled 266 de novo patients with PD who underwent 123I-metaiodobenzylguanidine (MIBG) scintigraphy on initial evaluation. The patients visited the outpatient clinic every 2-6 months, and were followed for a minimum of 18 months from the time they began taking dopaminergic medication. Each patient was assessed for the wearing-off phenomenon based on the clinical assessments and symptom diaries. Clinical events were analyzed from the date of evaluation by MIBG scintigraphy until the date of the first occurrence of the wearing-off phenomenon, or until the last follow-up date without wearing-off. Results: During a mean follow-up period of 30.4 ± 14.8 months, 71 patients developed wearing-off. The wearing-off phenomenon occurred more in patients with decreased MIBG uptake. A Cox-regression analysis revealed that both low MIBG uptake and early onset age significantly predicted the development of wearing-off. Conclusion: Our study suggests that a reduction in myocardial MIBG uptake in PD patients may be associated with a subsequent increased risk for the wearing-off phenomenon. Findings strongly supports that PD patients with normal cardiac sympathetic innervation might have less involvement of the midbrain dopaminergic circuitry, and a concomitant reduced risk for motor complications, such as wearing-off.

Title: International Parkinson and movement disorder society evidence-based medicine review: Update on treatments for the motor symptoms of Parkinson's disease.

Citation: Movement disorders : official journal of the Movement Disorder Society; Mar 2018

Author(s): Fox, Susan H; Katzenschlager, Regina; Lim, Shen-Yang; Barton, Brandon; de Bie, Rob M A; Seppi, Klaus; Coelho, Miguel; Sampaio, Cristina; Movement Disorder Society Evidence-Based Medicine Committee

Objective: The objective of this review was to update evidence-based medicine recommendations for treating motor symptoms of Parkinson's disease (PD).

Background: The Movement Disorder Society Evidence-Based Medicine Committee recommendations for treatments of PD were first published in 2002 and updated in 2011, and we continued the review to December 31, 2016.METHODSLevel I studies of interventions for motor symptoms were reviewed. Criteria for inclusion and quality scoring were as previously reported. Five clinical indications were considered, and conclusions regarding the implications for clinical practice are reported.

Results: A total of 143 new studies qualified. There are no clinically useful interventions to prevent/delay disease progression. For monotherapy of early PD, nonergot dopamine agonists, oral levodopa preparations, selegiline, and rasagiline are clinically useful. For adjunct therapy in early/stable PD, nonergot dopamine agonists, rasagiline, and zonisamide are clinically useful. For adjunct therapy in optimized PD for general or specific motor symptoms including gait, rivastigmine is possibly useful and physiotherapy is clinically useful; exercise-based movement strategy training and formalized patterned exercises are possibly useful. There are no new studies and no changes

in the conclusions for the prevention/delay of motor complications. For treating motor fluctuations, most nonergot dopamine agonists, pergolide, levodopa ER, levodopa intestinal infusion, entacapone, opicapone, rasagiline, zonisamide, safinamide, and bilateral STN and GPi DBS are clinically useful. For dyskinesia, amantadine, clozapine, and bilateral STN DBS and GPi DBS are clinically useful.

Conclusions: The options for treating PD symptoms continues to expand. These recommendations allow the treating physician to determine which intervention to recommend to an individual patient.

Title: Beta oscillations and urinary voiding in Parkinson disease.

Citation: Neurology; Mar 2018

Author(s): Roy, Holly A; Aziz, Tipu Z; Fitzgerald, James J; Green, Alexander L

Objectives: To investigate the role of beta oscillations in urinary voiding and their association with lower urinary tract symptoms in Parkinson disease (PD).

Methods: We used surgically implanted deep brain stimulation electrodes to record local field potential signals from the subthalamic nucleus (STN) and globus pallidus interna (GPi) of patients with PD during urinary voiding. Five patients with STN electrodes and 5 patients with GPi electrodes were tested. We also explored correlations between beta oscillatory power and urinary symptoms assessed by the International Consultation on Incontinence Lower Urinary Tract Symptoms questionnaire.

