ABSTRACT

Amy L. Morgan, Advisor

Parkinson’s disease (PD) is a neurodegenerative disorder associated with motor disturbances and impairments. Individuals diagnosed with PD often experience declines in muscular strength, muscular tone, gait, and posture. These declines compromise function and limit the person with Parkinson’s ability to care for themselves and lead independent lives. The purpose of this study was to compare perceived function and measured function in persons with Parkinson’s with the use of the Parkinson’s Disease Questionnaire 39 (PDQ-39), part II of the Unified Parkinson’s Disease Rating Scale (UPDRS), and the Physical Functional Performance 10 Test (PFP10). These scales were used to help identify relationships among perceived function, measured function, quality of life, and disease stage. Twenty-two participants with idiopathic Parkinson’s disease in stages 1 to 3 were recruited. Informed consent was collected and participants completed a medical history questionnaire. Perceived function was measured by completion of the PDQ-39 and part II of the UPDRS, while measured function was assessed with the completion of the PFP10. The PFP10 measures functional ability through the completion of 10 common activities of daily living (ADLs) with ADLs grouped to represent physical domains. Analysis of variance revealed statistically significant differences in mean PFP10 total scores between males and females ($F (1,16) = 4.898, p = 0.042$). Correlations revealed significant, negative correlations in men among domains of the PFP10 and part II of the UPDRS, and significant, negative correlations in the group among the PFP10 total score, a PFP10 domain and part II of the UPDRS. Additional correlations revealed negative correlation between the PFP10 total score and sections of the PDQ-39 as well as other negative correlations between a section of
the PDQ-39 and the domains of the PFP10. Finally, significant, positive correlations were seen between sections of the PDQ-39 and part II of the UPDRS. The key findings of the current study included significant relationships between perceived function and measured function. PFP10 and UPDRS scores indicated that persons with Parkinson’s were “somewhat” accurate in assessing their actual abilities.
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Parkinson’s disease (PD) is a neurodegenerative disorder associated with motor disturbances and impairments. Individuals diagnosed with PD may experience bradykinesia, rest tremors and/or rigidity, as well as postural and gait impairments (Przedborski, 2012). Diagnosis of PD is difficult as many of its associated symptoms mirror the symptoms of other neurodegenerative disorders. In addition, the presentation of symptoms varies greatly from person to person. The progression of PD is often associated with decreases in functionality, which can ultimately limit a person with Parkinson’s ability to care for themselves and lead an independent life. The progression of PD can also be associated with decreases in quality of life (QoL).

As the person with Parkinson’s ages and the disease progresses, function becomes compromised. Declines in muscular strength, muscular tone, gait, and posture significantly affect the individual’s ability to provide self-care. The functional declines accompanying PD can be measured with the following scales and test batteries: The Unified Parkinson’s Disease Rating Scale (UPDRS), and the Physical Functional Performance 10 Test (PFP10), The Parkinson’s Disease Questionnaire-39 (PDQ-39), the Berg Balance Scale (BBS), the Timed Up & Go test (TUG), the Forward Functional Reach test (FFR), the Backward Functional Reach test (BFR), and the Six-Minute Walk Test (6MWT). Many of the aforementioned scales have been validated for use in this population, however, researchers and clinicians must be mindful of disease progression when utilizing these tools. Much of the existing research associated with these scales has been conducted with persons classified as having early to middle stage PD. Schenkman et al. (2011) suggest that further research is needed in order to more clearly interpret the results that are yielded with such scales and test batteries.
The UPDRS is a scale noted as being the “gold standard” in assessing disease progression and functionality in persons with Parkinson’s. The assessment uses a variety of tests to evaluate multiple domains of life and functioning. The assessment is broken down into the following four sections: I. Mentation, Behavior and Mood, II. Activities of Daily Living, III. Motor Examination, and IV. Complications of Therapy. The first and second sections are administered to the person with Parkinson’s who then self-selects the appropriate responses. The third section is completed by a physical therapist or trained movement disorders specialist, and involves the evaluation of various movement patterns and muscle groups. The final section is completed with a clinician who spends time asking questions and discussing the use of dopaminergic medication with the person with Parkinson’s. The results of this assessment quantify disease progression (Brusse, Zimdars, Zalewski, & Steffen, 2005).

In addition to the UPDRS, the PFP10 assessment is useful because it evaluates the participant’s upper and lower body strength, upper body flexibility, balance, coordination, and endurance, all important components associated with successful self-care (Cress, Petrella, Moore, & Schenkman, 2005). Schenkman, Cutson, Kuchibhatla, Scott, and Cress (2002), suggested that this assessment will most accurately document functional declines when employed in the early stages of PD.

The functional declines associated with PD progression can influence multiple domains of the individual’s life. The PDQ-39 utilizes a variety of scales to evaluate the effects that PD and PD progression have on the individual’s quality of life (QoL). This self-report questionnaire evaluates QoL with the use of the following eight scales: Mobility, activities of daily living, emotions, stigma, social support, cognitions, communication, and bodily discomfort (Jenkinson
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et al., 2008). The PDQ-39 has been validated and has been demonstrated to be useful in documenting changes in QoL in the person with Parkinson’s.

The UPDRS, the PFP10, and the PDQ-39 are all appropriate assessment tools for those with PD as they provide valuable information about the person with Parkinson’s perceived function, measured function, and QoL. When used alone, the UPDRS has self-report components as well as assessments that are completed by a clinician, while the PFP10 measures function through the completion of activities essential to independent living, and the PDQ-39 utilizes a questionnaire completed by the patient. However, if utilized in combination, these assessments may have the ability to yield more meaningful results, as these might provide a more comprehensive evaluation of the person with Parkinson’s function and QoL. Researchers who utilize these tools together may be able to detect declines in functional ability that would not have been detected with the use of a single task assessment. More research is needed to determine if this combination of assessment tools will yield results that are meaningful to the person with Parkinson’s Disease.

Significance of the Study

Early identification of the functional compromises and associated weaknesses observed in individuals in the early stages of PD may allow for the implementation of interventions that better help persons with Parkinson’s needs, delay disease progression, and/or prolong function. Comparing the results of part II of the UPDRS, the PFP10, and the PDQ-39 may allow researchers to detect a relationship between a person with Parkinson’s perception of function and their measured level of function. This information will be useful because few studies have been conducted that examine the relationship between perceived function, measured function, and disease stage. Previously conducted research has demonstrated that many of the reliable and
valid Parkinson’s specific functional assessments do not provide a complete profile of the individual’s functional ability.

**Purpose of the Study**

The purpose of this study was to evaluate perceived and measured level of function in persons with Parkinson’s with the use of the PDQ-39, part II of the UPDRS, and the PFP10. These measures were utilized to help identify relationships among perceived level of function, measured level of function, quality of life, and disease stage.

**Hypotheses**

1. It was hypothesized that individuals who perceived a high level of ability would perform better, demonstrating a negative correlation between the PFP10 and part II of the UPDRS.

2. It was hypothesized that individuals who perceived a high quality of life would perform better, demonstrating a negative correlation between the PFP10 and the PDQ-39.

3. It was hypothesized that there would be a positive correlation between part II of the UPDRS and the PDQ-39.

4. It was hypothesized that the PFP10 would document lower function in individuals within mid-stages of Parkinson’s compared to those in early-stages of Parkinson’s.
Overview

Parkinson’s disease (PD), a neurodegenerative disorder, affects a large percentage of the population. It is estimated that one million people are living with PD in the United States (Myers et al., 2010). The etiology of PD is unknown, but hypothesized to be multifactorial. The etiological theories surrounding PD are widespread, but include theories of exposure to environmental toxins, genetic predisposition, and geographic location. The cardinal symptoms associated with the disease include bradykinesia, rest tremors, rigidity, postural impairments, and gait disturbances (Przedborski, 2012). While disease progression is varied among individuals, it ultimately leads to decrements in functional abilities.

Symptoms

James Parkinson described the symptoms of Parkinson’s disease in 1817 in his publication, *An Essay on the Shaking Palsy*. While Parkinson’s descriptions of the symptoms were based on observational studies from the time, many of his observations currently hold true. “Involuntary tremulous motion, with lessened muscular power, in parts not in action and even when supported; with a propensity to bend the trunk forwards, and to pass from a walking to a running pace: the senses and intellects being uninjured” (Parkinson, 2002, p. 223). The previous account describes many manifestations of what are now known as cardinal symptoms of the disease. Those cardinal symptoms include bradykinesia, rest tremors, rigidity, postural impairments, and gait disturbances.

Bradykinesia is defined as slowness of movement (Parkinson, 2002). Bradykinesia is commonly the first symptom that persons with Parkinson’s experience, however, because the onset of this disease may occur later in life, such slowness is initially attributed to the natural
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processes of aging (Mosley, Romaine, & Samii, 2010). Akinesia and hypokinesia are additional symptoms associated with bradykinesia that often affect persons with Parkinson’s. Akinesia refers to a lack of spontaneous or natural movements. Akinesia affects individuals’ ability to produce facial expressions, and movements such as arm swing with walking (Berardelli, Rothwell, Thompson, & Hallett, 2001). Hypokinesia refers to a reduction in the amplitude of movement, and affects individuals’ step and stride lengths (Berardelli et al., 2001). As disease severity progresses, bradykinesia and its associated symptoms can influence the individuals’ ability to complete activities of daily living (ADLs) as well as the individuals’ ability to communicate as it can cause difficulties in speech (Mosley et al., 2010). While bradykinesia is typically the first symptom that persons with Parkinson’s present, it is not usually the symptom that causes them to seek medical attention.

Tremor, a primary symptom of Parkinson’s disease, is usually the symptom that prompts an individual to seek medical attention (Mosley et al., 2010). In persons with Parkinson’s, tremors are typically most apparent during periods of rest, and classically dissipate with the initiation of movement (Parkinson, 2002). The severity of tremors can be influenced by the other symptoms of Parkinson’s, including bradykinesia, rigidity, postural impairments, and gait disturbances. Individuals with severe bradykinesia and rigidity are likely to experience more debilitating tremors (Mosley et al., 2010).

As indicated above, another key symptom of Parkinson’s disease is rigidity. Rigidity results in resistance to passive movements, as there is an increase in muscle tone. This symptom is often described as a feeling of stiffness by persons with Parkinson’s (Berardelli, Sabra, & Hallett, 1983).
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Postural impairments and gait disturbances are also featured symptoms of Parkinson’s disease. Persons with Parkinson’s may experience postural impairments that affect their ability to maintain their balance, in turn making it difficult to maintain posture (Visser et al., 2003). The ability to maintain postural control over one’s body is a vital component of safe ambulation, which is closely related to the ability to live independently. As such, clinicians evaluate persons with Parkinson’s ability to recover from postural disturbances as criterion for disease staging (Movement Disorder Society, 2008).

To compensate for postural impairments, the person with Parkinson’s may develop gait disturbances. These disturbances result in abnormal patterns of walking and present themselves differently from person to person (Giladi, Shabtai, Rozenberg, & Shabtai, 2001). A commonly developed gait disturbance is festinating gait (Giladi et al., 2001). Those experiencing a festinating gait walk with a forward lean of the trunk, taking quick, small steps (Giladi et al., 2001). Persons with Parkinson’s may also exhibit shuffling gait, as some person’s with Parkinson’s no longer walk with a heel to toe pattern (Myers, 2010). Additional gait disturbances that may be experienced include bouts of freezing, during which the individual is unable to initiate or terminate gait (Myers, 2010), or struggles when attempting to change the direction of gait. Unfortunately, individuals experiencing severe postural impairments and gait disturbances may be at a higher risk of experiencing falls.

Pathophysiology

The symptoms experienced by persons with Parkinson’s occur as a result of progressive damage to the body’s central nervous system. Destruction of the basal ganglia in the central nervous system is associated with movement disturbances, as this structure is linked to the region of the brain that is responsible for motor planning and control (Myers et al., 2010). Further
destruction of the substantia nigra, a structure within the basal ganglia, and its neurons within the substantia nigra pars compacta, leads to the degeneration of nigrostriatal dopaminergic pathways (Myers et al., 2010). Degeneration of nigrostriatal dopaminergic pathways consequently results in the loss of dopamine, which ultimately leads to the presentation and progression of PD symptoms (Myers et al., 2010).

