Parkinson's Disease
Current Awareness Bulletin

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Title: A Comprehensive Meta-analysis on Short-term and Working Memory Dysfunction in Parkinson's Disease

Author(s): Ramos A.A.; Machado L.

Abstract: A previous meta-analysis demonstrated short-term memory (STM) and working memory (WM) dysfunction in patients with Parkinson's disease (PD). However, considerable research on the topic that calls into question the extent of such impairments in PD has since been published. The aim of the present quantitative review was to provide the largest statistical overview on STM and WM dysfunction in Parkinson's disease (PD), while simultaneously providing novel insights on moderating factors of effect size heterogeneity in PD. The systematic literature search in PubMed, PsycINFO, PsycArticles, Scopus and Web of Science databases allowed us to estimate 350 effect sizes from 145 empirical studies that reported STM and WM scores for patients with PD against healthy controls. The outcomes indicated general dysfunction in the visuospatial domain and poor verbal WM in PD. Subgroup analyses suggested that mild cognitive impairment is associated with STM and WM difficulties in PD. Furthermore, meta-regression analyses revealed that disease duration accounted for more than 80% of the visuospatial STM effect size variance (beta = 0.136, p <.001, R2 =.8272), larger daily levodopa equivalent dose was associated with WM dysfunction (verbal: beta = -0.001, p =.016, R2 =.1812; visuospatial: beta = 0.003, p =.069, R2 =.2340), and years of education partially explained the verbal STM effect size variance (beta = -0.027, p =.040, R2 =.1171). Collectively, these findings advance our understanding of underlying factors that influence STM and WM functioning in PD, while at the same time providing novel directions for future research. Copyright © 2021, The Author(s), under exclusive licence to Springer Science+Business Media, LLC part of Springer Nature.

Title: Effects of music-based movement therapy on motor function, balance, gait, mental health, and quality of life for patients with Parkinson's disease: A systematic review and meta-analysis

Author(s): Zhou Z.; Wei W.; Luan R.; Zhou R.; Li K.

Objective: To conduct a systematic review evaluating the effects of music-based movement therapy on motor function, balance, gait, mental health, and quality of life among individuals with Parkinson's disease. Data sources: A systematic search of PubMed, Embase, Cochrane Library, Web of Science, PsycINFO, CINAHL, and Physiotherapy Evidence Database was carried out to identify eligible papers published up to December 10, 2020.

Review Methods: Literature selection, data extraction, and methodological quality assessment were independently performed by two investigators. Publication bias was determined by funnel plot and Egger's regression test. "Trim and fill" analysis was performed to adjust any potential publication bias.

Result(s): Seventeen studies involving 598 participants were included in this meta-analysis. Music-based movement therapy significantly improved motor function (Unified Parkinson's Disease Rating Scale motor subscale, MD = -5.44, P = 0.002; Timed Up and Go Test, MD = -1.02, P = 0.001), balance (Berg Balance Scale, MD = 2.02, P < 0.001; Mini-Balance Evaluation Systems Test, MD = 2.95, P = 0.001), freezing of gait (MD = -2.35, P = 0.039), walking velocity (MD = 0.18, P < 0.001), and mental health (SMD = -0.38, P = 0.003).

However, no significant effects were observed on gait cadence, stride length, and quality of life.

Conclusion(s): The findings of this study show that music-based movement therapy is an effective treatment approach for improving motor function, balance, freezing of gait, walking velocity, and mental health for patients with Parkinson's disease. Copyright © The Author(s) 2021.

Title: Interventions Involving Biofeedback to Improve Swallowing in People With Parkinson Disease and Dysphagia: A Systematic Review

Author(s): Battel I.; Walshe M.; Calvo I.

Objectives: To examine the effectiveness of biofeedback used in the treatment of adults with Parkinson disease (PD) and dysphagia, define the factors associated with biofeedback treatment outcomes, and inform a theory to guide the implementation of biofeedback in future dysphagia interventions.

Data Sources: A systematic review using a narrative synthesis approach of all published and unpublished studies were sought with no date or language restrictions. Ten electronic databases (EMBASE, PubMed, CINAHL, Web of Science, Scopus, Science Direct, AMED, The Cochrane Database of Systematic Reviews, ProQuest Dissertations and Theses A & I, Google Scholar) were searched from inception to April 2019. This search was updated in January 2020. The methodological quality of included studies was assessed using Downs and Black checklist.

