Parkinson's disease and occupational therapy: evidence based practice

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PARKINSON’S DISEASE AND OCCUPATIONAL THERAPY: EVIDENCE BASED PRACTICE

by

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ABSTRACT

The therapeutic benefit of occupational therapy with Parkinson’s disease has not been studied in great detail. The purpose of this Scholarly Project was to provide extensive and comprehensive evidence-based information about Parkinson’s disease as it applies to occupational therapists. This information was utilized to generate clinical guidelines in the form of a user-friendly manual meant for practicing OTs in treating Parkinson’s disease.

An extensive literature review was performed using PubMed to determine current evidence-based practice that occupational therapists and other rehabilitation therapists were currently using. Following the review of literature, a needs assessment was completed per survey directed towards practicing OTs. The goal of the survey was to validate the need for these guidelines throughout the country.

The user-friendly manual is based on the Ecological Model of Human Performance using establish/restore, adapt/modify and prevent as intervention strategies. The product is titled “Guidelines for Occupational Therapists in Treating Parkinson’s disease.” It consists of four portions, the first focuses on a brief introduction to the disease, the next explains the general neuroscience behind the disease, the third portion gives a brief overview of medical interventions including pharmacological and surgical.

The fourth part of the product consists of the evidence-based guidelines for OTs to follow when treating persons with Parkinson’s disease. Occupational therapy offers many benefits to persons with Parkinson’s disease, including modification and/or
adaptation of activities of daily living (ADLs) with or without the use of adaptive equipment. Other intervention areas OTs may focus on are: therapeutic exercise routines, caregiver education, joint movement coordination, energy conservation and social skills training. This user-friendly manual will provide occupational therapists with the necessary information to treat persons with Parkinson's disease using evidence based guidelines.
CHAPTER I

INTRODUCTION

Parkinson’s disease (PD) is a neurodegenerative disorder that affects about 1.5 million people in the United States. 60,000 individuals are diagnosed with PD every year (National Parkinson Foundation brochure, n.d.). This disease usually affects persons over the age of 60 years, and is not gender or ethnic specific. PD is not well understood, but has an effect on more people than multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), muscular dystrophy (MD), and myasthenia gravis collectively. The cause of PD is unknown, and there is presently no cure. It is a chronic and progressive disease. The disease is usually diagnosed through clinical observation of four main symptoms: bradykinesia, tremor, rigidity and postural instability, though the only guarantee of accurate diagnosis is through autopsy (Kittle, 2006).

PD can be a physical, mental and emotional challenge for both the person diagnosed and his/her family or caretaker. Areas of occupation that are affected include: activities of daily living (ADL), instrumental activities of daily living (IADL), work, leisure and social participation. These areas are affected both directly and indirectly by the symptoms of the disease. To be able to engage in these occupations, it often takes adaptations and modifications of the person, occupation and the environment. Occupational therapists (OTs) in conjunction with proper pharmacological interventions allow for increased independence when engaged in these occupations. The OT should focus on four constructs: person, task, context, and performance to provide a holistic
approach to treatment. Though OT has many benefits to offer individuals with PD, according to a United Kingdom (UK) survey, only 13 to 25% are referred for OT services (Jain et al., 2004).

The above information is consistent with the Ecological Model of Human Occupation, written by University of Kansas Medical Center. The model is built from four constructs: person, task, context and performance. The person is looked at holistically, considering physical, emotional, and cognitive needs. The task entails combined behaviors that allow a person to reach a goal. The context is defined by the surroundings of the person, including temporal and environmental. These contexts can either affect the person positively by supporting an occupation or negatively by creating a barrier to that occupation. Finally, the last construct is performance; this combines the task and the context, it displays a person’s skills and abilities as they are faced by the surrounding situation (i.e. brushing your teeth during an “off” period of Parkinson’s disease). This model also addresses interventions: establish/restore, alter, adapt/modify, prevent, and create. By using the Ecological model’s interventions, Parkinson’s disease treatment by OTs can be organized in such a way that the person, task, context and performance are attended to, thus providing a client-centered approach to treatment (Dunn et al., 2003).

Currently there is little evidence to support or refute the efficacy of OT intervention for persons with PD (Steultjens et al., 2005 & Deane et al., 2001). Regardless of the importance of evidence-based practice within the realm of clinical OT, most practitioners are not utilizing the information that is available to its maximum potential. Thus, a need has arisen to provide practicing OTs with comprehensive
evidence-based guidelines for treating individuals with PD (Murphy et al., 2000). This need is addressed through the results of this scholarly project.

It was discovered through fieldwork and personal experience that persons with neurological deficits, such as PD, were seeking information about the neuroscience aspect of their specific condition. One of their primary resources for obtaining this information was the OT. It was experienced that a majority of the time the practicing OT was unable to explain or validate why the signs and symptoms were occurring at a neurological level. Thus, part of the literature review focused on the pathophysiology of PD. It is our intention that the product will serve as evidenced-based guidelines in both treating and explaining PD to the individual.

The following chapters describe the aspects of PD that are pertinent to OT clinicians in the treatment and intervention of the disease. Chapter two provides an extensive literature review on the pathophysiology of PD, common medical interventions, OT evidence-based practice, and future research ideas that are pertinent for OTs to further investigate. Chapter three provides an overview of the product and the process in which the literature and information was obtained. This chapter will also describe the method in which a need for the product was confirmed. Chapter four contains the product titled Guidelines for Occupational Therapists in Treating Parkinson’s Disease. Lastly, chapter five provides a summary of the purpose, project and key information. It also includes recommendations for further research and limitations.
CHAPTER II
REVIEW OF LITERATURE

Parkinson’s Disease

Parkinson’s disease (PD) is a chronic neurodegenerative disorder that falls under the umbrella term parkinsonism. It affects adults usually sixty years and older, though five to ten percent are diagnosed by age 40 years (Kittle, 2005). The disease is typically recognized by four main signs: tremor, rigidity, postural instability, and bradykinesia (Copperman et al., 2002). The etiology of PD is said to be either idiopathic or acquired. Obtaining infections and consuming toxins fall under the latter category, while the etiology of idiopathic PD, by definition is unknown (Copstead et al., 2000). Research suggests that heredity and environmental aspects may play a crucial part. Currently, PD is diagnosed through clinical observation of symptoms due to the lack of objective diagnostic tools. However, an autopsy looking at the neuroanatomy is the only procedure that will diagnose the disease with absolute certainty (Copperman et al., 2002).

Physiology and Neuroanatomy

In order to comprehend the pathophysiology of this disease, the neuroanatomy and physiology that is affected must first be understood. Signs in PD are often manifested through dysfunction of motor movements, which are controlled by several areas of the brain and spinal cord. Primary regions within the brain associated with control of movement include the cerebral cortex, cerebellum, and a collection of interconnected regions deep within the brain called the basal ganglia. The basal ganglia are the
substantia nigra, caudate nucleus, putamen, globus pallidus, and subthalamus (aka subthalamic nucleus or STN); it serves as a source of output to the thalamus. The thalamus is the communication center that interprets and sends information to the sensory and motor cortex influencing areas such as attention, alertness, and motor control (Wikipedia, 2007).

The primary area of the basal ganglia affected in PD is the substantia nigra. Neurons in the substantia nigra normally utilize the neurotransmitter called dopamine to communicate with other regions of the basal ganglia and other areas of the brain (neurotransmitters are chemical substances that increase or decrease the electrical signals between neurons). These neurons are damaged and eventually die, but the cause of this damage is not fully understood. For example, in a recent review by Rivlin-Etzion et al. (2006), the authors state that “current physiological studies and models of the basal ganglia differ as to which aspects of neuronal activity are crucial to the pathophysiology of PD.” In an individual without PD, dopamine travels from the substantia nigra to the striatum (putamen and caudate nucleus). The dopamine and the input from the cortex together allow for gamma-aminobutyric acid (GABA) to be released into the globus pallidus. Since GABA is an inhibitory neurotransmitter in the nervous system, GABA inhibits the globus pallidus’ effect on other regions outside the basal ganglia. In ways still not understood (Rivlin-Etzion et al., 2006), this allows for appropriate and controlled output from the basal ganglia back to the motor and perhaps other processing centers in the brain (Bear et al., 2001)

As indicated above, PD destroys the dopaminergic cells in the substantia nigra for an unknown reason. This directly affects the amount of dopamine available to modify the
electrical signal needed for appropriate messages between cells. Insufficient dopamine levels affect the amount of GABA influence on the globus pallidus, creating inappropriate output to other brain regions. The four typical signs (tremor, rigidity, postural instability, and bradykinesia) of PD are evident because of this (Kroonenberg et al., 2006). When autopsies are performed on individuals with PD, the results show that the dopamine levels are less than ten percent of that found in individuals without PD (Copstead et al., 2000).

Current research suggests that the STN also plays a major role in decreasing the symptoms of PD by directly being influenced by Levodopa and deep brain stimulation (Bevan et al., 2006). When a small portion of the thalamus becomes overactive with electrical signals, Parkinson’s tremor is the result (Jacques et al., 2003). Even though it is suggested that the STN has a direct effect on the output of the thalamus, it is an area that is not yet fully understood and further research needs to be completed.

Neurological deficits of the brain not only affect motor movements, but also influence certain cognitive aspects such as dementia. Fifteen to twenty percent of the PD population is found to suffer from dementia (Copperman et al., 2002). In addition to affecting motor control, dopamine deficiencies also affect memory and concentration. Lewy bodies also play key role in these cognitive deficiencies, they are abnormal protein deposits found in nerve cells of the brainstem. The pathology of Lewy bodies is not well understood, however it is suggested that they may destroy nerve cells or they may be a result of the degenerative course of the disease (Duda, 2005). Ninety percent of autopsies performed on individuals with PD present with Lewy bodies in the brain (Hardy et al., 2006).
Stages of Parkinson’s disease

PD develops through five different stages, defined by Hoehn and Yahr (1967). Each stage contains different severities of symptoms experienced and therefore is often used in classifying each individual’s progression of the disease (Murphy, et al., 2000). Stage one is defined as “mild or early.” Symptoms such as slight tremor, postural changes, and decreased facial expression are all part of stage one (Hoehn et al., 1967). Ambulation difficulties begin at this stage, but it is important to recognize that ambulation becomes more difficult with each stage. OTs should be aware of the functional mobility disturbances during these first stages to allow for early intervention (Giladi, 2006). These ambulation difficulties include impaired balance, festination, shuffling, and reduced arm swing. Festination is shortening of stride, and quickening of gait, and is a major factor in falls risk for persons with PD. Usually only one side of the body is affected at stage one, and at this point the symptoms do not affect ADLs, but rather are experienced by the individual as bothersome.