**Diagnosis & Staging**

Diagnosing PD is difficult as the presentation and progression of the disease varies greatly from person to person. In fact, “PD symptoms are not noticeable in a person until about 80% of the cells in the substantia nigra are destroyed or until dopamine levels are reduced by the same amount” (Spring & Rorke, 2000, p. 176). While diagnosis is difficult, clinicians have utilized the same disease staging scale for over 40 years. Physicians Margaret Hoehn and Melvin Yahr developed the five-point Hoehn and Yahr stage scale (Hoehn & Yahr, 1967). PD affects individuals in Hoehn and Yahr stage 1 unilaterally while PD affects individuals in stage 2 bilaterally, without impairments of balance. Persons with Parkinson’s that are diagnosed as stage 3 are affected bilaterally, and experience some postural instability, but remain physically independent with the exception of needing assistance during recovery of a pull test. Those in stage 4 are severely disabled, but retain their ability to walk or stand unassisted while those in stage 5 are wheelchair bound or bedridden unless aided. This scale was modified in the 1990s, when two additional increments were added to the scale. The Modified Hoehn and Yahr stage scale includes the addition of stage 1.5 which denotes unilateral disease and axial involvement, as well as stage 2.5, which denotes mild bilateral disease with recovery on a pull test (Goetz et al., 2004). The aforementioned pull test is administered by a trained tester and involves a
forceful, backwards pull on the participant’s shoulders, with the purpose of displacing their balance in order to assess how the participant recovers from the disturbance.

The Hoehn and Yahr staging scale has been utilized in research and clinical practice for over 40 years. In 2004, Goetz et al. published a study that was conducted with the Movement Disorder Society (MSD) Task Force for Rating Scales in PD. The purpose of the study was to critique the Hoehn and Yahr staging scale. As expected, the MSD Task Force identified a combination of strengths and weaknesses associated with the Hoehn and Yahr staging scale. However, the strengths of the scale outweighed its weaknesses as the Task Force made five recommendations that supported the continuation of its application. The primary recommendation advised continued use of the original version of the scale (Goetz et al., 2004). An additional recommendation emphasized the usefulness of the scale in research settings as it can simply define inclusionary and exclusionary criteria (Goetz et al., 2004).

**Single Task Functional Testing**

There are a variety of single item tasks that have been utilized to assess functional ability in both normal populations as well as in the Parkinson’s population. Some of these single item tasks include the Berg Balance Scale (BBS), the Timed Up & Go test (TUG), the Forward Functional Reach test (FFR), the Backward Functional Reach test (BFR), the 360-Degree Turn, the Two-Minute Walk Test (2MWT), and the Six-Minute Walk Test (6MWT). Qutubuddin et al. (2005), concluded that BBS scores were correlated with multiple functional assessment tools, including part III of the UPDRS, the Modified Schwab and England Capacity for Daily Living Scale (S&E ADL Scale), and the Modified Hoehn and Yahr disease staging scale. These findings confirmed the clinical validity of the utilization of the BBS in persons with Parkinson’s (Qutubuddin et al., 2005). Thompson and Medley (1998) conducted a research study with the
TUG to establish “normative” data in persons with Parkinson’s. Thompson and Medley recruited 30 persons with Parkinson’s and 30 age, gender, height, and assistive device matched controls (Thompson & Medley, 1998). Participants were tested with the TUG in order to determine if differences existed between the Parkinson’s group and control group (Thompson & Medley, 1998). They also sought to determine if a relationship existed between persons with Parkinson’s and the Hoehn and Yahr disease rating scale (Thompson & Medley, 1998). Results revealed that person’s with Parkinson’s performed the TUG more slowly than controls and researchers concluded that the TUG is a reliable tool for detecting functional limitations in persons with Parkinson’s (Thompson & Medley, 1998).

Additionally, Light and colleagues evaluated the usefulness of the 2-minute walk test as a measure of endurance for persons with Parkinson’s (Light, Behrman, Thigpen, & Triggs, 1997). Light et al. (1997) indicate that the 2-minute walk test may be more practical in clinical settings than the 6-minute walk test and 12-minute walk test. They noted that persons with Parkinson’s typically experience difficulties in mobility that can lead to declines in endurance, making 12-minute and 6-minute walks difficult for the individual (Light et al., 1997). Conducting 12-minute and 6-minute walks becomes increasingly problematic for the person with Parkinson’s when accounting for the need of the walk to be completed three times to meet reliability criterion (Light et al., 1997). However, Cress et al. (1996) utilized a single 6-minute walk test in healthy adults aged 60 and older as a measure of endurance in the CS-PFP test battery and Cress et al. (2005) utilized a single 6-minute walk test in healthy adults aged 60 and older as a measure of endurance in the PFP10 test battery, both of which yielded valid and reliable measures. Schenkman et al. (2002) also utilized a single trial of the 6-minute walk test in the CS-PFP with persons with Parkinson’s, which also yielded valid and reliable measures.
While the BBS, TUG, FFR, BFR, the 360-Degree Turn, 2MWT, and the 6MWT have been validated in adult populations and heavily utilized in the Parkinson’s population, they only measure function at the moment of testing and may not be sensitive to detecting change over time. Further, while useful, single item tasks do not evaluate the full spectrum of functional ability. This is because single item tasks do not assess the person with Parkinson’s ability to complete activities essential to independent living serially. Tasks completed in a serial manner typically require a certain degree of endurance. Therefore, to fully measure functional ability, use of a more encompassing measure is suggested.

**Continuous Scale Physical Functional Performance Test (CS-PFP)**

The Continuous Scale Physical Functional Performance test (CS-PFP) was originally created to measure physical function in older adults. Cress et al. (1996) defined physical function as, “the integration of physiological capacity and physical performance capability mediated by psychosocial factors” (1996, p.1243). The CS-PFP quantifies physical functional performance through the completion of 16 tasks that measure the domains of upper body strength, upper body flexibility, lower body strength, balance and coordination, and endurance (Cress et al., 1996). The 16 tasks emulate common activities of daily living and are performed serially from least to most difficult. The low difficulty tasks include carrying a weighted pot a distance of 1 meter, pouring water from a jug to a cup, donning and removing a jacket, and placing and removing a sponge from an adjustable shelf. The next set of tasks include sweeping the floor with a broom and dustpan, transferring clothes from a washer to a dryer, transferring clothes from a dryer to a basket, opening and passing through a fire door, making a bed, vacuuming, placing a strap over a shoe, and picking up four scarves from the floor. The remaining tasks include carrying a bag up
and down a simulated bus stop, sitting on and standing up from the floor, climbing stairs, carrying groceries, and walking for 6 minutes.

In a validation study, the CS-PFP was shown to be a valid and reliable assessment tool in the older adult population. Cress et al. (1996) evaluated the physical functional performance of 148 older adults. Seventy-eight of these adults were community dwellers (CD), 31 were long-term care facility residents living independently (LTC/I) and the remaining 39 adults were long-term care facility residents with some dependence (LTC/D). Maximal physical performance was assessed by measuring maximal oxygen consumption (VO$_2$max), isokinetic strength, range of motion, gait, and balance. Physical functional performance was measured with the CS-PFP, and self-perceived function was measured with the Sickness Impact Profile (SIP), the Health Survey (SF36), and Instrumental Activities of Daily Living (IADL). Cress and colleagues did not find differences in IADL scores among groups. However, they did find that all groups had significantly different total CS-PFP scores in addition to having significantly different individual domain scores (Cress et al., 1996). Community dwellers earned higher total CS-PFP scores and higher domain scores than participants in the LTC/I and LTC/D groups, while individuals in the LTC/I group earned higher total CS-PFP scores and higher domain scores than participants in the LTC/D group (Cress et al., 1996).

A shorter version of the CS-PFP was later created to increase accessibility and application. The short version, the Physical Functional Performance 10 test (PFP10), consists of 10 of the original 16 tasks in the CS-PFP (Cress et al., 2005). The low difficulty tasks include carrying a weighted pot a distance of 1 meter, donning and removing a jacket, picking up four scarves from the floor, and placing and removing a sponge from an adjustable shelf. The moderate difficulty tasks include sweeping the floor with a broom and dustpan, transferring
clothes from a washer to a dryer, transferring clothes from a dryer to a basket, and sitting on and standing up from the floor. The high difficulty tasks include climbing stairs, carrying groceries, and walking for 6 minutes.

The PFP10 has been shown to be both valid and reliable in an older adult population. The older adult population included individuals that were 60 years of age or older (Cress et al., 2005). Cress et al. (2005) conducted a study to examine the validity, reliability, and sensitivity of data for the shortened version of the CS-PFP. Substudy 1 involved the careful identification of the tasks that would be included in the PFP10. Substudy 2 involved comparing previously collected CS-PFP data with performance on the PFP10. Findings indicated that the results yielded from the PFP10 were comparable to those yielded from the CS-PFP, indicating that these assessments can be used interchangeably without sacrificing valuable data.

The CS-PFP and the PFP10 are both scored using units of time, distance, and/or weight. Participants receive a score for each of the five domains, and the average of those scores is their overall CS-PFP or PFP10 score. Scores range from 0 to 100 on a continuous scale, with higher scores representing higher levels of physical functional performance (Cress et al., 2005). Participants select the speed at which each task is completed, and also select the amount of weight added for the weighted pot carry and grocery tasks. The continuous units of measurement utilized in the scoring of the CS-PFP and the PFP10 allow the assessment to be utilized in a variety of populations, as more able-bodied individuals can challenge themselves by performing tasks more quickly, while adding larger amounts of weight to the weighted tasks, which in turn reduces the chances of attaining a ceiling effect on tasks (Cress et al., 1996).

In addition to their application in the older adult population, the CS-PFP and PFP10 have been utilized in a variety of populations. For example, the CS-PFP has been utilized with and
validated in individuals suffering from coronary heart disease (Brochu et al., 2002) and Parkinson’s disease (Schenkman et al., 2002). The CS-PFP has even been used to measure functional ability in post-burn victims (Nakamura et al., 2000). In 2009, the PFP10 was utilized, though not validated, in assessing the functional ability of stroke survivors (Manns, Tomczak, Jelani, Cress, Haennel, 2009).

**Parkinson’s Disease Questionnaire 39 (PDQ-39)**

The Parkinson’s Disease Questionnaire 39 (PDQ-39) is a Parkinson’s specific assessment that evaluates how person’s with Parkinson’s quality of life (QoL) is influenced by PD. QoL is assessed with the use of eight scales that are representative of symptoms and/or problems that persons with Parkinson’s may experience in daily living. Each section contains three to 10 questions that address the following scales, mobility, activities of daily living (ADLs), emotions well-being, stigma, social support, cognition, communication, and bodily discomfort (Jenkinson et al., 1993).

The creation and validation of the PDQ-39 was accomplished through the implementation of three stages (Peto, Jenkinson, Fitzpatrick, & Greenhall, 1995). The first stage in this process involved the creation of the assessment tool. Questions for the assessment were generated through interviews with persons with Parkinson’s (Peto et al., 1995). Peto et al. concluded the interview process after the twentieth interview, as no new themes arose (Peto et al., 1995). Upon completion of interviews, they had generated 65 questions and sent the assessment to 21 persons with Parkinson’s to pilot the assessment (Peto et al., 1995). After the assessment was piloted, minor adjustments were made and stage two of the creation and validation process was initiated. The purpose of the second stage was to determine which items of the scale were redundant and could be eliminated (Peto et al., 1995). In stage two, the
assessment was mailed to 454 persons with Parkinson’s and was completed by 82% of individuals (Peto et al., 1994). After analysis of the 359 assessments returned from stage two, a shorter version of the assessment was created, containing just 39 items (Peto et al., 1995). The validity and reliability of the condensed questionnaire was assessed by another postal survey, completed by 227 persons with Parkinson’s (Peto et al., 1995). Construct validity was evaluated with the SF-36 Health Survey Questionnaire, which was mailed to stage 3 respondents along with two copies of the PDQ-39 (Peto et al., 1995). Respondents were asked to complete one copy of the PDQ-39 and the SF-36 Health Survey Questionnaire, and were then asked to complete the second copy of the PDQ-39 three days after the first (Peto et al., 1995). Upon statistical analysis, researchers determined that the questionnaire was reliable in internal consistency and test-retest reliability (Peto et al., 1995).