Study Selection: Four studies were included. The methodological quality of the included studies was low with a high risk of bias. Data were analyzed narratively and descriptively. Despite the heterogeneity of the included studies, the findings suggest that interventions incorporating visual biofeedback may have positive effects on swallowing-related quality of life.

Conclusion(s): Based on these preliminary findings, we provide directions for further research and clinical interventions that incorporate an augmentative biofeedback component of swallowing interventions in people with PD. Future studies should be rigorously designed and set appropriate biofeedback treatment in terms of types, schedules, and timing. Copyright © 2020 American Congress of Rehabilitation Medicine

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Title: The Spectrum of Sleep Disorders in Parkinson Disease: A Review

Author(s): Lajoie A.C.; Kaminska M.; Lafontaine A.-L.

Abstract: There is increasing interest in the effects of sleep and sleep disturbances on the brain, particularly in relation to aging and neurodegenerative processes. Parkinson disease (PD) is the second most common neurodegenerative disorder, with growing prevalence worldwide. Sleep disorders, including sleep-disordered breathing (SDB), are among the most frequent non-motor manifestations of PD. They can substantially impair quality of life and possibly affect the course of the disease. This article reviews the etiology, implications, and management of sleep disturbances in PD, such as excessive daytime sleepiness, insomnia, restless legs syndrome, rapid eye movement sleep behavior disorder, and SDB.

Also briefly explored is the potential role of sleep disorders, including SDB, in the progression of neurodegeneration.

Title: Sexual Disorders and Quality of Life in Parkinson's Disease

Author(s): Santa Rosa Malcher C.M.; Lopes dos Santos Lobato B.; Roberto da Silva Goncalves Oliveira K.; Fernandes Caldato M.C.; da Silva Pedroso J.; de Tubino Scanavino M.

Introduction: Sexual disorders are the most neglected nonmotor symptoms in Parkinson's disease (PD). Although doctors seek greater priority to motor manifestations, which are the basis for the diagnosis of PD, the nonmotor symptoms deserve to be highlighted as much as the motor problems because of their strong presence and discomfort in the patients, causing the important impairment in the quality of life (QoL) of the individual with PD.

Aim(s): Provide the prevalence of sexual disorders among patients with PD and alert the medical profession to investigate and be familiar with problems related to QoL and sexual disorders in PD.

Method(s): This is a large literature review on sexual disorders in PD and impaired QoL.

Main Outcome Measure(s): Sexual disorders in PD and prevalence between genders have been described in epidemiological studies. Neuroanatomy, pathophysiology, risk factors, QoL, and etiologies were reviewed.

Result(s): The estimate of the prevalence of sexual dysfunction in the form of compulsive sexual behavior in PD is higher in men by 5.2% than in women by 0.5%. This diagnosis is a determinant of intense and persistent suffering and is related to several health problems of a social, economic, personal, family, psychological, and occupational nature, which can even culminate in sexual abuse. It is most commonly associated with the use of drugs commonly used in PD therapy in 98.1% of cases. In addition to this serious public health problem, another common condition of sexual dysfunction occur with the decreased libido by loss of the neurotransmitter dopamine proper of the pathophysiology of PD.

Conclusion(s): The presence of sexual disorders in PD should be tracked and monitored because of its harmful consequences, whether due to increased sexual behavior or associated psychological distress, as well as the impacts on QoL. Early recognition and adequate treatment of PD in its fullness and richness of associated symptoms are essential for improving QoL. Santa Rosa Malcher CM, Roberto da Silva Goncalves Oliveira K, Fernandes Caldato MC, et al. Sexual Disorders and Quality of Life in Parkinson's Disease. Sex Med 2020;XX:XXX-XXX. Copyright © 2020 The Authors

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Title: The therapeutic potential of mitochondrial transplantation for the treatment of neurodegenerative disorders.