The disease progresses to stage two when symptoms are seen on both sides of the body. The individual display difficulties in areas of ambulation, balance, and engagement in ADLs. However, one is still able to complete all activities independently. Stage three is defined as “moderate.” During this stage, individuals may be unable to walk straight, or maintain standing balance. Bradykinesia and dyskinesia are also experienced. Bradykinesia is the slowed ability to start and continue body movements, and dyskinesia is the difficulty or distortion in performing voluntary movements. Therefore, engagement in ADLs is moderately to severely impaired, though the individual still demonstrates independence. In this stage, speech disturbance may also become a problem. This
disturbance called dysarthria, is characterized by slow and slurred speech. This makes it hard for persons with PD to express themselves and/or to be understood. In stage four, the disease has advanced to severe symptoms that inhibit independence, and therefore, the individual is not safe to live alone. Ambulation may still occur but only for shorter distances, and has increased in difficulty. Rigidity and bradykinesia are obvious, but the tremor has often decreased for unknown reasons. Stage five is the last and most debilitating phase of PD, due to minimal or absence of motor movements, often called the Cachectic stage. The individual requires permanent care and is no longer able to ambulate, stand or complete ADLs independently. Also, during this stage, cognitive deficits such as dementia could become obvious (Hoehn et al., 1967).

Another instrument commonly used in rating the progression of PD symptoms is the Unified Parkinson Disease Rating Scale (UPDRS). This instrument measures areas of cognition, behavior, mood, ADLs, and motor abilities through an interview process, then scoring each individual on a numerical scale ranging from 0-4 (0=no disability, 4=most severe) (Cifu, 2006). The UPDRS is valuable and reliable in addressing the stages of PD, but is unable to measure or detect slight changes that may occur. The Modified Schwab and England Activities of Daily Living scale is part of the UPDRS, and measures level of independence in ADLs. Independence is given a percentage score of 100% (complete independence) to 0% (vegetative functions) (Gaudet, 2002).
Evidenced-based Practice

Evidence-based practice (EBP) is defined by Cameron et al. (2005), as “a process that synthesizes clinical expertise with the best evidence available from systematic research, and the values and preferences available from systematic research, and the values and preferences of patients” (p. 124). It is important for health care professionals to utilize EBP to be able to “provide research on what each intervention consists of and how each is to be implemented for yielding the best outcomes for particular patient populations” (p. 127). It is beneficial in regards to several aspects, such as clients’ satisfaction and expectations of therapy received. EBP also provides credibility and responsibility to the health care professional to allow for quality care. Finally, it affects the financial distribution, providing cost-effective treatment for the lowest value available.

Pharmacological Interventions

Pharmacological interventions have proven to be effective in the early stages of PD by counteracting the lack of dopamine within the striatum of the brain. However, treatment becomes more complex as the disease progresses and the individual becomes more disabled (Wade et al., 2003). Drugs that change the dopamine levels are called dopaminergic drugs: examples are Levodopa and dopamine agonists (Mirjama-Lyons, 2006). The following section covers information on current, pharmacological interventions used for the treatment of PD.

Levodopa (L-dopa) is the most efficient drug used to treat the symptoms presented with PD. It is commonly used in conjunction with a peripheral dopa decarboxylase inhibitor. This drug prevents the breakdown of Levodopa. The
combination of these reduces the amount of Levodopa needed by about ten times, and also aids in the decrease of side-effects (Rang et al., 2003). Levodopa is an amino acid that can be absorbed within the digestive system. It then travels via the amino acid transport system into the brain where it forms dopamine. Typically, individuals with PD are given low doses of Levodopa at first, though as symptoms progress, higher dosages are slowly increased to reduce side-effects such as vomiting, nausea and postural hypotension (Martin et al., 2003).

About eighty percent of individuals taking Levodopa experience decreased rigidity and decreased hypokinesia, and about twenty percent experience near normal function. However, long-term use of the medication often leads to increased difficulties in motor control. The main difficulties are dyskinesia and “on-off” effects. Dyskinesia is defined as having difficulty controlling voluntary movements often displayed in the face and limbs. “On-off” periods are the response in motor control due to the medication. During the “on” period, ADLs can easily be performed due to a decrease in tremor and rigidity. When the dose of Levodopa reaches its peak, the individual may experience difficulty performing voluntary movements and this is referred to as “on with dyskinesias.” While during the “off” period, the individual demonstrates significant motor control difficulties in the areas of mobility, ADLs, and even speech. Typically the “off” period is experienced during the “wearing off” period, which is when the medication is starting to wear off and the subsequent dose is needed (Mirjama-Lyons, 2006). It has been reported that approximately fifty percent of individuals with PD experience such complications due to long-term use (more than five years). Such motor control difficulties are most often seen in individuals who experience early onset of the
disease (Martin et al., 2003). Individuals whose symptoms do not respond to Levodopa most likely suffer from other forms of parkinsonism (i.e. dementia with lewy bodies, multiple system atrophy, super nuclear palsy, cerebral vascular disease) and do not have the more traditional idiopathic Parkinson's disease (IPD) (Kittle, 2006).

Dopamine agonists have joined Levodopa as part of the first line of defense when it comes to pharmacological intervention. The dopamine agonists act on the dopamine receptors and allow for more Levodopa to be absorbed, thus improving some of the more typical symptoms experienced. Other drugs are used in conjunction with Levodopa, such as monoamine oxidase B (MAO-B) inhibitors and catechol-o-methyl transferase (COMT) inhibitors, both of which are used to slow dopamine metabolism (Mirjama-Lyons, 2006). Research has shown improvement of the “on” phase and diminished time of the “off” phase and increased motor control when using COMT inhibitors (Martin et al., 2003).

Amantadine is another drug used in the treatment in PD. It was found accidentally, primarily used as an antiviral medication before it was found to have beneficial affects on PD symptoms (Rang et al., 2003). Amantadine only mildly alleviates symptoms therefore studies have suggested using this drug only in the early stages of PD. One study indicated that oral Amantadine had lasting benefits for only three to eight months (Horstink et al., 2006). It is proposed that it helps in relieving Levodopa-provoked side effects, such as motor difficulties and dyskinesia. Current research has also proven its efficiency in protecting neurons from degeneration (Mirjama-Lyons, 2006).

Anticholinergic drugs are the oldest form of pharmacological intervention used in treating PD symptoms (i.e. tremor). They are often avoided due to the unpleasant side-effects, such as dry mouth, constipation, blurred vision, confusion and hallucination.
Currently they are used for individuals who are also taking antipsychotic drugs, because of the diminished effect Levodopa would have with the antipsychotic drugs (Rang, 2003).

Surgical Interventions

There is currently a variety of surgical techniques used with PD, including: pallidotomy, deep brain stimulation, thalamotomy, lesioning of the subthalamic nucleus, and fetal mesencephalic grafts. Individuals who go through any of these surgeries have been carefully evaluated and selected for a certain procedure. These operations are not meant to cure Parkinson’s disease, only to be used in conjunction with medications to treat the symptoms.

Current studies have shown pallidotomy to be effective in treating PD, compared to a control group receiving other available medical attention such as subthalamic nucleus stimulation (Horstink et al., 2006). The pallidotomy procedure is performed while the patient is under local anesthetic so that he/she is able to give feedback in regards to sensation or vision changes. A small probe is placed through the skull into a specific area of the brain, known as the globus pallidus. The exact area is measured using computed tomography (CT) and magnetic resonance imaging (MRI) scans. A small electric shock is administered to the area involved to test for any negative affects, such as tingling or changes in vision. If there are no evident changes, then a larger electric shock is given destroying the specific area of the globus pallidus. Individuals who have undergone this type of surgery may experience some significant side-effects. According to Horstink et al. (2006), these effects include: symptomatic infarction (3.9%), speech deficits (11.1%), facial paralysis (8.4%), visual deficits (<5%), psychosocial complication, or even death (1.2%) (p1188). The most suitable individuals for this surgery are those who are young,
have a history of reduced Levadopa effectiveness, and display unilateral dyskinesia (Walter et al., 2004).

Deep brain stimulation (DBS) is recognized as one of the more common surgical intervention techniques used with individuals with PD. It is used to treat typical symptoms such as: tremor, ambulatory difficulties, rigidity, stiffness, and slowed movements. A research review conducted by Horstink et al. (2006), showed that DBS of the globus pallidus is responsible for reduction of dyskinesia and “off” time response by 35-60% (p.1189). This procedure is typically used with individuals who demonstrate poor response to pharmacological interventions. Though medications continue to be used after the DBS procedure, the amount is considerably reduced.

Like the pallidotomy procedures, CT scans and MRI scans are used prior to the DBS in order to locate the exact part of the brain that is responsible for the PD symptoms. The thalamus, STN, and globus pallidus are typically targeted. Stimulation of the thalamus is rarely used because of the ineffectiveness it has on symptoms (i.e. akinesia). DBS consists of three parts that makes one device: a battery pack placed near the collarbone, an electrode that is placed in the brain, and a lead wire that connects both. This device is also known as a neurostimulator. It is responsible for electrical input to the brain that alleviates the abnormal movements of PD by blocking the atypical nerve signals. Unlike pallidotomy and other surgical interventions, DBS does not destroy brain tissue, and thus can be reversed if future interventions are discovered. As the disease progresses, the neurostimulator can be programmed to give the individual with PD optimal results. Side-effects when stimulating the globus pallidus are uncommon, but do include neuropsychiatric complications (2.7%), speech and swallowing difficulties.
(2.6%), sensory deficits (0.9%), and vision deficits (1.8%). Side-effects when stimulating the STN occur in about half of the individuals but are only permanent in about 20%. The side-effects are not serious enough to discard the surgery (Horstink et. al., 2006, p. 1189).