**Unified Parkinson’s Disease Rating Scale (UPDRS)**

The Unified Parkinson’s Disease Rating Scale (UPDRS) is another Parkinson’s specific assessment that provides insight to disease progression, symptoms, and individual’s functional limitations (Mosley et al., 2010). The first section is designed to evaluate mentation, behavior, and mood, while the second section is designed to evaluate the level of difficulty associated with carrying out activities of daily living (ADLs) (Fahn & Elton, 1987). The first and second sections are administered to the person with Parkinson’s, who then self-selects appropriate responses (Goetz, 2003). The motor examination section is completed by a movement disorder specialist or physical therapist, and is composed of 14 questions and physical manipulations evaluated by the clinician (Goetz, 2003). The final section is administered by a clinician and utilized with individuals that are receiving pharmacological treatment for PD and is designed to evaluate complications of therapy (Goetz, 2003).
In 2001, the Movement Disorders Society (MDS) created a task force to address concerns that surrounded standardized rating scales for PD (Goetz, 2003). The task force was responsible for critiquing available scales, identifying clinical aspects that were not well evaluated, and making recommendations for use or modification of available scales. The first step of this process involved sending each clinician of the MDS a questionnaire relating to usage patterns of the UPDRS. One hundred and eighty-five of the 1,593 sent questionnaires were returned. Results of the 185 returned questionnaires revealed that 96% of respondents had personal experiences with the UPDRS, with large percentages of respondents utilizing the scale in clinical trials, clinical practice, and for other research purposes (Goetz, 2003). After reviewing these results the task force determined that the UPDRS would be the first scale evaluated. The chairperson of the task force organized a committee that assisted in writing a critique of the UPDRS (Goetz, 2003).

Results of the MDS task force critique on the UPDRS revealed that use of this particular scale was advantageous as the scale assessed multiple features of PD, and had been applied across early, mid, and late stages of the disease (Goetz, 2003). The UPDRS is also advantageous as it has been thoroughly tested (Goetz, 2003). Results of this critique also revealed that the UPDRS demonstrates good internal consistency, content validity and construct validity (Goetz, 2003). Furthermore, the UPDRS has been shown to be sensitive to detecting change in clinical settings (Goetz, 2003).

While the MDS task force critique identified numerous benefits to utilization of the UPDRS, the task force also acknowledged doubts associated with utilization of the scale. The task force noted that the construction of questions in section IV differs from the other sections of the UPDRS (Goetz, 2003). Section IV utilizes questions with 5-point options as well as questions
with dichotomous options, while the other sections only utilize questions with the 5-point options (Goetz, 2003). Members of the task force felt that the use of both 5-point and dichotomous scales could make analysis difficult (Goetz, 2003). In addition, members of the task force agreed that some dichotomous questions failed to assess severity of impairment as such dichotomous questions only indicated the existence or absence of a problem (Goetz, 2003). Another issue that was addressed by this task force involved the identification of items that were thought to be overrepresented, and ambiguities between the sections of the UPDRS (Goetz, 2003). An additional critique identified part II of the UPDRS as “culturally biased”, as some of the items rated in the ADL section are not applicable to diverse ethnicities (Goetz, 2003). For example, one of the items evaluated in this section is the ease/difficulty associated with utilizing eating utensils, however, utensils are not utilized in all ethnic settings (Goetz, 2003).

In spite of the weaknesses identified in the MDS task force critique of the UPDRS, utilization of the version 3.0 of the scale is still recommended for clinical and research application (Goetz, 2003). However, members of the task force do support the indication for the creation of a new “official” version of the UPDRS (Goetz, 2003). Additionally, these members recommend extensive clinimetric testing when a new version of the scale arises, and believe such testing should included movement disorder specialists and members of the MDS (Goetz, 2003).

**Parkinson’s Disease & Exercise**

Exercise has been associated with numerous health benefits to both healthy and diseased populations. Some of the benefits of regular exercise include improvements in cardiovascular and respiratory function, and reductions in cardiovascular risk factors such as reduced resting systolic and/or diastolic blood pressure, reduced blood sugar, reduced cholesterol, and reduced body fat (Pescatello, 2014). Additional benefits of regular exercise include improvements in both
cognitive and physical function (Pescatello, 2014). In 2008, the Physical Activity Guidelines Advisory Committee evaluated publications of physical activity dating back to 1996. The committee concluded that individuals participating in moderate physical activity most days of the week obtained health benefits (Physical Activity Guidelines Advisory Committee, 2008). In addition, the committee identified a dose-response relationship, explaining that greater volumes of more intense exercise performed more frequently yielded greater benefits than lower volumes of less intense exercise performed infrequently.

The primary goals of exercise for the person with Parkinson’s include delaying disability and disease progression, preventing secondary complications, and improving QoL (Pescatello, 2014). The American College of Sports Medicine (ACSM) (2014) recommends that persons with Parkinson’s participate in aerobic exercise, resistance training, flexibility exercise, and neuromotor exercise (Pescatello, 2014). The anticipated outcomes of participating in these forms of exercise include improvements in gait, transfers, balance, joint mobility, and muscular power. All of these improvements lead to a positive impact on physical functional ability in persons with Parkinson’s (Pescatello, 2014).

In 2002, Bergen and colleagues conducted a 16-week exercise investigation to examine the influence of the intervention on aerobic capacity and neuromuscular coordination in persons with Parkinson’s. Aerobic capacity was measured as peak VO$_2$ and neuromuscular coordination was measured as movement initiation (MI) time for elbow flexion and extension (Bergen et al., 2002). Four of the persons with Parkinson’s were assigned to the exercise intervention group and four of the persons with Parkinson’s were assigned to the control group. Additionally, six healthy adults served as controls. All participants were defined as being moderately active with everyday tasks of living but were not regular exercisers, and all persons with Parkinson’s were in stage II
of the disease as defined by Hoehn and Yahr. Participants in the exercise intervention group participated in monitored exercise three days per week for 16 weeks. Sessions included a warm-up, stretching and equal amounts of time on cycle ergometers and treadmills. Exercise was individualized by heart rate monitoring, as participants were asked to work at 60-70% of their heart rate reserve. Bergen et al. reported that the aerobic capacity of persons with Parkinson’s improved significantly when compared to the control group demonstrating the effectiveness of the 16-week exercise intervention program (Bergen et al., 2002).

Park et al. (2013) conducted a 48-week, delayed start design exercise intervention study in persons with Parkinson’s. The primary purpose of this study was to evaluate the feasibility of a long-term group exercise program for persons with Parkinson’s. Secondary purposes of this study included gaining information on the neuroprotective effects associated with exercise as well as determining if early exercise can provide non-motor benefits to the person with Parkinson’s. The primary outcome measure of the study was the UPDRS (Park et al., 2013). Results of the 48-week exercise intervention supported the feasibility of a long-term exercise program as 30 of 31 participants adhered to the program. While no statistically significant results were documented, Park et al. (2013) did note that at week 48 both groups had shown improvements in UPDRS score.

The available literature surrounding exercise and Parkinson’s disease is abundant. Researchers have studied the benefits associated with various types of exercise including, but not limited to vigorous exercise (Ahlskog, 2011), forced exercise (Alberts, Linder, Penko, Lowe, & Phillips, 2011), aerobic exercise (Bergen et al., 2002), and community-based dancing (Duncan & Earhart, 2012). Alberts et al. (2011) defined forced exercise as a type of aerobic exercise in which rate is mechanically augmented to aid the participant in achieving an exercise rate greater
than their favored rate. The aforementioned studies each examined interesting aspects of exercise as it relates to persons with Parkinson’s. For example, Bergen and colleagues (2002) concluded that aerobic exercise may reduce harmful effects of neuromuscular slowing in persons with Parkinson’s via improvements in their decision making ability. Though the purposes and findings of the above studies varied, the “take home” message was that staying active and participating in exercise is of the utmost importance to the person with Parkinson’s.

Summary

To conclude, there is ample literature supporting the use of single task assessment tools and continuous task assessment tools in both healthy and diseased populations. Additional research also supports the use of numerous Parkinson’s specific assessment tools. However, research suggests that the use of single task assessment tools does not provide a complete profile of an individual’s functional abilities. This becomes even more concerning when evaluating diseased populations, such as those with Parkinson’s.
CHAPTER III. METHODS

Bowling Green State University’s Human Subject Review Board (HSRB) approved this study. The study was conducted on the Bowling Green State University campus in the Functional Testing laboratory. Twenty-two participants were recruited with advertisements through the Gardner McMaster Parkinson Center at the University of Toledo Medical Center, Delay the Disease exercise classes, the Parkinson Foundation of Northwest Ohio, the Bowling Green Senior Center, and through the leaders of the Parkinson’s disease support groups in Northwest Ohio and Southeast Michigan.

Participants

Inclusion in the study required the diagnosis of idiopathic Parkinson’s disease (PD) in stages 1 to 3 as defined by the Hoehn and Yahr staging scale (Hoehn & Yahr, 1967). Stage 1 denoted unilateral disease, stage 2 denoted bilateral disease without impairment of balance, and stage 3 denoted mild to moderate bilateral disease and some postural instability. Participants were excluded from the study if they had uncontrolled cardiovascular disease, uncontrolled hypertension, another known neurological disease, were undergoing deep brain stimulation, or had changes in medication or dosage in the last month. The characteristics of the participants are shown in Table 1.

Screening Tools

Prior to physical exertion, participants completed a medical history questionnaire which included family, personal, medical, and exercise history. Participant’s disease stage was assessed by a trained tester with the use of the pull test and was recorded on the medical history questionnaire. This information assisted researchers in screening participants and stratifying participation risk. See Appendix A to view the entire medical history questionnaire.
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE?

Table 1.

*Participant Characteristics (Mean ± SD)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men ( (n=13) )</th>
<th>Women ( (n=7) )</th>
<th>All ( (n=20) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs.)</td>
<td>64.6 ± 6.4</td>
<td>67.5 ± 8.3</td>
<td>65.7 ± 7.0</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>174.10 ± 6.42</td>
<td>158.97 ± 4.96</td>
<td>168.81 ± 9.4</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>88.09 ± 17.31</td>
<td>77.20 ± 12.35</td>
<td>84.28 ± 16.3</td>
</tr>
<tr>
<td>H&amp;Y Stage</td>
<td>1.5 ± 0.5</td>
<td>1.5 ± 0.5</td>
<td>1.5 ± 0.5</td>
</tr>
<tr>
<td>Number of Medications</td>
<td>7.7 ± 4.8</td>
<td>8.3 ± 6.9</td>
<td>7.9 ± 5.5</td>
</tr>
<tr>
<td>Number of PD Medications</td>
<td>2.5 ± 1.7</td>
<td>2.2 ± 1.2</td>
<td>2.4 ± 1.5</td>
</tr>
<tr>
<td>RSBP (mmHg)</td>
<td>114.7 ± 14</td>
<td>108.8 ± 11.2</td>
<td>112.7 ± 13.1</td>
</tr>
<tr>
<td>RDBP (mmHg)</td>
<td>76.3 ± 8.6</td>
<td>74.2 ± 9.7</td>
<td>75.6 ± 8.8</td>
</tr>
<tr>
<td>RHR (bpm)</td>
<td>68 ± 17.5</td>
<td>68 ± 4.8</td>
<td>68 ± 14.1</td>
</tr>
</tbody>
</table>

*Note.* RSBP = Resting Systolic Blood Pressure, RDBP = Resting Diastolic Blood Pressure, RHR = Resting Heart Rate

**Assessment Tools**

Participants’ weight (kg), height (cm), resting blood pressure by auscultation at the brachial artery (RBP - mmHg), and resting heart rate by palpation at the radial artery (RHR - bpm) were measured after questionnaires were completed or after the participant had been seated for five minutes. These measurements served as baseline data and the RBP measurement assisted in screening for hypertension. Participants with a resting systolic blood pressure (RSBP) ≥160 mmHg and/or a resting diastolic blood pressure (RDBP) ≥ 100 were not permitted to continue participating in the study, as such values are indicative of stage 2 hypertension with indications for pharmacological intervention (National Heart, Lung, and Blood Institute, 2004). However, no participants were excluded from the study for this purpose.
Question 30 in section III of the UPDRS evaluates postural stability by use of a retropulsion test. The retropulsion test, also known as the pull test, is an assessment tool utilized in the evaluation of postural stability in the person with Parkinson’s. The test was performed by the same evaluator for all participants and involved pulling the participant backwards from the shoulders in order to assess how well he/she recovered from a postural disturbance. Individuals with normal postural stability recovered from a postural disturbance by taking one or two steps in the direction of the disturbance, while individuals with slight problems in postural stability recovered from a postural disturbance unaided, but did so by taking three to five steps. Those with mild problems in postural stability also recovered from a postural disturbance unaided, but took more than five steps to recover. The results obtained from the retropulsion test were additionally correlated to the Hoehn and Yahr staging scale to assist in determining disease stage.