Results: Beta suppression occurred during urinary voiding in the GPi ($p < 0.05$) but not the STN. Furthermore, the beta signal in the GPi during voiding correlated significantly with severity of incontinence and urinary frequency ($p < 0.05$).

Conclusions: In this study, we have demonstrated that local field potentials can provide information about the neural control of the bladder. Our findings suggest that the GPi is implicated in the process of urinary voiding and that its mechanism of action is linked to signals in the beta frequency band. Moreover, our correlational analyses show that beta oscillations may be implicated more generally in the pathophysiology of lower urinary tract symptoms in PD.

Title: Workforce participation and activities in Parkinson's disease patients receiving device-aided therapy.

Citation: Acta neurologica Scandinavica; Mar 2018

Author(s): Sahlström, T; Eklund, M; Timpka, J; Henriksen, T; Nyholm, D; Odin, P

Objectives: Many countries have an aging population, and it is thus likely that Parkinson's disease (PD) will become an increasing health problem. It is important to ensure this group can use their resources in the best way possible, including remaining in the work market. This study aimed to investigate workforce participation and daily activities among patients with PD receiving device-aided therapy to provide new knowledge that may be used to inform decisions about these therapy options.

Materials and Methods: This was a retrospective, descriptive quantitative pilot study, including 67 patients with PD from 3 centers in Sweden and Denmark. Included patients were younger than 67 years at the time of introduction of device-aided therapy. Eligible patients were identified by the Swedish national Parkinson patient registry or by the treating neurologist. Quantitative interviews were made by telephone.

Results: A majority of the patients could perform the same, or more, amount of activities approximately 5 years after the introduction of device-aided therapy. A small number of patients

receiving deep brain stimulation (DBS) and levodopa-carbidopa intestinal gel (LCIG) were able to increase their work capacity within 1 year of initiating device-aided therapy and a remarkably high share could still work at the end-point of this study, approximately 15 years since the diagnosis of PD.

Conclusions: Device-aided therapy may sustain or increase daily activities and workforce participation in patients with PD who have not yet reached retirement age. There is need for prospective studies, both quantitative and qualitative, to confirm these results.

Title: Using Smartphones and Machine Learning to Quantify Parkinson Disease Severity: The Mobile Parkinson Disease Score.

Citation: JAMA neurology; Mar 2018

Author(s): Zhan, Andong; Mohan, Srihari; Tarolli, Christopher; Schneider, Ruth B; Adams, Jamie L; Sharma, Saloni; Elson, Molly J; Spear, Kelsey L; Glidden, Alistair M; Little, Max A; Terzis, Andreas; Dorsey, E Ray; Saria, Suchi

Importance: Current Parkinson disease (PD) measures are subjective, rater-dependent, and assessed in clinic. Smartphones can measure PD features, yet no smartphone-derived rating score exists to assess motor symptom severity in real-world settings.

Objectives: To develop an objective measure of PD severity and test construct validity by evaluating the ability of the measure to capture intraday symptom fluctuations, correlate with current standard PD outcome measures, and respond to dopaminergic therapy.

Design, Setting, and Participants: This observational study assessed individuals with PD who remotely completed 5 tasks (voice, finger tapping, gait, balance, and reaction time) on the smartphone application. We used a novel machine-learning-based approach to generate a mobile Parkinson disease score (mPDS) that objectively weighs features derived from each smartphone activity (eg, stride length from the gait activity) and is scaled from 0 to 100 (where higher scores indicate greater severity). Individuals with and without PD additionally completed standard in-person assessments of PD with smartphone assessments during a period of 6 months.

Main Outcomes and Measures: Ability of the mPDS to detect intraday symptom fluctuations, the correlation between the mPDS and standard measures, and the ability of the mPDS to respond to dopaminergic medication.