Author(s): Espino De la Fuente-Muñoz, César; Arias, Clorinda

Abstract: Mitochondrial activity is essential to support neural functions, and changes in the integrity and activity of the mitochondria can contribute to synaptic damage and neuronal death, especially in degenerative diseases associated with age, such as Alzheimer's and Parkinson's disease. Currently, different approaches are used to treat these conditions, and

one strategy under research is mitochondrial transplantation. For years, mitochondria have been shown to be transferred between cells of different tissues. This process has allowed several attempts to develop transplantation schemes by isolating functional mitochondria and introducing them into damaged tissue in particular to counteract the harmful effects of myocardial ischemia. Recently, mitochondrial transfer between brain cells has also been reported, and thus, mitochondrial transplantation for disorders of the nervous system has begun to be investigated. In this review, we focus on the relevance of mitochondria in the nervous system, as well as some mitochondrial alterations that occur in neurodegenerative diseases associated with age. In addition, we describe studies that have performed mitochondrial transplantation in various tissues, and we emphasize the advances in mitochondrial transplantation aimed at treating diseases of the nervous system.

Title: Risk of Nonmelanoma Skin Cancers and Parkinson's Disease-Meta-Analysis and Systematic Review.

Author(s): Krasowska, Danuta; Gerkowicz, Agnieszka; Mlak, Radosław; Leziak, Milena; Małecka-Massalska, Teresa; Krasowska, Dorota

Abstract: Patients with Parkinson's disease (PD) have an increased risk of melanoma compared with the general population. Considering that Nonmelanoma Skin Cancers (NMSCs) share similar risk factors with melanoma, there is a need to understand a possible connection between PD and NMSCs. The aim of the study was the evaluation of NMSC risk among PD patients via meta-analysis and systematic review. A comprehensive search of PubMed, Scopus, and Web of Science databases was conducted, including studies from January 2000 to April 2020. We identified 16 eligible studies including 140291 PD patients. Upon statistical analysis, a significantly higher risk of developing NMSCs in PD patients was found compared with the control group (odds ratio (OR) = 1.25, 95% CI: 1.17-1.33; $p < 0.0001$). Among all NMSCs, the risk of developing basal cell carcinoma in PD patients was significantly higher (OR = 1.30, 95% confidence interval (CI): 1.15-1.47; $p < 0.0001$), contrary to squamous cell carcinoma. Further analysis revealed a significantly higher risk of developing NMSCs in patients with previously diagnosed PD (OR = 1.26, 95% CI: 1.19-1.33; $p < 0.0001$). Our data suggest the necessity for regular skin examination of PD patients, though further studies are required to explore the mechanisms forming this relationship.

Title: The Role of Mental Imagery in Parkinson's Disease Rehabilitation.

Author(s): Abraham, Amit; Duncan, Ryan P; Earhart, Gammon M

Abstract: Parkinson's disease (PD) is a disabling neurodegenerative disease whose manifestations span motor, sensorimotor, and sensory domains. While current therapies for PD include pharmacological, invasive, and physical interventions, there is a constant need for developing additional approaches for optimizing rehabilitation gains. Mental imagery is an emerging field in neurorehabilitation and has the potential to serve as an adjunct therapy to enhance patient function. Yet, the literature on this topic is sparse. The current paper reviews the motor, sensorimotor, and sensory domains impacted by PD using gait, balance, and pain as examples, respectively. Then, mental imagery and its potential for PD motor and non-motor rehabilitation is discussed, with an emphasis on its suitability for addressing gait,

balance, and pain deficits in people with PD. Lastly, future research directions are suggested.

Title: The Mechanism of Physical Activity-induced Amelioration of Parkinson's Disease: A Narrative Review.

Author(s): Gronek, Piotr; Haas, Aline Nogueira; Czarny, Wojciech; Podstawski, Robert; Delabary, Marcela do Santos; Clark, Cain Ct; Boraczyński, Michał; Tarnas, Maria; Wycichowska, Paulina; Pawlaczyk, Mariola; Gronek, Joanna