The Parkinson’s Disease Questionnaire-39 (PDQ-39) is a self-report assessment tool that evaluated many aspects of the person with Parkinson’s life. This assessment includes 39 questions to evaluate the effect that PD has had on the participants’ quality of life (QoL) during the “last month”. Questions were generated from eight scales and answered with a response of never, occasionally, sometimes, often, or always. The PDQ-39 was scored in accordance with the New User Manual for the PDQ-39, PDQ-8 and PDQ Index (2nd Edition, 2008). See Appendix B to view the entire PDQ-39 questionnaire.

The Unified Parkinson’s Disease Rating Scale (UPDRS) is a self-report assessment tool used to evaluate multiple domains of the person with Parkinson’s life. Part II of the UPDRS focused on the individual’s activities of daily living (ADLs). This portion of the assessment includes 13 questions to gauge the severity of the effects that PD has had on the following
ADLs: speech, salivation, swallowing, handwriting, cutting food/handling utensils, dressing, hygiene, turning in bed/adjusting bed clothes, falling (unrelated to freezing), freezing when walking, walking, tremor (symptomatic complaint of tremor in any part of body), and sensory complaints related to Parkinsonism. Each question was rated on a scale ranging from zero to four. Participants were asked to circle a response that best described what they could do most of the time. This assessment tool was employed to assess perceived functional ability in the person with Parkinson’s. Part II of the UPDRS was scored independently from the other sections of the UPDRS. See Appendix C to view part II of the UPDRS assessment tool.

The Continuous Scale Physical Functional Performance 10 Test (PFP10) is an assessment tool that measures participants’ upper body strength, lower body strength, upper body flexibility, balance, coordination, and endurance. These aspects of fitness were measured through the completion of 10 tasks that emulated common ADLs. This assessment was scored using units of time, distance, and/or weight. Participants earned a higher rating if they completed all 10 tasks in the quickest amount of time, over the greatest amount of distance, and/or used more weight. The original 16-task version, the CS-PFP, has been shown to be valid and to accurately assess function in persons with Parkinson’s (Schenkman et al., 2002). However, additional research indicates that the PFP10 has convergent validity with the CS-PFP, suggesting that the PFP10 could be substituted for the 16-task version (Cress et al., 2005). Scoring was completed in accordance with Physical Functional Performance 10 Training Manual (Cress, 1996). As shown in Table 2, tasks are completed from easiest to most difficult with time, weight, and/or distance measured. Please view Appendix D to see the PFP10 test script and Appendix E to view the scoring sheet. For a complete description of testing protocol refer to Cress et al. (1996).
Table 2.

**PFP10 Task Table**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Task Classification</th>
<th>Variables Measured</th>
<th>Domains Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pan Carry</td>
<td>Low Difficulty</td>
<td>Weight (kg), Time (sec)</td>
<td>UBS B&amp;C</td>
</tr>
<tr>
<td>Jacket</td>
<td>Low Difficulty</td>
<td>Time (sec)</td>
<td>UBF B&amp;C</td>
</tr>
<tr>
<td>Scarves</td>
<td>Low Difficulty</td>
<td>Time (sec)</td>
<td>LBS B&amp;C</td>
</tr>
<tr>
<td>Shelf Reach</td>
<td>Low Difficulty</td>
<td>Distance (cm)</td>
<td>UBF</td>
</tr>
<tr>
<td>Floor Sweep</td>
<td>Moderate Difficulty</td>
<td>Time (sec)</td>
<td>LBS B&amp;C</td>
</tr>
<tr>
<td>Laundry 1 &amp; 2</td>
<td>Moderate Difficulty</td>
<td>Time (sec)</td>
<td>UBS LBS B&amp;C</td>
</tr>
<tr>
<td>Floor Sit-to-Stand</td>
<td>Moderate Difficulty</td>
<td>Time (sec)</td>
<td>LBS B&amp;C</td>
</tr>
<tr>
<td>Stair Climb</td>
<td>High Difficulty</td>
<td>Time (sec)</td>
<td>LBS B&amp;C</td>
</tr>
<tr>
<td>Grocery</td>
<td>High Difficulty</td>
<td>Weight (kg), Time (sec)</td>
<td>UBS LBS B&amp;C</td>
</tr>
<tr>
<td>6-minute Walk</td>
<td>High Difficulty</td>
<td>Distance (m)</td>
<td>END</td>
</tr>
</tbody>
</table>

*Note.* UBS = Upper Body Strength, B&C = Balance & Coordination, UBF = Upper Body Flexibility, LBS = Lower Body Strength, END = Endurance

**Procedure**

This study required participant attendance during one session. This session was conducted at a time of day that best suited the participant’s medication regimen to ensure that medication effects were ideal. PD medications, specifically dopaminergic medications, have a
varying time frame after consumption during which they work most optimally to lessen/alleviate symptoms. Therefore, the time of testing was arranged to the participant’s liking. Each study session lasted approximately one hour and 15 minutes.

Upon arrival, participants received information regarding study involvement and read and signed an informed consent document (see Appendix F) after all questions and potential concerns were addressed to participant satisfaction. Following collection of informed consent, participants completed a medical history questionnaire. After completing the questionnaire, the principle investigator reviewed the questionnaire to verify that the participant could proceed with the study.

Those that were able to proceed were taken through the retropulsion test, more commonly known as the pull test, to determine disease stage. The participant was informed of the procedure and asked to stand with their feet shoulder width apart, about seven feet from the wall. The participant was positioned with their back to the wall and the principle investigator stood behind the participant. The principle investigator reminded the participant that they could take steps backwards in order to recover their balance, if necessary, and also reminded the participant that the first pull would be less forceful than the second. The principle investigator then pulled on the shoulders of the participant to produce posterior displacement of the participant. If necessary the principle investigator provided the participant with assistance in recovering their balance. The participant was then repositioned and the principle investigator provided a more forceful pull on the shoulders of the participant to produce posterior displacement of the participant. The principle investigator counted the number of steps, if any, that the participant took in order to recover from the force of the pull. The principle investigator then asked the participant a specific question that was based upon the number of recovery steps taken in order to determine disease
stage. For a complete description of the retropulsion test please refer to the Movement Disorder Society (2008).

Those that were in Hoehn and Yahr stage 1, 2, or 3 were considered eligible for the study and were then asked to complete the PDQ-39. The participant was then instructed to complete part II of the UPDRS. After completing the questionnaires the participant remained seated and rested quietly for five minutes. Following this period of rest, the principle investigator measured the participant’s RBP and RHR as previously indicated. Next, weight in kilograms (kg) and height in centimeters (cm) without shoes was measured.

Participants were then given the opportunity to rest before beginning the PFP10. They were also reminded that they could stop to rest at any time during testing or between tasks. Participants were asked to complete each task to their best ability working as quickly as they possibly could while maintain their safety. Participants were given detailed, specific instructions before each task, and completed the 10 tasks in the following order: weighted pot carry, jacket, scarves, reach, floor sweep, laundry 1, laundry 2, floor sit, stair climb, groceries, and walk. Upon completion of the PFP10, participants’ rating of perceived exertion (RPE) for the entire battery were assessed. Participants were offered water and a place to sit down until they were ready to leave. Scoring was completed in accordance with Physical Functional Performance 10 Training Manual (Cress, 1996). As shown in Table 2, tasks are completed from easiest to most difficult with time, weight, and/or distance measured. Please view Appendix D to see the PFP10 test script and appendix E to view the scoring sheet. For a complete description of testing protocol refer to Cress et al. (1996).
Analysis

SPSS software was utilized to analyze all data. Pearson’s correlations were used to detect relationships between variables and ANOVAs were used to detect differences in PFP10, PDQ-39, and UPDRS part II scores by stage of disease and gender. Statistical significance was determined *a priori* at the $p \leq 0.05$ level. All data are presented as the mean ± SD unless otherwise noted.
CHAPTER IV. RESULTS

The mean scores and standard deviations of results of functional measures for participants are shown in Table 3.

Table 3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men ((n=13))</th>
<th>Women ((n=7))</th>
<th>Participants ((n=20))</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPDRS Part II</td>
<td>12.0 ± 5.5</td>
<td>9.9 ± 5.4</td>
<td>11.3 ± 5.4</td>
</tr>
<tr>
<td>PDQ-39</td>
<td>17.5 ± 11.4</td>
<td>14.3 ± 5.5</td>
<td>16.3 ± 9.7</td>
</tr>
<tr>
<td>MOB</td>
<td>12.7 ± 13.0</td>
<td>25.4 ± 18.2</td>
<td>17.1 ± 15.8</td>
</tr>
<tr>
<td>ADL</td>
<td>18.9 ± 15.7</td>
<td>4.8 ± 2.9</td>
<td>14.0 ± 14.4</td>
</tr>
<tr>
<td>EMO</td>
<td>19.2 ± 17.5</td>
<td>11.3 ± 7.1</td>
<td>16.5 ± 15.0</td>
</tr>
<tr>
<td>STIG</td>
<td>11.1 ± 11.7</td>
<td>5.4 ± 5.6</td>
<td>9.1 ± 10.2</td>
</tr>
<tr>
<td>SOC</td>
<td>8.3 ± 10.8</td>
<td>3.0 ± 5.2</td>
<td>6.5 ± 9.4</td>
</tr>
<tr>
<td>COG</td>
<td>20.7 ± 16.2</td>
<td>17.9 ± 15.5</td>
<td>19.7 ± 15.6</td>
</tr>
<tr>
<td>COM</td>
<td>20.5 ± 15.4</td>
<td>3.6 ± 6.6</td>
<td>14.6 ± 15.3</td>
</tr>
<tr>
<td>BOD</td>
<td>28.2 ± 23.7</td>
<td>42.9 ± 15.5</td>
<td>33.3 ± 22.0</td>
</tr>
<tr>
<td>PFP10</td>
<td>47.6 ± 12.2</td>
<td>32.7 ± 15.6</td>
<td>42.4 ± 14.9</td>
</tr>
<tr>
<td>UBS</td>
<td>57.1 ± 18.2</td>
<td>36.2 ± 22.8</td>
<td>49.7 ± 21.9</td>
</tr>
<tr>
<td>UBF</td>
<td>58.7 ± 7.1</td>
<td>55.4 ± 19.8</td>
<td>57.5 ± 12.6</td>
</tr>
<tr>
<td>LBS</td>
<td>42.7 ± 14.5</td>
<td>26.3 ± 14.9</td>
<td>37.0 ± 16.4</td>
</tr>
<tr>
<td>B&amp;C</td>
<td>45.2 ± 12.0</td>
<td>31.8 ± 14.9</td>
<td>40.5 ± 14.2</td>
</tr>
<tr>
<td>END</td>
<td>47.1 ± 12.0</td>
<td>32.1 ± 14.6</td>
<td>41.8 ± 14.6</td>
</tr>
</tbody>
</table>

*Note. UPDRS Part II = Unified Parkinson’s Disease Rating Scale Part II Score, PDQ-39 = Parkinson’s Disease Questionnaire 39 Index Score, MOB = Mobility, ADL = Activities of Daily Living, EMO = Emotions, STIG = Stigma, SOC = Social Support, COG = Cognitions, COM = Communication, BOD = Bodily Discomfort, PFP10 = Physical Functional Performance 10 Test Total Score, UBS = Upper Body Strength, UBF = Upper Body Flexibility, LBS = Lower Body Strength, B&C = Balance & Coordination, END = Endurance*
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE?