Thalamotomy is rarely used to treat PD, but has proven effective in treating symptoms such as unilateral tremor and rigidity of the upper and lower extremities. Horstink et al. (2006) reported a 70% improvement in tremor and rigidity, but little to no effect in treating akinesia (p.1189). The procedure is most often conducted on those younger than 65 years of age and who are demonstrating appropriate functional activity levels. It has been reported that thalamotomy allows for better results the earlier it is conducted in the disease’s progression (Havens et al., 2005). During the procedure the individual is under local anesthesia, while a hole is drilled into the skull. An instrument containing liquefied nitrogen is inserted into the brain through the hole and selectively destroys brain tissue, specifically a minute region of the thalamus, which plays a role in involuntary motor movements. Thalamotomy is usually conducted unilaterally and on the side opposite the abnormal motor movements (i.e. if the tremor was on the right side, the surgery would be on the left side of the brain). The same procedure can be conducted on the other side if needed. However the risk of experiencing speech difficulties and other cognitive deficits increases. Long-lasting complications after the procedure are reported to be uncommon (Walter et al., 2004).

Lesioning of the STN is another type of surgical intervention that is rarely used because of the effectiveness of DBS. This surgical procedure consists of cutting the STN, thus permanently destroying that part of the brain (Dystonia Medical Foundation, 2006).
The individuals that receive this type of intervention usually have suffered from persistent dyskinesias (Horstink et al., 2006).

Foetal mesencephalic grafts are also rarely done due to the need of human fetal tissue; about eight fetuses are needed for one successful graft. While some studies have shown that transplantation of these cells into the striatum can advance major and long-lasting improvements, not all studies conclude the same efficacy (Taylor et al., 2005). Horstink et al. (2006) concluded that this type of surgery is currently ineffective as a regular intervention, yet further studies are necessary (p 1190).

Occupational Therapy Interventions and Assessments

Even though EBP has been proven beneficial both to the patient population and to the health care providers, OTs have been slow to implement this tool into their practice. To be able to provide the best service to persons with PD, it is important that the service and care provided is directly correlated to the therapist’s skills and knowledge as well as his/her ability to utilize research. OTs have research available to them but most do not understand how to use the material or how to implement it in their clinical setting (Cameron et al., 2005). With regards to PD, there is currently scant evidence on the effectiveness of OT interventions, yet the evidence that is available is not being utilized. It is suggested that there is a need for meta-analysis research studies and that the data could then be translated into a user friendly guide for OTs to employ within their practice (Murphy et al., 2000). The following information has been reviewed from a variety of research articles and written in a way that is helpful to the OT profession when treating individuals with PD.
An assessment is usually the first part of OT patient treatment intervention. Very few PD assessments include the framework and domain of OT. The reason for this is that these assessments were not developed by OTs. However, some studies have found a variety of OT-based assessments that have been under study to explore their effectiveness in measuring different aspects of PD. One such assessment is the Canadian Measure of Occupational Performance (COPM). This assessment tool is used by OTs to measure how individuals view their ability to carry out occupations over a period of time (Carswell et al., 2004). According to Gaudet (2002), the tool is a “standardized evaluation, cost-effective, easy to administer, an outcome measure, client-centered and sensitive to change….method of assessing occupational performance…and are reasonably objective and quantitative” (p 108). The COPM could be administered to any population; however, it has been recognized as a beneficial tool to use with persons with PD, due to its ability to measure the person’s occupational performance in both the “on” and “off” periods of the disease (Gaudet, 2002).

Another tool that has been suggested to measure occupational performance in PD is the Assessment of Motor and Process Skills (AMPS). According to the organization that produces the AMPS, it is “an assessment that rates the effort, efficiency, safety, and independence of 36 motor and process skill items” (AMPS, 2007). This tool has been considered by Gaudet, (2002) to be more reliable than the COPM, but less sensitive to change, and therefore is less valid in assessing persons with PD. The AMPS is invalid during the “off” period and is only able to be administered when the individual is able to be involved and complete an occupational activity (Gaudet, 2002). In another study performed by Hariz et al. (1998), the AMPS was frequently used as a tool to measure
individuals' performance of instrumental activities of daily living (IADLs) when receiving and not receiving DBS. The results indicated that the AMPS was able to provide the researchers with data regarding each individuals' performance capacity. The researchers suggest that the AMPS is a good assessment tool to use with individuals because of its focus on the individual's ability to perform a task rather than focusing on separate performance components. Some disadvantages of tasks involved with the AMPS are that they do not take gender and age into consideration, such as unavailability of common older male specific tasks (Hariz et al., 1998).

There are three outcome measurements that focus on quality of life for persons with PD. First, the Parkinson's Disease Questionnaire 39 (PDQ 39), is an assessment that OTs use to explore an individual's self-report of mobility status, ADL status, emotional well being, stigma, support, cognition, communication and discomfort. These areas are more holistic of the individual, rather than just exploring the severity of symptoms (Marinus, et al. 2002). According to Gaudet (2002), the PDQ 39 is a "reliable and valid tool for measuring quality of life for those with Parkinson’s disease" (p. 110).

The second outcome measure is the Parkinson's Disease Quality of Life Scale (PDQL). This scale is also a self-report questionnaire that explores the individual’s symptoms, emotional and social occupations (Hobson et al., 1999). The results of the study by Hobson et al. (1999), indicate that the PDQL is a valid measure for using with people with PD (p. 344).

The third quality of life measure is the Parkinson’s Impact Measurement Scale (PIMS). It is a ten item scale in which items unrelated to physical symptoms are addressed, rather focusing on the mental aspects of the person being assessed.
Specifically it assesses the individual’s perception of quality of life in regards to living with and dealing with PD. The study by Schulzer et al. (2002) concluded that the PIMS was a reliable, valid and was sensitive to change. This study indicates that the assessment tool would be a valuable source for OTs when treating persons with PD. Out of the three outcome measure questionnaires discussed in this section the PDQ-39 has the most research to support its efficacy.

Some other tools that have been suggested for measuring ADLs in PD include: Northwestern University Disability Scale, Self Care Scale, Webster Rating Scale, Activities of Daily Living Scale, portions of the UPDRS, portions of the University of Los Angeles Scale, portions of the New York University Parkinson’s Disease Disability Scale, and also portions of the Kings College Hospital Parkinson’s Disease Rating Scale. A majority of these assessment tools do not take into consideration the later stages of PD, such as dyskinesia, “on” and “off” periods, as well as cognitive deficits. Since OT is often involved in the later stages, these assessment tools may not be beneficial in providing a holistic approach for the individual. None of the tools measure the individuals’ point of view when measuring their own occupations (Gaudet, 2002).

Individuals with PD benefit from OT services that focus on performance components, occupations, and quality of life. Along with treating the individual, a focus should also be given to family and caregivers. According to the National Family Caregivers Association (NFCA) 82% of caregivers are female, 48% care for a spouse, 60% are older than 50 years, and 39% have been caregivers for less than four years. Another interesting statistic is that over half are unemployed (Imke et al., 2006).
According to a study conducted by Martin et al. (2003), the goal of OT “is to maintain functional independence and, as the disease progresses and abilities decline, to assist individuals and their families to adapt and change strategies to optimize function at a new level” (p. 31). It is further suggested that educating the person and their family is a vital part of OT in treating persons with PD (Martin et al., 2003). It is important for OTs to provide support for these caregivers so that they are able to in turn provide quality care leading to increased social participation and appropriate medical execution. It is also important for OTs to recognize that the role of a caregiver can be a high stress and tiresome occupation. In the study conducted by Cifu et al. (2006), this distress is defined as “the strain of load born by a person who cares for an elderly, chronically ill, or disabled family member or other person….the point where the experience is no longer a viable or healthy option for either the caregiver or the person receiving care” (p. 500). Areas that may add to the stress include physical, psychological, emotional, financial, and social strain. Up until now, the impact of caregivers on PD has not been well documented. The information that these studies potentially provide is beneficial for OTs to successfully treat the person with PD holistically by including their caregiver and other social support systems.

Another area of OT intervention is the home modification and assessment. The home visit is usually done at the beginning of therapy sessions so that the OT is able to observe the person in his/her natural context (Jain et al., 2004). An area that is common for OTs to focus on is the need for adaptive equipment within the home, allowing for the individual with PD to be independent and safe (Martin et al., 2003). Suggestion and education of adaptive equipment is a staple of OT interventions for persons with PD.
Adaptive equipment can address different deficits of PD, such as decrease in self-care, work and leisure functions, handwriting, and mobility (Cianci et al., 2006).

There have been few studies focusing on the role of rehabilitation professionals, such as OTs, physical therapists (PTs), and speech language pathologists (SLPs) in the treatment of PD symptoms (Jobges et al., 2006). Some of the following interventions have been found to be specifically beneficial in treating the symptoms of PD.

The relationship between exercise and increased dopamine levels has been widely studied, indicating that exercise programs would be beneficial to individuals with PD. A review of studies on the importance of exercise indicated that exercise did indeed improve individual’s functional performance in physical activity and in ADLs (Crizzle et al., 2006). When treating bradykinesia of the upper extremities, it has been proven that exercise programs create positive outcomes. The review by Jobges et al. (2006) discovered that both karate and other upper body exercise programs create favorable results. Individuals showed improvements in gait, fine motor coordination, tremor and grip (p. 5). Training of ADLs, relaxation, breathing, and gait are a few other areas of exercise commonly implemented in PD treatment (Crizzle et al., 2006). In another study performed by Ashburne et al. (2007), the risk of falling was dramatically decreased with the implementation of a home exercise program designed by a PT. This may indicate that exercise also positively affects postural stability and balance of individuals with PD (p. 12).