Results: The mPDS was derived from 6148 smartphone activity assessments from 129 individuals (mean [SD] age, 58.7 [8.6] years; 56 [43.4%] women). Gait features contributed most to the total mPDS (33.4%). In addition, 23 individuals with PD (mean [SD] age, 64.6 [11.5] years; 11 [48%] women) and 17 without PD (mean [SD] age 54.2 [16.5] years; 12 [71%] women) completed in-clinic assessments. The mPDS detected symptom fluctuations with a mean (SD) intraday change of 13.9 (10.3) points on a scale of 0 to 100. The measure correlated well with the Movement Disorder Society Unified Parkinson Disease's Rating Scale total ($r = 0.81$; $P < .001$) and part III only ($r = 0.88$; $P < .001$), the Timed Up and Go assessment ($r = 0.72$; $P = .002$), and the Hoehn and Yahr stage ($r = 0.91$; $P < .001$). The mPDS improved by a mean (SD) of 16.3 (5.6) points in response to dopaminergic therapy.

Conclusions and Relevance: Using a novel machine-learning approach, we created and demonstrated construct validity of an objective PD severity score derived from smartphone assessments. This score complements standard PD measures by providing frequent, objective, real-world assessments that could enhance clinical care and evaluation of novel therapeutics.

Title: Gambling behavior in Parkinson's Disease: Impulsivity, reward mechanism and cortical brain oscillations.

Citation: Psychiatry research; Mar 2018

Author(s): Balconi, Michela; Angioletti, Laura; Siri, Chiara; Meucci, Nicoletta; Pezzoli, Gianni

Abstract: Psychopathological components, such as reward sensitivity and impulsivity, and dopaminergic treatment are crucial characteristics related to the development of Pathological Gambling (PG) in Parkinson's Disease (PD). The aim of the present study is to investigate the differences in decision-making in PD patients with or without PG considering both neurophysiological and behavioral aspects. The IOWA Gambling Task (IGT) and electroencephalographic (EEG) activity were considered to elucidate the decision and post-feedback processes in PG. The sample included fifty-two PD patients, divided in three groups: 17 PD patients with active gambling behavior (PD Gamblers, PDG); 15 PD patients who remitted from PG (PD Non-Gamblers, PDNG); and a Control Group (CG) composed by 20 patients with PD only. EEG and IGT performance were recorded during decision and post-feedback phase. Results showed worse performance and an increase of the low frequency bands in the frontal area for the PDG group compared to the other two groups. In addition, higher BAS (Behavioral Activation System) and BIS-11 (Barratt Impulsiveness Scale) personality components were correlated to groups' behavioral response. These results show an anomalous behavioral (IGT) and cortical response of PDG patients related to their inability to use adequate control mechanisms during a decision-making task where reward mechanisms (BAS) and impulsivity (BIS-11) are relevant.

Title: Strengths and challenges in conducting clinical trials in Parkinson's disease mild cognitive impairment.

Citation: Movement disorders : official journal of the Movement Disorder Society; Mar 2018

Author(s): Litvan, Irene; Kieburtz, Karl; Tröster, Alexander I; Aarsland, Dag

Abstract: Treatments to slow the progression of cognitive dysfunction to dementia and improve the quality of life of persons with Parkinson's disease (PD) are desperately needed. Because PD mild cognitive impairment is considered a transitional stage before dementia, it opens a window to timely intervention. This article critically reviews the strengths and challenges of pharmacologic and nonpharmacologic clinical therapeutic trials in PD mild cognitive impairment conducted during the past 5 years, including ongoing trials. Relatively few high-quality trials have been conducted, and some important factors in designing future clinical trials are discussed. © 2018 International Parkinson and Movement Disorder Society.

Title: Office-Based Screening for Dementia in Parkinson Disease: The Montreal Parkinson Risk of Dementia Scale in 4 Longitudinal Cohorts.