ANOVAs

Table 4.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Df</th>
<th>F</th>
<th>$\eta^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDQ-39</td>
<td>1</td>
<td>2.461</td>
<td>0.133</td>
<td>0.136</td>
</tr>
<tr>
<td>UPDRS Part II</td>
<td>1</td>
<td>0.099</td>
<td>0.006</td>
<td>0.757</td>
</tr>
<tr>
<td>PFP10</td>
<td>1</td>
<td>0.068</td>
<td>0.004</td>
<td>0.798</td>
</tr>
</tbody>
</table>

Note. PDQ-39 = Parkinson’s Disease Questionnaire 39 Index Score, UPDRS Part II = Unified Parkinson’s Disease Rating Scale Part II Score, PFP10 = Physical Functional Performance 10 Test Total Score

Two-way ANOVAs were conducted to examine the effect of Hoehn and Yahr disease stage and gender on various measures of function. As shown in Table 4 there were no statistically significant interactions between the effects of Hoehn and Yahr disease stage and gender on the PDQ-39 index score ($F(1, 16) = 2.461, p = 0.136$) or the score for part II of the UPDRS ($F(1, 16) = 0.099, p = 0.757$). Additionally, there was not a statistically significant interaction between the effects of Hoehn and Yahr disease stage and gender on PFP10 total score ($F(1, 16) = 0.068, p = 0.798$).

Table 5.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>df</th>
<th>F</th>
<th>$\eta^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDQ-39</td>
<td>1</td>
<td>0.428</td>
<td>0.026</td>
<td>0.522</td>
</tr>
<tr>
<td>UPDRS Part II</td>
<td>1</td>
<td>0.685</td>
<td>0.041</td>
<td>0.420</td>
</tr>
<tr>
<td>PFP10*</td>
<td>1</td>
<td>4.898</td>
<td>0.234</td>
<td>0.042</td>
</tr>
</tbody>
</table>

Note. PDQ-39 = Parkinson’s Disease Questionnaire 39 Index Score, UPDRS Part II = Unified Parkinson’s Disease Rating Scale Part II Score, PFP10 = Physical Functional Performance 10 Test Total Score
* Indicates significance

As shown in Table 5 a two-way ANOVA did reveal that there were statistically significant differences in mean PFP10 total scores between males and females ($F(1,16) = 4.898, p = 0.042$).
Correlations

Table 6. Relationships Among Measured Function (PFP10) & Perceived Function (UPDRS II) in Men

<table>
<thead>
<tr>
<th>PFP10</th>
<th>UBS</th>
<th>UBF</th>
<th>LBS</th>
<th>B&amp;C</th>
<th>END</th>
<th>UPDRS Part II</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPDRS Part II</td>
<td>-0.705</td>
<td>-0.784</td>
<td>-0.551</td>
<td>-0.770</td>
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Note. PFP10 = Physical Functional Performance 10 Test Total Score, UBS = Upper Body Strength, UBF = Upper Body Flexibility, LBS = Lower Body Strength, B&C = Balance & Coordination, END = Endurance, UPDRS II = Unified Parkinson’s Disease Rating Scale Part II. * Correlations are significant at the 0.05 level.

As shown in Table 6, there were significant, negative correlations among the balance and coordination (B&C), and endurance (END) domains of the PFP10 and part II of the UPDRS for men.

As shown in Table 7, there were several correlations between PFP10 total score and PFP10 domain scores that were observed in women. Specifically, significant relationships were observed between balance and coordination (B&C) and upper body strength (UBS), B&C and upper body flexibility (UBF), endurance (END) and UBS, and END and UBF.
As shown in Table 8 there was a significant, negative correlation between the PFP10 total score and the score for part II of the UPDRS, regardless of sex. An additional significant, negative correlation is shown between the lower body strength (LBS) domain of the PFP10 and the score for part II of the UPDRS.
Table 8.

Relationships Among Measured Function (PFP10) & Perceived Function (UPDRS II) in Participants

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<td>-0.482*</td>
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<td>0.841</td>
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Note. PFP10 = Physical Functional Performance 10 Test Total Score, UBS = Upper Body Strength, UBF = Upper Body Flexibility, LBS = Lower Body Strength, B&C = Balance & Coordination, END = Endurance, UPDRS II = Unified Parkinson’s Disease Rating Scale Part II
* Correlations are significant at the 0.05 level

As shown in Table 9, there was a negative correlation between the PFP10 total score and the mobility (MOB) domain score of the PDQ-39. Several other negative correlations between the MOB domain score of the PDQ-39 and the domains of the PFP10 are shown in Table 9.

As shown in Table 10, there are significant, positive correlations between the activities of daily living (ADL), and social support (SOC) sections of the PDQ-39 and part II of the UPDRS.
### Relationship Among Measured Functional Scores of the PFP10 & Perceived Functional Scores of the PDQ-39

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<th>UBF</th>
<th>LBS</th>
<th>B&amp;C</th>
<th>END</th>
<th>PDQ39</th>
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Note. PFP10 = Physical Functional Performance 10 Test Total Score, UBS = Upper Body Strength, UBF = Upper Body Flexibility, LBS = Lower Body Strength, B&C = Balance & Coordination, END = Endurance, PDQ39 = Parkinson’s Disease Questionnaire 39 Index Score, MOB = Mobility,
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE?

ADL = Activities of Daily Living, EMO = Emotions, STIG = Stigma, SOC = Social Support, COG = Cognitions, COM = Communication, BOD = Bodily Discomfort

* Correlations are significant at the 0.05 level

Table 10.

**Relationships Among Perceived Functional Scores of the UPDRS II & the PDQ-39 in Participants**

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<td>0.433</td>
<td>0.514*</td>
<td>0.179</td>
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<tr>
<td>EMO</td>
<td>1.000</td>
<td>0.183</td>
<td>0.795</td>
<td>0.705</td>
<td>0.670</td>
<td>0.217</td>
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<td>STIG</td>
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<td>-0.070</td>
<td>0.369</td>
<td>0.197</td>
<td>0.232</td>
<td></td>
<td></td>
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<tr>
<td>SOC</td>
<td>1.000</td>
<td>0.386</td>
<td>0.607</td>
<td>0.159</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>COG</td>
<td>1.000</td>
<td>0.411</td>
<td>0.416</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>COM</td>
<td>1.000</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>BOD</td>
<td>1.000</td>
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<td></td>
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</tr>
</tbody>
</table>

**Note.** UPDRS Part II = Part II of the Unified Parkinson’s Disease Rating Scale, PDQ39 = Parkinson’s Disease Questionnaire 39 Index Score, MOB = Mobility, ADL = Activities of Daily Living, EMO = Emotions, STIG = Stigma, SOC = Social Support, COG = Cognitions, COM = Communication, BOD = Bodily Discomfort

* Correlations are significant at the 0.05 level
### T-Tests

Table 11.

**Differences in Perceived & Measured Functional Scores by Hoehn & Yahr Disease Stage**

<table>
<thead>
<tr>
<th>Variable</th>
<th>H&amp;Y Stage 1 (n=9)</th>
<th>H&amp;Y Stage 2 (n=11)</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDQ-39</td>
<td>11.8 ± 6.7</td>
<td>20.0 ± 10.5</td>
<td>-2.033</td>
<td>18</td>
<td>0.174</td>
</tr>
<tr>
<td>UPDRS II</td>
<td>9.5 ± 4.1</td>
<td>12.6 ± 6.0</td>
<td>-1.289</td>
<td>18</td>
<td>0.296</td>
</tr>
<tr>
<td>PFP10</td>
<td>40.8 ± 13.1</td>
<td>43.5 ± 16.8</td>
<td>-0.393</td>
<td>18</td>
<td>0.159</td>
</tr>
</tbody>
</table>

*Note. PDQ-39 = Parkinson’s Disease Questionnaire 39 Index Score, UPDRS II = Part II of the Unified Parkinson’s Disease Rating Scale, PFP10 = Physical Functional Performance 10 Test Total Score*

Table 12.

**Differences in Perceived & Measured Functional Scores by Gender**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men (n=13)</th>
<th>Women (n=7)</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDQ-39</td>
<td>17.5 ± 11.4</td>
<td>14.3 ± 5.5</td>
<td>0.845</td>
<td>17.9</td>
<td>0.029</td>
</tr>
<tr>
<td>UPDRS II</td>
<td>12.0 ± 5.5</td>
<td>9.9 ± 5.4</td>
<td>0.839</td>
<td>18</td>
<td>0.943</td>
</tr>
<tr>
<td>PFP10</td>
<td>47.6 ± 12.2</td>
<td>32.7 ± 15.6</td>
<td>2.359</td>
<td>18</td>
<td>0.555</td>
</tr>
</tbody>
</table>

*Note. PDQ-39 = Parkinson’s Disease Questionnaire 39 Index Score, UPDRS II = Part II of the Unified Parkinson’s Disease Rating Scale, PFP10 = Physical Functional Performance 10 Test Total Score*
Figure 1 illustrates the distribution of PFP10 total scores for men and women across Hoehn and Yahr disease stages 1 and 2.
CHAPTER V. DISCUSSION

The key finding in this investigation was a relationship between perceived function and measured function in persons with Parkinson’s. The negative relationship observed between the PFP10 total score and the mobility (MOB) section score of the PDQ-39 is logical because an individual with a high PFP10 score, or measured functional score would be proficient in completing tasks essential to independent living, while a negative MOB section score, or perceived functional score would indicate that the individual perceives that he/she experiences fewer problems with mobility. Individuals that are able to complete activities essential to independent living are likely mobile, as successful completion of such tasks typically requires a certain degree of mobility.

Inverse relationships found in this study between the UBS, LBS, B&C, and END domain scores of the PFP10 and the MOB section score of the PDQ-39 are also logical. These relationships indicate that the person with Parkinson’s perceives that he/she is able to complete tasks requiring UBS, LBS, B&C, and END, while a low MOB section score on the PDQ-39 indicates that the individual perceives his/her QoL related to mobility positively. Also observed were significant, negative relationships between the PFP10 score, the LBS domain score and part II of the UPDRS. The negative relationship between the PFP10 score and part II of the UPDRS indicates that the individual perceived himself/herself as able to complete activities essential to independent living and was able to complete activities requiring LBS compared to the other domains of the PFP10.

Interesting relationships between the PFP10 and part II of the UPDRS were also observed between men and women in the current investigation. Men (n=13) demonstrated significant, negative relationships among the balance and coordination (B&C) and endurance (END) domain
scores of the PFP10 and part II of the UPDRS (Table 6). These negative relationships are practical as higher PFP10 scores are good as they indicate good measured function, which translates to the person with Parkinson’s sufficient performance of activities essential to independent living. Lower scores on part II of the UPDRS are good as they indicate good perceived function. The relationships observed demonstrate that the men in this study perceived themselves as having high levels of B&C and END and were measured to have high levels of B&C and END compared to the other domains of the PFP10. However, it is unclear why men perceived themselves as having high levels of B&C and END compared to the other PFP10 domains. In women (n=7), no significant relationships were observed between the PFP10 scores and part II of the UPDRS (Table 7). These differences may be attributed to the smaller sample of women involved in this study.

As hypothesized there was a strong relationship between the score for part II of the UPDRS and the scores for the PDQ-39. Results revealed that the activities of daily living (ADL) section score, and the social support section score (SOC) of the PDQ-39 were positively correlated with the score for part II of the UPDRS. This relationship was expected as higher UPDRS and higher PDQ-39 scores indicate higher levels of problems associated with disease and decreased QoL, while lower UPDRS and lower PDQ-39 scores indicate positive perception of functional ability and increased QoL. The positive correlation between the score of part II of the UPDRS and the ADL section score of the PDQ-39 should be expected as part II of the UPDRS evaluates ADLs.

An additionally important finding documented no statistically significant differences in overall physical functional performance by disease stage, though it was hypothesized that the PFP10 would document lower function in individuals within mid-stages of Parkinson’s
compared to those in early-stages of Parkinson’s. However, numerous factors could have contributed to this finding.

One factor that may have contributed to no statistically significant differences in physical functional performance by disease stage focuses on the documented controversy associated with the use of the pull test for disease stage determination. As mentioned previously, the pull test is utilized in the assessment of postural stability and disease stage determination. However, use of the pull test is controversial as the assigned rating of this test is dependent upon the force of the “pull” administered by the tester (Goetz et al., 2003). This was controlled for by having the same tester conduct all pull tests throughout this study. Accurate disease stage determination is also dependent upon the honest self-report of unilateral disease vs. bilateral disease of the participant.