OT interventions that include coordination of joint movement have also been proven beneficial in the treatment of bradykinesia. Based on the study by Maitra et al. (2005), it was demonstrated that motor movements such as reaching and grasping were
slower in individuals with PD than the control group with no neurological deficits. Due to these results the authors were able to conclude that bradykinesia is caused by “the breakdown of co-ordination between joint movements as a result of presumably slow executive processing of motor programs” (p. 218). By implementing coordination interventions, OTs can contribute to decreased bradykinesia, and thus increased ADL independence.

By engaging in therapeutic exercise, individuals with PD not only improve physical symptoms, but also emotional and social distress. The development of group exercise programs allows for individuals with PD to engage socially, increase life enjoyment, thus decreasing risk of depression and anxiety, which are common symptoms of PD. A regular exercise program will also allow for improved levels of energy which is important to overcome fatigue (De Paula et al. 2006).

Fatigue is recognized as one of the most common symptoms in PD (42% of all individuals with PD experience this), but is often overlooked by the multidisciplinary team (Yoshi et al., 2006 & Ferreri et al., 2006). This is an area important for OTs to target due to its possible hindrance in engaging in meaningful occupations, diminishing the individual’s perception of quality of life. Current research on specific treatment strategies for fatigue is poor. As clinicians, patients, and caregivers it is important to be able to distinguish between symptoms of fatigue to what often can be perceived as laziness. Thus, education is a key role in the intervention of fatigue to promote the most efficient participation in the individual’s daily occupations. Specific techniques in fatigue management include: energy conservation and sensory cueing (Ferreri et al., 2006).
Since depression affects 30% to 50%, and anxiety affects 40% of all individuals with PD (Miller et al., 2007 & Lauterbach, 2004), OT has the opportunity to intervene in this area. The review by Jobges et al. (2006), suggested that stress management, cognitive rebuilding, social skills training, role playing, and relaxation techniques were rated very highly by individuals with PD involved in the study. No objective data was available from formal assessments to prove efficacy of these treatment strategies (p. 6). Although, another literature review looked at three different studies that focused on psychosocial aspects, it concluded that individuals receiving therapy in both group and individual formats benefited in the form of decreased depression. One of these three studies also demonstrated that caregivers benefited as much from the intervention as the individual with PD (Gage et al., 2004). Dementia, apathy, sleep disorders (60%-90%), addiction and psychosis are other neuropsychiatric problems associated with PD (Lauterbach, 2004). These symptoms are usually caused by pharmacological side-effects, inability to deal with life changes, and the disease itself (Ferreri et al., 2006).

Sensory cueing may be another technique used by OTs to increase transfer safety and functional mobility. Cues are defined by Keus et al., (2006) as “stimuli from the environment or generated by the patient, which the patient uses, consciously or not, to facilitate (automatic and repetitive) movements.” There are four different types of sensory cues: auditory, visual, tactile and cognitive. The sensory cueing role in the intervention of PD has been well studied, especially such techniques as placing stripes on the floor, and rhythmic sounds (i.e. counting, music). These techniques have been proven to affect functional mobility for some individuals with PD (Keus et al., 2006). In a study
done by Nowak et al. (2006), the combination of DBS and auditory cueing improved akinesia when completing an upper extremity task (p. 171).

Despite the lack of evidence available on the efficacy of OT in the treatment of PD, the majority of evidence concurs that it is indeed effective. In a study done by Murphy et al. (2000), 37% of individuals that did not participate in OT still displayed positive outcomes, while 63% of individuals that did participate in OT demonstrated positive results. This suggests that OT has a reasonable effect on intervention outcomes for persons with PD. It has also been confirmed that in adjunction with other rehabilitation services, OT improves motor function for individuals with PD, for up to three years after the initial session (Carne et al., 2005). Another study concluded that individuals that participated in eight sessions of OT had improvement in ADLs. Indicating that OT interventions are useful for persons with PD, and should be considered when patients are experiencing mild to moderate symptoms (Jain et al., 2004).

Other studies suggest that OT has not been proven effective in the treatment of PD (Wiley-Liss, Inc. 2002 & Steultjens et al., 2005). There is conflicting evidence in the current literature to support or refute the long-term gain of OT. Some studies suggest that benefits last up to three years, others suggest that they last no longer than six months (Jain et al, 2004 & Carne et al, 2005). Deane et al. (2002) concluded that OT interventions were not effective in treating PD, further noticing that these results might have been contributed to flaws in the design of the study. The OT that these individuals received in Deane’s study was in the form of group therapy, consisting of game playing and basketry (p. 988). In conclusion, there is no clear-cut evidence supporting OT intervention efficacy for persons with PD. It is suggested that this may be due to poor
methodological research designs, and the small number of participants involved with each study (Steultjens et al., 2005).

Summary

Throughout this extensive literature review, it has become apparent that there is no evidence to support a standard way for OTs to treat individuals with PD. To be able to determine the most effective and appropriate treatment interventions currently used by clinicians, data needs to be collected from the clinical setting. This approach will provide sufficient information on the most efficient techniques and “best practice” currently available for OTs to use in treating individuals with PD. For future research studies to provide information on appropriate intervention techniques and efficacy of treatment, large randomized control group studies need to be conducted. Deane et al. (2006), implies that the data from these future studies “should be analyzed according to intention-to-treat principles” (p. 9). Another focus for future research has been to involve multidisciplinary health care professionals. Areas focusing on psychosocial deficits and caregiver’s role have currently not received much attention, and thus should be included into the treatment strategies of PD (Gage et al., 2004). It has also been recommended that further research needs to address the appropriateness of one therapy over another (i.e. OT over PT or vice versa) in the treatment of PD (Wiley-Liss Inc., 2002).
CHAPTER III

ACTIVITIES/METHODOLOGY

The aim of this scholarly project is to investigate the current evidence-based occupational therapy (OT) interventions in Parkinson’s disease (PD) populations and provide comprehensive guidelines for OTs to utilize in the clinical setting. Current literature within this domain suggests little evidence to support or refute the efficacy of OT intervention for patients with PD.

Before the review of literature was completed, a need assessment was fulfilled per survey directed towards practicing OTs throughout the United States. Four OTs completed the survey. The survey included six questions related to the need for evidence-based guidelines for the treatment of PD. The goal of the survey was to validate the need for these guidelines. Based on the responses, three out of four OTs believed evidence-based guidelines for PD treatment was either important or very important. One therapist suggested it was not at all important. Three out of four therapists thought a user-friendly guide would benefit them when treating persons with PD, one OT declared “any type of new or old information on the disease would be helpful.” Topics that were suggested for the manual included: “medication in conjunction with therapy, guidelines for family/caregivers, activity of daily living (ADL) modifications, equipment needs, upper extremity interventions, and suggestions from people with Parkinson's as to how to deal with the disease.” All four OTs admitted to seldom use of evidence-based practice. Finally, all the OTs agreed that they treated their patients with PD according to his/her deficits and needs.
The first step in gathering information for the product was to perform an extensive literature review. Searches were carried out in PubMed, OT-Seeker and American Journal of Occupational Therapy (AJOT). Keywords included: evidence based practice occupational therapy, Parkinson's disease occupational therapy, occupational therapy and Parkinson's disease, occupational therapy interventions with Parkinson's disease, head injuries and Parkinson's disease, OT and Parkinson's disease, drug-induced Parkinsonism, genetics and Parkinson's disease, features in Parkinsonism, rehabilitation and Parkinson's disease, OT rehabilitation in Parkinson's disease, and drugs and Parkinsonism. Twenty-three articles were found to be relevant, and after a close investigation, written summaries were conducted for each article. The decision of relevancy of each article was based on an outline identifying important topics to be included in the project. As the literature review was conducted, more evidence and research was needed to complete each section. Other sources of information were used accordingly, such as textbooks, electronic sites, and more journal articles.
CHAPTER IV

PRODUCT

Introduction

This product is meant to provide evidence-based guidelines for occupational therapists (OTs) to use in the clinical setting when treating individuals with Parkinson’s disease (PD). The product contains information on the pathophysiology of the disease, medical interventions, such as pharmacological and surgical, and evidence-based OT assessments and interventions. The goal of the product is to provide a user-friendly manual that contains information on current, research-based interventions for OTs in the clinical setting. It is also intended that the manual will save the OT time, alleviating any comprehensive research in regards to questions or concerns related to PD. Throughout this manual the product is guided by the Ecological Model of Human Performance and the interventions discussed are divided into three different sections according to the model: establish/restore, adapt/modify, and prevent.

Description

The product is a user-friendly manual that is directed towards practicing OTs. It contains information on evidence-based guidelines for current OT assessments and interventions. In addition it provides a description of the neurological aspects that are occurring in persons with PD. This additional information will benefit the OT in that it provides basic knowledge to be able to explain to patients and caregivers the reasons for the common symptoms that affect each occupation. Occupation-based assessments that
have been found reliant include the Canadian Occupational Performance Measure (COPM) and the Assessment of Motor and Process Skills (AMPS). The establish interventions include: caregiver education, therapeutic exercise routines, and community integration. Restore interventions will focus on ADLs, instrumental activities of daily living (IADLs), motor control, and social/leisure skill training. Under adapt/modify interventions home modification, ADLs, IADLs, and cognitive therapies are addressed. Finally, therapeutic exercise routines, and psychosocial training are prevention specific interventions.