Citation: JAMA neurology; Mar 2018

Author(s): Dawson, Benjamin K; Fereshtehnejad, Seyed-Mohammad; Anang, Julius B M; Nomura, Takashi; Rios-Romenets, Silvia; Nakashima, Kenji; Gagnon, Jean-François; Postuma, Ronald B

Importance: Parkinson disease dementia dramatically increases mortality rates, patient expenditures, hospitalization risk, and caregiver burden. Currently, predicting Parkinson disease dementia risk is difficult, particularly in an office-based setting, without extensive biomarker testing.

Objective: To appraise the predictive validity of the Montreal Parkinson Risk of Dementia Scale, an office-based screening tool consisting of 8 items that are simply assessed.

Design, Setting, and Participants: This multicenter study (Montreal, Canada; Tottori, Japan; and Parkinson Progression Markers Initiative sites) used 4 diverse Parkinson disease cohorts with a prospective 4.4-year follow-up. A total of 717 patients with Parkinson disease were recruited between May 2005 and June 2016. Of these, 607 were dementia-free at baseline and followed-up for 1 year or more and so were included. The association of individual baseline scale variables with eventual dementia risk was calculated. Participants were then randomly split into cohorts to investigate weighting and determine the scale's optimal cutoff point. Receiver operating characteristic curves were calculated and correlations with selected biomarkers were investigated.

Main Outcomes and Measures: Dementia, as defined by Movement Disorder Society level I criteria.

Results: Of the 607 patients (mean [SD] age, 63.4 [10.1]; 376 men [62%]), 70 (11.5%) converted to dementia. All 8 items of the Montreal Parkinson Risk of Dementia Scale independently predicted dementia development at the 5% significance level. The annual conversion rate to dementia in the high-risk group (score, >5) was 14.9% compared with 5.8% in the intermediate group (score, 4-5) and 0.6% in the low-risk group (score, 0-3). The weighting procedure conferred no significant advantage. Overall predictive validity by the area under the receiver operating characteristic curve was 0.877 (95% CI, 0.829-0.924) across all cohorts. A cutoff of 4 or greater yielded a sensitivity of 77.1% (95% CI, 65.6-86.3) and a specificity of 87.2% (95% CI, 84.1-89.9), with a positive predictive value (as of 4.4 years) of 43.90% (95% CI, 37.76-50.24) and a negative predictive value of 96.70% (95% CI, 95.01-97.85). Positive and negative likelihood ratios were 5.94 (95% CI, 4.08-8.65) and 0.26 (95% CI, 0.17-0.40), respectively. Scale results correlated with markers of Alzheimer pathology and neuropsychological test results.

Conclusions and Relevance: Despite its simplicity, the Montreal Parkinson Risk of Dementia Scale demonstrated predictive validity equal or greater to previously described algorithms using biomarker assessments. Future studies using head-to-head comparisons or refinement of weighting would be of interest.

Title: Comparison of clinical features among Parkinson's disease subtypes: A large retrospective study in a single center.

Citation: Journal of the neurological sciences; Mar 2018; vol. 386 ; p. 39-45

Author(s): Konno, Takuya; Deutschländer, Angela; Heckman, Michael G; Ossi, Maryam; Vargas, Emily R; Strongosky, Audrey J; van Gerpen, Jay A; Uitti, Ryan J; Ross, Owen A; Wszolek, Zbigniew K

Introduction: Tremor dominant (TD), postural instability/gait difficulty (PIGD), and akinetic-rigid (AR) subtypes are widely used in classifying patients with Parkinson's disease (PD).

Methods: We compared clinical characteristics between PD subtypes in a large retrospective cohort. Between 1998 and 2016, we included a total of 1003 patients with PD in this retrospective study. Six hundred ninety-four patients had more than one visit. Data were collected regarding motor/non-motor symptoms at the initial/final visits. Based on the prominent symptom at the initial visit, we classified patients into one of the four subtypes: TD, AR, gait difficulty, and mixed. Rapid progression was defined by emergence of falls, dementia, or dependency within 5years after onset.