Abstract: Physical activity, together with its ameliorative effects on Parkinson's disease (PD) symptoms, remains a relatively unappreciated factor which may be beneficial for the treatment outcome. Contemporary evidence supports the positive effects of non-pharmacological approaches to PD symptom management, in particular the effects of the exercise on both, motor and non-motor symptoms. The aim of the study was to review the mechanisms of exercise-induced amelioration of PD symptoms. Methods: Electronic databases (PubMed, Web of Science and Google Scholar) were searched using the following key words: "Parkinson and physical activity" OR "Parkinson disease and exercise" OR "Parkinson disease and lifestyle factors" OR "Parkinson disease and longevity". A total of 97 studies which investigated PD genetics and various forms of exercise and their etiologic impact on PD were reviewed. The studies were subdivided into four topic groups: 1) genetics of PD, 2) exercise and the brain, 3) physical activity and PD, 4) mind-body interventions, and discussed accordingly. Adequate levels of physical activity are associated with higher quality of life in PD patients. Physical activity may have protective and stimulatory effects for better functional efficiency in higher-level cognitive networks. It can also improve balance and motor functions by improving muscle strength. Given the etiologic evidence of the beneficial effects of physical activity on PD, albeit tentative, a concerted effort to elucidate the processes and outcomes of physical activity on ameliorating symptoms of PD must be undertaken.

Title: Peripheral electrical stimulation to reduce pathological tremor: a review.

Author(s): Pascual-Valdunciel ; Hoo, Grace W.; Avrillon, Simon; Barroso, Filipe Oliveira; Goldman, Jennifer G.; Hernandez-Pavon, Julio C.; Pons, José L.

Abstract: Interventions to reduce tremor in essential tremor (ET) and Parkinson's disease (PD) clinical populations often utilize pharmacological or surgical therapies. However, there can be significant side effects, decline in effectiveness over time, or clinical contraindications for these interventions. Therefore, alternative approaches must be considered and developed. Some non-pharmacological strategies include assistive devices, orthoses and mechanical loading of the tremorgenic limb, while others propose peripheral electrical stimulation. Specifically, peripheral electrical stimulation encompasses strategies that activate motor and sensory pathways to evoke muscle contractions and impact sensorimotor function. Numerous studies report the efficacy of peripheral electrical stimulation to alter tremor generation, thereby opening new perspectives for both short- and long-term tremor reduction. Therefore, it is timely to explore this promising modality in a comprehensive review. In this review, we analyzed 27 studies that reported the use of peripheral electrical

stimulation to reduce tremor and discuss various considerations regarding peripheral electrical stimulation: the stimulation strategies and parameters, electrodes, experimental designs, results, and mechanisms hypothesized to reduce tremor. From our review, we identified a high degree of disparity across studies with regard to stimulation patterns, experimental designs and methods of assessing tremor. Having standardized experimental methodology is a critical step in the field and is needed in order to accurately compare results across studies. With this review, we explore peripheral electrical stimulation as an intervention for tremor reduction, identify the limitations and benefits of the current state-of-the-art studies, and provide ideas to guide the development of novel approaches based on the neural circuitries and mechanical properties implied in tremor generation.

Title: Delirium after Deep Brain Stimulation in Parkinson's Disease.

Author(s): Li ; Han, Shunchang; Feng, Juan

Abstract: Deep brain stimulation is a primary treatment method that improves motor and motor complications in patients with advanced Parkinson's disease. Delirium is a common and serious complication following deep brain stimulation. However, the clinical attention toward this complication remains insufficient. Advanced age, cognitive decline, and the severity of the disease may all be risk factors for delirium. The presence of delirium may also affect cognitive function and disease prognosis. Neurotransmitters such as acetylcholine and dopamine may be involved in the occurrence of delirium. Furthermore, inflammation, the effects of microlesioning of local nuclei, and brain atrophy may also play roles in the onset of delirium. Nonpharmacological therapy appears to be the primary treatment for postoperative delirium in Parkinson's disease. The current article reviews the pathogenesis, epidemiology, prognosis, and treatment of delirium following deep brain stimulation in Parkinson's disease to help clinicians better understand this common complication and to prevent, identify, and treat it as soon as possible, as well as to provide more accurate treatment for patients.

Title: Long-term study of ropinirole patch in Parkinson's disease patients with/without basal L-dopa

Author(s): Mochizuki H.; Hattori N.; Hasegawa K.; Nomoto M.; Uchida E.; Terahara T.; Okawa K.; Fukuta H.

Introduction: A dopamine agonist patch could be an important treatment option for Parkinson's disease. This study evaluated the long-term efficacy and safety of the ropinirole hydrochloride patch. The steady state plasma ropinirole concentration was also assessed.

Method(s): In a multicenter, open-label, uncontrolled study, Parkinson's disease patients with/without basal levodopa and with/without prior dopamine agonist therapy (any of these four regimens) received application of a ropinirole patch once daily for up to 52 weeks with unforced titration from 8 to 64 mg. For patients with prior dopamine agonist therapy, the initial dose of ropinirole patch was determined from the prior dopamine agonist dose by using a conversion table.