Frame of Reference

The Ecological Model of Human Performance is used to formulate these guidelines. The model is built from four constructs: person, task, context and performance. The person is looked at holistically, considering physical, emotional, and cognitive needs. The task entails combined behaviors that allow a person to reach a goal. The context is defined by the surroundings of the person, including temporal and environmental (physical, cultural and social). These contexts can either affect the person positively by supporting an occupation or negatively by creating a barrier to that occupation. Finally, the last construct is performance; this combines the task and the context, it displays a person’s skills and abilities as they are influenced by the surrounding situation (i.e. brushing your teeth during an “off” period of PD). This model also addresses interventions: establish/restore, alter, adapt/modify, prevent, and create (Dunn et al., 2003). Under establish/restore, adapt/modify, and prevent, titles of evidence-based treatments are listed. For example, under establish/restore, caregiver education is described. By using the Ecological model’s interventions, PD treatment by
OTs can be organized in such a way that the person, task, context and performance are attended to, thus providing a client-centered and holistic approach to treatment.
Guidelines for Occupational Therapists in Treating Parkinson’s Disease

by

Gordon Stubbings, MOTS
Tiffany Vliem, MOTS

Advisor:
Michael Atkinson, Ph.D.
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</table>
Introduction to Parkinson’s Disease

Neuroscience

The primary area of the basal ganglia affected in PD is the substantia nigra. The basal ganglia is described as a group of nuclei that are found deep in the hemispheres. Substantia nigra, caudate nucleus, putamen, globus pallidus, and subthalamus are common names included in this region of the brain. The basal ganglion is responsible for a variety of functions such as: motor movement, learning, cognition, and emotion (Wikipedia, 2007). Neurons in the substantia nigra normally utilize the neurotransmitter called dopamine to communicate with other regions of the basal ganglia and other areas of the brain. Neurotransmitters are chemical substances that regulate the passage of electrical signals between neurons. Certain of the substantia nigra neurons – those that contain dopamine – are damaged and eventually die in individuals affected by PD, but the cause of this damage is not fully understood. In an individual without PD, neurons that contain dopamine send out long projections (axons) to other regions of the basal ganglia, and other regions of the brain. Dopamine is transported down these projections to be used for signaling between neurons in these regions. In ways still not understood (Rivlin-Etzion et al., 2006), this allows for appropriate and controlled output from the basal ganglia back to the motor and perhaps other processing centers in the brain (Bear et al., 2001)

As indicated above, PD damages and eventually destroys the dopaminergic cells in the substantia nigra in ways not understood. This directly affects the amount of dopamine available to modify the electrical signaling needed for appropriate motor control. The four typical signs of PD (tremor, rigidity, postural instability, and
bradykinesia) are evident because of this (Kroonenberg et al., 2006). When autopsies are performed on individuals with PD, the results show that the dopamine levels are less than ten percent of that found in individuals without PD (Copstead et al., 2000).

Current research suggests that the subthalamic nucleus (STN) also plays a major role in decreasing the symptoms of PD by directly being influenced by Levodopa and deep brain stimulation (DBS) (Bevan et al., 2006). When a small portion of the thalamus becomes overactive with electrical signals, the result is Parkinson’s tremor (Jacques et al., 2003). Even though it is suggested that the STN has a direct effect on the output of the thalamus, it is an area that is not yet fully understood and further research needs to be completed.

Neurological deficits of the brain not only affect motor movements, but also influence certain cognitive aspects such as dementia. Fifteen to twenty percent of the PD population is found to suffer from dementia (Copperman et al., 2002). In addition to affecting motor control, dopamine deficiencies also affect memory and concentration. Lewy bodies (abnormal protein deposits found in nerve cells of the brainstem) play a key role in these cognitive deficiencies. The pathology of Lewy bodies is not well understood however it is suggested that they may destroy nerve cells or they may be a result of the degenerative course of the disease (Duda, 2005).

*Medical Interventions*

Pharmacological interventions have proven to be effective in the early stages of PD by counteracting the lack of dopamine within the striatum of the brain. However, treatment becomes more complex as the disease progresses and the individual becomes more disabled (Wade et al., 2003). Drugs that change the dopamine levels are called
Dopaminergic drugs: examples are Levodopa and dopamine agonists (Mirjama-Lyons, 2006). The following section covers information on current, pharmacological interventions used for the treatment of PD.

Table 1. Pharmacological Interventions.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Description</th>
<th>Side-Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levodopa</td>
<td>The most efficient drug used to treat symptoms of PD. Eighty percent of individuals experience decreased rigidity and decreased hypokinesia, the other twenty percent experience near normal function.</td>
<td>Dyskinesia and “on/off” effects, nausea, postural hypostension, and occasional psychotic symptoms</td>
</tr>
<tr>
<td>Dopamine Agonists</td>
<td>Used along with Levodopa. Affects dopamine receptors, allowing for more Levodopa to be absorbed</td>
<td>Nausea, swelling of ankles, sickness, confusion, hallucinations, dizziness, hypotension, increased dyskinesia, and drowsiness</td>
</tr>
<tr>
<td>MAO-B Inhibitors</td>
<td>Used along with Levodopa. Slows dopamine metabolism.</td>
<td>Dyskinesia, hallucinations and vivid dreaming</td>
</tr>
<tr>
<td>COMT Inhibitors</td>
<td>Used along with Levodopa. Slows dopamine metabolism.</td>
<td>Nausea, dyskinesia, and vomiting</td>
</tr>
<tr>
<td>Amantadine</td>
<td>Only mildly alleviates symptoms, used during early stages of PD.</td>
<td>Infrequent, but could present with dizziness, insomnia, and slurred speech</td>
</tr>
<tr>
<td>Anticholinergic</td>
<td>Oldest form of pharmacological intervention, often avoided due to side effects.</td>
<td>Dry mouth, constipation, blurred vision, confusion and hallucination</td>
</tr>
</tbody>
</table>

(Parkinson’s Disease Society, 2007 & Rang et al., 2003)

There are currently a variety of surgical techniques used with PD, including: pallidotomy, deep brain stimulation, thalamotomy, lesioning of the subthalamic nucleus, and foetal mesencephalic grafts. Individuals who go through any of these surgeries have been carefully evaluated and selected for a certain procedure. These operations are not
meant to cure PD, only to be used in conjunction with medications to treat the symptoms (Walter et al., 2004 & Horstink et al., 2006).

Table 2. Surgical Interventions.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Description</th>
<th>Side-Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Brain Stimulation</td>
<td>Most common surgical intervention. Electrical input targeted at the thalamus, subthalamic nucleus (STN) or the globus pallidus.</td>
<td>Uncommon, but may include: neuropsychiatric complications, speech and swallowing difficulties, sensory deficits, and vision deficits.</td>
</tr>
<tr>
<td>Pallidotomy</td>
<td>Probe used to target the globus pallidus, provides an electric shock that destroys a small part of the globus pallidus.</td>
<td>Uncommon, but may include: symptomatic infarction, speech deficits, facial paralysis, visual deficits, psychosocial complications, or death.</td>
</tr>
<tr>
<td>Thalamotomy</td>
<td>Rarely used. Liquified nitrogen is inserted into the brain to destroy a region of the thalamus.</td>
<td>Long lasting deficits are uncommon, speech and cognitive deficits may increase if procedure is done on both sides of the brain.</td>
</tr>
<tr>
<td>Lesioning of the STN</td>
<td>Rarely used. Cutting of a small portion of the STN.</td>
<td>Postural changes, possible hemiballismus due to STN infarction.</td>
</tr>
<tr>
<td>Foetal Mesencephalic Grafts</td>
<td>Rarely used. Transplantation of foetal mesencephalic cells into the striatum.</td>
<td>Dyskinesias</td>
</tr>
</tbody>
</table>

(Walter et al., 2004 & Horstink et al., 2006)
OT Assessments

An assessment is usually the first part to OT patient treatment intervention. Very few PD assessments include the framework and domain of OT. The reason for this is that these assessments were not developed by OTs. However some studies have found a variety of OT-based assessments that have been under study to explore their effectiveness in measuring different aspects of PD. The following table provides an overview of proven efficient assessment tools that measure occupational performance and quality of life.

Table 3. Assessment Tools.

<table>
<thead>
<tr>
<th>Assessment:</th>
<th>Description:</th>
<th>More Information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parkinson’s disease Questionnaire 39 (PDQ-39)</td>
<td>Assesses individuals self-report of mobility, ADLs, emotional well being, stigma, support, cognition, communication and discomfort.</td>
<td><a href="http://www.publichealt.h.ox.ac.uk/units/hsru/PDQ">http://www.publichealt.h.ox.ac.uk/units/hsru/PDQ</a></td>
</tr>
<tr>
<td>Parkinson’s disease Quality of Life Scale (PDQL)</td>
<td>Self report questionnaire that explores the individual’s symptoms, emotional and social occupations.</td>
<td><a href="http://ageing.oxfordjournals.org/cgi/content/abstract/28/4/341">http://ageing.oxfordjournals.org/cgi/content/abstract/28/4/341</a></td>
</tr>
<tr>
<td>Parkinson’s Impact Measurement Scale (PIMS)</td>
<td>Scale that focuses on mental aspects of the individual, specifically targets perception of quality of life.</td>
<td><a href="http://www.parkinson.ca/pd/Documents/PIMSSENG.pdf">http://www.parkinson.ca/pd/Documents/PIMSSENG.pdf</a></td>
</tr>
</tbody>
</table>
OT Interventions

Although little evidence is available on the efficacy of OT in the treatment of PD, what evidence there is seems to suggest that OT treatment is indeed effective. In a study done by Murphy et al. (2000), 37% of individuals that did not participate in OT still displayed positive outcomes, while 63% of individuals that did receive OT, demonstrated positive results. This suggests that OT has a reasonable effect on intervention outcomes for persons with PD. It has also been confirmed that in conjunction with other rehabilitation services, OT improves motor function for individuals with PD, for up to three years after the initial session (Carne et al., 2005). Another study concluded that individuals that participated in eight sessions of OT had improvement in ADLs. It indicated that OT interventions were found to be useful for persons with PD, and should be considered when patients are experiencing mild to moderate symptoms (Jain et al., 2004).

There is conflicting evidence in the current literature to support or refute the long-term benefit of OT, some studies suggest that benefits last up to three years, others suggest that benefits last no longer than six months (Jain et al., 2004 & Carne et al, 2005). Deane et al. (2002) concluded that OT interventions were not effective in treating PD, further noticing that these results might have been contributed to flaws in the design of the study. In conclusion, there is no clear-cut evidence supporting OT intervention efficacy for persons with PD (Steultjens et al., 2005).