Another factor that may have contributed to the lack of differences in overall physical functional performance by disease stage relates to the distribution of participants between the Hoehn and Yahr disease staging scale. In this study participants were classified as being in Hoehn and Yahr stage 1 or 2 on a five-point scale. Therefore, Hoehn and Yahr stage 3 is truly indicative of mid-stage Parkinson’s. Significant differences between individuals in different stages may not have been observed as a result of the lack of participants (n=0) in Hoehn and Yahr stage 3. In fact, Schenkman et al. (2002), found a significant group effect when examining CS-PFP scores for differences by Hoehn and Yahr disease stage ($F= 12.30, p < 0.0001$). Upon post hoc analysis researchers concluded that differences in CS-PFP scores were shown in those that were in Hoehn and Yahr disease stage 3 as compared to lower stages (Schenkman et al., 2002). Such findings may indicate that there are not detectable differences between individuals in stage 1 compared to those in stage 2. However, such findings could also suggest that the
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE

disease has not yet progressed to a point where it had a noticeable impact on performance in stages 1 and 2.

While the results of this study support the hypotheses, it is important to remember that this may not be the case for all persons with Parkinson’s. Clinicians must, therefore, be mindful when evaluating self-assessments of persons with Parkinson’s, as some PD specific measures may lead persons with Parkinson’s to overestimate their physical functional abilities. Schenkman et al. (2002) suggested that persons with Parkinson’s overestimate their abilities on some PD specific measures because they examine basic activities of daily living (ADLs), rather than more complex instrumental activities of daily living (IADLs). For this reason it would be beneficial to both the clinician and the person with Parkinson’s to complete an assessment that evaluates measured function in addition to self-assessments that evaluate perceived function. Schenkman and colleagues (2011) supported the use of the CS-PFP in persons in early stages of Parkinson’s as the assessment has been shown to be extremely responsive in detecting limitations.

When utilizing the PFP10 in the Parkinson’s population, several considerations must be taken into account. First a specific range of PFP10 scores marking the transition to disability has not yet been identified in this population (Schenkman et al., 2011). In the older adult population, namely those 60 and older, a score of 57 marks the transition to disability while a score of 46 is common of an individual that is in some way functionally dependent (Cress et al., 1996). Therefore, the clinician must be mindful of this when generating the individual’s physical functional performance report, as the person with Parkinson’s could be classified as “functionally dependent” when they are not.

While the person with Parkinson’s physical functional performance report may indicate disability according to the previously mentioned cut-off, the clinician must consider what
contributed to the classification. For example, in the current study, investigators observed that participants completed many of the tasks of the PFP10 with great caution. Investigators noticed that the majority of the individuals in this group were cognizant of their abilities or lack thereof, and did not appear to “push the envelope” (i.e., they could have performed better) by perhaps carrying more weight or completing a given task more quickly. Such observations could account for lower than expected physical functional performance scores, as individuals that complete tasks more quickly earn higher physical functional performance scores. However, the scores obtained from this study were comparable to those obtained by Schenkman et al (2002).

Schenkman et al. (2002) reported overall CS-PFP scores of 44.3 (SD = 17.6) and CS-PFP domain scores around 50 or below in persons with Parkinson’s. Additionally, clinicians should be aware of the symptomology a person with Parkinson’s may be experiencing when completing an assessment such as the PFP10. The person with Parkinson’s could experience bradykinesia, for example, which would lead to an increase in the time taken to complete the task, decreasing the individual’s score. A lower score resulting from symptomology of the disease could be detrimental to the person with Parkinson’s as low scores may lead to undesirable classifications (Schenkman et al., 2011). The American College of Sports Medicine (ACSM) acknowledges that many persons with Parkinson’s experience impaired mobility, and note that impairments of mobility are usually accompanied by low levels of physical fitness (Pescatello, 2014). To combat such decrements in physical fitness, ACSM (2014) recommends that persons with Parkinson’s participate in aerobic exercise, resistance training, flexibility exercise, and neuromotor exercise (Pescatello, 2014).

In the current study, PFP10 scores ranged from 27.5 to 57.3 of 100 possible points. The average PFP10 score was 42.4 (SD = 14.9). The PFP10 scores of persons with Parkinson’s in this
study were low; even the individual with the highest score would still be classified on the brink of disability if using previously determined cut-offs for those 60 years and older. While many of the participants in this study were higher functioning persons with Parkinson’s there was no bias in the recruitment of participants. Scores of part II of the UPDRS ranged from 5.9 to 16.7 of 52 possible points, with an average of 11.3 (SD = 5.4). Moderate, negative relationships were found between the PFP10 scores and part II of the UPDRS indicating that participants were “somewhat” accurate in assessing their actual abilities. However, it must be remembered that it is difficult to classify person’s with Parkinson’s based on their PFP10 scores, as population specific values indicative of disability do not yet exist. One may also wish to use caution in classifying a person with Parkinson’s as “functionally dependent” based solely on PFP10 scores if that person is able to complete each task.

**Limitations**

The primary limitations of the study revolve around the moderate sample size ($n=20$), and the distribution of participants across Hoehn and Yahr disease stages. One factor that may have contributed to the moderate sample size is the need for a standardized testing laboratory. The inability to travel to the participants and conduct testing in or near their homes may have limited the number of participants recruited as some persons did not have the means to travel to the laboratory to participate in testing. Another limiting factor was that recruiting and testing were conducted during winter months. The months of testing were accompanied by particularly harsh winter weather, limiting travel. An additional limitation to this study revolved around the pharmacological treatment of Parkinson’s. Many of the persons that participated in this study received pharmacological treatment, however, the medication type(s) and dosage(s) varied greatly from person to person. The principle investigator aimed to control for medication effects
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE

by scheduling participants at times that best suited their medication regimen, however, differences in medication type(s) and dosage(s) were not controlled. Differences among pharmacological treatment may have influenced results of treated participants.

Future Research

Future research could involve an extension of this study in which researchers may choose to focus on obtaining a more representative sample by recruiting an equal number of individuals in each Hoehn and Yahr disease stage. Additionally, researchers may choose to conduct testing across a wider range of cities and states, which could in turn result in a larger, more diverse sample.

Conclusion

To conclude, the key findings of the current study included acceptably strong relationships between perceived function and measured function. Individuals with good perceived function scored low on the PDQ-39 and part II of the UPDRS, both of which assessed perceived function, while individuals with good measured function scored high on the PFP10, the tool which directly assessed function. PFP10 and UPDRS scores from the current study indicated that persons with Parkinson’s were “somewhat” accurate in assessing their actual abilities. The current findings warrant caution, however, as classification values based on PFP10 scores do not yet exist in the Parkinson’s population. Therefore, PFP10 scores should continue to be obtained in persons with Parkinson’s in order to generate more data in hopes of establishing cut-off ranges in the Parkinson’s population. Information about the person with Parkinson’s functional abilities that are generated from PFP10 testing could be particularly valuable to physical therapists and health fitness specialists in developing more personalized rehabilitation and exercise programs. Such personalized rehabilitation and exercise programs could improve
the individuals’ quality of life, and perhaps delay further disease progression in the person with Parkinson’s.


PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE


Parkinson's disease: Are there differences among measured & perceived function between stages of disease


Schenkman, M., Ellis, T., Christiansen, C., Barón, A. E., Tickle-Degnen, L., Hall, D. A., &


APPENDIX A. MEDICAL HISTORY QUESTIONNAIRE

EXERCISE PHYSIOLOGY LABORATORY
BOWLING GREEN STATE UNIVERSITY
MEDICAL HISTORY QUESTIONNAIRE

All information given is personal and confidential. It will enable us to better understand you and your health and fitness habits. In addition, we will use this information to classify your health status according to the American College of Sport Medicine (ACSM) recommendations for risk stratification (ACSM, 2009). Please let us know if and when you have changed your medication (dose & type), diet, exercise or sleeping habits within the past 24 or 48 hours. It is very important for you to provide us with this information. This information will not be reviewed by a physician. This form is used to identify your specific risk level of participation in our study.

NAME ___________________ AGE _______ DATE __________ OCCUPATION _________________________

1. *FAMILY HISTORY

Check each as it applies to a blood relative:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Attack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sudden Death</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coronary Revascularization</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Father’s Age _____ Deceased _____ Age at death _____

(*Before 55 yr. in father or first-degree male relative)

Mother’s Age _____ Deceased _____ Age at death _____

(*Before 65 yr. in mother or first-degree female relative)

2. PERSONAL HISTORY

Check each as it applies to you:

* Age (men ≥ 45 yr; women ≥ 55 yr) yes ____ no ____
* Current Cigarette Smoking yes ____ no ____ unsure ____
* Sedentary Lifestyle yes ____ no ____ unsure ____
  Persons not participating in at least 30 min of moderate intensity physical activity on at least 3 days/wk for at least 3 months.
* Obesity – BMI >30 kg·m⁻² yes ____ no ____ unsure ____
  Waist circum. > 40” men; 35” women: yes ____ no ____
* High Blood Pressure yes ____ no ____ unsure ____
  Systolic Blood Pressure >140mmHg or diastolic >90mmHg: yes ____ no ____ unsure ____
* Dyslipidemia yes ____ no ____ unsure ____
  Total Serum Cholesterol >200 mg·dl⁻¹: yes ____ no ____ unsure ____
  LDL-C ≥ 130 mg·dl⁻¹: yes ____ no ____ unsure ____
  HDL-C ≤ 40 mg·dl⁻¹: yes ____ no ____ unsure ____
  On lipid lowering medication: yes ____ no ____ unsure ____
* PreDiabetes yes ____ no ____ unsure ____
  If yes, age of onset: ______ years
  Impaired fasting glucose ≥ 100 mg·dl⁻¹: yes ____ no ____ unsure ____
  Impaired glucose tolerance test: yes ____ no ____ unsure ____
  (Note: values confirmed by measures on two separate occasions)
*Negative Risk Factor: yes ____ no ____ unsure ____
  HDL ≥ 60 mg·dl⁻¹: yes ____ no ____ unsure ____

Have you ever had:

* Diabetes yes ____ no ____ unsure ____
* Tuberculosis yes ____ no ____ unsure ____
* Heart Attack yes ____ no ____ unsure ____
* Angina yes ____ no ____ unsure ____
* EKG Abnormalities yes ____ no ____ unsure ____
* Asthma yes ____ no ____ unsure ____
* Emphysema yes ____ no ____ unsure ____
* Surgery yes ____ no ____ unsure ____
* Stroke yes ____ no ____ unsure ____
* Severe Illness yes ____ no ____ unsure ____
* Hospitalized yes ____ no ____ unsure ____
* Black Outs yes ____ no ____ unsure ____
* Gout yes ____ no ____ unsure ____
* Nervousness yes ____ no ____ unsure ____
* Joint Problems yes ____ no ____ unsure ____
* Allergy yes ____ no ____ unsure ____
* Convulsions yes ____ no ____ unsure ____
* Paralysis yes ____ no ____ unsure ____
* Headaches yes ____ no ____ unsure ____
* Depression yes ____ no ____ unsure ____
* Chest Pain yes ____ no ____ unsure ____
* Arm Pain yes ____ no ____ unsure ____
* Shortness of Breath yes ____ no ____ unsure ____
* Indigestion yes ____ no ____ unsure ____
* Ulcers yes ____ no ____ unsure ____
* Overweight yes ____ no ____ unsure ____
* Hernia yes ____ no ____ unsure ____
* Back Pain yes ____ no ____ unsure ____
* Leg Cramps yes ____ no ____ unsure ____
* Low Blood Pressure yes ____ no ____ unsure ____
* Insomnia yes ____ no ____ unsure ____

For Office Use Only:
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE

NOTE: All risk factors are explained verbally to each person completing the questionnaire.