Result(s): Most adverse events were mild or moderate. All application site adverse events were mild, except for moderate application site erythema in one patient. In patients with prior dopamine agonist therapy, switching to ropinirole patch did not lead to a significant early

increase of adverse events. A change from baseline in the UPDRS Part III total score, the primary efficacy endpoint, showed improvement until Week 16 compared with baseline, followed by little subsequent change until Week 52, indicating maintenance of efficacy. The plasma ropinirole concentration was at steady state throughout the study period and showed a dose-proportional increase.

Conclusion(s): Once-daily application of ropinirole patch showed long-term efficacy and safety (52 weeks) for Parkinson's disease. Switching from other dopamine agonists to ropinirole patch was effective and safe. The plasma ropinirole concentration was at steady state throughout the study period and showed a dose-proportional increase. Copyright © 2021 Elsevier Ltd

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Title: Cerebral small vessel disease may worsen motor function, cognition, and mood in Parkinson's disease

Citation: Parkinsonism and Related Disorders; Feb 2021; vol. 83 ; p. 86-92

Author(s): Chen H.; Wan H.; Zhang M.; Liu G.; Wang X.; Wang Z.; Ma H.; Pan Y.; Feng T.; Wang Y.

Introduction: Emerging evidence has suggested that cerebral small vessel disease (CSVD) may worsen motor function and cognition in Parkinson's disease (PD). However, the effect of CSVD on anxiety and depression in patients with PD remains unknown. This study explored the multi-dimensional effects of CSVD on PD outcomes (motor, cognition, and depression/anxiety).

Method(s): This cross-sectional study included 431 patients with PD from Beijing Tiantan Hospital from May 2016 to August 2019. CSVD imaging markers were assessed and the four-point CSVD burden score was calculated. Motor function (MDS-UPDRS III score and subscores), cognition (MMSE, MoCA), anxiety (HAMA), and depression (HAMD) were assessed in these patients. The associations of CSVD with these outcomes were analyzed using the Spearman's correlation and multivariable linear regression models.

Result(s): Motor dysfunction, cognitive impairment, depression, and anxiety were significantly worse in patients with severe CSVD than in those with mild CSVD. Multivariable linear regression showed that CSVD burden was significantly associated with motor dysfunction (MDS-UPDRS III score and rigidity and bradykinesia subscores), impaired cognition, and high levels of depression and anxiety. A marginally significant association was observed between CSVD burden and gait/postural instability in multivariable regression analysis. Among the CSVD imaging markers, white matter hyperintensity, number of lacunes, and microbleeds were positively correlated with the severity of motor, cognitive, and emotional impairments, while the perivascular space in the basal ganglia was only correlated with cognitive impairments.

Conclusion(s): Comorbid CSVD may affect multiple functional domains in patients with PD. Management of cerebrovascular disease may improve PD outcomes. Copyright © 2021 Elsevier Ltd

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Title: Late onset depression: Dopaminergic deficit and clinical features of prodromal Parkinson's disease: A cross-sectional study

Citation: Journal of Neurology, Neurosurgery and Psychiatry; Feb 2021; vol. 92 (no. 2); p. 158-164

Author(s): Kazmi H.; Schrag A.-E.; Walker Z.; Booij J.; Khan F.; Shah S.; Sudre C.H.; Buckman J.E.J.

Background: Late onset depression (LOD) may precede the diagnosis of Parkinson's disease (PD) or dementia with Lewy bodies (DLB). We aimed to determine the rate of clinical and imaging features associated with prodromal PD/DLB in patients with LOD.

Methods: In a cross-sectional design, 36 patients with first onset of a depressive disorder (Diagnostic and Statistical Manual of Mental Disorders IV criteria) diagnosed after the age of 55 (LOD group) and 30 healthy controls (HC) underwent a detailed clinical assessment. In addition, 28/36 patients with LOD and 20/30 HC underwent a head MRI and 29/36 and 25/30, respectively, had dopamine transporter imaging by 123 I-ioflupane single-photon emission computed tomography (SPECT) imaging. Image analysis of both scans was performed by a rater blind to the participant group. Results of clinical assessments and imaging results were compared between the two groups.