Some of the following interventions have been found to be specifically beneficial in treating the symptoms of PD. Using the Ecological Model of Human Performance, the interventions have been organized into establish, restore, adapt/modify, and prevent.
ESTABLISH
Along with treating the individual, a focus should also be given to family and caregivers. According to the National Family Caregivers Association (NFCA) 82% of caregivers are female, 48% care for a spouse, 60% are older than 50 years, and 39% have been caregivers for less than four years. Another interesting statistic is that over half are unemployed (Imke et al., 2006). These statistics give OTs a brief understanding of the common caregiver. According to a study conducted by Martin et al. (2003), the goal of OT “is to maintain functional independence and, as the disease progresses and abilities decline, to assist individuals and their families to adapt and change strategies to optimize function at a new level” (p. 31).

It is suggested that educating the person and their family is a vital part of OT in treating persons with PD (Martin et al., 2003). It is important for OTs to provide support for these caregivers so that they are able in turn provide quality care leading to increased social participation and appropriate medical execution. It is also important for OTs to recognize that the role of a caregiver can be a high stress and tiresome occupation. Areas that may add to the stress include physical, psychological, emotional, financial, and social strain. The information that these studies potentially provide is beneficial for OTs to successfully treat the person with PD holistically by including their caregiver and other social support.
Caregiver Education Sessions

The following eight sessions were gathered from a study done by Simons et al. (2006). Both caregivers and persons with Parkinson’s disease involved in the study concluded that the sessions improved their mood, and was helpful in the information provided.

**Session 1: Information**
This session is educational in nature and introduces general information about Parkinson’s disease and the symptoms that are presented. The primary focus is on how participants can acquire relevant information from specific professionals (i.e. OTs, PTs).

**Session 2: Self-monitoring**
This session explains self-monitoring and its uses. Practical exercises using self-monitoring tools such as a diary are addressed, and questions are answered.

**Session 3: Health Empowerment through Leisure**
This session covers the health benefits of maintaining leisure activities, and participants learn how to maintain healthy activities.

**Session 4: Stress Management**
This session provides information about stress and its components. Ways to recognize stressful situations and prevent stress are discussed. Caregiver stress is given a large chunk of the session.

**Session 5: Caregiver’s Challenge**
This session discusses the potential for caring to become a burden. Strategies to prevent or reduce burden of care are discussed.

**Session 6: Social Competence**
This session goes over ways to communicate and overcome problems in communication (general and Parkinson’s disease specific). The role of thoughts (helpful vs. unhelpful) in social situations is presented, and socially competent behavior is practiced.

**Session 7: Social Support**
The importance of receiving support from the formal and informal social network is described and discussed. Participants practice asking for and receiving help.

**Session 8: Summary**
This session is a reflection of the information presented in the previous sessions. Participants are asked to offer feedback on their experiences throughout the program.

(Simons et al., 2006)
Therapeutic Exercise Routines

The relationship between exercise and increased dopamine levels has been widely studied, indicating that exercise programs would be beneficial to individuals with PD. A review of studies on the importance of exercise indicated that exercise did indeed improve individual's functional performance in physical activity and in ADLs (Crizzle et al., 2006). When treating bradykinesia, it has been proven that exercise programs create positive outcomes. The review by Jobges et al. (2006) discovered that both karate and other upper body exercise programs create favorable results. Individuals showed improvements in gait, fine motor coordination, tremor and grip (p. 5). Training of ADLs, relaxation, breathing, and gait are a few other areas of exercise commonly implemented in PD treatment (Crizzle et al., 2006). In another study performed by Ashburne et al. (2007), the risk of falling was dramatically decreased with the implementation of a home exercise program designed by a physical therapist. This may indicate that exercise also positively affects postural stability and balance of individuals with PD (p. 12).

By engaging in therapeutic exercise, individuals with PD not only improve physical symptoms, but also emotional and social distress. The development of group exercise programs allows for individuals with PD to engage socially, increase life enjoyment, thus decreasing risk of depression and anxiety, which are common symptoms of PD (De Paula et al. 2006).
Therapeutic Exercise Routine:
Patient Handout

Deep Breathing

Inhaling in through the nose

Exhaling through pursed lips

Facial Exercises

Raise eyebrows, then frown.

Close eyes tight, then open wide.

Smile, then pucker lips.

Open mouth wide, then close.

Lick lips.
Neck and Shoulder Exercises

1) Look side to side.

2) Look up, then look forward.

3) Hand in front of chest, pull elbows back, squeezing shoulder blades together.

4) Move shoulders in a circle.

Arm Exercises

1) Extend both arms out to the sides at shoulder height, bring forward in front of chest, crossing one arm over the other.

2) Forward swimming stroke.

3) Backward swimming stroke.

4) Hang arms down at your sides and swing them back and forth, as when walking.

Wand Exercises

*Hold wand in both hands, shoulder width apart*

1) Raise wand overhead.

2) Move wand in a large circle.

3) Move wand in a figure eight.

4) Move wand in a diagonal.
Wrist and Hand Exercises

1) Turn hands palm up, then palm down on your lap.

2) Rotate wrists in one direction, then repeat in the other direction.

3) Alternately bend one hand up towards the ceiling, and the other down towards the floor.

4) Alternately open one hand, as the other hand is in a fist.

5) Touch thumb to each finger, individually.

Trunk Exercises

1) Rotate trunk to look behind you, one side then the next.

2) Hand on your hips, bend sideways.

3) Bend forward at the waist and touch your ankles.

4) Place hands on your hips, arch your back.

5) "Walk" hips forward then backwards in the chair.

(Better Health Channel, 2006)
Fatigue is recognized as one of the most common symptoms in PD (42% of all individuals with PD experience this), but is often overlooked by the multidisciplinary team (Yoshi et al., 2006 & Ferreri et al., 2006). This is an area important for OTs to target due to its possible hindrance in engaging in meaningful occupations, diminishing the individual's perception of quality of life. Current research on specific treatment strategies for fatigue is poor. As clinicians, patients, and caregivers it is important to be able to distinguish between symptoms of fatigue to what often can be perceived as laziness. Thus, education is a key role in the intervention of fatigue to promote the most efficient participation in the individual’s daily occupations. Specific techniques in fatigue management include energy conservation. (Ferreri et al., 2006).
Energy Conservation Techniques: Patient Handout

Rearrange Environment

- Keep frequently used items in easily accessible places
- Replace existing heavy items with lighter ones; for example, use plastic plates and cups rather than dinnerware and glass
- Install long handles on faucets and doorknobs
- Adjust work spaces, such as raising a tabletop, to eliminate awkward positions (bad posture drains energy)
- Install pull-out or swing-out shelving in cabinets
- Wear an apron with pockets to carry around cooking utensils or cleaning tools
- Consider moving bed to the first floor to eliminate climbing stairs

Eliminate Unnecessary Effort

- Sit rather than stand whenever possible (i.e. while preparing meals, washing dishes, ironing)
- Use adaptive equipment to make tasks easier; try a jar opener, a reacher, a shower chair to allow you to sit while bathing, or a hands-free headset for your phone
- Soak your dishes before washing, then let them air dry; use paper plates
- Use prepared or frozen foods when possible
- Get a rolling cart to transport heavy items around the house, rather than carrying
- See if your grocery store will deliver your groceries
- Use store-provided wheelchairs or scooters when shopping

Plan Ahead

- Gather all the supplies you need for a task or project before starting, so everything is in one place
- Call ahead to stores to make sure the items you need are available
- Cook in larger quantities and refrigerate or freeze extra portions for later
- Work breaks into activities as often as possible, take a break before you get tired
- Schedule enough time for activities – rushing takes more energy
- Try keeping a daily activity journal for a few weeks to identify times of day or certain tasks that result in more fatigue

Prioritize

- Eliminate or reduce tasks that aren’t that important
- Delegate tasks to friends or family members
- Consider hiring professionals, such as a cleaning or lawn care service, to cut down workload

(PHCentral, 2006 & Canada’s Occupational Therapy Resource Site, 2004)
Sensory cueing may be a technique used by OTs to increase transfer safety and functional mobility. Cues are defined by Keus et al. (2006), as "stimuli from the environment or generated by the patient, which the patient uses, consciously or not, to facilitate (automatic and repetitive) movements." There are four different types of sensory cues: auditory, visual, tactile and cognitive. The sensory cueing role in the intervention of PD has been well studied, especially such techniques as placing stripes on the floor, and rhythmic sounds (i.e. counting or music). These techniques have been proven to affect functional mobility for some individuals with PD (Keus et al., 2006). In a study done by Nowak et al. (2006), the combination of DBS and auditory cueing improved akinesia when completing an upper extremity task (p. 171).
Sensory Cueing Strategies: Tips for OTs in Implementing Rhythmic Cues

**Auditory**
- Beats within music/metronome
- Beeps administered through an earpiece

**Visual**
- Stripes on the floor
  - People are asked to walk on the stripes to normalize their stride, persons with PD are able to do so even if they are not able to rely on internal cues
- Light flashes

**Tactile**
- Electrical Stimulation
  - Applied over the left hip abductor musculature because it is a prime mover of initial stride
  - Person with PD may benefit from practice with this sensory cue because it is not regularly experienced
- Somatosensory
  - Pulsed vibrations delivered by a miniature cylinder worn under a wristband

(Nieuwboer et al., 2007 & Dibble et al., 2004 & Azulay et al., 2006)
RESTORE
Motor Control/Coordination

OT interventions including coordination of joint movement have also been proven beneficial in the treatment of bradykinesia. Based on the study by Maitra et al. (2005), it was demonstrated that motor movements such as reaching and grasping were slower in individuals with PD than the control group with no neurological deficits. Due to these results the authors were able to conclude that bradykinesia is caused by "the breakdown of coordination between joint movements as a result of presumably slow executive processing of motor programs" (p. 218). By implementing coordination interventions, OTs can contribute to decreased bradykinesia, and thus increased ADL independence. Although there is evidence that this type of OT intervention would be helpful, there has not been any formal research published on the effectiveness of such an intervention with PD.
Motor Control Interventions

Techniques to Facilitate Joint Movement

- Exercise (slow stretching and karate) shows improvement of coordination in persons with Parkinson's disease.