3. MEDICAL HISTORY

Name of your physician __________________________________________

Date of your most recent physical examination __________________________

What did the physical examination include? __________________________________________

Have you ever had an exercise EKG? Yes_______ No_______

Have you ever taken:

- Digitalis: yes____ no____ unsure____
- Nitroglycerin: yes____ no____ unsure____
- High Blood Pressure Medication: yes____ no____ unsure____
- Sedatives: yes____ no____ unsure____
- Inderal: yes____ no____ unsure____
- Insulin: yes____ no____ unsure____
- Pronestyl: yes____ no____ unsure____
- Vasodilators: yes____ no____ unsure____
- Other: yes____ no____ unsure____

List ALL Medications

<table>
<thead>
<tr>
<th>Medication</th>
<th>Time Taken</th>
<th>Last Dose Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tester Use Only

Hoehn & Yahr Disease Stage Rating:

4. EXERCISE HISTORY

Do you exercise? Yes____ No____ What activity __________________________

How long have you been exercising? __________________________

How many days do you exercise? ___________ How many minutes per day? ___________

What kinds of shoes do you work out in? __________________________

Where do you usually exercise? __________________________
5. HEALTH HISTORY

<table>
<thead>
<tr>
<th>Height</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Age 20</td>
<td>At Age 30</td>
</tr>
<tr>
<td>20</td>
<td>30</td>
</tr>
</tbody>
</table>

Do you use Health Foods?  Yes______ No______ List________________________

Do you take Vitamin pills?  Yes______ No______ List________________________

Approximate your daily intake:  Coffee______ tea______ coke______ beer______ wine______ liquor______

Do you smoke or use tobacco products?  Yes______ No______

If yes, approximate your daily usage:  Cigarettes______ Cigars______ Pipes______ Chewing Tobacco______

Did you ever smoke?  Yes______ No______ How many years?_______________ Age when you quit_________

Approximate the number of hours you work per week?___________ Vacations weeks per year___________

Home Status:  Very happy_________ Pleasant_________ Difficult_________ Problem_________

Work Status:  Very happy_________ Pleasant_________ Difficult_________ Problem_________

Do you feel you are stressed?  Yes______ No______ Unsure_________

Are you worried about your health? Yes______ No______ Unsure_________

6. APPROXIMATE A TYPICAL 24 HOUR DAY FOR YOU

Number of hours:

<table>
<thead>
<tr>
<th>Work</th>
<th>TV</th>
<th>Relaxation/Leisure activities</th>
<th>Driving/Riding</th>
<th>Eating</th>
<th>Exercise</th>
<th>Sleep</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional information from client interview to further assess health/coronary risk status:

__________________________________________________________________________

Signature of Tester_________________________________________________________ Date_________
PDQ-39 QUESTIONNAIRE

Please complete the following

*Please tick one box for each question*

<table>
<thead>
<tr>
<th>Due to having Parkinson's disease, how often during the last month have you...</th>
<th>Never</th>
<th>Occasionally</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always or cannot do at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Had difficulty doing the leisure activities which you would like to do?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2 Had difficulty looking after your home, e.g. DIY, housework, cooking?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3 Had difficulty carrying bags of shopping?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4 Had problems walking half a mile?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5 Had problems walking 100 yards?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6 Had problems getting around the house as easily as you would like?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7 Had difficulty getting around in public?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8 Needed someone else to accompany you when you went out?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9 Felt frightened or worried about falling over in public?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10 Been confined to the house more than you would like?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>11 Had difficulty washing yourself?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>12 Had difficulty dressing yourself?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>13 Had problems doing up your shoe laces?</td>
<td>☐</td>
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</tr>
</tbody>
</table>

Please check that you have ticked one box for each question before going on to the next page
Due to having Parkinson's disease, how often during the last month have you....

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Occasionally</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always or cannot do at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Had problems writing clearly?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>15 Had difficulty cutting up your food?</td>
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<tr>
<td>16 Had difficulty holding a drink without spilling it?</td>
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<tr>
<td>17 Felt depressed?</td>
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<td>18 Felt isolated and lonely?</td>
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<tr>
<td>19 Felt weepy or tearful?</td>
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<tr>
<td>20 Felt angry or bitter?</td>
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<tr>
<td>21 Felt anxious?</td>
<td></td>
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<tr>
<td>22 Felt worried about your future?</td>
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<tr>
<td>23 Felt you had to conceal your Parkinson's from people?</td>
<td></td>
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<td></td>
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<tr>
<td>24 Avoided situations which involve eating or drinking in public?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Felt embarrassed in public due to having Parkinson's disease?</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>26 Felt worried by other people's reaction to you?</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>27 Had problems with your close personal relationships?</td>
<td></td>
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</tr>
<tr>
<td>28 Lacked support in the ways you need from your spouse or partner?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>If you do not have a spouse or partner tick here</td>
<td></td>
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</tr>
<tr>
<td>29 Lacked support in the ways you need from your family or close friends</td>
<td></td>
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</tr>
</tbody>
</table>
### Due to having Parkinson's disease, how often during the last month have you....

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Occasionally</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unexpectedly fallen asleep during the day?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Had problems with your concentration, e.g. when reading or watching TV?</td>
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<tr>
<td>Felt your memory was bad?</td>
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</tr>
<tr>
<td>Had distressing dreams or hallucinations?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Had difficulty with your speech?</td>
<td></td>
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</tr>
<tr>
<td>Felt unable to communicate with people properly?</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Felt ignored by people?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had painful muscle cramps or spasms?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Had aches and pains in your joints or body?</td>
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<td></td>
</tr>
<tr>
<td>Felt unpleasantly hot or cold?</td>
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<td></td>
</tr>
</tbody>
</table>

*Please tick one box for each question*

*Please check that you have ticked one box for each question before going on to the next page*

*Thank you for completing the PDQ 39 questionnaire*
## APPENDIX C. UPDRS PART II

### II. Activities of Daily Living

#### 5. Speech
- 0-normal
- 1-mildly affected, no difficulty being understood
- 2-moderately affected, sometimes asked to repeat
- 3-severely affected, frequently asked to repeat
- 4-unintelligible most of time

#### 6. Salivation
- 0-normal
- 1-slight but noticeable increase, may have nighttime drooling
- 2-moderately excessive saliva, may have minimal drooling
- 3-marked excess of saliva with some drooling
- 4-marked drooling, requires constant tissue or handkerchief

#### 7. Swallowing
- 0-normal
- 1-rare choking
- 2-occasional choking
- 3-requires soft food
- 4-requires NG tube or G-tube

#### 8. Handwriting
- 0-normal
- 1-slightly small or slow
- 2-moderately slow or small, all words are legible
- 3-severely affected, not all words are legible
- 4-majority of words are not legible

#### 9. Cutting Food/Handling Utensils
- 0-normal
- 1-somewhat slow and clumsy, but no help needed
- 2-can cut most foods, although slow and clumsy, some help needed
- 3-food must be cut, but can still feed self slowly
- 4-needs to be fed

#### 10. Dressing
- 0-normal
- 1-somewhat slow, no help needed
- 2-occasional help with buttons or arms in sleeves
- 3-considerable help required, but can do some things alone
- 4-helpless

#### 11. Hygiene
- 0-normal
- 1-somewhat slow, but no help needed
- 2-needs help with shower or bath or very slow in hygienic care
- 3-requires assistance for washing, brushing teeth, combing hair, going to bathroom
- 4-foley catheter or other mechanical aids

#### 12. Turning in Bed/Adjusting Bed Clothes
- 0-normal
- 1-somewhat slow and clumsy, but no help needed
- 2-can turn alone or adjust sheets, but with great difficulty
- 3-can initiate but not turn or adjust sheets alone
- 4-helpless

#### 13. Falling (Unrelated to Freezing)
- 0-none
- 1-rare falls
- 2-occasional falls, less than one per day
- 3-falls an average of once per day
- 4-falls more than once per day

#### 14. Freezing When Walking
- 0-none
- 1-rare freezing when walking, may have start hesitation
- 2-occasional freezing when walking
- 3-frequent freezing, occasional falls from freezing
- 4-frequent falls from freezing

#### 15. Walking
- 0-normal
- 1-mild difficulty, may not swing arms or may tend to drag leg
- 2-moderate difficulty, but requires little or no assistance
- 3-severe disturbance of walking, requires assistance
- 4-cannot walk at all, even with assistance

#### 16. Tremor (symptomatic complaint of tremor in any part of body)
- 0-absent
- 1-slight and infrequently present
- 2-moderate, bothersome to patient
- 3-severe, interfere with many activities
- 4-marked, interferes with most activities

#### 17. Sensory Complaints Related to Parkinsonism
- 0-none
- 1-occasionally has numbness, tingling, or mild aching
- 2-frequently has numbness, tingling, or aching, not distressing
- 3-frequent painful sensation
- 4-excruciating pain

**TOTAL PART II SCORE:**

---

For each section, the score is determined by the highest level of difficulty or impairment described. The total score is calculated by summing the scores for each section, with each level of difficulty having a specific value. The final score reflects the overall level of functional impairment in daily living activities.
CS-PFP 10 TESTING DIALOGUE

TESTER DIRECTIONS

• All sentences in **bold** should be read to the client

• All sentences in brackets, capitalized, underlined, or unbolded are instructions for the **tester only**.
INTRODUCTION

This is a test to measure your ability to perform tasks that are important for living independently. The way we do this is by measuring the time it takes for you to do the task, the weight you carry, and sometimes both.

These tasks are ordered from easiest to most difficult. It is important for you to pace yourself so you can complete all the tasks. I will show you where you are on this chart to help you monitor your total progress. You may stop the test at any time.

Because this is a timed test, conversation needs to be held to a minimum. I will accompany you throughout the testing process and give you specific directions for each task. Please tell me if you do not understand the directions or if you would like them to be repeated.

SAFETY BELT

You will be wearing this safety belt throughout the test.

[TESER: Briefly hold up safety belt]

SPECIAL NEEDS AND CAUTION

Do you have any problems that we have not talked about? Please let me know if you would like a drink of water or to use the bathroom during the course of the test. As this test requires physical exertion, please stop the test if you feel tightness in your chest, pain radiating down your left arm, pain in your lower jaw, or at the base of your left shoulder blade. If you need a rest break, do not wait for me to offer, please request a rest break.
RPE & SCORING

TESTER: HOLD UP SCALE FOR SUBJECT

At the end of the test I will ask your perceived effort with this scale. During the test I want you to pay close attention to how hard you feel you are working.

Your Physical Functional Performance score is based upon the amount of weight you carry and how fast you can complete each task. Perform each task safely, working AS FAST AS YOU CAN.

- Do you have any questions before we begin?
- Would you like to use the rest room before we begin?

Take the following assessments before starting:

Blood Pressure

Weight

Height

Age

Living Status
LOW EFFORT TESTS

POT CARRY

In this task, you will carry a pot of weights from this counter to the counter behind you. Add sandbags to this pot until you have reached the maximal amount of weight you feel you can carry safely to the counter.

[TESER: Stop and wait. Weigh pot before the test and if greater than 30 kg (65 lbs), remove weight until it = 30 kg (65 lbs). Counter to counter is a diagonal movement measuring 180 cm.]

Put your hands by your side. At the word ‘go’ pick up the pot and carry it to the counter behind you. Set it down and put your hands by your side. Do you have any questions? Ready. Set. Go.

STOP: POT IS PLACED FULLY ON COUNTER. Record time, weight, and units.

JACKET

What size jacket do you normally wear?

Position yourself in front of the chair. At the word ‘go’ pick up the jacket, put it on, pull the front together and then remove the jacket without zipping or buttoning it. Return it to the chair. Do you have any questions? Ready. Set. Go.

[TESER: When client is adjusting the front of the jacket say “remove”]

STOP: WHEN CLIENT’S SECOND HAND EMERGES FROM SECOND SLEEVE UPON REMOVAL. Record time and jacket size.
**SCARVES**

In this task you will be asked to pick up four scarves from the floor.

[Tester: Place four scarves in a square pattern approximately one inch (2.5 cm) apart directly in front of subject]

Facing the scarves, begin with your hands at your side. At the word ‘go’ pick up each scarf separately until you have picked up the last scarf. Do you have any questions? Ready. Set. Go.

Stop: Client in a standing position with upper arm in alignment with torso. Record time.

---

**REACH**

This is not a timed test. In this test you will reach as high as possible. Push the shelf up as high as possible with your feet flat on the floor.  
[Tester: This is to estimate the shelf height.]

Place the sponge on the shelf and let go, then reach up and remove the sponge. You may lean on the wall or go up on your toes. Do you have any questions?  
[Tester: Hand the client the sponge.]

[Tester: Ask “Can you go higher?” Repeat until the client says “No.” If too high, tester should move shelf down 1 cm and ask the client to retry.] Record reach height, add correction factor and calculate final reach height.

*Offer the client a drink of water.*
MEDIUM EFFORT TESTS
FLOOR SWEEP

[TESTER: Spread ½ cup kitty litter on the floor in the 19 x 122 cm (3 ft x 4 ft) taped area on a vinyl mat. The client starts by holding the broom and dustpan.]

Holding the broom and dustpan, at the word ‘go’ sweep the kitty litter from the floor into the dustpan, set the pan on this counter (indicate position; subject starts at same end counter is located).

Do this job to your own satisfaction as quickly as possible. Do you have any questions? Ready. Set. Go.