Results: TD was the most prevalent subtype (44%), followed by AR (29%), mixed (18%), and gait difficulty (9%). Rapid progression was observed more frequently in gait difficulty compared to AR (OR: 3.59 P<0.001). Hallucinations at the final visit were more likely to occur in AR (OR: 2.36, P=0.005) and mixed (OR: 3.28, P<0.001) compared to TD.

Conclusions: Our findings provide support for a distinction of four different PD subtypes: TD, AR, gait difficulty, and mixed. The gait difficulty subtype was distinguishable from the AR subtype.

Title: Medical and surgical management of advanced Parkinson's disease.

Citation: Movement disorders : official journal of the Movement Disorder Society; Mar 2018

Author(s): Antonini, Angelo; Moro, Elena; Godeiro, Clecio; Reichmann, Heinz

Abstract: Advanced Parkinson's disease is characterized by the presence of motor fluctuations, various degree of dyskinesia, and disability with functional impact on activities of daily living and independence. Therapeutic management aims to extend levodopa benefit while minimizing motor complications and includes, in selected cases, the implementation of drug infusion and surgical techniques. In milder forms of motor complications, these can often be controlled with manipulation of levodopa dose and the introduction of supplemental therapies such as catechol-O-methyl transferase inhibitors, monoamine oxidase B inhibitors, and dopamine agonists including apomorphine. Clinical experience and evidence from published studies indicate that when these agents cannot satisfactorily control motor complications, patients should be assessed and considered for device-aided therapies. This review article summarizes some of the newer available therapeutic opportunities such as use of enzyme inhibitors like opicapone and safinamide, adenosine A2A receptor antagonists, apomorphine and levodopa/carbidopa intestinal gel infusion, deep brain stimulation including the role of closed-loop and adaptive stimulation, and MRI-guided focused ultrasound. © 2018 International Parkinson and Movement Disorder Society.

Title: Patient experiences of receiving a diagnosis of Parkinson's disease.

Citation: Journal of neurology; Mar 2018

Author(s): Schrag, A; Modi, S; Hotham, S; Merritt, R; Khan, K; Graham, L; A on behalf of the European Parkinson’s Disease Association

Objective: To report patients' own experiences of receiving a diagnosis of Parkinson's disease (PD) and to identify factors influencing this experience.

Methods: A survey by the European Parkinson's Disease Association in 11 European countries.

Results: 1775 patients with an average age of 69.7 years participated of whom 54% were male. Those living in rural areas reported having waited longer to seek medical help ($p < 0.05$). A possible diagnosis of PD was made at the first appointment in a third of respondents. When the diagnosis was made, only 50% reported that the diagnosis was communicated sensitively. 38% of patients reported having been given enough time to ask questions and discuss concerns, but 29% did not. 98% of participants reported having been given information about PD at the time of diagnosis but 36% did not find the information given helpful. Patient satisfaction with the diagnostic consultation was positively associated with more sensitive delivery of diagnosis, the helpfulness and quantity of the information provided and time to ask questions (all $p < 0.001$). Where diagnosis was given by a specialist, participants reported greater perceived satisfaction with the diagnostic consultation, greater sensitivity of communicating the diagnosis, time to ask questions, provision and helpfulness of information, and earlier medication prescription (all $p < 0.0001$).

Conclusions: There is a need to improve how the diagnosis of PD is communicated to patients, the opportunity to ask questions soon after diagnosis, and the amount, timing and quality of life information provided, as this is associated with greater satisfaction with the diagnostic process.

Sources Used:

The following databases are searched on a regular basis in the development of this bulletin: Amed, British Nursing Index, Cinahl, Medline

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