- Practice of certain motions shows to improve bradykinetic movements of persons with Parkinson's disease

Techniques to Increase Hand Function (Handwriting)

Persons with PD often show decrease in handwriting size (micrographia) as the extent of the writing they make increases. The reasons for this in not known, but possible causes are:

- Decreased coordination and/or control of upper extremity (fingers, wrist, and arm)
- Decreased cognition and/or word finding (processing of future words)
- Increased extension of the wrist joint when writing heads to the right of the paper (Van Gemmert et al. 2001).

By creating interventions that address each of these possible causes, OTs may be able to increase hand function. There has not been any evidence to support or refute the effectiveness of handwriting interventions for persons with PD.

(Van Gemmert, A.W.A., 2001)
Psychosocial Skills Training

Since depression affects 30% to 50%, and anxiety affects 40% of all individuals with PD (Miller et al., 2007 & Lauterbach 2004) OT has the opportunity to intervene in this area. The review by Jobges et al. (2006), suggested that stress management, cognitive rebuilding, social skills training, role playing, and relaxation techniques were rated very highly by individuals with PD involved in the study. No objective data was available from formal assessments to prove efficacy of these treatment strategies (p. 6). Although, another literature review looked at three different studies that focused on psychosocial aspects, and it concluded that individuals receiving therapy in both group and individual formats benefited in terms of decreased depression. One of these three studies also demonstrated that caregivers benefited as much from the interventions as did the individual with PD (Gage et al., 2004). Dementia, apathy, sleep disorders (60%-90%), addiction and psychosis are other neuropsychiatric problems associated with PD (Lauterbach, 2004). These symptoms are usually caused by pharmacological side-effects, inability to deal with life changes, and the disease itself (Ferreri et al., 2006).

In the research study done by Depronzo Dobkin et al. (2006), a cognitive behavioral technique was applied to identify the benefits for persons with PD whom also suffered from depression. The results indicated that the therapy intervention was effective and feasible to implement.
Psychosocial Interventions

**Identify Life Stressors**

Ask the client to take a look at their daily activities, and record what they feel are most stressful to them. You may provide the client with a list if they are finding it difficult to identify stressors independently.

The following is an example of a stressors list:

- Slowing down
- Not being able to complete simple tasks secondary to symptoms
- Time with children or grandchildren too short
- Feeling of remaining time being short
- Thinking about your own death
- Change in your sleeping habits (i.e. ability to fall or stay asleep)
- Wishing parts of your life had been different.
- Constant or recurring pain
- Reaching a milestone year (becoming 65, 70, 75, 80, 85, 90)
- Not enough visits to or from family members
- Change in your sexual activity
- Concern for children (such as out of work, divorce, arguments, etc.)
- Reducing eyesight
- Concern for completing required forms (such as income tax, Medicare forms, etc.)
- Decreasing mental abilities (such as forgetting, difficulty with decision-making, planning, etc.)
- Change in your diet or eating habits
- Death of close friend
- Remembering to take medications
Plans to Minimize Stress and Maximize Quality of Life

After listing all the daily stressors, ask the client to think of which ones they can eliminate or do something about. Encourage the client to talk to other people, friends, family, and clergy. Offer assistance in determining which stressors they can eliminate and/or minimize.

Goals to Complete Daily Exercise to Enhance Mood and Motor Function

Studies have shown that exercise is tied to increased mood and motor function for persons with Parkinson’s disease. This indicates that creating a simple goal sheet to complete a daily exercise routine will in turn increase mood and psychosocial function. The exercise routines will contribute to decreased stress, fatigue and negative thoughts.

The following are tips on how to create Daily Exercise Goals:

- Form achievable goals
- Write down goals and put them in a place where they are seen everyday
- Establish goals that are measurable (i.e. 30 min./day)
- Set target dates for goals (i.e. “I will be exercising 30 min./day by 3 weeks”)
- Rewards after reaching each goal

Focus on Meaningful Activities

As occupational therapists it is our duty to provide activities for clients that are meaningful for each individual. By encouraging persons with Parkinson’s disease that have a psychosocial comorbidity (i.e. depression) to engage in activities, they gain a sense of purpose and fulfillment in their lives in the face of this progressive disease.

Encourage to Broaden Leisure/Enjoyable Occupations

Clients need to be encouraged to alter their expectations of themselves, expanding their range of enjoyable activities. Leisure activities are also thought to decrease the clients’ focus on physical symptoms.

Introduce Sleep Hygiene Techniques

Psychosocial dysfunction may be a result of poor sleep hygiene. The negative impact of sleep problems can disrupt normal functioning, affecting mood, attention, memory, or even social relationships. Without the proper quality and amount of sleep stress levels can increase and thus fuel negative psychosocial functioning. Tips include:

- Avoid daytime naps
- Establish daytime/nighttime routines (getting up and going to bed at a certain time)
- Avoid heavy meals in the evening
- Avoid caffeine and/or alcohol in the evening
• Write down “worry” issues to avoid ruminating at night
• Exercise early in the day, not in the evening
• Get plenty of light during the day

(Comella, 2006).

## Relaxation Techniques

### Diaphragmatic breathing
**Instructions to client:**

1) Lie on your back, or sit in a chair. Bend your knees and make sure your head and neck are supported and relaxed. Use a pillow under your knees to support your legs if lying on your back. Place one hand on upper chest and the other just below your rib cage. This will allow you to feel your diaphragm move as you breathe.
2) Breathe in slowly through your nose so that your stomach moves out against your hand. The hand on your chest should remain as still as possible.
3) Tighten your stomach muscles, letting them fall inward as you exhale through pursed lips. The hand on your upper chest must remain as still as possible.

(The Cleveland Clinic Foundation, 2004)

### Progressive muscle relaxation

Progressive muscle relaxation is a systematic technique for achieving a deep state of relaxation. It is done through tensing up and releasing each muscle group one at a time. The exercise takes 20-30 minutes.

**Instructions to client:**

1) Make sure you are in a setting that is quiet and comfortable.
2) When you tense a particular muscle group, do so vigorously without straining, for 7-10 seconds. You may want to count "one-thousand-one," "one-thousand-two," and so on, as a way of marking off seconds.
3) Concentrate on what is happening. Feel the buildup of tension in each muscle group. It is often helpful to visualize the particular muscle group being tensed.
4) When you release the muscles, do so abruptly, and then relax, enjoying the sudden feeling of limpness. Allow the relaxation to develop for at least 15-20 seconds before going on to the next group of muscles.
5) Allow all the other muscles in your body to remain relaxed, as far as possible, while working on a particular muscle group.
6) Tense and relax each muscle group once. But if a particular area feels especially fight, you can tense and relax it two or three times, waiting about 20 seconds between each cycle.

(Jacobson, 2006)
Guided visualization

This relaxation technique requires the occupational therapist to guide the person with Parkinson’s disease through a relaxing scene (i.e. a beach). The client closes his/her eyes and uses imagination to walk through the visualization. It is usually done in a quiet relaxing environment.

Recording Negative Thoughts and Feelings

Keeping a journal gives persons with Parkinson’s disease a tangible way to identify the negative thoughts that occur on a daily basis. This tangible evidence gives way to identifying areas of intervention that can later be addressed by the occupational therapist.

Caregiver Education

Caregiver sessions can be aimed to decrease frustration and the feeling of helplessness. By educating the caregiver about signs and interventions of depression, they can in turn aid in helping the client achieve his/her goals.

The following topics are ideas for caregiver education sessions:

- How to respond to negative, pessimistic behaviors
- How to encourage newly learned coping skills
- How to discouraged helplessness

(Defronzo-Dobkin et al., 2006)
ADAPT/MODIFY
Home Modifications

Another area of OT intervention is the home modification and assessment. The home visit is usually done at the beginning of therapy sessions so that the OT is able to observe the person in his/her natural context (Jain et al., 2004). An area that is common for OTs to focus on is the need for adaptive equipment within the home, allowing for the individual with PD to be independent and safe (Martin et al., 2003). Suggestion and education of adaptive equipment is a staple of OT interventions for persons with PD. Adaptive equipment can address different deficits of PD, such as decrease in self-care, work and leisure functions, handwriting, and mobility (Cianci et al., 2006).
Home Modifications: Tips to Modify a Home

Entrances/Exits

- Install a ramp if a wheelchair is used, or if stairs become too difficult secondary to gait disturbances.
- The doorway needs to be at least 36 inches wide if a wheelchair is used
  - Remove regular hinges with swing hinges
  - Remove doorstops
  - Remove thick thresholds that may make it difficult to roll over
  - Remove door altogether, replace with decorative curtain
- Door knob replaced with lever due to decreased dexterity/joint coordination
- Avoid thick doormats to prevent tripping

Kitchen

- Use turntables inside cabinets to give access to the whole cabinet
- Install a sink faucet with a single-lever handle for easier control
- Purchase a stand mixer when tremor interrupts cooking/baking activity
- Place often used items in easy to reach cabinets
- Keep heavy pots and pans on stove top to decrease strain and risk of falls

Bedroom

- Remove any scatter rugs that may increase risk of falls
- Place clothing that is used often in higher dresser drawers

Bathroom

- Toilet
  - Elevating the toilet seat may make it easier to get up and off of seat
  - Place bars on either side of toilet to help with transfers
- Shower/Bath
  - Place bars inside shower/bath to help with navigation
  - Install hand-held shower head so that shower can be brought to the level in which the person is seated
  - Purchase shower bench/chair so that showers are less exhausting, or if balance is an issue

(Infinitec.org: Infinite Potential through Assistive Technology, n.d.)
Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs)

ADLs are activities that people engage in throughout their structured day. According to the American Occupational Therapy Association (AOTA), these activities entail: dressing, walking, bathing, toileting, toilet hygiene, grooming, eating, and sleeping. Evidence suggests that engagement in physical activity and education can improve functional performance in areas of ADLs (Montgomery et al., 1994[AOTA]). IADLs are occupations that individuals partake in on a daily basis that are oriented towards interacting with the environment and that are complex, generally optional in nature. Such activities include: care of others (including selecting and supervising caregivers), care of pets, child rearing, communication device use, community mobility, financial management, health management and maintenance, home establishment and management, meal preparation and cleanup, safety procedures/emergency responses, and shopping (Occupational Therapy Practice Framework, 2002).