Results: Patients with LOD (n=36) had significantly worse scores than HC (n=30) on the PD screening questionnaire (mean (SD) 1.8 (1.9) vs 0.8 (1.2); p=0.01), Movement Disorder Society Unified Parkinson's Disease Rating Scale total (mean (SD) 19.2 (12.7) vs 6.1 (5.7); p<0.001), REM-sleep behaviour disorder screening questionnaire (mean (SD) 4.3 (3.2) vs 2.1 (2.1); p=0.001), Lille Apathy Rating Scale (mean (SD)-23.3 (9.6) vs-27.0 (4.7); p=0.04) and the Scales for Outcomes in PD-Autonomic (mean (SD) 14.9 (8.7) vs 7.7 (4.9); p<0.001). Twenty-four per cent of patients with LOD versus 4% HC had an abnormal 123 I-ioflupane SPECT scan (p=0.04).

Conclusions: LOD is associated with increased rates of motor and non-motor features of PD/DLB and of abnormal 123 I-ioflupane SPECTs. These results suggest that patients with LOD should be considered at increased risk of PD/DLB. Copyright © Author(s) (or their employer(s)) 2021. Re-use permitted under CC BY. Published by BMJ.

Title: Health behaviors a year after an early intervention exercise and education program for people with Parkinson's disease

Author(s): Li G.; Paul S.S.; Horne J.

Aim: To evaluate the impact of an early intervention program on exercise behavior and mood in people with Parkinson's disease (PD) 1 year following participation.

Methods: Education and exercise program participants (n = 152) were followed up for 1 year. Changes in exercise behavior and mood and factors associated with these changes were examined.

Result(s): At follow-up, 28% more participants exercised (p < 0.001). Changes in the proportion reporting depression (12% reduction; p = 0.10) or anxiety (4% increase, p = 0.09) were not statistically significant.

Conclusion(s): An education and exercise program promoted positive exercise behavior change sustained for a year, supporting the importance of early intervention for people with PD. Future research should explore sustainable ways to encourage prolonged behavior change, including regular follow-up. Copyright © 2021

Title: Comparison of forward and backward postural perturbations in mild-to-moderate Parkinson's disease

Author(s): Lu C.; Amundsen-Huffmaster S.L.; Lowe R.; Abulu R.; Vitek J.L.; MacKinnon C.D.; Cooper S.E.; Louie K.H.; McGovern R.A.

Background: Assessing postural stability in Parkinson's disease (PD) often relies on measuring the stepping response to an imposed postural perturbation. The standard clinical technique relies on a brisk backwards pull at the shoulders by the examiner and judgement by a trained rater. In research settings, various quantitative measures and perturbation directions have been tested, but it is unclear which metrics and perturbation direction differ most between people with PD and controls.

Objective(s): (1) Use standardized forward vs. backward perturbations of a support surface to evaluate reactive stepping performance between PD and control participants. (2) Evaluate the utility of using principal components analysis to capture the dynamics of the reactive response and differences between groups.

Method(s): Sixty-two individuals participated (40 mild-to-moderate PD, off medication). Standardized rapid translations of the support surface were applied, requiring at least one step, backward or forward, to restore balance. The number of steps taken and the projection of the first principal component (PC1) of the center of pressure (COP) time series were entered in linear repeated-measures mixed effect models.

Result(s): Forward falls required significantly fewer steps to recover than backward falls. PC1 captured more than half of the variance in the COP trajectory. Analysis of the PC1 projection revealed a significant interaction effect of group (PD vs. controls) by direction, such that there was a group difference in forward stepping, but not backward.

Significance: Forward reactive stepping in PD differed from controls more than backward-stepping. PC1 projections of the COP trajectory capture the dynamics of the postural response and differ between PD and controls. Copyright © 2020 Elsevier B.V.

Title: Which features of postural sway are effective in distinguishing Parkinson's disease from controls? A systematic review

Author(s): Ge W.; Apthorp D.; Suominen H.; Lueck C.J.

Background: Postural sway may be useful as an objective measure of Parkinson's disease (PD). Existing studies have analyzed many different features of sway using different experimental paradigms. We aimed to determine what features have been used to measure sway and then to assess which feature(s) best differentiate PD patients from controls. We also aimed to determine whether any refinements might improve discriminative power and so assist in standardizing experimental conditions and analysis of data.