STOP: DUSTPAN HITS THE MARKED AREA. Record time.

LAUNDRY 1

[TESTER: Check to be sure 4.5 kg (3 of 1 kg & 1 of 2.5 kg) [9 lbs (3 of 2 lbs & 1 of 3 lb weight)] of sandbags are present. Have frailer clients practice opening the dryer door.]

Start in front of the washer. At the word ‘go’ open the washer door. Transfer the clothes and the sandbags from the washer to the dryer. Close the dryer door. Do you have any questions? Ready. Set. Go.

STOP: WHEN DRYER DOOR IS CLOSED. Record time.
LAUNDRY 2

[TESTER: Place basket on the floor just behind and to side of the client.]

Start in front of the dryer. At the word ‘go’ open the dryer door and transfer only the clothes from the dryer to the laundry basket. Leave the sandbags in the dryer. You may move the basket closer to the dryer if you wish. Place the basket of clothes on top of the dryer. Close the dryer door. Do you have any questions? Ready. Set. Go.

STOP: BASKET IS FULLY PLACED ON TOP OF THE DRYER OR WHEN DRYER DOOR IS CLOSED, WHICHEVER COMES LAST. Record time.

FLOOR DOWN/UP

[TESTER: Have two chairs available, however client may choose to use only one chair. If using a mat, the client should stand on the floor, next to the mat and the chair(s). Have at least one hand on safety belt to control the descent and/or to assist client up from sitting, if needed.]

Start in a standing position. At the word ‘go’ sit down on the floor, stretch your legs out in front of you, immediately stand up and put your hands by your side. You may use the chair seat for support.

Task continued on next page...
FLOOR DOWN/UP (continued)

Ask the client: “Do you know how you would sit on the floor and return to standing?”
If yes --- proceed with task.
If no --- demonstrate one way to do the task.

Ask the client: “Do you feel you are able to proceed with this task?”
If yes --- proceed with task.
If unsure --- ask the client “Do you want to try?”
Do you have any further questions? Ready. Set. Go.

TESTER: IF CLIENT ATTEMPTS TASK BUT FAILS TO COMPLETE IT, RECORD THE APPROPRIATE REASON AND PROCEED TO NEXT TASK.
STOP: FULL STANDING POSITION WITH ARMS IN AT SIDE. Record time.
Offer client a drink of water.

HARD EFFORT TESTS

STAIR CLIMB

In this task, you will climb and descend the steps. At the word ‘go’ climb the steps to the platform, then turn around and descend the stairs.

Do this at your usual pace. You may use the handrail (or your walking aid), but do not pull yourself up the steps.

Do you have any questions? Ready. Set. Go.

STOP: WHEN SECOND FOOT CONTACTS THE GROUND AFTER STEPPING OFF THE FINAL STEP. Record time and 8 steps.
GROCERY

[Tester: Point as you explain.]

In this task, you will carry groceries up and down the steps, out the door, around the cone in the gym, return, open the closed door, and place the bag(s) on the counter. Knowing this distance and the need to climb stairs, place the maximal amount of weight you can safely carry into one or more of these grocery bags (you will not be timed on this portion of the task). You may carry the bags any way you like (and you may use your walking aid).

[Tester: Pause. Weigh the bag(s) before the test and if the weight is greater than 30 kg (65 lbs), remove weight until it = 30 kg (65 lbs).]

Task continued on next page...

GROCERY (continued)

[Tester: Client starts with the bag handles in hand, but not lifted off the ground.]

Stand at the line. At the word ‘go’ carry the bag(s) up the steps, descend the steps, walk out the door into the gym and around the cone, return and open the door and place the bag(s) on the counter.

Do you have any questions?
Ready. Set. Go.

STOP: ALL BAGS ARE PLACED FULLY ON THE COUNTER. Record time and weight. Offer the client a drink of water.
6-MINUTE WALK
At the word ‘go’ walk at a pace that will allow you to cover the GREATEST distance you can in 6 minutes (using a walking aid if you wish). Walk as quickly as possible around the outside of the cones. I will tell you your time each minute. You may rest any time if you need to. Set your own pace. I will follow you. Do you have any questions? Ready. Set. Go.

[Tester: Walk just off and behind outside shoulder of client. During the test announce “5 minutes left...1 minute left”.]
ANNOUNCE “15 seconds...10...5, 4, 3, 2, 1, TEST OVER KEEP WALKING”.
Record number of full laps. Mark the distance of the partial lap. Then attend to the client (offer chair, drink of water). Total distance may be calculated and recorded after attending to the client.

THE RPE SCALE

[Tester: Hold the 6-20 RPE scale up for the subject to see.]

I want you to evaluate your total feeling of exertion throughout the entire test. Do not focus on one particular task or one factor, such as fatigue, intensity, or leg pain. What one number would you choose?

Record RPE numerical value.
RPE SCALE

6 --- NO EXERTION
7 --- EXTREMELY LIGHT
8
9 --- VERY LIGHT
10
11 --- LIGHT
12
13 --- SOMEWHAT HARD
14
15 --- HARD (HEAVY)
16
17 --- VERY HARD
18
19 --- EXTREMELY HARD
20 --- MAXIMAL EXERTION

UNUSUAL OCCURRENCES

[TESTER: Ask this at the completion of the PFP-10]

Did you experience anything unusual in the performance of any of the tasks or the overall test?

[TESTER: Log anything unusual based on the client’s response.]
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE

<table>
<thead>
<tr>
<th>Low Effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pot Carry</td>
</tr>
<tr>
<td>Jacket</td>
</tr>
<tr>
<td>Scarves Pick Up</td>
</tr>
<tr>
<td>Reach</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medium Effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor Sweep</td>
</tr>
<tr>
<td>Laundry Transfer</td>
</tr>
<tr>
<td>Floor Down/Up</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hard Effort</th>
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</thead>
<tbody>
<tr>
<td>Stairs</td>
</tr>
<tr>
<td>Groceries</td>
</tr>
<tr>
<td>6-Minute Walk</td>
</tr>
</tbody>
</table>

Last Revision: Fall 2013
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE

APPENDIX E. SCORING SHEET

CS-PFP 10 ITEM DATA SHEET

<table>
<thead>
<tr>
<th>TASK</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pot Carry</td>
<td></td>
</tr>
<tr>
<td>Weight:</td>
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<tr>
<td>Time:</td>
<td></td>
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<tr>
<td>Jacket</td>
<td></td>
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<tr>
<td>Time:</td>
<td></td>
</tr>
<tr>
<td>Scarves</td>
<td></td>
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<tr>
<td>Time:</td>
<td></td>
</tr>
<tr>
<td>Reach</td>
<td></td>
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<tr>
<td>Height:</td>
<td></td>
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<td>Time:</td>
<td></td>
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<tr>
<td>60.96 cm =</td>
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</tr>
<tr>
<td>Floor Sweep</td>
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<tr>
<td>Time:</td>
<td></td>
</tr>
<tr>
<td>Laundry 1</td>
<td></td>
</tr>
<tr>
<td>Time:</td>
<td></td>
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<tr>
<td>Laundry 2</td>
<td></td>
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<tr>
<td>Time:</td>
<td></td>
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<tr>
<td>Floor Sit</td>
<td></td>
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<tr>
<td>Time:</td>
<td></td>
</tr>
<tr>
<td>Stair Climb</td>
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<tr>
<td>Time:</td>
<td></td>
</tr>
<tr>
<td># Stairs:</td>
<td></td>
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<tr>
<td>Groceries</td>
<td></td>
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<tr>
<td>Weight:</td>
<td></td>
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<tr>
<td>Time:</td>
<td></td>
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<tr>
<td>Walk</td>
<td></td>
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<tr>
<td># Laps:</td>
<td></td>
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<tr>
<td>Partial Lap:</td>
<td></td>
</tr>
</tbody>
</table>

OVERAL PFP RPE: ____________________

Data Entry: ____________________ (Initial & Date)
APPENDIX F. INFORMED CONSENT

Informed Consent

Introduction:
My name is Lauren Pesola, and I am a graduate student at Bowling Green State University. I am enrolled in the Kinesiology program in the school of Human Movement, Sport, and Leisure Studies. My program advisor is Dr. Amy Morgan.

Purpose:
The purpose of this study is to investigate the influences that Parkinson’s disease has on various aspects of your life. I would like to see how the disease affects your ability to complete various activities of daily living, and how the disease affects the quality of your life.

Participation in this study will provide you with insight as to how Parkinson’s disease is affecting your ability to carry out tasks of daily living. Identification of compromises in function can assist your healthcare providers in determining treatment and/or intervention options. Additionally, this study could potentially contribute to current research on Parkinson’s disease, and functional compromises, as they may be associated with advancing disease stage.

Procedure:
This study will require your participation in one session. Your session will be conducted at a time of day that best suits your medication schedule so that it is not interrupted. Your session may last up to 2 ½ hours.

Upon arrival, I will begin by telling you about my study. If you agree to participate I will have you sign this document. Following this I will have you fill out a medical history form. This document will help me to determine if it is safe for you to participate in this study. After you have completed this paperwork, the following will occur:

- I will measure your resting blood pressure, heart rate, weight, and height
- I will determine your disease stage with the Hoehn and Yahr staging scale and pull test
You will complete the Parkinson’s Disease Questionnaire 39 (PDQ-39)
  o This is a thirty-nine-question survey that will ask how Parkinson’s
disease has affected your life over the past month

I will administer part II of the Unified Parkinson’s Disease Rating Scale
(UPDRS)
  o This is a thirteen-question survey that will ask how Parkinson’s
disease has affected your ability to perform common tasks of daily
living while on and off your medications

You will complete the Physical Functional Performance 10 test (PFP-10).
  o I will give you instructions before each task and you will perform
each task at a pace that is comfortable to you. You may take a break at
any time.
  o This test will involve:
    ▪ Carrying a weighted pot
    ▪ Putting on and taking off a jacket
    ▪ Picking up scarves from the floor
    ▪ Placing and removing a sponge from a shelf
    ▪ Sweeping the floor
    ▪ Moving clothes from a washer to dryer and dryer to basket
    ▪ Sitting and standing up from the floor
    ▪ Climbing and descending stairs
    ▪ Carrying groceries
    ▪ Walking for six minutes
  o After completing this test your rating of perceived exertion (RPE) will
be assessed, and you will be offered water and a place to sit until you
are ready to leave.

Voluntary Nature:
Your participation in this study is completely voluntary. You are free to withdraw
from this study at any time. You may decide to skip questions on surveys, or
decide not to complete a particular task. You may also decide to stop participation
at any time without penalty. Deciding to participate or not will not affect your
relationship with Bowling Green State University.
Confidentiality:
All collected data and personal health information will be stored in a locked filing cabinet, and/or on a password-protected computer. Data and personal health information will be de-identified and kept for three years. No forms except this informed consent document will have your name on it. You will be assigned a code and that will be placed on all of the surveys and data sheets. The key to this code will be kept on a password protected computer that only the research team will have access to.

Risks:
While we have taken the time to cautiously evaluate your medical history and questionnaire regarding your readiness to participate in physical activity, there are still natural risks involved.

Some of the potential risks involved with physical activity include but are not limited to, fainting, fatigue, irregular blood pressure, abnormally fast/slow heart rhythm, falling, and sore/pulled muscles. For your safety there will be two CPR and first aid certified testers present at all times during testing for this study. In the case of a medical emergency appropriate responders will be called. If something happens that requires medical assistance, you will be responsible for the costs.

Contact Information:
If you have any questions regarding the study or your participation in the study you may contact me or my advisor.

Lauren Pesola  
Phone: 630-269-0120 Email: lepesol@bgnet.bgsu.edu

Dr. Amy Morgan  
Phone: 419-374-0596 Email: Amorgan@bgsu.edu

If you have any questions about your rights as a participant you may contact the Human Subjects Review Board (HSRB).

HSRB  
Phone: 419-372-7716 Email: hsrb@bgsu.edu.
PARKINSON’S DISEASE: ARE THERE DIFFERENCES AMONG MEASURED & PERCEIVED FUNCTION BETWEEN STAGES OF DISEASE

I, ________________________________, have been informed of the purposes, procedures, risks and benefits of this study. I have had the opportunity to have all my questions answered and I have been informed that my participation is completely voluntary. I agree to participate in this research.

_________________________  _______________________
Participant Signature         Date