Parkinson’s disease may lead to decreased ability to safely and functionally perform one or more of these areas of ADLs/IADLs due to the symptoms of the disease. This section offers a variety of adaptive techniques to successfully engage in daily activities as independently as possible. For the purpose of this product, the following section covers tasks related to ADLs.
Tips for Successful ADLs

Dressing

General
- Take your time getting dressed, rushing the activity may lead to increased difficulty and frustration
- Warm up muscles (i.e. stretching) before starting activity
- Sit down when dressing, preferably a well supported and stable chair, edge of bed may lead to loss of balance

Clothing
- A pullover creates fewer problems versus clothing with buttons and zippers
- Pants with elastic waists and loose ankle fitting are easy to dress and comfortable
- Buttons could be replaced with velcro to ease the process
- Zipper-loops could be attached to the zipper to help with fine motor deficits
- Clothing that increased friction (i.e. flannel, valour) increases difficulties with transfers and repositions
- A lightweight (i.e. aluminum) reacher may allow easier dressing of lower body as well as grabbing items. This equipment could be purchased through medical suppliers and/or through the occupational therapist. Proper instructions on correct use should be provided by the therapist before use.
- Button-hooks may aid the individual in buttoning clothing, this equipment could be purchased through medical suppliers and/or through the occupational therapist, proper instructions on correct use should be provided by the therapist before use

Shoes and Socks
- Socks without elastic bands are easier to dress
- Socks with anti-slip soles allow for increased safety versus bedroom slippers
- Lightweight shoes with Velcro or elastic shoelaces (either straight or curly) should be prioritized due to ease of putting on and taking off
- Long-handled shoehorns makes it easier and safer (no forward bending necessary) to put on shoes, this equipment could be purchased through medical suppliers and/or through the occupational therapist
- Sock-aids allows for easier/safer dressing of socks, this equipment could be purchased through medical suppliers and/or through the occupational therapist, proper instructions on correct use should be provided by the therapist before use
Women
- Wide woven bands at top of hosiery are recommended to allow for easy dressing and comfort
- Avoid high-heeled shoes as these may lead to decrease balance

Caregivers
- Allow the individual to do as much of the activity as possible and assist when needed, interfering can inhibit the person’s functional abilities and thus feeling of dependence
- Shoes, socks, and pants may be easier to dress when person is lying down on back (supine)

Grooming
- Engaging in these activities while sitting increases safety and ability to complete the task, also allows for energy conservation
- Rest arms/hands on sink if tiring and to provide stability when performing the activity
- Electric shavers versus razors to increase safety
- Electric tooth brush is recommended
- Hands-free dryers could be mounted to different surfaces

Bathing and Showering
- Handrails should be installed to allow for safety, this should be assessed by the occupational therapist and installed by professionals, soap cups, vanity, towel racks, etc. are not meant to support a person and should not be used as handrails
- Tub/shower transfer bench or chairs should be utilized to prevent falls when engaged in the activity, the need for such equipment and recommendations should be discussed with the occupational therapist
- Long-held shower head should be installed
- Doors in the shower stall should be replaced with shower curtains
- Bathtub/shower should have an anti-slip surface (i.e. bathtub/shower mat)
- Utilize pumps for soap and shampoo, makes it easier and less slippery than bar soaps
- Long-held bathing sponges allow for washing body parts without bending and flexing
- If alone, bring a cordless phone system to the bathroom incase of an emergency
Toileting

General
- Establish a regular bathroom routine if experiencing urinary difficulties
- Avoid caffeinated drinks if experiencing urinary problems
- Use pads, shields or other products if experiencing incontinence
- Always keep a nightlight on in the bathroom
- If experiencing burning sensations when engaged in activity, this may be an indication of urinary tract infection a healthcare provider should be notified immediately.
- A commode could be rented and/or purchased, this equipment could be placed over the toilet for increased support and balance as well as being placed next to the bed at nighttime, discuss the equipment with the occupational therapist

Caregivers
- Correct and safe transfer techniques should be acquired from the occupational therapist for toilet/commode transfers
- Allow the individual sufficient time (often much time needed)
- Devices (i.e. a bell to ring, baby monitors, alarms, etc.) could be used to allow the individual privacy

Rest and Sleep

Into Bed
- Feel the mattress behind legs when approaching the bed, reach straight back with both arms to ease the descent
- Lean on forearm and allow your trunk to slide down while the legs will come up
- Crawling into bed is not recommended for safety reasons

Out of Bed
- Bend knees with feet flat on mattress, let knees fall to the side and roll body towards edge of bed
- Lower feet from the bed and use arms to push body to an upright sitting position
- Bed rails could be installed to aid in pulling/pushing body up.
- Adjustable electrical beds may provide assistance in getting out of bed and make breathing easier.
- Floor-ceiling-pole mounted close to the edge of the bed may be beneficial in that the individual grabs on to it when standing up from the bed
Eating

General
- If possible plan meals during “on” periods or when medication is working
- The meal should be cut into smaller pieces to make the eating process easier and safer.
- Sit upright in a chair and continue holding this position (30 minutes) after the meal.
- An insulated dish may help keeping the food warm for longer periods of time.
- Hi-low scoop plates prevent food from sliding off the plate
- Rocker knife/pizza cutter may aid in cutting the food
- Angled utensils may make it easier to eat
- Nosey cup allows the individual to drink without bending head backwards.
- Non-slip surfaces may prevent the plate from sliding around

Caregivers
- Allow the individual sufficient amount of time to complete the meal
- Smaller meals spread out through the day may be easier for the individual to comprehend, rather than three bigger meals per day
- Knowing the Heimlich procedure is recommended should the individual choke

(Cianci et al., 2006)
PREVENT
Prevention

All of the previous intervention techniques contribute to prevention aspects. For example, therapeutic exercise routines and home modifications may contribute to decreased falls and/or injuries. Educating caregivers may help in the prevention of caregiver distress, in turn providing more quality care to the individual with PD. By establishing energy conservation techniques individuals will prevent fatigue and/or falls. Commonly, individuals with Parkinson’s disease experience falling backwards during engagement in different daily activities. Listed below are suggestions to prevent this from occurring.
Fall Prevention Techniques

**Walking**

- Lift feet to avoid a shuffling gait
- When standing for longer periods, create a broad base, spreading feet apart
- Use a wide U-turn pattern, facing forward, instead of pivoting
- Step over an object (or imagine stepping over an object) when feet feel "stuck" and/or rock body from side to side (it does not help if caregiver pulls the individual forward to help out)
- Utilize free arm swing when walking

**Reaching Overhead**

- While reaching overhead for objects, place other hand on a stable surface (countertop, wall etc.) as a way of stability and support
- Ladders, stairs, and step stools should be avoided

**Carrying Objects**

- Objects should not be carried with both hands while walking

**Stepping Backwards**

- When stepping away from objects, turn body to one side while lifting knees and using marching movements
- Backing-up to sit in a chair or the bed make sure to feel the edge of the furniture before sitting and reach arm behind back

**Changing Positions**

- When changing positions, make sure to do it in a slow and timely manner, when moving from one position to another, allow a 15 second pause

(Occupational therapy-Parkinson's preventing falls, n.d.)
**Recommended Online Readings/Resources**

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<td>Book by John Argue, teaches exercises and movement methods</td>
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CHAPTER V
SUMMARY

The purpose of this Scholarly Project was to provide extensive and comprehensive evidence-based information about Parkinson’s disease (PD) as it applies to occupational therapists (OTs). This information further led to clinical guidelines in the form of a user friendly manual meant for practicing OTs in treating PD.

The literature review indicated that there are different factors that affect the pathophysiology in the brain causing idiopathic PD. The literature suggests that medical and pharmacological interventions can help in alleviating the symptoms. Although there is not an extensive amount of information on the efficacy of OT in the treatment of the disease, most literature indicates it to be beneficial in the treatment process. The role of OT in the process includes: establishing and restoring the person’s skills, adapting and modifying tasks and environment, as well as preventing any undesired outcomes. This is in congruency with the Ecological Model of Human Occupation. Appropriate assessment tools for OTs to utilize with this population have been indicated in the literature review to be either the Canadian Occupational Performance Measure (COPM) or the Assessment of Motor and Process Skills (AMPS).

The information from the literature review helped to formulate the product, “Guidelines for Occupational Therapists in Treating Parkinson’s Disease.” Included in this project are evidence-based OT interventions, assessments, and basic information on PD. It was determined that knowledge of the disease’s typical progression, and affect on
the brain would benefit the person with PD and their caretaker. By using this manual for the treatment of PD, an OT will be able to access evidence-based treatment without performing exhausting literature searches.

Limitations of the project

A limitation to this project was that the data collected from evidence-based research was inconsistent from one study to another; therefore this manual does not suggest one particular way of treating a person with PD. Another limitation of this project is that the “Guidelines for Occupational Therapists in Treating Parkinson’s Disease” has not been implemented in a clinical setting; therefore its effectiveness has not been identified.

Proposal for implementation

The OT guidelines that have been developed for the treatment of persons with PD will be available for therapists interested in this subject. The guidelines are meant to be implemented in either physical disability or psychosocial settings, including but not limited to: inpatient, outpatient, home health, skilled nursing facilities (SNF) and hospice.

Conclusions

The literature review indicated that further research would need large randomized control group studies to be able to determine the validity and reliability of OT treatment with PD. Another focus for future research has been to involve the entire rehabilitation team and the role of caregivers. The project that was developed provides guidelines for occupational therapists working with adults diagnosed with Parkinson’s disease. The project involves the Ecological Model of Human Occupation for directing a holistic and occupational approach.
Recommendations

Future evidence-based research on the effectiveness of occupational therapy treatment and interventions in Parkinson’s disease are needed to guide practicing clinicians. In addition to the information gathered through this scholarly project, it is recommended that current practice used with this population is sought out to determine “the best” possible practice available.
References


National Parkinson Foundation (n.d.). Your guide to Parkinson Disease. NPF Inc.: Miami, FL.