Method(s): In this systematic review of the literature, effect size (ES) was calculated for every feature reported by each article and then collapsed across articles where appropriate. The influence of clinical medication status, visual state, and sampling rate on ES was also assessed.

Result(s): Four hundred and forty-three papers were retrieved. 25 contained enough information for further analysis. The most commonly used features were not the most effective (e.g., PathLength, used 14 times, had ES of 0.47, while TotalEnergy, used only

once, had ES of 1.78). Increased sampling rate was associated with increased ES (PathLength ES increased to 1.12 at 100 Hz from 0.40 at 10 Hz). Measurement during "OFF" clinical status was associated with increased ES (PathLength ES was 0.83 OFF compared to 0.21 ON).

Conclusion(s): This review identified promising features for analysis of postural sway in PD, recommending a sampling rate of 100 Hz and studying patients when OFF to maximize ES. ES complements statistical significance as it is clinically relevant and is easily compared across experiments. We suggest that machine learning is a promising tool for the future analysis of postural sway in PD. Copyright © 2020 The Authors. Brain and Behavior published by Wiley Periodicals LLC

Title: Two-year follow-up results of magnetic resonance imaging-guided focused ultrasound unilateral pallidotomy for Parkinson's disease

Author(s): Ito H.; Fukutake S.; Kamei T.; Yamamoto K.; Yamaguchi T.; Taira T.

Background: Posteroventral globus pallidus internus (GPi) pallidotomy is one of the therapeutic options for motor fluctuations in Parkinson's disease (PD). Transcranial magnetic resonance imaging-guided focused ultrasound (MRgFUS) is a new intervention to ablate an intracranial target.

Aim(s): To investigate the long-term efficacy and safety of MRgFUS unilateral GPi pallidotomy for PD.

Method(s): This was a prospective and open-labeled study involving a single center. We enrolled 3 PD patients with medication-refractory motor fluctuations (3 women, aged 59 to 78 years). Participants underwent MRgFUS unilateral GPi pallidotomy and were evaluated serially for 2 years using the Unified Parkinson's Disease Rating Scale (UPDRS) and Unified Dyskinesia Rating Scale (UDysRS). Additionally, we assessed safety issues during the study period.

Result(s): Although motor fluctuations improved in 2 patients, the motor function in the off-medication state and levodopa-induced dyskinesia (LID) exacerbated in 1 of them. In the other patient, LID improved for 2 years; however, improvement of the motor function was limited and it exacerbated. Patients developed neither serious nor delayed complications.

Conclusion(s): The efficacy of MRgFUS unilateral GPi pallidotomy differed in each patient and might depend on the natural course of PD. No safety issues were observed. Copyright © 2020 Societas Neurologica Japonica (Japanese Society of Neurology) and John Wiley & Sons Australia, Ltd

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Title: Hospital bed height influences biomechanics during bed egress: A comparative controlled study of patients with Parkinson disease

Author(s): Xu H.; Li X.; An L.; Shi Y.; Taylor D.; Christman M.; Merryweather A.; Morse J.

Abstract: Although a significant proportion of patient falls occur during egress from the hospital bed, the biomechanical adaptations during egress from different bed heights are still largely unknown. The purpose of this study was to evaluate the effect of hospital bed height on natural transition during egress in patients with Parkinson disease (PD). Twelve patients

with PD and fourteen healthy elderly adults (HEA) were recruited and the natural transition during egress from three different bed heights (low, medium and high) were recorded for each participant using a motion capture system and force plates. The bed egress time, joint kinematics, ground reaction force and center of mass (CoM) were compared using a two-factor repeated ANOVA to determine the effects of three bed heights and two groups. The results showed that patients with PD had a significantly increased bed egress time, decreased peak of pelvis anterior tilt, hip flexion, and anteroposterior distance between pelvis center and CoM compared to HEA. Additionally, both PD and HEA groups increased the peak of trunk, hip and knee flexions to generate forward CoM momentum and joint torque to rise from a low bed height. These findings indicated that patients with PD invoked a more conservative movement pattern than HEA during egress to improve postural stability. The low bed height increased demands of balance and postural control during egress which exacerbates the risk of falls for patients with PD. Copyright © 2020 Elsevier Ltd

Sources Used:

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

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